SonicWall®
Secure Mobile Access 12.1

Administration Guide

SONICWALL®

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Part 1

Introduction

- About Secure Mobile Access

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About Secure Mobile Access

Secure Mobile Access on SMA Appliances

Welcome to the *Secure Mobile Access 12.1* Administration Guide. This manual provides the information you need to successfully activate, configure, and administer Secure Mobile Access (SMA) on SonicWall SMA appliances.

SonicWall SMA appliances provide secure access—including clientless access to web applications, access to client/server applications, and file sharing—to employees, business partners, and customers. All traffic is encrypted using Secure Sockets Layer (SSL) to protect it from unauthorized users.

The appliance makes applications available from a range of access methods—including a standard Web browser, a Windows client, or a mobile device—on a wide range of platforms including Windows, Macintosh, and Linux.

You might use the appliance to create a:

- Remote access VPN that enables remote employees to securely access private company applications such as email over the Internet.
- Business partner VPN that provides designated suppliers with access to an internal supply chain application over the Internet.

The appliance's granular access control lets you define policy and control access down to the user and resource level. Managing policy and configuring the appliance is quick and easy with the Web-based management console.

For an overview of planning your SonicWall Secure Mobile Access appliance configuration and deployment, see the *SonicWall SMA Deployment Planning Guide*.

About SMA Documentation

Your SonicWall SMA appliance also comes with a printed *Getting Started Guide*, and there is a *SonicWall SMA Deployment Planning Guide* that explains important VPN concepts and components and aids in deploying your VPN. For access to electronic copies of all product documentation, visit the SonicWall Support portal or log in to your MySonicWall account and register your appliance. See Registering Your SMA Appliance for more information.

Document Conventions

Throughout this document:

- External refers to the network interface connected to the Internet.
- Internal refers to the network interface connected to your internal corporate network.

This document uses the following typographical conventions:

Document conventions

Typographical convention	Usage
Bold	User interface components (such as UI pages, dialogs, text fields, or buttons).
`Monospace font`	Information you are supposed to type.
`commandname -x [-y]`	In command-line syntax, square brackets indicate optional parameters.

What's New in This Release

SonicWall Secure Mobile Access (SMA) 12.1 includes these new features:

- Biometric Identity Verification
- Web-based RDP, VNC, SSH, and Telnet
- Legacy and SAML SSO Support with CAM
- Endpoint Security Integration SDK (OESIS) Version 4
- Appliance Management Console (AMC) and WorkPlace management interface have a redesigned, easy-to-use page layout
- Global High Availability (Global HA) with GTO
- GTO support for Outlook Anywhere, Exchange ActiveSync, Custom FQDN, and Custom WorkPlace
- Capture Advanced Threat Protection (Capture ATP)

Deprecated Features

These features have been deprecated on all SMA appliances in SMA 12.1:

GMS	GMS is not supported in SMA 12.1. For more information, refer to the *SMA 12.1 Central Management Server with Global High Availability Administration Guide*.
Secure Sockets Layer (SSL) Version 3.0	The Secure Sockets Layer (SSL) protocol has proven to be an inefficient and insecure protocol, and customers have been requesting its removal. Secure Sockets Layer (SSL) Version 3.0 is being deprecated on all SMA 1000 series appliances in SMA 12.1. The option to enable SSLv3 is not available on the SSL configuration page. The system disable SSLv3 automatically when upgrading to SMA 12.1 or when importing the configuration. This applies to standalone appliances and CMS installations. The SSLv3 protocol is not supported or negotiated for any connections in SMA 12.1. During system upgrade or configuration import, if SSLv3 is enabled on the incoming configuration, it is removed from the new configuration and the upgrade or import process succeeds. The Management API, enum SSL_V3_AND_TLS_1_0_AND_HIGHER is no longer valid when configuring the SSL encryption via the encryption resource.
Virtual Assist	When you attempt to upgrade to SMA 12.1 from an earlier release, or import an SMA 12.1 configuration, the system prevents the upgrade or import and notifies you with this message: `Virtual Assist is not available in SMA 12.1. You must disable Virtual Assist before you can upgrade to SMA 12.1.` You can then disable Virtual Assist and start the upgrade process again. This time the upgrade will complete.
Replication	CMS provides Global High Availability (Global HA), which provides redundancy. Therefore, the Replication feature has been removed from SMA, and all references to the replication feature have been removed from the AMC. The **Replicate** section no longer appears on the **Maintenance** page, and the entire **Configure Replication** page, accessed via the **Configure** button, has been removed. **IMPORTANT:** CMS Policy Synchronization is the equivalent of SMA Replication.
High Availability Pair	High Availability (HA) Pair is being deprecated on all SMA 1000 series appliances in SMA 12.1. GTO now provides those features more efficiently. All HA Pair connections must be disabled before you can upgrade to SMA 12.1. Attempting to upgrade a node in an HA Pair to SMA 12.1 will not succeed, but will generate this error message: `Except: Special CEM to allow upgrade that breaks node out of pair.` Importing a full SMA 12.1 configuration will not succeed, but importing a partial SMA 12.1 configuration will succeed. Central User licenses replace HA Pair licenses.
Virtual Host with IP Address	Virtual Host with IP address is being deprecated. This feature provided dedicated IP address usage for: • Workplace sites • Host-mapped URL resources • Activesync URL resources This feature is not needed and has been hidden since the 10.7.0 release. Upgrading to SMA 12.1 will not succeed if any virtual hosts with IP addresses are configured in the current configuration. Importing a full SMA 12.1 configuration will not succeed, but importing a partial SMA 12.1 configuration will succeed if the extra IP addresses are removed from the current configuration first.

Features of Your SMA Appliance

Topics:

SonicWall SMA Appliance Models

SonicWall offers the following SMA and EX Series appliance models, all of which are documented in this manual.

In this document, the term SMA appliance refers to the appliances listed in the SMA Appliance models table. Except for the SMA 8200v Virtual Appliance, all SMA appliances provide for clustering two identical appliances behind one virtual IP address or up to eight appliances using an external load balancer.

SMA Appliance models

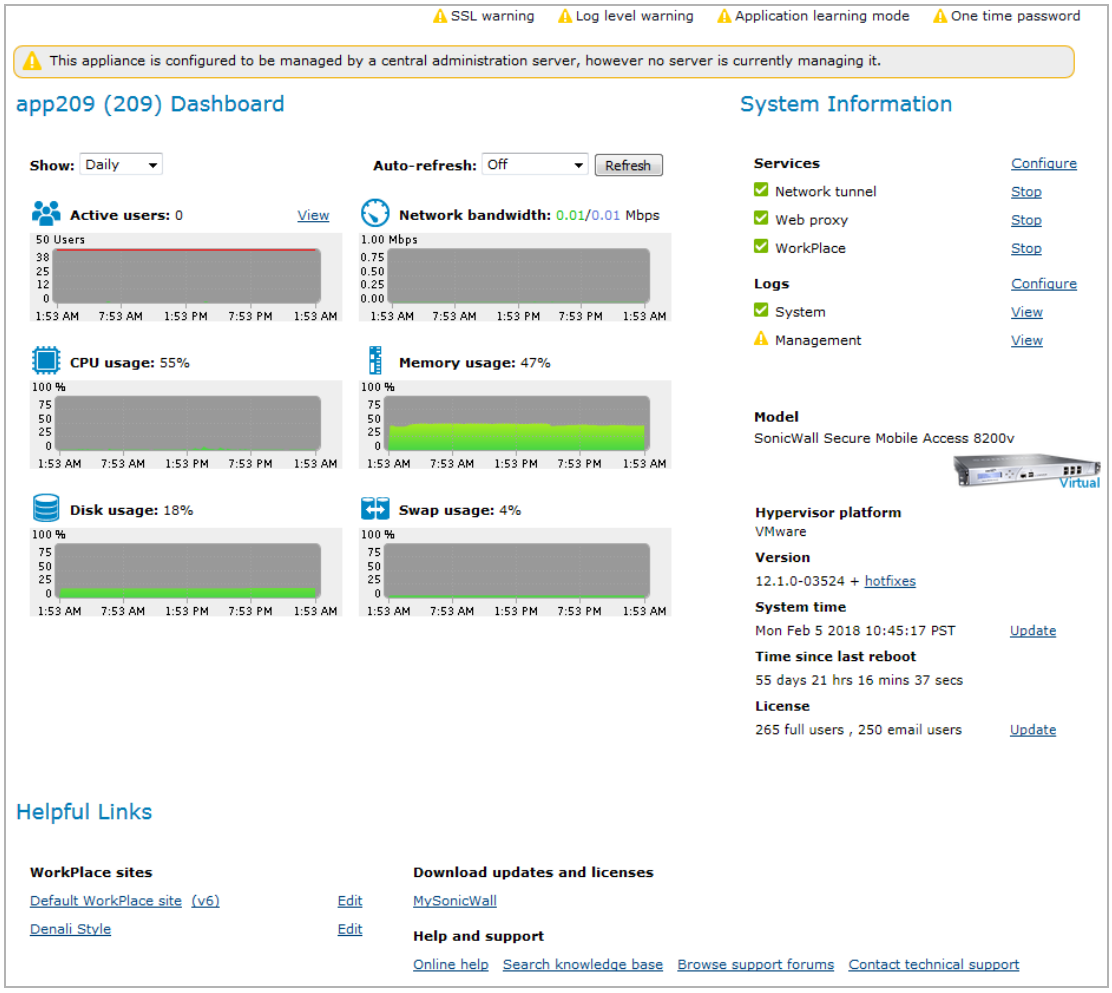
This appliance	Supports up to this many concurrent users
E-Class SMA EX9000	20,000
E-Class SMA EX7000	5,000
E-Class SMA EX6000	250
SMA 7200	10,000
SMA 6200	2,000
SMA 8200v Virtual Appliance	5,000 users for Hyper-V and ESX

Administrator Components for Managing Appliances and Services

- **Appliance Management Console (AMC)** is a Web-based administrative tool (see AMC Dashboard) that manages the appliance by providing centralized access for:
  - Managing security policies.
  - Configuring the system (including networking and certificate configuration).
  - Monitoring.

  AMC is accessible from a Web browser.

AMC Dashboard



- **Web proxy service** provides users with secure access to Web-based applications, Web servers, and network file servers from a Web browser. Web proxy service is a secure HTTP reverse proxy that brokers and encrypts access to Web-based resources.
- **Network tunnel service** is a network routing technology that provides secure network tunnel access to a wide range of applications, including those that use
    - Non-TCP protocols such as Voice Over IP (VoIP) and ICMP.
    - Reverse-connection protocols.
    - Bi-directional protocols such as FTP.

  Network tunnel service works in conjunction with the Connect Tunnel client and the OnDemand Tunnel agent to provide authenticated and encrypted access. It can traverse firewalls, NAT devices, and other proxy servers that can interfere with traditional VPN devices.
- **Management API Library** provides URLs to view and modify appliance data in JSON format. The API is divided into two primary URLs that handle HTTP requests before and after the appliance has completed initial configuration:
    - During initial configuration: `https://<AMC IP address:8443>/Setup`
    - On configured appliance: `https://<AMC IP address:8443>/Console`

where <*AMC IP address*> is the IP address of your AMC appliance.

NOTE: When using a virtual machine, use the virtual machine port number instead of port 8443.

Browser-based documentation is available at:

- `https://<AMC IP address:8443>/Setup/UserGuide`
- `https://<AMC IP address:8443>/Console/UserGuide`

User Access Components

The SMA appliance includes several components that provide users with access to resources on your network:

- WorkPlace
- Connect and OnDemand Tunnel Clients
- End Point Control (EPC)

WorkPlace

The WorkPlace portal provides users with quick access to resources on your network. It is accessible from any Web browser that supports SSL and has JavaScript enabled. WorkPlace provides a range of access methods for you to choose from:

- Basic Web (HTTP) resources are accessible using the Web translation engine, a reverse proxy that provides single sign-on and fine-grained access control. The web translation engine has three modes of operation:
  - **Alias**-based translation appends a custom alias to the end of the URL that users access (also called URL re-writing). For example, if you specify `http://hr.mycompany.com/` as a URL resource with an alias of `hr`, users would access it by clicking on a link in Workplace that looked like this: `https://vpn.mycompany.com/hr/`. This type of configuration is recommended for simple web applications that do not require advanced functionality, like Java applets or JavaScript (AJAX). SonicWall supports a limited number of applications in the alias-based translated web access method; see Web Application Services.
  - **Host-mapped URL** access changes the hostname that the resource is accessed on. For example, if `http://hr.mycompany.com/` URL resource is configured with a custom hostname of hr.vpn.mycompany.com, users access the resource by clicking on a link that looks like this in Workplace: `https://hr.vpn.mycompany.com/`. Host mapped URL access is recommended for complex web applications that may use Java applets, advanced AJAX (and other advanced web technologies).

    TIP: It is highly recommended to purchase either a wildcard SSL certificate, or a SAN certificate with wildcards in it to make expansion of host-mapped URL resources easier.
  - **Port-mapped URL** access changes the port number that the resource is accessed on. For example, if `http://hr.mycompany.com/` URL resource is configured with a custom port (8888) for access, users access the resource by clicking on a link that looks like this in Workplace: `https://vpn.mycompany.com:8888/`. One of the downsides of custom port URL access is that it does require you to open up a port for each web application that you want to configure to use the port mapped URL access.

    TIP: Port-mapped URL resources is recommended for complex web applications that may use Java applets, advanced AJAX, and other advanced web technologies.

- File system resources are accessible from the Web-based Network Explorer that is integrated in WorkPlace.
- Client/server traffic (TCP/IP) is accessible using one of the network redirection clients, OnDemand Tunnel. The client is provisioned automatically or activated when the user logs in to WorkPlace.

The access method you choose will be based on several factors, including the network protocols used by your applications, your security requirements, end-user convenience, and the target platforms.

Connect and OnDemand Tunnel Clients

Tunnel clients provide network-level access to all resources, effectively making each user device a virtual node on your network.

- The Connect Tunnel client provides full network and application access from a Web-deployed Windows client for computers running a Windows 7 SP1, 10, Mac OS, or Linux operating system. The client can be provisioned either transparently using a link from the WorkPlace portal or through an executable installation package. The Connect Tunnel client provides split-tunneling control, granular access controls, and automatic proxy detection and authentication.
- The OnDemand Tunnel agent provides the same features as the Connect Tunnel, except that it can't be used as a dial-up adapter for domain logins, and is integrated into WorkPlace. OnDemand can operate in either split-tunnel mode or redirect all traffic mode.

End Point Control (EPC)

EPC components ensure that your network is not compromised when accessed from PCs in untrusted environments by enabling you to interrogate devices to determine whether they are running the programs you require. **Advanced EPC** simplifies granular end point protection by allowing you to set up device profiles (for clients running on Microsoft Windows) using a comprehensive predefined checklist that includes security solutions from leading vendors like OPSWAT, McAfee, Computer Associates, Sophos, and Kaspersky. Advanced EPC is included with the SMA 6200, SMA 7200, EX9000, and EX7000 appliances and licensed separately for the other appliances in the EX Series.

ADA 508 Improvements

The Administrator (AMC) and User Access (WorkPlace and Connect Tunnel) components provided with your appliance have ADA 508 improvements for the operating systems shown in the ADA 508 improvements table.

ADA 508 improvements

Component	Windows	Mac OS X	Linux
AMC	✓		
WorkPlace	✓	✓	✓
Connect Tunnel	✓	✓	

ADA 508 improvements include the following features to improve keyboard usability and compatibility with assistive technologies:

- Keyboard shortcuts and proper keyboard tab order.
- Visual focus that identifies the user's location on a page and allows them to use the Tab key to move between elements on a page. This is especially helpful for tabbed pages, radio buttons, checkboxes, push buttons, and other types of selection methods.

- Meaningful popup captions on property windows, dialog boxes, and non-text elements.
- Completion message when Connect Tunnel successfully completes installation.
- User actions in the Configuration Wizard are more accessible.
- Browser-based High Contrast theme, which makes text on the computer screen easier to see. This feature is available on Internet Explorer, Chrome, and Firefox browsers, but results vary based on the operating system and browser combination.

Login and runtime dialogs, session statistics, and status are rearranged to make them more accessible.

NOTE: SonicWall recommends using NonVisual Desktop Access (NVDA) or JAWS screen-reading software.

Related Documentation

Refer to these SonicWall SMA documents for specific details about the various features and products of SMA 12.1:

- *SMA 12.1 CMS Administration Guide*
- *SMA 12.1 WorkPlace User Guide*
- *SMA 12.1 Upgrade Guide*
- *SMA 12.1 Connect Tunnel User Guide*
- *SMA 12 8200v Getting Started Guide*

System Requirements

This section describes the system requirements for the client and administrator (server) components for Secure Mobile Access.

NOTE: For additional and updated information about the system requirements and limitations of SMA 12.1, see the *Secure Mobile Access 12.1 Release Notes*.

Support status is indicated by the font type for items listed in the tables:

- Fully supported (normal font)
- ***Compatible with, moving into support, issues addressed as needed (bold italics)***
- *Compatible with, moving out of support (italics)*

There are no known issues with “compatible with” configurations, but they have not been specifically tested in the current release. Therefore, SonicWall does not guarantee that significant issues will not occur, and there is no guarantee of support for such issues.

NOTE: Metro View is not supported in Microsoft Internet Explorer (IE) v10.

Topics:

Client Components

The system requirements for client components are listed in the following tables:

- WorkPlace Lite Access
- Web-Based Clients
- Tunnel Clients
- Proxy Clients
- End Point Control

NOTE: The tables that follow show the latest released versions of software available at the time of the corresponding SonicWall Secure Mobile Access (SMA) release.

WorkPlace Lite Access

WorkPlace Lite requirements

Operating system	Browser	Notes
• Windows 10 • Windows 10 Creators	• IE (32 bit only) • Firefox • Chrome • Edge	No access agent or EPC is required. The browser must support HTML5.
• Windows 7 x86/x64 SP1	• IE (32 bit only) • Firefox • Chrome	
• iPhone/iPad OS v9.0 • iPhone/iPad OS v8.0 • iPhone/iPad OS v7.0	• Safari	
• Android 6.x • Android 5.x • Android 4.x	• Firefox • Chrome	
• ChromeOS		
• Windows Phone 10	• Edge	
• Mac OSX 10.12.X • Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari	
• Linux x86/x64 Kernel 4.X or later	• Firefox	
Supported HTML5 bookmarks: • RDP • Telnet • SSH • VNC • Citrix (through Storefront) • Network Explorer		

Web-Based Clients

WorkPlace Portal, Translated Web, Network Explorer, Host/Port Mapping URL Access

Web-based client system requirements

Operating system	Browser	Notes
• Windows 10	• N/A	• N/A
• Windows 7 x86/x64 SP1	• N/A	• N/A
• Mac OSX 10.12.X • Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari	• Java
• Linux x86/x64 Kernel 4.X or later	• Firefox	• Java (disabled in Firefox version 52 and later)

Web Application Services

Translated/Custom Port Mapped/Custom FQDN Mapped Web application service requirements

Operating system	Browser	Notes
• Outlook Web Exchange 2016	• IE (32 bit only)	
• Outlook Web Access 2013	• IE (32 bit only) • Firefox	
• Outlook Web Access 2010	• IE (32 bit only) • Firefox	
• SharePoint 2013	• IE (32 bit only)	
• SharePoint 2010	• For Windows 8.1 use IE	

Web Application: Generic (Simple)

Browser: Internet Explorer, Firefox, and Chrome

NOTE: Support of a given web application using alias-based translation is based on the compatibility and complexity of these underlying web application. Some web applications do not work with alias-based translation, in which case custom host or port mapping URL access should be used. SonicWall only supports and tests the specifically listed applications in this section for alias-based translation access. Supports NTLM, BASIC, and forms-based Single Sign-On (SSO).

Custom Port Mapped/Custom FQDN Mapped Web application service requirements

Operating system	Browser	Notes
• Domino Web Access 9.0.1	• IE (9.0.1 only) • Firefox • Chrome	

Web Application: Generic (Advanced)

Browser: Internet Explorer, Firefox, and Chrome

NOTE: Recommended for advanced web applications that may use Java Applets, AJAX, or other advanced web technologies. Supports NTLM, BASIC, and forms-based Single Sign-On (SSO).

Tunnel Clients

Connect Tunnel client requirements

Operating system	Browser	Notes
• Windows 10	• N/A	• N/A
• Windows 8.1 x86/x64 Update	• N/A	• N/A
• Windows 7 x86 SP1/x64	• N/A	• N/A
• Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari	• Java
• Linux x86/x64 Kernel 4.X or later	• Firefox	• Java

Connect Tunnel service requirements

Operating system	Browser	Notes
• Windows 2016 Server R2	• N/A	
• Windows 2012 Server R2	• N/A	
• Windows 2008 Server R2 x64	• N/A	

OnDemand Tunnel agent requirements

Operating system	Browser	Notes
• Windows 10 Threshold 2 (build 10586) x86/x64	• N/A	• N/A
• Windows 8.1 x86/x64 Update	• N/A	• N/A
• Windows 7 x86 SP1/x64	• N/A	• N/A
• Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari	• Java
• Linux x86/x64 Kernel 3.X or later	• Firefox	• Java
• TurboLinux v7	• Mozilla	• Java

Proxy Clients

Web Proxy client requirements

Operating system	Browser	Notes
• Windows 10	• IE (32 bit only)	• Active X
• Windows 8.1 x86/x64 Update	• IE (32 bit only)	• Active X
• Windows 7 x86 SP1/x64	• IE (32 bit only)	• Active X

OnDemand Proxy agent requirements (mapped mode)

Operating system	Browser	Notes
• Windows 10	• IE (32 bit only) • Firefox	• Active X
• Windows 8.1 x86/x64 Update	• IE (32 bit only) • Firefox	• Active X
• Windows 7 x86/x64SP1	• IE (32 bit only) • Firefox	• Active X
• Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari	• Java
• Linux x86/x64 Kernel 3.X or later	• Firefox	• Java

End Point Control

End Point Control (Interrogator and Installer) client system requirements)

Operating system	Browser	Notes
• Windows 10	• IE (32 bit only) • Firefox • Chrome	• Active X
• Windows 8.1 x86/x64 Update	• IE (32 bit only) • Firefox • Chrome	• Active X
• Windows 7 x86 SP1/x64	• IE (32 bit only) • Firefox • Chrome	• Active X
• Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari v9.x • Safari v8.x	• Java
• Linux x86 • Linux x64	• Firefox	• Java

Third Party Component (OESIS, Cache Cleaner) requirements

Operating system	Browser	Notes
• Windows 10	• IE (32 bit only) • Firefox	• Active X • OESIS not supported on Firefox
• Windows 8.1 x86/x64 Update	• IE (32 bit only) • Firefox	• Active X • OESIS not supported on Firefox
• Windows 7 x86 SP1/x64	• IE (32 bit only) • Firefox	• Active X • OESIS not supported on Firefox
• Mac OSX 10.11.X • Mac OSX 10.10.X	• Safari	• Java
• Linux x86 • Linux x64	• Firefox	• Java • OESIS not supported on Firefox
• Cache Cleaner 3.6	• Windows • Mac	• Java

GTO Clients

Only the clients running 11.4.0 and above listed in Supported GTO clients are able to connect to GTO-based appliances. Also supported are any upgrades from a previous version to a supported version.

Supported GTO clients

Client
Windows CT
MAC CT
Linux
Mobile Connect for Android
Mobile Connect for Chrome
Mobile Connect for iOS
Mobile Connect for Mac
Mobile Connect for Windows 10

Server Components

The system requirements for the administrator components and authentication servers are listed in these tables.

- System Administration
- Authentication Servers
- ActiveSync Clients
- ActiveSync Servers
- Outlook Anywhere
- Citrix Server Farms
- Server Farms
- Native Access Modules (NAMs)
- SMA 8200v and CMS Platforms
- API Support

System Administration

System requirements for management computer accessing AMC

Operating system	Browser	Notes
Appliance Management Console (AMC)		
• Windows 10	• IE (32 bit only) • Firefox	
• Windows 8.1 x86/x64 Update	• IE (32 bit only) • Firefox	
• Windows 7 x86 SP1/x64	• IE (32 bit only) • Firefox	

Authentication Servers

Requirements

Operating system	Version	Notes
Microsoft		
• Windows 2012 Server R2 x64 • Windows 2008 Server R2 SP1 x64 • Outlook Anywhere		
LDAP servers		
• LDAP v3 compatible Servers		LDAP password change supported on IDS
• IBM Tivoli Directory Server Enterprise Edition	• V6.x	LDAP password change supported on IDS
• Oracle Directory Server Enterprise Edition	• V11	
• Novell eDirectory	• V8.8 SP7	
RADIUS Protocol		
• RSA Authentication Manager	• v8.1 • v7.x	
• General	• Will support IP address assignment	
• Quest Defender	• v5.81 • v5.7	
Single Sign-on Servers		
• RSA Federated Identity Manager (Clear Trust)	• RSA Clear Trust Agent 5.5	
SAML Servers/Providers		
• Office 365	• Azure AD or Azure AD sync with local AD	
• Workplace	• SonicWall CAM	
• Google Apps/Email	• Azure AD or Internal Shibboleth IdP	
• Salesforce.com	• Azure AD or any other IdP	
• Box	• Azure AD or any other IdP	
• Onelogin.com	• Onelogin.com	
• AWS	• Azure AD or any other IdP	
• Workplace	• CA SiteMinder	

ActiveSync Clients

Requirements

Servers	Version
• Android Phone/Tablet	• Android 6.x • Android 5.x • Android 4.x
• iPhone/iPad	• iPhone/iPad OS V9.x • iPhone/iPad OS v8.x • iPhone/iPad OS v7.x
• Windows Phone	• Windows Phone 10

ActiveSync Servers

Requirements

Servers	Version
• Microsoft Exchange	• Exchange 2016 • Exchange 2013 • Exchange 2010

Outlook Anywhere

Outlook Anywhere using MAPI over HTTP

Servers	Clients
• Windows 10 Threshold 2 (build 10586) x86/x64	• Outlook 2016
• Windows 8.1 x86/x64 Update	• Outlook 2010 SP2
• Windows 7 SP1 x86/x64	• Outlook 2013 SP1

Outlook Anywhere using RPC over HTTP

Servers	Clients
• Windows 10 Threshold 2 (build 10586) x86/x64	• Outlook 2016
• Windows 8.1 x86/x64 Update	• Outlook 2010
• Windows 7 SP1 x86/x64	• Outlook 2013

Citrix Server Farms

Requirements

Servers	Version
• Citrix	• Citrix XenApp 7.7 • Citrix XenApp 7.6 • Citrix XenDesktop v7.6 • Citrix XenDesktop v7.7

Server Farms

Requirements

Servers	Version
• vWorkspace	8.6
• VMware Horizon View	6.X

Native Access Modules (NAMs)

The Secure Mobile Access appliance integrates with several popular third party agents. In some cases, the files necessary for integration are already on the appliance, and in other cases they must be copied to the appliance.

Requirements

Description	Notes
Terminal Services agent	
• Windows V4.x	
• Mac v12.x	• Java
• Linux v13.x	• Java
Citrix Receiver	
• Windows v3.x	
• Mac v3.x	
• Linux v3.x	
VMware View	
• Windows v3.x	
• Mac v3.x	
• Linux v3.x	
vWorkspace	
• Windows - vWorkspace Connector 8.6	
• Mac OSX - vWorkspace Connector 8.6	
• Pre-installed Linux vWorkspace Connector 8.6	

SMA 8200v and CMS Platforms

vWorkspace Server Farm requirements

Component Web-based	Version
• VMWare	• ESX/ESXi 6.0, 7.x
• Microsoft Hyper-V	• Windows Server 2016

API Support

API Support

Component Web-based	Version
• Management API	• Ruby 1.9.3 • Mechanize 2.7.4
• Authentication API	• Ruby 1.9.3 • Mechanize 2.7.4

Part 2

Installation

- Installation and Initial Setup

2

Installation and Initial Setup

Network Architecture

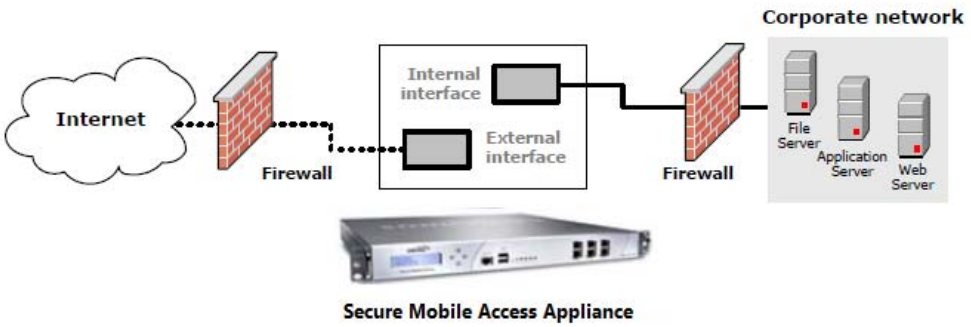
This section shows where the appliance fits into your network environment, provides installation and cabling instructions, and explains how to use the Web-based Setup Wizard (or alternatively use the command-line Setup Tool) to perform basic network configuration.

All SonicWall SMA appliances can be set up in either a dual interface or single interface configuration:

NOTE: The SMA 7200, SMA 6200, EX9000, EX7000, and EX6000 appliances include physical network interfaces that can be set up to use an external load balancer.

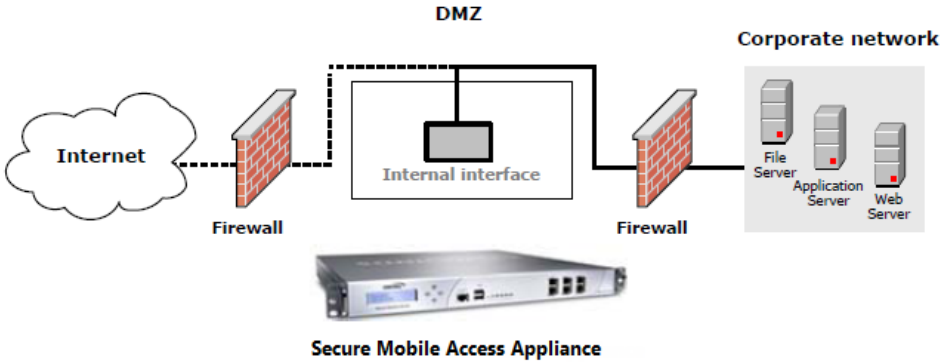
- Dual-homed Configuration (Internal and External Interfaces – see Dual-homed interface configuration) — One network interface is used for external traffic (that is, to and from the Internet), and the other interface is used for internal traffic (to and from your corporate network).

  Dual-homed interface configuration



- Single-homed interface configuration (internal interface – see Single-homed interface configuration) — A single network interface is used for both internal and external traffic. The appliance is usually installed in the demilitarized zone (or DMZ, also known as a perimeter network).

Single-homed interface configuration



In both configurations, incoming requests to the Secure Mobile Access services—including HTTP/S traffic for the Web proxy service—are sent over port 80 (HTTP) and port 443 (HTTPS). Traffic from the OnDemand agent is always sent over port 443. Because most networks are configured to enable traffic over these ports, you shouldn't need to reconfigure firewalls on your network.

You should install the appliance in a location where it can connect to resources on your network, including:

- Application servers and file servers, including Web or Windows servers, and client/server applications.
- External authentication repositories (such as an LDAP, Microsoft Active Directory, or RADIUS server).
- One or more Domain Name System (DNS) servers.
- Optionally, a Windows Internet Name Service (WINS) server. This is required for browsing Windows networks using WorkPlace.

CAUTION: The SonicWall SMA appliance does not provide full firewall capabilities and should be secured behind a firewall. Running without a firewall makes the appliance vulnerable to attacks that can compromise security and degrade performance.

Although not required, enabling the appliance to communicate with these additional resources provides greater functionality and ease of use:

- Network Time Protocol (NTP) server for synchronizing the time on the appliance.
- External server for storing syslog output.
- Administrator's workstation for secure shell (SSH) access.

You can configure the appliance to use a self-signed server certificate or, for enhanced security, you can obtain a certificate from a commercial certificate authority (CA). For more information, see Obtaining a Certificate from a Commercial CA.

Preparing for the Installation

Before beginning the installation, you need to gather information about your networking environment and verify that your firewalls are properly configured to permit traffic to and from the appliance.

Topics:

Gathering Information

Before configuring the appliance, you need to gather the following information. You are prompted for some of this information when running Setup Wizard (see Web-Based Configuration Using Setup Wizard) or Setup Tool (see Configuring a New Appliance Using Setup Tool), but most of it will be used when you configure the appliance in AMC (see Network and Authentication Configuration).

Topics:

Settings Required to Start the Appliance Management Console

- The root password for administering the appliance
- The name for the appliance (because this name is used only in log files, you don't need to add it to DNS)
- The internal IP address and, optionally, an external IP address
- Select a routing mode and supply IP addresses for the network gateways to the Internet, and your corporate network.

Certificate Information

Several pieces of information are used to generate the server and AMC certificates:

- A fully qualified domain name (FQDN) for the appliance and for any WorkPlace sites that use a unique name. These names should be added to your public DNS; they are also visible to users when they connect to Web-based resources.
- A FQDN for the Appliance Management Console (AMC) server. The AMC server name is used to access AMC, which is a Web-based tool for managing the appliance.

Name Lookup Information

- Internal DNS domain name of the network to which the appliance is connected
- Primary internal DNS server address (additional DNS servers are optional)
- IP address for an internal WINS server and the name of your Windows domain (required to browse files on a Windows network using WorkPlace, but are otherwise optional)

Authentication Information

- Server name and login information for your authentication servers (LDAP, Active Directory, or RADIUS)

Virtual Address Pool Information

- If you are planning to deploy either network tunnel client (Connect Tunnel or OnDemand Tunnel), you must allocate IP addresses for one or more address pools. For more information, see Configuring IP Address Pools.

Optional Configuration Information

- To enable SSH access from a remote machine, you need to know the remote host's IP address.
- To synchronize with an NTP server, you need to know the IP addresses for one or more NTP servers.
- To send data to a syslog server, you need to know the IP address and port number for one or more syslog servers.

Verifying Your Firewall Policies

For the appliance to function correctly, you must open ports on your external (Internet-facing) and internal firewalls.

External Firewall

For secure access to the appliance from a Web browser or OnDemand, you must make sure that ports 80 and 443 are open on firewalls at your site; see the Traffic types and ports used by SMA on external network table. Opening your firewall to permit SSH access is optional, but can be useful for performing administrative tasks from a remote system.

Traffic types and ports used by SMA on external network

Traffic type	Port/protocol	Usage	Required?
HTTP	80/tcp	Unencrypted network access	Y
HTTPS	443/tcp	Encrypted network access	Y
SSH	22/tcp	Administrative access to the appliance	
ESP	4500/UDP	Enable ESP encapsulation of tunnel network traffic	

Internal Firewall

If you have a firewall on the internal network, you may need to adjust its policy to open ports for back-end applications with which the appliance must communicate. In addition to opening ports for standard network services such as DNS and email, you may need to modify your firewall policy before the appliance can access the services shown in the Traffic types and ports used by SMA on internal network table.

Traffic types and ports used by SMA on internal network

Traffic type	Port/protocol	Usage
Microsoft networking	• 138/tcp and 138/udp • 137/tcp and 137/udp • 139/udp • 162/snmp • 445/smb	Used by WorkPlace to perform WINS name resolution, browse requests, and access file shares
LDAP (unencrypted)	389/tcp	Communicate with an LDAP directory or Microsoft Active Directory

Traffic types and ports used by SMA on internal network

Traffic type	Port/protocol	Usage
LDAP over SSL (encrypted)	636/tcp	Communicate with an LDAP directory or Microsoft Active Directory over SSL
RADIUS	1645/udp or 1812/udp	Communicate with a RADIUS authentication server
NTP	123/udp	Synchronize the appliance clock with an NTP server
Syslog	514/tcp	Send system log information to a syslog server
SNMP	161/udp	Monitor the appliance from an SNMP management tool

Helpful Management Tools

To manage the appliance from a remote system running Microsoft Windows, you may find the following management tools useful. Both of these tools use encryption to protect information from eavesdropping, unlike standard FTP or Telnet utilities:

- **A Secure Shell (SSH) client** enables you to securely log in to the appliance and configure it from the command line. This is useful for backing up the system, viewing log files, and configuring advanced network settings. A popular SSH client for Windows is VanDyke Software's SecureCRT. A trial download is available at http://www.vandyke.com/products/securecrt/. Another popular client is PuTTY, a free implementation of Telnet and SSH for Windows platforms. PuTTY is recommended by Cisco.

  To connect to the appliance using SSH, you type `root` as the username and type the password you created using Setup Wizard.

- **A Secure Copy (SCP) client** makes it easy to securely transfer files from a PC running Windows to the appliance. This is useful for copying certificates and other data to the appliance. A popular Windows client is WinSCP, available at http://winscp.sourceforge.net/eng/.

Most of the configuration management tasks that you need to perform—backing up and restoring your appliance configuration, applying upgrades, and so on—can be done on the **Maintenance** page in AMC, as described in Managing Configuration Data. If you prefer to handle these tasks on the command line, see Saving and Restoring Configuration Data.

Installation and Deployment Process

This section outlines the process of installing, configuring, and testing the appliance, and then deploying it in a production environment. See the Installation steps table for an overview.

Installation steps

Installation step	Description
Make a note of your appliance serial number and authentication code	you will need this information when you register your product on MySonicWall. The serial number and authentication code are printed on your appliance label; they are also displayed on the **General Settings** page in AMC.
Rack-mount the appliance and connect the cables	See Specifications and Rack Installation and Connecting the Appliance.

Installation steps

Installation step	Description
Turn on the appliance and begin configuration	To connect to your appliance on your internal network you must specify an internal IP address, the subnet mask, and indicate whether your appliance is part of a cluster. Use the controls on the front of the appliance. See Powering Up and Configuring Basic Network Settings.
Run Setup Wizard	The wizard guides you through the process of initial setup for your SMA appliance. See Web-Based Configuration Using Setup Wizard.
Register your appliance on MySonicWall	Register your appliance on MySonicWall. Product registration gives you access to essential resources, such as your license file and updates. To register, you need both the serial number for your appliance and its authentication code.

The SMA appliance uses a few different types of licenses. All license files must be retrieved from MySonicWall and imported to the appliance. See Software Licenses.

If you choose the Free Evaluation license on MySonicWall, you get 24/7 support for 30 days.

If you install the CMS virtual machine and do not register it with MySonicWall, you get these licenses:

- 15 Central user licenses for 3 days
- 3 managed appliances for 3 days

Both the Setup Wizard and AMC are Web-based applications for configuring the appliance. PCs running these applications must have JavaScript enabled. JavaScript must also be enabled on the browsers used for accessing WorkPlace.

Topics:

Specifications and Rack Installation

After you've unpacked the appliance, you're ready to install and configure it on your network. The appliances are designed to fit on a standard, 19-inch telecom rack. Before connecting the appliance, make sure that you have sufficient space and adequate power. The specifications for each appliance model are:

SonicWall SMA 7200 and SMA 6200 Hardware

The SMA 7200 and SMA 6200 include:

- Rails (in kit, not attached)
- Standard IEC 60320 C13 to NEMA 15 USA only power cord(s)
- 6 1Gb Ethernet ports
- 2 10Gb SFP+ ports (on SMA 7200)
- 2 USB ports
- 1 DIAG port
- 2 500 GB SATA hard drives:

Specifications

	SMA 7200	SMA 6200
Regulatory Model/Type	1RK30-0AF	1RK31-0B0
CPU	E3-1275 3.5GHz	I5-4570S 2.9GHz
RAM	4 x 16GB DDR3 1600MHz ECC	4 x 8GB DDR3 1600MHz ECC
Network ports	8 (6-port 1GE + 2-port 10Gb SFP+)	6 (6-port 1GE)
Power supply	Dual hot swappable	Fixed
Front panel illustration	See SMA 6200/7200 Front Panels	See SMA 6200/7200 Front Panels

SonicWall E-Class SMA EX9000 Hardware

The SonicWall E-Class SMA EX9000 includes:

- Rails (in kit, not attached)
- Standard IEC 60320 C13 to NEMA 15 USA only power cords
- 1 GB Ethernet ports
- 10 GB Ethernet ports
- 2 USB ports
- 1 DIAG port
- 2 80 GB SATA hard drive
- Serial connection to appliance (115,200 baud)

SonicWall E-Class SMA EX7000 and EX6000 Hardware

The SonicWall E-Class SMA EX7000 and EX6000 includes:

- Rails (in kit, not attached)
- Standard IEC 60320 C13 to NEMA 15 USA only power cords
- 1 GB Ethernet ports
- 2 USB ports
- 80 GB SATA hard drive
- Serial connection to appliance (115,200 baud)

The models differ from each other most in terms of processor power, RAM, network ports, and power supply:

Hardware specifications

	SMA EX9000	SMA EX7000	SMA EX6000
Regulatory Model/Type	2RK03-092	1RK15-059	1RK20-05A
Intel processor		Core2 Duo 2.1GHz CPU	Celeron 2.0GHz CPU
RAM	32 Gig	2Gig DDR533	1Gig DDR533
PCIe Gig network ports	12 (8-port 1GE + 4-port 10GE)	6 (HA Pair is not supported)	4 (HA Pair is not supported)
Power supply	Dual hot swappable	Dual hot swappable	Fixed
Front panel (illustration)	See EX9000 Appliance Front Panel Controls	See EX7000 Appliance Front Panel Controls	See EX6000 Appliance Front Panel Controls

Front Panel Controls and Indicators

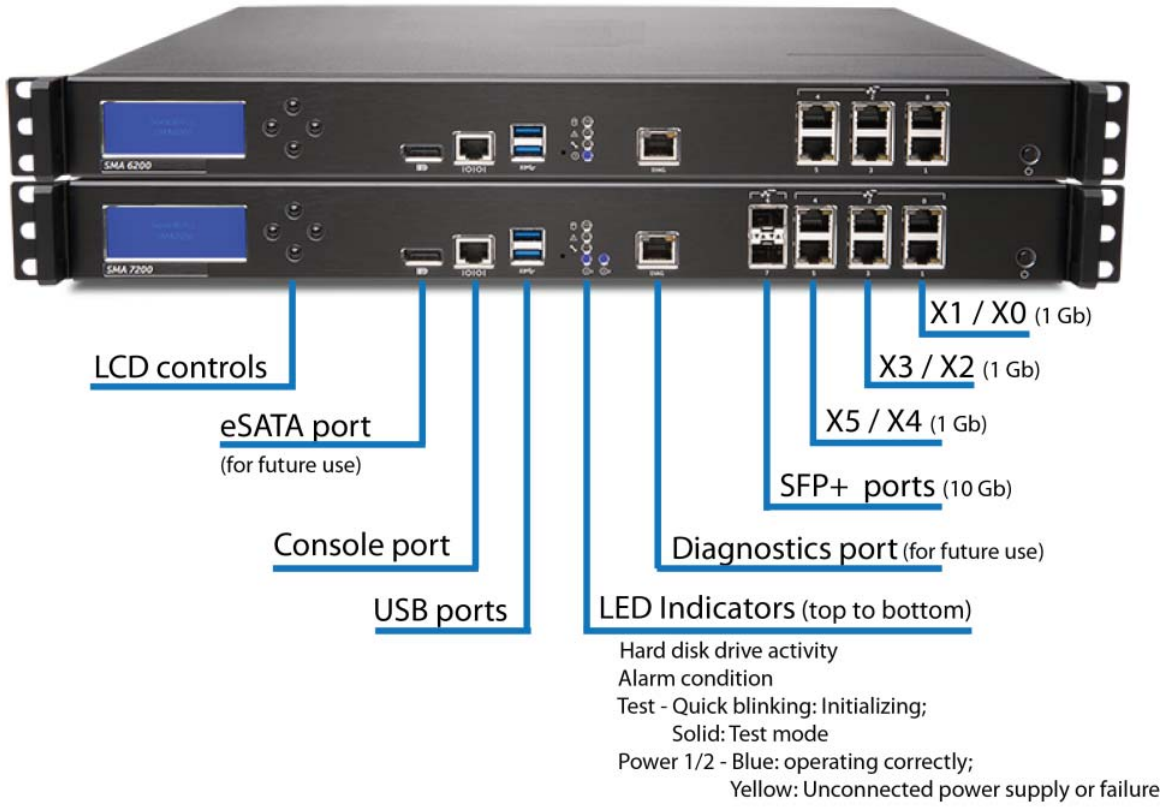
Before powering up the appliance, you should familiarize yourself with the front panel controls:

- SMA 6200/7200 Front Panels
- EX9000 Appliance Front Panel Controls
- EX7000 Appliance Front Panel Controls
- EX6000 Appliance Front Panel Controls
- LCD Controls for the SMA 7200, SMA 6200, EX9000, EX7000, and EX6000

SMA 6200/7200 Front Panels

The power button is at the bottom, right corner of the front panel.

Front panels of the SMA 6200 and SMA 7200



Controls and indicators on the front panels

Item	Description
Hard Drive modules	Dual hard drives.
LCD display screen and controls	Displays status and configuration about the appliance. Keypad buttons are used to display appliance status and configure initial settings: • For more information on displaying appliance status and using the keypad to shut down or reboot the appliance, see LCD Controls for the SMA 7200, SMA 6200, EX9000, EX7000, and EX6000. • For information on using the LCD controls during initial configuration (so that you can run Setup Wizard), see Configuring an SMA 7200, SMA 6200, EX9000, EX7000, or EX6000 Appliance.
Console port	Connects the appliance to a personal computer with an Ethernet cable.
USB ports	There are two USB ports.
LED indicators	From top to bottom, the LED indicators are: • Hard disk drive activity • Alarm • Test • Power 1 and 2: •Blue: operating correctly •Yellow: Unconnected power supply or failure

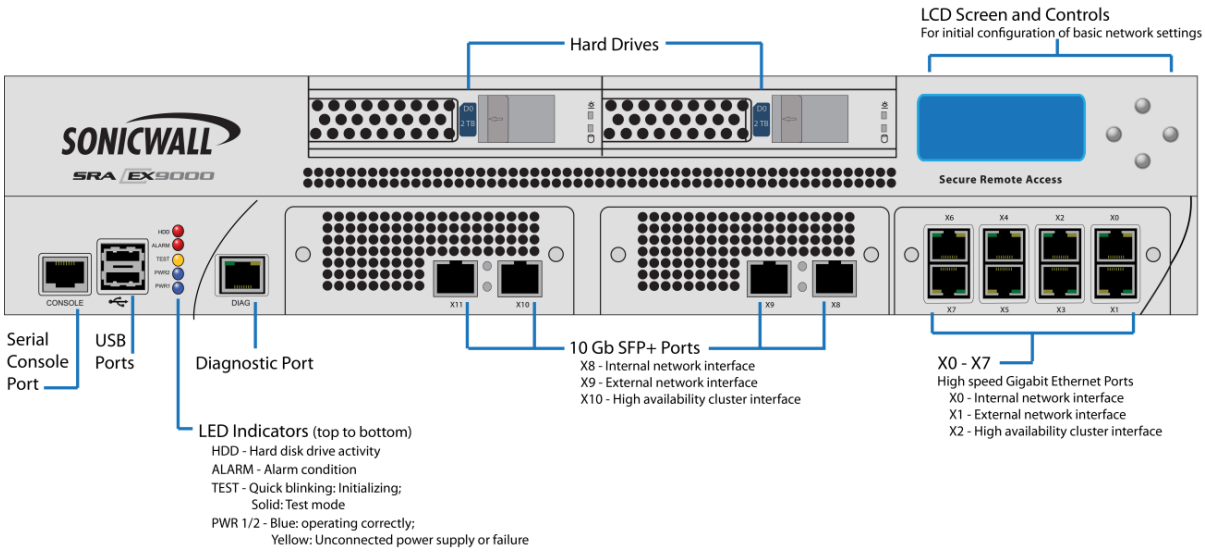
Controls and indicators on the front panels

Item	Description
DIAG port	Diagnostics port.
X0: Internal network	Connects the appliance to your internal network.
X1: External network	Connects the appliance to your external network.
X2: Cluster interface	In SMA 12, the X2 interface is no longer supported for clustering. See Deprecated Features.
X3-X5	Not used.
X6 SFP+: Internal network	Connects the appliance to your internal 10Gb network.
X7 SFP+: External network	Connects the appliance to your external 10Gb network.

EX9000 Appliance Front Panel Controls

The power switch is located on the rear panel.

Front panels of the EX9000



Controls and indicators on the EX9000 front panel

Item	Description
Hard Drive modules	Dual hard drives.
LCD display screen and controls	Displays status and configuration about the appliance. Keypad buttons are used to display appliance status and configure initial settings: • For more information on displaying appliance status and using the keypad to shut down or reboot the appliance, see LCD Controls for the SMA 7200, SMA 6200, EX9000, EX7000, and EX6000. • For information on using the LCD controls during initial configuration (so that you can run Setup Wizard), see Configuring an SMA 7200, SMA 6200, EX9000, EX7000, or EX6000 Appliance.
Console port	Connects the appliance to a personal computer with a DB-9 serial cable.
USB ports	There are two USB ports.

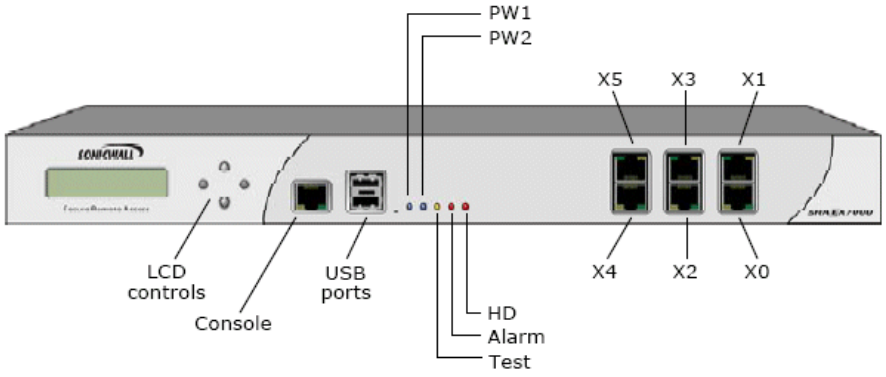
Controls and indicators on the EX9000 front panel

Item	Description
LED indicators	From top to bottom, the LED indicators are: • HDD Hard disk drive—red indicates disk activity. • Alarm • Test • Power 2 and 1 •Blue: operating correctly •Yellow: Unconnected power supply or failure
DIAG port	Diagnostics port.
X8: 10GigE network	Connects the appliance to your internal 10GigE network.
X9: 10GigE network	Connects the appliance to your external 10GigE network.
X10: 10GigE network	In SMA 12, the X2 interface is no longer supported for clustering. See Deprecated Features.
X11	Not used.
X0: Internal network	Connects the appliance to your internal network.
X1: External network	Connects the appliance to your external network.
X2: Cluster interface	In SMA 12, the X2 interface is no longer supported for clustering. See Deprecated Features.
X3-X7	Not used.

EX7000 Appliance Front Panel Controls

The power switch is located on the rear panel.

Front panels of the EX7000



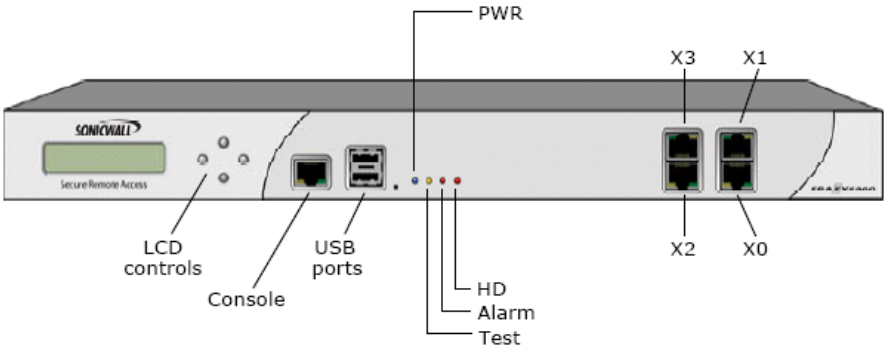
Controls and indicators on the EX7000 front panel

Item	Description
LCD display screen and controls	Displays status and configuration about the appliance. Keypad buttons are used to display appliance status and configure initial settings: • For more information on displaying appliance status and using the keypad to shut down or reboot the appliance, see LCD Controls for the SMA 7200, SMA 6200, EX9000, EX7000, and EX6000. • For information on using the LCD controls during initial configuration (so that you can run Setup Wizard), see Configuring an SMA 7200, SMA 6200, EX9000, EX7000, or EX6000 Appliance.
Console	Connects the appliance to a personal computer with a DB-9 serial cable.
USB ports	There are two USB ports.
LED indicators	From left to right, the LED indicators are: • Power 1 and 2 • Test • Alarm • Hard disk drive—red indicates disk activity.
X0: Internal network	Connects the appliance to your internal network.
X1: External network	Connects the appliance to your external network.
X2: Cluster interface	In SMA 12, the X2 interface is no longer supported for clustering. See Deprecated Features.
X3-X5	Not used.

EX6000 Appliance Front Panel Controls

The power switch is located on the rear panel.

Front panels of the EX6000



Controls and indicators on the EX6000 front panel

Item	Description
LCD display screen and controls	Displays status and configuration about the appliance. Keypad buttons are used to display appliance status and configure initial settings: • For more information on displaying appliance status and using the keypad to shut down or reboot the appliance, see LCD Controls for the SMA 7200, SMA 6200, EX9000, EX7000, and EX6000.

Controls and indicators on the EX6000 front panel

Item	Description
	• For information on using the LCD controls during initial configuration (so that you can run Setup Wizard), see Configuring an SMA 7200, SMA 6200, EX9000, EX7000, or EX6000 Appliance.
Console	Connects the appliance to a personal computer with a DB-9 serial cable.
USB ports	There are two USB ports.
LED indicators	From left to right, the LED indicators are: • Power • Test • Alarm • Hard disk drive
X0: Internal network	Connects the appliance to your internal network.
X1: External network	Connects the appliance to your external network.
X2: Cluster interface	In SMA 12, the X2 interface is no longer supported for clustering. See Deprecated Features.
X3	Not used.

LCD Controls for the SMA 7200, SMA 6200, EX9000, EX7000, and EX6000

Use the four-button keypad to the right of the LCD display on the SMA and EX Series appliances to:

- Display status and configuration information about the appliance.
- Shut down or reboot the appliance.

CAUTION: SMA 6200, SMA 7200, EX9000, EX7000, and EX6000 appliances: Remove any USB devices from the appliance before you reboot it. If a USB device is plugged in to your appliance when it is rebooted, the appliance tries to use it as a boot device. As a result, the boot information stored in the BIOS on the appliance is overwritten, and the device becomes unusable.

LCD keypad functions

Keypad Function	Description

Left button	Press the **Left** button once to reboot the appliance. This prompt is displayed:
	`Restart appliance?`
	`<Yes No>`
	Press the **Left** button again to reboot the appliance, or press the **Right** button to cancel the reboot.

Up button	Press the **Up** button once to display the configuration of the appliance's network settings. Each time you press it, the display shows another network setting: • Internal address • External address • Default gateway • Host name • Domain name • IP address • Netmask

LCD keypad functions

Keypad Function	Description

Right button	Press the **Right** button once to shut down the appliance. This prompt is displayed:
	`Shut down now?`
	`<Yes No>`
	Press the **Left** button again to shut down the appliance, or press the **Right** button to cancel the shutdown.

Down button	To return to the default view at any time, or to refresh the display, press the Down button once.

Connecting the Appliance

Follow the appropriate instructions for your appliance model to connect the appliance to your network:

- Connecting the SMA 6200 or SMA 7200 Appliance
- Connecting the EX9000 Appliance
- Connecting the EX7000 Appliance
- Connecting the EX6000 Appliance
- Powering Up and Configuring Basic Network Settings

Connecting the SMA 6200 or SMA 7200 Appliance

For a diagram of the appliances, see SMA 6200/7200 Front Panels.

To connect the SMA 6200/7200 appliance

1. Connect a network cable from your internal network to the internal interface on the appliance. (X0 for 1GB and X6 for 10GB).
2. Optionally, connect a cable from your external network to the external interface on the appliance. (X1 for 1GB and X7 for 10GB).
3. Connect the supplied power cord(s) to the appliance power supply and to an AC outlet.

Connecting the EX9000 Appliance

For a diagram of the appliance, see EX9000 Appliance Front Panel Controls.

To connect the EX9000 appliance

1. Connect a network cable from your internal network to the internal interface on the appliance (X0).
2. Optionally, connect a cable from your external network to the external interface on the appliance (X1).
3. Connect a standard AC power cord to the power supply.

Connecting the EX7000 Appliance

For a diagram of the appliance, see EX7000 Appliance Front Panel Controls.

To connect the EX7000 appliance

1. Connect a network cable from your internal network to the internal interface on the appliance (X0).
2. Optionally, connect a cable from your external network to the external interface on the appliance (X1).
3. Connect a standard AC power cord to the power supply.

Connecting the EX6000 Appliance

For a diagram of the appliance, see EX6000 Appliance Front Panel Controls.

To connect the EX6000 appliance

1. Connect a network cable from your internal network to the internal interface on the appliance (X0).
2. Optionally, connect a cable from your external network to the external interface on the appliance (X1).
3. Connect a standard AC power cord to the power supply.

Powering Up and Configuring Basic Network Settings

After you've connected the appliance, you are ready to power up for the first time and begin the configuration process. You use a Web-based Setup Wizard to configure the settings needed to get the appliance up and running quickly, but to start the wizard you must first enter information that enables a Web browser to connect to your appliance.

After your appliance is configured, you can control its configuration and operation from AMC, the Appliance Management Console. On the LCD screen of the appliance you can also see basic information about the appliance (its name and internal address, for example) or restart it, which is useful if your appliance is not in the same area as the browser you use to run AMC.

NOTE: You cannot run Setup Wizard on an appliance that has already been configured unless you first restore the appliance's factory default configuration settings. This applies whether you initially configured the appliance using Setup Wizard, or by running `setup_tool` from the command line. See Configuring the Appliance Using the Management Console

Configuring Basic Network Settings

To start Setup Wizard you must first enter information that enables a Web browser to connect to your appliance. The recommended procedure for initial setup is to use the LCD controls (to the right of the LCD screen on the front of your appliance) to enter minimal settings and then run Setup Wizard. Alternatively, you have the option of using Setup Tool on the command-line. Both procedures are outlined below.

After your basic settings are entered you will be able to run the Web-based Setup Wizard, as described in Web-Based Configuration Using Setup Wizard.

Configuring an SMA 7200, SMA 6200, EX9000, EX7000, or EX6000 Appliance

To the right of the LCD screen on the front of your appliance are four buttons you'll use to enter your settings.

Configuring Basic Network Settings using the LCD Controls

To configure with LCD controls:

1. Press the **Up** and **Down** controls to read the welcome screen.
2. Press **Right** to continue past it.
3. Set the IP address for your internal interface. To change the IP address that appears:
    a. Use the **Left** and **Right** buttons to position your cursor over the number you want to change.
    b. Use **Up** and **Down** to change the number.
    c. Press **Right** to continue to the next screen.
4. Enter your subnet mask:
    a. Use the four buttons to change the IP address displayed on the LCD screen.
    b. Press **Right** to continue to the next screen.
5. Review your settings and confirm them. In a few moments your settings are saved, and you will see instructions on browsing to a URL on your desktop computer. This is the URL for continuing your appliance configuration with Setup Wizard. For instance, the LCD display might read as follows:

    ```
    Please browse to: https://172.31.0.140:8443
    ```

For a description of configuring your appliance using Setup Wizard, see Web-Based Configuration Using Setup Wizard.

Configuring an Appliance Using Setup Tool on the Command Line

To set the minimum configuration items necessary for running Setup Wizard, you must use Setup Tool. Below is an overview of your steps; see Configuring a New Appliance Using Setup Tool for detailed instructions.

To configure basic network settings using Setup Tool:

1. Use a terminal emulation program to establish a serial connection with the appliance from a laptop computer or terminal.
2. Turn the appliance on. The first time you start the system from a serial connection, Setup Tool automatically runs. When prompted to log in, type `root` for the username.
3. To configure the appliance, you are prompted to provide this information:
    - IP address and subnet mask for the internal interface
    - Default gateway used to access the internal interface (optional)

For a description of configuring your appliance using Setup Wizard, see Web-Based Configuration Using Setup Wizard.

Web-Based Configuration Using Setup Wizard

Setup Wizard guides you through a series of required and optional steps for configuring the appliance. The AMC home page includes a **Setup Checklist** that indicates which items you have completed.

Running Setup Wizard requires the same system configuration as AMC (see System Requirements for details); in addition, JavaScript must be enabled in the browser.

To configure settings:

1. **License agreement:** Read the terms of the End User License Agreement.
2. **Basic Settings:**
   - Specify the password you will use to access the AMC. Your password must be at least eight characters long, but no longer than 20 characters.
   - (Optional) Select a time zone, and then click **Change** to set the current time. You can synchronize the time with an NTP server later in the AMC. For more information, see Configuring Time Settings. It is important to ensure that the appliance's date and time settings are correct for your time zone before you import your license file.
3. **Network Settings:**
   - Enter a name for the appliance (the default is *SMA1000SSLVPN*).

     TIP: Because this name is used only in log files, you don't need to add it to DNS.

   - The IP address and subnet mask for the internal interface (connected to your private network) is shown. For a dual-homed configuration, enter the IP address and subnet mask for the external interface.
4. **Routing:** To leverage an existing router, select the dual gateway option to reach your resources. To restrict incoming appliance traffic to just a few routes or subnets, select the single gateway option and enter the routes or subnets as static routes later in the AMC.

   If the appliance is on a different network than the computer you will use to access AMC, you must set up routing to maintain access to AMC.
5. **Name Resolution:** The appliance must be able to perform name resolution to reach resources on your internal network. Enter a default domain, which is the domain in which the appliance is located (such as `yourcompany.com`).
6. **User access:** You can give users full network access by provisioning the OnDemand Tunnel access agent. If you do, you also need to specify the Source NAT address that appears to back-end servers as the source of client traffic. This must be an IP address that is on the same subnet as the internal interface, and is not in use elsewhere.

   Decide on an initial access policy for users (you can refine it later in AMC). This can be completely permissive (granting access to the entire network protected by the SSL VPN), very strict (deny all access), or in-between (give users access to all resources as you define them in AMC).

The end of the Setup Wizard process displays your settings. Proceed to AMC, the management console, for the last steps in the configuration process. See Configuring the Appliance Using the Management Console for details.

Configuring the Appliance Using the Management Console

The final installation and deployment settings are done in AMC.

To configure the appliance in the AMC:

1 Log in to AMC.

Log in to AMC, the Web-based application used to administer the appliance, and look at the setup checklist on the right.

2 Register the appliance on MySonicWall and retrieve your license file.

When you register your appliance, you must enter both your serial number and your authentication code, which is the hardware identifier for the appliance you purchased:

- The serial number is printed on a label on the outside of your appliance.
- The authentication code is displayed in AMC: click **General Settings** from the main navigation menu, and then look in the **Licensing** area.

When you receive your SMA appliance there is a single user license on it, valid for an unlimited number of days. To become familiar with the AMC and test it in your environment with additional users, request a lab license. After initial setup and testing, download your license file from MySonicWall and then import it to the appliance.

See Managing Licenses.

3 Define one or more authentication servers.

Authentication is used to verify the identity of users. When configuring an authentication server, you are prompted to specify a directory type (LDAP, Microsoft Active Directory, RADIUS, or local users) and a credential type (username/password, token, or digital certificate).

See Managing User Authentication.

4 Configure a server certificate.

The appliance encrypts information using the Secure Sockets Layer (SSL) protocol. You can create a self-signed certificate using AMC, or optionally obtain a certificate from a commercial certificate authority (CA).

See Certificates.

5 Define application resources and groups.

Application resources include TCP/IP-based resources (such as client/server applications, file servers, or databases), Web-based resources (including Web applications or Web sites) that run over HTTP, and Windows network share resources (to be accessed in WorkPlace). Resource definitions can include variables, so that a single resource can, for example, derive its network name or address based on each user.

See Creating and Managing Resources.

6 Define users and groups.

User and group definitions are used in access control rules to control access to application resources.

See Managing Users and Groups.

7 Define realms and communities.

Realms enable the appliance to directly integrate with authentication servers, eliminating the need to create and manage accounts for each user who needs access to your network. Communities aggregate users with similar access needs and End Point Control requirements.

See Managing User Authentication.

8 Create access control rules.

Access control rules determine what resources are available to users and groups.

See Access Control Rules.

9 Configure shortcuts for WorkPlace.

To provide your users with easy access to a Web, file system, or graphical terminal resource from within WorkPlace, you may want to create shortcuts in WorkPlace.

See Working with WorkPlace Shortcuts.

10 (Optional) Configure the network tunnel service.

If you plan to deploy the network tunnel clients, you must configure the network tunnel service and allocate IP address pools for the clients.

See Configuring the Network Tunnel Service.

11 (Optional) Enable and configure End Point Control.

End Point Control optionally deploys data protection components designed to safeguard sensitive data and ensure that your network is not compromised when accessed from PCs in untrusted environments. End Point Control is deployed through communities.

See End Point Control and Using End Point Control Restrictions in a Community.

12 Apply your changes.

To activate your configuration changes, you must apply them.

See Applying Configuration Changes.

13 Test system accessibility.

Verify that the appliance can access your external user repositories, and ensure that the resources on your network are accessible.

See Troubleshooting.

Moving the Appliance into Production

After you have tested the appliance sufficiently in your network environment and determined how you want it to work, you're ready to move it into its permanent home.

To move the appliance into production:

1 Reconfigure the appliance with new address information.

If the network environment changed when you moved the appliance into production, you must reconfigure the basic network settings and adjust any of the following values if they have changed:

- IP addresses for the internal and external interfaces
- Default gateway IP addresses
- Static routes
- Default DNS domain and DNS server IP address

2 Register the appliance with DNS.

   If you haven't already registered the appliance with your company's DNS, do this now. This ensures that external users can access your network resources using a fully qualified domain name instead of an IP address. Edit your DNS server's database to include the fully qualified domain name contained in the appliance's certificate and any WorkPlace sites.

3 Obtain a commercial SSL certificate.

   You may want to obtain a commercial certificate for the appliance to assure users of its identity. (Generally, a self-signed certificate is adequate for AMC.)

   For more information on generating server certificates, see Obtaining a Certificate from a Commercial CA.

4 Adjust your firewall policies.

   If you have an Internet-facing firewall, you may need to adjust its policy to open ports required by the appliance. By default, the Web proxy service communicates using port 443/tcp (it uses port 443/tcp for HTTPS and port 80/tcp for HTTP). If you want to use SSH to connect to the appliance from outside the network, you'll need to open port 22/tcp.

   If you have a firewall that faces the internal network, you may need to adjust the policy for that firewall to open ports for any back-end applications with which the appliance must communicate (if these ports are not already open). For instance, if you use an LDAP or Microsoft Active Directory server for authentication, you must open port 389/tcp on your internal firewall. For RADIUS, open ports 1645/ucp and 1812/udp.

   If you're using WorkPlace to access Windows network shares, you must also open internal ports on your internal firewall so that WorkPlace can perform name resolution, make browse requests, and connect to file shares.

   For more information, see Gathering Information.

5 Create shortcuts and deploy WorkPlace.

   If you use WorkPlace as an interface to Web-based resources and to provide Web-based access to Windows network share and graphical terminal resources, you must create shortcuts (see Working with WorkPlace Shortcuts). You should also publish the WorkPlace URLs so your users know how to access resources through your VPN.

   You may want to customize the appearance of WorkPlace for your environment. See Configuring WorkPlace General Settings for more information.

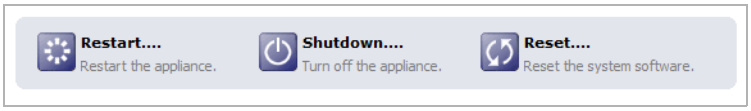
Powering Down and Restarting the Appliance

When it's time to power down or restart the appliance, be sure to follow the proper procedure. The appliance stores important data in memory while it is running. That data must be written to the hard disk before you turn off the power.

CAUTION: Powering down the appliance improperly can result in loss of data and leave the system's files in an inconsistent state. For EX9000, EX7000, EX6000, SMA 7200, and SMA 6200 appliances: Remove any USB devices from the appliance before you reboot it. If a USB device is plugged in to your appliance when it is rebooted, the appliance tries to use it as a boot device. As a result, the boot information stored in the BIOS on the appliance is overwritten, and the device becomes unusable.

To power down or restart the appliance in AMC

1 From the main navigation menu, click **Maintenance**. The **Maintenance** page displays.



2 Click the appropriate button:

- To restart the appliance, click **Restart**. AMC stops responding. After the appliance restarts, you can log in to AMC again.
- To shut down the appliance, click **Shutdown**. AMC stops responding and the appliance powers down. You do not need to press the power button on the front panel.

All appliance models can be shut down or restarted at the appliance:

a On the front of the appliance, press the **Down** button on the four-button keypad to get to the main LCD menu.

b Scroll down until you reach the option you want, **Restart** or **Shutdown**.

c Both options display a confirmation message; press the **Left** button to continue.

d The results are the same as restarting or shutting down in AMC:

- AMC stops responding; after the appliance restarts, you can log in to AMC again.
- AMC stops responding and the appliance automatically powers down. You do not need to press the power button on the front panel.

Hyper-V for the SMA 8200v

Microsoft Hyper-V in Windows Server 2016 is supported as a host platform for both the Central Management Server (CMS) and Secure Mobile Access (SMA) appliances. Customers using a Microsoft Hyper-V-based virtualization/private cloud infrastructure can host SMA appliances and CMS.

Configuring Hyper-V for SMA 8200v

NOTE: Hyper-V is supported only on Windows Server 2016 and later.

To create a new SMA 8200v on a Hyper-V host:

1 Copy the SMA ISO file to a location that can be accessed by the Hyper-V Manager.

2 Create a Generation 1 virtual machine with 4 processors and 4GB of memory.

3 Create a new 64 Gb dynamic hard drive with a `.vhdx` suffix instead of a `.vhd` suffix.)

4 Add the hard drive to the virtual machine on IDE Controller 0.

5 Create a second network adapter. Select VMXnet3 for the NIC.

NOTE: The virtual machine is created with just one network adapter.

6 The virtual machine gets created with a DVD:

- Specify the media for the DVD to be the SMA ISO file.
- Change the virtual machine BIOS boot order so that the DVD is first.

7 Start the virtual machine. It boots from the DVD.

8 After a successful boot, an SMA appliance is created, and the virtual machine is automatically stopped.

9 Remove ISO SMA as it is no longer needed.

10 Change the BIOS boot order so that the hard drive is higher than the DVD

11 Connect the network adapters to the appropriate virtual switch in the Hyper-V environment.

The next time the virtual machine is started, it boots from the hard drive and you can configure the SMA 8200v from the console.

The maximum concurrent user count for the Hyper-V platform is 5000 CCU.

For more details about configuring a Hyper-V, see the *Secure Mobile Access Virtual Appliance Hyper-V Deployment Guide.*

Next Steps

After you have completed the initial network setup, use AMC to continue configuring the appliance. AMC is accessible using a Web browser.

TIP: If you're new to AMC, you might want to read Working with Appliance Management Console.

If you're ready to continue configuring the appliance, see Network and Authentication Configuration.

Part 3

Management

- User Management
- Working with Appliance Management Console

3

User Management

Users, Groups, Communities, and Realms

Access control rules determine which resources are available for users or groups of users. Accordingly, you must define users and groups in AMC that map to users or groups stored in external user directories or in the local user authentication repository on the appliance. At a higher level, communities organize users or user groups that share common characteristics, most notably access policy and access methods, and can also be used in access control rules.

Topics:

Users and groups

A user is an individual who needs access to resources on your network, and a group is a collection of users. After you've created users or groups on the appliance, you can reference them in an access control rule to permit or deny access to resources.

Users and groups can be stored on an external authentication server or on the appliance in a local user authentication repository. When an external authentication server, such as LDAP or Microsoft Active Directory, is being used, you create references to existing users or groups stored in that server. These users or groups, as well as local users and groups, are referenced in access control rules to control authorization. You can even query the external directory (looking for users who share certain attributes, for example) and use the results to create a group to use in an access control rule. This is useful when you do not want to create and manage users directly on the appliance.

Creating local users and groups on the appliance is useful to allow external users to access a set of internal company resources, such as a reseller who needs access to a special order status page on an internal system. For deployments without an existing company-wide directory server in place, the local user authentication repository allows group-based policy without the need to install, configure, and maintain another server.

You can define a user or group before referencing it in an access control rule; alternatively, you can define a new user or group directly from the access control rule interface.

Communities

Communities are collections of users that determine which access methods and End Point Control agents are deployed to the members of a user population when they log in to a realm. For example, you may want to enable OnDemand for your mobile employees, but provide only Web access to your business partners. If End Point Control is enabled, communities can also be used to determine which “zones of trust” members belong to.

Realms

A realm references an authentication server and determines which access agents are provisioned to your users and what End Point Control restrictions are imposed.

Using Realms and Communities

When you set up realms and user communities, AMC enables you to specify which access agents are provisioned to members of the communities. You also have the option of classifying community members’ devices into “zones of trust.” The following illustration shows how a realm authenticates users, assigns them to communities to provision access agents and, with End Point Control enabled, assigns community members to different zones based on the trustworthiness of their computers.

If your network uses only one authentication server to store user information, then you probably need to create only one realm in AMC. If your network uses multiple authentication servers, you must create at least one realm for each of them. You can also create multiple realms in AMC that reference separate user populations in a single external repository.

Using only one authentication realm doesn’t limit your ability to create subsets of users based on their access needs or other security considerations, because realms must be associated with communities of users. A community can consist of all users in a realm or only selected users; it is used to deploy access agents and to enforce End Point Control restrictions for members of a community. For information on communities, see Configuring an SMA Appliance to Send RADIUS Accounting Records to a Firewall.

Topics:

- Viewing Realms
- Default, Visible, and Hidden Realms
- Specifying the Default Realm
- Enabling and Disabling Realms
- Best Practices for Defining Realms

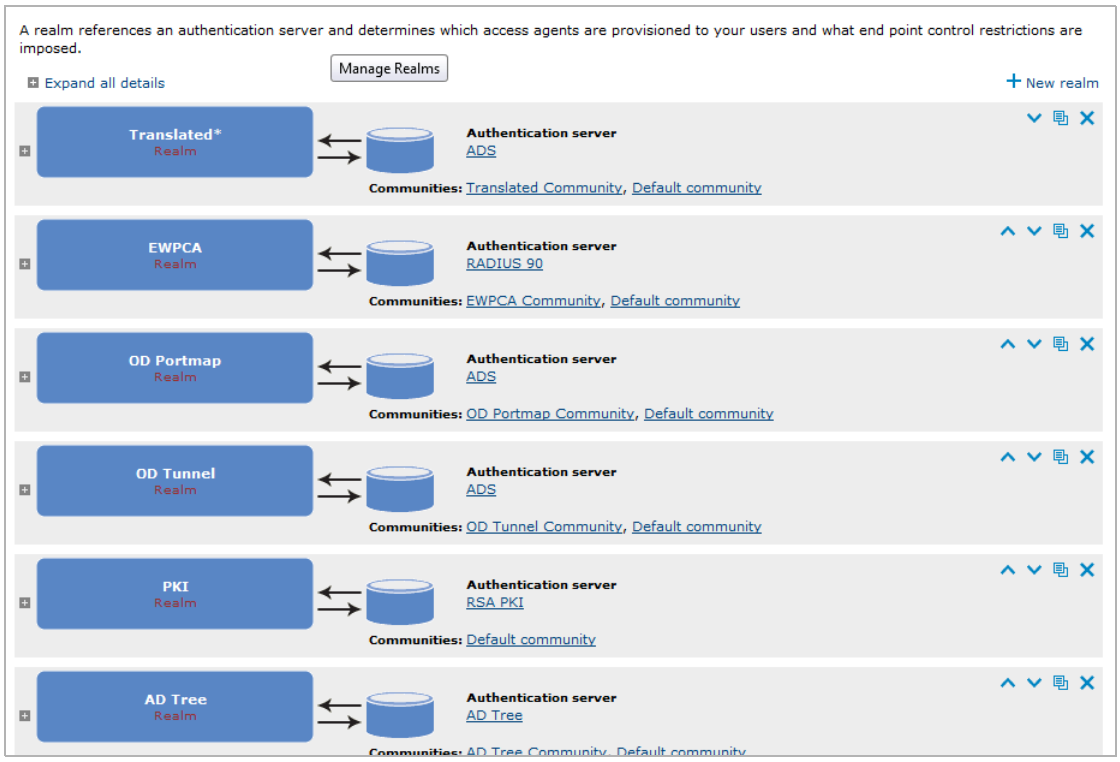
Viewing Realms

You can view the list of configured realms, including all “building blocks” that are associated with each one: the authentication servers and communities. The communities, in turn, determine who has access using what methods, what security zone to place a device in, based on its profile, and even the appearance of WorkPlace.

To view configured realms

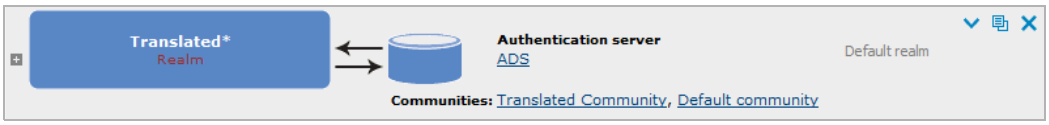
1 Under **User Access** in the left navigation pane, click **Realms**. The **Realms** page displays.

Collapsed view



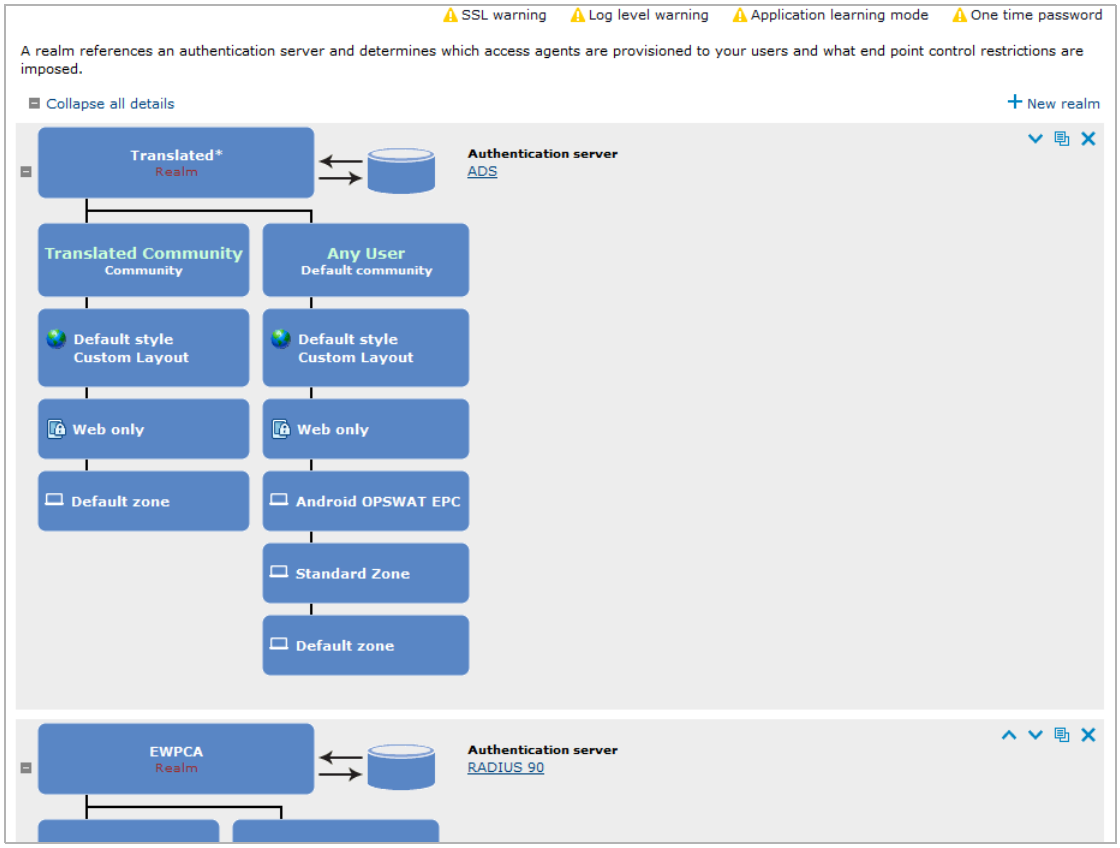
The Collapsed view gives you a quick summary of each realm. Click any item to go directly to its corresponding configuration page in AMC:

- All realms that are enabled appear in blue, while those in gray are disabled. Users and groups associated with a disabled realm are unable to log in. See Enabling and Disabling Realms for more details.
- The **Authentication server** area shows the name or names of the servers that are used by a realm to verify users' identities. Clicking on the server name displays the **System Configuration > Authentication Servers** page for that server.



- The (optional) descriptive text you entered when creating a realm is on the right.
- You can use the:
  - **Up** and **Down Arrow** icons to re-order the list of realms
  - **Copy** icon to create a copy of a realm to modify
  - **Delete** icon to delete a realm.
- Below the server information is a list of communities associated with the realm.

Expanded view



The Expanded view expands the list of communities to graphically represent the community and its layout, configuration, and zones.

You can:

- Expand or collapse all realms by clicking on the Expand all details or Collapse all details icon at the top of the page.
- Expand or collapse a single realm by clicking its:
  - **Plus Sign** (+) to see more detail.
  - **Minus Sign** (–) to see less detail.

2 Communities allow you to group realm members based on different security needs. For a quick check of which members belong to a community, move the pointer over the community name.

3 You can access the relevant pages for:

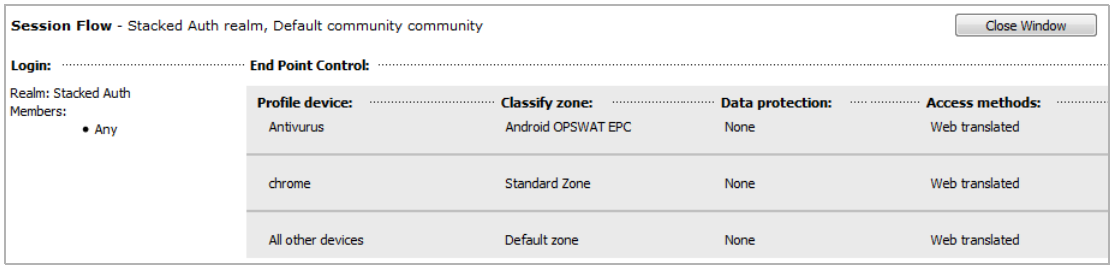
- Default style – The appearance of the WorkPlace portal is governed by a style and layout that you can configure. If you have a community of mobile device users, for example, you might want to create a more compact look and layout for it.
- Access method – Lists the browser access method(s) for the community.

- Security zones – Are used to allow or deny access using device profiles. For a quick check of which device profiles are used by a particular zone, move the pointer over the zone name.

4 There are a number of community-level configuration changes you can make on this page in AMC. Move the cursor over a community name:

Using the controls that appear when you are positioned over a community, you can:

- Add or delete a community with the **Add** (**+**) or **Delete** (**X**) icons.
- Change the order in which users are grouped by moving the community left or right with the **Right** (**>**) or **Left** (**<**) **Arrow** icons.
- To see the session workflow, move the pointer over the community name and click the **Session Flow** icon.



5 Specify a default realm from the **Default realm** drop-down menu (at the bottom of the page), which lists all the displayed realms. The default realm is preselected in user login screens.

Default, Visible, and Hidden Realms

To authenticate a user, the appliance must know which realm the user belongs to. If only one realm is enabled, the appliance automatically uses it. However, if multiple realms are enabled, the appliance needs to know which one to use.

When users log in, they typically select the appropriate realm from a list. You can make the choice easier for them by defining a default realm in AMC (see Specifying the Default Realm for more information). If a default realm is defined, the realm selection field is automatically populated with that realm. The specific behavior of each access method is outlined in this section.

IMPORTANT: SonicWall strongly recommends that you specify a default realm.

You can also choose which realm names are visible to users. If a realm is hidden, the user must know its name and manually type it during login. For example, you could create realms for various suppliers. If you'd prefer that they not know about one another, you could configure the realm names to be hidden. Each supplier then has to type the realm name when logging in to the appliance.

For the typical user login experience for various realm configurations, see the Typical user login experience for various realm configurations table.

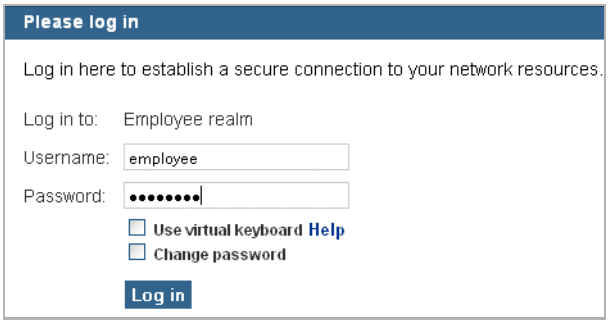
Typical user login experience for various realm configurations

Realms enabled	Default realm configured?	Hidden realms configured?	User's login experience
One	N/A	N/A	User does not need to select a realm during the login process. Access methods automatically use the one enabled realm for authentication.
Multiple	Yes	None	User selects a realm from the list. The **Realm** field is initially populated with the default realm.
Multiple	No	None	User selects a realm from the list. The **Realm** field is initially populated with the first realm (sorted alphabetically).
Multiple	Yes	Yes	User selects a realm from the list. The **Realm** field is initially populated with the default realm. If login requires a hidden realm, user selects **Other** and then types the realm name in a second field.

When users first access Secure Mobile Access WorkPlace, they are presented with one or more login pages. If only one realm is enabled, they see only the page requesting their user credentials. If multiple realms are enabled, they see a login page on which they select the appropriate realm from a drop-down menu. The default realm selected on the **User Access > Realms** page is displayed as the preselected realm in the drop-down menu. If there are one or more hidden realms, the login page prompts the user to type in the realm name.

NOTE: Up to 200 realms can be defined for users to choose from. As an alternative, to avoid manual selection, WorkPlace sites can be set up with a unique realm configured for each WorkPlace site. The default number of Workplace sites is **200**, but there is no limit.

After clicking **Next**, users authenticating with user name and password are presented with the page for entering credentials.



Specifying the Default Realm

If you specify more than one authentication realm, you must designate one as the default. To authenticate a user, the appliance must know which realm the user belongs to. If only one realm is enabled, the appliance automatically uses it. If multiple realms are enabled, the appliance needs to know which one to use. A user can select the appropriate one from a list, but the process is easier for the user if you designate a default realm in AMC. (Even if you configure only one realm, you should specify it as the default; otherwise AMC displays the warning message, `There is no default realm selected`, on the **Realms** page.)

To specify a default realm

1 From the main navigation menu, click **Realms**.

2 In the **Default realm** list (at the bottom of the AMC page), select the authentication realm that will be the default. This list shows only those realms that are enabled and configured to be displayed.

Enabling and Disabling Realms

The appliance supports the simultaneous use of multiple realms. You can control which realms are active by enabling and disabling them. When a realm is disabled, users and groups associated with that realm are unable to log in. If no authentication realm is enabled, users do not have access to the network.

To enable or disable an authentication realm

1 From the main navigation menu, click **Realms** to see the list of defined realms. If a realm is enabled, its indicator icon in the **Enabled** column is green. If a realm is disabled, the indicator is gray.

2 Click the name of the realm you want to enable or disable. This displays the **Configure Realm** page for that realm.

3 In the **General** area, select whether the **Status** for the realm is **Enabled** or **Disabled**.

4 Click **Save**.

Best Practices for Defining Realms

When defining realms, follow these best practices to simplify your users' login experience.

- Your users select a realm name when logging in, so define realm names that clearly describe the user population. For example, a realm that includes all internal employees might be named "employees," while a realm that includes external suppliers might be named "suppliers."

  If a realm will be referenced by mobile device users, keep the name short so that all of it is visible on the mobile device. A Pocket PC device using standard text size, for example, can normally display a name that is about 30 characters long, but a smart phone cannot.

- If some users will be logging in to a realm that is hidden, make sure they know the name of the realm and how to type it in (choose **Other** from the realm list and then type the realm name in the field).

- Enable multiple realms only if necessary. If only one realm is enabled, users do not need to select a realm as part of the login process. When moving from a test to a production environment, verify that all test realms have been removed.

Configuring Realms and Communities

Topics:

- Creating Realms
- Adding Communities to a Realm
- Creating and Configuring Communities
- Network Tunnel Client Configuration
- Using the Default Community
- Changing the Order of Communities Listed in a Realm
- Configuring RADIUS Accounting in a Realm
- Configuring an SMA Appliance to Send RADIUS Accounting Records to a Firewall

Creating Realms

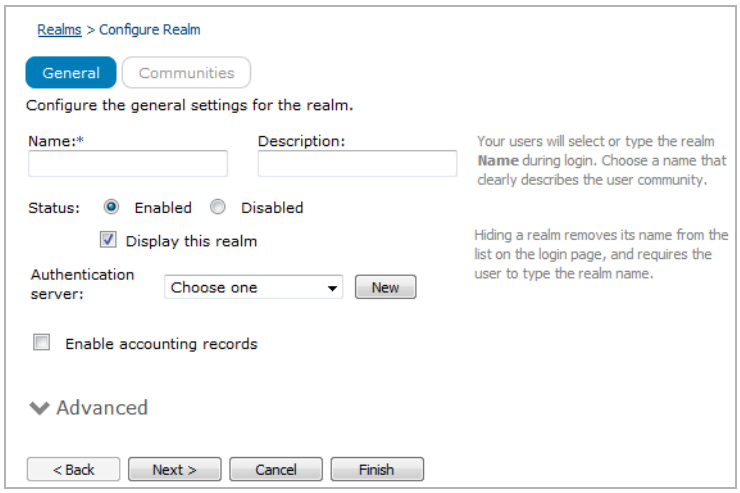
If you create more than one realm, you must specify one as the default.

After you create a realm and associate it with an external authentication server, you can either add one or more communities to the realm or use the preconfigured Default community. If you create and save a realm without assigning a community to it, AMC automatically assigns the Default community to the realm. See Using the Default Community and also Adding, Editing, Copying, and Deleting Objects in AMC.

To create a realm

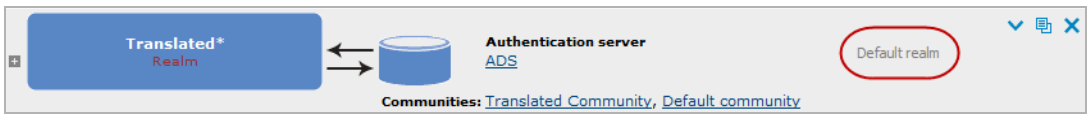
1 Under **User Access** in the navigation pane, click **Realms**.

2 Click **+ New realm**. The **Configure Realm** page appears with the **General** settings displayed.



3 In the **Name** field, type a meaningful name for the realm. If users are required to select a realm name when logging in to the VPN, make sure the name clearly describes the user population.

4 In the **Description** field, type a descriptive comment about the realm. This is optional, but helpful, especially if your VPN uses multiple authentication realms. The text you enter in this field is displayed in the list of realms.



5 Enable or disable this realm by selecting the appropriate **Status**. See Enabling and Disabling Realms for more information.

6 If you want this realm to appear in the list seen by your users (recommended in most cases), select the **Display this realm** checkbox.

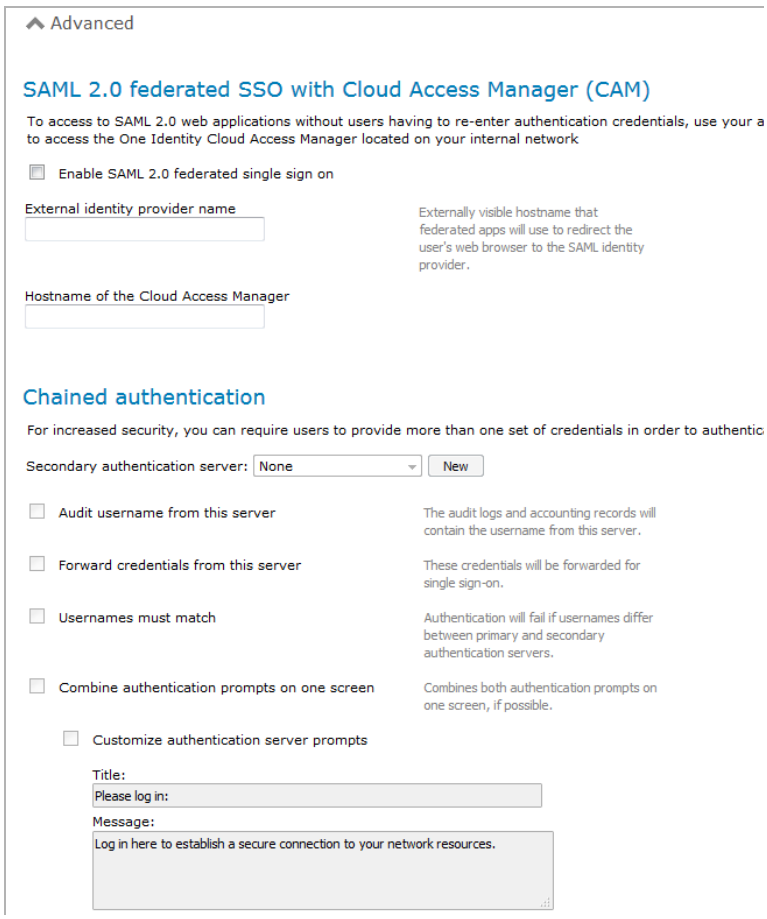
7 From the **Authentication server** drop-down menu, select the realm used to verify a user's identity. You must select a server.

CAUTION: Setting Authentication server to None allows unauthenticated, open access to this realm and its resources. Do not do this unless you are sure this is what you intend.

8 You can also click **New** to display the **Authentication Servers > New Authentication Server** page for configuring a new authentication server and referencing it in the realm. For more information, see Configuring Authentication Servers.

9 If you want to save accounting information about this realm, select the **Enable accounting records** checkbox. When selected, all RADIUS, syslog, and routing changes are saved.

10 Click **Advanced** to display the advanced settings.



11 To have users access SAML 2.0 web applications without having to reenter authentication credentials, in the **SAML 2.0 federated SSO with Cloud Access Manager (CAM)** section:

   a Select the **Enable SAML 2.0 federated single sign on** checkbox.

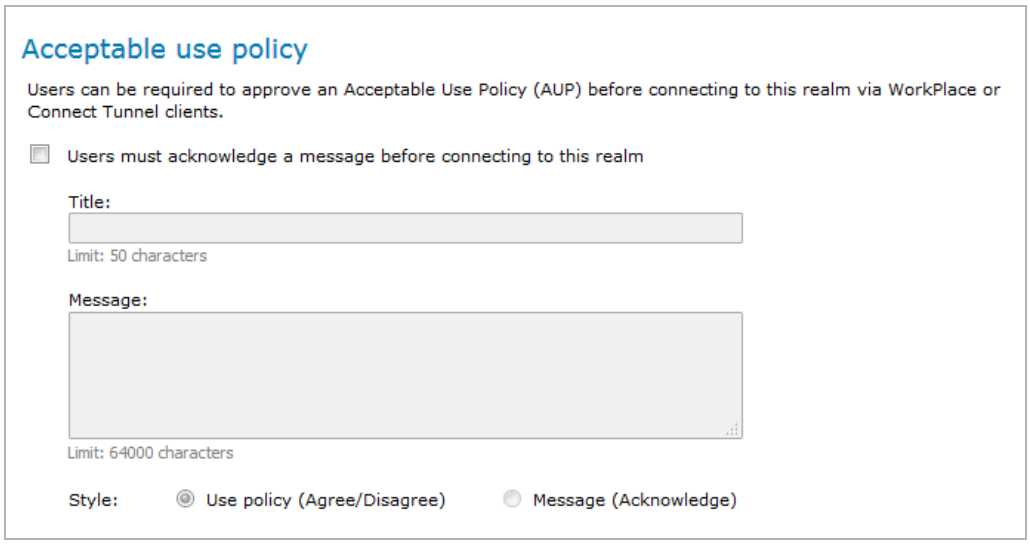
   b Enter an externally visible hostname that federated apps use to redirect users to the SAML identity provider in the **External identity provider name** field.

   c Enter the One Identity hostname in the **Cloud Access Manager** field.

12 Set up the appliance to use a second authentication server and create a customized Acceptable Use Policy (AUP). There are two ways to set up a second authentication server:

- **Chained authentication**: Require users to provide more than one set of credentials. See Configuring Chained Authentication.
- **Enable group affinity checking**: Query a secondary authentication repository. See Enabling Group Affinity Checking in a Realm for more information.

13 In the **Acceptable Use Policy** area, select the **Users must acknowledge a message before connecting to this realm** checkbox to force users to agree to an Acceptable Use Policy before being allowed to log in to the realm.



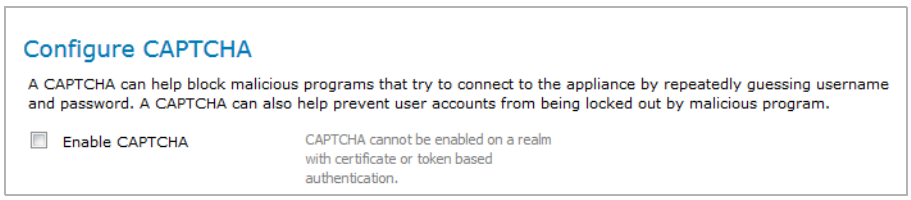
14 In the **Title** field, type in the title of the AUP, up to 50 characters.

15 In the **Message** field, type in the AUP message to which the user needs to agree, up to 64,000 characters.

16 For the **Style** setting, select one of these radio buttons:

- **Use policy (Agree/Disagree)** – The use policy agreement is displayed, and the user must click the **Agree** button to continue connecting. If **Disagree** is clicked, the session is ended.
- **Message (Acknowledge)** – The message is displayed, and the user clicks the **OK** button to continue connecting.

17 In the **Configure CAPTCHA** area, check the **Enable CAPTCHA** checkbox to require WorkPlace users to enter CAPTCHA characters in addition to a user name and password during login. The CAPTCHA prompt is displayed on the WorkPlace login page only if CAPTCHA is enabled here.



CAPTCHAs are effective in preventing these types of malicious program attacks on password systems:

- A bot that attempts to login by guessing the username/password by iterating through a dictionary of password possibilities.
- A denial-of-service attack from a bot that attempts to lock out user accounts by forcing a sequence of numerous unsuccessful logins.

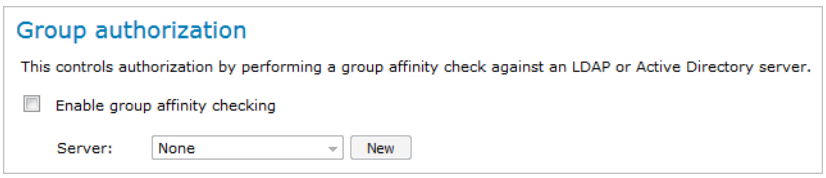
NOTE: This prompt is displayed and CAPTCHA can be enabled only when the **captchaCapable** option is enabled in the `setMicroInterrogationResult()` API.

A CAPTCHA is configured at the realm level across all WorkPlace access methods and all authentication service configurations (local Auth, LDAP, Active Directory, RADIUS). The CAPTCHA consists of 6 alphanumeric characters that are not case sensitive.

Remember the following when using CAPTCHA:

- In chained authentication mode, CAPTCHA is shown only for the primary authentication
- CAPTCHA cannot be enabled on a Realm with token-based or certificate-based authentication. The CAPTCHA configuration section is disabled in these cases.

18 In the **Group authorization** area, check the **Enable group affinity checking** checkbox and select the server from the **Server** drop-down menu to perform a group affinity check against an LDAP or Active Directory server.



To add a new authentication server, click the **New** button to configure a new server as explained in Configuring Authentication Servers.

19 Click **Save**.

You can add user communities to the realm (see Adding Communities to a Realm). If you create and save a realm without assigning a community to it, AMC automatically assigns the global Default community to the realm. For more information, see Using the Default Community.

NOTE: For information on how to edit, copy, and delete communities, see Adding, Editing, Copying, and Deleting Objects in AMC.

Adding Communities to a Realm

After you create a realm, the next step is to configure one or more communities that belong to it. If all users in a realm should be treated the same, then only a single community needs to be defined. Create additional communities if you want to subdivide users; you might want to give remote employees, for example, access methods and End Point Control restrictions that differ from those for local employees. Each community defines the following:

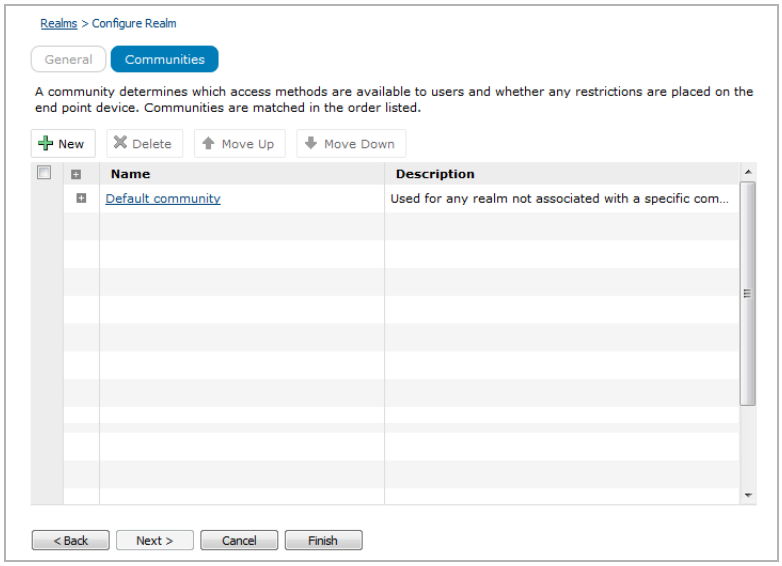
- A subset of users within a realm
- Which access methods are available to those users when they log in to a realm
- What restrictions (if any) are placed on their end point devices

Each realm on the appliance must reference at least one community. Using multiple communities can be an efficient way of segmenting your user population to provide specific access agents to certain users or to place End Point Control restrictions on certain types of devices used by community members.

You can either use the preconfigured Default community (see Using the Default Community) or add other communities to the realm. As your user access or security policy requirements change over time, you can add additional communities to a realm, modify the user communities referenced by a realm or delete them.

To add a community to a realm

1 After creating a realm on the **General** tab of the **Configure Realm** page, go to the **Communities** page by clicking the **Next** button. The **Configure Realm** page appears with the **Communities** tab highlighted.



2 If you want to use an existing community as is (without changing it), you may need to change the order in which the communities are listed. See Changing the Order of Communities Listed in a Realm.

3 To:

- Create a new community for the realm, click **New**.
- Edit an existing community, click its link.

The **Configure Community** page appears. Follow the steps described in Creating and Configuring Communities.

Creating and Configuring Communities

Creating a community involves these basic steps:

- Assign members to the community
- Select access methods for the community
- Optionally, specify End Point Control restrictions for the community
- Specify a style and layout for the WorkPlace portal.

Topics:

- Assigning Members to a Community
- Selecting Access Methods for a Community
- Using End Point Control Restrictions in a Community
- Configuring the Appearance of WorkPlace

Assigning Members to a Community

The first step in creating a community involves specifying which users will be members. By default, a community is configured to include all users from the authentication realm to which it is assigned. However, you can configure a community to permit access to only a subset of users or user groups in a realm.

This is useful, for example, if you want to segment a realm into one community for employees and another community for business partners. You can then provide each community with the appropriate access agents or impose End Point Control restrictions if users are logging in from non-secure computers. Communities can also be referenced in access control rules to permit or deny access to your resources.

To assign members to an existing community:

1. From the main navigation menu, click **Realms**.
2. Within the realm, click the link for the community you want to configure. The **Configure Community** page appears with the **Members** tab displayed.
3. The **Members** menu specifies which users or groups belong to this community. Click **Edit** to select from a list of users and groups. If no users or groups are specified, the default value of this field is **Any**, meaning that any users from the authentication realm that references this community belong to this community.
4. In the **Maximum active sessions** field you can limit the number of sessions each member of this community is allowed to have active at one time. For mobile users, for example, you may want to restrict the number of sessions to 1—each session consumes one user license, and it's impractical for a mobile user to have more than one active session. With other communities, such as employees who alternate between working from home and in the office, the number of allowed sessions should probably be higher. See How Licenses Are Calculated for more information.
5. To select which access methods are available to members of the community, click the **Access Methods** tab. See Selecting Access Methods for a Community for more information.
6. To restrict user access based on the security of client devices, click the **End Point Control restrictions** tab and specify which zones are available to users in this community. See Using End Point Control Restrictions in a Community.
7. Click **Save**.

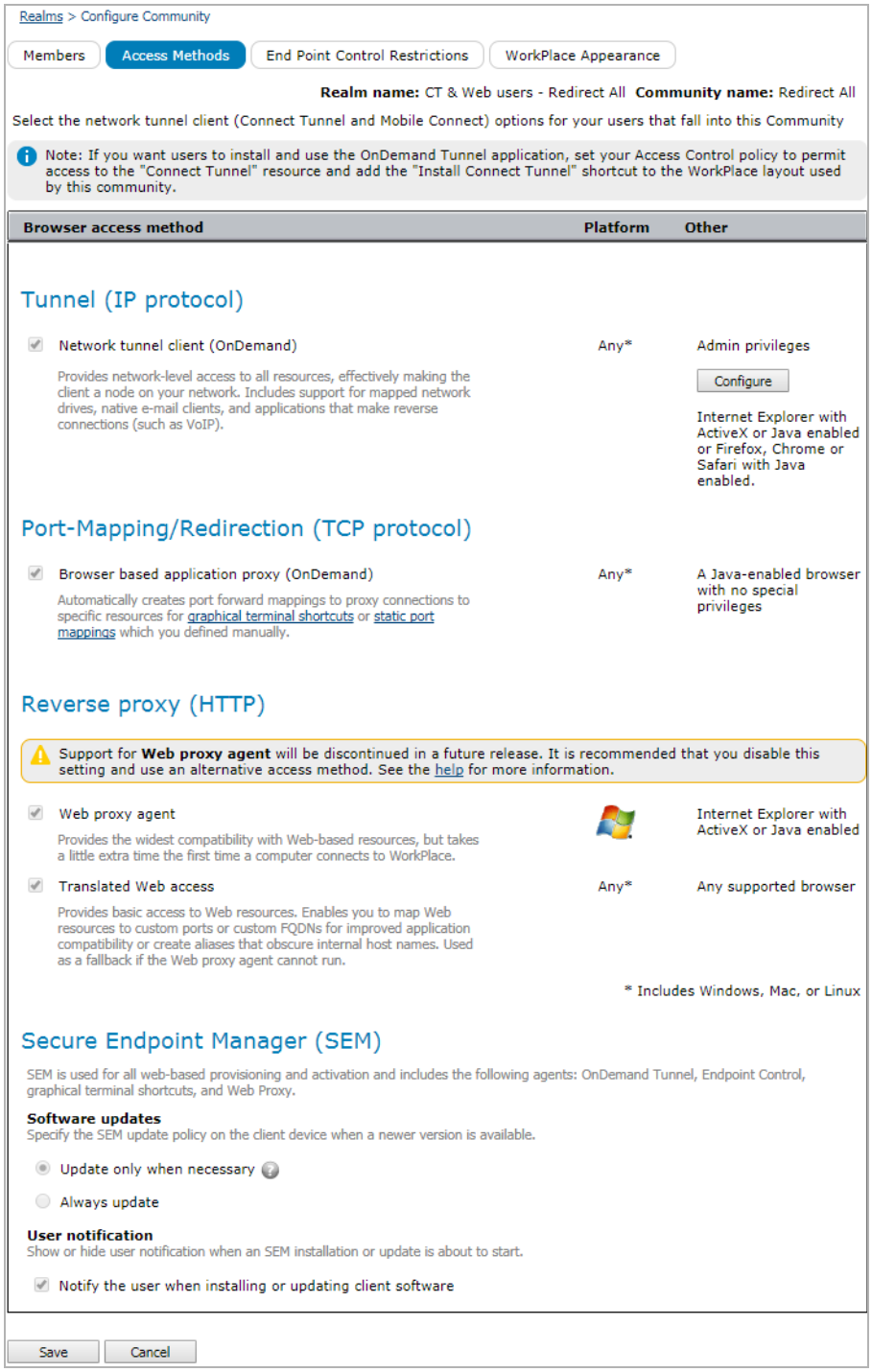
Selecting Access Methods for a Community

The second step in creating a community is to determine which access methods will be available for community members to connect to the appliance and access your network resources. For information on which access methods are compatible with your users' environments, see User Access Components.

To specify the access methods available to community members:

1. From the main navigation menu, click **Realms**.
2. Click the link for the community you want to configure.

3 Click the **Access Methods** or click **Next**.



4 Select the access methods community members can use with a browser to connect to resources on your network. Based on the capabilities of the user's system, the appliance activates the access agents you have selected. For information on the capabilities and system requirements of the various access agents, see User Access Components and Services.

5 If you want to provide network tunnel client access to members of a community, select a combination of the following:

- In the tunnel access area, select **Network tunnel client**. You can use a built-in resource and shortcut if you want users to download the Connect Tunnel client and activate it from a link in WorkPlace.
- For Web-based proxy access:
    a) Select **Client/server proxy agent (OnDemand)**.
    b) Click **Auto-activate from WorkPlace**. This provisions or activates the Web-based OnDemand Tunnel agent to users automatically when they connect to WorkPlace.
- In the Web access (HTTP) area, select:
    - **Web proxy agent** for clientless access to most types of Web-based resources for Windows clients.
    - **Translated Web access** for clientless access to Web resources that are mapped to custom ports or custom FQDNs for improved application compatibility or that use aliases to obscure internal host names. Translated Web access can be used as a fallback if the default Web proxy agent cannot run. See Web Access for information about the different types of Web access, and see Adding Resources for information about adding Web-based resources.

NOTE: Web proxy agent will be discontinued in future releases.

6 To deploy the network tunnel clients to users, you must first make one or more IP address pools available to the community. By default, AMC makes all configured IP address pools available to a community; however, you can select specific IP address pools if necessary. See Network Tunnel Client Configuration.

7 You can require users to install a Secure Mobile Access agent or client before granting them access to network resources when they log in to WorkPlace. Selecting **Require agent in order to access network** provides better application compatibility for applications that need an agent: it means broader access for users, and fewer Help Desk calls for you.

When this setting is disabled, a user logging in to WorkPlace can choose not to install an agent and proceed with translated, custom port mapped or custom FQDN-mapped Web access. In this case, the user is placed in either the **Default** zone or a **Quarantine** zone, depending on how the community is configured.

8 When you have finished selecting access methods for the community, click **Next** to proceed to the **End Point Control restrictions** area, where you can restrict access to community members based on the security of their client devices. See Using End Point Control Restrictions in a Community.

9 If you don't want to employ End Point Control for the community, click **Finish**.

NOTE: If the network tunnel client option is not enabled for a particular community, users who previously had access to the Connect Tunnel client are still able to use it to access the appliance.

If the community is configured to provide only Translated Web access, terminal resources are unavailable because the client PC does not have the network transport required to access a proprietary application protocol. For information on configuring graphical terminal agents, see Managing Access Services.

Using End Point Control Restrictions in a Community

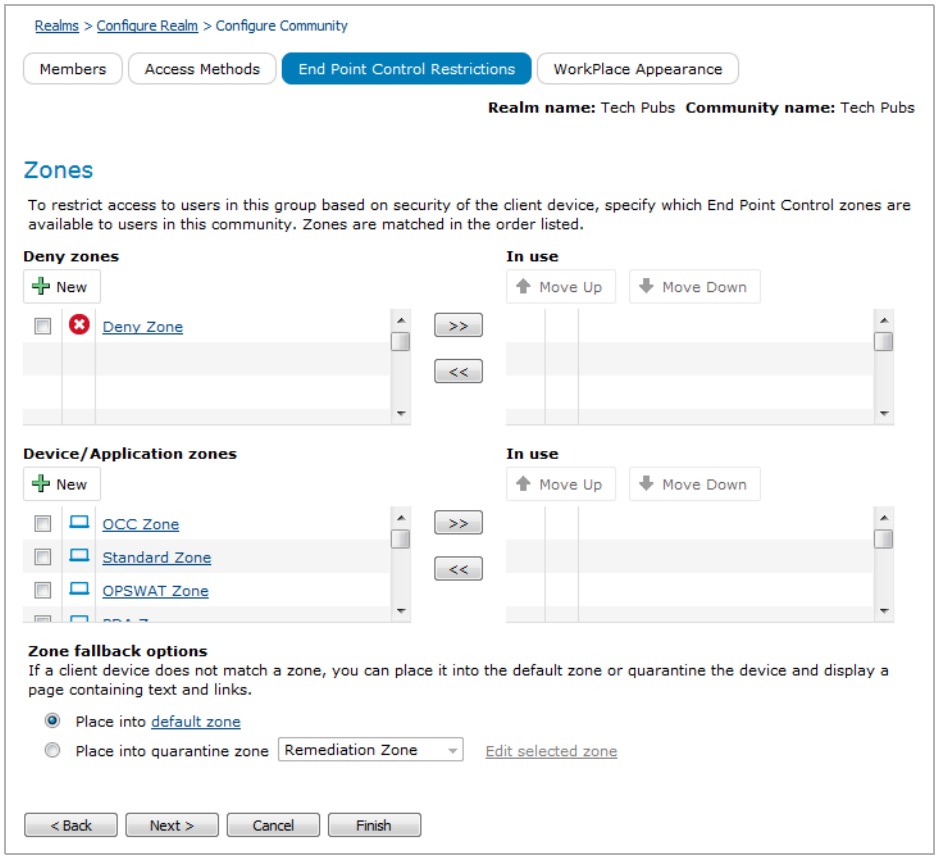
When you're creating a community, you have the option of restricting access to users based on the security of their client devices. To do this, specify which End Point Control zones are available to users in this community. There are four types of zones—Deny, Standard, Quarantine, and Default. For more information on how to create and configure End Point Control zones, and the device profiles they use to classify connection requests, see Managing EPC with Zones and Device Profiles.

You can also set an inactivity timer, even if you don't use End Point Control zones for a community, if your users access the appliance using the Connect Tunnel client.

To apply End Point Control restrictions for a community:

1 From the main navigation menu, click **Realms**.

2 Click the link for the community you want to configure, and then click the **End Point Control Restrictions** tab.



3 Use a Deny zone if you have a device profile that is unacceptable in your deployment. You might, for example, want to deny access to any user who has Google Desktop installed on the PC with which they are trying to connect. Select (or create) an entry in the **Deny zones** list and click the **>>** button to move it to the **In use** list. Deny zones are evaluated first (if there's a match, the user is logged off).

To create a new EPC zone and then add it to the list, click the **New** button. For information on how to create a zone, see Defining Zones.

4 You can assign one or more End Point Control Standard zones to the community, which are used to determine which devices are authorized to access a community. If you don't select a zone, community members are assigned to the default zone, which could limit or even deny access to resources, depending on your access policy. Select the checkbox for a zone in the **Standard zones** list and then click the **>>** button to move it to the **In use** list.

5 If the community references more than one zone, use **Move Up** and **Move Down** to arrange their order in the list. Zones are matched in the order they are listed, so it is important to you consider which devices are authorized in each zone. You should place your most specific zones at the top of the list.

6 If a client device does not match a zone, use the settings in the **Zone fallback options** area to place it into the default zone, or quarantine the device and (optionally) display a customized page with text and links. See Creating a Quarantine Zone for more information.

7 To set the inactivity timer (which is triggered when there is no keyboard or mouse activity) for community members, select a time limit (ranging from **After 3 mins** to **After 10 hours**) from the **End inactive user connections** list. This is a Windows-only setting that is used by the network tunnel client.

8 Click **Save** to complete the configuration of the community.

NOTE: The appliance uses EPC interrogation to check for certain device profile attributes on the client and then classifies the device accordingly. If a Quarantine zone is your fallback option, and if EPC interrogation somehow fails, a device that would normally be quarantined may instead end up in the Default zone.

Configuring the Appearance of WorkPlace

Each community can be assigned a style and layout for its WorkPlace portal content pages.

A WorkPlace style determines the colors, fonts, and images used to display the pages, and a layout determines page content, how it is arranged, and how you navigate the portal. Keep in mind that the style for the login, error, and notification pages is specified when you set up a site.

To create a style and layout for a community:

1 From the main navigation menu, click **Realms**.

2 Click the link for the community you want to configure, and then click the **WorkPlace Appearance** tab.

3 Select an existing style or click **Manage styles** to modify or create one. For more information on configuring a WorkPlace style, see Creating or Editing a WorkPlace Style.

4 Select an existing layout or click **Manage layouts** to modify or create one. For more information on configuring a WorkPlace layout, see Creating or Editing a WorkPlace Layout.

5 The layout for this community is changed automatically to accommodate smaller devices; for example, the **Intranet Address** field (if it is part of the layout) is displayed on an advanced mobile device, but not a basic one.

If that result is not acceptable, you can specify a different layout for different classes of devices in the **Small form factor devices** area. A good approach when creating a community is to see how the WorkPlace portal for this community looks on a mobile device by default, and then create a new layout or modify an existing one only if you need to.

Network Tunnel Client Configuration

This section describes how to configure settings for the Connect Tunnel client and the OnDemand Tunnel agent.

- IP Address Allocation
- Session Persistence
- Redirection Modes
- Proxy Server Redirection
- UDP Tunnel Mode
- Secure Network Detection
- Windows Tunnel Client Automatic Client Updating
- Session Termination
- Configuring Tunnel Client Settings

IP Address Allocation

Configuring the network tunnel service to manage TCP/IP connections from the network tunnel clients requires setting up IP address pools for the allocation of IP addresses to the clients. Setting up the address pools is typically done when you configure the network tunnel service. For information on how to initially set up IP address pools, see Configuring IP Address Pools.

When you create communities that will deploy the network tunnel clients to users, you must specify which of those IP address pools are available to members of that community. By default, AMC makes all configured address pools available; however, you can select specific IP address pools if necessary.

Session Persistence

The tunnel clients automatically handle the sorts of connection interruptions that users (and especially mobile users) are familiar with, like undocking a laptop and taking it into a meeting or crossing cellular network boundaries while on the road. Users can experience these temporary interruptions and then resume their sessions without having to reauthenticate.

To allow sessions to be reestablished automatically when a user's IP address changes (for example, when moving from the office to home), select the **Allow user to resume session from multiple IP addresses** checkbox when you set up EPC zones. See the steps described in Creating a Device Zone or Configuring the Default Zone for more information.

Reauthentication is, however, required if this setting is disabled or if any of the following is true:

- The user's session on the appliance has expired
- The credentials provided (such as a SmartCard) do not persist during suspend/resume

Redirection Modes

When configuring the network tunnel clients, you must specify a redirection mode, which determines how client traffic is redirected to the appliance. The network tunnel service supports these redirection modes:

- Split Tunnel Modes
- Redirect All Mode

Split Tunnel Modes

In **Split tunnel mode**, traffic bound for resources defined in AMC is redirected through the tunnel, and all other traffic is routed as normal. This is less secure than redirect all mode, but also more convenient for users because it doesn't interfere with Internet access.

To safeguard against unauthorized access to users' computers through their Internet connections, which could potentially reach network resources by re-routing through the split tunnel, consider using End Point Control restrictions to require that users' computers are running personal firewalls or antivirus protection.

To also give users access to local printers and file shares, select **Split tunnel, with access to local network**.

When the appliance is configured for one of the split tunnel modes, you can allow users to decide whether to give preference to local or remote network access. For example, let's say you have a host resource—a Web server—with an address of `192.168.230.1`. The user goes on a business trip and it turns out that the printer he or she wants to use, on a local network at a conference center, uses that same address. If you've selected the **Allow users to indicate which split tunnel redirection mode to use on the client** option in AMC, you allow the traveler to indicate a preference for local resources (in this case, the printer) when there is a network conflict. The choice is made on the client in the **Connect Tunnel Properties** dialog, on the **Advanced** tab.

Redirect All Mode

In **Redirect all mode**, traffic is redirected through the tunnel regardless of how resources are defined in AMC. This option provides enhanced security, blocking users from being able to access any network device during their tunnel sessions. It may also prevent Internet access, depending on your network configuration.

Redirect all mode is more secure than split tunnel redirection. After launching Connect Tunnel in redirect all mode, users can still modify the routing table, but any traffic not in accordance with the redirection list the appliance sent down to the client is immediately dropped. This prevents users from modifying the routing tables on their computers to bypass the appliance and effectively creating their own split tunnel connection back to the network. Once the routing table has been changed by the Connect Tunnel client, modifying the routing table is ineffective. For more information, see Configuring the Network Tunnel Service.

To direct all traffic through the appliance, but also give users access to local printers and file shares, select **Redirect all, with access to local network**. For example, if you have a community of remote employees, working from home, you could use this redirection mode for maximum security, yet still allow them to use resources on their home networks, such as a printer.

Proxy Server Redirection

Optionally, you can configure traffic bound for the Internet to be redirected through an internal proxy server when the VPN connection is active. This can be useful if you want to use an HTTP proxy server to control remote users' access to Internet resources. This option is available only when one of the redirect all modes is enabled. For information about configuring these settings, see Configuring Tunnel Client Settings.

NOTE: If you have selected a redirection mode of Redirect all, with access to local network, users will have access to local file shares and printers. You should be aware, however, that if you are using a .pac file for a remote proxy, then its redirection rules take precedence for any traffic routed through the WinINet networking library (such as Internet Explorer, Media Player, and Instant Messenger). For example, a user may expect to be able to reach a Web application on a server—because it is on the local network—but find that the request has been redirected through the remote proxy instead.

Tunnel Clients and Proxy Auto-Configuration Files (Linux Platform)

When OnDemand Tunnel or Connect Tunnel is launched on the Linux platform in an environment where a proxy server is used for outbound access to the Internet, the SMA appliance appends redirection settings to the browser's proxy auto-configuration (`.pac`) file. These modifications are made for the duration of the session only; the original browser settings are reinstated when the user logs out. There are some known issues involving this combination of platform and client:

- In the course of a user's session, one or more prompts may appear requesting approval for changes to the browser's `.pac` file. In order to log in to WorkPlace and ensure proper functionality, the user must accept these `.pac` file modifications.
- If the server `.pac` file is updated, the user must either connect using the OnDemand Tunnel or Connect Tunnel client to incorporate the changes or manually revert to the original proxy settings.
- If a user has a Firefox browser window open when Connect Tunnel is started, the modifications that the appliance needs to make to the browser's `.pac` file (for properly redirecting connections) are not applied to any open browser windows.

  The user must either close and then re-open Firefox or manually reload the browser's proxy settings.

UDP Tunnel Mode

A network address translator (NAT) allows multiple private network addresses to share a single, public IPv4 address. But address translation also means that client-to-client networking applications, such as VoIP and video conferencing, will not work properly: these applications need to know a user's IP address in order to establish and maintain a reliable connection.

ESP (Encapsulating Security Payload) is a way to encapsulate and decapsulate packets inside of a UDP wrapper (port 4500) for traversing NATs. Using it can improve the performance of UDP-streaming applications like VoIP. For more information on ESP, see RFCs 2406 and 3948:

http://www.ietf.org/rfc/rfc2406.txt

http://www.ietf.org/rfc/rfc3948.txt

ESP encapsulation is the default setting for newly defined communities. UDP port 4500 must be open in network firewalls for traffic to and from the appliance's external IP addresses and virtual IP addresses when using it. If the external appliance traffic is subject to NAT, then NAT must be configured for UDP port 4500. Also, in rare cases where the network environment does not properly implement PMTU discovery (see RFC 1191), certain applications may run inefficiently or perhaps not at all when using ESP encapsulation.

When enabled, ESP use is automatically negotiated between a client and the EX Series appliance. You can choose to use it for all traffic or just UDP traffic; if ESP fails or if the client does not support it, then the SSL tunnel is automatically used instead. The **User Sessions** page in AMC indicates which type of tunnel is being used.

The log files also indicate which tunnel was used: log messages will indicate UDP port 4500 packets for ESP traffic and TCP port 443 packets for SSL tunnel packets.

Secure Network Detection

Secure Network Detection allows users to automatically establish a tunnel connection when attempting to login from an unsecure location. The client determines whether the device is in a secure network by comparing the client's DNS suffixes and servers to the connected interface. Depending on this comparison, the following occurs:

Secure network detection

	If connected...	If not connected...
DNS entry found	Disconnect and reconnect in SND state	Connect in SND state
DNS entry not found	Leave connected	Connect using dialer

Secure Network Detection (SND) is provided by Connect Tunnel and Mobile Connect. SND allows secure "always on, always connected" SSL VPN sessions to SMA appliances from client endpoint devices. When Secure Network Detection is enabled, the Connect Tunnel and Mobile Connect clients can detect when the user is located on a non-secure network and automatically establish a tunnel connection. The connection status is indicated by an icon on the systray:

Systray icons

Systray Icon	Description
	Connected
	Disconnected

Consider the following when using SND:

- At the EPC Zone level, the **Allow session to resume from multiple IP addresses** checkbox must be checked for SND to work.
- When enabling Secure Network Detection without Credential Caching, the user may be prompted for their credentials when they transition from secure to non-secure networks (or vice-versa) if their session has been alive longer than the maximum Credential Lifetime length under **General Settings**. They will also be prompted if a fallback server is used with Secure Network Detection, and Connect Tunnel detects that the primary appliance is down or unavailable (as the users session is not valid on the fallback appliance).
- To workaround the fallback server issue, enable Credential Caching for the Community your users are logging in to, as well as Secure Network Detection. This securely re-sends the user's credentials to the fallback appliance, creating their session for them again without any interaction by the user.

  NOTE: Credential Caching only works with username/password type authentication servers.

- The team source check property in the AMC default zone will affect the appliance when EPC is disabled.
- An appliance running a version prior to 10.7 with End Point Control disabled allows a user to login from multiple different IP addresses because the default value for **Allow user to resume session from multiple IP addresses** has changed to true (checked) as it follows the value in the default zone when End Point Control is disabled.

Post-Connection Scripting

You can configure the client to launch an executable file or script on Windows, Mac OS X, or Linux computers after a network tunnel connection has been established. For example, you could specify a Windows `.bat` file that executes a command script that maps network drives. You can also specify command-line options to run when the script launches.

The appliance does not provision the script to users: the client simply executes the script with any specified command-line options. The specified script must already be present on users' computers before the client can execute it, and any specified scripts must be deployed and managed separately.

For information about configuring these settings, see Configuring Tunnel Client Settings.

Windows Tunnel Client Automatic Client Updating

For users who are running the Windows version of the Connect Tunnel or OnDemand Tunnel client (version 8.7 and later), you can ensure that they have the most recent version of the client by enabling automatic software updating.

Each time a user starts a Windows tunnel client and authenticates, the current client software version is checked against the newest version available on the appliance. If a newer version is available, the user is alerted that an update is ready for download. You can configure (on a per-community basis) what options a user has for installing client updates:

- Allow the user to choose when to start the update process. The update can be deferred indefinitely; however, the user will see the update alert whenever the tunnel client is started (once per day) until the update is installed.
- Make updates mandatory by either requiring them (the user must accept updates in order to access VPN resources) or enforcing them (the install process begins immediately and the user cannot cancel it).

When a user accepts a tunnel client software update by clicking **Install** in the software-update dialog box, the client software update is automatically downloaded and installed on the user's computer (in the case of Connect Tunnel) or activated (in the case of OnDemand Tunnel). After the installation is complete, the tunnel client automatically restarts. Users do not need to reboot their computers after installing the update.

For information about configuring software updating, see Configuring Tunnel Client Settings.

Session Termination

By default, a tunnel client session is never terminated by the appliance once it has been established: users can leave sessions idle and return to them later without having to reauthenticate. If this is a security risk in your environment, there are a couple of ways to terminate sessions and require users to re-authenticate:

- Manually: To see a list of sessions click **User Sessions** in the main navigation menu in AMC, and then choose one of the available termination options. For more information, see Ending User Sessions.
- Automatically: You can configure the tunnel client to prompt users to re-authenticate as soon as their credentials expire. When **Limit session length to credential lifetime** is selected during tunnel client configuration, sessions in a given community end and require re-authentication after the length of time specified by **Credential lifetime** (on the **Configure General Appliance Options** page).

  See Configuring Tunnel Client Settings for more information about configuring this option.

Configuring Tunnel Client Settings

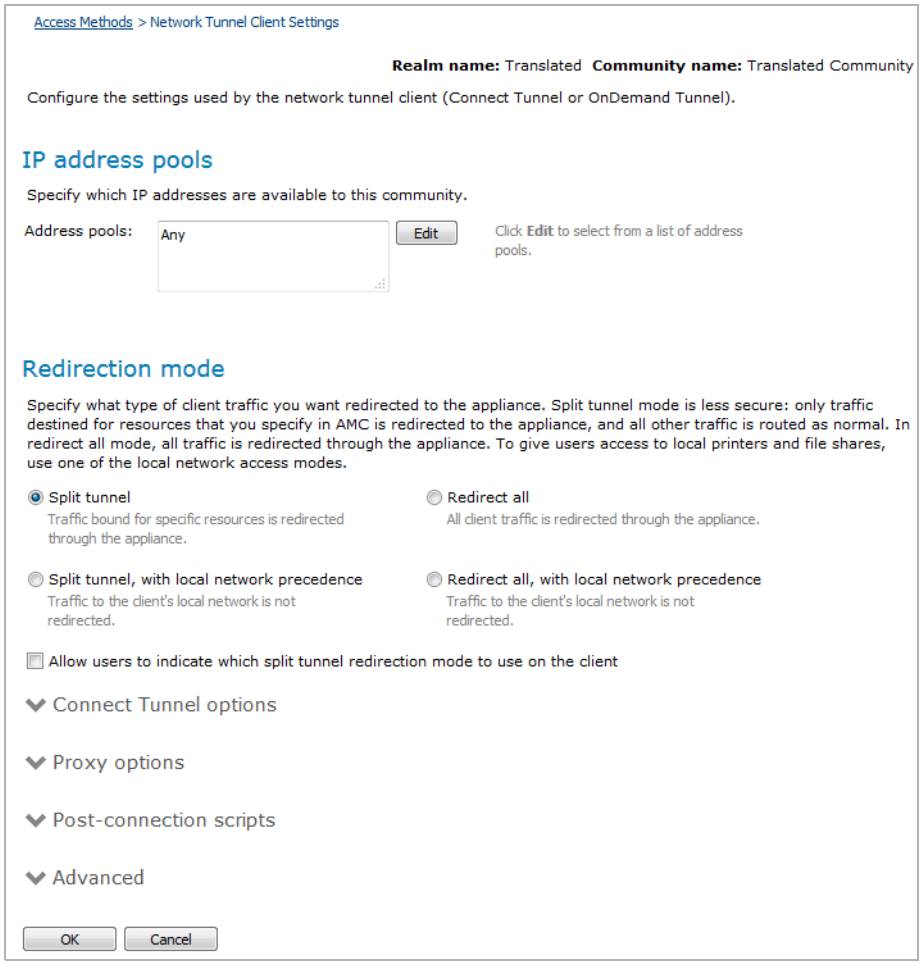
Connect Tunnel is a client application that is installed on a user's device, and OnDemand Tunnel is a lightweight, Web-based agent that is activated each time a user logs in to WorkPlace from an ActiveX or Java-enabled device. These two access methods differ in how they are installed or activated, but they share the same configuration settings.

This section describes how to configure settings for the tunnel clients. For a more detailed description of these settings, see Network Tunnel Client Configuration.

To configure tunnel client or agent settings:

1. On the **Access Methods** page for the selected community, select one or both of these access methods:
   - **Network tunnel client (OnDemand)**
   - **Client/server proxy agent (OnDemand)**

2 Click **Configure** in the **Smart tunnel Access** area. The **Network Tunnel Client Settings** page appears.



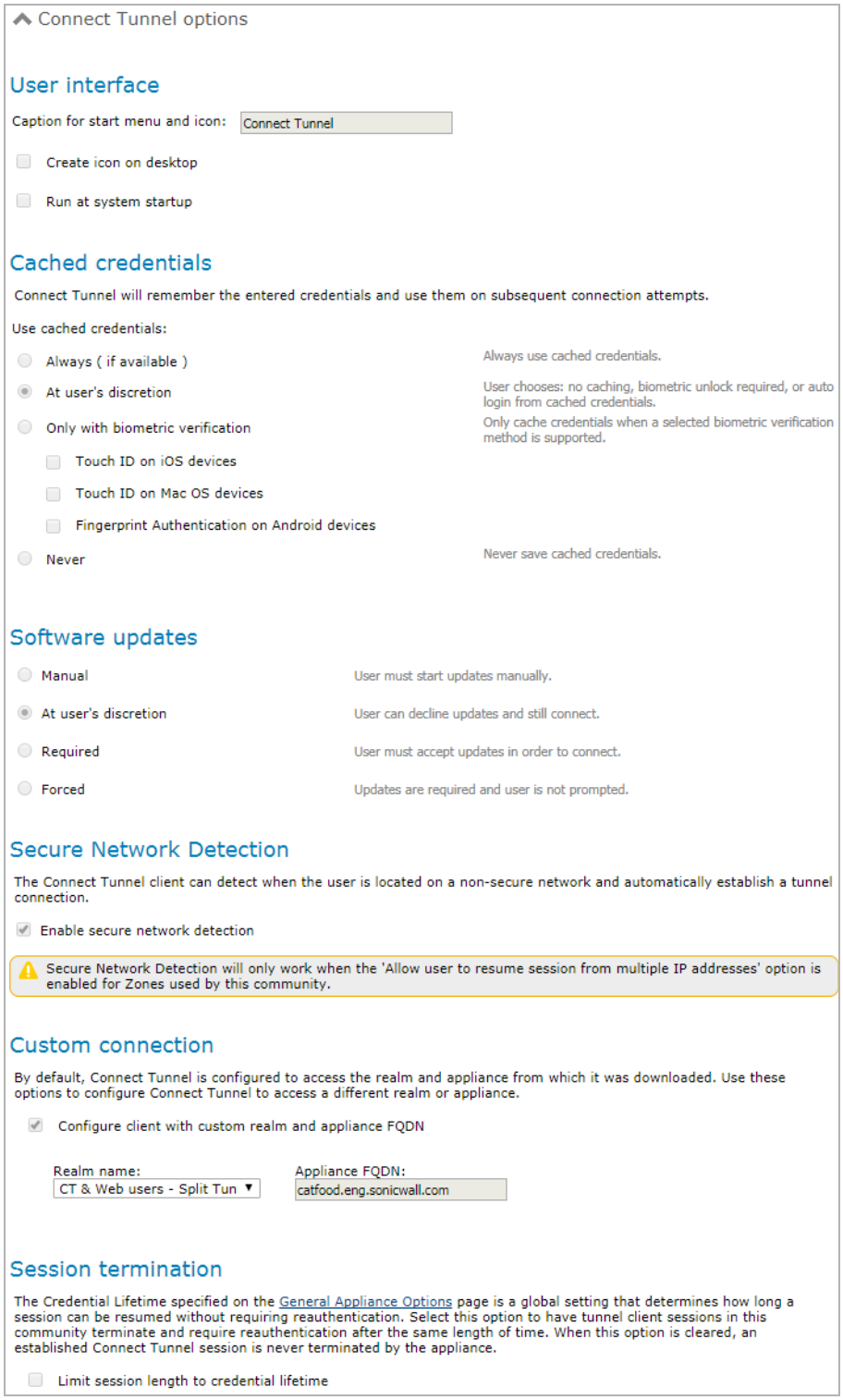
3 By default, any configured IP address pool is available to the selected community. To select specific IP address pools, click **Edit** in the **IP address pools** area and then select from the list of configured pools.

4 Select the **Redirection mode** used to route client traffic to the appliance. The network tunnel service supports several redirection modes. For a more detailed description of the supported redirection modes, see Redirection Modes.

- **Split tunnel:** Traffic bound for resources defined in AMC is redirected through the tunnel, and all other traffic is routed as normal.
- **Split tunnel, with access to local network** gives users access to local printers and file shares.
- **Redirect all**: Traffic is redirected through the tunnel regardless of how resources are defined in AMC.
- To direct all traffic through the appliance, but also give users access to local printers and file shares, select **Redirect all, with access to local network**.

5 (Optional) If the appliance is configured for one of the split tunnel modes, you can allow users to decide whether to give preference to local or remote network access by selecting **Allow users to indicate which split tunnel redirection mode to use on the client**. For more information and an example, see Redirection Modes.

6 (Optional) Click to expand the **Connect Tunnel options** section:



- In the **Caption for start menu and icon** field, type the customized text that you want to appear for the Connect Tunnel client on the menu and beneath the Connect icon on the user's desktop.
- **Create icon on desktop:** Places the Connect Tunnel client icon on the desktop.
- **Run at system startup:** Automatically runs the Connect Tunnel client when the operating system starts on the user's computer (Windows only).

7 To use Single Sign-on, select when cached credentials should be used:

- **Always:** Always used cached credentials if available.
- **At user's discretion:** Let the user decide when to used cached credentials.
- **Never:** Prohibit users from using cached credentials.

NOTE: On a Windows system, Connect Tunnel uses cached *system* credentials. On other systems, Connect Tunnel remembers the entered credentials and uses them on subsequent connection attempts.

8 Use one of the **Software updates** options to alert users when client updates are available or update their software automatically. This setting is available only when the network tunnel client is configured to provision client from Secure Mobile Access WorkPlace, and only with version 8.7 and later:

- **Manual**—User must start updates manually.
- **At user's discretion**—Allows users to decide when to install software updates. The update can be deferred indefinitely; however, the user will see the software-update alert when he or she starts the tunnel client (once per day) until the update is installed.
- **Required**—User must accept updates in order to access VPN resources through the tunnel client.
- **Forced**—Updates are required in order to connect. The update program starts, and a progress bar is visible during installation, but the user is not prompted during the process.

9 (Optional) To automatically establish a tunnel connection when a user attempts to login from an unsecure location, check the **Enable secure network detection** checkbox in the **Secure Network Detection** section. For addition information, see Secure Network Detection.

10 (Optional) By default, the client is configured to access the realm and appliance name from which the client was downloaded. However, you can override this default behavior and configure the client to access a different realm or appliance. In the **Custom connection** area, select the **Configure client with custom realm and appliance FQDN** checkbox, and then specify these options as needed:

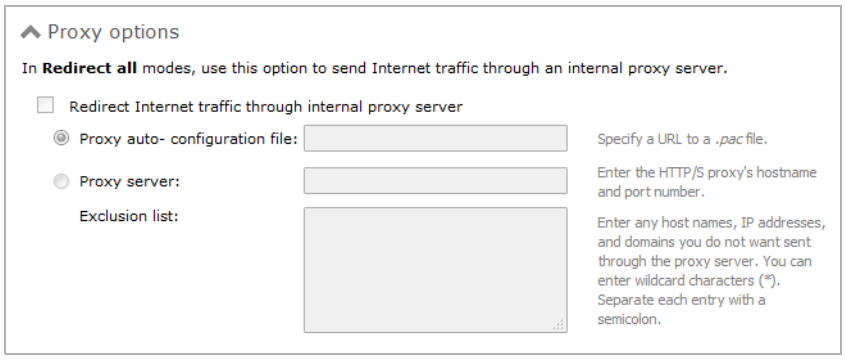
- From the **Realm name** list, click the name of the default realm.
- In the **Appliance FQDN** field, type the fully qualified domain name of the default appliance.

11 (Optional) By default, a tunnel client session is never terminated by the appliance once it has been established: users can leave sessions idle and return to them later without having to reauthenticate. If you want to require users to re-authenticate after a certain period of time, select **Limit session length to credential lifetime**. This requires users to re-authenticate once the amount of time specified by **Credential lifetime** (on the **Configure General Appliance Options** page) has passed. When this option is selected, users are notified when a session is nearing the inactivity threshold and users can avert the disconnect by performing any mouse or keyboard activity.

If you need a TCP connection or consistent UDP traffic flow between the same two address/port tuples to live longer than eight hours, you must put the user in a community that has this option unchecked. Even with the **Limit session length to credential lifetime** checkbox unchecked, users cannot authorize new flows within the tunnel after their credentials expire.

12 (Optional) If you enabled **Redirect all** in the **Redirection mode** area, you can configure Internet traffic to be sent through an internal proxy server when the VPN connection is active. In the **Proxy options** area,

select the **Redirect Internet traffic through internal proxy server** checkbox, and then select one of the proxy server options.



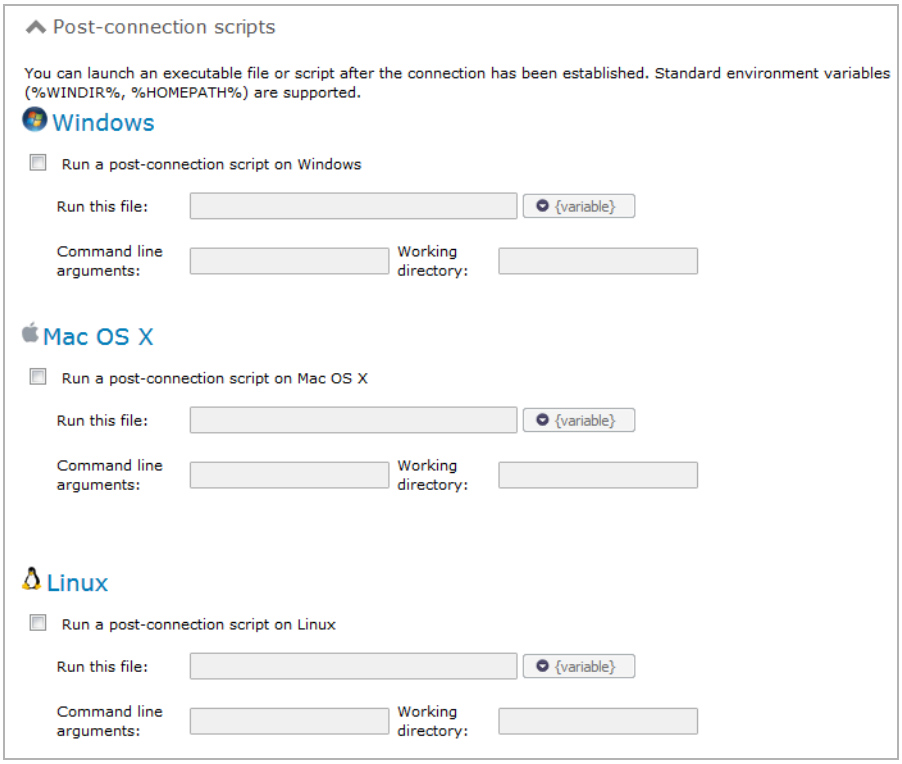
- To specify a proxy auto-configuration (`.pac`) file, click **Proxy auto-configuration file** and then type the URL, preceded by the `http://` protocol identifier, for the `.pac` file. The `.pac` file configures the user's Web browser to load its proxy configuration settings from a JavaScript file rather than from information that you manually specify; the JavaScript file specifies which proxy servers can be used and can redirect specific URLs to specific proxy servers. For information about formatting `.pac` files, see: http://en.wikipedia.org/wiki/Proxy_auto-confighttp://en.wikipedia.org/wiki/Proxy_auto-config
- To manually specify a proxy server, click **Proxy server** and then type the server's host name and port number in `host:port` format (for example, `myhost:80`). Optionally, in the **Exclusion list** field, you can type the host names, IP addresses, or domain names of any resources that you do not want redirected through the proxy server. When defining these resources, wild cards are valid, and multiple entries must be separated by semicolons.

13 (Optional) To launch an executable file or script after the connection has been established:

a Click to expand the **Post-connection scripts** area.

b Select the **Run a post-connection script** checkbox that corresponds to your operating system.

c Specify your settings. For more information, see Secure Network Detection.



a) In the **Run this file** field, type the path and name for the script file. For example:

```
%Program Files%\ACME\remote_access.bat
```

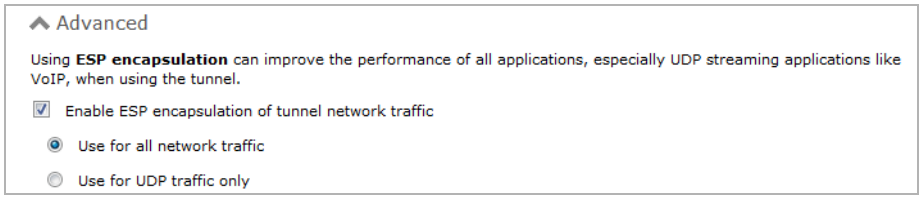
b) (Optional) In the **Command line arguments** field, type any command-line arguments that you want to execute when running the script. For example:

```
-user=%USERNAME% -system=%OS%
```

c) (Optional) In the **Working directory** field, type the directory in which the script will be executed. When defining the working directory, you can specify environment variables formatted as `%VariableName%`, where `VariableName` represents the actual environment variable name. For example:

```
%USERPROFILE%\ACME
```

14 In the **Advanced** area, **Enable ESP encapsulation of tunnel network traffic** is selected by default for all network traffic (for all tunnel traffic). ESP (Encapsulating Security Payload) is a way to encapsulate and decapsulate packets inside of UDP packets for traversing Network Address Translators (NATs). Using it can improve the performance of applications, especially UDP-streaming applications like VoIP.



For an ESP tunnel to function, UDP port 4500 needs to be open in the firewall for traffic to and from the EX Series appliance external IP and Virtual IP addresses.

When ESP is enabled, the tunnel client tries to bring up an ESP tunnel, but falls back to a legacy SSL tunnel if there is a problem establishing the ESP tunnel. The typical reason for this failure is that UDP port 4500 is not open in the network firewall.

If you do not want to use ESP because you do not want to open UDP port 4500 in your firewall or for any reason, then clear the **Enable ESP encapsulation of tunnel network traffic** checkbox. To disable the default use of ESP in a community, clear the checkbox on the **Realms > *[your tunnel realm]* > Communities > *[your tunnel community]* > Access Methods > Configure under Smart Tunnel Access > Advanced**.

15 Click **OK**.

NOTE:

- If users are running OnDemand Tunnel in "redirect all" mode, connections to translated Web resources fail with `Page cannot be displayed` errors. To work around this issue, add an A (Address) record to the internal DNS servers to assign the appliance VIP or external IP to the appliance FQDN.
- When **At user's discretion** is enabled for **Client software updates** in the **Software updates** area, the user sees an upgrade notification, and the Connect Tunnel client caches the user's response for 24 hours. If the setting is then changed to **Required** or **Forced**, a user who opted to delay updating may not be prompted again until the following day because the earlier response is still cached.
- If you plan to run a VB script after a connection has been established, you cannot simply enter the path and name of the `.vbs` script file; you must use the Windows Script Host utility to invoke it. To work around this, configure the post-connection options as follows:
  - **Run this file**: `<drive>:\windows\system32\cscript.exe`
  - **Command line arguments**: `<Path to script>`. For example:

    ```
    c:\path\to\script.vbs or \\path\to\script.vbs
    ```

  Leave **Working directory** empty.
- When you specify a `.pac` file location, be certain that your tunnel users have access to it. You can do this by defining a resource and creating an access rule. See Creating and Managing Resource Groups and Configuring Access Control Rules.

Using the Default Community

After you create a realm, you must associate one or more communities with the realm. This is because communities are the mechanism that the appliance uses to deploy access agents and End Point Control components to users.

The easiest way to associate a community with an authentication realm is to use the global Default community that is preconfigured in AMC. The properties automatically assigned to the Default community are:

- Membership in the community is set to **Any**, meaning all users in the authentication realm are assigned to the community.
- Each member of the community is allowed a maximum of *5* active sessions.
- Web-based proxy access (TCP protocol) and Web access (HTTP) methods are made available to community members.
- No End Point Control restrictions are imposed on users' computers.

NOTE:

- You can modify the settings for a realm's Default community the same as you can other communities. See Configuring an SMA Appliance to Send RADIUS Accounting Records to a Firewall.
- You can also create additional communities and associate them with a realm. See Adding Communities to a Realm.

Changing the Order of Communities Listed in a Realm

When users log in to an authentication realm, the appliance looks up the community to which they belong so that access agents and EPC policy can be deployed to them. If you use only one community per realm or if you ensure that each user is assigned to only one community, then the process of logging in and receiving the appropriate access agent is straightforward.

However, if some users belong to more than one community, the order in which the communities are listed on the **Communities** tab of the **Configure Realm** page determines which community those users are assigned to. The appliance attempts to match users to communities starting at the top of the list. Users are assigned to the first community in the list that they match. The best practice is to place the most specific community at the top of the list.

To change the order of the communities for a realm

1 From the main navigation menu, click **Realms**.

2 Click the name of the authentication realm whose communities you want to re-order. The **General** tab of the **Configure Realm** page appears.

3 Click the **Communities** tab. The communities that are part of this realm will be matched in the order that is listed here.

4 Use the **Move Up** or **Move Down** links to move the selected community up or down.

5 When the communities are listed in the order you want, click **Save**.

NOTE: The community a user is assigned to is displayed on the Secure Mobile Access WorkPlace home page (click **Details** in the **Connection Status** area).

Configuring RADIUS Accounting in a Realm

If you use a RADIUS server for collecting accounting information, you can configure a RADIUS accounting server in AMC and then enable accounting on a per-realm basis. The appliance sends RADIUS accounting messages to the server identifying user sessions, the time and duration of their connections, and their source IP addresses.

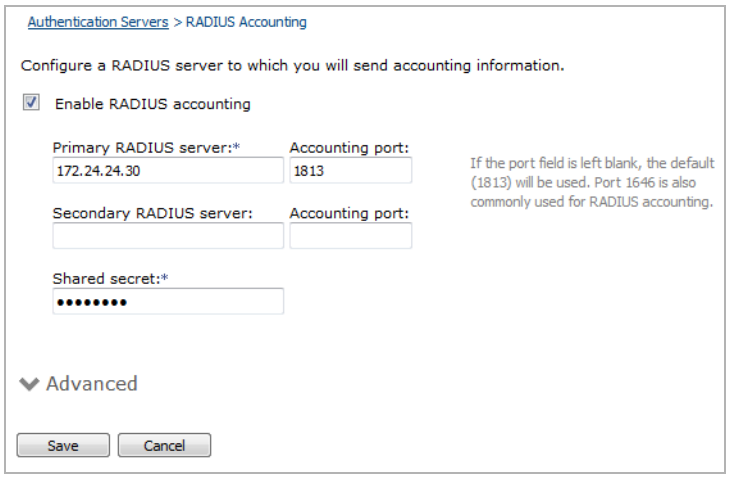
The appliance can connect to one RADIUS server at a time. If two RADIUS servers are configured in AMC, the appliance sends messages to just the primary server, and communicates with the secondary server only if there is a communication failure with the primary one.

To configure a RADIUS accounting server

1 From the main navigation menu, click **Authentication Servers**.

2 In the **Other servers** area of the page, click the **Edit** link next to **RADIUS Accounting**.

3 To enable the appliance to save RADIUS, syslog, and routing changes, select the **Enable accounting records** checkbox.



4 In the **Primary RADIUS server** field, type the IP address for the primary accounting server. In the **Accounting port** box, type the port number used to communicate with the server. If left blank, AMC uses the default server port (**1646**).

5 If you are using a second RADIUS accounting server as a backup in case communication between the appliance and the server fails, enter the server's IP address in the **Secondary RADIUS server** field, and the port number in the **Accounting port** field.

6 In the **Shared secret** field, enter the shared secret that allows the appliance to communicate with the RADIUS accounting server.

7 In the **Retry interval** field (in the **Advanced** area), type the number of seconds to wait for a reply from the RADIUS server before retrying communication with the server.

8 By default, the appliance uses its appliance name (from the **Configure Network Interfaces** page) to identify itself to the RADIUS accounting server. However, you can use the **NAS-Identifier** and **NAS-IP-Address** boxes to have the appliance send different identity information.

9 In the **Locale encoding** area, do one of the following:

- Choose a character set from the **Selected** drop-down menu. See Selected RADIUS Character Sets for a list of selected character sets.
- Click **Other** and then type the name of a character set in the field. See Other Supported RADIUS Character Sets for a list of character sets that can be entered.

10 Click **Save**.

Editing, Copying and Deleting Communities

For information on how to edit, copy, and delete communities, see Adding, Editing, Copying, and Deleting Objects in AMC.

Managing Users and Groups

User and group management is an ongoing job. Although most user management is done through external user repositories (users and groups are not stored directly on the appliance, but are instead referenced), keeping the AMC list current is essential for delivering reliable access.

The users and groups defined in AMC are associated with any directories currently configured on the appliance.

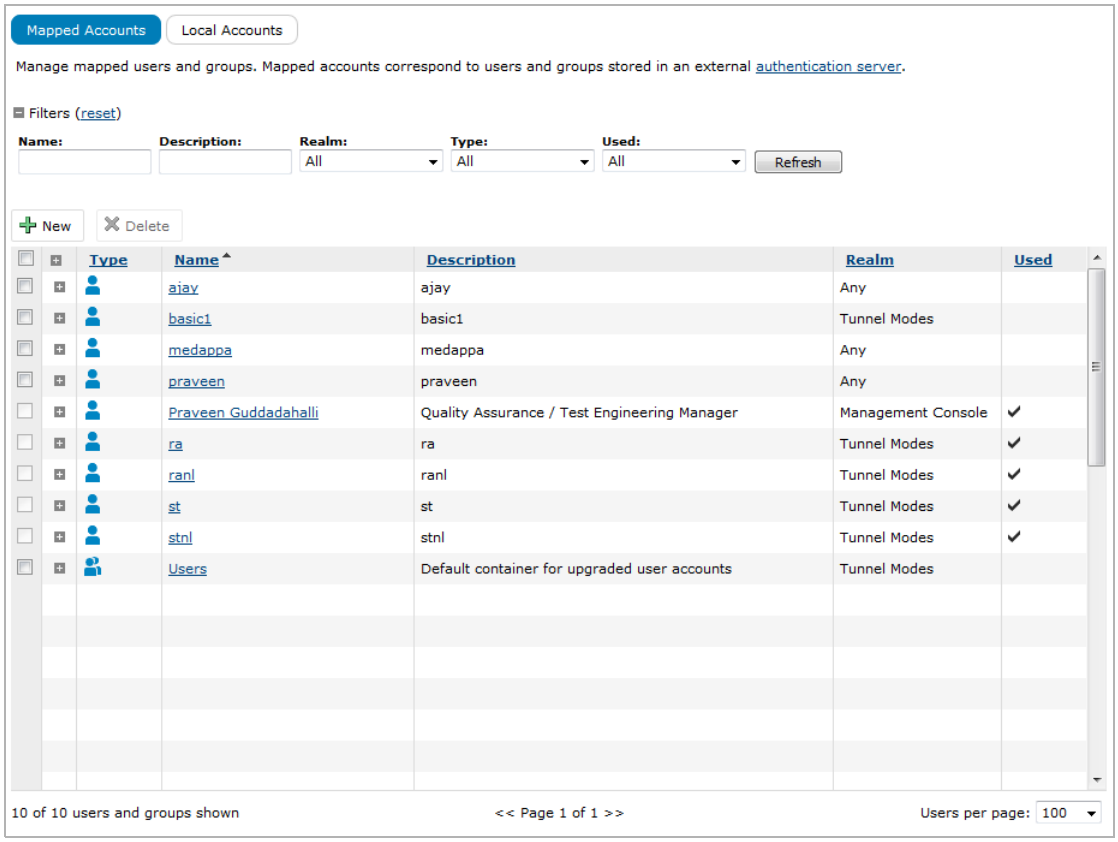
- Viewing Users and Groups
- Managing Users and Groups Mapped to External Repositories
- Managing Local User Accounts

Viewing Users and Groups

Users and groups configured in AMC are displayed on the **Mapped Accounts** and **Local Accounts** pages.

To view users and groups

1 On the main navigation menu, select **Users & Groups**.



2 Select the tab for the user object you want to view:

This tab	Lets you
Mapped Accounts	Manage groups of users and individual users mapped to group information stored on an external authentication server. Create new groups based on directory information.
Local Accounts	Manage users stored in a local user-authentication repository on the appliance.

3 Optionally, use the **Filters** settings to display only the objects you are interested in. For information about using filters, see Filters.

4 Review the data shown in the list of managed or local accounts:

- The checkbox column is used to select one or more list items to delete.

- The plus sign (+) column expands the display of user, group, or local account information.
- The **Type** column displays an icon identifying whether the object is a user or group.
- The **Name** column displays the name you assigned when creating a user, group, or local user account.
- The **Description** column shows the text you entered when creating an account.
- The **Realm** column displays the realm with which a user, group, or local user account is associated.
- The **Used** column shows whether the user or group is currently in use.

5 Click a column heading to sort the list by that column.

Managing Users and Groups Mapped to External Repositories

Unless defined as members of the local user authentication store, users and groups are not stored directly on the appliance, but are instead referenced from external user directories. In most cases, you manage individual users in AMC only when you need to assign them permissions that are different from those that their group membership allows. There are two ways to form groups of users in AMC using information stored in external directories:

- Use the same group names as the external directory. In most directories, similar user accounts are grouped together so they can be granted similar rights and permissions. Assuming that your directory is organized in this way, your user management on the appliance is usually centered around groups, not users. Set up the appliance to reference user groups stored in your directory, and then reference those groups in access control rules.
- Query the external directory using common attributes. The results can be used to create a new group (one that is not referenced in the external directory) that can be used in access control rules. You might create a new group named “Local employees” by querying the directory for all employees living within a given set of zip codes.

For Microsoft Active Directory and LDAP directories, there are several ways to add groups (this feature is not available for adding users referenced by a RADIUS realm or in the local user store):

- Manually type a distinguished name (DN)
- Search the contents of the directory and select groups from a list
- Build a dynamic group expression

For testing and evaluation purposes, you can also create local users on the appliance. See Managing Local User Accounts.

Topics:

- Adding Users or Groups Manually
- Adding Users or Groups by Searching a Directory
- Advanced Search Methods
- Creating Dynamic Groups Using a Directory
- Editing Users or Groups
- Deleting Users or Groups

Adding Users or Groups Manually

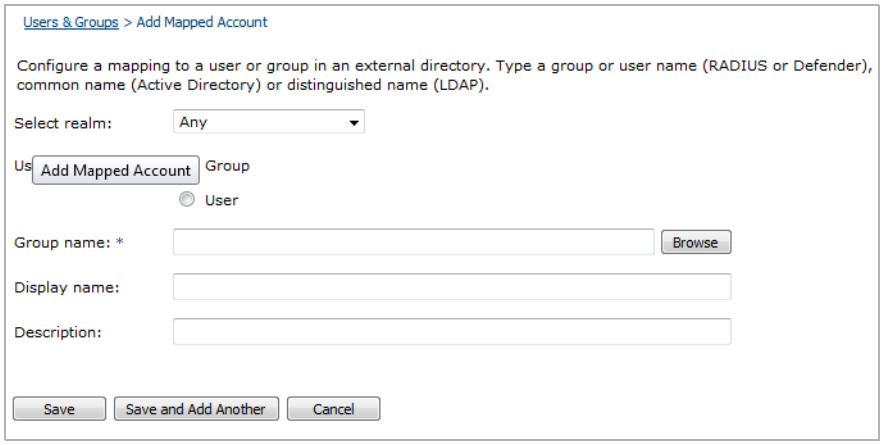
When you create an access control rule, one of the things you do is specify the users and groups to which a given rule applies. You must add users before you can specify them in access control rules. Users can be added manually or by using the Active Directory or LDAP directory. To use a directory, click **Browse** to search the directory. See Adding Users or Groups by Searching a Directory for more information.

To add a user manually

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Mapped Accounts** tab, and then click **New**. A pop-up menu displays.

3 Select **Manual entry**. The **Add Mapped Account** page appears.



4 In the **Select realm** drop-down menu, select the realm to which the user belongs. If the user exists in multiple realms and you want the appliance to search for any occurrence, select **Any** from the realm list.

5 From the **User type** radio buttons, select the type of account to add: **Group** (default) or **User**.

6 If you selected Group, in the **Group name** field type the group name exactly as it appears in the external repository. (Group names are case-sensitive.) The name depends on the type of directory to which you are mapping:

Directory type	What to type
LDAP	Type a distinguished name (DN). For example: `cn=Sales,cn=Users,dc=example,dc=com`
Active Directory	Type a common name (CN) or distinguished name (DN). A CN is easier to enter than a DN (for example, you can type `Sales` instead of: `cn=Sales,cn=Users,dc=example,dc=com`) but the CN is not guaranteed to be a unique match. When in doubt, it's best to use a DN.
RADIUS	Type a group name. For example, `Sales`.

When you specify an Active Directory or LDAP group, its sub-groups (if any) are also included. The number of nesting levels that you want to include when evaluating group membership is configured when you set up an authentication server; see Configuring LDAP with Username and Password and Configuring Active Directory with Username and Password for more information.

NOTE: When using an external directory for authentication and you add a user group in AMC, you are not actually grouping users. You are merely adding the name of a user group that is defined in your external user repository.

The appliance also supports local users and groups. See Managing Local User Accounts.

7 If you selected **User**, for the **User name**, type the user name exactly as it appears in the external repository. User names are case-sensitive; the Name selection table explains the syntax used to define users.

Name selection

Directory type	What to enter
Active Directory or RADIUS	Type a user name. For example, `jsmith`.
LDAP	Type a distinguished name (DN). For example: `cn=jsmith,cn=Users,dc=example,dc=com`

8 (Optional) In the **Display name** field, type the name to display in AMC pages to identify the group or user.

9 (Optional) In the **Description** field, type a descriptive comment about the group or user.

10 Click **Save** or **Save and Add Another**.

NOTE: If you enter the name incorrectly the user will not be authorized to access any resources.

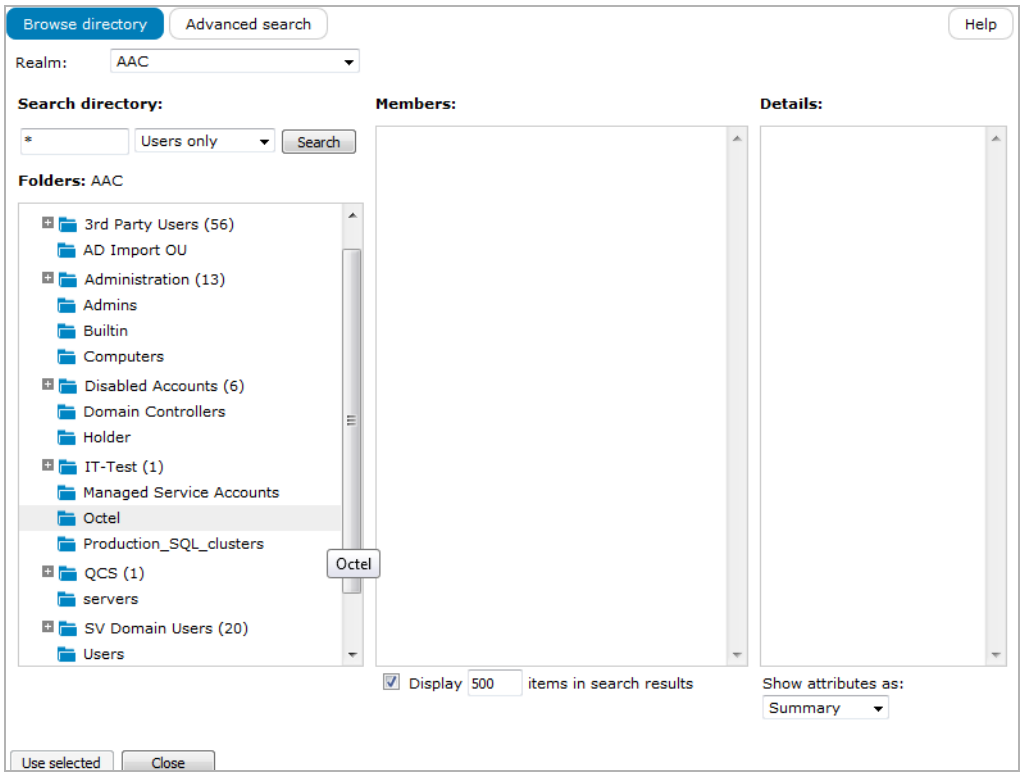
Adding Users or Groups by Searching a Directory

The most common way to add groups in AMC is to browse an external directory and add matching groups.

To add a user or group by searching a directory

1 From the main navigation menu, select **Users & Groups**.

2 On the **Mapped Accounts** tab, click **New**, and then select **Directory search.** The **Search Directory** page appears.



3 Select the realm you want to search (only realms that use an Active Directory, Active Directory Tree, or LDAP authentication server are available).

If you select a realm that uses an authentication server on which group checking is disabled, the **Search** field is not clickable and the message `Group checking has been disabled for this realm` is displayed. See Disabling Authorization Checks for more information.

4 If the realm you selected uses an Active Directory Tree authentication server, select the domain you want to search.

5 Define your search criteria:

- In the **Search directory** field, type all or part of a user or group name. The default is `*`, which returns all records in the realm. You can use the wild card character (`*`) anywhere in the search string. For example, to find group names beginning with the letter `j`, you would type `j*`. Or, to find users named `Mary` or `Marty` (but not `Max`), you could type `m*y`.
- To narrow your search, type the name and select **Groups only** or **Users only** from the drop-down menu. For example, you might type `sn` to look for a user's surname or `cn` to find a common name.
- To specify more detailed search criteria, click the **Advanced** tab; see Advanced Search Methods for details.

6 Click **Search**, which displays all matches in the second column.

7 Locate the objects you want to add:

- Use the arrow buttons (**<** and **>**) in the lower left pane to page through the results. Use **<<** and **>>** to display the first and last pages.
- To view detailed information about a user or group, click its name. A detailed list of attributes appears in the right-hand pane. If a group is nested, click the sub-group to see its details:

  The number of nested levels that it is possible to display is configured when you set up an authentication server; see Configuring LDAP with Username and Password and Configuring Active Directory with Username and Password for more information.
- Select the checkbox to the left of any users or groups you want to add to the appliance.

8 To add selections to the appliance, click the **Add Selected** button. The items are added to the list on the appropriate page (**Groups** or **Users**) in alphabetical order.

9 When you're finished, click the **Close** button in the upper right to close the **Search Directory** page.

NOTE: By default, the basic search is configured to locate users and groups by querying the **sAMAccountName**, **cn**, **uid**, and **userid** attributes.

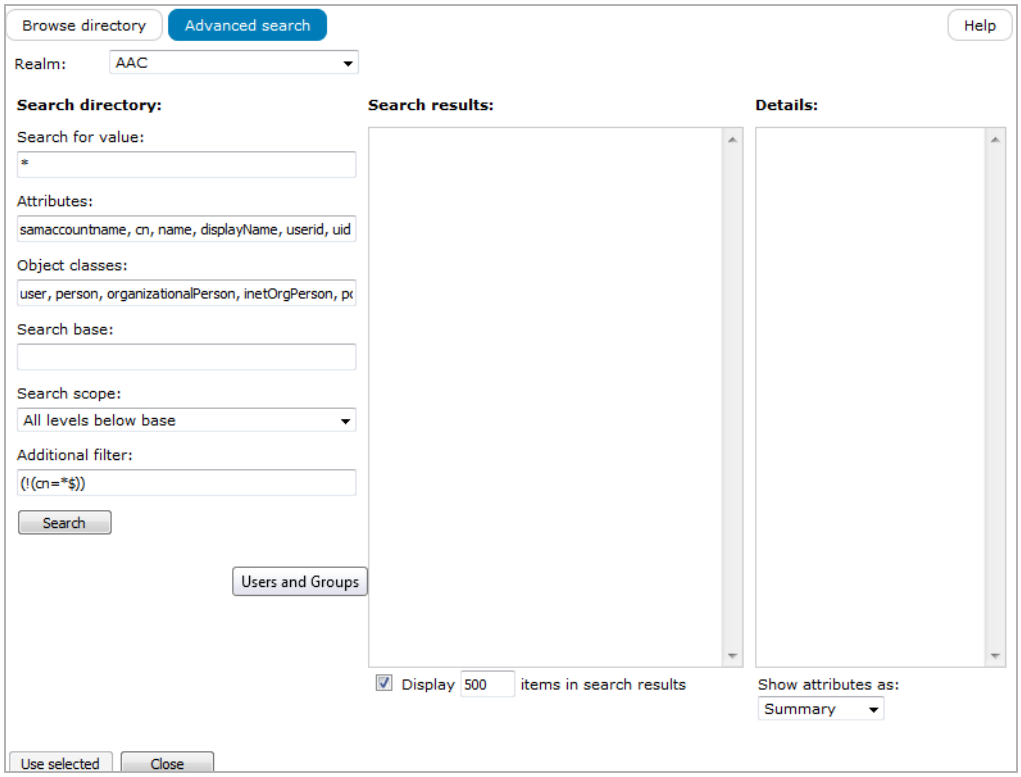
Most chained authentication deployments involve an LDAP or AD server paired with another authentication server (like RADIUS). In the unlikely event that you are using chained authentication with a combination of LDAP and AD servers, keep the following in mind:

- If you are searching for users, only search results from the first LDAP or AD authentication server in the chain are displayed. The policy server, however, returns results from both servers in the chain.
- The same is true when searching for groups (except if an affinity server is configured for the realm: it will be searched instead of the authentication servers).

For example, if you have a group called *Accounting* on both LDAP or AD servers in your chained authentication, any access control rules you create that are restricted to the *Accounting* group applies to group members on both servers, even though the Search Directory page shows results from just the first server in the chain.

Advanced Search Methods

If you are familiar with LDAP syntax, you can create an advanced search to further narrow the scope of your query. This is especially useful when querying a large directory. In some cases, you may also need to perform an advanced search to query a directory using a non-standard schema. To perform an advanced search, click the **Advanced search** tab.



The fields used to specify advanced search criteria are explained in the Advanced search criteria table:

Advanced search criteria

In this field	You
Search for value	Specify an LDAP search filter to reduce the scope of the search. Type all or part of a user or group name. The default is `*`, which returns all records in the realm. You can use the wild card character (`*`) anywhere in the search string. For example, to find group names beginning with the letter `j`, you would type `j*`. Or, to find users named `Mary` or `Marty` (but not `Max`), you could type `m*y`.
Attributes	Select an LDAP attribute. For example, you might select **sn** to look for a user's surname or **cn** to find a common name.
Object classes	Specify the object class containing users or groups. For users, this is typically `user` or `inetOrgPerson`. For groups, this is usually `group`, `groupOfNames`, or `groupOfUniqueNames`.
Search base	Enter the point in the LDAP directory from which to begin searching. Usually, this is the lowest point in the directory tree that contains users or groups. For LDAP, you might type `ou=Users,o=example.com`. To search Microsoft Active Directory, you might use `CN=users,DC=example,DC=corp,DC=com`.

Advanced search criteria

In this field	You
Search scope	Select the containers that you want to search: **one** – Retrieves information from one level below the search base. The search base itself is not included in this scope. **sub** – Retrieves information from the search base and all levels below the search base. **base** – Retrieves information only from the search base. No containers below the search base are searched. **All levels below base** (default) – retrieves information from all levels below the search base. The search base itself is not included in this scope.
Additional filter	Specify an LDAP search filter to reduce the scope of the search:

	Syntax:
	`(filter=(operator(LDAP attribute=value)(..)))`
	Operators:
	• OR = |
	• AND = &
	• NOT = !
	Examples:
	`(cn=Sandy Cane)`
	`(!(cn=Tim Howes))`
	`(&(objectClass=Person)(|(sn=Cane)(cn=Sandy C*)))`

NOTE: For more information on LDAP search filters, see RFC 2254 at http://www.ietf.org/rfc/rfc2254.txt.

The LDAP search syntax is flexible and provides several ways to accomplish the same result. For example, you might use the object class to search for all groups in a directory:

```
objectclass=group;groupOfNames
```

Alternatively, you can get the same result using a search filter:

```
(|(objectclass=group)(objectclass=groupOfNames))
```

Creating Dynamic Groups Using a Directory

If you are using an external Microsoft Active Directory or LDAP directory, you can form AMC groups by building your own directory query or, if you're familiar with LDAP syntax, writing your own directory query. Whenever this dynamic group is referenced in an access control rule, the external directory is queried and the results are cached for 30 minutes.

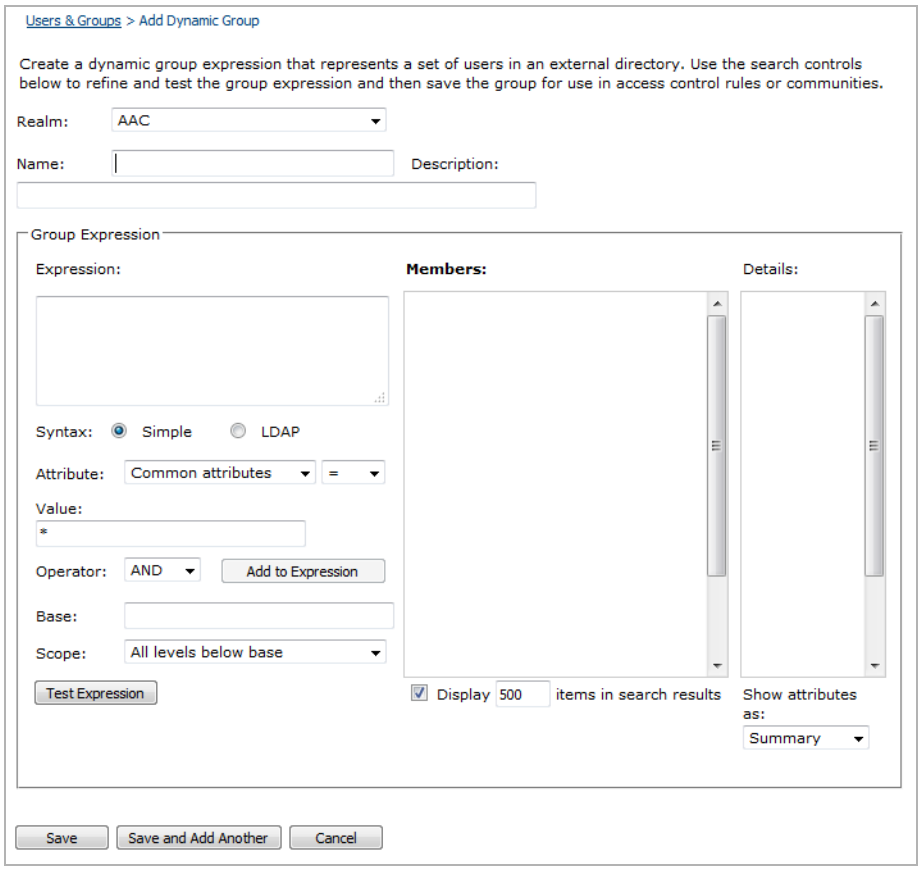
Dynamic groups are useful if you want to create a policy that applies to a group that is not already defined in the external directory. For example, you might want to create a group called *Operations (Seattle)*. Although the external directory might already have a group called *Operations*, you want to narrow it down to members who are based in Seattle.

To add a dynamic group using an external directory:

IMPORTANT: When conducting a multi-valued query against an LDAP or AD directory, you must specify the full DN of the group being queried.

1 From the main navigation menu, select **Users & Groups**.

2 On the **Mapped Accounts** tab, click **New** and then select **Dynamic group**. A separate **Add/Edit Dynamic Group** page opens.



Users who match the expression that you build or write in this page are dynamically included in this group. If a user is added later and matches this expression, he or she is automatically included in this group.

3 Select the realm to which this new group belongs from the **Realm** drop-down menu. Only realms that have been configured with an Active Directory or LDAP server (single or chained authentication) are available.

4 (Optional) Type a **Name** for this dynamic group.

5 Optionally, type a **Description** that can be used when creating access rules that apply to only certain groups.

6 Choose between **Simple** and **LDAP** syntax. Use the one you are most familiar with so that you can edit the query (if needed) in the **Expression** field.

7 Use these fields in the **Expression** area to build your query (see the Advanced Search Methods table for help with LDAP query syntax):

Fields usage

Setting	Description
Expression	The query you create using the following fields is displayed here so that you can edit it (if necessary).
Attribute	An initial query is sent to the external directory server to get a list of defined attributes. (If this list does not look correct, check the name of the realm you selected in the **Realm** list.)

Fields usage

Setting	Description
Filter operators	A menu of commonly used LDAP search operators (**=**, **!=**, **>=**, and **<=**) to filter the values returned by the LDAP or Active Directory server.
Value	A user-entered value that can contain wild cards (*****). Assuming an **Attribute** of *ZipCode*, for example, you could type a **Value** of `98*` to query for all employees living in Washington state.
Operator	Common logical operators (**AND**, **OR**).
Add to Expression	Adds the current attribute, value, and operator to the **Expression** text area. You can cycle back through (as many times as needed), defining an additional **Attribute**, **Value**, and **Operator** to further refine your query. Click **Add to Expression** after each addition.
Base	(Optional) Base of the AD/LDAP authentication server. It specifies the point in the LDAP directory from where to start the query. For example, to search users in the Microsoft Active Directory: `CN=users, DC=engineering, DC=sonicwall, DC=com` If a base is not entered, the query is performed at the search based of the authentication server.
Scope	Depth of the query. Selecting **All levels below base** (default) to retrieve information from all levels below the base. Select **One level below base** to retrieve information from the search base itself. No containers below the search base are searched.

You can also type a query directly in the **Expression** field.

8 Test the expression you've created. The results are displayed in the Members section and should tell you whether you need to broaden or refine your search. To limit the number of members displayed, check the **Display** checkbox and typing the maximum number of items in the **Display** field.

Testing an expression sends the LDAP search query displayed in the **Expression** area to the LDAP or AD server and displays the results (a list of users) in the right-hand pane. If the results are not what you expect, modify the query by either building the expression or editing the query directly in the **Expression** field and then test again.

TIP: A new group should not be saved until the expression has been tested.

9 Use the **Show attributes as** drop-down menu in the lower right corner of the page to display details in the **Details** sections about the member selected in the **Members** section. Selecting **Summary** shows a summary of the member, and selecting **All attributes** shows all attributes of the member.

NOTE: Most chained authentication deployments involve an LDAP or AD server paired with another authentication server (like RADIUS). In the unlikely event that you are using chained authentication with a combination of LDAP and AD servers, keep the following in mind:

- If you are searching for users, only search results from the first LDAP or AD authentication server in the chain are displayed. The policy server, however, will return results from both servers in the chain.
- The same is true when searching for groups (except if an affinity server is configured for the realm: it will be searched instead of the authentication servers).

For example, if you have a group called *Accounting* on both LDAP or AD servers in your chained authentication, any access control rules you create that are restricted to the *Accounting* group will apply to group members on both servers, even though the **Search Directory** page shows results from just the first server in the chain.

Editing Users or Groups

If a user or group name or distinguished name changes in your external directory, you must modify the account on the appliance. You can also change local user accounts or group names on the appliance. For information about editing local accounts, see Managing Local User Accounts.

To edit a user or group

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Mapped Accounts** tab, and then click the name of the group or user that you want to edit. The **Add/Edit Mapped Account** page appears.

3 Make any edits as needed. If the user or group is in an Active Directory or LDAP realm, you can click **Browse** and then search for the user.

4 Click **Save**.

Deleting Users or Groups

NOTE: You cannot delete a user or group if it is referenced by another object. For example, if you try to delete a user or group that is referenced in an access control rule, AMC displays an error message. You must first remove all references to the user or group before you can delete it. See Deleting Referenced Objects for more details.

When you delete a user or group that is mapped to an external user directory, its mapping is removed from the system. Deleting a user or group mapping does not remove the user or group from the external user directory. For information about deleting local users or group, see Managing Local User Accounts.

To delete a user or group:

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Mapped Accounts** tab.

3 Select the checkbox to the left of any groups or users that you want to delete.

4 Click **Delete**.

Managing Local User Accounts

Create local user accounts on the appliance in one of these ways:

- Manually create local user accounts in AMC and store them in a local user authentication repository.
- Import local user accounts from a comma-separated (CSV) text file and store them in a local user authentication repository. See Importing New Local Users and Groups.

Regardless of the method you use, local users are stored on the appliance, unlike all other users who are stored in external authentication repositories and referenced by AMC. AMC lets you create, modify, and delete local accounts for individual users on the appliance, and also supports local accounts for groups of users.

Topics:

- Adding Local Users
- Editing Local Users
- Deleting Local Users
- Adding Local Groups

- Editing Local Groups
- Deleting Local Groups

Adding Local Users

Before you can add local users, you must first create a local user authentication repository on the appliance, as described in Configuring Local User Storage. You do not need to configure a local authentication realm before adding local users.

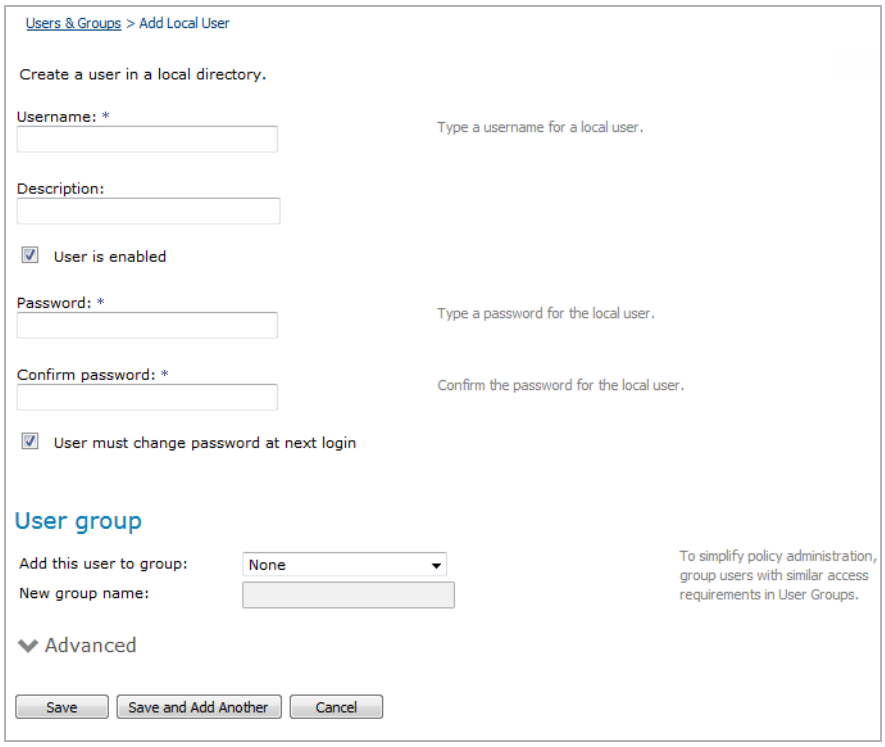
After you've created a local user authentication repository, you can add local users to the appliance.

To add local users to the appliance:

1 On the main navigation menu, select **Users & Groups**.

2 Click the **Local Accounts** tab.

3 Click **New** and then select **User**. The **Add Local User** page appears.



4 In the **Username** field, type the name of the local user you want to add to the local user authentication repository. The user name can be any length between one and 255 characters.

5 In the **Description** field, type a descriptive comment about the local user.

6 To enable the user to log in, select the **User is enabled** checkbox.

7 In the **Password** field, type a password for the local user, and type it again in the **Confirm Password** field. The password must conform to the password policy configured for the local authentication server. For information, see Configuring Local User Storage.

8 To require the user to change password at initial login, select the **User must change password at next login** checkbox.

9 In the **User Group** section, select a local group for the user from the **Add this user to group** drop-down menu. Select:

- **None** if you do not want to add the user to a local group. T, select
- **(New)** to create a new group for this user; and then enter the group name in the **New group name** field.

10 Expand the **Advanced** section to add an email address or device identifier for the user.

11 In the **Email Address** field, configure an email address for the user. This address is used for sending one-time passwords to the user, and overrides the default `username@domain` email address. This e-mail address is assigned to the **mail** attribute for the user.

12 In the **Device identifier(s)** field, enter one or more comma-delimited device identifiers for computers or other devices associated with this user. This value is used by the equipment identifier end-point-control feature to enforce user-device affinity. These values are assigned to the **deviceId** attribute.

13 Click:

- **Save** to create the local user account and save it to the local user authentication repository on the appliance.
- **Save and Add Another** to save it and then configure another local user.

Editing Local Users

To change a local user's settings:

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Local Accounts** tab.

3 Click the name of the user you want to edit. The **Add/Edit Local User** page appears.

4 Make any edits to the user's settings, and then click **Save**.

Deleting Local Users

IMPORTANT: You cannot delete a local user if he or she is referenced by another object. For example, if you try to delete a local user referenced in an access control rule, AMC displays an error message. Click the link in the error message to see a list of all references to this user. See Deleting Referenced Objects for more details.

To delete a local user:

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Local Accounts** tab.

3 Select the checkbox for the user you want to delete.

4 Click **Delete**.

Adding Local Groups

Before you can add local groups, you must first create a local user authentication repository on the appliance, as described in Configuring Local User Storage. You do not need to configure a local authentication realm before adding local groups.

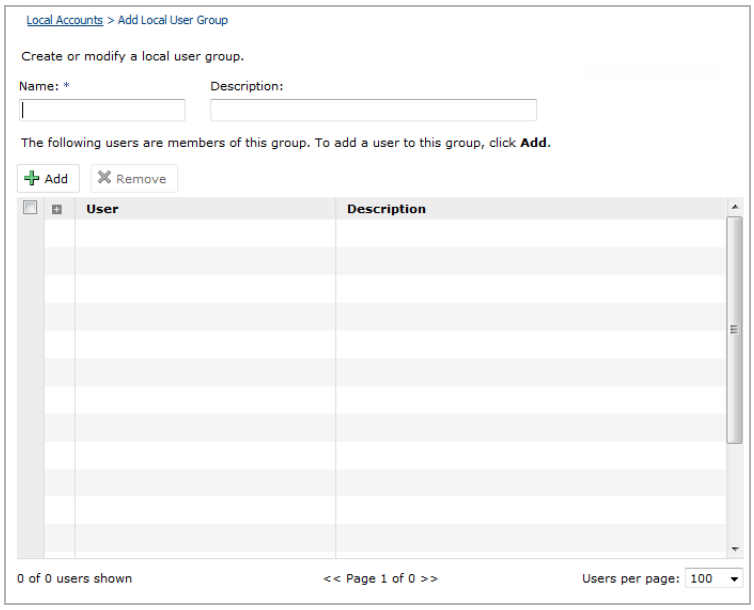
After you've created a local user authentication repository, you can add local groups to the appliance. Either add local groups manually or import groups, as explained in Importing and Exporting Local Accounts.

To add local groups to the appliance:

1 On the main navigation menu, select **Users & Groups**.

2 Click the **Local Accounts** tab.

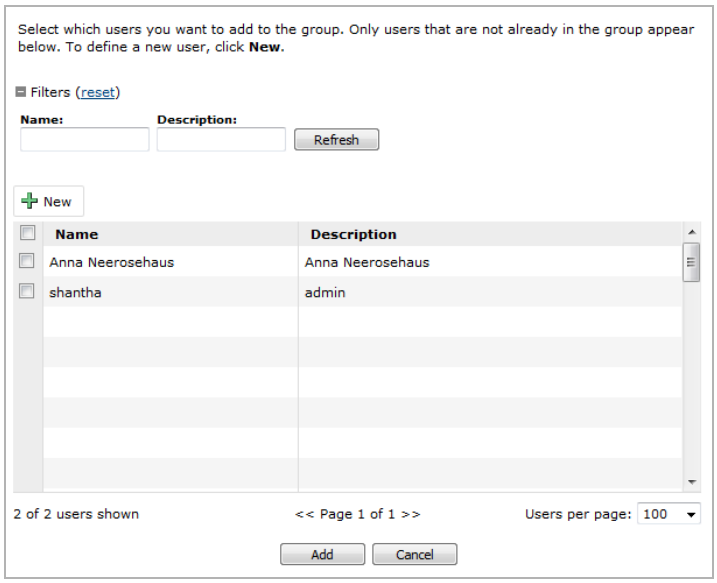
3 Click **New** and then select **Group**. The **Add Local User Group** page appears.



4 In the **Name** field, type the name of the local group you want to add to the local user authentication repository.

5 In the **Description** field, type a descriptive comment about the local group.

6 To add a user to the group, click the **Add** button. The **Add User to Group** page opens.



7 Select the checkbox beside each user you want to add to the group.

8 Click **Add**. Only users who are not already in the selected group are displayed.

9 To create a new user, click the **New** button to display the **Add User** page. See Adding Local Users for a description of the fields.

10 Click:

- **Save** to create the local user group and save it to the local user authentication repository on the appliance.
- **Save and Add Another** to save it and then configure another local group.

Editing Local Groups

To change a local group's settings:

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Local Accounts** tab.

3 Click the name of the group you want to edit. The **Add/Edit Local Group** page appears.

4 Make any edits to the group's settings.

5 Click **Save**.

Deleting Local Groups

IMPORTANT: You cannot delete a local group if it is referenced by another object. For example, if you try to delete a local group referenced in an access control rule, AMC displays an error message. Click the link in the error message to see a list of all references to this group. See Deleting Referenced Objects for more details.

To delete a local group:

1 From the main navigation menu, select **Users & Groups**.

2 Click the **Local Accounts** tab.

3 Select the checkbox for the group you want to delete, and then click **Delete**.

Importing and Exporting Local Accounts

SMA appliances use CSV files to import and export user and group information. User and group information can be imported for new and existing user accounts as long as the CSV file conforms to the guidelines shown in Creating the CSV File. Detailed import information is provided in Importing New Local Users and Groups and Importing Data for Existing Local Users.

Export creates a CSV file named `LocalUsers.csv` that contains all local user accounts in the local user authentication repository. Follow the guidelines in Exporting Local User Accounts to create the export file.

Topics:

- Importing New Local Users and Groups
- Importing Data for Existing Local Users
- Importing New Groups
- Exporting Local User Accounts
- Import and Export Error Messages

Importing New Local Users and Groups

To easily add or edit local users and groups, import local user information from a comma-separated (CSV) text file into the appliance configuration. This time-saving feature is especially useful to new customers who must add numerous local users to the appliance. Importing users is also very useful when you need to update one or more properties for existing users. For example, you can quickly add a new group to several users when a new group is created. See Importing Data for Existing Local Users for additional information.

Before you can import local users and groups, you must first create a local user authentication repository on the appliance, as described in Configuring Local User Storage. Once you've created a local user authentication repository, you can import local users and groups to the appliance.

NOTE: A local authentication realm does not need to be created before importing local users and groups.

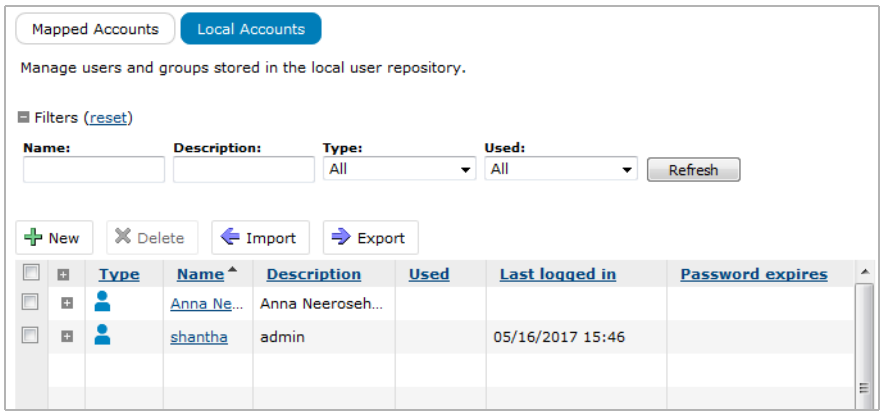
To import local users and groups to the appliance:

1 Ensure the CSV file to be imported resides on the local computer and adheres to the guidelines in Creating the CSV File.

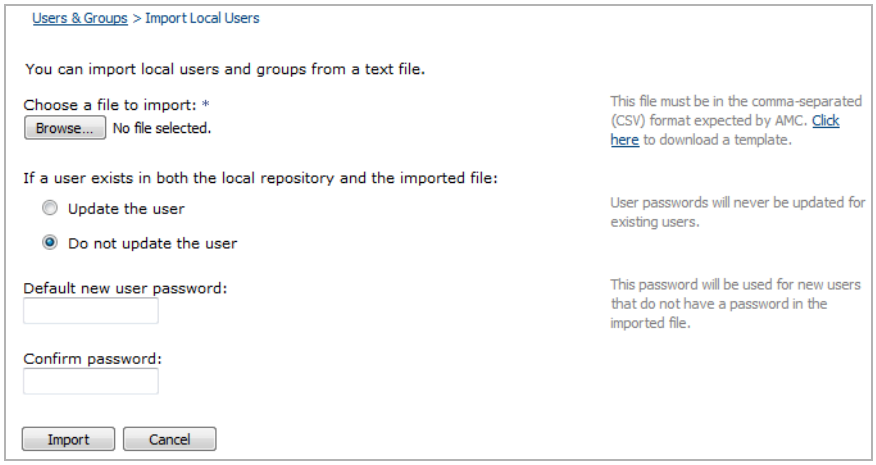
IMPORTANT: No data is imported if AMC encounters any errors in the CSV file.

2 On the main navigation menu under **Security Administration**, select **Users & Groups**.

3 Click the **Local Accounts** tab.



Click the **Import** Import button, which displays the **Import Local Users** page you use to import local users from a CSV file into the local user authentication repository.



You must have modify access to the **Local Accounts** page and a local user authentication repository must be available.

4 In the **Choose a file to import** field, click **Browse** to locate the file you want to import. Before importing a file, ensure that it meets the requirements shown in Creating the CSV File.

5 Select how a user account that is in both the local user authentication repository and the imported file should be handled:

Select	To
Update the User	Update the duplicate user data in the local user authentication repository to match the user record in the imported CSV file
Do not update the user	Ignore the duplicate user record in the CSV file and leave the user data in the local user authentication repository unchanged

Regardless of this setting, the passwords of existing users are never updated. However, passwords for new users are imported.

6 In the **Default new user password** field, type the password to be used by all new imported local users who do not have a password defined in the CSV file. The password must conform to the password policy configured for the local authentication server. New users will use this default password to login the first time.

7 Retype the default password in the **Confirm password** field.

8 Click the **Import** button to add local user accounts to the local user authentication repository.

Creating the CSV File

The CSV file used to import user accounts into the appliance must be generated with the guidelines shown in the CSV file field order table, and fields must be in the order shown.

CSV file field order

Field	Required or Optional	Guidelines	Description
Username	Required	1-255 characters (case-sensitive)	Name the user enters to login
Description	Optional	Any number and type of characters allowed	Additional information about the user
Password	Optional	Must conform to the password policy configured for the local authentication server (used only when importing new users)	Password the user enters to login
Enabled	Required	Must contain either `True` or `False` **NOTE:** Case-sensitive	Whether the user is allowed to login
E-mail	Optional	Local user name and domain name separated by an @ (up to 254 characters)	Valid e-mail address used to send one-time passwords to the user
Devices	Optional	Comma-separated list	Device IDs associated with the user
Groups	Optional	Comma-separated list (up to 255 characters) **NOTE:** A group is created if AMC tries to import an undefined group.	Comma-separated list of groups to which the user belongs

This example shows the file format required to import users into AMC:

```
Username,Description,Password,Enabled,Email,Devices,Groups
"user0","This describes user0",,true,user0@domain.com,"abc123,def456","group0"
"user1","This describes user1",,true,user1@domain.com,"","group1,group0"
"user2","This describes user2",,false,,"",""
```

The following guidelines are also required, as shown in the above example:

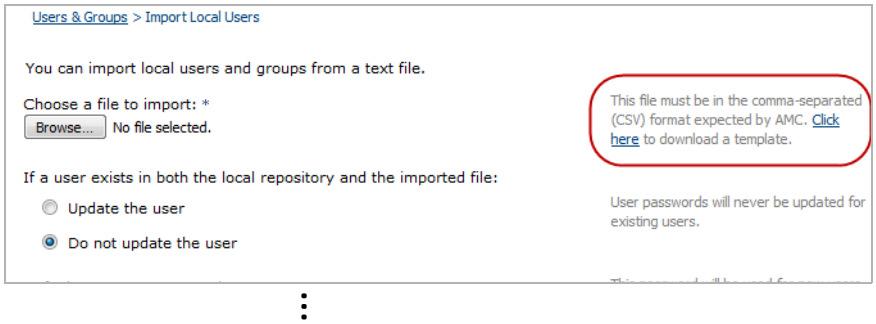
- The first row of the file is ignored, because the CSV format uses the first row as column headers.
- String values are typically quoted using double quotes (“).
- String values containing commas must be quoted.
- String values containing quotes must escape the quote by using another double quote character, for example, `“The group name is ””Team1””.”`

If AMC encounters any errors in the CSV file, no data is imported and an error message is displayed. Error messages are shown in Import and Export Error Messages.

Downloading a CSV Template

To download a template you can use to create the CSV file containing user data:

1. On the main navigation menu under **Security Administration**, select **Users & Groups**.
2. Click the **Local Accounts** tab.
3. Click the **Import** Import button.
4. On the **Import Local Users** page, click the **Click here** link



5. When the Windows **File Download** dialog appears, click the **Save** button.
6. When the Windows Save As dialog appears, either:
   - Click the **Save** button to accept the defaults. By default, the file is named `LocalUsersTemplate.csv` and located in your Downloads folder.
   - Select another file name and location for the CSV file.
7. After downloading the file, use it as a guide to add user data that you want to import into the local user authentication repository.

Importing Data for Existing Local Users

As an alternative to manually editing user accounts, import users when you need to update one or more properties for several user accounts already in the local user authentication repository. For example, you can quickly add several users to a group when a new group is created. Simply export user accounts to a CSV file, change the desired properties, and then import the revised user accounts back into the local user authentication repository.

To import data for existing local users, follow the instructions in Importing New Local Users and Groups with the following exceptions:

- When selecting whether data should be updated for the user, be sure to select **Update the User**.

  Passwords are imported for new users only. Regardless of this setting, the passwords of existing users are never updated.

- Use the same CSV file format used to import new users. See Creating the CSV File. However, only the following properties are imported.
  - Description
  - E-mail Address
  - Device IDs
  - Groups
- Properties can be added but not removed when importing users.

Importing New Groups

When importing data for new or existing local users, group memberships also are imported (if available in the imported CSV file). AMC does not explicitly import local groups. However, if a user is a member of a group that has not been configured in AMC, a new local group is created and the user is added as a member of the group.

CAUTION: Make sure all group names in the CSV file are correct. Otherwise, unwanted groups will be created.

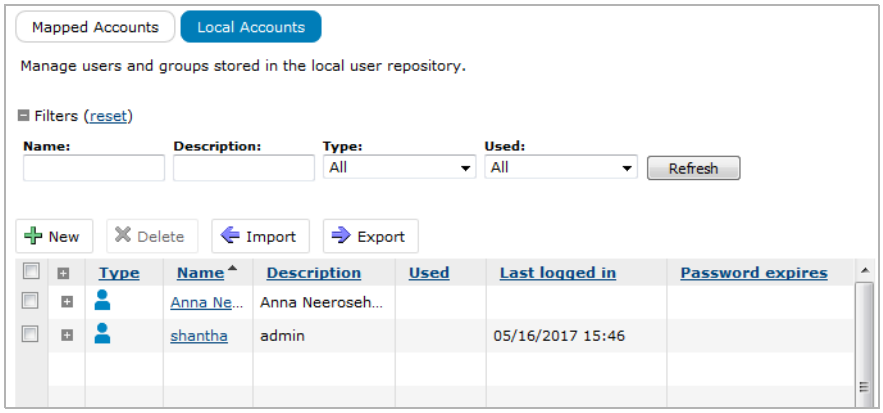
Exporting Local User Accounts

The AMC provides the ability to create a CSV-formatted text file by exporting local user accounts and related group information currently defined in the local user authentication repository. This CSV file can then be used to import user data into any database.

To export local user accounts:

1 On the main navigation menu under Security Administration, select **Users & Groups**.

2 Click the **Local Accounts** tab.



3 Click the Export **Export** button, which displays the **Windows File Download** dialog.

4 Click the **Save** button.

5 When the **Windows Save As** dialog appears, either:

- Click the **Save** button to accept the defaults. By default, the file is named `LocalUsers.csv` and located in your Downloads folder.
- Select another file name and location for the CSV file.

Import and Export Error Messages

The following error messages may occur when importing or exporting a CSV file. If an error is encountered during import, no data is imported. Therefore, you must correct the error before the file can be imported.

`Duplicate user names`	If the same user name (case-insensitive) appears in more than one record in the CSV file, an error message identifies the user name and line on which the duplicate user name appears.
`Wrong number of data columns`	If a record contains an invalid number of columns, an error message indicates that the data is invalid and identifies the line number of the record.
`Invalid email address`	If a record contains an e-mail address that is not a valid address (for example “`useratdomain.com`”), an error message identifies the user name, invalid address, and line number where the invalid address occurs.
`Invalid default password`	If the default password does not meet the password criteria configured on the local authentication server, an error message identifies the criteria that is not met. For example, if the password does not contain either an uppercase letter or a symbol but is required to have at least one or both, the error message indicates that both are missing.
`Invalid “enabled” value`	If the value for the Enabled column is not “`true`” or “`false`”, an error message identifies the problem and line number of the record.
`Invalid user name`	If a user name is invalid (for example, more than 255 characters), an error message identifies the problem and line number of the record.
`Invalid group name`	If a group name is invalid (for example, more than 255 characters), an error message identifies the problem and line number of the record.
`Missing user name`	If an entry is missing a user name, an error message identifies the problem and line number of the record.

`Missing password` (and no default provided for new users)	If an entry for a new user is missing a password and no default password is provided, an error message identifies the problem and line number of the record.
`Invalid user password`	If an entry for a new user contains a password that does not meet the password policy configured on the local authentication server, an error message identifies that the password does not meet the policy and the line number of the problem.

Integrating an SMA Appliance with a SonicWall Firewall

Secure Mobile Access (SMA) 1000 series appliances running firmware version 12.1 and higher can be integrated to work with SonicWall TZ, NSA, and SuperMassive series firewalls running firmware version SonicOS 5.9.X and higher.

These devices can be integrated to share session information using the SonicOS Single Sign-On (SSO) feature. The SonicWall TZ, NSA, or SuperMassive series firewall can be configured to act as a RADIUS accounting server and to receive RADIUS accounting records from a Secure Mobile Access (SMA) 1000 series appliance.

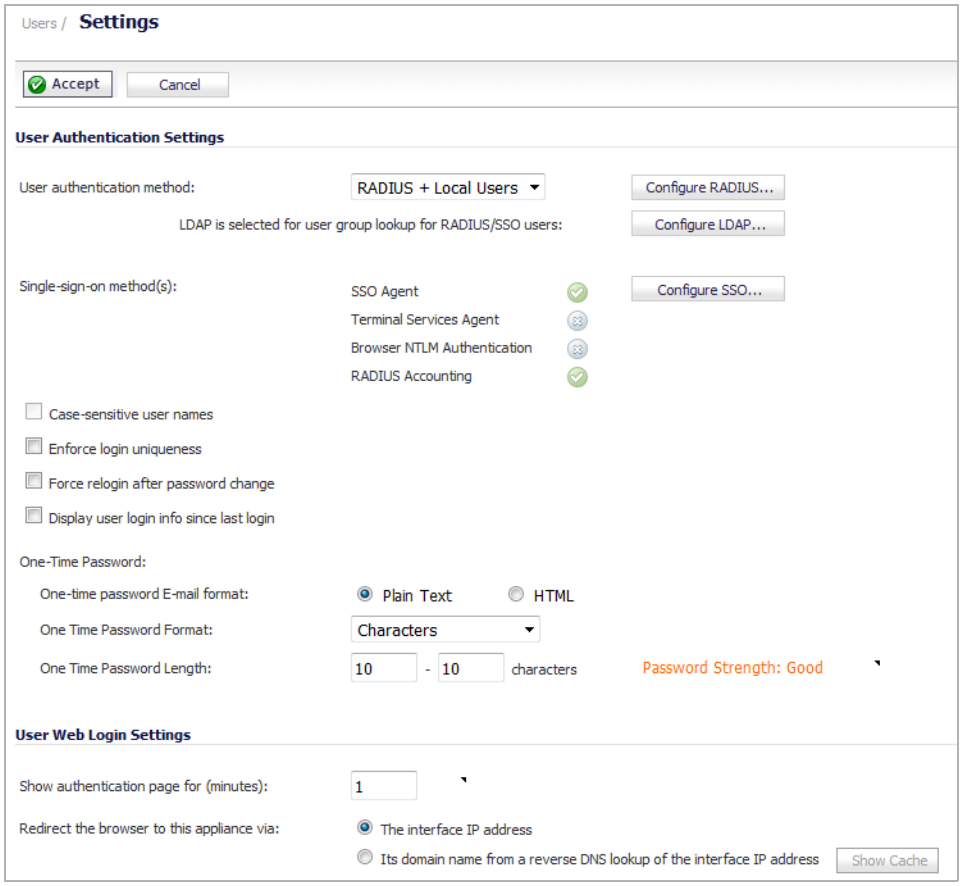
Topics:

- Configuring a Firewall to Receive RADIUS Accounting Records from an SMA Appliance
- Configuring an SMA Appliance to Send RADIUS Accounting Records to a Firewall
- Viewing SMA Users on the Firewall

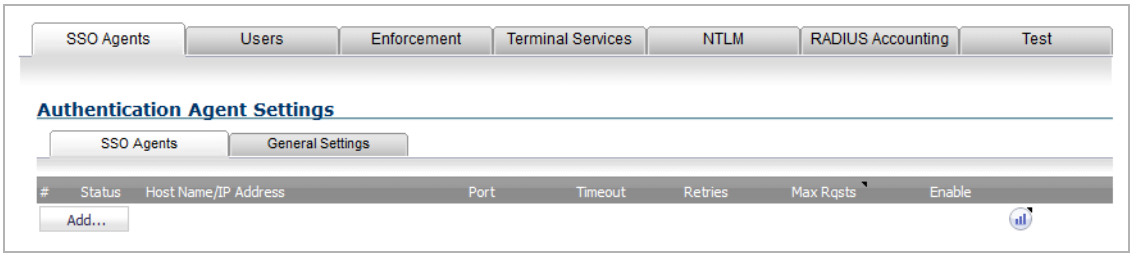
Configuring a Firewall to Receive RADIUS Accounting Records from an SMA Appliance

To configure a firewall to receive RADIUS accounting records from an SMA Appliance:

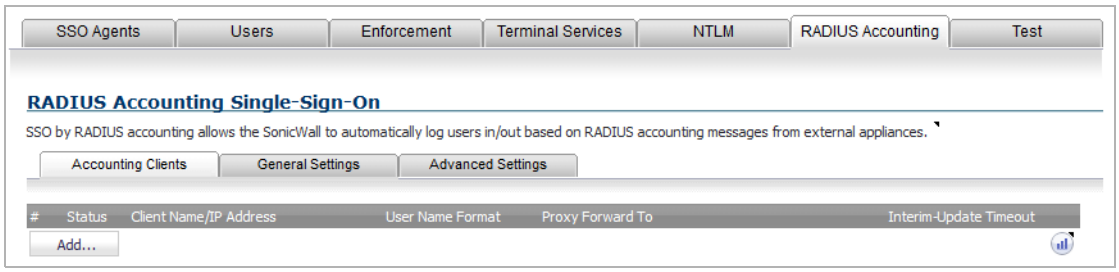
1 On the firewall, go to the **Users > Settings** page.



2 Click **Configure SSO**. The **SonicWall SSO Authentication Configuration** page appears.

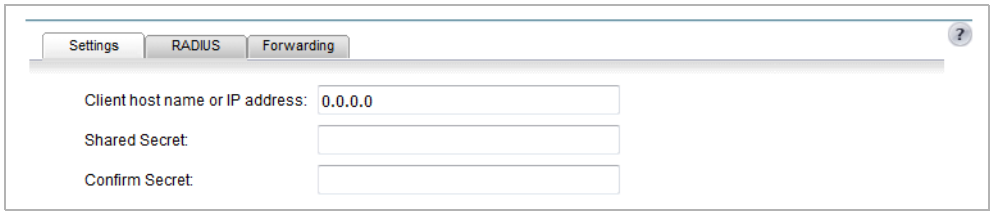


3 Select the **RADIUS Accounting** tab.



4 Select the **Accounting Clients** tab.

5 Click **Add**. The **Settings** tab appears.



6 In the **Client host name or IP address** field, enter the IP address or host name of the internal interface on the SMA appliance (RADIUS client) that is connected to the firewall (RADIUS server).

7 Enter the **Shared Secret**.

> **NOTE:** The **Shared Secret** is a text string of your choice that serves as the password between the RADIUS client and the RADIUS server. This instance of the **Shared Secret** is for the firewall, which is acting as the RADIUS server. You will enter this same **Shared Secret** when you configure the SMA appliance.

8 Enter the **Shared Secret** again in the **Confirm Secret** field.

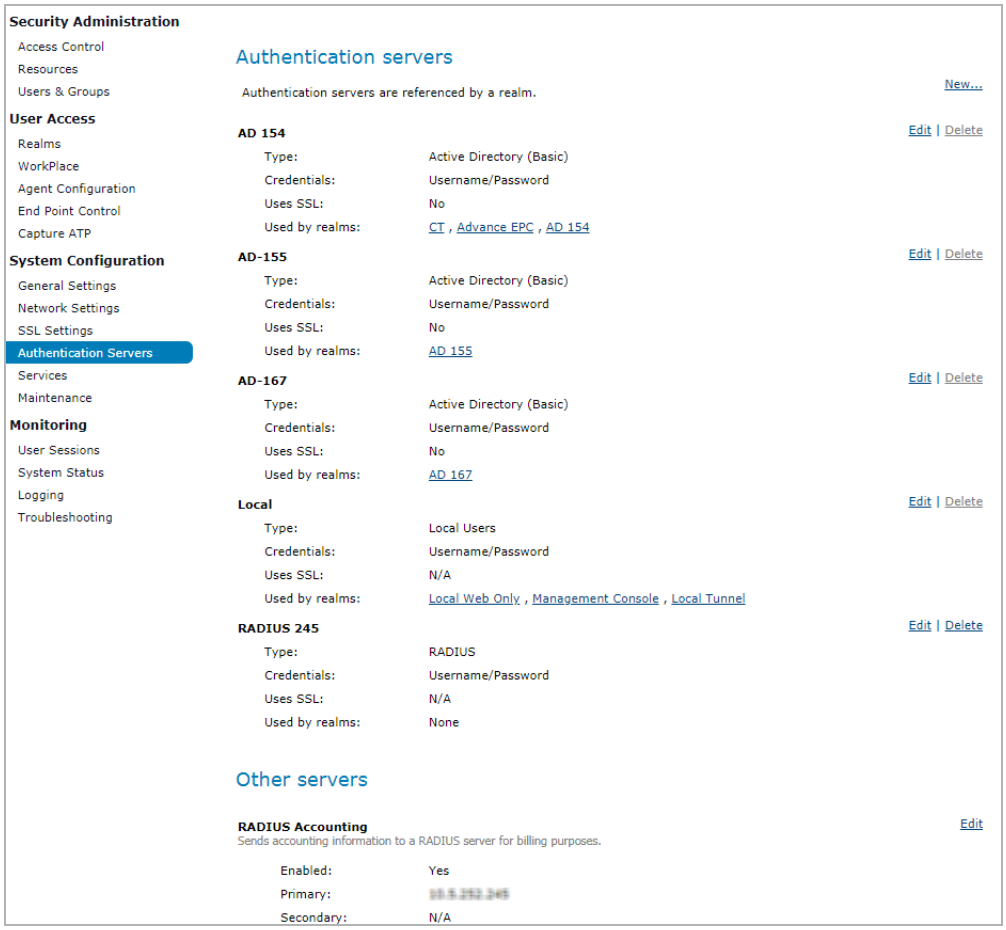
9 Click **Apply**.

10 Click **OK**.

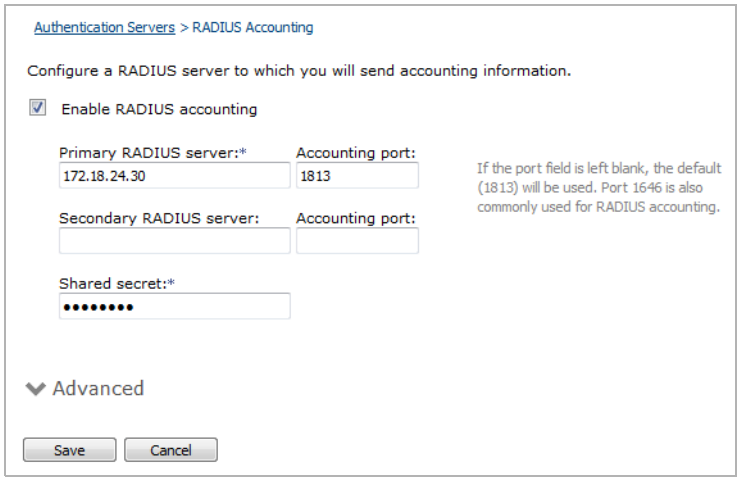
Configuring an SMA Appliance to Send RADIUS Accounting Records to a Firewall

To configure an SMA appliance to send RADIUS accounting records to a firewall:

1 On the SMA appliance, go to the **System Configuration > Authentication Servers** page.



2 Under **Other servers**, click the **Edit** icon for **RADIUS Accounting**. The **RADIUS Accounting** dialog appears.



3 Select the **Enable RADIUS Accounting** checkbox.

4 In the **Primary RADIUS server** field, enter the IP address of the firewall that you configured in Integrating an SMA Appliance with a SonicWall Firewall.

   a In the **Accounting port** field, enter the port number you want to use. If the port field is left blank, the default port (**1813**) is used. Port 1646 is also commonly used for RADIUS accounting.

5 In the **Secondary RADIUS server** field, enter the IP address of the firewall that you configured in Integrating an SMA Appliance with a SonicWall Firewall.

   a In the **Accounting port** field, enter the port number you want to use. If the port field is left blank, the default port (**1813**) is used. Port 1646 is also commonly used for RADIUS accounting.

6 In the **Shared secret** field, enter the same **Shared Secret** you configured on the firewall in Integrating an SMA Appliance with a SonicWall Firewall.

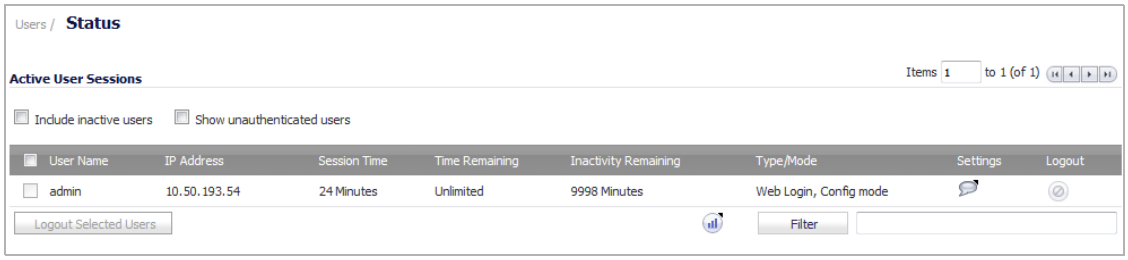
7 Click **Save**.

Viewing SMA Users on the Firewall

When your SonicWall firewall is connected to an SMA appliance via a VPN client, you can view the SMA users on the firewall.

To view SMA users on the firewall:

1 On the firewall, go to the **Users > Status** page.



2 Select the checkbox for **Include inactive users**. SMA users should appear in the list.

As the SMA users are logged into a device that is external to the firewall, the firewall treats those user sessions as inactive. To see the SMA users displayed on this page, you must select the checkbox for **Include inactive users**. After the firewall is configured to receive RADIUS accounting information from the SMA appliance, users are automatically added to this list as soon as they are successfully authenticated by the SMA appliance. They are removed automatically when their SMA session ends.

4

Working with Appliance Management Console

Logging In to AMC

This section introduces the Appliance Management Console (AMC), a Web-based interface for managing the appliance.

Before logging in to AMC, you need the host name or IP address you typed for the internal interface during the initial setup with Setup Tool.

To log in to AMC:

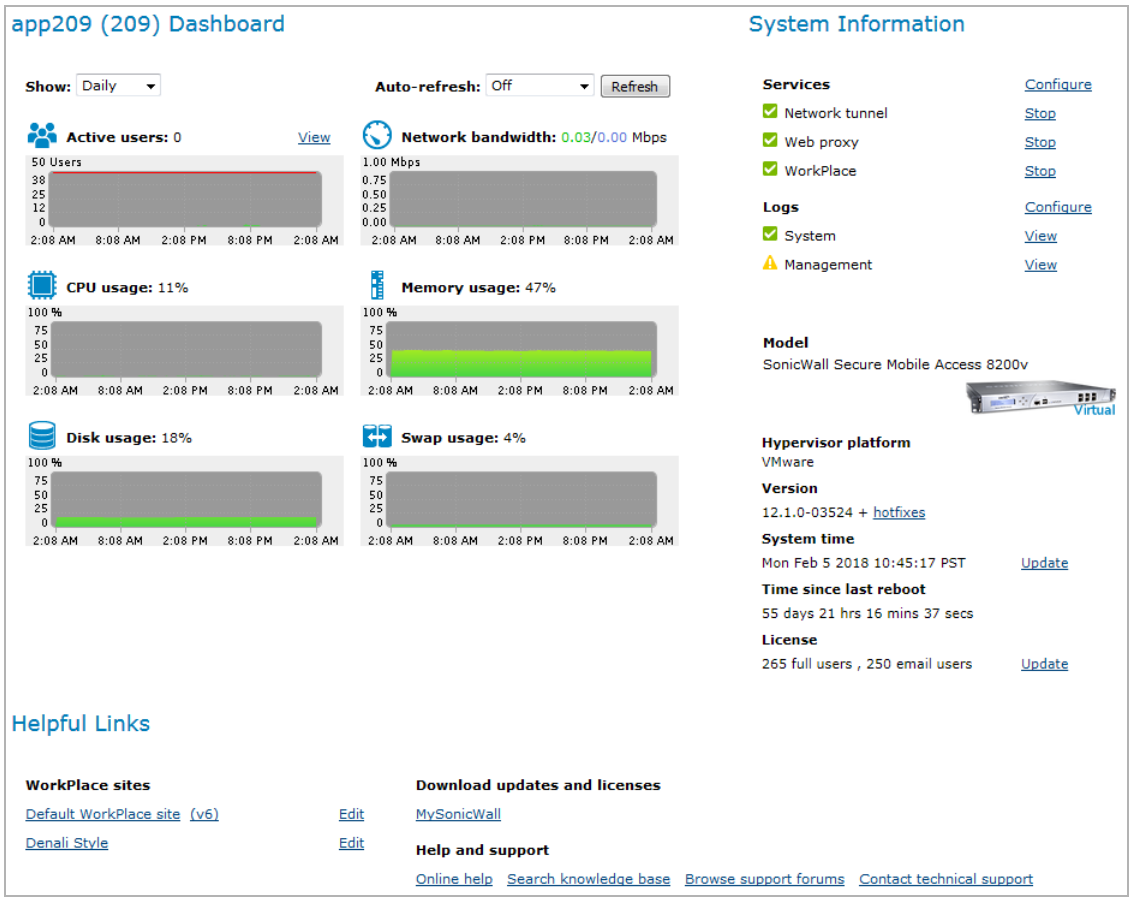
1 Start your Web browser and type the URL `https://<ipaddress>:8443/console`, where *<ipaddress>* matches the address you specified for the internal interface when you ran Setup Tool or Setup Wizard.

2 Enter `admin` in the **Username** text field.

3 Enter the root password you created using Setup Tool in the **Password** text field.

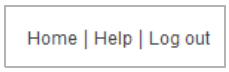
4 Select the **Management Console** in the **Log in using** drop-down menu.

5 Click **Login**. The AMC home page appears.



6 Review the system statistics and use the functions on the right to configure and maintain your system.

7 Click **Help** at the top for details about configuring your appliance.



For information on changing the AMC password, see Editing Administrator Accounts.

NOTE: Avoid multiple administrators making changes to AMC simultaneously. For more information, see Avoiding Configuration File Conflicts with Multiple Administrators.

Logging Out

It is important to preserve the security of your AMC administrator account. When you're finished working in AMC, click **Log out** in the upper-right portion of the screen. If you terminate a session by simply closing your Web browser, your session remains active until it times out (after 15 minutes of inactivity). There is an exception to this rule that you should be aware of; see Appliance Sessions for details.

AMC Basics

This section describes the basics of working with AMC. All configuration data is encrypted using SSL as it's transferred between AMC and your browser, ensuring that it remains secure. To increase security, AMC should be used within a trusted network (on an internal network that is behind a firewall). See Working with Certificates FAQs for more details.

- A Quick Tour of the AMC Interface
- Adding, Editing, Copying, and Deleting Objects in AMC
- Getting Help

A Quick Tour of the AMC Interface

The AMC interface will be familiar to anyone who has worked with similar Web-based security management applications. Here are some basic notes about working with AMC.

Topics:

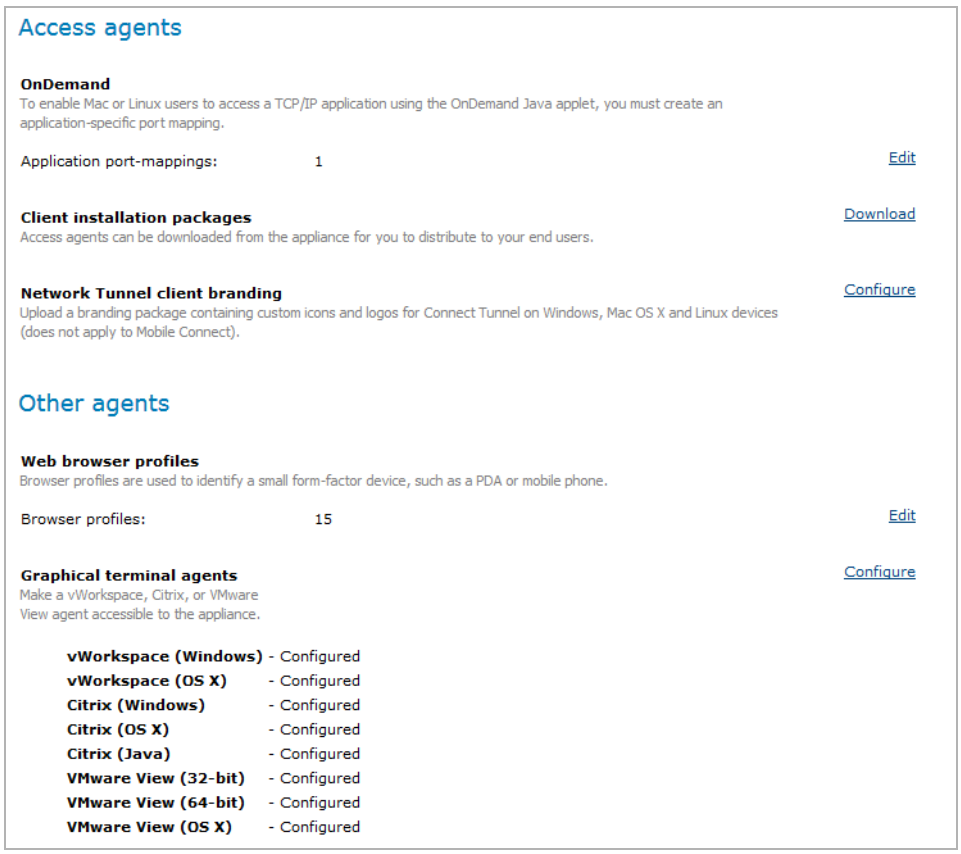
- Summary Pages
- Tables and Tabs
- Filters
- Page Links
- Editing an Object
- Changing the Page View
- Expanded View of List Details
- Required Fields and Errors
- Assigning Names and Descriptions
- Saving Changes on a Page
- AMC Status Area
- Version Number and Product Serial Number

Summary Pages

Several top-level pages in AMC are summary pages that provide quick access to subordinate configuration pages and display summaries of key configuration settings and other status information. These summary pages are:

- Agent Configuration
- General Settings
- Network Settings
- SSL Settings
- Authentication Servers
- Services

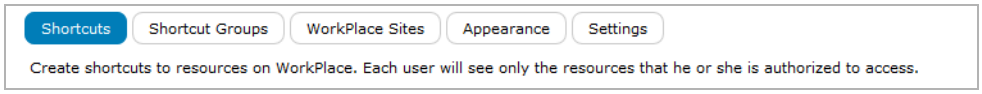
For example, the **Agent Configuration** page provides links to pages for configuring End Point Control, Secure Mobile Access access, and other agents. You can see right away on this summary page whether a specific agent is enabled or disabled.



Tables and Tabs

Many AMC pages use a tabular layout to present the objects you'll be managing. The tables include scroll bars, which make it easier for you to keep the main elements on the page (including the navigation bar, header, and footer) in view when working with long lists. You can also sort the data displayed in some tables by clicking the underlined column headings.

In some cases, you'll use tabs to switch between modes. For example, you'll use tabs to switch between managing resources, groups of resources, and variables used in defining resources.



Filters

On pages in AMC that contain a list of items that can grow to many pages in a large configuration, filtering is available to make it easier for you to find what you are looking for. Filters are available on the AMC pages shown in the Pages containing filters table:

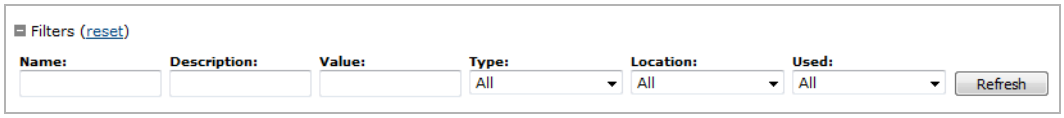
Pages containing filters

Security Administration	User Access
Access Control	WorkPlace

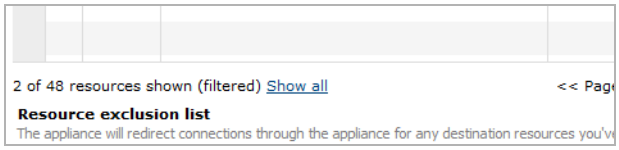
Pages containing filters

Resources	WorkPlace > Shortcut Groups
Resources > Resource Groups	**Monitoring**
Users & Groups	User Sessions
Users & Groups > Local Accounts	Logging

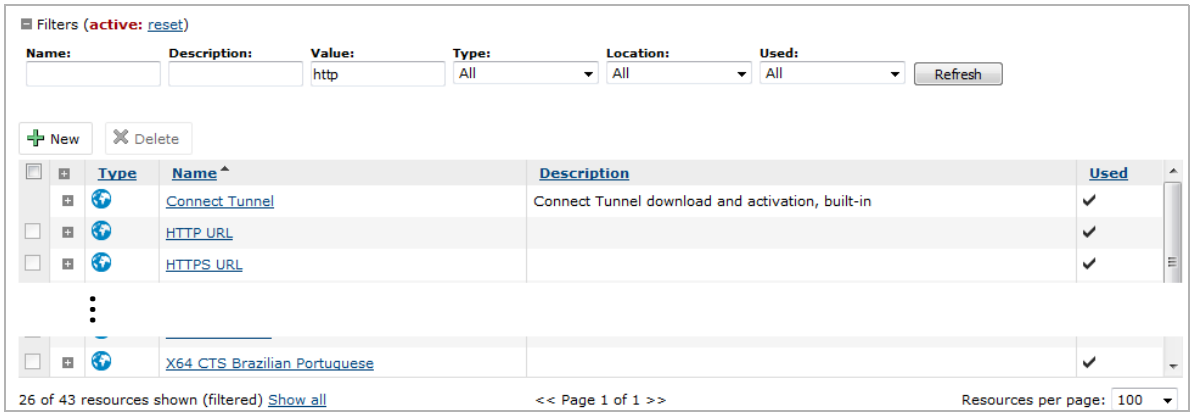
The exact filters vary slightly with each page, but the following functionality is consistent across all pages:



- There is a **reset** link that resets the filter fields to their default values.
- There is a red **active** indicator that indicates that the page was loaded using filters, meaning that the list may not be displaying all the configured items.
- There is a **Refresh** button that reloads the page with the specified filters applied.
- The filters are stored so that the next time you loads the page, it uses the same filters that were last applied. The filters are stored across sessions, so even if you log out and log back in, the same filters will be used.
- There is a footer at the bottom of the list that shows the number of items displayed and the total number of items in the list. If filtering is active, there is a **(filtered)** indicator and a **Show all** link that resets the filters to the defaults and refresh the page to display all items in the list.



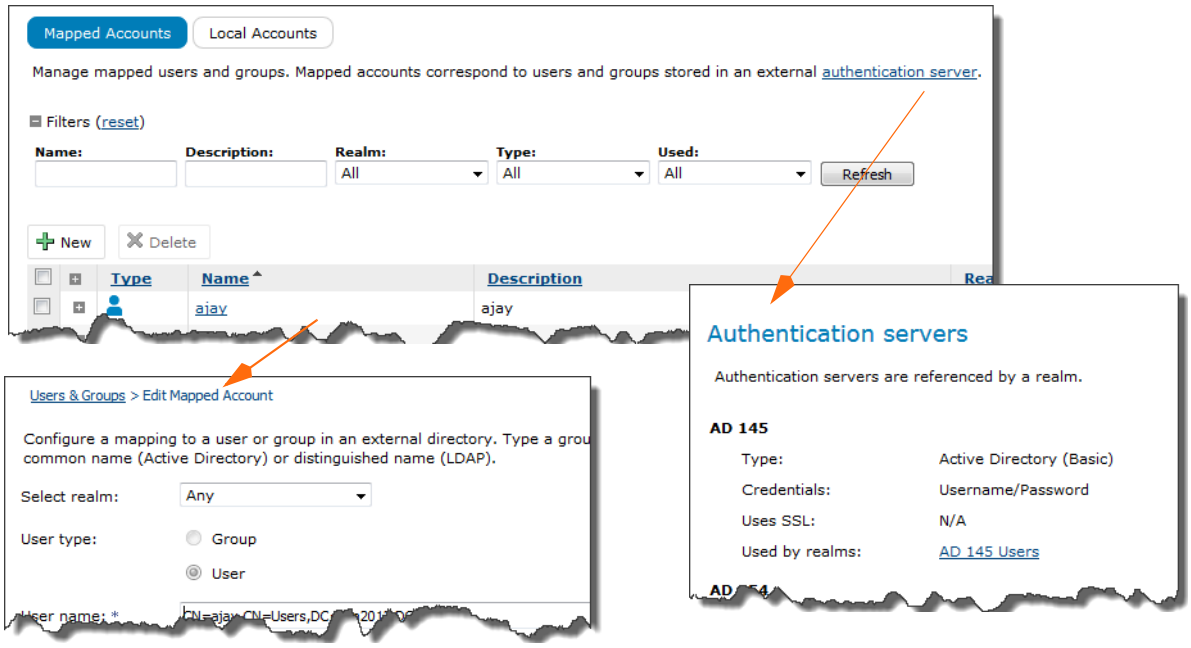
In general, the available filters map to the displayed columns in the list. In some cases, such as **Resource Groups** or **Shortcut Groups**, you can filter the list based on the members of the group, which is not a column in the list. As another example, on the **Resources** page you could filter the list based on something in the **Value** attribute, which is not a column, but is visible when an item in the list is expanded.



One way that you could use this feature for custom filtering is to create your own “tags” by adding a custom string to the **Description** field of related items. For example, if a certain set of resources are all used by one department or for one customer, you could add a keyword or tag to the description of those resources, and then use the filtering capability to quickly display only the resources that contain the special keyword or tag.

Page Links

Links to other pages are shown in blue and are underlined. Clicking on the link displays the page.



Editing an Object

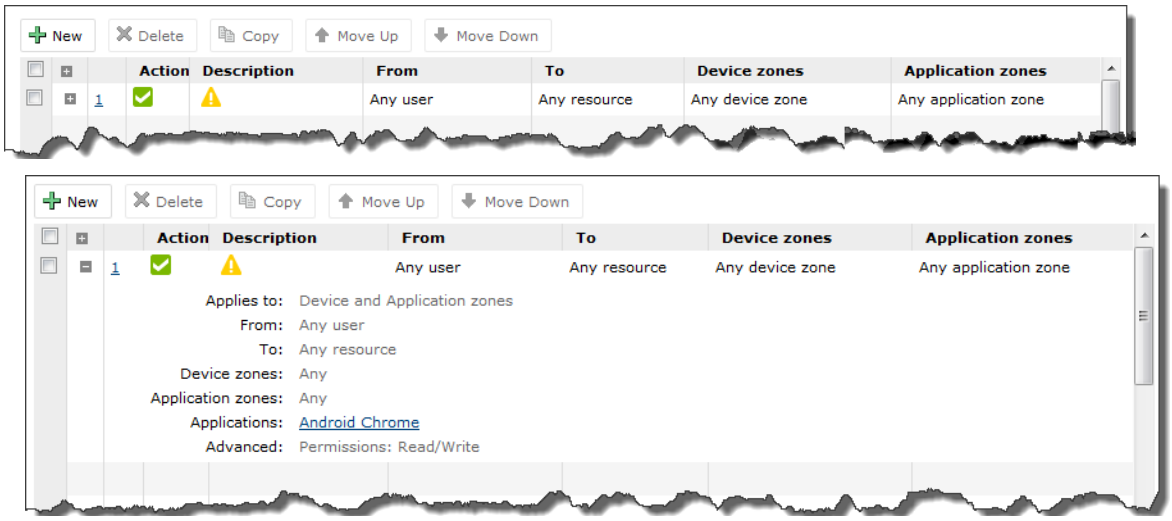
In most of the tables used to display lists of objects, the name field (or in the case of the **Access Control** page, the rule number) is hyperlinked. To edit an object, click its hyperlink.

Changing the Page View

Some of the longer, more complex pages in AMC hide the edit controls used to configure advanced features. This makes it easier for you to focus on the most important configuration options. To view hidden options, click the down arrow (click the up arrow to hide them again):

Expanded View of List Details

AMC pages that display lists of objects, such as the **Access Control** page, let you view details about an object by clicking the plus sign (**+**) in the second column. To return to the one-line view, click the minus sign (**-**).



Required Fields and Errors

Required fields are indicated in AMC with an asterisk. If you omit a value for a required field and click **Save**, a red message appears beneath the field indicating that it is required. A red message is also used to indicate an error (for example, if you type an invalid value).

Assigning Names and Descriptions

Most of your time in AMC will be spent managing three types of objects:

- Access control rules
- Resources
- Users and groups

When you create these objects, AMC requires that you type a name. AMC also has a space for you to type an optional description.

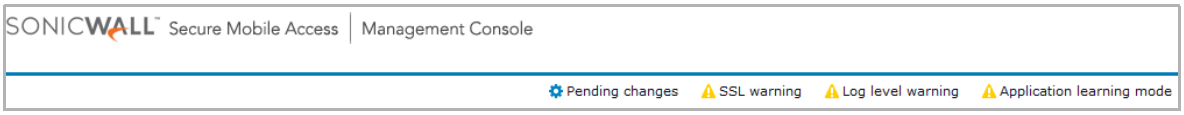
Although not required, meaningful descriptions can help you remember critical details about the objects you're managing, such as the purpose of an access rule or what resources are in a subnet range. A good description is especially helpful when managing a group of objects; when you return to AMC later to manage a large group of network resources, for example, you'll be glad to have a description reminding you of what's in the group.

Saving Changes on a Page

On some AMC pages you can **Save** or **Cancel** the changes you make. If you click **Cancel**, or use the **Back** button in your browser, your changes are not saved.

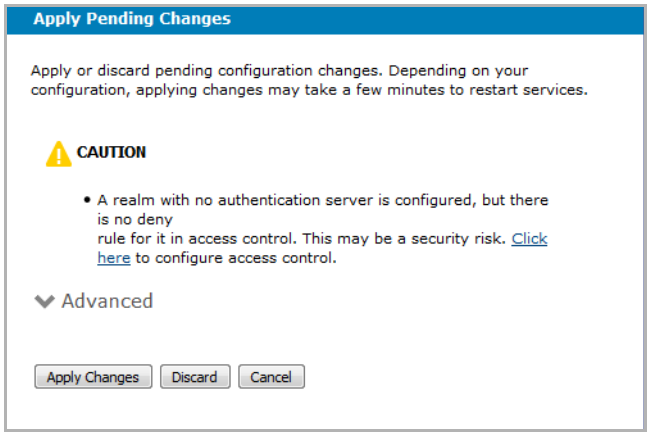
AMC Status Area

A status area just beneath the SonicWall Secure Mobile Access banner displays important information:

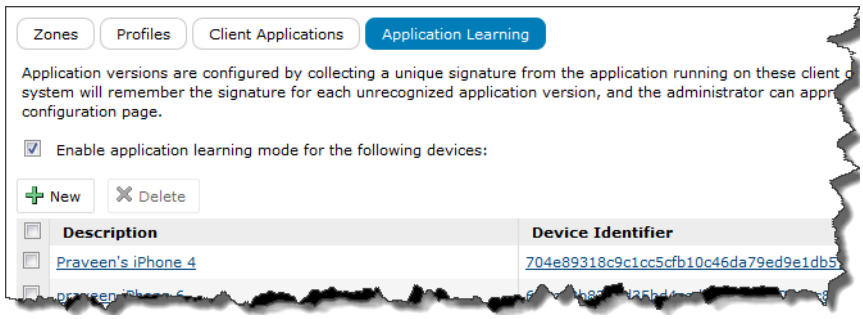


Each message has an indicator for the importance of the information; for example, a yellow warning sign. Each of these messages is a link that displays either:

- A dialog with further information: for example, clicking on **Pending changes** displays:



- The relevant page; for example, clicking on **Application learning mode** displays **End Point Control > Application Learning**:



Version Number and Product Serial Number

The version of the current system software and the product serial number are displayed at the bottom of the left-hand navigation bar on every page in AMC.

In addition to the version number, the **System Status** and **Maintenance** pages display a list of any hot fixes that have been applied. The version number and hot fix information is useful for planning system updates, and you need to have it when contacting SonicWall Technical Support.

Adding, Editing, Copying, and Deleting Objects in AMC

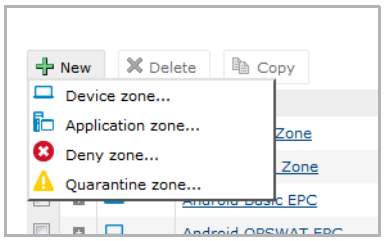
AMC features a standardized user interface for managing most objects, such as resources, access control rules, users, communities, End Point Control zones and device profiles, and other items used to organize and operate your VPN.

Following are the basic procedures for adding, editing, copying, and deleting objects in AMC, although there may be some minor variations depending on the object and AMC page you're working on. The examples provided here use the **End Point Control Zones** page.

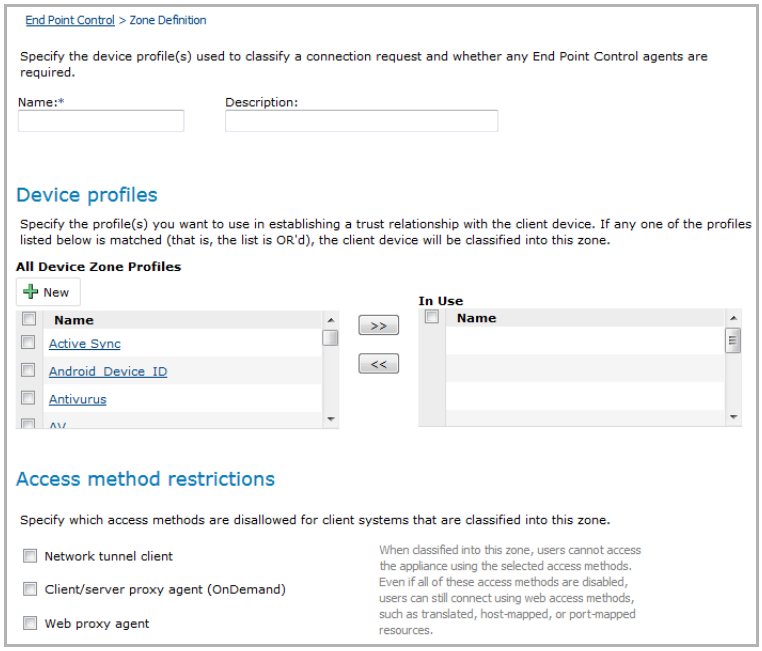
To add a new object in AMC:

1 Click **New** on the page listing the type of object you want to create.

2 Select the option you want to create. This example uses **Device zone...**.



The **Zone Definition - Device Zone** page appears.



3 Complete the relevant information for the object.

4 Click **Save** at the bottom of the screen.

To edit an object in AMC:

1 On the page that lists the object you want to edit, click the link for the name (or in some cases, the number) of the object you want to modify. For a quick description of the object, an expand (+) button is available on most lists.

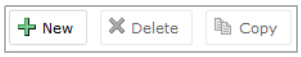
2 Make any changes to the information for the object.

3 Click **Save**.

To copy an object in AMC:

1 On the page that lists the object you want to copy, select the checkbox to the left of the object.

2 Click **Copy**.



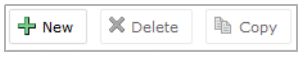
3 Make any changes to the information about the source object, and be certain to assign the object a new name.

4 Click **Save**.

To delete an object in AMC:

NOTE: You cannot delete an object that is still associated with other objects. For information, see Deleting Referenced Objects.

- On the page that lists the object you want to delete, select the checkbox to the left of the object.
- Click **Delete**.



Getting Help

Every AMC page includes a **Help** button (in the upper right portion of the page) that displays context-sensitive online help in a new browser window:

The **Help** window includes a navigation pane on the left and help content on the right. Click an item in the navigation pane to display help content for that item.

Administrator Accounts

This section describes how to:

- Manage AMC administrator accounts,
- Avoid problems if more than one administrator is managing the appliance.

Topics:

- Managing Administrator Accounts and Roles
- Avoiding Configuration File Conflicts with Multiple Administrators

Managing Administrator Accounts and Roles

AMC enables you to create multiple administrator accounts, each with a separate username and password. You can then assign roles to administrators, specifying which features in AMC they can use, and their levels of access.

By default, AMC is configured with a primary administrator role that has full access to all areas of AMC. Only the primary administrator can add, edit, or delete other administrator accounts.

Topics:

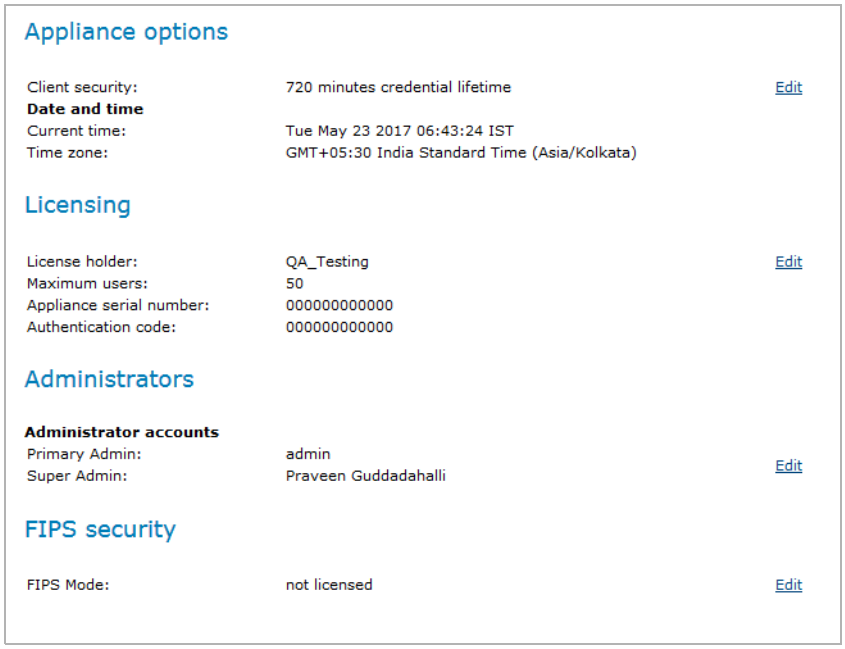
Adding Administrator Accounts

You can create additional administrator accounts if more than one person is responsible for managing policy and you want each person to have individual login credentials. Only the "primary" administrator—whose default name of *admin* cannot be changed—can create, modify, and delete secondary administrator accounts.

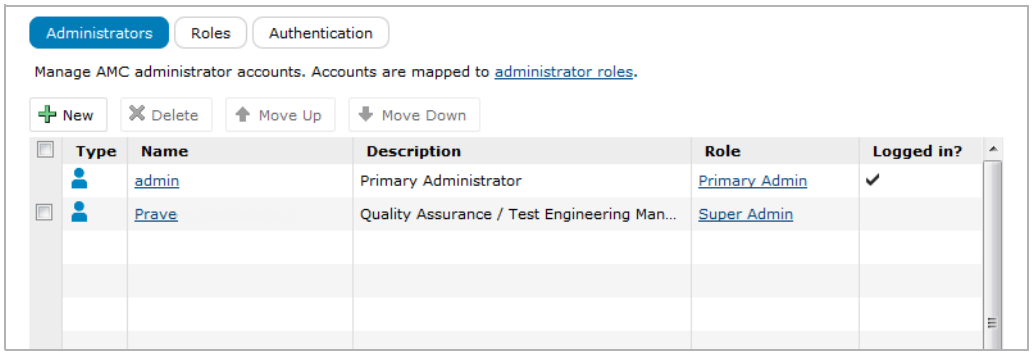
By default, the preconfigured roles include the ability to view all forms of session data and to terminate sessions. See Viewing User Sessions and Ending User Sessions for more information.

To add an administrator account:

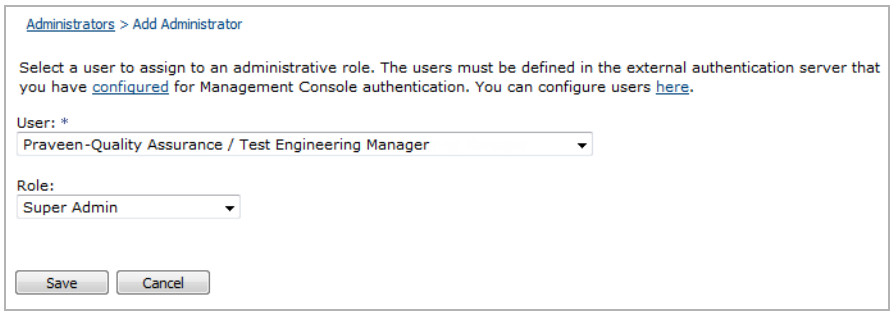
1 From the main navigation menu, click **General Settings**.



2 In the **Administrator accounts** area, click **Edit**. The **Manage Administrator Accounts** page appears.



3 Click **New > Administrator...**. The **Add/Edit Administrator** page appears.



4 In the **User** drop-down menu, select a user.

5 Select an Administrator Role from the **Role** drop-down menu. AMC provides preconfigured roles, which are defined on the **Add/Edit Administrator Role** page; see Preconfigured role descriptions. You can modify these preconfigured roles, or create new roles (see Defining Administrator Roles):

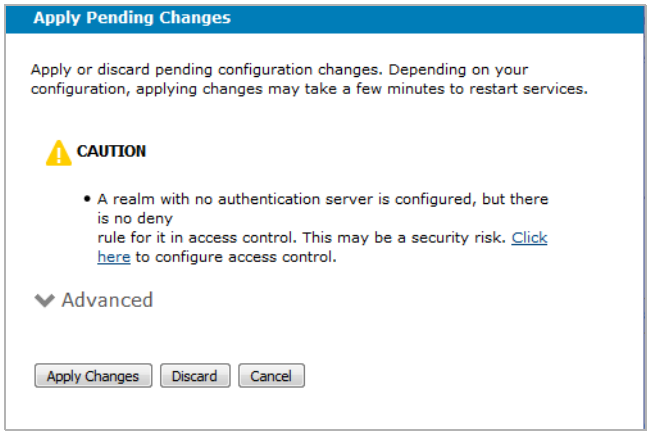
NOTE: By default, the preconfigured roles include the ability to view all forms of session data and to terminate sessions. See Viewing User Sessions and Ending User Sessions for more information.

Preconfigured role descriptions

Preconfigured role	Description
Super Admin	Has read/write access to all pages in AMC
Security Admin	Has read/write access to security administration and monitoring pages in AMC, and view access to system settings
System Admin	Has read/write access to system and monitoring pages, and view access to security pages

6 Click **Save**.

7 Click **Pending Changes** at the top of the page. The **Apply Pending Changes** dialog displays.



8 Click **Apply Changes**.

Editing Administrator Accounts

NOTE: For information on deleting administrator accounts, see Adding, Editing, Copying, and Deleting Objects in AMC

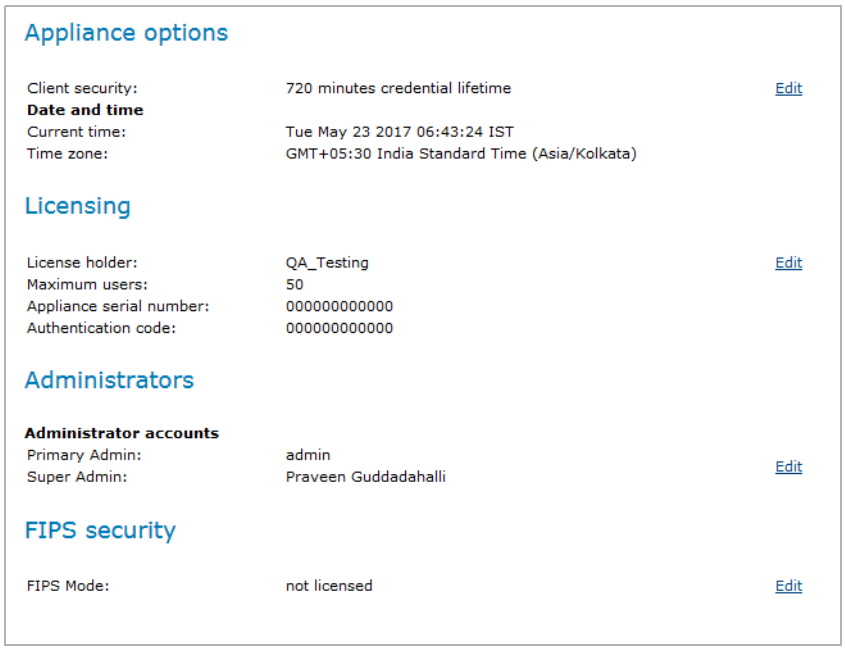
To help keep your AMC password secure, you should change it from time to time. Each administrator can edit his or her own account to change the password or update the description. The primary AMC administrator (whose username is *admin*) can edit the account settings for any other administrator.

Your password must contain between eight and 20 characters, and is case-sensitive. A strong password—with a combination of uppercase and lowercase letters, and numbers—is recommended. You should also avoid using words found in a dictionary.

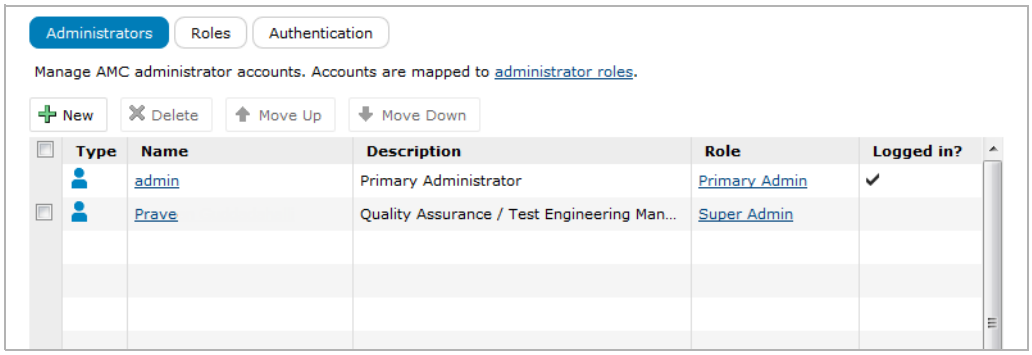
After you change your password, record it somewhere and keep it secure. If you change a secondary administrator's password, be sure to share the password with the appropriate administrator.

To edit an administrator account:

1 From the main navigation menu, click **General Settings**.



2 On the **General Settings** page, in the **Administrators** area, click **Edit**.

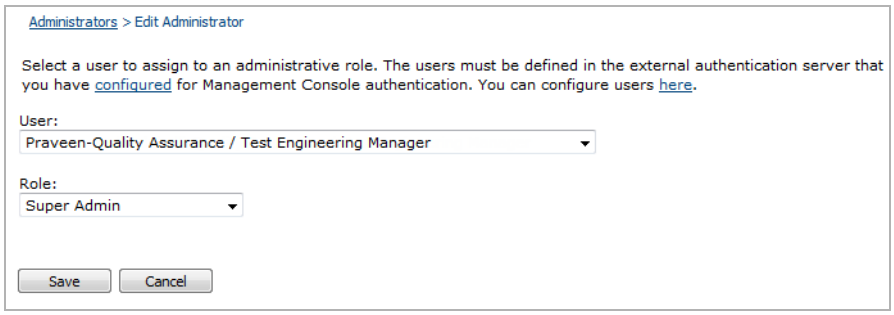


3 In the **Name** column on the **Manage Administrator Accounts** page, click the name of the administrator you want to edit .

IMPORTANT: If the password for the primary administrator (whose username is *admin*) is changed, the password for logging in to the appliance directly (as *root*) is also changed.

NOTE: The username and role of the primary or legacy local administrator cannot be changed.

4 On the **Add/Edit Administrator** page, change the textual description, login password, or role.



Adding/Editing Legacy Local Administrator Accounts

You can create or modify legacy local administrator accounts, which are supported for backwards compatibility only. The recommended way to configure local administrators is to create users in a local authentication server and map them to administrative roles. In previous versions, administrators could only be defined locally on the appliance, rather than defined in an authentication server.

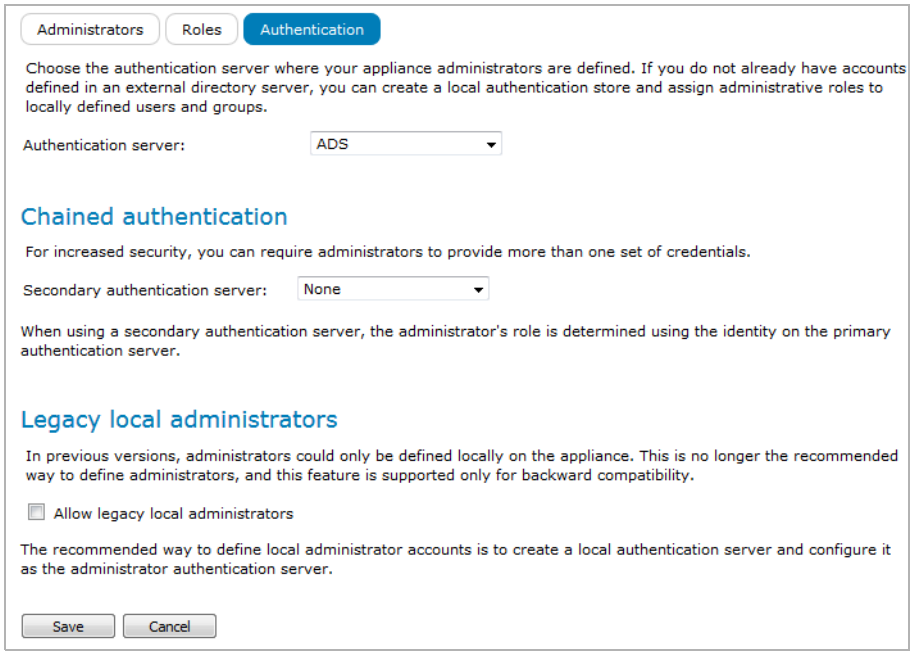
For information on deleting administrator accounts, see Adding, Editing, Copying, and Deleting Objects in AMC.

To add or edit a legacy local administrator account:

1 From the main navigation menu, click **General Settings**.

2 In the **Administrators** area, click **Edit** for the Administrator accounts. The **Manage Administrator Roles** page appears.

3 If you are adding a legacy local administrator, click **Authentication**.



a In the **Legacy local administrators** area, select the **Allow legacy local administrators** checkbox.

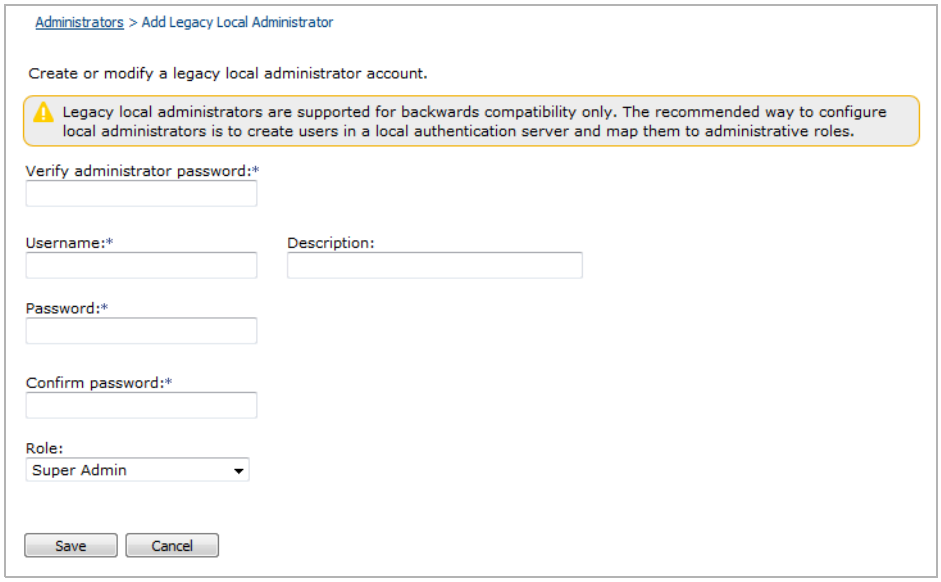
b Click **Save**.

4 In the **Administrator** area, click **Edit**. The **Manage Administrator Accounts** page appears.

5 To:

- Add a legacy local administrator account, click **New > Legacy Local Administrator...**.
- Edit an existing legacy local administrator account, click the name of the administrator you want to edit.

The **Add/Edit Administrator** page appears.



6 In the **Verify administrator password** field, enter the admin's password.

7 In the **Username** field, enter the legacy local administrator's username.

8 In the **Description** field, enter a descriptive comment about the legacy local administrator account.

9 In the **Password** field, enter the legacy local administrator's password.

10 In the **Confirm password** field, type in the legacy local administrator's password again.

11 In the **Role** drop-down menu, select an Administrator Role. AMC provides preconfigured roles, which are defined on the **Add/Edit Administrator Role** page; see the Preconfigured role descriptions table. You can modify these preconfigured roles, or create new roles (see Defining Administrator Roles).

12 Click **Save**.

13 Click **Pending Changes** at the top of the page.

14 Click **Apply Changes**.

Defining Administrator Roles

Role-based administration enables the primary administrator to grant limited administrative control to secondary AMC administrators.

For defining administrator roles, the features in AMC are grouped into four categories. For each category, you must specify the permissions you want to grant a role. The four categories of administrator permissions in AMC are described in the Administrator permissions table. The permission level for each category can be set as shown in the Permission levels table.

Administrator permissions

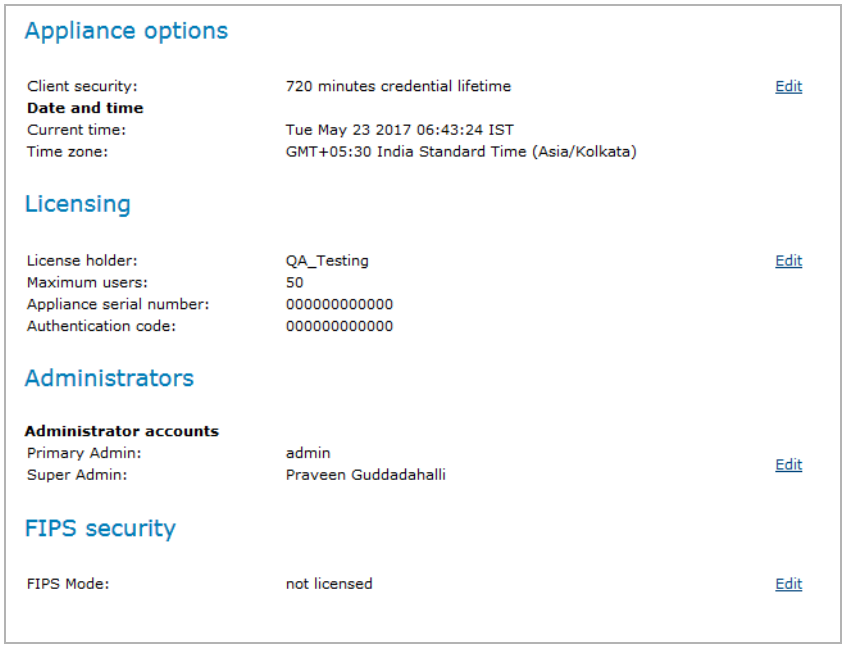
Category	Administrator permissions
Security administration	Controls administrator access to pages for access control rules, resources, users and groups, WorkPlace, OnDemand, and End Point Control.
System configuration	Controls administrator access to pages for network settings, general appliance settings, SSL settings, access and network services, authentication servers, and realms.
System maintenance	Controls administrator permission to shut down or restart the appliance, update or roll back the system software, and import or export configuration data.
System monitoring	**View** access permits the administrator to view system logs and graphs, view active users, and run troubleshooting tools (such as starting, stopping, downloading, and deleting network traces). **Modify** provides additional permissions to terminate user sessions and modify log settings.

Permission levels

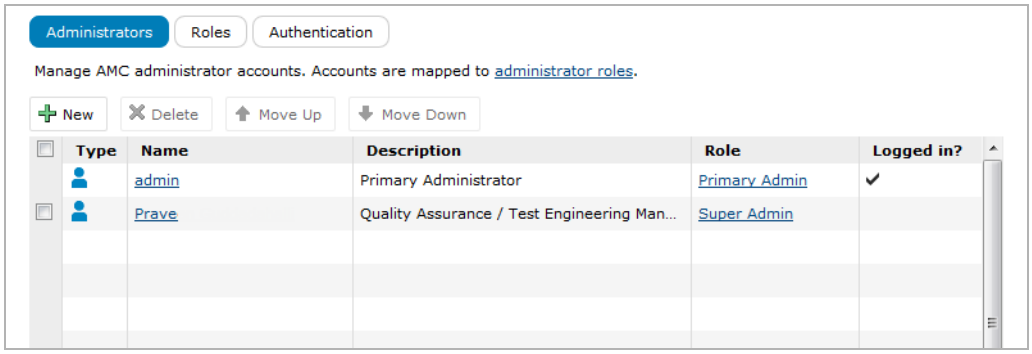
Permission level	Description
Modify	Permits read/write access within a category.
View	Provides read-only access within a category.
None	Disables access to the relevant AMC pages within a category. When you select **None** as the permission level for a category, AMC does not display either the pages within that category or the main navigation menu commands that lead to those pages.

To create an administrator role:

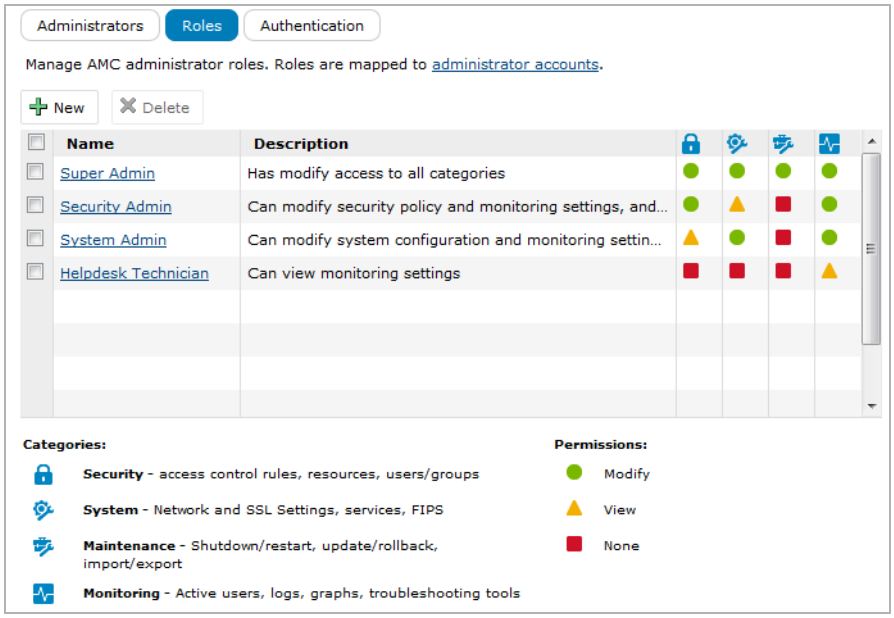
1 From the main navigation menu, click **General Settings**.



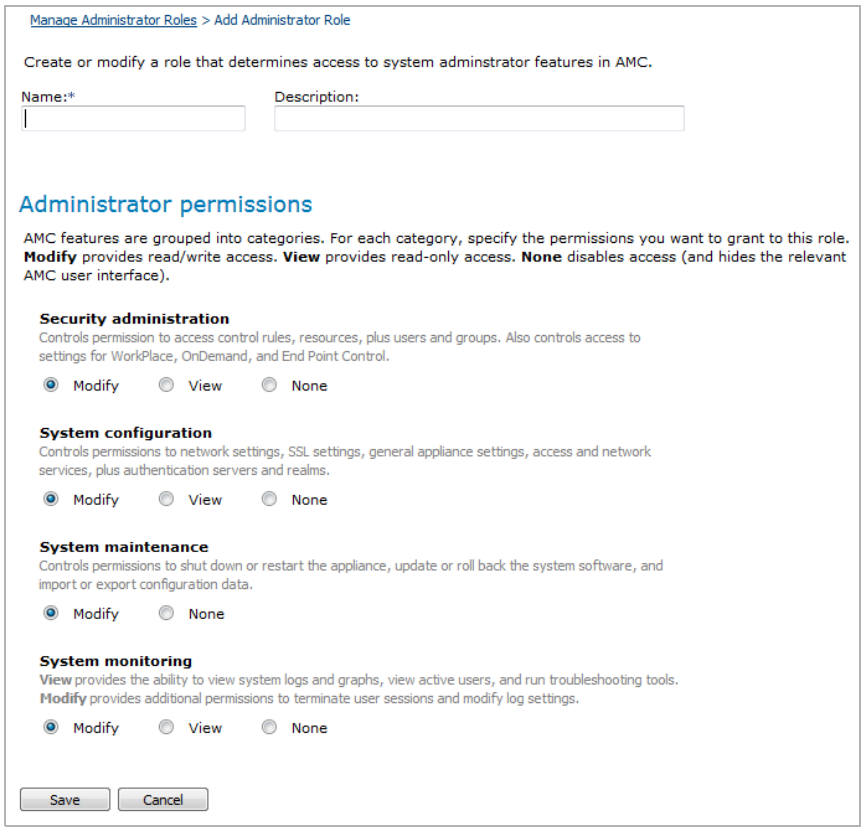
2 In the **Administrators** area, click **Edit** for the Administrator accounts. The **Manage Administrator Roles** page appears and lists the administrators and their roles.



3 Click the **Roles** tab.



4 Click **New.** The **Add Administrator Role** page appears.



5 In the **Name** field, type the name for the administrator role.

6 Optional. In the **Description** field, type a descriptive comment about the role.

7 In the **Administrator permissions** area, select one or more categories of permissions that will be granted to the role.

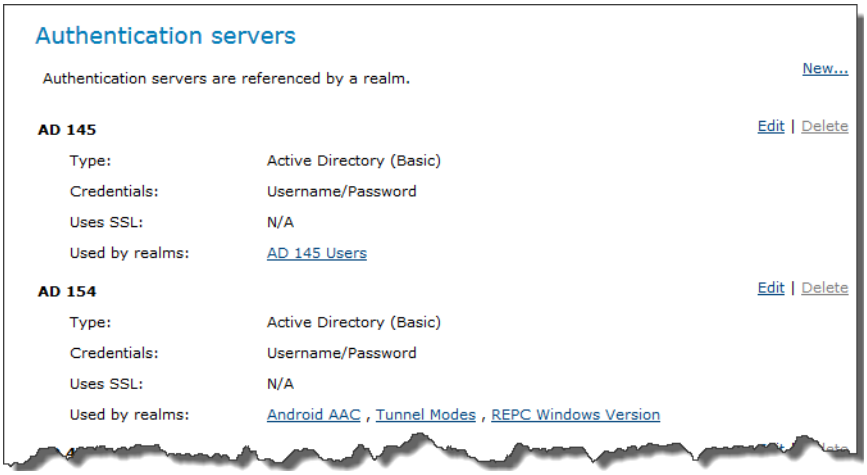
8 Click **Save**.

Adding Authentication Server

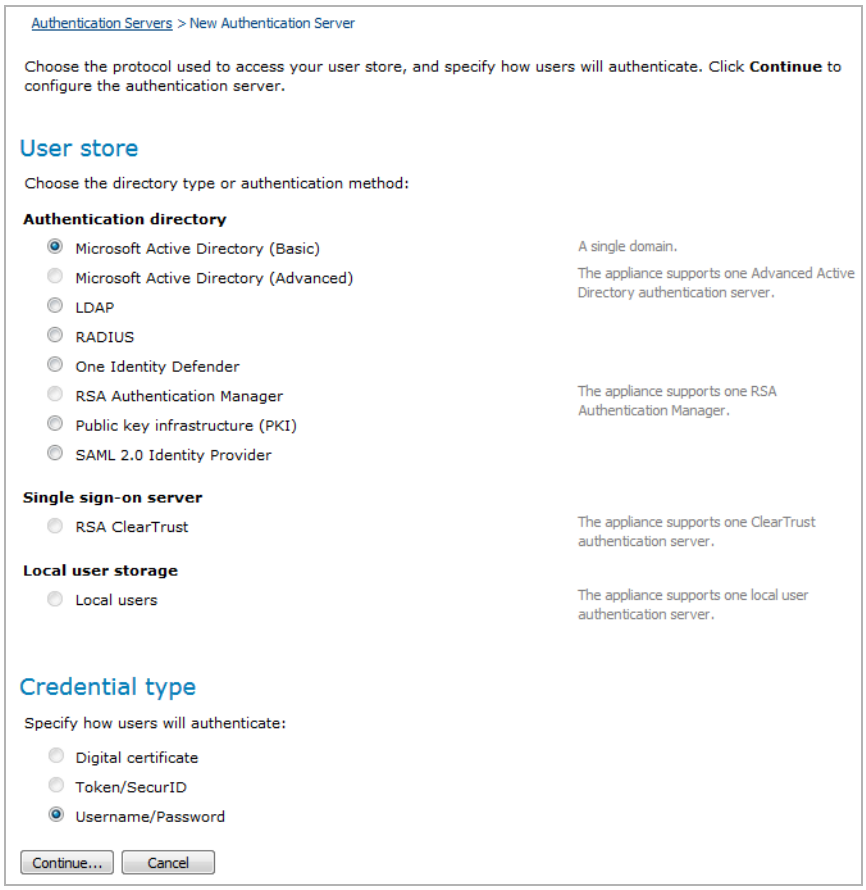
Secure Mobile Access allows you to choose the authentication server where your appliance administrators are defined. If you do not already have accounts defined in an external directory server, you can create a local authentication store and assign administrative roles to locally defined users and groups.

To add an authentication server:

1 From the main navigation menu, click **Authentication Servers**.

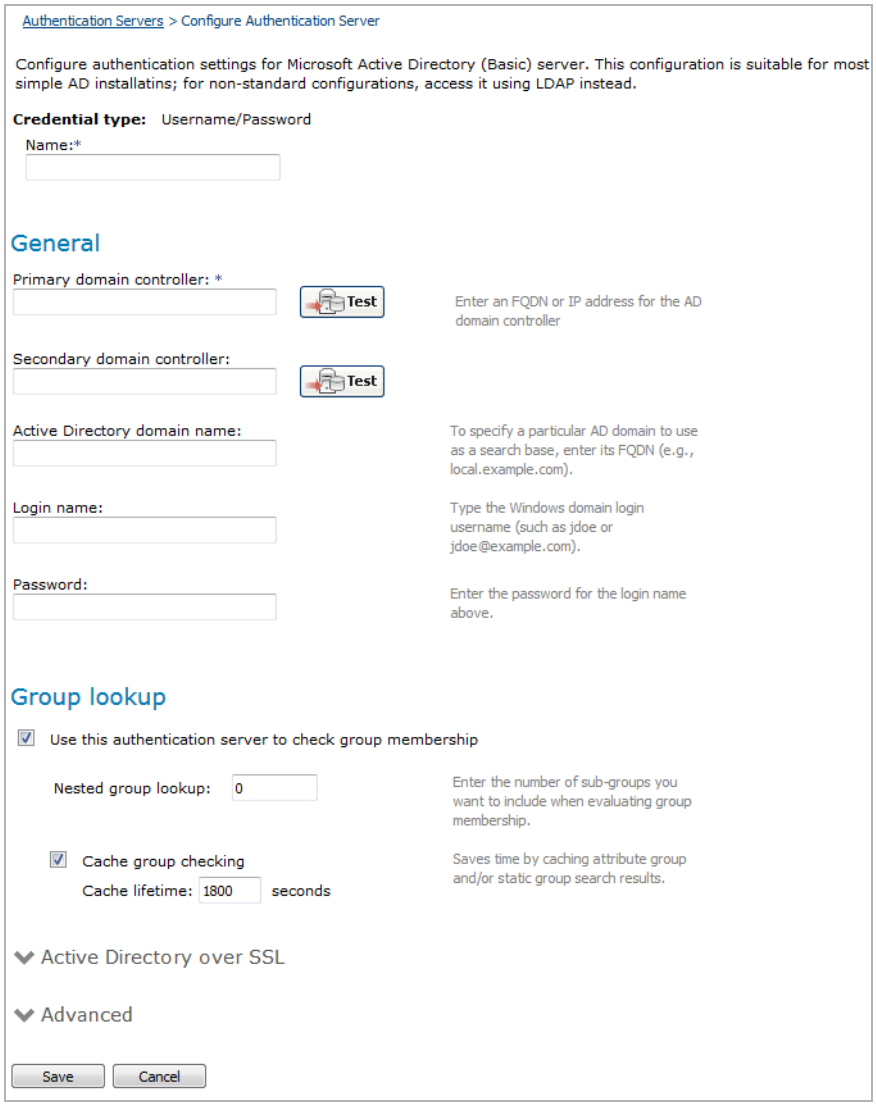


2 Click **New...**. The **New Authentication Server** page appears.



3 Enter your configuration settings,

4 Click **Continue...**. The **Configure Authentication Server** page appears.



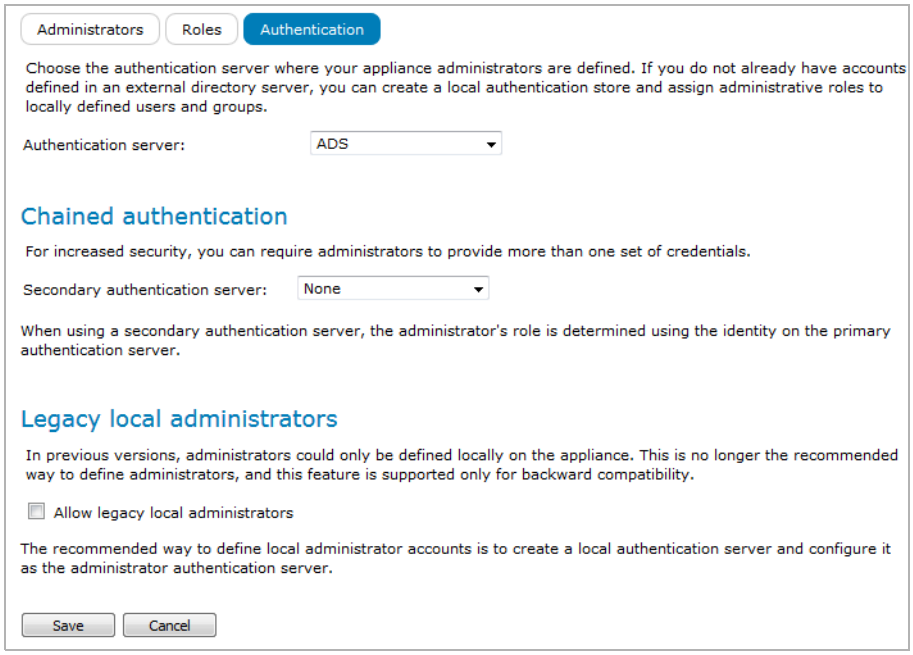
5 Enter your configuration settings.

6 Click **Save**.

7 Navigate to **General Settings**.

8 In the **Administrators** area, click **Edit** for the Administrator accounts.

9 Click the **Authentication** tab.



10 In the **Authentication server** drop-down menu, select the authentication server you added in Step 2.

11 Keep all other options as default.

12 Click **Save**.

13 Click **Pending Changes** in the upper-right of the page.

14 Click **Apply Changes**.

Editing Administrator Roles

The primary AMC administrator can modify any secondary administrator role to change permission levels, and can also delete secondary roles. For more information, see Defining Administrator Roles.

Avoiding Configuration File Conflicts with Multiple Administrators

If more than one administrator is managing your appliance, you should avoid working in AMC at the same time. If multiple administrators make changes to the same object, AMC saves the most recent one. This can cause unintentional results, and potentially cause security problems if conflicting changes are made to access control rules.

If more than one administrator is logged into AMC, you are alerted by a link in the upper-right corner of AMC.

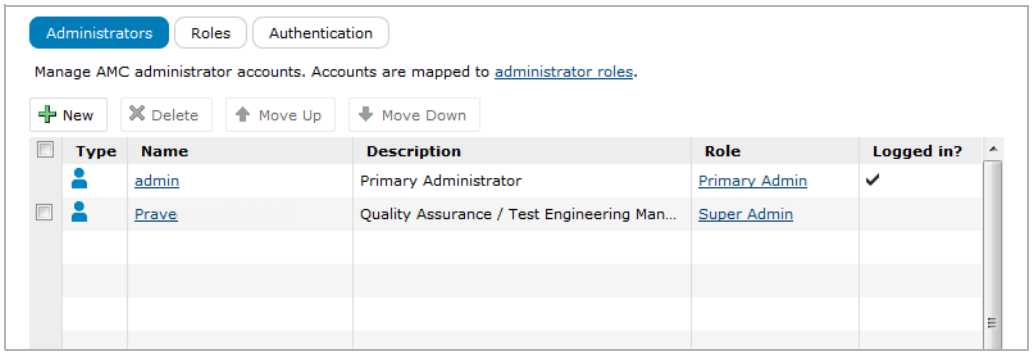
To see a list of the user names and IP addresses of all administrators who are logged into AMC, click this link: the **Administrator Sessions** page appears in a separate window. If an administrator has multiple instances of the Web browser logged into AMC, the administrator's user name and IP address is listed more than once.

You should contact the other administrators and coordinate your activities to avoid configuration file conflicts.

To view the complete list of AMC administrators:

1 Click **General Settings** in the main AMC navigation menu.

2 Click **Edit** in the **Administrator accounts** area. The **Manage Administrator Accounts** page lists all administrators and shows which ones are currently logged in.



The management console audit log tracks any AMC configuration changes made by administrators. See Management Audit Log.

To end an AMC session you must click **Log Out**; if you terminate a session by closing your Web browser, the session appears in the list of active sessions until it times out (by default, in 15 minutes).

Managing Multiple Secure Mobile Access Appliances

SMA appliances should be managed by the Central Management Server (CMS).

IMPORTANT: GMS is not supported in SMA 12.1.

The Central Management Server (CMS) is a single administrative user interface from which you can manage all of your VPN appliances. CMS is a virtual machine that reduces the total cost of operation and simplifies the management of multiple VPN appliances for enterprise companies.

Central Management Server (CMS)

The VPN Administrator uses the Central Management Console (CMC) of the Central Management Server (CMS) to manage all the VPN appliances regardless of location in the world. There is close integration between the CMS and the managed appliances through a channel with native communications. Central Management:

- Provides enterprise customers a Dashboard to manage their distributed VPN infrastructure.
- Reduces Total Cost of Operation (TCO) and operator errors associated with the management of multiple appliances.
- Provides a Central Management Console (CMC) to configure, maintain and monitor appliances.
- Simplifies license management with a centralized license that eliminates the need for separate appliance licenses.
- Optimizes license usage, that is, licenses are dynamically allocated to appliances based on user load.
- Facilitates centralized alerts via the console dashboard and SNMP traps.
- Requires no dedicated appliance or hardware (The Central Management Server is a virtual machine.)

This dashboard view in the CMC gives you a summarized view of all managed appliances.

You can apply a common configuration to managed appliances from the CMC. Consolidated monitoring and reporting gives the Administrator an overview of all the appliances that are being managed.

Working with Configuration Data

This section explains how to save and activate configuration changes in AMC.

Topics:

Saving Configuration Changes to Disk

When you're finished making changes on a page in AMC and you click **Save,** your changes are saved to disk. If you click **Cancel** or use the Back button in your browser, your changes are not saved.

To save configuration changes to disk:

1. Make any changes on a page in AMC.
2. Click **Save** at the bottom of the page.

Configuration changes are saved to disk, but are not applied to the active configuration. The status area in AMC changes to indicate that you have pending changes that need to be applied to the appliance.

See Applying Configuration Changes for more information.

There are several options for managing configuration data—exporting it or saving it on the appliance, or restoring it, for example. See Managing Configuration Data for more information.

Applying Configuration Changes

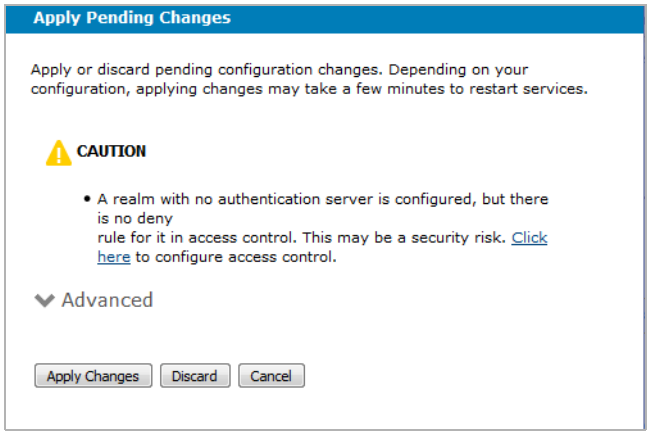
As you make configuration changes to the appliance, they are saved to disk but are not immediately applied. These changes can either be activated (described in this section) or discarded (see Discarding Pending Configuration Changes for more information).

To activate your changes, you must apply them. You can apply most changes without interrupting service to users, and new connections will use the new configuration. Low-level configuration changes (for example, an IP address change) are a bit more disruptive: network services are automatically restarted and user connections are terminated, forcing users to reauthenticate. If possible, you should apply these sorts of configuration changes during off-peak hours (perhaps during a maintenance window) and notify your users beforehand.

If you need to restart services manually, see Stopping and Starting the Secure Mobile Access Services.

To apply your changes:

1 From the list of messages at the top of the page, click **Pending changes**. The Apply Pending Changes dialog displays.



2 Assess the impact of applying your changes by looking at the message on the **Apply Changes** page:

Warning message	Description
• Applying changes will restart all services and terminate all user connections. • Applying changes will terminate existing TCP/IP user connections. • Applying changes will terminate existing HTTP user connections.	Applying any of these changes terminates existing user connections. **CAUTION: This requires users to reauthenticate, and may cause them to lose data.**
Your changes will require AMC to restart, which will end your current administrative session. When the request is complete, open a new browser and log in to AMC again.	AMC will be unavailable after your current session ends. Close your browser and then log in to AMC again.
No authentication realms are enabled. This will prevent users from accessing any resources.	At least one authentication realm must be enabled for users to have access to resources. Otherwise, users cannot authenticate to the appliance.

3 Click **Apply Changes** to apply configuration changes.

When you apply configuration changes to WorkPlace, AMC performs a restart of the services. Users do not need to reauthenticate to WorkPlace, but if they provided Windows login credentials to access a network share, they are prompted to re-enter them when WorkPlace restarts.

Any connections that exist when you apply changes continue to use the old configuration until the connection terminates. Because Web connections are short-lived, most users accessing Web resources pick up configuration changes fairly quickly. On the other hand, client/server connections can survive for a long period of time.

If the new configuration fails to load, existing connections remain in effect but new connection attempts will fail. For details on what to do in this situation, see AMC Issues.

Discarding Pending Configuration Changes

Configuration changes you make in AMC are saved to disk, but they are not in effect until you apply them, as described in Applying Configuration Changes. You can use the AMC log file to find out what changes are pending, and go to the **Apply changes** page in AMC to discard them. Pending changes can only be discarded as a group: you cannot discard them selectively.

To discard pending changes:

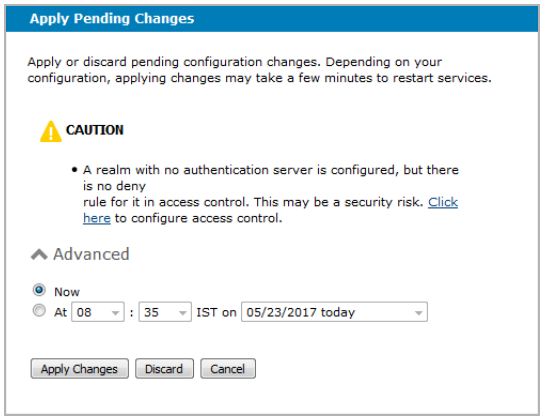
1. (Optional) You can review the list of pending changes in the management console audit log file.
   a. From the main navigation menu, click **Logging**, and then select **Management Console audit log** in the **Log file** list.
   b. Any **Info** level item added since the last **Applied configuration changes message** appears is a change that can be discarded.

   See Management Audit Log for more information.
2. From the main navigation menu, click **Maintenance**.
3. Click **Apply changes**.
4. On the **Apply Changes** page, click **Discard**. The time- and date-stamp of the configuration that will be restored when you discard pending changes is displayed.
5. Click **OK** to confirm that you want to discard changes.

Scheduling Pending Changes

To schedule changes:

1. Either click the **Pending changes** link in the upper-right corner of AMC, or click the **Apply changes** button on the **Maintenance** page to display the **Apply Pending Changes** dialog:
2. Expand the **Advanced** section by clicking the **Down** arrow icon next to the **Advanced** heading.



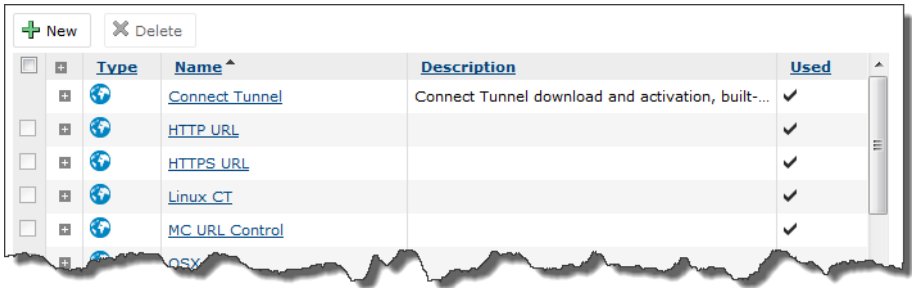
3. To schedule the pending changes to be applied at a later time, click the **At** radio button and select the desired time and date.

   You also may apply the pending changes immediately by selecting the **Now** radio button or discard the pending changes by clicking **Discard**.
4. Click **Apply Changes.** Thereafter, clicking **Pending Changes** displays the scheduled actions.

A schedule can be changed or discarded at any time before the scheduled time using this dialog.

Deleting Referenced Objects

You cannot delete an object (such as a resource or a user) if it is still referenced by another object (the checkbox next to it in AMC cannot be selected). In this example, the resource *Connect Tunnel* cannot be deleted:



To delete an object that is in use by anther object—such as a Web shortcut, a WorkPlace layout, or an access rule—you must first out what objects are using it. To do this, expand the list item by clicking on the plus (**+**) sign next to it. In this example the resource is used by a WorkPlace shortcut named *DFS*; it can be deleted only after the WorkPlace shortcut is removed. (The resource is also part of a resource group named **Default Resources**, but it can be deleted if that is the only reference.)

the Object types that cannot be deleted if referenced by other objects table lists the object types that cannot be deleted if they are referenced by other objects.

Object types that cannot be deleted if referenced by other objects

This object type…	Can be referenced by this object type…
Resource	Access control rules, resource groups, WorkPlace Web shortcuts
Resource groups	Access control rules
Users	Access control rules
User groups	Access control rules
Realms	Users, user groups
Authentication servers	Realms
Communities	Realms
Web application profiles	Resources
End Point Control zones	Access control rules, communities
Device profiles	End Point Control zones

Part 4

Authentication

- Network and Authentication Configuration

5

Network and Authentication Configuration

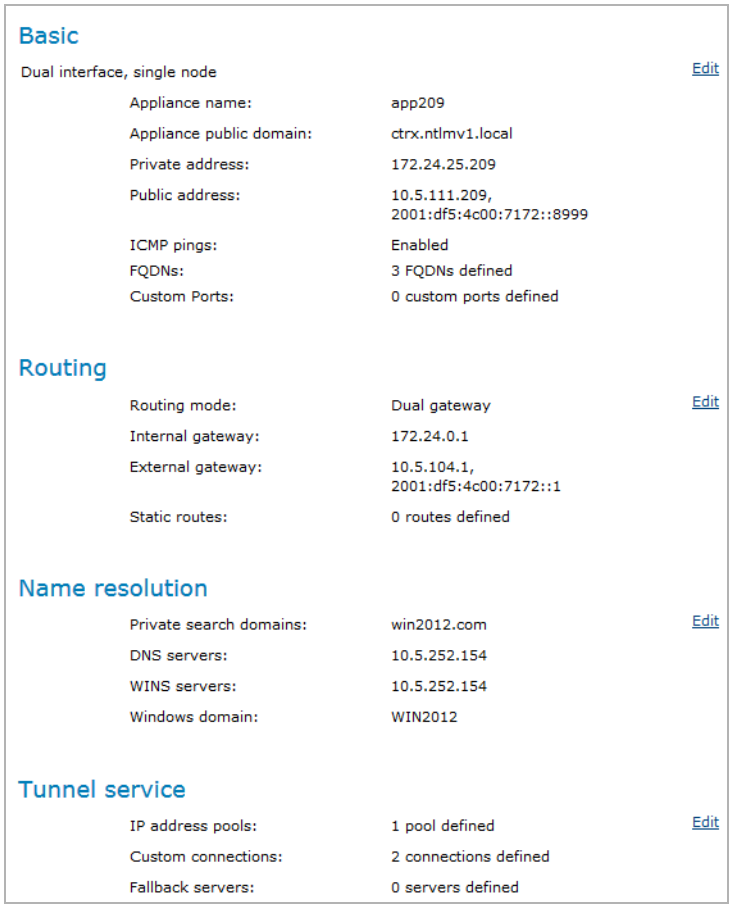
About Configuring the Network

This section provides information about essential network configuration tasks, including configuring network interfaces, selecting a routing mode, configuring network gateways, defining static routes, and name resolution. It also explains how to manage SSL and CA certificates, and configure user authentication.

This is the minimal network configuration required to get the appliance up and running. For information on configuring additional services—including NTP, SSH, ICMP, and syslog—see System Administration.

Configuring Basic Network Settings

All basic network settings—including IP interfaces, routing, and name resolution—are configurable in AMC. The starting point in AMC for configuring network options is the **Network Settings** page.



Topics:

- Specifying System Identity
- Configuring Network Interfaces
- Configuring ICMP
- Viewing Fully Qualified Domain Names and Custom Ports
- Configuring Fallback Servers for Connect Tunnel

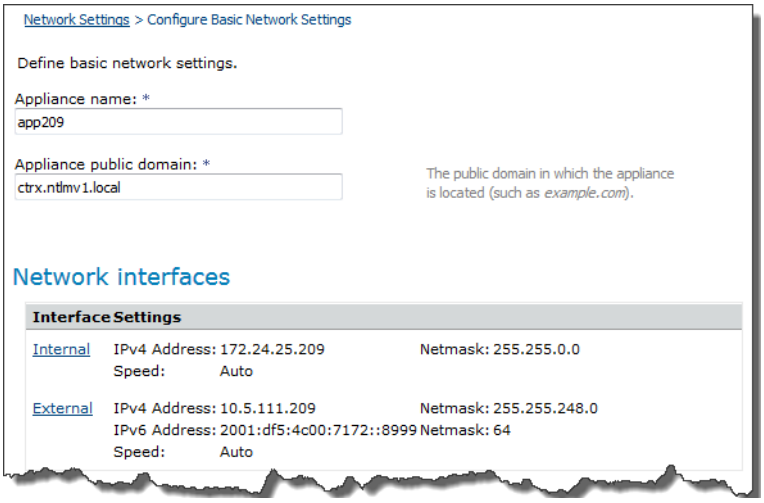
Specifying System Identity

You must name the appliance and specify the domain name in which it is located.

To specify system identity:

1 From the main navigation menu in AMC, click **Network Settings**.

2 In the **Basic** area, click **Edit**. The **Configure Basic Network Settings** page appears.



3 The **Appliance name** helps you differentiate appliances in several contexts (especially if more than one appliance is running):

- It sets the command prompt for the SMA appliance.
- It is saved to a log file, so you can identify the appliance to which a particular log message applies.
- When you export a configuration file for the appliance (on the **Maintenance** page in AMC), the **Appliance name** is prepended to the file name.

The name is not visible to users.

4 In the **Default Domain** field, type the name of the domain in which the appliance is located (for example, `yourcompany.com`). This name defines the DNS namespace used to identify hosts accessed by the appliance.

Configuring Network Interfaces

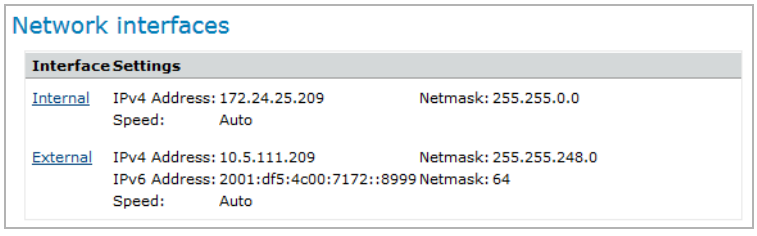
To configure the network interfaces, specify the IP address, subnet mask, and interface speed. You can run the appliance using both the internal and the external interfaces (a dual-homed configuration), or optionally just the internal interface (a single-homed configuration). For more information on the interface configuration options, see Network Architecture.

To configure network interfaces:

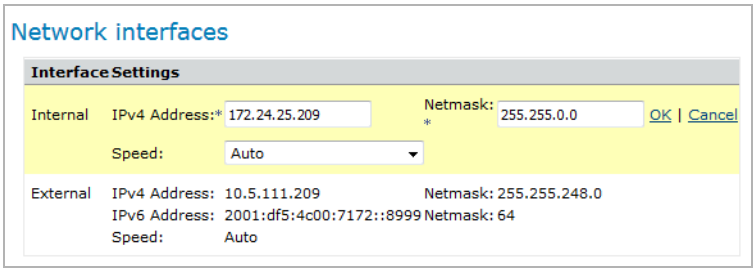
1 From the main navigation menu in AMC, click **Network Settings**.

2 In the **Basic** area, click **Edit**. The **Configure Basic Network Settings** page appears.

3 In the **Network interfaces** area, configure the settings for the internal interface connected to your internal (or private) network.



a Click **Internal**. The display becomes editable.



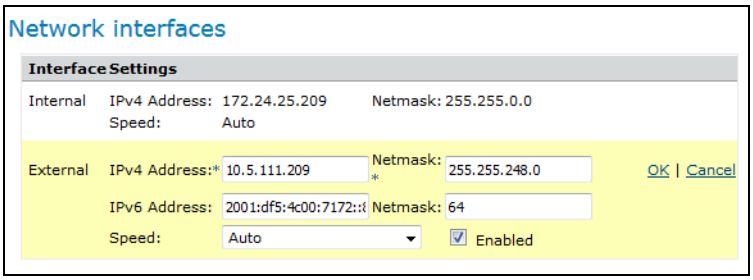
b Type an **Address** and **Netmask** for the interface.

c Select the appropriate **interface Speed** from the list (the default is **Auto**).

d Click **OK**.

4 Configure the settings for the interface connected to the external network (or Internet):

a Click **External**. The display becomes editable.



b Type the **Address** and **Netmask** settings used to access the SMA appliance from the Internet. The external IPv4 or IPv6 address must be publicly accessible.

c Select the appropriate **interface Speed** from the list (the default is **Auto**).

d Select the **Enabled** checkbox.

e Click **OK**.

5 Click **Save**.

6 Click **Pending changes**.

7 Apply the changes. (For more information, see Applying Configuration Changes.)

If you configure the appliance to use both the internal and external interfaces, verify your routing settings to make sure that you have a network route to the internal interface. If the appliance is on a different network than the computer you're using to access AMC, you must set up routing (configure an internal default network gateway that will pass traffic to an internal router, or define a static route to the network on which the appliance is installed) to maintain access to AMC after you apply your network configuration changes. For more information, see Configuring Routing.

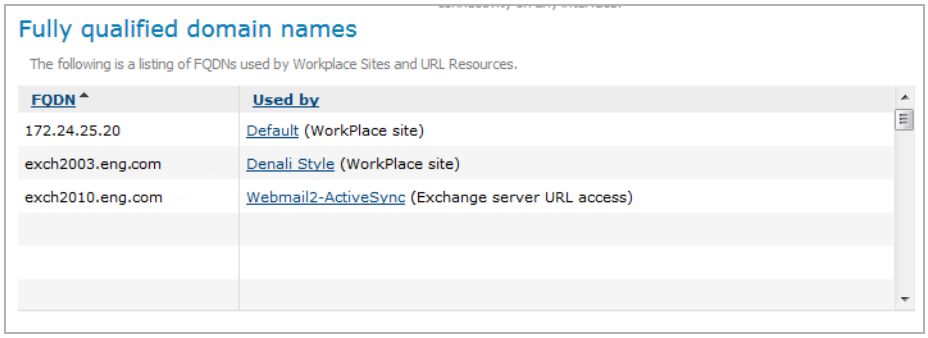
Configuring ICMP

Enabling ICMP (Internet Control Messaging Protocol) lets you use the ping command to test network connectivity on a IPv4 or IPv6 interface.

To enable pings, select the **Enable ICMP pings** checkbox. To disable pings, clear the checkbox.

Viewing Fully Qualified Domain Names and Custom Ports

The **Fully qualified domain names** section of the page provides a table of the IPv4 or IPv6 addresses, FQDNs, and the WorkPlace sites and URL resources they are used by. You can sort the list forward or backward by any column heading by clicking the column heading link.



Under **Used by**, click a WorkPlace site name or URL resource name that appears as a link to go to that page in AMC where you can edit the settings for it.

The **Custom ports** section provides a table showing the custom port number and the URL resource that uses that port for all URL resources configured to use custom ports. Under **Used by resource**, click a URL resource name that appears as a link to go to the **Resources > Edit Resource** page to edit the resource settings.

Configuring Fallback Servers for Connect Tunnel

You can set up one or more fallback servers for Connect Tunnel users in case their primary appliance becomes unavailable due to a planned outage, for example, or a natural disaster. Users do not need to know the names of the fallback servers you set up: any time a client successfully connects to an appliance that has any fallback servers specified, the list of fallback servers is transmitted to the client and stored there.

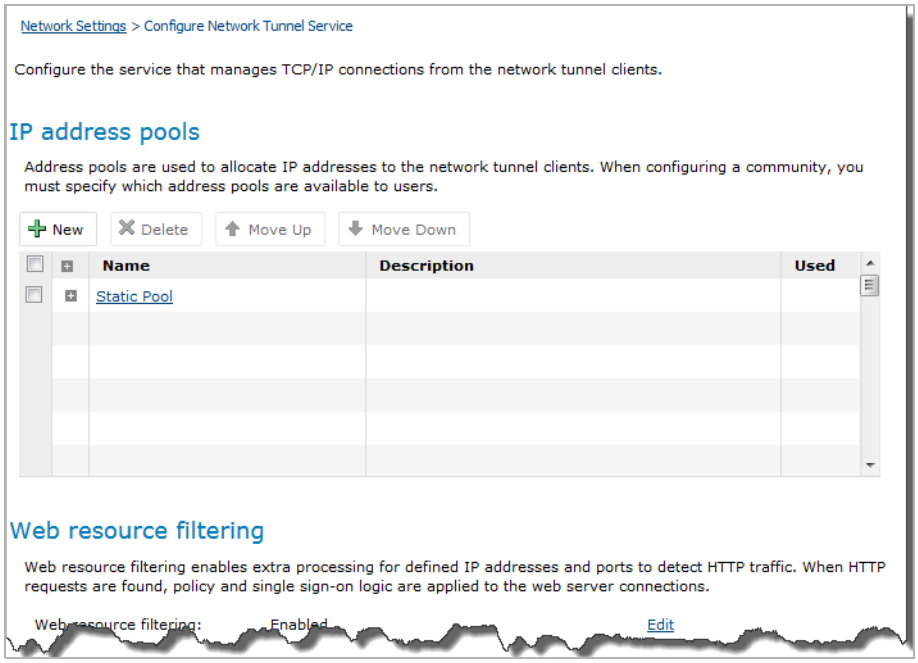
Topics:

- Fallback Servers and the User Experience
- Session Limits

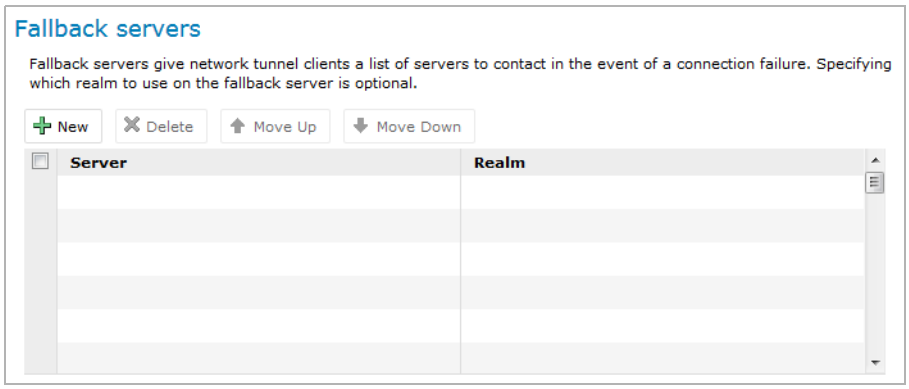
To specify a fallback server for Connect Tunnel users:

1 From the main navigation menu, click **Network Settings**.

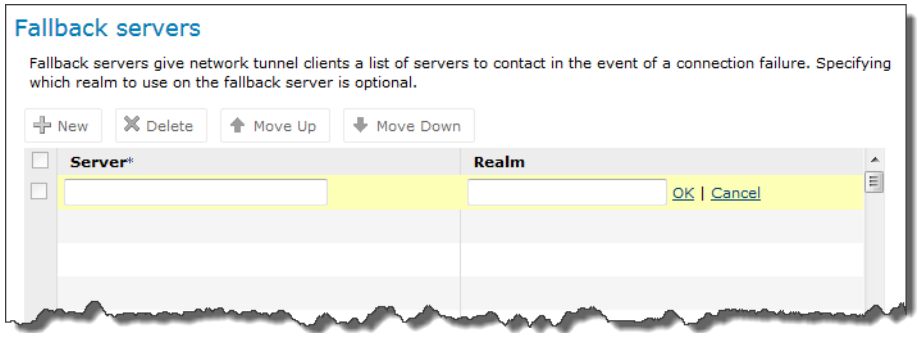
2 In the **Tunnel service** area, click **Edit**. The **Configure Network Tunnel Service** page appears.



3 In the **Fallback servers** area, click **New**.



4 Specify the fallback **Server** by host name or IP address.



5 For the **Realm** field you have two choices:

- Leave it blank: Whatever realm the user was logged in to before the primary server became unavailable is the same realm name that will be used on this particular fallback server.
- Specify a realm: Force users to log in to a particular realm when they connect to this server.

6 Click **OK**.

Fallback Servers and the User Experience

If an attempted connection to the primary server fails, the Connect Tunnel client automatically attempts a connection to any fallback servers that are specified. This feature is available to Connect Tunnel clients running on a Windows, Macintosh, or Linux operating system. Users will not be aware that a fallback server is being contacted, except for an initial pause of about 20 seconds as the connection is attempted, and a status message indicating that a backup host is being contacted.

A fallback server is used only when the user manually initiates a new connection to the primary appliance (which is down). If the primary server becomes unavailable during an active session, the session will exit and the user must start a new session.

Session Limits

If the login credentials for users include a PIN or other parameter that is valid for only a limited period of time, you should be aware of what your session limits are. For example, if **Credential lifetime** is set to only 30 seconds and the client works through several fallback servers while attempting to make a connection, the user's PIN or other parameter may time out before the list of possible servers is exhausted.

There are a few settings that govern how long a session can be resumed without requiring reauthentication:

- **Credential lifetime** is a global setting that is specified on the **Configure General Appliance Options** page (click **General Settings** in the main navigation menu, and then click **Edit** in the **Appliance options** area).
- **Limit session length to credential lifetime** is a setting that is configured on a per-community basis. When selected, tunnel client sessions in a given community terminate and require reauthentication after the length of time specified by **Credential lifetime**.

NOTE:

- If the client connects to a fallback server and the requested realm (as configured in AMC) is unavailable, the connection fails with an authentication error.
- Users connecting to a high-availability pair of appliances operate with the same fallback information, regardless of which member of the pair they initially connect to.
- Once a server has been contacted, fallback will not continue even if the login attempt fails.
- If a user manually changes from one appliance that has a fallback list of servers to another, the second server will display the last known realm the user selected for that host.

Configuring Routing

The SMA appliance can be configured to route traffic using network gateways or static routes. These routing methods can be used separately or in combination with each other.

Topics:

About Routing

- If you configure the appliance to use both the internal and external interfaces, verify the routing settings to make sure that you have a network route to the internal interface. If the appliance is on a different network than the computer you're using to access AMC, you must set up routing (configure an internal default network gateway that will pass traffic to an internal router, or define a static route to the network on which the appliance is installed) to maintain access to AMC after you apply your network configuration changes. For more information, see Configuring Routing.
- The routing information in AMC is sorted as follows:
  - The primary key is the **Netmask**, with entries sorted in descending order (from largest to smallest)
  - The secondary key is **IP address**, with entries sorted in ascending order (from smallest to largest)
- If your internal network has a contiguous address space, you can combine multiple static routes into one entry by specifying the proper subnet mask when you create the static route. the Multiple static routes combining table provides two examples of using a subnet mask to route internal traffic to multiple networks from a single static route entry:

  Multiple static routes combining

To route traffic to these networks:	Type this IP address	Type this subnet mask
192.168.0.0 192.168.1.0 192.168.2.0 192.168.3.0	192.168.0.0	255.255.252.0
192.168.*.* (all networks in 192.168 range)	192.168.0.0	255.255.0.0

  If necessary, you can explicitly create additional static routes for other subnets; the routing table searches net masks from most to least specific.

Configuring Network Gateways

A network gateway is the address of a router that serves as point of access to another network. Network gateway options are based on your network architecture and depend on whether you have configured the appliance as dual-homed (both internal and external interfaces are enabled) or single-homed (only the internal interface is enabled). See Network Architecture for more information.

Topics:

- Choosing a Network Gateway Option
- Configuring Network Gateways in a Dual-Homed Environment
- Configuring Network Gateways in a Single-Homed Environment

Choosing a Network Gateway Option

When configuring network gateways in a dual-homed environment, you can choose among four routing mode options:

- Dual gateway
- Single gateway, restricted

- Single gateway, unrestricted
- No gateway

Use these scenarios to help you decide which option is best for your needs:

- Scenario 1: Using an Internal and Internet Router
- Scenario 2: Managing Client Requests with Static Routes
- Scenario 3: Returning Client Requests to a Specified Gateway
- Scenario 4: Evaluating the Appliance in a Lab Setting
- Scenario 5: Deploying Network Tunnel Clients in “Redirect All” Mode

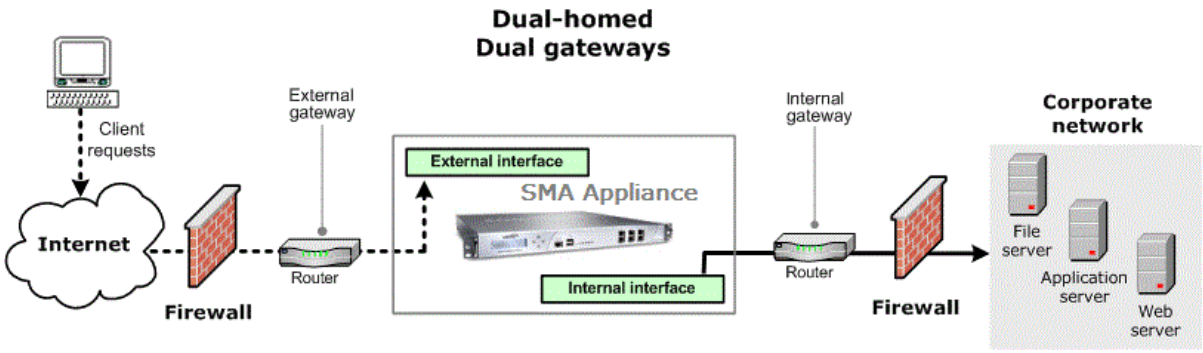
Scenario 1: Using an Internal and Internet Router

If you have an internal router as well as an Internet router, use the **Dual gateway** option. You can leverage your internal router to access your internal resources.

Sample Scenario

Company A has resources and a number of subnets on their internal network, and they already have a robust routing system in place. With the dual gateway routing mode on the appliance, client requests destined for internal resources on the corporate network can be delivered to an internal router. See Internal and internet router usage.

Internal and internet router usage

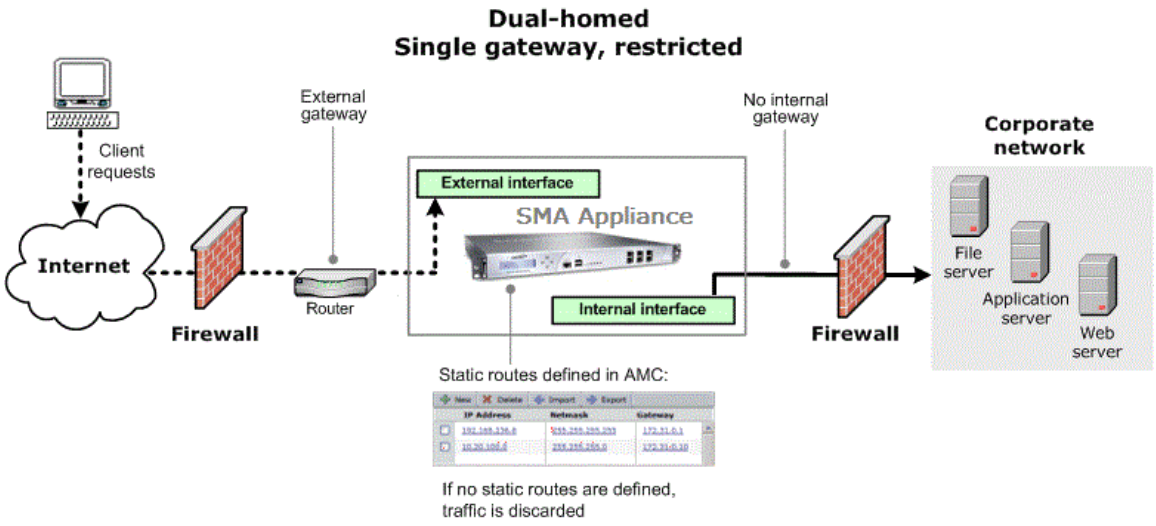


Scenario 2: Managing Client Requests with Static Routes

If you’re not using an internal router, or prefer managing routing on the appliance, use the *Single gateway, restricted* option. In this scenario you must define static routes for all of your client requests. Client requests without a static route will be discarded by the appliance. This option requires more effort, but allows greater control over in-bound traffic.

Sample Scenario

Company B does not use a lot of internal resources, and prefers to manage its routing information on the appliance. They create a static route for each resource to which their VPN users should have access. If a VPN user attempts to reach an address that is not defined within the appliance’s routing table, then the traffic is discarded. See Managing client requests with static routes.



Scenario 3: Returning Client Requests to a Specified Gateway

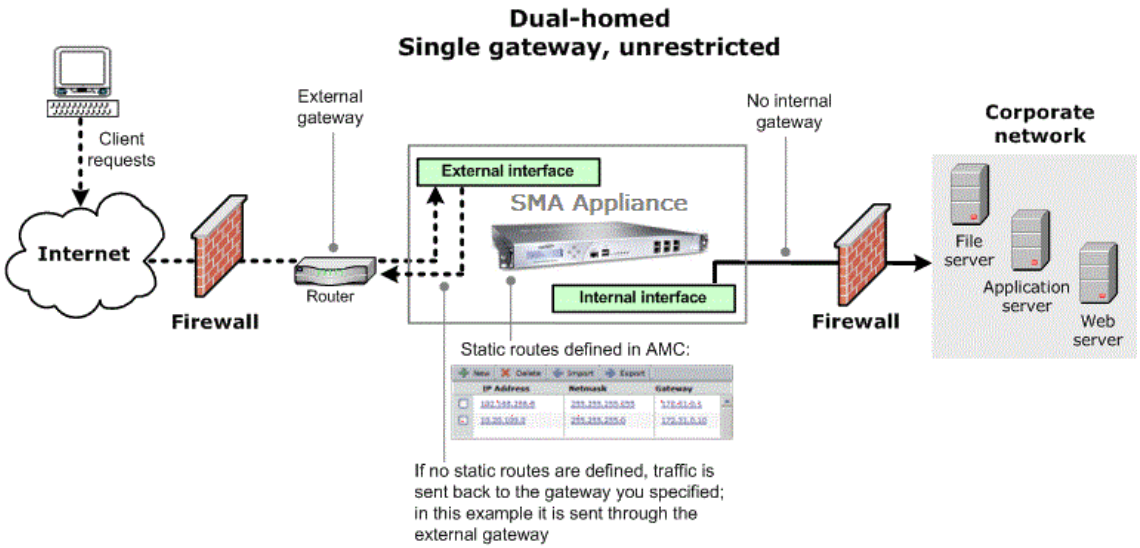
With the **Single gateway, unrestricted** option, the appliance delivers all client requests that do not match a static route to the gateway that you specify (on either the internal or external interface of the appliance). This option is less secure because it could allow traffic to pass to your Internet router and out of your network, depending on the filtering and routing policies of your infrastructure. This configuration is also more difficult to maintain.

Sample scenario

Like company B, company C prefers to manage its routing information on the appliance and has created static routes for each resource to which VPN users need access. However, some users in this organization also need access to Internet resources, and this traffic must be redirected from the appliance. For example, a company's users might need to access a public Web server that requires pre-registered IP addresses. See Returning client requests to a specified gateway.

A user must first establish a VPN session with the appliance; the request is then redirected to the external gateway of the appliance.

Returning client requests to a specified gateway



Scenario 4: Evaluating the Appliance in a Lab Setting

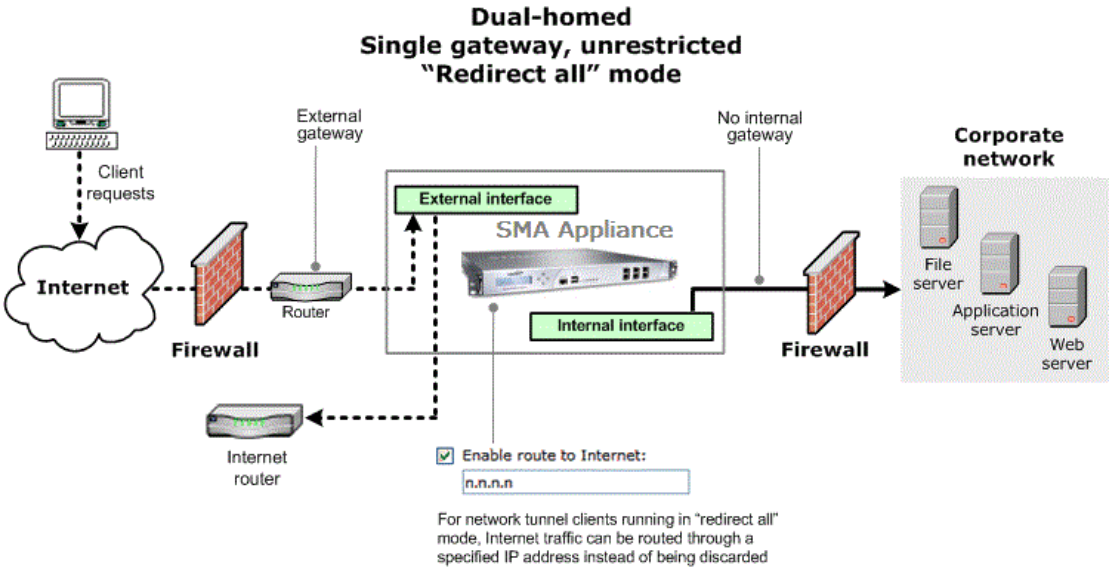
Use the **No gateway** option during evaluation if you will have the interfaces connected to your testing networks without the need for routing.

Scenario 5: Deploying Network Tunnel Clients in “Redirect All” Mode

If you are planning to deploy network tunnel clients in “redirect all” mode, you may need to give your network tunnel users access to both your internal network and the Internet (for more information, see Redirection Modes). This can be accomplished by either of these options:

- Use the **Dual gateway** option, and make certain that your internal gateway router has been configured with a route to the Internet. See Deploying network tunnel clients in “Redirect All” mode.
- Use the **Single gateway, unrestricted** option, and then configure the appliance to use a route to the Internet; see Enabling a Route to the Internet.

Deploying network tunnel clients in “Redirect All” mode



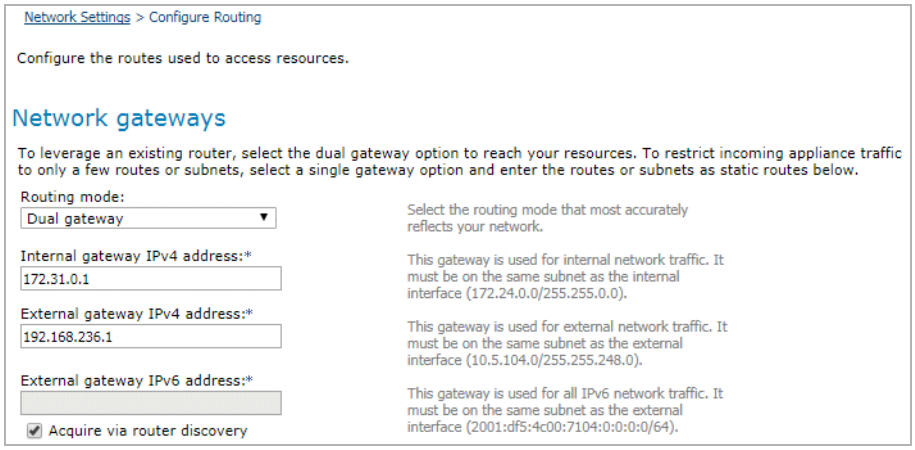
Configuring Network Gateways in a Dual-Homed Environment

The following steps guide you through the setup of network gateways in a dual-homed environment, where both the internal and external interfaces are enabled.

To configure network gateways in a dual-homed environment:

1 From the main navigation menu, click **Network Settings**.

2 In the **Routing** area, click **Edit**. The **Configure Routing** page appears.



3 To route traffic to your network gateways, select a routing mode from the following options:

- **Dual gateway**—Specify an IP address for both the external and the internal gateways. Network traffic generated in response to client requests will be sent to the external gateway. All other traffic that does not have a static route defined will be sent to the internal gateway.
- **Single gateway, restricted**—Specify an IP address for just the external gateway. All other traffic that does not have a static route defined will be discarded.
- **Single gateway, unrestricted**—Specify an IP address to be used as both the external and internal gateway. Network traffic not matching a static route will be sent to the external gateway.

- **No gateway**—Network traffic received by the appliance but not matching a static route is discarded.

4 Click **Save**.

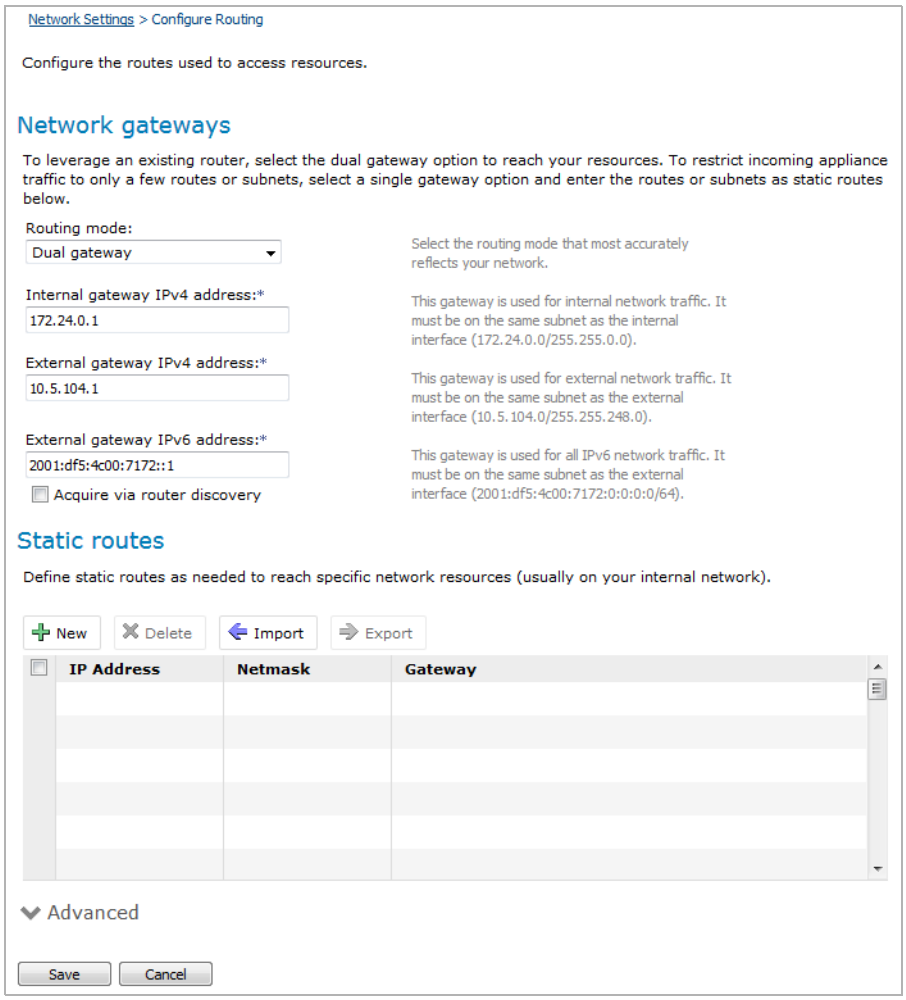
Configuring Network Gateways in a Single-Homed Environment

The following steps guide you through the setup of network gateways in a single-homed environment, where only the internal interface is enabled. This configuration is less common than one that is dual-homed.

To configure a network gateway in a single-homed environment:

1 From the main navigation menu in AMC, click **Network Settings**.

2 In the **Routing** area, click **Edit**. The **Configure Routing** page appears.



3 To route traffic to your network gateway, select one of these routing modes:

- **Default gateway**—Specify an IP address for the default gateway. Network traffic received by the appliance, but not matching a static route will be sent to this address.
- **No gateway**—Network traffic received by the appliance, but not matching a static route is discarded.

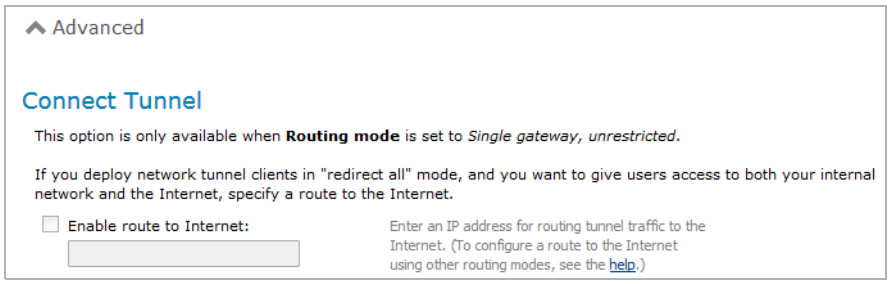
4 Click **Save**.

Enabling a Route to the Internet

If **Routing mode** is set to **Single gateway, unrestricted** you can still enable a route to the Internet for your network tunnel clients, provided your appliance is dual-homed (both internal and external interfaces are enabled). When **Enable route to Internet** is set, all tunnel traffic originating from the client and destined for the Internet (running in “redirect all” mode) will be routed to the specified IP address instead of being discarded.

To enable a route to the Internet:

1. From the main navigation menu in AMC, click **Network Settings**.
2. In the **Routing** area, click **Edit**. The **Configure Routing** page appears.
3. Expand the **Advanced** area. The **Connect Tunnel** area appears.



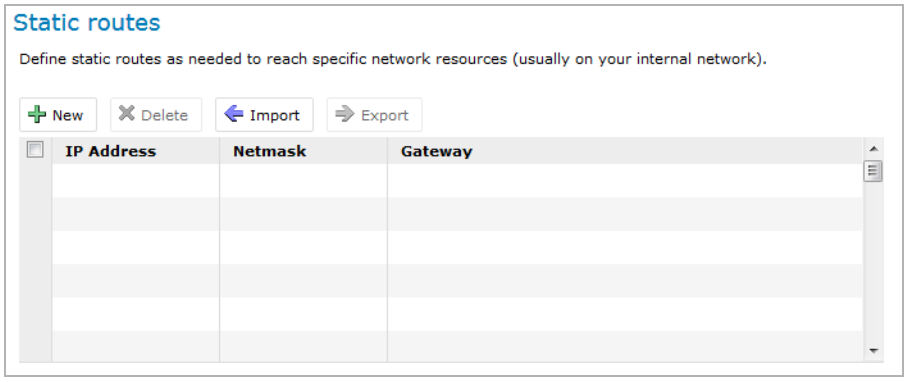
4. Select the **Enable route to Internet** checkbox, and then type the IP address of your Internet router.
5. Click **Save**.

Configuring Static Routes

Static routes are added as entries to the routing table for networks reached from the internal interface. Managing static route tables can be cumbersome, especially at a large site: you may want to create and edit the routing information in a comma-separated value (CSV) text file outside of AMC and then import it. Static route information that you import into AMC must be in an ASCII text file, with each entry on a new line (separated from the previous entry by a CR/LF), and three values separated by commas: IP address, netmask, and gateway. When you import a file, its contents entirely replace any static routes currently specified in AMC.

To configure static routing information:

1. From the main navigation menu in AMC, click **Network Settings**.
2. In the **Routing** area, click **Edit**. The **Configure Routing** page appears.
3. In the **Static routes** area, you can add or modify list entries one by one or as a group:



- Add a single entry by clicking **New**, and then typing the route information in the **IP address**, **Netmask**, and **Gateway** fields. To modify a list entry, click its link, and then make your changes. After you add or modify an entry, click **OK**.
- Click **Import** to select the static route table you want to import. The static route information must be in an ASCII text file in CSV format. Each entry must be on a new line (separated from the previous entry by a CR/LF), and must have three values separated by commas: IP address, netmask, and gateway. When you import a file, its contents entirely replace any static routes currently specified in AMC.
- To modify an existing list of routes, you must either click the list item that you want to change, or export the entire list, modify its contents, and then import it.

4 Click **Save** when you are finished making changes.

To delete a static route:

1 On the **Configure Routing** page, select the checkbox to the left of any static routes you want to remove, and then click **Delete**.

2 Click **Save**.

Configuring Name Resolution

The appliance needs access to DNS servers to resolve host names to IP addresses. If you use WorkPlace to browse Windows networks, you also need to specify a WINS (Windows Internet Name Service) server and Windows domain name.

Topics:

- Configuring Domain Name Service
- Configuring Windows Network Name Resolution

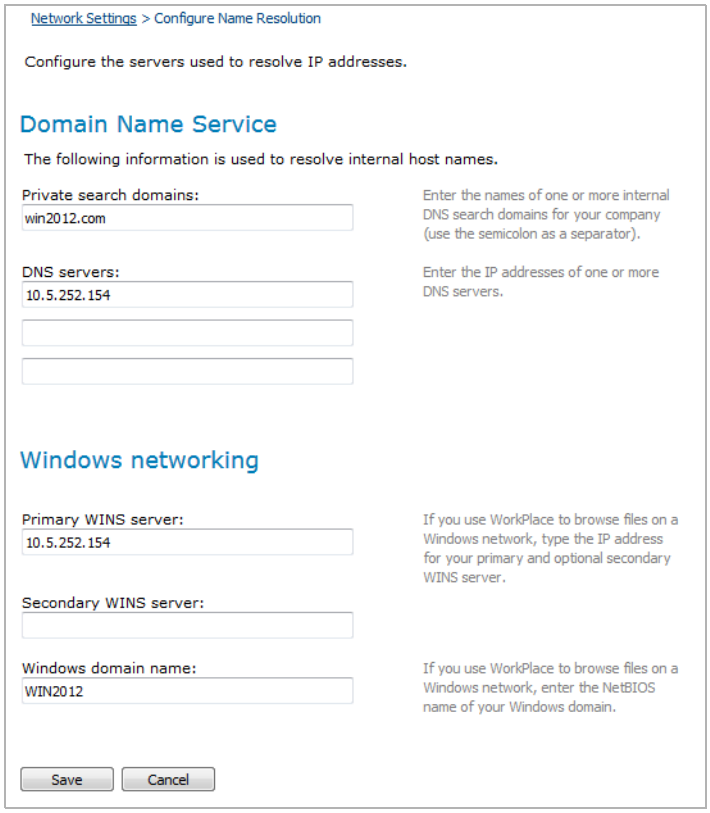
Configuring Domain Name Service

Configuring a DNS server enables the appliance to correctly resolve host names. Properly configuring DNS ensures that the appliance can provide access to your network resources.

To configure DNS name resolution:

1 From the main navigation menu in AMC, click **Network Settings**.

2 In the **Name resolution** area, click **Edit**. The **Configure Name Resolution** page appears.



3 In the **Private search domains** field, type one or more DNS domain names for your company with a semicolon (;) separator (such as `example.com`; `sales.example.com`). This domain name will be appended to unqualified host names to resolve them. You can enter a maximum of six domain names, separated by semicolons.

4 In the **DNS servers** fields, type the IP addresses of your primary and (if applicable) backup DNS servers. The backup servers are used if the primary server is unavailable.

5 Click **Save**.

Configuring Windows Network Name Resolution

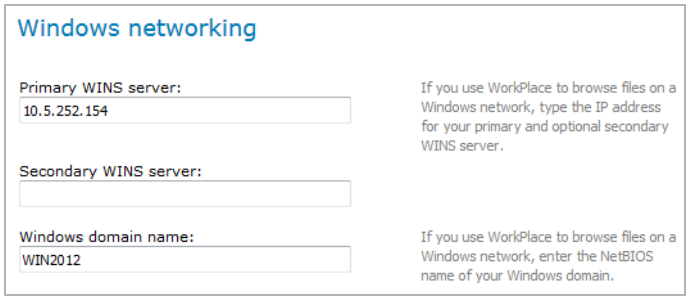
If you want to browse files on a Windows network using WorkPlace, you must specify a WINS (Windows Internet Name Service) server and a Windows domain name. WorkPlace uses this information to perform name resolution and build a list of resources for users to browse.

To configure Windows network name resolution:

1 From the main navigation menu in AMC, click **Network Settings**.

2 In the **Name resolution** area, click **Edit**. The **Configure Name Resolution** page appears.

3 In the **Windows networking** area, type:



- The IP address of your primary and (if applicable) secondary WINS server.
- Your **Windows domain name** using NetBIOS syntax (for example, `mycompany`).

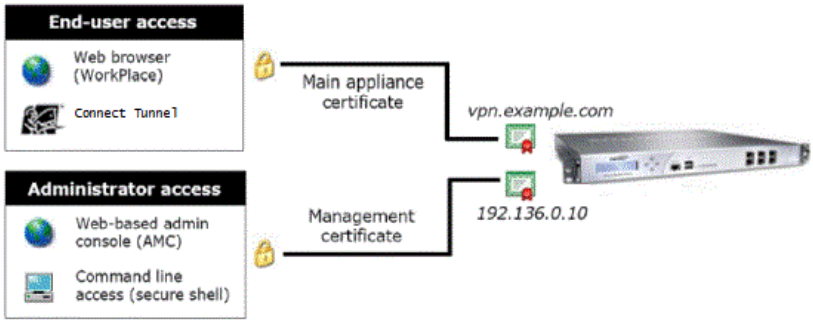
4 Click **Save**.

Certificates

The SMA appliance uses SSL certificates to secure information that the client computer sends to the server, and to validate the appliance's identity to connecting users; see Certificate usage. It requires at least two SSL certificates:

- The Secure Mobile Access services use a certificate to secure user traffic from a Web browser to WorkPlace, and from the Connect clients to the appliance. (If you want to provide several WorkPlace sites, you can use a wildcard certificate for multiple sites, or associate a different certificate with each one. In either case, the sites can have different host and domain names; for more information, see Adding WorkPlace Sites.)
- AMC uses a separate certificate to secure management traffic. This is usually a self-signed certificate.

Certificate usage



Subject Alternative Name (SAN) certificates are supported for Workplace, Workplace sites, and Connect Tunnel. These certificates are used to securely encrypt communication channels between a set of clients and multiple distinct SSL or TLS services.

SAN certificates simplify the IP address/hostname/certificate sets needed for a typical deployment. With a single SAN certificate, you can utilize one IP address with multiple distinct SSL or TLS protected web or client/server services, without the need for configuring additional IP addresses. Additionally, SANs can be used for different host names on the same IP address, alleviating the need for a one-to-one mapping of SSL certificate Common Names to FQDN.

NOTE: Only IPv4 addresses are supported in SAN certificates and Certificate Signing Requests (CSR).

Improvements include:

- SANs-related features can be generated via the AMC instead of through mechanisms external to the appliance:
    - CSR with SANs
    - Self-signed certificates with SAN entries
- WorkPlace sites, custom FQDN URL resources, and ActiveSync resources can be created using existing SAN certificates.
- The appliance seamlessly handles Web connections to Workplace sites that use a combination of IP address, FQDN, or SSL certificate, regardless of whether that Workplace site has its own dedicated IP address or is sharing one with the Default Workplace site.
- When using Connect Tunnel or Mobile Connect connections to Workplace sites, ensure Workplace sites are not defined with a dedicated IP address, but share the Default Workplace site IP address. For example, if a Default Workplace site of `vpn.mycompany.com` is bound to `192.168.200.160` with a SSL certificate, `*.mycompany.com`, and you want to add a new Workplace site for `contractors.mycompany.com`, simply add the Fully Qualified Domain Name (FQDN) to the New Workplace Site configuration page, and do not specify another IP address. This allows Web or Tunnel connections to connect to either `vpn.mycompany.com` or `contractors.mycompany.com` with no further configuration needed on the appliance.

The Administrator can generate, import, process, and otherwise use a SAN certificate for Workplace, ActiveSync, Custom FQDN URL Mapping, or Tunnel-based access services.

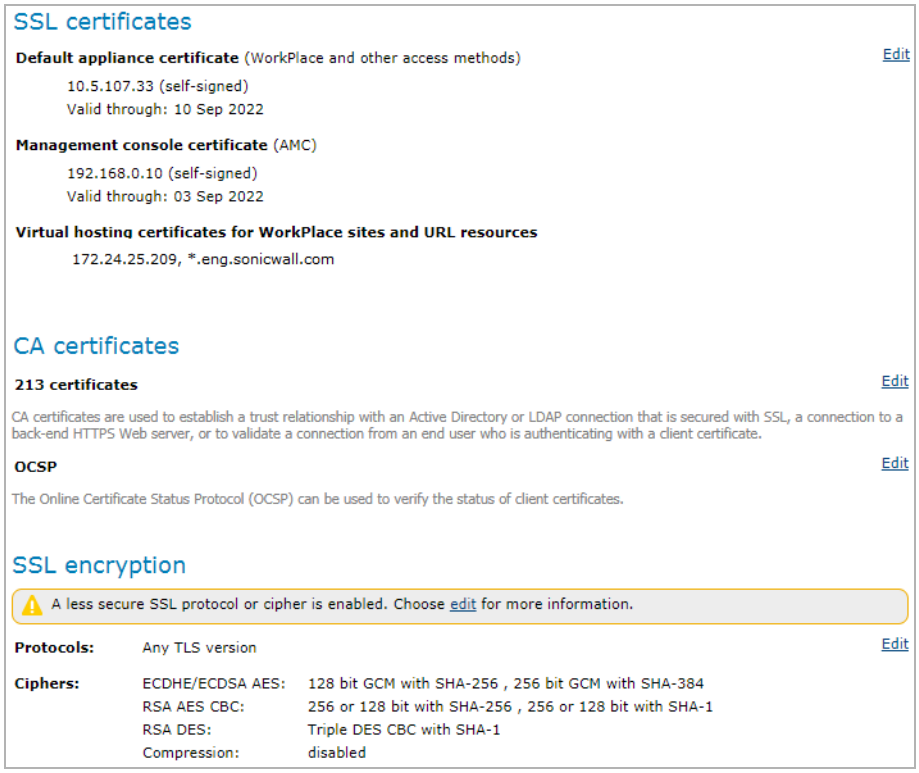
CA certificates are also used for securing connections to back-end servers and authentication using client certificates. See Importing CA Certificates for more details.

Topics:

- Server Certificates
- CA Certificates
- Working with Certificates FAQs

Server Certificates

To manage the SSL server certificates used to access WorkPlace and AMC, click **SSL Settings** in the main navigation menu in AMC.



This is where you view, import, and delete SSL and CA certificates.

- Certificate Strategy
- Obtaining a Certificate from a Commercial CA
- Creating a Self-Signed Certificate
- Managing Server Certificates in AMC

Certificate Strategy

There are two types of certificates:

- A **commercial CA** verifies your company's identity, vouching for your identity by providing you with a certificate that the CA signs. A CA need not be commercial or third-party—a company can be its own CA. Commercial certificates are purchased from a CA such as Symantec (http://www.symantec.com/ssl-certificates), and are usually valid for one year.
- With a **self-signed SSL certificate**, you are verifying your own identity. The associated private key data is encrypted using a password. A self-signed certificate can also be a wildcard certificate, allowing it to be used by multiple servers which share the same IP address and certificate, but have different FQDNs.

  Although this kind of certificate is secure, a self-signed certificate is not in the browser's built-in list of CAs, so the user is prompted to accept it before each connection. There are a few ways to avoid this prompting:

  - Configure the Secure Mobile Access clients to use the certificate root file.

- Add the self-signed certificate to the user's list of Trusted Root Certificate Authorities in the Web browser.
- Use a commercial CA, which is widely trusted by default.

When deciding which type of certificate to use for the servers, consider who will be connecting to the appliance and how they will use resources on your network:

- If business partners are connecting to Web resources through the appliance, they will likely want some assurance of your identity before performing a transaction or providing confidential information. In this case, you would probably want to obtain a certificate from a commercial CA for the appliance.

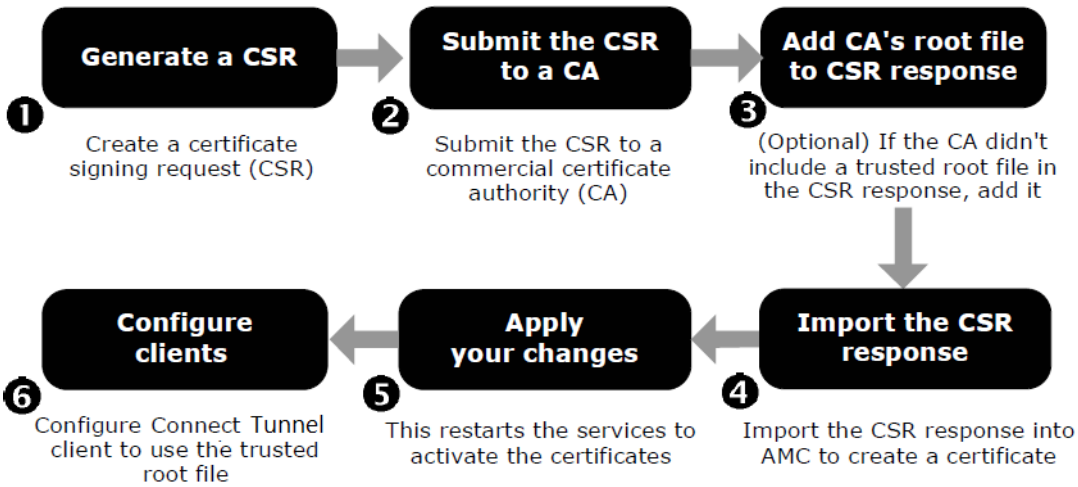
  On the other hand, employees connecting to Web resources may trust a self-signed certificate. Even then, you may want to obtain a third-party certificate so that users are not prompted to accept a self-signed certificate each time they connect.
- To accommodate users who connect to the appliance from small form factor devices, configure the appliance with a certificate from a leading CA (such as VeriSign), or import the root certificate from your CA to your users' small form factor devices.

CAUTION: When the appliance is configured with a certificate from a CA that is not well known or one that is self-signed, small form factor device users may see an error message and be unable to log in. Windows Mobile-powered devices, for example, are configured with the root files for only VeriSign, CyberTrust, Thawte, and Entrust. For more information on small form factor devices, see WorkPlace and Small Form Factor Devices.

Obtaining a Certificate from a Commercial CA

Obtaining a certificate from a commercial CA provides verification of your identity for people who connect to your network through the appliance. You must perform several steps to obtain and configure a certificate from a commercial CA, as shown in Obtaining a CA certificate.

Obtaining a CA certificate



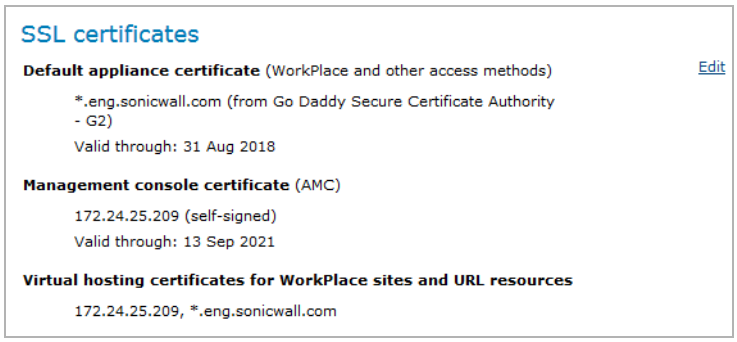
- Step1: Generate a Certificate Signing Request
- Step2: Submit the CSR to a Commercial CA
- Step 3: Review CSR Response and Add CA's Root Certificate
- Step 4: Import the CSR Response Into AMC
- Step 5: Apply Your Changes

Step1: Generate a Certificate Signing Request

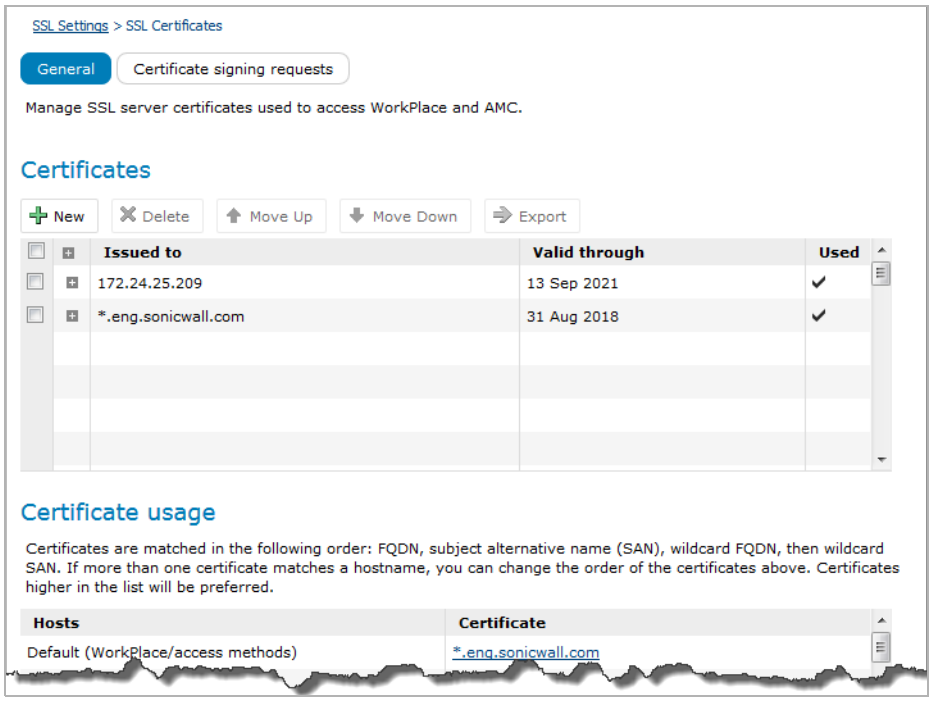
Using AMC, you can generate a certificate signing request (CSR). This process creates an RSA key pair that is used to secure server information, and a CSR containing your public key and identity information. The information you provide is used by the commercial CA to generate your certificate, and may be visible to users who connect to the appliance.

To generate a CSR:

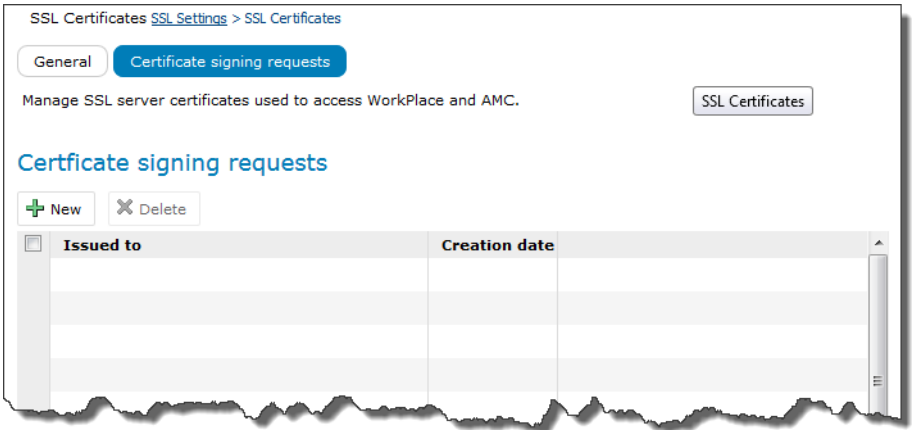
1 From the main navigation menu in AMC, click **SSL Settings**.



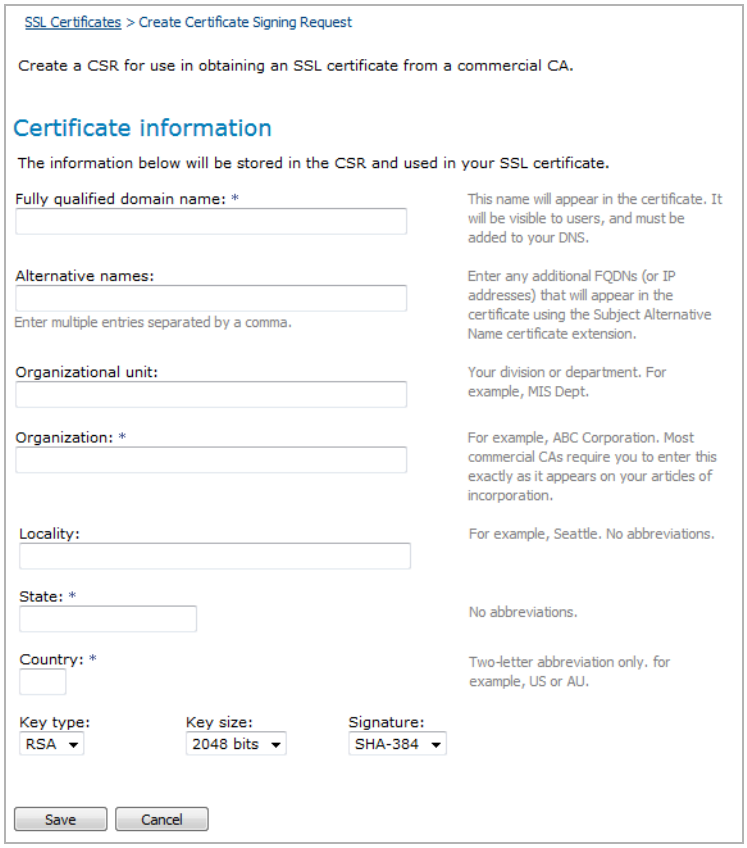
2 In the **SSL certificates** area, click **Edit**. The **SSL Certificates** page displays.



3 Click the **Certificate signing requests** tab.



4 In the **Certificate signing requests** area, click **New...**. The **Create Certificate Signing Request** page appears.



5 The Certificate information you fill out is stored in the CSR and used by the commercial CA when generating your certificate; it may be visible to users who connect to the appliance.

> **NOTE:** Some commercial CAs may have problems reading CSRs that contain characters produced by pressing the SHIFT key, such as & or !. For example, when specifying your company name or other information, you may want to spell out *&* (if used) as *and*.

a In the **Fully qualified domain name** field, type the server name as you want it to appear in the certificate. Also known as a common name (or CN), this is usually composed of a host and a domain name; for example, you might type `vpn.example.com`.

Users with a Web-based client will use this name to access the appliance (in other words, to access WorkPlace), so it's best to use a name that is easily remembered. You'll also reference this

name when configuring the Connect or OnDemand components to provide access to TCP/IP resources. You must add this name to your external DNS to make the appliance accessible to users.

Certificate Signing Requests can be created with multiple FQDN or IP addresses. On the **SSL Settings > SSL Certificate > Create Certificate Signing Request** page, simply enter multiple FQDNs and/or IP addresses separated by commas. Any number of SANs can be added to a certificate, but the text input field is 1,000 characters maximum. Wild cards are permitted. The entered FQDNs and IP addresses are encoded in the subject alternative name certificate extension and the certificate FQDN is encoded as an additional SAN entry in the CSR.

b In the **Alternative name** field, type any additional FQDNs or IP addresses that should appear in the certificate using the Subject Alternative Name certificate extension. Separate multiple alternative names and IP addresses with a comma.

c In the **Organizational unit** field, type your division or department (for example, MIS Dept).

d In the **Organization** field, type your company or organization name as you want it to appear in your SSL certificate.

e In the **Locality** field, type your city or town. Do not use an abbreviation.

f In the **State** field, type the name of your state or province. Do not use an abbreviation.

g In the **Country** field, type the two-letter abbreviation for your country. For a list of valid country codes, see the International Organization for Standardization (ISO) Web site at http://www.iso.org and search for ISO 3166-1.

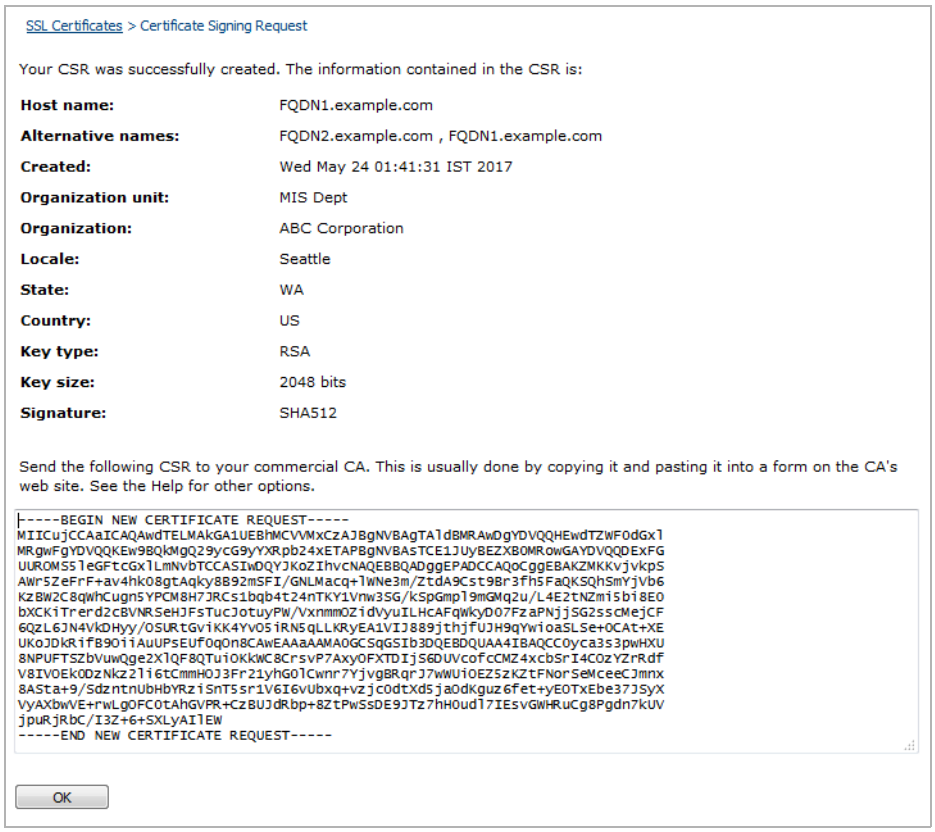
h In the **Key length** drop-down menu, select the key length you want to use for the key: **512**, **768**, **1024**, **1280**, **1536**, **2048** (the default), or **3072**. Larger keys increase security, but make the appliance run more slowly. A key length of 2048 is recommended for most installations.

6 Select the key type from the **Key type** drop-down menu. The default is **RSA**.

7 In the **Signature** drop-down menu, select the algorithm used for the certificate.

8 Review the information to verify that you've typed it correctly.

9 Click **Save** to generate the CSR. The **Certificate Signing Request** page redisplays with the CSR information you entered.



10 Copy the contents of the CSR text from AMC to the clipboard or into a text file.

11 Click **OK**.

Step2: Submit the CSR to a Commercial CA

The process of submitting a CSR varies, depending on which commercial CA you choose.

To submit a CSR to a commercial CA:

1 Copy the contents of your certificate signing request from the **Create Certificate Signing Request** page in AMC.

2 Submit it to the CA using the method they request (usually you either copy and paste the CSR text into a form on the CA's Web site, or attach it to an email message).

Depending on what is specified by the CA, you may need to paste all the text, or only the text between the `BEGIN NEW CERTIFICATE REQUEST` and `END NEW CERTIFICATE REQUEST` banners (including the banners themselves). If you're not sure, contact the CA.

3 Wait for the commercial CA to verify your identity. You may be asked to produce one or more documents attesting to your corporate identity (such as a business license or article of incorporation).

NOTE: Submit your CSR only once; you may otherwise be billed twice by the CA. This would also change the internal private key, making the response from the CA unusable.

Step 3: Review CSR Response and Add CA's Root Certificate

After you've submitted your CSR, you must wait for the CA to verify your identity. After they complete this process, the CA will send you the certificate reply. It is usually in one of two formats:

- **A file attached to an email message.** In this case, you can save the file to your local file system (the one from which you'll access AMC) and then import it into AMC.
- **Text embedded within an email message.** In this case, you copy the text and paste it into a text box provided in AMC. Be sure to include the `BEGIN CERTIFICATE` and `END CERTIFICATE` banners.

If the CA does not provide a full certificate chain in the CSR response (a common practice), AMC will try to complete the certificate chain when you import the CSR response. If it is unable to complete the chain, AMC displays an error message. If this occurs, you must upload the CA's root certificate or any intermediary public certificates to the appliance. If you are acting as your own CA, you will probably need to perform this step.

To complete a certificate chain:

1. Obtain the trusted root certificate or intermediary public certificate from the CA. Most external commercial CAs provide the certificates on their Web site; if the CA is run by your company, check with the server administrator.
2. From the main navigation menu in AMC, click **SSL Settings**.
3. In the **SSL certificates** area, click **Edit**.
4. In the **Certificate signing requests** list, click the **Process CSR response** link for the appropriate certificate. The **Import CSR Certificate** page appears.
5. Upload the certificate:
    - If the certificate is in binary format, click **Browse** and then upload the certificate reply from your local file system (that is, the computer from which you've logged in to AMC).
    - If the certificate is in base-64 encoded (PEM) text format, click **Certificate text** and then paste the certificate into the field. Be sure to include the `BEGIN CERTIFICATE` and `END CERTIFICATE` banners.
6. Click **Import** to return to the **CA Certificates** page.
7. To verify that the certificate was properly uploaded, click **CA Certificate**. The new certificate should appear on the **CA Certificates** page.

Step 4: Import the CSR Response Into AMC

To create a certificate, import the CSR response into AMC.

To import a certificate reply:

1. From the main navigation menu in AMC, click **SSL Settings**.
2. In the **SSL certificates** area, click **Edit**.
3. In the **Certificate signing requests** list, click the **Process CSR response** link for the appropriate certificate.
4. Upload the certificate on the **Import CSR Certificate** page:
    - If the certificate is in binary format, click **Browse** and then upload the certificate reply from your local file system (that is, the computer from which you have logged in to AMC).
    - If the certificate is in base-64 encoded (PEM) text format, select **Certificate text** and paste the certificate into the text box. Be sure to include the `BEGIN CERTIFICATE` and `END CERTIFICATE` banners.

5 In the **Used by** drop-down menu, select **AMC** or **WorkPlace/access methods** (select **None** if you want to build a list of certificates from which to choose later). If you defined additional WorkPlace sites (in addition to the default WorkPlace site), their names are included in this list.

6 Click **Save**.

7 To verify that the certificate was properly uploaded, click the plus sign (**+**) next to it on the **SSL Certificates** page.

Step 5: Apply Your Changes

To start using a new certificate, you need to apply your configuration changes. For more information, see Applying Configuration Changes.

After applying the change, the appliance examines the new certificate and begins using it for all new connections. If the appliance fails to correctly process the certificate, you see a failure message and the event log records information about the failure. Typically, this occurs if there is no certificate, the certificate has expired (or is not yet valid), or the cached password in the encrypted password file is incorrect.

NOTE: If your users authenticate using digital certificates, you must configure a trusted root file on the server as well as on the clients. See Configuring Client Certificate Revocation.

Creating a Self-Signed Certificate

If you plan to use a self-signed SSL certificate (instead of obtaining a certificate from a commercial CA), you can create one using AMC. A host is not selected for the certificate, because there is no one to one mapping of certificates to hosts. Wildcard certificates allow one certificate to map to multiple hosts. In addition, a self-signed SSL certificate can be created with multiple FQDN or IP addresses.

To create a self-signed certificate:

1 From the main navigation menu in AMC, click **SSL Settings**.

2 In the **SSL certificates** area, click **Edit**.

3 Click **New....**

4 Select **Create self-signed certificate** from the menu.

5 In the **Fully qualified domain name** field, type a wildcard domain name such as `*.domainname.com`, or type the individual server name as you want it to appear in the certificate:

- The main appliance certificate can be a wildcard certificate, or you might type something like `vpn.example.com`. You must add this name to your external DNS to make the appliance accessible to users.

  This is the name users will enter for access to Web-based resources on your network. For a wildcard certificate, the * matches any string of characters up to the dot, such as specific server names. You also reference this name when configuring the Connect clients to provide access to TCP/IP resources.

- If this certificate will be used by AMC (as opposed to WorkPlace), you might type something like `amc.example.com`. In most cases, you should add this name to your internal DNS to simplify access to AMC.

- Any number of SANs can be added to a certificate, but the text input field is 1,000 characters maximum. Simply enter multiple FQDNs and/or IPv4 or IPv6 addresses separated by commas. SANs can contain wildcard entries (`*.example.com`, `*.access.example.com`), unique FQDNs (`access.example.com`, `vpn.example.com`), and IP addresses.

The entered FQDNs and IP addresses are encoded in the subject alternative name certificate extension and FQDNs are encoded as an additional SAN name in the certificate. If a SAN is an IP address, it is encoded as an IPAddress in the SAN extension instead of a DNSName.

6 In the **Alternative names** field, type any additional FQDNs or IP addresses that should appear in the certificate using the Subject Alternative Name certificate extension. Separate multiple alternative names and IP addresses with a comma.

7 In the **Organization** field, type the company or organization name as you want it to appear in your SSL certificate.

8 In the **Country** field, type the two-letter abbreviation for your country. For a list of valid country codes, go to the International Organization for Standardization (ISO) Web site at http://www.iso.org and look for information on ISO 3166-1.

9 In the **Key size** list, select the key length you want to use for the key. Larger keys increase security, but make the appliance run more slowly. A key length of *1024 bits* or *1280 bits* is recommended for most installations.

10 In the **Signature** list, select the algorithm used for the certificate.

11 Click **Save**.

12 Click **Pending changes** and then apply the changes. (For more information, see Applying Configuration Changes.)

Creating the Trusted Root File for a Self-Signed Certificate

If you use a self-signed certificate, you will probably want to provide your users with a trusted root file (otherwise they will see a security prompt at every login).

NOTE:

- Setup Tool creates a self-signed certificate for AMC. For most deployments, this self-signed certificate is sufficient and there is no need to obtain a certificate from a commercial CA. It is important, however, to use AMC within a trusted network. Self-signed certificates protect against passive eavesdroppers but not against active attackers.
- If you're deploying OnDemand for Microsoft Internet Explorer users on Apple Macintosh systems, you must obtain a commercial SSL certificate. A self-signed certificate will not work because the Macintosh Java Virtual Machine (JVM) won't accept a certificate signed from an unknown CA.

To create a trusted root file for a self-signed certificate:

1 Log in to the appliance.

2 Make a copy of the `server.cert` file, which is located in `/usr/local/extranet/etc`.

3 Open the copied file in a text editor and remove everything except the root certificate. The file will contain one or more certificates as well as the private key. The root certificate is the last certificate block in the file, including the banners. In the following example, you would delete the first certificate block and the private key block:

Certificate 1

```
-----BEGIN CERTIFICATE-----
MIIDdTCCAx+gAwIBAgIBATANBgkqhkiG9w0BAQQFADCBqDELMAkGA1UEBhMCVVMxY3vnmd
u7oLCM+sgnCBzTmRfrl1960LB/6Q==
-----END CERTIFICATE-----
```

Root certificate

```
-----BEGIN CERTIFICATE-----
MIIDTjCCAvigAwIBAgIBADANBgkqhkiG9w0BAQQFADCBqDELMAkGA1UEBhMCVVMx7Vkfwp
/zfKMBawQicc+/SK60AXCuYT2Kc5XlGDnY01Hjxw==
-----END CERTIFICATE-----
```

Private key

```
-----BEGIN ENCRYPTED PRIVATE KEY-----
MIIBeDAaBgkqhkiG9w0BBQMwDQQIL0CvT+F7hucCAQUEggFYWAuHCeZHWynCvasPrYjnYY
WnJV7rTVeSgElvDhdecVtkMnN0FoCrUJEUwfk6gJtgLuSZ7MTZd2U=
-----END ENCRYPTED PRIVATE KEY-----
```

The resulting file looks like this:

```
-----BEGIN CERTIFICATE-----
MIIDTjCCAvigAwIBAgIBADANBgkqhkiG9w0BAQQFADCBqDELMAkGA1UEBhMCVVMx7Vkfwp
/zfKMBawQicc+/SK60AXCuYT2Kc5X1GDnY01Hjxw==
-----END CERTIFICATE-----
```

4 Distribute this file to your users. This increases security and prevents users from being prompted to accept the SSL certificate each time they connect. See Importing CA Certificates.

If you want increased security for your Web-based users, this file should be imported into the browsers for these users.

Managing Server Certificates in AMC

Topics:

- Importing an Existing Certificate from Another Computer
- Exporting an SSL Certificate

Importing an Existing Certificate from Another Computer

If you already have a certificate from a commercial CA, you may want to transfer it and its private key to the appliance. After you import the certificate, it will be used by the servers to secure user traffic on the appliance.

A host is not selected for the certificate, because there is no one to one mapping of certificates to hosts. Wildcard certificates allow one certificate to map to multiple hosts.

The appliance stores certificates in the PKCS #12 format. If your certificate is stored in a different format, convert it to PKCS #12 before importing. After performing the conversion, confirm that the PKCS #12 file contains the complete certificate chain.

To transfer an existing certificate to the appliance:

1 From the main navigation menu in AMC, click **SSL Settings**.

2 In the **SSL certificates** area, click **Edit**.

3 Click **New**, and then select **Import certificate** from the menu.

4 On the **Import Certificate** page, click **Browse**, and then upload the certificate from your local file system (that is, the computer from which you have logged in to AMC).

5 In the **Password** file, type the password that was used to encrypt the private key.

6 Click **Save**.

The appliance uses the previous certificate until you apply your configuration changes.

Exporting an SSL Certificate

You can export the SSL certificate used to secure user traffic on the appliance. The certificate will include the private key and be saved in PKCS #12 format.

To export the SSL certificate from the appliance:

1 From the main navigation menu in AMC, click **SSL Settings**.

2 In the **SSL certificates** area, click **Edit**.

3 Select the checkbox next to the certificate you want to export, and then click **Export**. The **Export Certificate** page appears.

4 In the **Password** field, type the password that you want to use to encrypt the private key.

5 Click **Save**, and then download the certificate file to your local file system (that is, the computer from which you've logged into AMC).

6 Click **OK**.

CA Certificates

Every CA requires a certificate so that it can be "trusted" by entities that request digital certificates from it. If a client trusts a CA certificate, it automatically trusts any other certificates that are issued by that CA. CA certificates thus form one of the foundations of public key cryptography. The CA certificate is either signed by the CA itself (a "root certificate"), or by a higher authority in a hierarchy of CAs in a public key infrastructure (an "intermediate CA certificate").

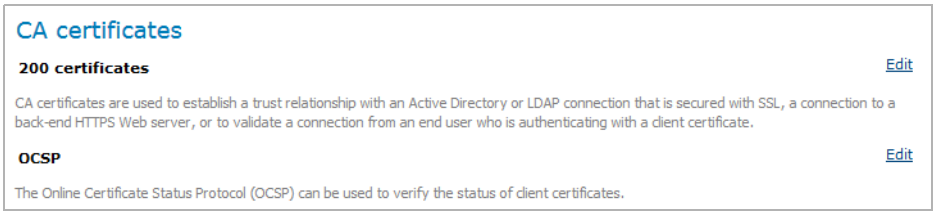
The appliance uses CA certificates to secure the following:

- Connections to a back-end LDAP or AD authentication server
- Connections to a back-end HTTPS Web server
- Device profiling (End Point Control), to verify the validity of certificates submitted by users who connect to the appliance. See the Device Profile Attributes: client certificate table in Device Profile Attributes for more information.

CA certificates usage

The appliance includes over 100 public root certificates from leading commercial CAs. If you've obtained a certificate from a commercial CA, its root certificate or intermediary public certificate is probably already installed on the appliance. However, if you are acting as your own CA you must import a root or intermediary public certificate to the appliance.

To view the list of certificates, click **Edit** in the **CA Certificates** area of the **SSL Settings** page.



This is also where you delete CA certificates.

Topics:

- Importing CA Certificates

- Configuring Client Certificate Revocation
- Managing CA Certificates

Importing CA Certificates

If the appliance is not configured with the necessary CA certificate, you must obtain a copy and import it to the appliance using AMC. The procedure is the same, whether the certificate will be used to secure connections to back-end resources, or to authenticate users by means of a client certificate.

The new certificate appears in the alphabetical list on the **CA Certificates** page. When you upload a CA certificate for use with client certificate authentication (and you apply the change), network services are automatically restarted and user connections are terminated, forcing users to reauthenticate. You may want to schedule the change during off-peak hours.

NOTE:

- If the certificate is being used to secure authentication server connections, check to see that the appropriate **LDAP over SSL** or **Active Directory over SSL** settings are enabled on the **Configure Authentication Server** page in AMC.
- By default, the Web proxy service is configured to verify the root certificate presented by back-end HTTPS Web servers. This important security check helps ensure that you can trust the identity of the back-end server. See Configuring the Web Proxy Service.
- If you do not want to trust a CA listed on the **CA Certificates** page, select the checkbox next to it, and then click **Delete**.
- When setting up devices profiles, avoid checking for client certificates within the same zone more than three times. If there are multiple EPC checks for client certificates within the same zone, users may see an error message (`An error was encountered encoding data to be sent to the Logon Server`).

To import a CA certificate to the appliance:

1. Obtain the trusted root certificate or intermediary public certificate from the CA. Most external commercial CAs provide the certificates on their Web sites; if the CA is run by your company, check with the server administrator.
2. From the main navigation menu in AMC, click **SSL Settings**.
3. In the **CA Certificates** area, click **Edit** on the **certificates** line.
4. Click **New...**. The **Import CA Certificate** page appears.
5. Do one of the following:
   - If the certificate is in binary format, click **Choose File** and then upload the certificate from your local file system (that is, the computer from which you've logged in to AMC).
   - If the certificate is in base-64 encoded (PEM) text format, click **Certificate text** and then paste the certificate into the text box. Be sure to include the `BEGIN CERTIFICATE` and `END CERTIFICATE` banners.
6. Specify the connection types this certificate will be used to secure:

Connection types for certificates

Connection type	Description
Authentication server connections (LDAPS)	Securing your LDAP or Active Directory (AD) connection with SSL enhances security by preventing attempts to impersonate the LDAP or AD server. To configure LDAP or AD over SSL, you must add the root certificate for the CA that granted your LDAP or AD certificate to the SSL trusted roots file.

Connection types for certificates

Connection type	Description
Web server connections (HTTPS)	If you have a back-end Web resource that is secured with SSL (that is, it uses HTTPS instead of HTTP), configure the Web proxy service to verify the root certificate presented by the back-end server. This important security check will help ensure that you can trust the identity of the back-end server. See Configuring the Web Proxy Service for details. If the back-end server's root certificate is not pre-installed on the appliance, you must obtain a copy and import it in AMC.
Device profiling (End Point Control)	EPC can be used to verify the validity of certificates submitted by users who connect to the appliance. If a client certificate is used in a device profile to classify users into an EPC zone, the appliance must be configured with the root or intermediary certificates for the CA that issued the client certificate to your users. When the appliance interrogates the user's computer to determine if the specified certificate is present, it can be configured to search just the system store (*HKLM\SOFTWARE\Microsoft\SystemCertificates*), or also include the user store (*HKCU\Software\Microsoft\SystemCertificates*).
OCSP response verification	The OCSP response signing certificate is used to verify a response from a configured OCSP responder. When importing the OCSP response signing certificate, enable **OCSP response verification**. This is a different certificate than the CA certificate for the OCSP responder or server itself, which is used in the PKI Authentication server.

7 Click **Import**. The **CA Certificates** page appears and displays a confirmation message.

Configuring Client Certificate Revocation

Certificates installed on client devices can be used to authenticate users or devices, giving them access to a particular realm. A certificate is usually valid until it expires, but it is possible for it to be compromised before it expires. For example, a CA may decide that a certificate was improperly issued, or its private key may have been compromised.

You can consult a certificate revocation list (CRL) to check a certificate's validity (its location—the CRL distribution point, or CDP—is typically included in the X.509 certificate). If a certificate is no longer valid, the user is denied access. CRLs are published for each authority and can contain status of only the certificates issued by that certificate authority. This requires a separate, hierarchical CRL server for each CA that you want to trust. The client needs to know the public key for each CA in the chain to verify each certificate and CA at each level in the chain.

Online Certificate Status Protocol (OCSP) and an OCSP responder server can be used instead of a CRL server to check the status of a certificate. OCSP responders take the certificate from a client, evaluate it and give back a response to the server as revoked, unrevoked, or unknown. OCSP can save bandwidth in a large organization, as the CRL server list can get very large. OCSPs can be configured to operate for any number of CAs and certificates. A single OCSP server can be configured for the entire PKI infrastructure, irrespective of CA relations.

NOTE:

- If both CRL and OCSP are enabled for a CA certificate, only OCSP will be used.
- Fallback from CRL to OCSP or OCSP to CRL is not supported.

Topics:

- Managing Certificates with a CRL
- Configuring an OCSP Responder

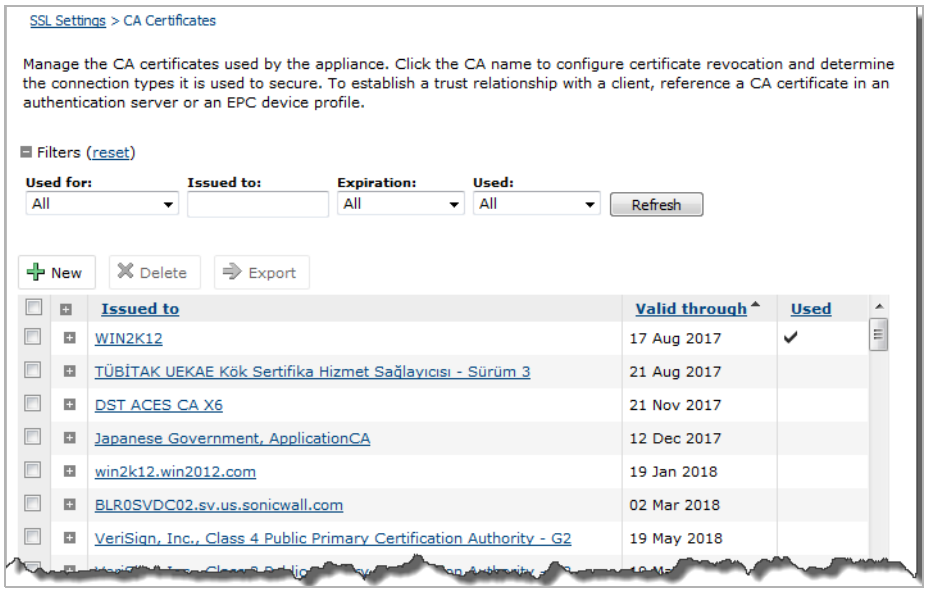
Managing Certificates with a CRL

Use the **Manage CA Certificate** page in AMC to configure certificate revocation checking for individual certificates, and determine the connection types the certificate is used to secure.

To verify the validity of a client certificate and configure certificate revocation:

1 From the main navigation menu in AMC, click **SSL Settings**.

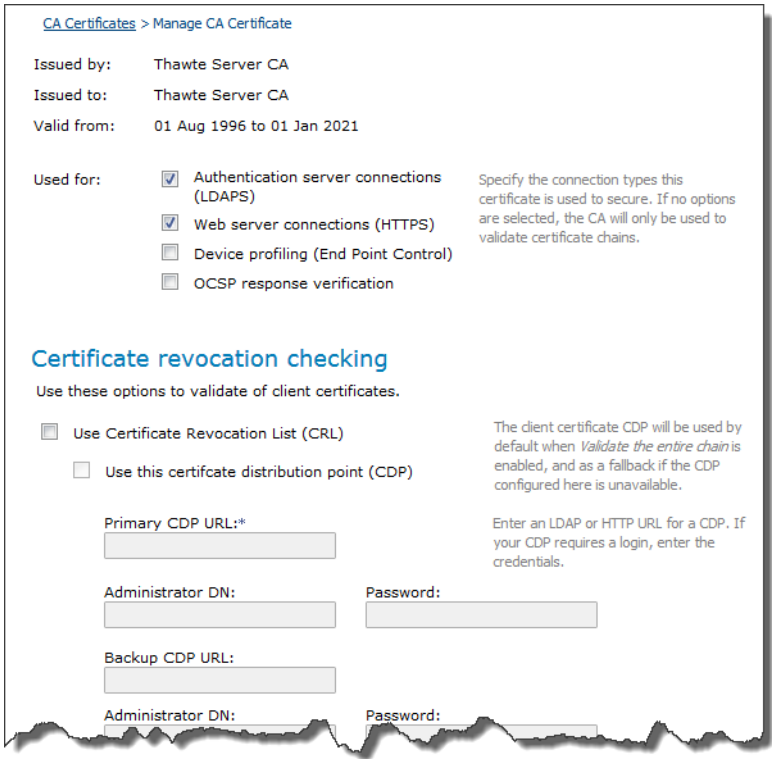
2 Under **CA Certificates**, click **Edit** on the ***<number>* certificates** line. All the certificates are displayed.



3 To see details about a certificate, click its plus sign (**+**) in the second column. To edit a certificate, click its link. For example:

a Click the plus sign next to *Thawte Server CA* to see details about this certificate from Thawte Consulting.

b Click the link to edit it. The **Manage CA Certificate** page displays.

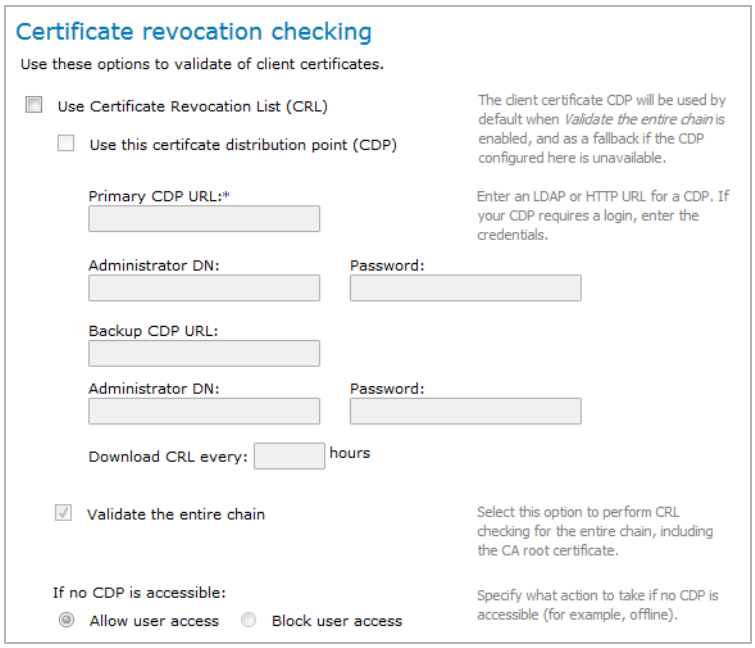


4 In the **Used for** area, specify the connection types this certificate is used to secure.

- **Authentication server connections (LDAPS)**—See Configuring a PKI Authentication Server.
- **Web server connections (HTTPS)**—See CA Certificates.
- **Device profiling (End Point Control)**—See the Device Profile Attributes: client certificate table in Device Profile Attributes.
- **OCSP response verification** – Verifies a response from a configured OCSP responder.

5 To specify CRL settings, check the **Use Certificate revocation list** in the **Certificate revocation checking** area.

IMPORTANT: The format for the CRL must be DER-based (`.crl`); the appliance cannot use a CRL that's been created in PEM format.



6 The appliance retrieves lists of revoked certificates from a CRL distribution point (CDP). Specify the location of this CDP:

- The CDP is usually specified in the certificate itself. By default, the appliance uses the **CDP from the client certificate**.
- Alternatively you can specify a URL for it. Check the **Use this certificate distribution point (CDP) checkbox**. If a login is required for it, type the credentials.

7 If **Use this certificate distribution point (CDP)** is selected, you can specify how often the CRL should be retrieved using the **Download CRL every <n> hours** option. If you don't specify a download interval, a new CRL is retrieved when the old one expires. (CRLs are updated frequently so that when a certificate is revoked, that information is distributed in a timely manner.)

8 The appliance checks client certificates against this list. To perform CRL checking for the entire chain of certificates, starting with the CA root certificate, select the **Validate the entire chain** checkbox.

9 Specify whether users should be allowed or denied access if the CDP is inaccessible by selecting **Allow user access** or **Block user access**. The remote CDP you specified might be offline, or it may not be indicated on the certificate. (It is an optional item for the X.509 standard, not a mandatory one.)

10 Click **Save**.

Configuring an OCSP Responder

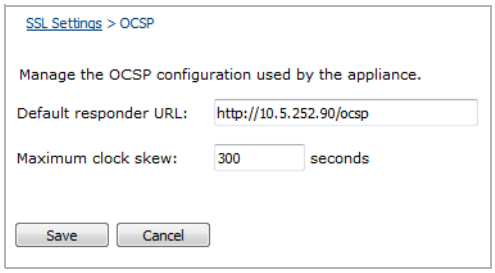
Use the **OCSP** page in AMC to configure global settings for an OCSP responder. The OCSP responder can be referenced when configuring a PKI authentication server.

NOTE: Just importing a CA certificate and enabling OCSP is not sufficient for OCSP to work. You must import the OCSP response signing certificate for the CA certificate being used and enable OCSP response verification when importing it. See Importing CA Certificates.

To configure an OCSP responder:

1 From the main navigation menu in AMC, click **SSL Settings**.

2 Under **CA Certificates**, click **Edit** on the **OCSP** line. The OCSP page is displayed.



3 In the **Default responder URL** field, enter the URL of the OCSP responder server.

4 In the **Maximum clock skew** field, enter the maximum number of seconds that the OCSP response time can differ from the local time. The default value is **300** seconds, the minimum is 1 second, and the maximum is 3600 seconds.

5 Click **Save**.

Managing CA Certificates

This section describes tasks related to managing certificates on the appliance; importing certificates is described in Importing CA Certificates.

Topics:

- Viewing CA Certificate Details
- Mapping Certificates to Hosts
- Exporting CA Certificates
- Deleting CA Certificates

Viewing CA Certificate Details

You can view the details for the appliance certificate, such as the subject, issuer, start and end time, serial number, and MD5 checksum. Details of a newly imported certificate are not available until you have applied the configuration change.

To view CA certificate details:

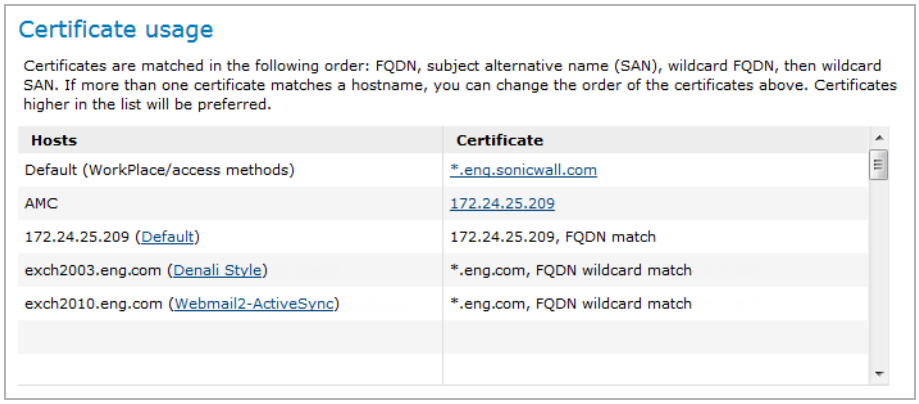
1 From the main navigation menu in AMC, click **SSL Settings**.

2 In the **CA Certificates** area, click **Edit**.

3 Click the plus sign (**+**) to the left of the certificate you want to see details about.

Mapping Certificates to Hosts

As multiple hosts on the appliance may use a single wildcard certificate, the **Certificate usages** table provides a mapping of a single certificate to multiple sets of hosts. A set of hosts is defined as one or more WorkPlace sites, Exchange sites, or custom FQDN mapped resources that are on the same IP address. Any given set of hosts must use the same wildcard certificate and therefore are treated as a single item for mapping certificates in the **Certificate usages** table. AMC is treated as a separate host even if it is on the same IP address as other hosts on a single-homed appliance.



To map a new certificate to a host or set of hosts:

1. From the main navigation menu in AMC, click **SSL Settings**.
2. In the **SSL Certificates** area, click **Edit**.
3. In the **Certificates** column of the **Certificate usages** table, click on the certificate to activate an in-place editor with a drop-down certificate selector.
4. Select the certificate. For individual hosts, all certificates are available for selection. For a set of multiple hosts, only wildcard certificates are available for selection.
5. Click **OK**.

Exporting CA Certificates

You can export a CA certificate and its private key to your local computer. The certificate is saved in PKCS #12 format.

To export a CA certificate:

1. From the main navigation menu in AMC, click **SSL Settings**.
2. In the **CA Certificates** area, click **Edit**.
3. Select the checkbox to the left of the certificate you want to export.
4. Click **Export**.
5. In the **Password** field, type the password that encrypts the private key.
6. Click **Save**. The certificate is saved (by default) to a file named `server_cert.p12`.

Deleting CA Certificates

To make the list of certificates more manageable, you might want to delete those that you know you will never need.

To delete a CA certificate

1. From the main navigation menu in AMC, click **SSL Settings**.
2. In the **CA Certificates** area, click **Edit**.
3. Select the checkbox to the left of any certificates you want to delete.
4. Click **Delete**.

Working with Certificates FAQs

Topics:

How do I Obtain a Certificate from a Non-Commercial CA?

The process is identical to the one for obtaining a certificate from a commercial CA, except that you submit the CSR to a non-commercial CA (such as a Microsoft Self-Signed Certificate Authority). This part of the process is outlined in Step2: Submit the CSR to a Commercial CA.

When do Certificates and CRLs Expire?

Self-signed certificates are valid for five years. The expiration date for third-party certificates varies, depending on who issued the certificate; contact the CA for more information. A Certificate Revocation List (CRL) is valid for a much shorter period of time: days, or even hours.

When using certificates and CRLs, it is important for the clock on the appliance to be accurate, since it is used to determine when these items expire.

Does Secure Mobile Access support SAN Certificates?

Subject Alternative Name (SAN) certificates are supported for Workplace, Workplace sites, and Connect Tunnel. Certificates (also called UCC--Unified Communications Certificate) are used to securely encrypt communication channels between a set of clients and multiple distinct SSL or TLS services.

SAN certificates simplify the IP address/hostname/certificate sets needed for a typical deployment. With a single SAN certificate, you can utilize one IP address with multiple distinct SSL or TLS protected web or client/server services, without the need for configuring additional IP addresses. Additionally, SANs can be used for different host names on the same IP address, alleviating the need for a one-to-one mapping of SSL certificate Common Names to FQDN.

NOTE: Only IPv4 addresses are supported in SAN certificates and Certificate Signing Requests (CSR).

Improvements include:

- SANs-related features can be generated via the AMC instead of through mechanisms external to the appliance:
  - CSR with SANs
  - Self-signed certificates with SAN entries

- WorkPlace sites, custom FQDN URL resources, and ActiveSync resources can be created using existing SAN certificates.
- Global load balancing uses original web requests to direct traffic to a load balancer instead of the default WorkPlace site.
- Connect Tunnel seamlessly handles connections to Workplace sites that use a combination of IP address, FQDN, or SSL certificate, regardless of the number of IP addresses associated with a WorkPlace site.

The Administrator can generate, import, process, and otherwise use a SAN certificate for Workplace, ActiveSync, Custom FQDN URL Mapping, or Tunnel based access services.

Are Intermediate Certificates supported for End-User Certificate Verification?

Yes, intermediate certificates are supported for end user certificate verification. This covers PKI and LDAP certificate methods. This allows an intermediate certifying authority to be imported to validate a certificate chain, without requiring trust of the root certifying authority.

A client machine can use a client certificate that was issued by an intermediate certifying authority. When such a client certificate is imported directly on Windows 7, the client certificate is stored in the personal store, the intermediate certificate is imported to the intermediate CA store, and the root CA certificate is imported to the root CA store. This is the recommended method, and the certificates will work with tunnel clients and ExtraWeb clients using PKI authentication. If all three certificates are stored in the personal store, which can happen if certmgr.msc is used to import the client certificate, then Connect Tunnel may display an error and deny access. This is not a recommended configuration.

What Are the Different CA Certificates on the Appliance and How Are They Used?

To see the list of CA certificates available on the appliance, click **SSL Settings** on the main navigation menu, and then click **Edit** in the **CA Certificates** area. By default, any certificate in the list can be used to secure up to three connection types (authentication server, secure Web server, and client certificate). Click on a certificate to set the connection types you want it to secure.

How many CA Certificates can be Stored on the Appliance?

The roots file can contain as many certificates as you want to trust. For instructions on how to import additional CA certificates, see Importing CA Certificates.

Can Private Keys or CSRs Generated from Other Tools be Imported to the Appliance?

Private keys and CSRs must be generated on the appliance using Setup Tool or the certificate generation tool. However, you can copy private keys and CSRs from one SMA appliance to another using the procedure described in Managing Server Certificates in AMC. Any copied certificates are overwritten if you make changes to them in AMC.

Where Is the AMC Certificate Stored?

AMC's self-signed certificate is stored on the appliance in `/usr/local/app/mgmt-server/sysconf/active/`.

For AMC, a self-signed certificate is sufficient for most environments. It is important, however, to use AMC within a trusted network. Self-signed certificates protect against passive eavesdroppers but not against active attackers.

Should I Keep All CA Certificates on the Appliance or Just the Ones I Need?

For the sake of convenience, the appliance includes more than 100 CA certificates. To make your deployment more secure, you may want to pare this list down so that it includes only the CA certificates you need for client certificates, LDAPS, and HTTPS. A shorter list is also easier to manage.

Managing User Authentication

Authentication is the process of verifying a user's identity to ensure that the individual really is who he or she claims to be. (Authentication differs from authorization: it verifies identity, while authorization specifies access rights.) This section describes how to reference external authentication servers.

To manage user authentication, you must first define one or more external authentication servers in AMC, and then set up realms that reference those authentication servers. These are the realms that users will log in to. For information on realms, see Using Realms and Communities. You can also configure a local authentication repository on the appliance for testing, as described in Configuring Local User Storage.

Topics:

About Intermediate Certificates

You can configure an authentication server to trust intermediate CAs without verifying the entire chain. This provides benefits, such as distributing certificate management among several signing authorities, several of whom might be remote to the root CA server and therefore would otherwise be unable to issue certificates, and adds security because the compromise of any single signing authority does not compromise the entire network.

To configure trusted intermediate certificates, see Configuring a PKI Authentication Server.

For example, you could create a root certificate signing authority on a system that is not connected to the corporate network. You can then issue a set of trusted intermediate signing authority certificates to be deployed in various sectors of the network (often by department or organizational unit). For the VPN, this is most often done to distribute machine or personal certificates to client systems.

The other alternative is to obtain a signing certificate from a certificate authority such as VeriSign or Thawte. In this case, your main CA is actually an intermediate CA itself.

By SSL rules, the root CA certificate must be accessible in order to validate the entire chain. However, the appliance makes no distinction between importing a CA certificate for trust and importing a CA certificate to validate a certificate chain for the intermediate CA that you want the appliance to trust. If no options are selected when a CA certificate is imported, the CA will only be used to validate certificate chains. (The options are the connection types the certificate is used to secure: Authentication server connections (LDAPS), Web server connections (HTTPS), and Device profiling (End Point Control)). Any CA certificate used only to validate certificate chains is not offered as a trusted signer during client certificate authentication or EPC certificate enforcement.

When an end user presents a client certificate signed by an intermediate CA, assuming the appliance trusts the signing authority, the user is allowed to authenticate and access resources normally.

When an end user presents a client certificate issued by a root CA of the trusted intermediate CA, unless the administrator has also imported the root CA for trust purposes, the end user authentication attempt fails due to lack of valid and trusted certificate.

If a client presents a certificate that is signed by a CA that exists only for chain validation, the certificate will be rejected. This results in an authentication failure or a failure for certificate authentication and in a failure to match the device profile for certificate EPC.

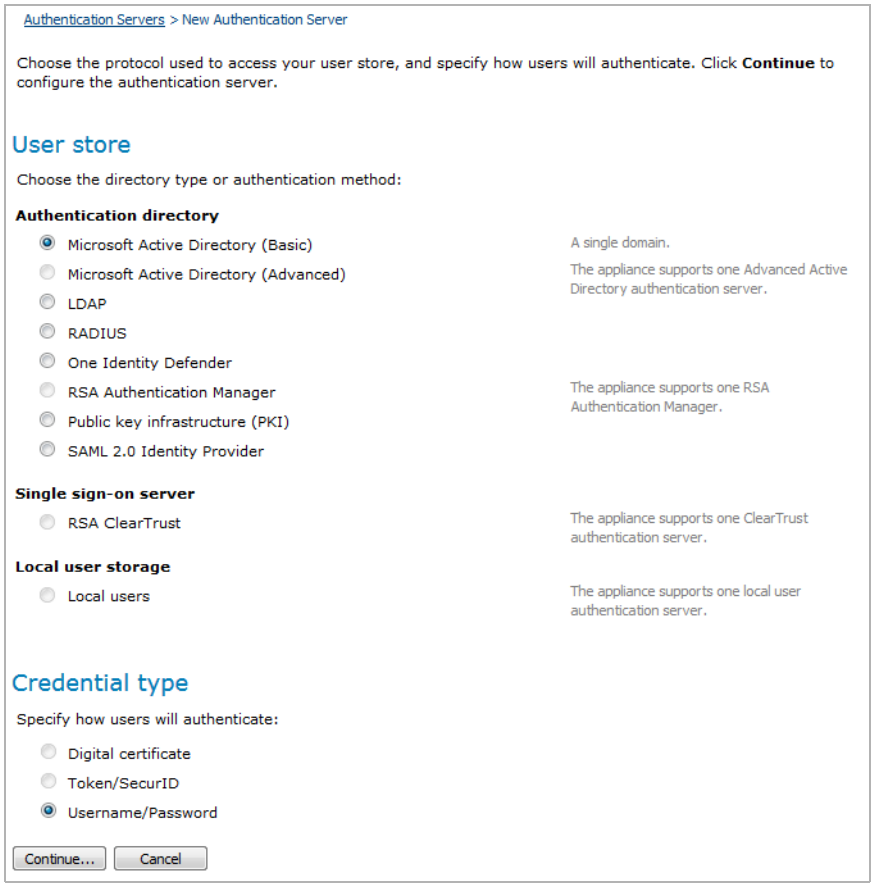
Configuring Authentication Servers

Setting up authentication involves the following: a directory (such as LDAP, Microsoft Active Directory, or the local authentication store on the appliance), an authentication method (username/password, token or smart card, or digital certificate), and other configuration items that make the authentication process unique (for example, an LDAP search base, or adding custom prompts and messages). The SMA appliance supports the leading authentication directories and methods.

After you reference an authentication server in a realm and associate users with the realm, the appliance checks users' credentials against the credentials stored in the specified authentication repository. You can also set up chained (two-factor) authentication; see Configuring Chained Authentication for details.

To configure an authentication server:

1 From the main navigation menu in AMC, click **Authentication Servers**, and then click **New...**.



2 In the **User store** area, specify the directory type or authentication method you want to configure:

Directory type or authentication method selection

Authentication directory	Credential type	For more information
Microsoft Active Directory Microsoft Active Directory Tree	• Username/password	Configuring Microsoft Active Directory Servers
LDAP	• Username/password • Digital certificate	Configuring LDAP and LDAPS Authentication
RADIUS	• Username/password • Token-based authentication (such as SecurID or SoftID)	Configuring RADIUS Authentication
RSA Authentication Manager Server	• Token-based authentication (such as SecurID or SoftID)	Configuring RSA Server Authentication
Public key infrastructure (PKI)	• Digital certificate (with optional certificate revocation checking)	Configuring a PKI Authentication Server
SAML 2.0 Identity Provider	• Username/password	Configuring a SAML-Based Authentication Server

Directory type or authentication method selection

Authentication directory	Credential type	For more information
RSA ClearTrust (single sign-on)	• N/A	Configuring a Single Sign-On Authentication Server
Local users (local user storage)	• Username/password	Configuring Local User Storage

3 Select the **Credential type** of the authentication server (what types are available depends on the **User store** you selected).

4 Click **Continue...**. For information about the next step in the configuration process, follow the link for the **User store** you selected in the previous step.

for further information about tasks after configuring the authentication server, see:

- Defining Multiple Authentication Servers
- Disabling Authorization Checks
- Configuring Chained Authentication
- Enabling Group Affinity Checking in a Realm
- Using One-Time Passwords for Added Security

Defining Multiple Authentication Servers

The SMA appliance supports the definition and use of multiple authentication servers. A *realm* references one or two authentication servers and determines which access agents are provisioned to your users and what End Point Control restrictions (if any) are imposed. See Users, Groups, Communities, and Realms for more about realms.

Following are examples of using multiple authentication servers referenced by realms:

- **Chained authentication (two authentication servers)**

  Example: RADIUS with Token/SecurID and LDAP with username/password

  Users logging in to a realm are authenticated against two servers. You can configure AMC so that users see only one prompt. See Configuring Chained Authentication for details.

- **Use different servers to handle authentication and authorization**

  Example: RADIUS with Token/SecurID and Active Directory (for group information)

  The user authenticates against one repository, and then the user's group information is passed from a second one. For more information, see Enabling Group Affinity Checking in a Realm.

- **Multiple credential types and a single authentication server**

  Example: RADIUS with username/password and RADIUS with Token/SecurID

  Suppose your company employees log in with usernames and passwords, but the employees of your call-center log in with SecurID tokens. You could create an *employee* realm and a *callcenter* realm, each referencing the appropriate credential type and RADIUS server.

- **Multiple instances of the same directory/authentication method using different back-end servers**

  Example: Two RADIUS/password instances using different RADIUS servers

  In this case you would define two authentication servers, each with the appropriate server information.

- **Multiple instances of the same directory/authentication method on the same server, configured differently**

Example: Two instances of LDAP with username/password on the same server but using different search bases

In this case each realm would search a different subtree within the directory. For example, suppose Partner A is in one LDAP subtree and Partner B is in another. You could define a *partnerA* realm and a *partnerB* realm, each configured with the appropriate search base.

Disabling Authorization Checks

You can optionally disable the querying of group information used for authorization when configuring an authentication server. A **Use this authentication server to check group membership** checkbox is available for each server type that can contain group information used for authorization, including Active Directory, Active Directory Tree, and LDAP servers.

Usually, when you use a directory server as part of authentication, you also want the group information stored there to be used in policy authorization. However, in some cases a directory server is used for secondary authentication and does not contain group information. In other cases, the secondary authentication server does not use the same identifier for the user.

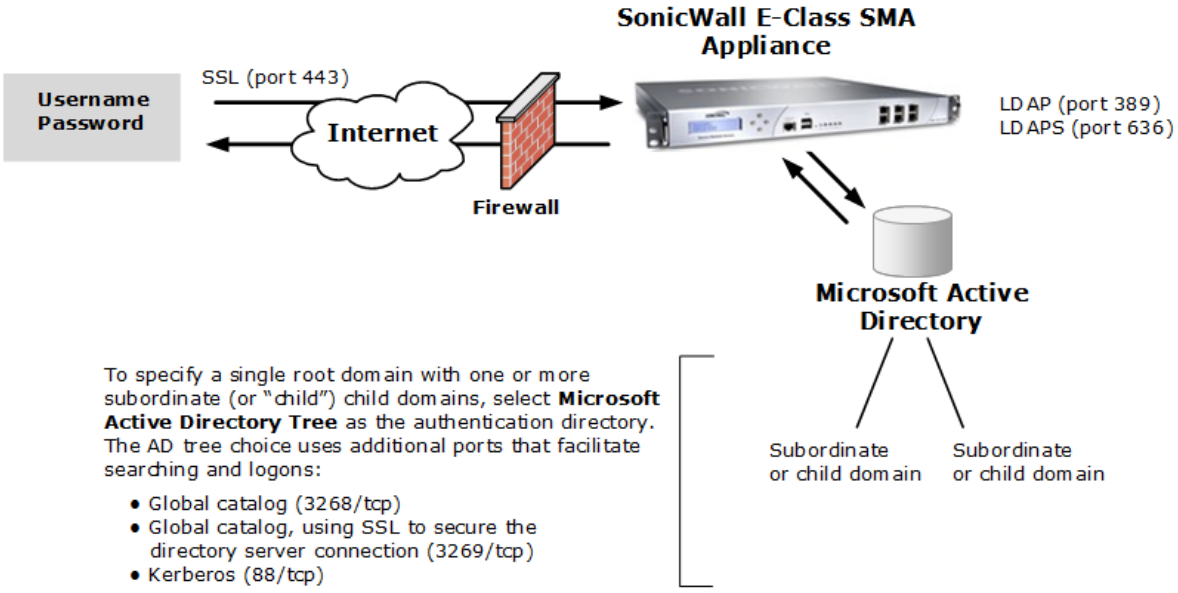
If a group query is made on both a primary and a secondary server, the authentication process takes longer. However, if the user name is different on the two servers, a group query using the name from the primary server will result in an error from the secondary server. Since the appliance policy always defaults to closed, such an error will result in any deny rule being applied to the end user. By disabling group authorization checks on the secondary server, you can avoid these problems.

If group checking is disabled for an authentication server, the server will not be available in the list of available affinity servers on the realm configuration page. Conversely, if an authentication server is in use as an affinity server for any realm, group checking cannot be disabled for that authentication server. See Enabling Group Affinity Checking in a Realm for more information.

Configuring Microsoft Active Directory Servers

The appliance can validate username/password credentials against Microsoft Active Directory (AD) configured with either a single root domain, or one or more subordinate (child) domains. Microsoft Active Directory configuration options shows typical Active Directory configuration options.

Microsoft Active Directory configuration options



You must modify your firewall or router to allow the appliance to communicate with your AD server. The appliance uses standard LDAP and LDAPS ports to communicate with Active Directory:

- LDAP (389/tcp)
- LDAP over SSL (636/tcp)

With Microsoft Active Directory Tree there are additional ports, which facilitate searches and logons:

- Global catalog (3268/tcp)
- Global catalog using SSL (3269/tcp)
- Kerberos (88/tcp)

After configuring an AD server, you can validate the realm configuration settings by establishing a test connection. For more information, see Testing LDAP and AD Authentication Configurations.

Topics:

- Configuring Active Directory with Username and Password
- Configuring Multiple Active Directory Trees
- Configuring LDAP to Authenticate Against Active Directory
- LDAP Examples for Active Directory Authentication

Configuring Active Directory with Username and Password

NOTE:

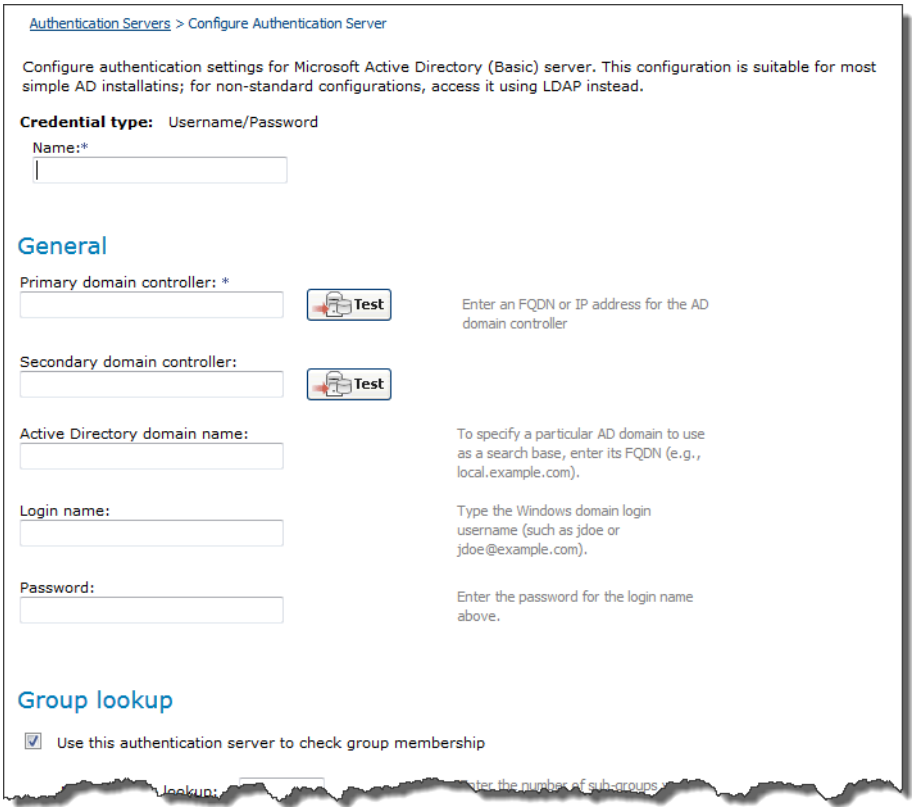
- If you are using Active Directory with digital certificates, you must configure AD as an LDAP realm. See Configuring LDAP to Authenticate Against Active Directory.
- If your AD authentication server has subordinate (child) domains, see Configuring Multiple Active Directory Trees for more information.

To configure an Active Directory authentication server with username/password validation:

1 From the main navigation menu in AMC, click **Authentication Servers**, and then click **New...**.

2 Under **User store**, click **Microsoft Active Directory (Basic)**.

3 The only **Credential type** that is available for AD is **Username/Password**. Click **Continue...**. The **Configure Authentication Server** page appears.



4 In the **Name** field, type a name for the authentication server.

5 In the **Primary domain controller** field, type the IP address or host name of the AD domain controller. If you are using a failover server (optional), specify its address in the **Secondary domain controller** field.

If the AD server is listening on a something other than the well-known port (389 for unencrypted connections, or 636 for SSL connections), specify a port number as a colon-delimited suffix (for example, `ad.example.com:1300`).

6 To specify a particular AD domain, type it in the **Active Directory domain name** field. This should be the domain that you want to use as the search base (in other words, the domain that contains the appropriate `cn=users` container). For example, if you want to search a single domain such as *marketing*, type `marketing.example.com`. If you want to search your entire company's domain, type `example.com`. If you do not specify a domain, the appliance searches the first available default naming context on the domain controller.

7 To perform AD searches, the appliance must log in to Active Directory (unless you have configured AD to allow anonymous searches). In the **Login name** field, type the username or **sAMAccountname** attribute used to log in to the Windows domain (such as `jdoe` or `jdoe@example.com`).

The login should be for a user who has privileges to perform searches and view user records, such as the administrator on that domain controller. You may also specify a non-administrator user who has these privileges.

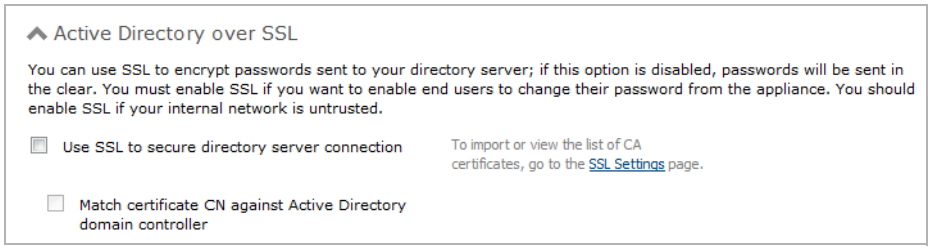
If you specify an AD domain, the appliance searches that domain for users. If you do not specify a domain, the appliance searches the first available default naming context on the domain controller. If the user information is not stored in either of these locations, you need to configure this realm as an LDAP realm. See Configuring LDAP to Authenticate Against Active Directory.

8 Type the **Password** that corresponds to the **Login name**. After you've entered credentials, you can click the **Test** button for each server you specified in order to test the connection.

9 Complete the information listed under **Group lookup**:

- To enable group checking on this server, select the **Use this authentication server to check group membership** checkbox. When this box is unchecked, the nested controls are disabled because they apply only to group checking behavior. This checkbox, when unselected, allows an authentication server for LDAP, AD, or AD-Tree to be configured without enabling it for authorization checks. This improves efficiency by allowing better stacked/affinity authentication support.
- To specify the depth of the search (how many sub-groups to include in it), enter a number in the **Nested group lookup** checkbox. Be aware that this type of search can take some time because it requires searching the entire Active Directory tree; enabling **Cache group checking** is highly recommended.
- To reduce the load on your directory and get better performance, cache the attribute group or static group search results. Select the **Cache group checking** checkbox and then specify a **Cache lifetime**, in seconds. The default value is *1800* seconds (30 minutes).

10 To secure the AD connection with SSL, expand the **Active Directory over SSL** area, and the configure the following settings:

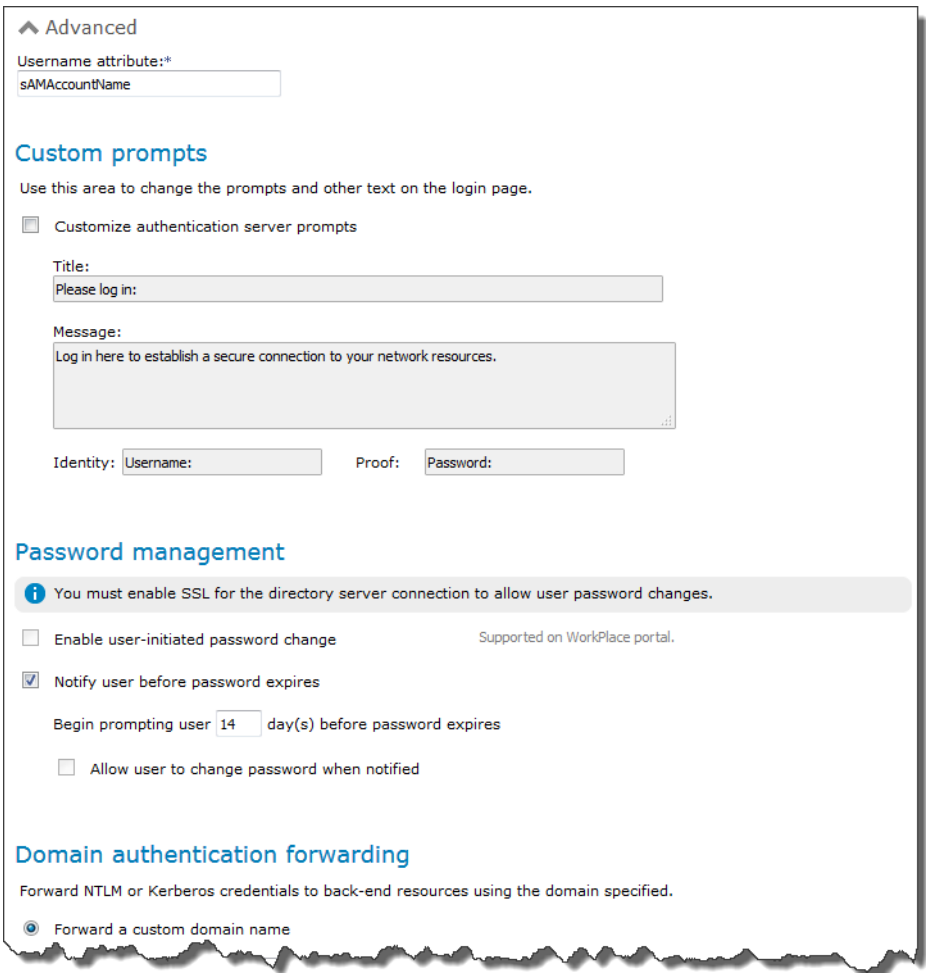


a Select the **Use SSL to secure Active Directory connection** checkbox.

b To view your certificate details and to verify that the root certificate can be used by the appliance, click the **SSL Settings** link. This list should show the name of the CA (or CAs) that issued the client certificates and the SSL certificates. If your AD server's CA is not listed in the file, or if you use a self-signed certificate, you must add your certificate to this file. See Importing CA Certificates for details.

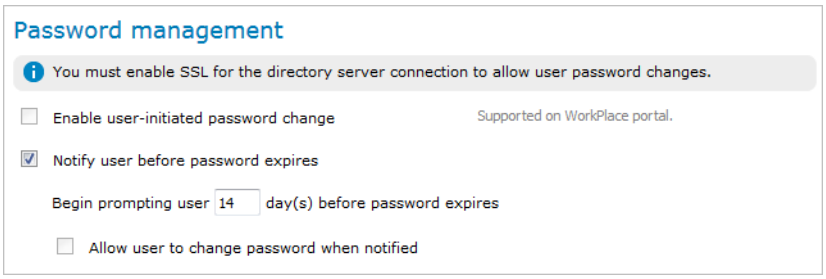
c To have the appliance verify that the AD domain controller host name is the same as the name in the certificate presented by the Active Directory server, select the **Match certificate CN against Active Directory domain controller** checkbox. Typically, your server name will match the name specified in its digital certificate. If this is the case with your server, SonicWall recommends enabling this option in a production environment. This makes it more difficult for an unauthorized server to masquerade as your AD server if your digital certificate or DNS server is compromised.

11 In the **Advanced** area, you can specify a username attribute, set up custom prompts, enable users to be notified of expiring Active Directory passwords, configure NTLM authentication forwarding options, and set up one-time passwords.



12 Type the **Username attribute** you want to use to match user names. In most AD implementations, **sAMAccountName** matches the user ID (for example, *jdoe*). You can use `cn` instead, but that would require the user to authenticate with his full name (*John Doe*) instead of his user ID (*jdoe*).

13 To change the prompts and other text that Windows users see when they log in to the authentication server, select the **Customize authentication server prompts** checkbox. If users should log in using an employee ID, for example, you could change the text for the **Identity** prompt from **Username***:* to **Employee ID**. (If you plan to use chained authentication, customized password prompts are especially useful so that users can differentiate between them.)



14 If the connection between the appliance and the authentication server is secured with SSL (**Use SSL to secure Active Directory connection** is enabled), you can allow users to change their passwords in WorkPlace by selecting **Enable user-initiated password change**.

CAUTION: If Active Directory over SSL is not enabled, passwords are transmitted in the clear to the AD server. If the internal network is not trusted, you should enable SSL. Your AD server must also be enabled to use SSL. See the Microsoft AD documentation for details.

NOTE:

- The **Login name** and **Password** fields are not always required to connect to an Active Directory server. However, if they are not provided (or you don't specify a password) the appliance will bind anonymously. In this case, if you have not configured Active Directory to allow anonymous searches, the search will fail.
- Users must have permission on the AD server to change their passwords during the password notification period, and the administrator must have permission to change user passwords after they expire. For security reasons, both of these operations replace passwords rather than reset them.
- If you define multiple Active Directory with SSL servers, you should specify the same **Match certificate CN against Active Directory domain controller** setting for each server. (SonicWall recommends enabling this option for a production environment.) Although AMC allows you to configure this setting on a per-realm basis, the appliance actually uses the setting specified in the last loaded ADS realm. For example, if you select this checkbox for three ADS realms, but clear it for a fourth, the functionality would be disabled for all four realms.

15 To allow the Active Directory server to notify users that their passwords are going to expire, select the **Notify user before password expires** checkbox. Indicate when the advance notice should begin (the default is **14** days, and the maximum is 30 days). The password prompt users see is controlled by the AD server.

16 To allow users to manage their own passwords, select the **Allow user to change password when notified** checkbox. This setting can be changed only if the **Use SSL to secure Active Directory connection** checkbox in the **Active Directory over SSL** area is selected. Password management is available only to users with Web access and those who are using Connect Tunnel.

17 To enable NTLM authentication forwarding, click one of the **NTLM authentication forwarding** options. For more information, see NTLM Authentication Forwarding.

18 To configure authentication that includes an OTP, enable **Use one-time passwords with this authentication server**. You must also configure your mail server: if OTPs are going to be delivered to external domains (for example, an SMS address or external webmail address), you may have to configure the SMTP server to allow passwords to be sent from the appliance to the external domain.

- Enter the number of characters for the OTP in the **Password contains** field. The default length is 8, the minimum is 4, and the maximum is 20.
- Select the type of characters in the OTP from the drop-down menu. Select **Alphabetic**, **Alphabetic and numeric**, or **Numeric**.
- In the **From address** field, enter the email address from which the OTP will be sent.
- In the **Primary email address attribute** field, enter the directory attribute for the email address to which one-time passwords will be sent. If the primary attribute exists on the authentication server, it is used.
- The **Secondary email address attribute**, if specified, is used in addition to the primary email address. The OTP is sent to both addresses.

  To have OTPs sent as a text message (instead of an email message), enter the corresponding attribute name (for example, `SMSphone` instead of `Mail` or `primaryEmail`). See Configuring the AD or LDAP Directory Server for more information.

- In the **Subject** field, customize the subject line of the OTP email. You can use the replacement variable *{password}* to indicate a position in the subject line where the actual password will display.
- In the **Body** field, customize the body of the OTP message. Use the replacement variable *{username}* to indicate a position in the message where the user's account name will display. Use the replacement variable *{password}* to indicate a position in the message where the actual password will display.
- To test delivery of an OTP to a user, enter the email address of the user who will receive the OTP into the **Email address** field and click the **Send test message** button. If the appliance is able to send the message, the status `Message successfully sent` is displayed below the button. Failure messages are also displayed below the button, such as errors connecting to the SMTP server, or errors communicating with the AD/LDAP server or looking up the specified user on the AD/LDAP server.

19 Click **Save**.

Configuring Multiple Active Directory Trees

This feature expands user authentication and authorization from one Active Directory (AD) tree to multiple AD trees within a trusted forest and AD Federated Forests. Configuring AD multi-forest/multi-realm support consists of the following steps:

1 Configure AD forest authentication server with AD domains from the current AD forest and trusted forests enabled.

2 Configure groups using multiple trees.

3 Configure groups using trees from trusted forests.

Once AD multi-forest/multi-realm support is configured, users from the designated forests can be authenticated and log into WorkPlace and Connect Tunnel.

NOTE: A trusted domain is a domain that authenticates users when they login.

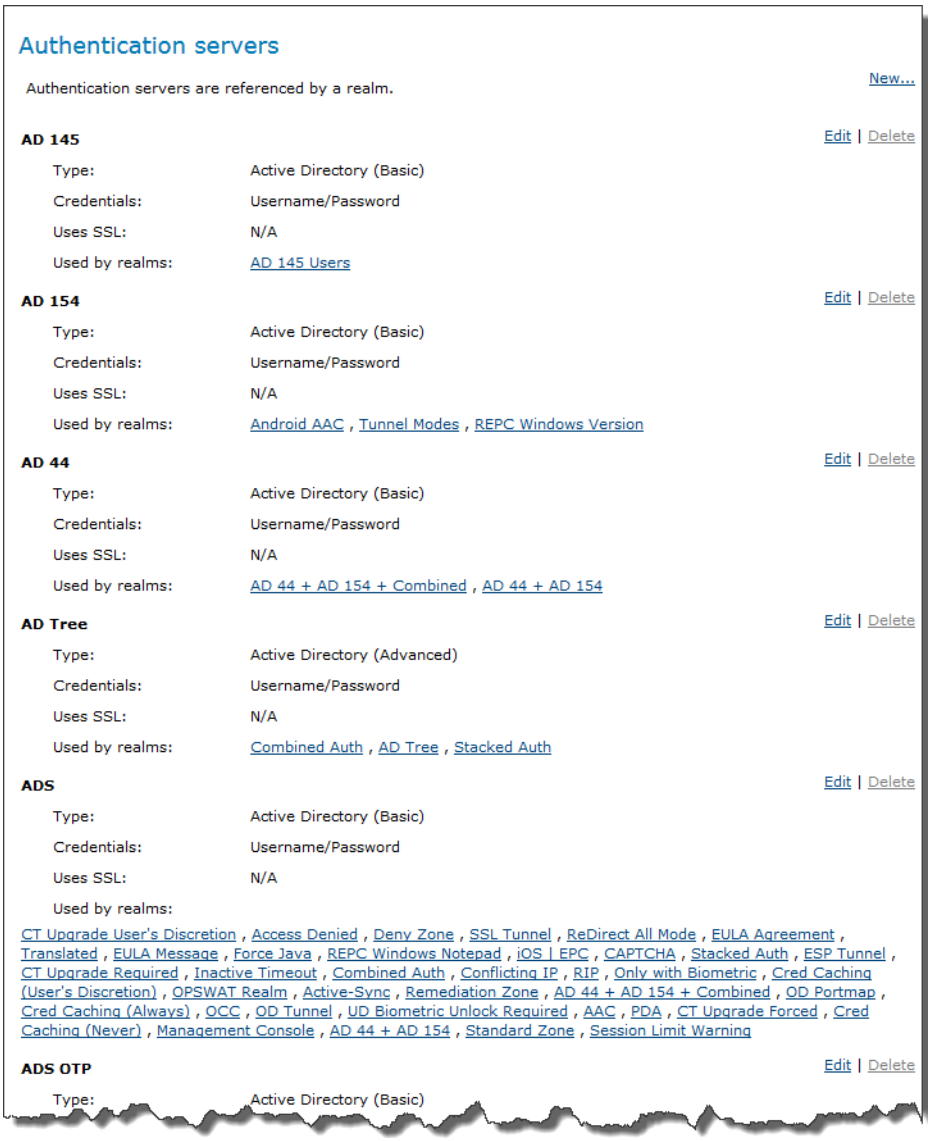
Topics:

- Configure AD Forest Authentication Server
- Configure Groups Using Multiple Trees
- Configure Groups Using Trees from Trusted Forests
- User Login

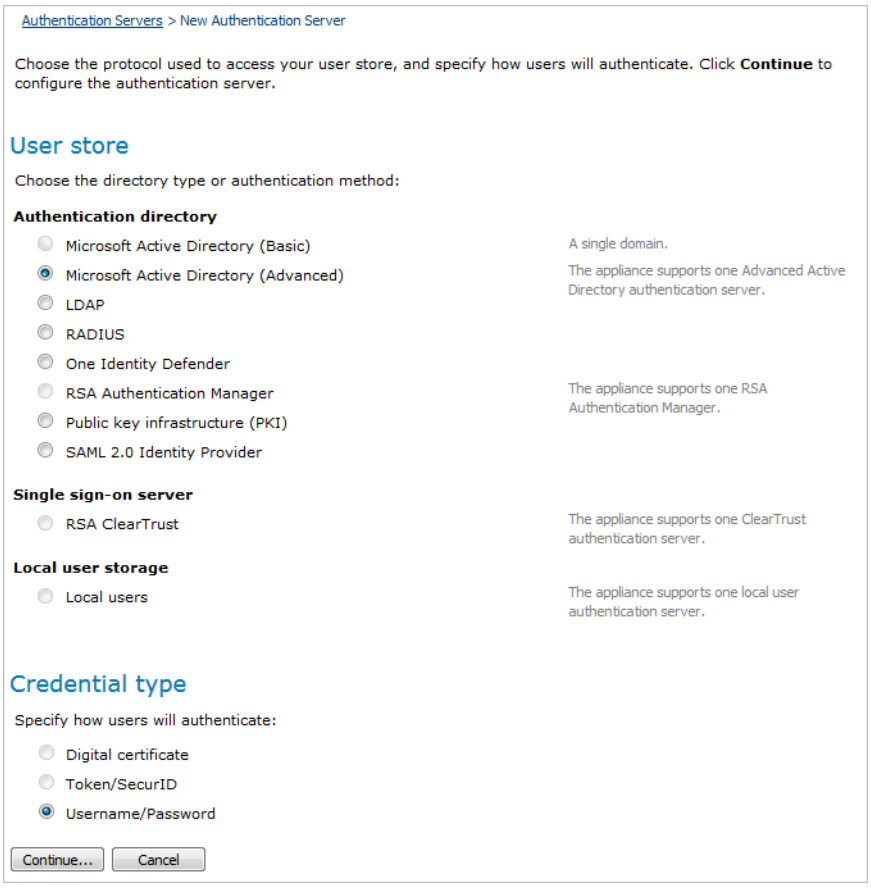
Configure AD Forest Authentication Server

Configure the AD forest authentication server and enable AD domains from the current AD forest and trusted forests:

1 In the main navigation menu, select **Authentication Servers,** and then click **New...** in the **Authentication servers** section.



2 In the **User Store** section of the **New Authentication Server** page, select **Microsoft Active Directory (Advanced)**.



3 Select any other applicable options and click **Continue...**. to advance to the **Configure Authentication Server** page.

4 In the **Name** field, type the name that will be used to identify the Active Directory tree or forest.

5 In the **Root Domain** field, type the AD root domain of the forest.

6 Check the **Enable cross-forest trust** checkbox to enable appliance access to other trusted forests. If not enabled, the appliance can access only the forest in a direct trust relationship with the configured forest.

7 In the **Login name** and **Password** fields, type the user name and password for a user who has read access to the entire Forest.

8 In the **Active Directory DNS** section, configure the DNS and Key Distribution Centers (KDCs) correctly.

- Select **Use DNS to lookup Active Directory domains** to enable DNS lookups for a KDC/Kerberos realm, and then select the domains that will be displayed on WorkPlace. Only domains fetched from the configured forest are listed when **Enable cross-forest trust** is disabled (checkbox not checked).
- Select **Use these Active Directory domains and KDCs** to also use KDCs and then click **New** and configure the KDCs.

Configure Groups Using Multiple Trees

Create groups of users and groups imported from the AD domains in the forest. Only users and groups from the configured forest are included when cross-forest trust is disabled.

Configure Groups Using Trees from Trusted Forests

Create groups of users and groups imported from AD Domains in the configured forest and trusted forests. Users and groups from the configured forest and all trusted forests are included when cross-forest trust is enabled.

User Login

Once AD multi-forest/multi-realm support is configured, users from the designated forests can be authenticated and log into WorkPlace and Connect Tunnel.

Users login to WorkPlace or Connect Tunnel using one of the following:

- Username in UPN form (for example, <*username*>@KERBEROS_REALM) and password
- Username, Password and Domain - when Domain Selection option is configured)
- Username and Password – when a default domain is configured

Configuring LDAP to Authenticate Against Active Directory

If you have customized Active Directory (by, for example, specifying a search base instead of using the AD default), you need to authenticate to Active Directory using LDAP. The procedure for configuring an LDAP server is defined in Configuring LDAP and LDAPS Authentication. When configuring LDAP, you should pay special attention to the attributes you're using to query the directory. Because every implementation of AD is different, you must know how the object classes and related attributes are configured in your Active Directory schema.

NOTE: When an Active Directory (AD) server is used as an LDAP server, ACL checks cannot be performed. Short names (SN) or common names (CN) are not supported on LDAP servers. They are only supported on AD servers.

The following table describes the key AD attributes used to validate username and password credentials. The attributes are not case-sensitive.

AD attributes for credential validation

Field	Description
Login DN	The DN used to establish a connection with your Active Directory server. In a generic AD configuration located in the *example.com* domain, the DN for a user named John Doe would be: `cn=John Doe,cn=users,dc=example,dc=com`
Search base	The point in the AD directory from which you want to search for user information. Usually, this is the lowest point in the directory tree that contains user information. The user binding to AD must have permissions to view the directory at this level. For a generic installation, a search base of `cn=users,dc=example,dc=com` will find most users. You may want to search from a higher level (such as `dc=example,dc=com`) if some users are stored in a different branch.
Username attribute	The attribute used to match usernames. In most AD implementations, **sAMAccountName** matches the user ID (for example, *jdoe*). You can use `cn` instead, but that would require the user to authenticate with his full name (*John Doe*) instead of his user ID (*jdoe*).

If you create an access control rule that references a group, a user must be an explicit member of that group for his or her request to match the rule. To include nested groups when evaluating group membership, make sure that **Nested group lookup** is set accordingly when you configure the authentication server in AMC.

For example, assume that the *SeattleCampus* group contains a group called *Marketing*. Employee *John Doe* is a member of the *Marketing* group, but is not explicitly a member of *SeattleCampus*. If **Nested group lookup** is

set to *0*, the appliance will not recognize *John Doe* as a member of the *SeattleCampus* group; if it is set to *1*, he is recognized.

Microsoft provides a graphical tool that makes it easy to perform LDAP operations, including connecting, browsing, and modifying a directory. The tool—called LDP (`ldp.exe`)—is available with the Support Tools for the Windows Server platform; see the Microsoft Product Support site for more information.

LDAP Examples for Active Directory Authentication

Example 1—Active Directory

Active Directory Configuration 1

Login DN	*CN=AVtest,CN=Users,DC=testusrs,DC=example,DC=com*
Search base	*DC=testusrs,DC=example,DC=com*
Username attribute	*sAMAccountName*

Example 2—Active Directory

Active Directory Configuration 2

Login DN	*CN=johnDoe,CN=Users,DC=na,DC=example,DC=com*
Search base	*CN=Users,DC=na,DC=example,DC=com*
Username attribute	*sAMAccountname*

Example 3—LDAP with Domino Server

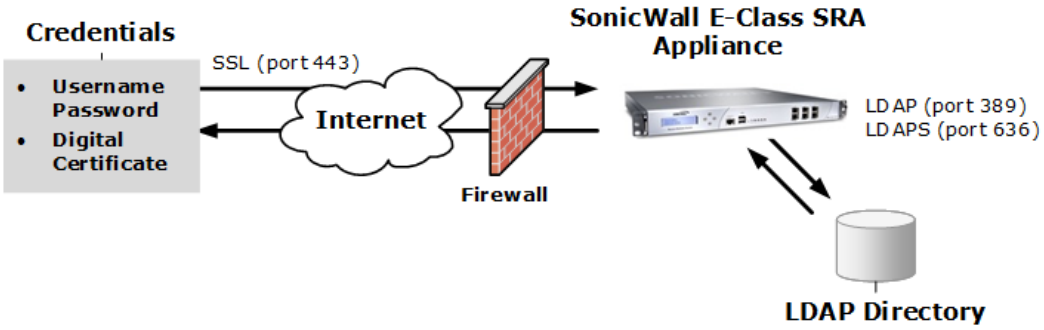
LDAP Configuration with Domino Server

Login DN	*CN=E-Class SMA,O=peoplesoft*
Search base	*o=peoplesoft*
Username attribute	*cn*

Configuring LDAP and LDAPS Authentication

The SMA appliance supports authentication using the LDAP or LDAPS (LDAP over SSL) protocols. Either protocol can be used to validate username and password credentials. LDAP and LDAPS authentication configuration options shows typical LDAP configuration options.

LDAP and LDAPS authentication configuration options



Securing your LDAP connection with SSL requires additional configuration. You must add the root certificate of the CA that granted your LDAP certificate to the SSL trusted root file. This enhances security by preventing attempts to impersonate your LDAP server. For more information, see Importing CA Certificates.

After configuring an LDAP or LDAPS server, you can validate the realm configuration settings by establishing a test connection. For more information, see Testing LDAP and AD Authentication Configurations.

Consider the following restrictions when configuring LDAP authentication:

- **Firewalls and routers** - You must configure your firewall or router to allow the appliance to communicate with your LDAP server. Standard LDAP uses port 389/tcp; LDAPS communicates over port 636/tcp.
- **LDAP Affinity servers** - Although it is possible to configure LDAP Affinity servers for all authentication servers, an Affinity server should be used only for an authentication server that does not include full group search capabilities, such as a RADIUS, RSA, and PKI server. In addition, Secure Mobile Access does not support Affinity servers for stacked authentication where any one of the authentication servers has group checking capabilities.

  NOTE: When an Active Directory (AD) server is used as an LDAP server, ACL checks cannot be performed. Short names (SN) or common names (CN) are not supported on LDAP servers. They are only supported on AD servers.

- **Digital certificate validation** - Configuring an LDAP authentication server with digital certificate validation is offered for legacy customers. New users should use the standard method described in Configuring a PKI Authentication Server. The **Trust intermediate CAs without verifying the entire chain** option is offered on the configuration pages for both the **LDAP** with **Digital Certificate** option and the **Public key infrastructure (PKI)** option.

Topics:

- Configuring LDAP with Username and Password
- Configuring a PKI Authentication Server
- Importing CA Certificates
- About Intermediate Certificates

Configuring LDAP with Username and Password

Remember the following when configuring LDAP:

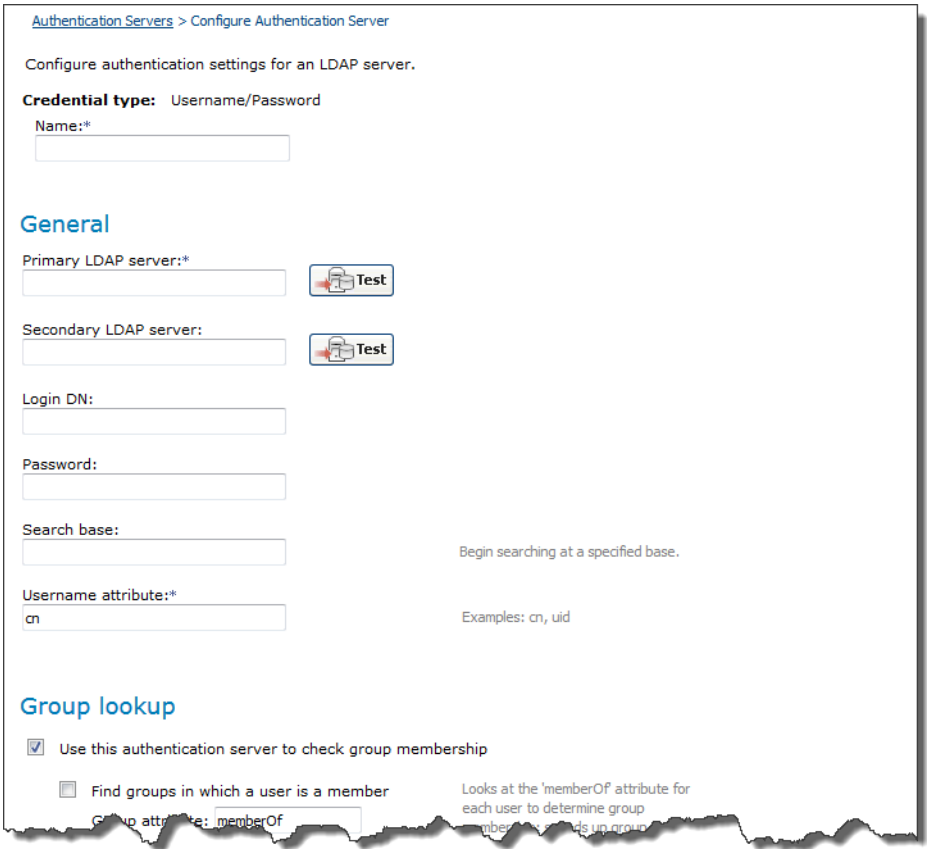
- The **Notify user before password expires** and **Allow user to change password when notified** settings in the **Password management** area have some constraints:
  - They are supported only on IBM Directory Server.

- They are available only for users who connect to the appliance using Web access (the Web proxy agent or translated, custom port mapped, or custom FQDN mapped Web access), or using Connect Tunnel.
- Users must have permission on the LDAP server to change their passwords.

- The **Login DN** and **Password** fields are not always required in order to connect to an LDAP server. However, if they are not provided (or you do not specify a password), the appliance binds to LDAP anonymously, which does not usually provide the appropriate permissions for performing user and group information searches.
- If you define multiple LDAPS servers, you should also configure the **Match certificate CN against LDAP server name** setting to be the same for each realm. (Enabling this option is recommended in a production environment.) Although AMC allows you to configure this setting per realm, the appliance actually uses the setting configured in the last loaded LDAPS realm. In other words, if you selected this checkbox for three LDAPS servers, but cleared it for a fourth LDAPS realm, the functionality would be disabled for all four servers.
- Configuring an LDAP authentication server with digital certificate validation is offered for legacy customers. New users should use the standard method described in Configuring a PKI Authentication Server.

To configure an LDAP authentication server with username and password validation:

1. From the main navigation menu in AMC, click **Authentication Servers**, and then click **New...**.
2. Under **Authentication directory**, click **LDAP**.
3. Under **Credential type**, click **Username/Password**, and then click **Continue...**. The **Configure Authentication Server** page appears.



4. In the **Name** field, type a name for the authentication server.

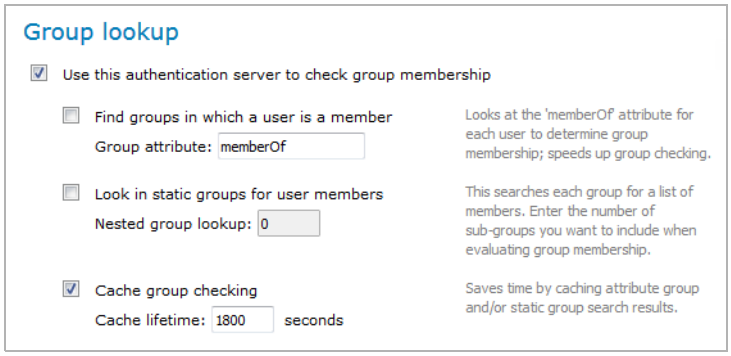
5 Complete the information listed under **General**:

- In the **Primary LDAP server** field, type the host name or IP address of your LDAP server. If you are using a failover server (optional), specify its address in the **Secondary LDAP server** field.

  If the LDAP server is listening on a something other than the well-known port (389 for unencrypted LDAP connections, or 636 for SSL connections), specify a port number as a colon-delimited suffix (for example, `myldap.example.com:1300`).

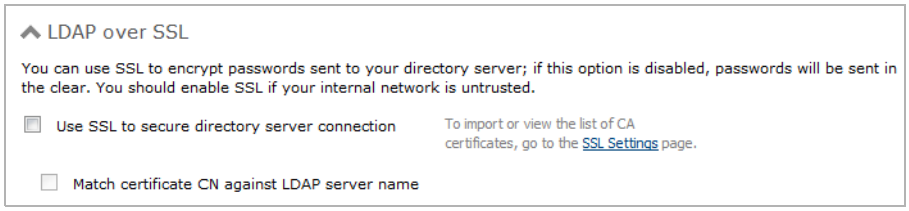
- In the **Login DN** field, type the distinguished name (DN) used to establish a connection with the LDAP server.
- In the **Password** field, type the password used to establish a connection with the LDAP server.
- In the **Search base** field, type the point in the LDAP directory from which you want to begin searching for user information. This will usually be the lowest point in the directory tree that contains user information. For example, you might type `ou=Users,o=xyz.com`. The user binding to the LDAP directory must have permissions to view the directory at this level.
- In the **Username attribute** field, type the attribute used to match usernames. This is usually `cn` or `uid`.
- Click the **Test** button for each server you specified in order to test the connection.

6 Complete the information listed under **Group lookup**:



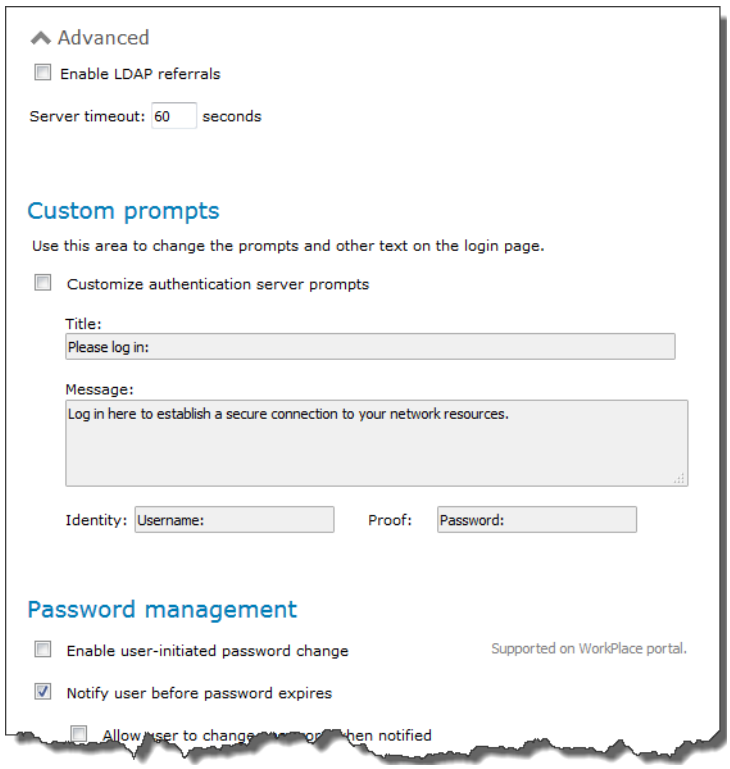
- To enable group checking on this server, select the **Use this authentication server to check group membership** checkbox. When this checkbox is unchecked, the nested controls are disabled because they apply only to group checking behavior. This checkbox, when unselected, allows an authentication server for LDAP, AD, or AD-Tree to be configured without enabling it for authorization checks. This improves efficiency by allowing better stacked/affinity authentication support.
- If you want the LDAP search to determine a user's group membership by searching the group attribute in the user container, select the **Find groups in which a user is a member** checkbox and then type the **Group attribute**. This attribute is most often **memberOf**. Do not select this checkbox unless attribute-based groups are supported by and enabled on your LDAP server.
- If your LDAP server does not support attribute-based groups or you have not enabled this functionality, you can select the **Look in static groups for user members** checkbox; to specify the depth of the search (how many sub-groups to include in the search), enter a number in the **Nested group lookup** checkbox. Be aware that this type of search can take some time because it requires searching the entire LDAP tree; enabling **Cache group checking** is highly recommended.
- To reduce the load on your directory and get better performance, cache the attribute group or static group search results. Select the **Cache group checking** checkbox and then specify a **Cache lifetime**, in seconds. The default value is **1800** seconds (30 minutes).

7 To secure the LDAP connection with SSL, complete the information under **LDAP over SSL**:



- To secure the LDAP connection with SSL, select the **Use SSL to secure LDAP connection** checkbox.
- View your certificate details and verify that the root certificate can be used by the appliance. See Importing CA Certificates for details.
- To configure the appliance to verify that the LDAP host name is the same as the name in the certificate presented by the LDAP server, select the **Match certificate CN against LDAP server name** checkbox. Typically, your server name will match the name specified in its digital certificate. If this is the case with your server, SonicWall recommends enabling this option in a production environment. This makes it more difficult for an unauthorized server to masquerade as your LDAP server if your digital certificate or DNS server is compromised.

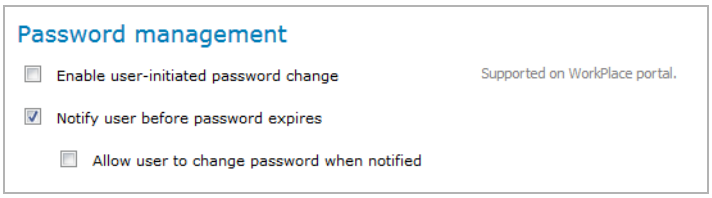
8 Optionally, complete the information listed under **Advanced**.



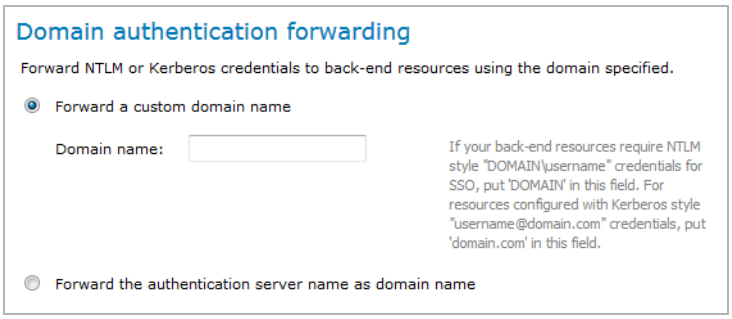
- When an LDAP server cannot answer a client's query, you can refer it to other LDAP servers by selecting the **Enable LDAP referrals** checkbox. Use caution when enabling this feature because it can slow down the authentication process. If you are configuring LDAP to authenticate against Microsoft Active Directory, you may want to disable this feature.
- In the **Server timeout** field, type the number of seconds to wait for a reply from the LDAP server. The default value is **60** (one minute).
- To change the prompts and other text that Windows users see when they log in to the authentication server, select the **Customize authentication server prompts** checkbox. The page title, message, and login prompts can all be customized. If users log in using a PIN as a password,

for example, change the text for the **Proof** prompt from **Password***:* to **PIN***:* (a customized **Message** could explain how to retrieve a forgotten PIN).

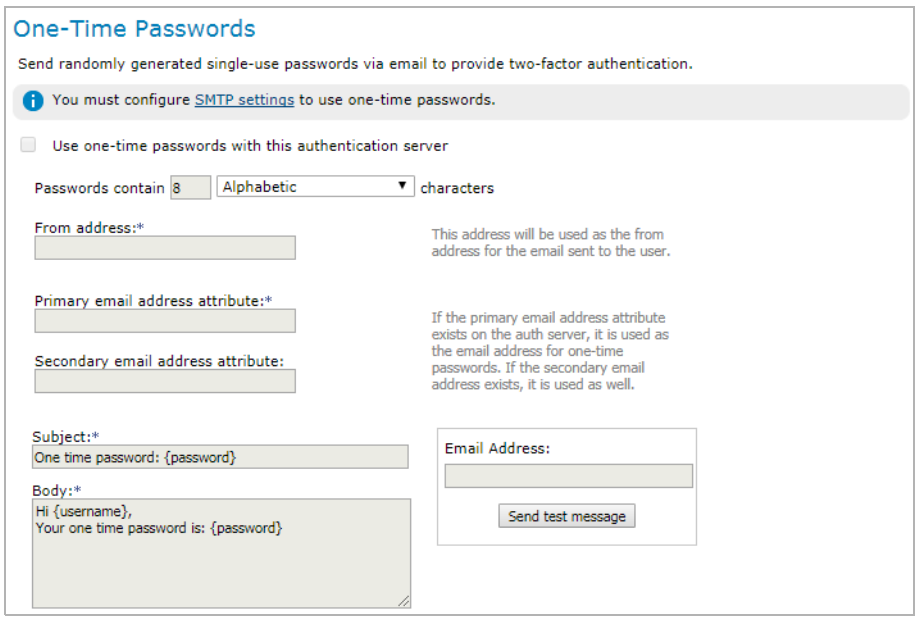
- You can allow users to change their passwords (in WorkPlace only) by selecting **Enable user-initiated password change**. If a realm is configured with stacked authentication and requires two sets of username/password credentials, a user who changes his or her password will be changing the credentials for just the first of the two authentication servers.



- To allow the LDAP server to notify users that their passwords are going to expire, select the **Notify user before password expires** checkbox. To also permit them to change their passwords when prompted by the LDAP server, select the **Allow user to change password when notified** checkbox. The password prompt users see is controlled by the LDAP server.
- To enable NTLM authentication forwarding, click one of the **Domain authentication forwarding** options. For more information, see NTLM Authentication Forwarding.



9 To configure authentication that includes an OTP, enable **Use one-time passwords with this authentication server**. You must also configure your mail server: if OTPs are going to be delivered to external domains (for example, an SMS address or external webmail address), you may have to configure the SMTP server to allow passwords to be sent from the appliance to the external domain.



- Enter the number of characters for the OTP in the **Password contains** field. The default length is **8**, the minimum is 4, and the maximum is 20.
- Select the type of characters in the OTP from the drop-down list. Select **Alphabetic**, **Alphabetic and numeric**, or **Numeric**.
- In the **From address** field, enter the email address from which the OTP will be sent.
- In the **Primary email address attribute** box, enter the directory attribute for the email address to which one-time passwords will be sent. If the primary attribute exists on the authentication server, it is used.
- The **Secondary email address attribute**, if specified, is used in addition to the primary email address. The OTP is sent to both addresses.

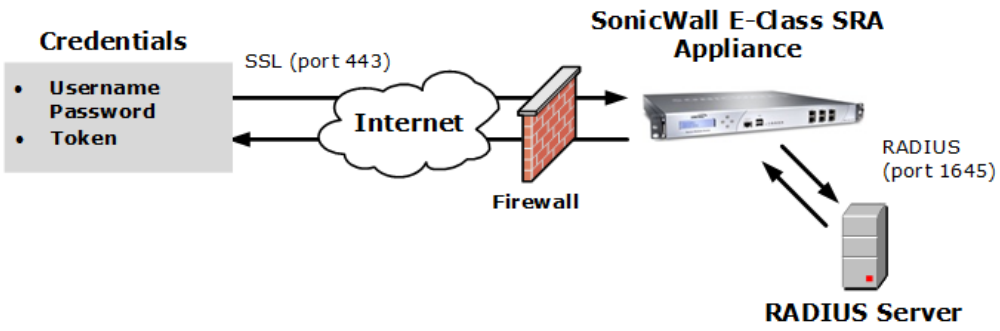
  To have OTPs sent as a text message (instead of an email message), enter the corresponding attribute name (for example, `SMSphone` instead of `Mail` or `primaryEmail`). See Configuring the AD or LDAP Directory Server for more information.
- In the **Subject** field, customize the subject line of the OTP email. You can use the replacement variable *{**password**}* to indicate a position in the subject line where the actual password will display.
- In the **Body** field, customize the body of the OTP message. Use the replacement variable *{**username**}* to indicate a position in the message where the user's account name will display. Use the replacement variable *{password}* to indicate a position in the message where the actual password will display.
- To test delivery of an OTP to a user, enter the email address of the user who will receive the OTP into the **Email address** field and click the **Send test message** button. If the appliance is able to send the message, the status `Message successfully sent` is displayed below the button. Failure messages are also displayed below the button, such as errors connecting to the SMTP server, or errors communicating with the AD/LDAP server or looking up the specified user on the AD/LDAP server.

10 Click **Save**.

Configuring RADIUS Authentication

The appliance can validate username/password or token-based credentials against a RADIUS database. RADIUS authentication configuration options shows typical RADIUS configuration options:

RADIUS authentication configuration options



You must modify your firewall or router to allow the appliance to communicate with your RADIUS server. The RADIUS authentication protocol typically uses port 1645/udp. In addition, you must configure your RADIUS

server to include the IP address of the appliance as a RADIUS client (most often referred to as a *Network Access Server*).

NOTE: Affinity servers should be used only for authentication servers that do not include full group search capabilities, such as RADIUS, RSA, and PKI servers.

Topics:

Configuring RADIUS with User or Token-Based Credentials

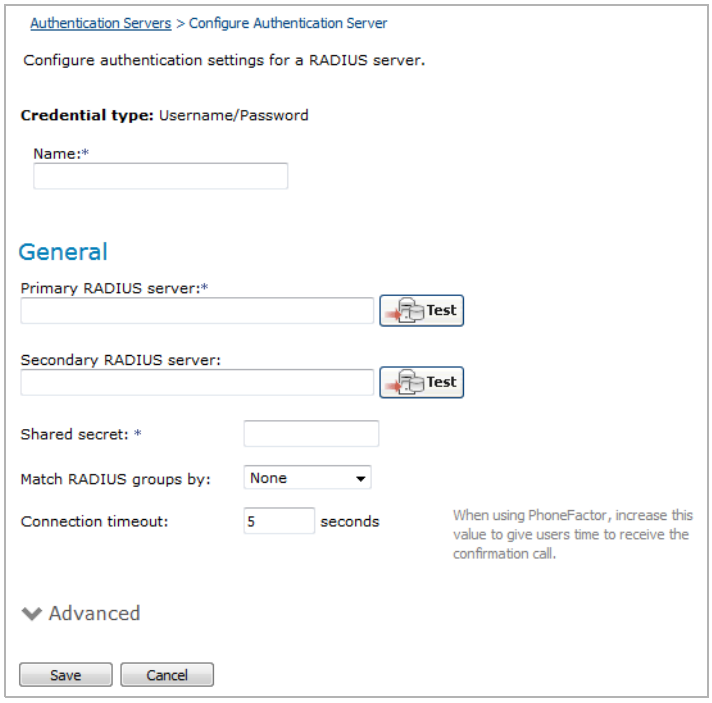
The appliance supports two different types of credentials for RADIUS: username and password, and token-based user credentials, such as SecurID or SoftID, which are validated against a database on a RADIUS server. You can configure the RADIUS authentication method to use either type of credential.

You can also deploy PhoneFactor authentication using RADIUS. When a user logs into their company's VPN, a RADIUS request is made to the PhoneFactor Agent, which acts as a RADIUS proxy server. It first validates the user name and password with the target RADIUS server before initiating a PhoneFactor authentication. There are two methods for two-factor authentication using PhoneFactor:

- The user enters his username and password and is then called by PhoneFactor. The user answers his phone and presses # or enters a PIN.
- The user enters his username and password and then PhoneFactor sends him a text message containing a one-time passcode. The user replies to the text message with the passcode, or the passcode and his PIN, to authenticate.

To configure RADIUS for user- or token-based credentials:

1. From the main navigation menu in AMC, click **Authentication Servers**, and then click **New...**.
2. Under **Authentication directory**, click **RADIUS**, and then click **Continue...**. The **Configure Authentication Server** displays.



3 Under **Credential type**, click **Username/Password** or **Token/SecurID**, and then click **Continue...**. For PhoneFactor, select **Token/SecurID**.

4 In the **Name** field, type a name for the authentication server.

5 In the **Primary RADIUS server** field, type the host name or IP address of your primary RADIUS server. If your RADIUS server is listening on a port other than 1645 (the well-known port for RADIUS), you can specify a port number as a colon-delimited suffix (`:<port number>`).

6 In the **Secondary RADIUS server** field, type the host name or IP address of your secondary RADIUS server. You can also add a port number if necessary.

7 In the **Shared secret** field, type the password used to secure communication with the RADIUS server. This must be the same secret that is specified on the designated RADIUS server.

8 In the **Match RADIUS groups by** list, select the attribute containing the groups of which the user is a member. The value returned from RADIUS will be used in the group portion of the appliance access rule. There are three possible values:

RADIUS groups matching

Match RADIUS groups by	Description
None	Ignores the group attribute
filterid attribute (11)	Matches against the **FilterID** attribute
class attribute (25)	Matches against the **Class** attribute

9 In the **Connection timeout** field, type the number of seconds to wait for a reply from the RADIUS server before timing out the authentication attempt. The default is **5** seconds, with a range of 5 to 300 seconds. When using PhoneFactor, increase this value to give users time to receive the confirmation call.

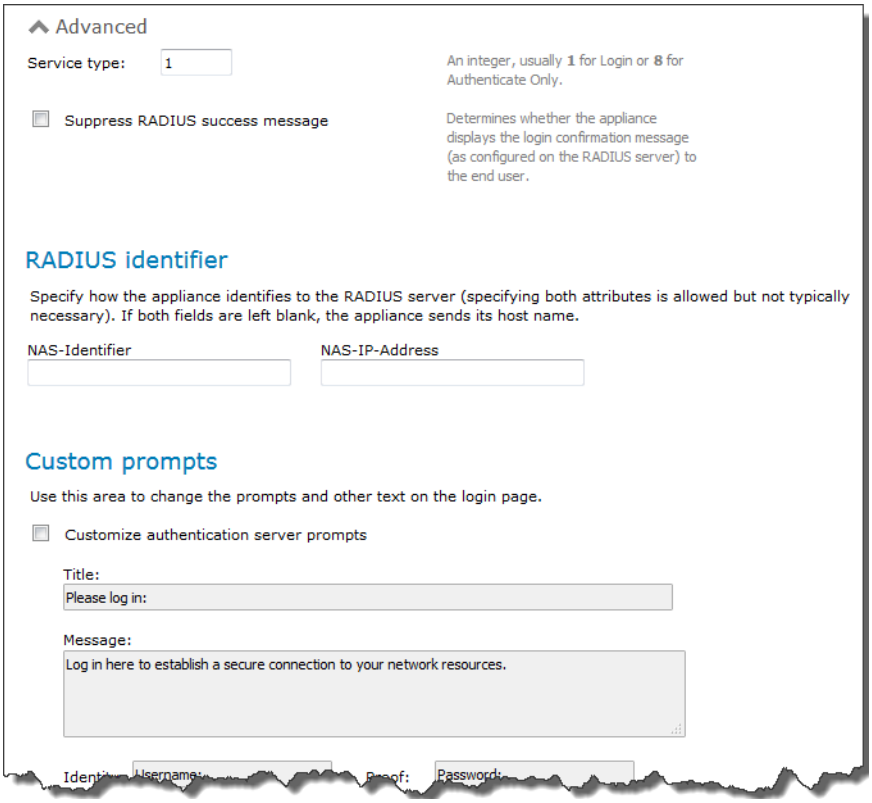
10 Expand the **Advanced** button to see additional, optional settings; these are described in Configuring Advanced RADIUS Settings.

11 Click **Save**.

Configuring Advanced RADIUS Settings

To configure additional (optional) RADIUS settings

1 Click the **Advanced** button to display additional (optional) RADIUS settings.



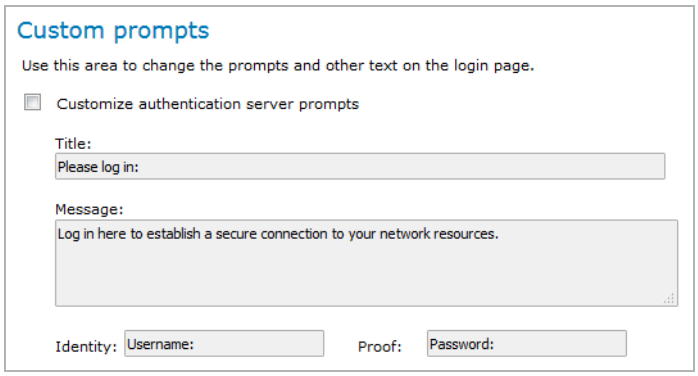
2 In the **Service type** field, type a RADIUS Service-Type integer indicating the type of service being requested. For most RADIUS servers, type **1** (for Login; default) or **8** (for Authenticate Only).

3 When a user's credentials are accepted, the RADIUS server normally sends a confirmation message (for example, `Passcode accepted`). If you do not want this message displayed, select the **Suppress RADIUS success message** checkbox.

4 The appliance normally identifies itself using its host name. If the RADIUS server is unable to accept that name, specify a **NAS-Identifier** or **NAS-IP-Address** (specifying both is allowed but not typically necessary).

5 To change the prompts and other text that Windows users see when they log in to the authentication server, select **Customize authentication server prompts**. The page title, message, and login prompts can

all be customized. For example, if a user logs in using his employee ID, you could change the text for the **Identity** prompt from **Username:** to **Employee ID:**.



6 If the RADIUS server uses an older version of the RADIUS protocol that does not support UTF-8 character encoding, select a **Local encoding** scheme from the **Selected** list, or type one in the **Other** field. For more information, see RADIUS Policy Server Character Sets.

7 (RADIUS with a **Credential type** of **Username/Password** only) To enable NTLM authentication forwarding, click one of the **NTLM authentication forwarding** options. For more information, see NTLM Authentication Forwarding.

User-Mapped Tunnel Addressing

User-Mapped Tunnel Addressing enables network administrators to identify network traffic from a specific user by the source IPv4 address of the traffic.

On an internal network, administrators may sometimes be able to associate specific end users with specific IPv4 addresses, that are assigned to the user by the administrator.

Although assigning IP addresses to specific users is currently supported through the use of external RADIUS servers, User-Mapped Tunnel Addressing enables administrators to specify the assignment from an attribute in the appliance's local authentication server.

Administrators who deploy a RADIUS server as their authentication server can include an IPv4 address in the RADIUS Framed IP Address parameter for a specific user and associate that user's Community with a RADIUS address pool. This type of assignment can be done only if the address is available and no addressing conflicts prohibit it.

NOTE: If an address conflict prevents this type of assignment, the normal tunnel addressing process continues with the next tunnel in the list that is allowed by the Community. If no more pools are available, the tunnel configuration fails.

The RADIUS Pool in the Configure Network Tunnel Service is now called the User-Mapped Pool. When a RADIUS-framed IP address is available from the authentication server, that address is available to the User-Mapped Pool. An IPv4 address that is provided by a user's local authentication server, is also available to the User-Mapped Pool and is used exactly the same as if it was from the RADIUS Pool. The User-Mapped Tunnel Addressing feature extends user-mapped addresses to the local user's authentication server. No other address pools may supply addresses.

More than one address may be obtained from the authentication server, enabling a single user to establish more than one tunnel simultaneously, on separate devices. The number of simultaneous tunnel connections that a single user can establish can be configured by specifying the number of addresses for a user in the authentication server. This value can also be configured by setting the **Maximum Active Sessions** limit for all users of a particular community on the **Configure Community** page.

The User-Mapped Tunnel Address Pool, like RADIUS, can be used to provide a strict correspondence (or mapping) between virtual IPv4 addresses and tunnel clients. You can specify that a particular client gets a virtual address from a particular pool on the **Network Tunnel Client Settings** page. The client is assigned to a specific community and that community only gets IPv4 addresses from a particular address pool.

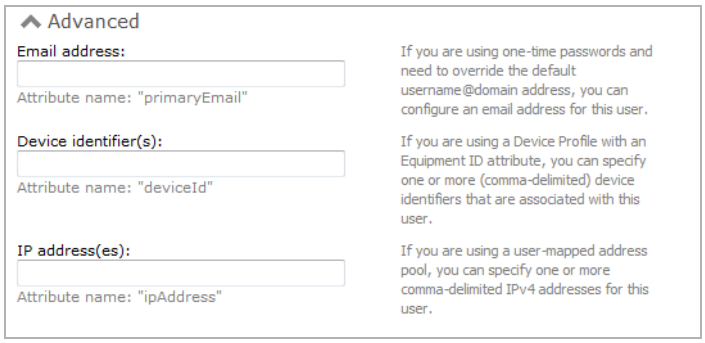
The User-Mapped Tunnel Address Pool attempts to establish an IPv4 address as the tunnel virtual address at tunnel connect time. If the address is available and no client-side conflicts arise, the virtual address is assigned. If the address fails, then the system proceeds to the next address pool in the list allowed by the community. If no other address pools are available, the tunnel connection attempt fails.

The authentication server used to get IPv4 addresses is not limited to its own authentication server. The User-Mapped Tunnel Address Pool may get addresses from its own authentication server or from the client's local authentication server

The authentication server may supply an ordered list of IPv4 addresses, not just a single address, so that you can assign multiple simultaneous tunnel connections to a single client, on separate devices.

On the **Users & Groups** page, on the **Add/Edit Local User** dialog, under the **Advanced** section, you can configure the following fields:

- Email address
- Device identifier(s)
- IP address(es)



To edit local users information:

1. From the main navigation menu in AMC, click **Users & Groups**.
2. Click **Local Accounts** and then click on the **Name** of the local account you want to edit.
3. Expand the **Advanced** section to access the additional options.
4. In the **Email Address** field, configure an email address for the user. This address is used for sending one-time passwords to the user, and overrides the default `username@domain` email address. This email address is assigned to the "mail" attribute for the user.
5. In the **Device identifier(s)** field, enter one or more (comma-delimited) device identifiers for computers or other devices that are associated with this user.
6. In the **IP address(es)** field, enter either a single IPv4 address or list of IPv4 addresses (comma-delimited). If you enter a:
    - Single IPv4 address, each IPv4 address should match the network address of the resource interface.
    - List of IPv4 addresses, these addresses are presented to the User-Mapped Tunnel Address Pool, in the order they appear in the list.

Configuring RSA Server Authentication

The appliance supports SecurID, token-based user credentials that are validated against a database on an RSA Authentication Manager server. Configuring this type of authentication involves changes on both the RSA server and the SMA appliance, which are outlined below. For step-by-step instructions for RSA Authentication Manager 7.1, see the Knowledge Base article, *Configuring RSA Authentication For Use With an E-Class Secure Remote Access Appliance (SW6571)*.

NOTE: Affinity servers should be used only for authentication servers that do not include full group search capabilities, such as RADIUS, RSA, and PKI servers.

To configure RSA Authentication Manager for token-based credentials:

1. Create an agent host on the RSA server with the IP address for the internal interface of the SMA appliance.
2. Make the configuration changes necessary to resolve the names of both the RSA server and the SMA appliance:
   - DNS must be able to resolve the RSA server's name; simply adding the appliance and its IP address to your `/etc/hosts` file will not work.
   - The appliance's name (as configured on the RSA server) must resolve to the internal IP address of the appliance.
3. DNS must be able to resolve the RSA server's name in both directions:
   - The appliance's name (as configured on the RSA server) must resolve to the internal IP address of the appliance; simply adding the appliance and its IP address to your `/etc/hosts` file will not work.
   - The RSA server requires a reverse DNS entry for the internal interface of the SMA appliance.
4. After adding the agent host on the RSA server, make sure that you generate the configuration file (`sdconf.rec`) for the correct agent host.
5. From the main navigation menu in AMC, click **Authentication Servers**, and then click **New...**.
6. Under **Authentication directory**, choose **RSA Authentication Manager**. The **Credential type** is automatically set to **Token/ SecurID**.
7. Click **Continue...**.
8. In the **Name** field, type a name for the authentication server.
9. Specify the location of your RSA Authentication Manager server SecurID configuration file, `sdconf.rec`. This configuration file is in binary format and contains the ports and processes associated with the RSA authentication service. When in place, this file is used by the RSA libraries to communicate over the network to an RSA server.
10. Click **Save** to upload it to the appliance.
11. The node secret is negotiated when the first authentication request is made from the agent host. Make sure that the **node secret created** flag is cleared on the RSA server.

NOTE:

- If you make any changes to the RSA server (for example, change its IP address, host name, or re-install it), the `sdconf.rec` file must be uploaded to the appliance again.
- After upgrading some older versions, users may not be able to authenticate through the RSA server because the node secret did not migrate properly. In this case, clear the node secret for the authentication agent on the RSA server.

Configuring a PKI Authentication Server

You can set up a certificate server so that a user authenticates using a client certificate on his or her device. Digital certificate authentication can be used alone or in conjunction with another authentication method, such as RADIUS. (If you set up chained authentication and a digital certificate is one of the methods you use, it must be the first method; for more information, see Configuring Chained Authentication.)

NOTE: Affinity servers should be used only for authentication servers that do not include full group search capabilities, such as RADIUS, RSA, and PKI servers.

NOTE:

- If both CRL and OCSP are enabled for a CA certificate, only OCSP is used.
- Fallback from CRL to OCSP or OCSP to CRL is not supported.

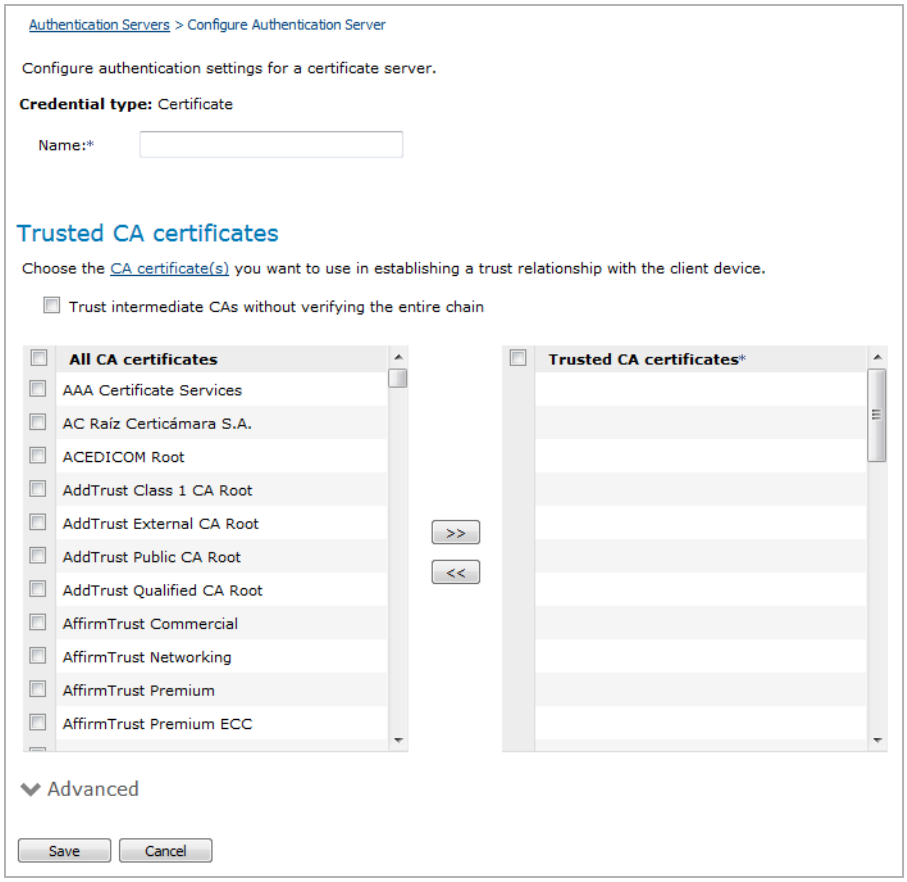
To configure a PKI authentication server:

1 From the main navigation menu in AMC, click **Authentication Servers**.

2 Click **New...**.

3 Under **Authentication directory**, click **Public key infrastructure (PKI)**. The only possible **Credential type** is **Digital certificate.**

4 Click **Continue...**. The **Configure Authentication Server** page appears.



5 In the **Name** field, type a name for the authentication server.

6 Under **Trusted CA certificates**, optionally select the **Trust intermediate CAs without verifying the entire chain** checkbox. This allows a set of trusted intermediate signing authority certificates to be deployed in

various sectors of the network (often by department or organizational unit). For more information, see About Intermediate Certificates.

7 On the left is a list of **All CA certificates** used by the appliance. Specify one or more root certificates for establishing a trust relationship with the client device by selecting the checkbox to the left of a certificate and then clicking the **>>** button (a root certificate is one where the **Subject** and **Issuer** are the same). A client's certificate will be trusted if it matches a root certificate listed in the **Trusted CA certificates** list.

8 Under **Advanced**, in the **Username attribute** field, type the attribute used for single sign-on (for example, `cn` or `uid`).

9 To use an OCSP responder to determine client certificate status, select the **Use OCSP to verify client certificates** checkbox. If selected, a user may use any access method (ExtraWeb or Connect Tunnel) to authenticate to a realm that uses this PKI authentication method.

10 Select one of the following options for **Use this OCSP responder**:

- **System default** – A manually configured OCSP responder has priority. The configured OCSP responder URL is shown here if configured. You can configure it by clicking the **here** link, which takes you to the **OCSP** page available from **SSL Settings**.
- **User certificate's AIA extension** – The user certificate is parsed to extract the URL of the OCSP responder. The Authority Information Access (AIA) certificate extension contains URL locations that provide the issuing CA's certificate. The AIA extension can contain HTTP, FTP, LDAP, or FILE URLs.
- CA certificate's AIA extension – The CA certificate is parsed to extract the URL of the OCSP responder.

11 Select the **Allow certificate if responder is unavailable** checkbox if the authentication should succeed in cases where an error occurs, an **unknown** status is returned, or the OCSP responder is not available.

12 Select the **Trust signing certificates in response** checkbox to trust certificates in the OCSP response. This is enabled by default.

You must import the OCSP response signing certificate for the CA certificate being used and enable **OCSP response verification** when importing it. The OCSP response signing certificate can be copied from the OCSP responder or server to a local management machine and then imported from the **SSL Settings** page while you are logged in to AMC.

13 Select the **Send nonce in request** checkbox and **Require nonce in response** checkbox to guard against malicious replay attacks, in which a successful response is replayed to the client after the subject certificate is revoked.

14 Click **Save**.

Additional Field for Custom Certificates

The custom SSL client certificate has an additional field to contain an employee ID number (a 10-digit number). This employee ID number can be parsed and passed to an Active Directory authentication server, which will use this additional information to determine the authorization and client access privilege of the client and add that client to the authorized group.

To generate and gain access to SMA with a custom certificate:

1 Create a custom certificate; include the Employee ID number in the custom field.

2 Create a user group on the Active Directory authentication server based on the Employee ID number field.

3 Create an SMA access policy for that user group on the Active Directory authentication server.

4 Configure the Employee ID number field as the SSO username on the Active Directory authentication server.

5 Configure Group Affinity Checking on the Active Directory authentication server.

6 Add the appropriate resources and enable SSO for the configured username.

The custom certificate is assigned to the client with that username and is installed on the client's device. The client can now use that device to access SMA and all resources that are enabled with SSO for that client.

Configuring a SAML-Based Authentication Server

Security Assertion Markup Language (SAML) is an XML-based framework for communicating user authentication, entitlement, and attribute information. SAML provides a foundation for Web based single sign-on (Web SSO) by allowing business entities to make assertions regarding the identity, attributes, and entitlements of a subject (such as a human user) to other entities, such as a partner company or another enterprise application.

In Web SSO, a user either accesses a resource via a service provider (such as the EX Series appliance), or accesses an identity provider (IDP) such that the service provider and desired resource are understood or implicit. The user authenticates to the IDP, which then produces an authentication assertion and the service provider consumes the assertion to establish a security context for the user. When the security context for the user exists, the user can access resources at another site without additional authentication. SAML also provides a Single Logout (SLO) service.

This release supports external IDPs that are deployed in the public Internet. It is assumed that the user uses a standard browser and can authenticate to the IDP by some means outside the scope of SAML. The user accesses the appliance through a SAML Authenticated Realm.

When configuring the EX Series appliance to use an SAML 2.0 Identity Provider, such as CA SiteMinder, refer to the following configuration information:

- The appliance hosts the SAML SSO Service at `https://<appliance>/saml2ssoconsumer`
- The appliance hosts the SAML SLO Service at `https://<appliance>/saml2sloconsumer`
- On the IDP:
  - HTTP-POST and HTTP-Redirect Bindings should be enabled and configured
  - SAML SSO and SLO services should be enabled and configured
  - Encryption of nameIDs and Assertions should be disabled

Configuring a SAML 2.0 Identity Provider Authentication Server

NOTE:
- The SAML 2.0 Identity Provider Authentication Server is supported for Web-based access. Tunnel agents are not supported.
- The SAML 2.0 Identity Provider Authentication Server cannot be used for chained authentication.

NOTE: For detailed information on how to configure third party SAML Identity Providers (IDPs), see Configuring SAML Identity Providers.

SAML 2.0 Identity Provider (IDP) provides a centralized security management foundation that enables the secure use of the Web to deliver applications and cloud services to customers, partners, and employees.

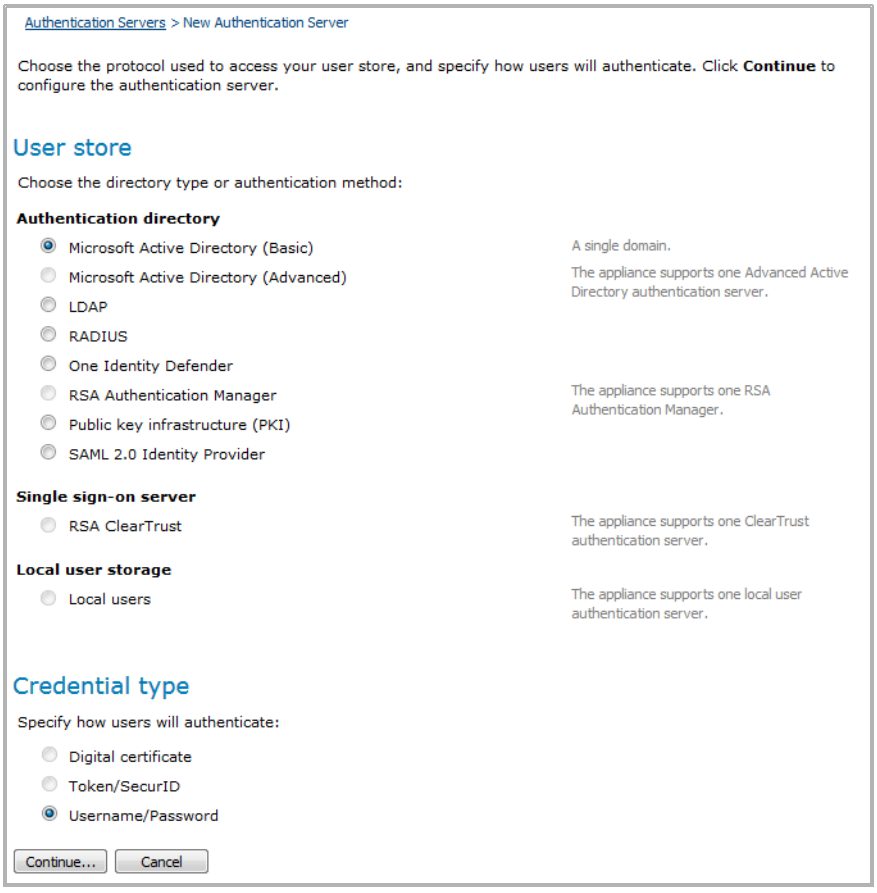
SMA has replaced CA SiteMinder with SAML 2.0 Identity Provider, which supports CA SiteMinder as well as other IDPs. SAML 2.0 Identity Provider supports the following IDPs:

- Microsoft Azure IDP
- One Identity Cloud Access Manager
- Shibboleth IDP
- OneLogin
- CA Single Sign-On (CA SiteMinder)
- PingIdentity PingOne
- CA SiteMinder

To configure a SAML 2.0 Identity Provider authentication server:

1 In the AMC, go to the **System Configuration > Authentication Servers** page.

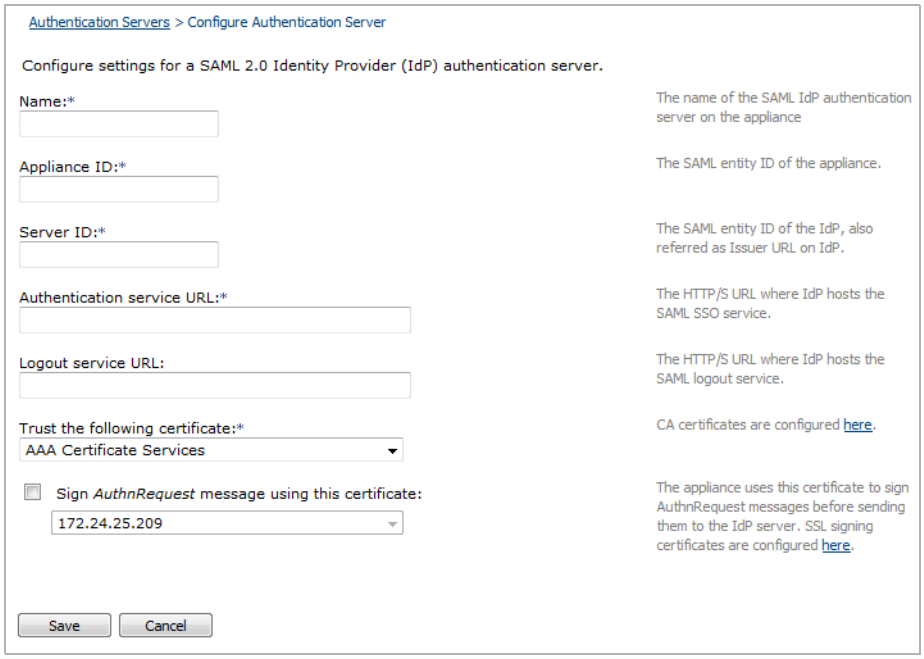
2 Click **New...**. The **New Authentication Server** dialog appears.



3 Under **Authentication directory**, select **SAML 2.0 Identity Provider**.

4 Under **Credential type**, select **Username/Password**.

5 Click **Continue...**. The **Configure Authentication Server** page appears.



6 In the **Name** field, type a name for the authentication server.

7 In the **Appliance ID** field, enter the SAML entity ID of the appliance. This is a URI of not more than 1024 characters in length.

8 In the **Server ID** field, enter the SAML entity ID of the IDP server. This is used by the appliance to determine the IDP authentication server identity. This is a URI of not more than 1024 characters in length.

9 In **Authentication Service URL**, enter the URL where IDP hosts the SAML SSO service.

10 In **Logout service URL**, enter the URL where IDP hosts the SAML Single Logout (SLO) service.

11 Select the CA certificate for the IDP server from the **Trust the following certificate** drop-down menu. To configure the CA certificate, you can click the **here** link in the explanatory text at the right. This CA certificate needs to be imported onto the appliance if it is not there.

12 Select the **Sign AuthnRequest message using this certificate** checkbox and then select the signing certificate from the drop-down menu. The appliance uses this certificate to sign authentication request messages before sending them to the IDP server. To configure the SSL signing certificate, you can click the **here** link in the explanatory text at the right. The signing certificate needs to be imported into the appliance if it is not there.

13 Click **Save**.

Configuring a Single Sign-On Authentication Server

Single sign-on (SSO) allows you to configure the appliance to forward user credentials to back-end Web resources. It also means that the user does not need to log in multiple times (once to get to the appliance, and again to access an application resource).

The appliance supports various types of Web SSO (as a security measure, SSO is disabled by default).

NOTE:

- To use SSO functionality when accessing Web applications during tunnel sessions, you can enable **Web resource filtering**. See Configuring Web Resource Filtering for more information.
- The Web proxy agent does not support single sign-on to back-end Web servers secured with SSL. Links to these resources accessed through the Web proxy agent will not provide single sign-on. To provide either basic authentication or NTLM authentication forwarding to an HTTPS resource, create an alias for the Web resource and then add it as a link in WorkPlace. This forces the appliance to provide translated, custom port mapped, or custom FQDN mapped Web access.
- By default, Web content is proxied directly through the appliance for users running OnDemand Tunnel. Select **Use Web content translation** in the **Web shortcut access** area of the **Configure WorkPlace** page in AMC.

Topics:

Forms-Based Single Sign-On

Many Web applications use forms-based authentication, where the user interface for authentication is a Web form. You can use AMC to set up a single sign-on profile that will forward a user's appliance credentials to a Web application that uses forms-based authentication. There are some built-in profiles that you can modify for your environment:

- OWA (multiple versions)
- Citrix Nfuse 1.7
- Citrix XenApp

See Creating Forms-Based Single Sign-On Profiles for more information.

NOTE: Forms-based SSO is supported only with translation. For other access agents (Web proxy and OD Tunnel) access the backend Web application cookies required for translation are not provisioned to the server.

Basic Authentication Forwarding

This form of authentication forwarding is supported on a wide variety of platforms, but is not very secure because it sends passwords in the clear across the network. The appliance can be configured to send each user's authentication credentials, or "static" credentials (that is, the same credentials for all users).

To configure basic authentication forwarding:

1. Configure a Web application profile to use SSO and specify which user credentials to use.
2. Attach the Web application profile to any Web resources for which you want to use SSO.

Basic authentication forwarding is configured within a Web application profile. For more information, see Adding Web Application Profiles.

NTLM Authentication Forwarding

NTLM (Windows NT LAN Manager) uses a challenge/response mechanism to securely authenticate users without sending passwords in the clear across the network. It provides a secure method for sending Windows network credentials to a Microsoft IIS (Internet Information Services) Web server.

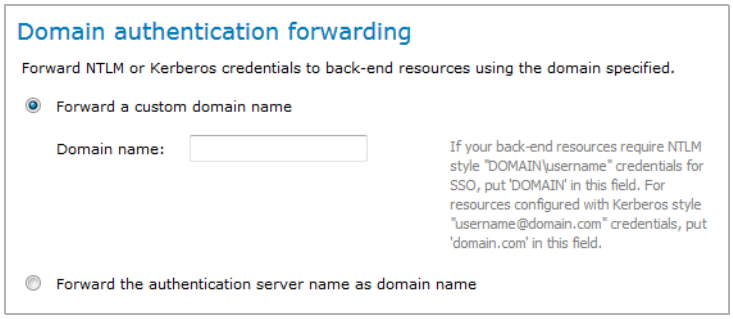
NTLM authentication forwarding passes a Windows domain name along with the user's authentication credentials. This enables users accessing Web resources on Windows networks to be securely authenticated without sending their passwords in the clear.

NOTE:

- To use NTLM authentication forwarding in situations in which the credentials do not match, users must be running a Web browser that supports NTLM.
- When single sign-on is enabled, the Web proxy service and the back-end server determine which authentication method is used. If only one authentication method (basic authentication or NTLM authentication) is enabled in AMC, that method is used. However, if both methods are enabled in AMC, NTLM authentication is used because it is the more secure of the two.

To configure NTLM authentication forwarding:

1. Enable the SSO options in a Web application profile, and then attach the profile to any Web resources to which you want to forward user credentials.
2. From the main navigation menu in AMC, click **Authentication Servers**.
3. Click the **Edit** link for the server you want to configure. The **Configure Authentication Server** page appears.
4. Expand the **Advanced** settings.
5. Specify the domain name you want to forward in the **Domain authentication forwarding** area:



   - You can type a custom name in the **Domain name** field, but it is not required. If you do not specify a name, an empty (null) domain name is forwarded, along with the user credentials.
   - To forward the authentication server name (as specified in the **Name** field at the top of the page) along with the user credentials, click **Forward the authentication server name as domain name**.

Using RSA ClearTrust

With single sign-on, user authentication credentials are forwarded to the appliance from an RSA ClearTrust server, and the appliance then forwards the credentials to any back-end resource that requires them for authentication. See RSA ClearTrust Configuration for information on setting up the appliance in this authentication environment.

Legacy and Federated Identity SSO Support with CAM

Topics:

About Legacy and Federated Identity SSO with CAM

Legacy and Federated Identity SSO with CAM provides unified Single Sign-On (SSO) support for legacy and SAML federated Software as a Service (SaaS) applications using Cloud Access Manager (CAM) as an Identity Provider (IDP).

Legacy and Federated Identity SSO with CAM uses the Federated SSO capabilities and enables the SMA appliance to cooperate with the CAM IDP on the internal corporate network. It also provides transparent SSO to internal and cloud based SAML resources.

Federated Identity SSO supports both SaaS and on-premise applications, such as, Office 365, Google Apps, Salesforce, and Citrix XenApp.

Legacy and Federated Identity SSO with CAM provides legacy application SSO. SMA users only need to log in once. SSO provides the credentials to both the on-premise applications and to the cloud SaaS.

The connection to CAM is made by injecting the authentication credentials into the SAML traffic as it flows through the SMA appliance to the CAM IDP. The CAM IDP generates a SAML token and attaches it to the user's web browser, providing SSO to federated services.

All forms of SMA authentication, including chained authentication in conjunction with SAML SSO, are supported with tunnel agents. This feature enables users, including users that require chained authentication, to authenticate to any authentication realm, instead of only being able to authenticate to the SAML authentication realm.

Legacy and Federated Identity SSO with CAM enables SMA to use its existing authentication systems with Active Directory authentication servers. This can be done individually or in chained authentication. To maintain legacy SSO, SMA injects the user’s credentials into the HTTP or HTTPS traffic stream.

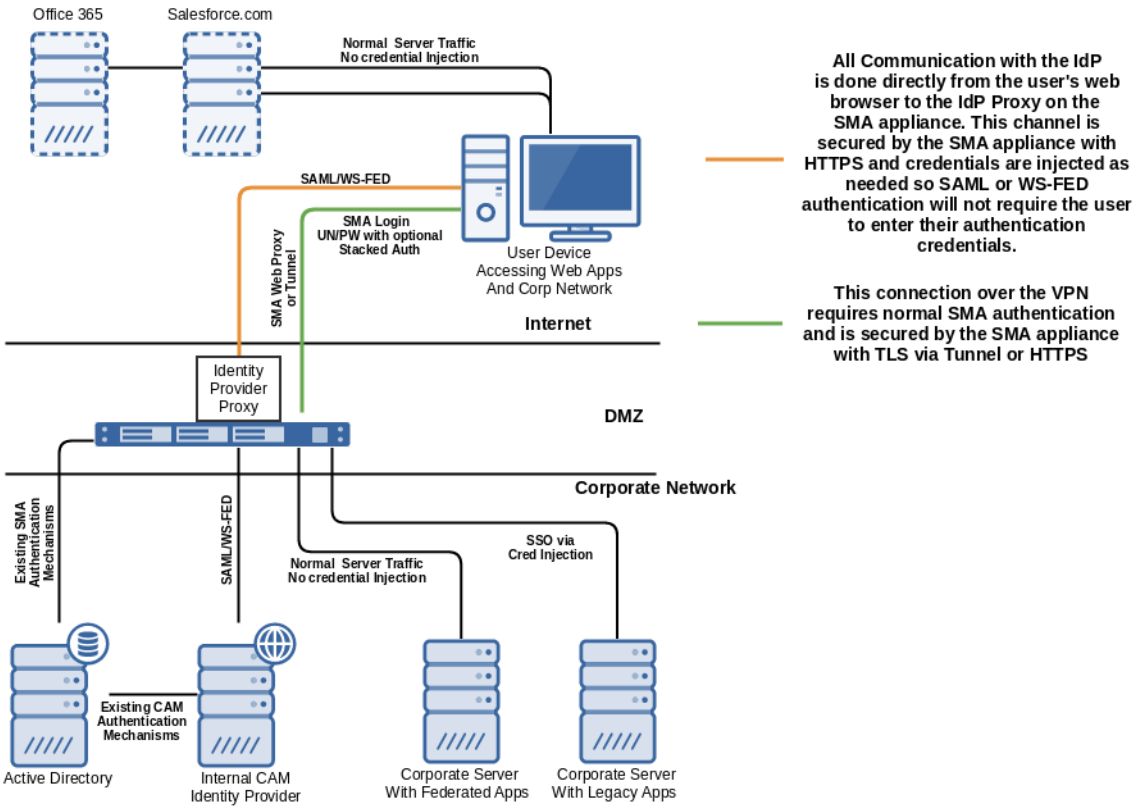
Federated Identity SSO is enabled when SMA presents an IDP proxy to the CAM IDP located on the internal network. The IDP proxy receives all traffic from the user's web browser when the traffic is redirected to the IDP to obtain an SAML or WS-FED token. The IDP proxy injects the user credentials into a login request to the IDP. This allows the CAM IDP to generate SAML and WS-FED tokens without user interaction.

This feature enables users to use their SMA credentials for SSO to legacy applications in the corporate network as well for highly integrated hybrid deployments with public cloud and private cloud federated applications.

For this to work, the SMA and CAM IDP must be using the same authentication store as the master user credential repository.

Legacy and Federated Identity SSO with CAM traffic flows shows how traffic flows in a typical deployment.

Legacy and Federated Identity SSO with CAM traffic flows



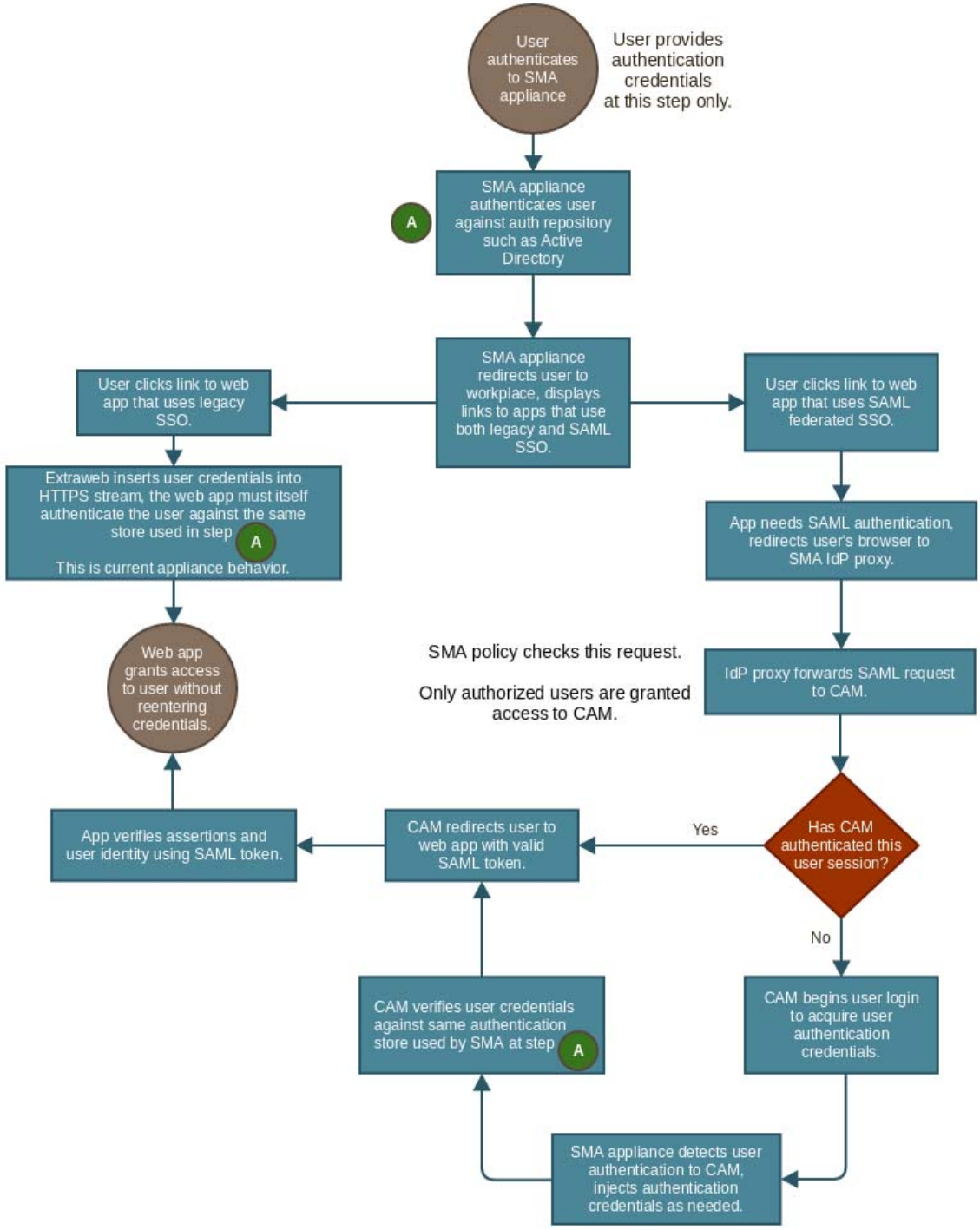
The SMA appliance is a service that uses its own connection to the internal authentication server for its own users and for legacy SSO. It uses CAM to provide both SAML and WS-FED SSO for SaaS applications.

The SMA appliance is well suited for this purpose because it is designed to provide secure access to services on the corporate network from anywhere on the Internet. It can broker requests to SaaS applications located in the cloud via this same central enforcement point policy, utilizing the same VPN session with the end user.

Users authenticate first to the SMA Appliance through the existing non-SAML realm. An IDP Proxy is then configured to send traffic to the internal CAM IDP. This injects the authentication credentials for the user as needed. Thus SAML and WS-FED tokens can be generated by CAM without user interaction, allowing both legacy SSO and federated SSO access to both internal and external application servers.

Legacy and Federated Identity SSO with CAM user authentication shows how a user is authenticated.

Legacy and Federated Identity SSO with CAM user authentication



Configuring SSO with CAM

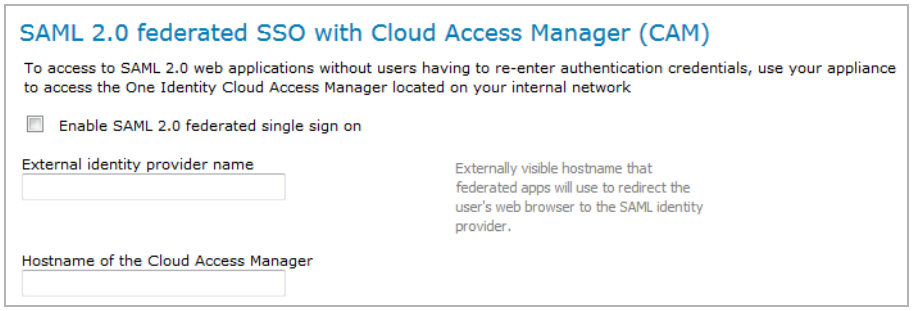
You can configure SMA to inject a Cloud Access Manager (CAM) into a VPN session when the Single Sign-On (SSO) service accesses the federated identity resource. Keep these restrictions in mind:

- SMA and CAM must both use the same Authentication Server for SSO credentials.

- SAML 2.0 federated Single Sign-On does not currently work with the Global Traffic Optimizer (GTO), it is available only for stand-alone single appliances.

To configure SSO with CAM:

1. Navigate to the **Managed Appliances > Configure > Define Policy** page.
2. In the **User Access** section, click **Realms**.
3. Click the name of the Realm you want to edit.
4. On the **General** page, expand the **Advanced** panel
5. Select the checkbox for **Enable SAML 2.0 federated single sign on**.



6. In the **External identity provider name** field, enter the FQDN of the CAM IDP proxy service on the SMA appliance. The **External identity provider name** for:
   - Non split DNS should be different from the host name of the CAM.
   - Split DNS should be the same as the host name of the CAM.
7. In the **Hostname of the Cloud Access Manager** field, enter the FQDN of the name that the CAM is known by on the internal network.

When the checkbox for **Enable SAML 2.0 federated single-sign on** is selected, the **App Configuration** link is available. In this case, SMA is a transparent IDP proxy that service providers use for authentication services that are relayed to the CAM.

You can click **App Configuration** to view these three URLs that are necessary for a SAML Service Provider to authenticate through a SAML IDP:

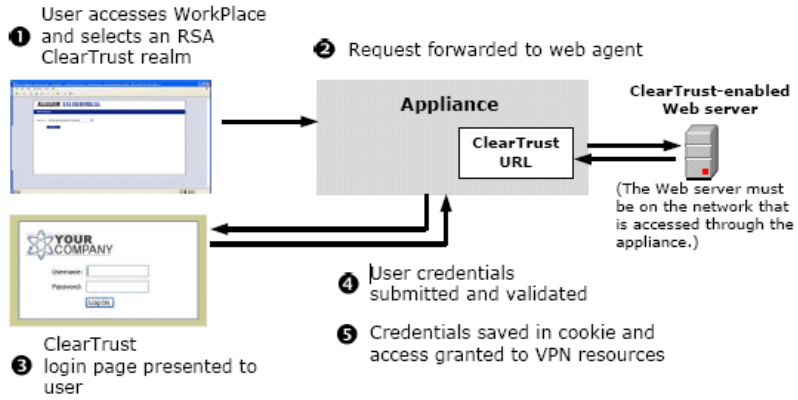
- Server ID: `urn:external_idp.example.com/CloudAccessManager/RPSTS`
- Logon URL: `https://external_idp.example.com/CloudAccessManager/RPSTS/Saml2/Default.aspx`
- Logoff URL: `https://external_idp.example.com/CloudAccessManager/RPSTS/Saml2/Logout.aspx`

Using RSA ClearTrust Authentication

The SMA appliance supports authentication by accepting credentials in an RSA ClearTrust authentication environment. Users can authenticate through the RSA ClearTrust server only when connecting using a Web browser.

RSA ClearTrust Authentication sequence shows the typical sequence of events as a user logs in to authenticate in an RSA ClearTrust environment:

RSA ClearTrust Authentication sequence



1 The user enters the URL for WorkPlace and picks a ClearTrust realm from the drop-down menu. If you've configured only one realm for users, it is automatically selected.

2 The SMA appliance forwards the request to the appropriate Web agent. The ClearTrust Web agent is on a separate ClearTrust-enabled Web server that you specified in AMC.

3 The Web agent checks with the ClearTrust policy server and displays the corresponding authentication page, prompting the user for credentials.

4 The user's credentials are forwarded to the Web agent, which validates them against its policy server.

5 The user is either authenticated or denied access. If authentication is successful, the credentials are saved in a cookie and the user has access to VPN resources during the WorkPlace session.

RSA ClearTrust Configuration

To configure RSA ClearTrust to authenticate users, you must specify the URL of the external server because the appliance does not host the ClearTrust agent. Configuration also requires using AMC to export a `.zip` file containing a private key and CGI script, both of which must be installed on the ClearTrust-enabled Web server.

NOTE: When installing the CGI script file on an RSA ClearTrust-enabled Web server, you must ensure that the file's owner, group, and permissions are set appropriately for that server.

To configure the RSA ClearTrust authentication:

1 From the main navigation menu in AMC, click **Authentication Servers**.

2 Click **New...**.

3 Under **Single sign-on server**, click **RSA ClearTrust** (only one ClearTrust server can be specified; if one has already been configured, this option is dimmed).

4 Click **Continue...**. The **Configure Authentication Server** page appears.

5 In the **Name** field, type a name for the authentication server.

6 In the **ClearTrust server URL** field, type the URL of the Web server that hosts the ClearTrust agent. If the ClearTrust-enabled Web server is listening on a port other than the default of 636, you can specify a port number as a colon-delimited suffix. If you want to use a secure SSL connection, include the `https://` protocol identifier in this box.

7 A private key and CGI script must be installed on the RSA ClearTrust server, or the computer on which the RSA ClearTrust Web agent is installed. Click **Export** to save these items in a `.zip` file (with a default name of `ctAgent.zip`), then install them as follows:

- The private key file (named ***webagent.key***) must be available on the RSA ClearTrust server in the `/usr/local/webagent` directory. The computer on which the RSA ClearTrust Web agent is installed should have `openssl` libraries in the `/usr/lib` directory. Or, at a minimum, the libraries `libssl.so.0.9.7` and `libcrypto.so.0.9.7` should be available in the same directory.
- The CGI script must be placed in the `/cgi-bin` directory of the RSA ClearTrust server.

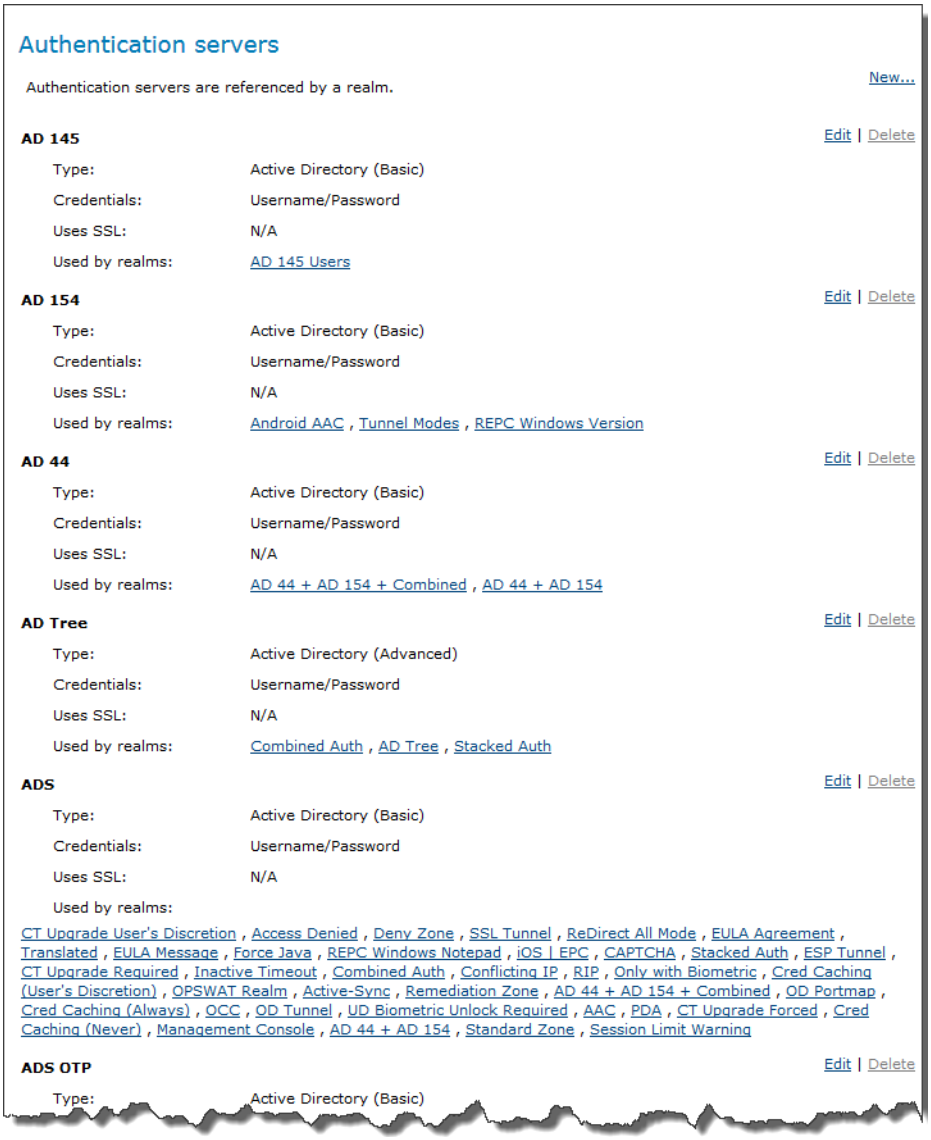
8 Click **Save**.

One Identity Defender

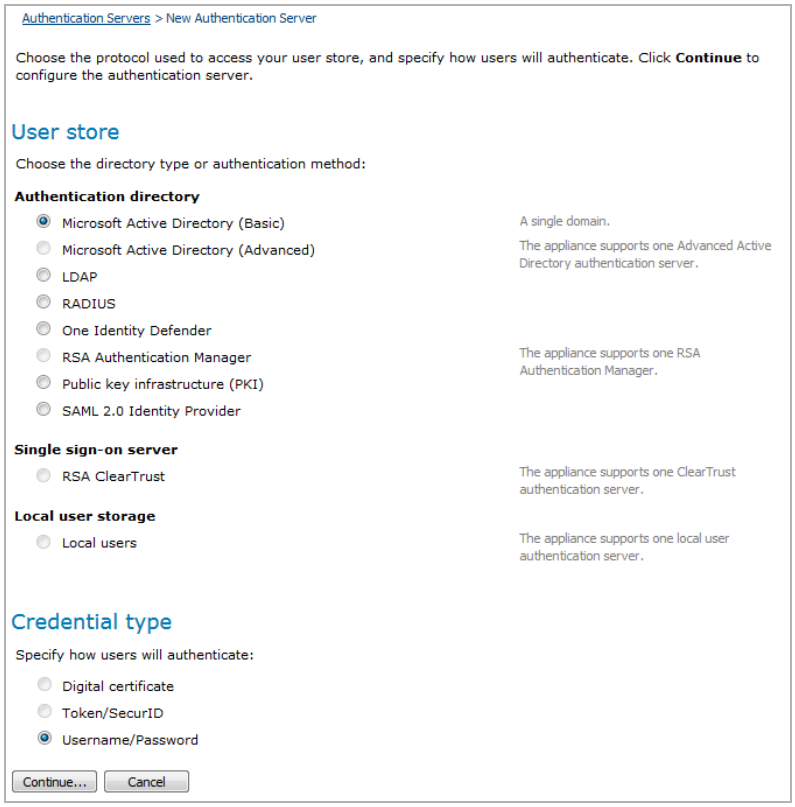
Defender is a product for 2-factor authentication. SMA supports One Identity Defender configuration as a generic RADIUS server.

To configure a new Authentication Server with One Identity Defender:

1 In the AMC, go to the **System Configuration > Authentication Servers** page.



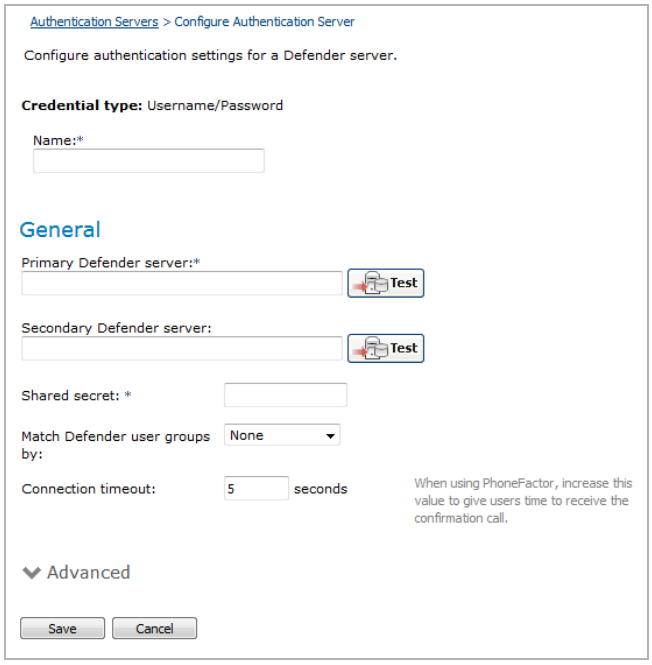
2 Click on **New...**. The **New Authentication Server** dialog appears.



3 Select the **One Identity Defender** option.

4 Under **Credential Type**, select either **Token/SecurID** or **Username/Password**.

5 Click **Continue...**. The **Configure Authentication Server** dialog appears.



6 In the **Name** field, enter a name for the authentication server.

7 In the **Primary Defender server** field, enter the IP address of the primary defender server.

8 In the **Secondary Defender server** field, enter the IP address of the secondary defender server.

9 In the **Shared Secret** field, enter your shared secret.

10 From the **Match Defender user groups by** drop-down menu, select:

- **None** (default)
- **filterid attribute (11)**
- **class attribute (25)**

11 In the **Connection timeout** field, enter the connection timeout value, in seconds.

12 Click **Save**.

Configuring Local User Storage

You can create local user accounts in AMC and then map them to a local authentication repository. For information on creating local user accounts, see Managing Local User Accounts.

Only one local user store can be created on the appliance.

To configure local user authentication:

1 From the main navigation menu in AMC, click **Authentication Servers**.

2 Click **New...**.

3 Under **Local user storage**, click **Local users** (if a local store already exists, this option is dimmed).

4 Click **Continue...**. The **Configure Authentication Server** page appears.

5 In the **Name** field, type a name for the authentication server.

6 In the **Password policy** area, specify the minimum and maximum number of characters allowed for passwords. The minimum can be as few as 4, and the maximum can be as many as 256.

7 Select the **Lowercase letters** checkbox to specify that user passwords must contain at least one lowercase character.

8 Select the **Uppercase letters** checkbox to specify that user passwords must contain at least one uppercase character.

9 Select the **Numeric digits** checkbox to specify that user passwords must contain at least one number (0-9).

10 Select the **Symbols** checkbox to specify that user passwords must contain at least one symbolic character (~`!@#$%^&*( )_-+={}[]|\:;"'<,>.?/).

NOTE: UTF-8 characters are supported in the password.

11 In the **Password expiration** area, select the **Passwords expire after** checkbox. Clear the checkbox to allow user passwords to never expire.

- Enter the number of days after which user passwords will expire.he default is 60 days, the minimum is 1 day, and the maximum is 365 days.

12 Select the **Begin prompting user** checkbox and enter the number of days before expiration that the user will be prompted to change the password. The default is **14** days.

13 To change the prompts and other text that Windows users see when they log in, expand the **Advanced** section.

14 Select the **Customize authentication server prompts** checkbox.

The page title, message, and login prompts can all be customized. For example, if an employee ID number is used to identify a user, you could change the text for the **Identity** prompt from **Username:** to **Employee ID:**. If this configuration is being used for testing, a customized **Message** could point to test procedures or other instructions.

15 Enter the password or other proof of identity into the **Proof** field.

16 In the **One-Time Passwords area, to configure two-factor authentication with one-time passwords,** select **Use one-time passwords with this authentication server**.

17 Define the password format by entering the number and type of characters into the **Passwords contain** field.

18 In the **From address** field, enter the email address from which one-time passwords will be sent.

19 In the **Default domain** field, optionally enter the domain to be appended to each username to create an email address for local users to which one-time passwords will be sent.

20 You can override the default domain by configuring an email address for each local user in the **Email Address** field. This email address will be available as a User attribute type policy variable named `primaryEmail`. One email address per user is supported.

21 Click the **Send test message** button to send a test email message to verify that the message, password, and SMTP settings are correct.

22 In the **Subject** field, enter the text for the subject line when e-mailing the one-time password.

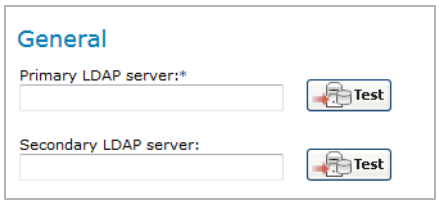
23 In the **Body** field, enter the content of the email that will contain the one-time password.

For more information about one-time passwords, see Using One-Time Passwords for Added Security.

24 Click **Save**.

Testing LDAP and AD Authentication Configurations

To help you validate your authentication configuration settings, the AMC pages used to configure Microsoft Active Directory and LDAP servers include a **Test** button. Clicking this button establishes a connection with your external user repository and provides status information.



If you have correctly configured the appliance, a message reading `Valid connection!` appears. If there is an error in the configuration settings, the message provides a description of the problem.

NOTE: The test connection feature is intended only for testing whether the appliance can bind to an external directory. If you enter login credentials, the appliance will use them, but it will otherwise attempt to bind to the directory anonymously. Because it does not actually search the directory, testing a connection will not validate that your login credentials provide access to the configured domain.

Configuring Chained Authentication

For increased security, you can require users to authenticate to a single realm using two different authentication methods. For example, you could set up RADIUS or a digital certificate as the first authentication method, and LDAP or Active Directory as the second one. The local authentication store can be used as either the primary or secondary authentication server. You can require that the user names are the same on the primary and secondary authentication servers. To make the login experience for your users a one-step process you can configure AMC such that users see only one set of prompts.

To configure chained authentication:

1 From the main navigation menu in AMC, click **Realms**.

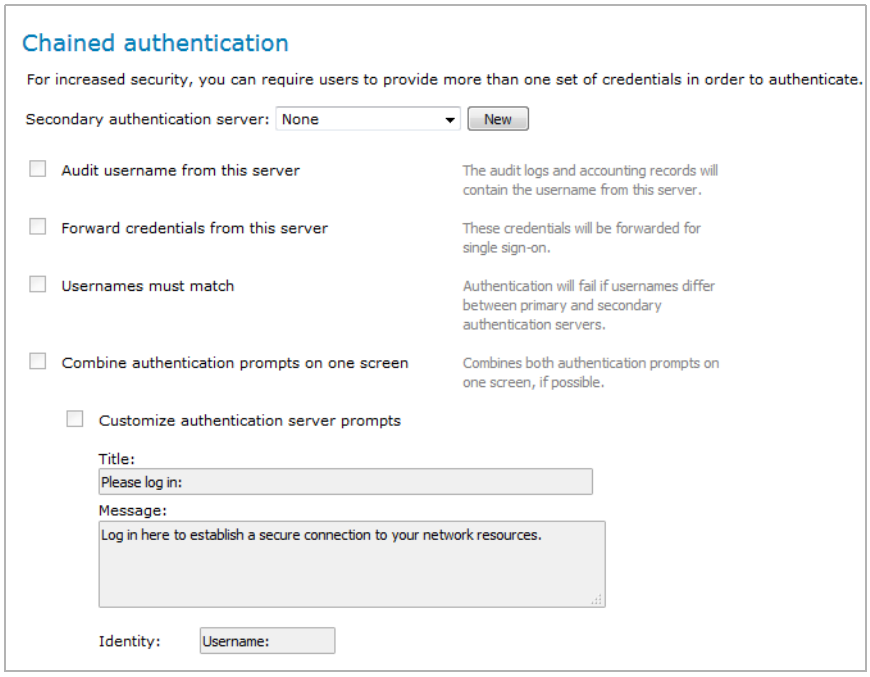
2 Click either:

- The name of the realm you want to modify.
- **New** and then select an entry in the **Authentication server** drop-down menu.

This is your primary authentication server.

If one of your credential types for chained authentication is a digital certificate, the corresponding authentication server must be the primary one: you can't configure a PKI server as your secondary authentication server.

3 Click **Advanced** and scroll to the **Chained authentication** section.



4 Select a **Secondary authentication server** (if none is defined, click **New**; see Configuring Authentication Servers for the steps involved in setting up an authentication server).

5 The remaining (optional) settings, listed in the Authentication settings table, can provide more security, help with troubleshooting, and simplify the login process:

Authentication settings

Setting	Description
Audit username from this server	Show the username from the secondary server in the audit and accounting logs (instead of the username from the primary authentication server).
Forward credentials from this server	For single sign-on, one set of credentials must be forwarded to back-end Web resources. Select this checkbox to forward the credentials from this (the secondary) authentication server.
Usernames must match	When this checkbox is selected, authentication will fail if the user ID submitted for the first authentication step differs from the user ID submitted in the second step. This option is available when the authentication methods use either a username/password or a token or certificate. One use case for this option is when the primary authentication server uses a certificate and the secondary uses a username/password. Without this option enabled, an end user could log in with another user's certificate if the first user had valid credentials. When this setting is turned on, that authentication attempt would fail because the username in the certificate would not match the username in the username/password credentials.
Combine authentication prompts on one screen	When this checkbox is selected, the appliance verifies that the username is the same on both authentication servers. If it is, the prompts for a user's credentials are combined on a single screen; if the usernames differ, the login is rejected and (for security reasons) there is no error message explaining why. Authentication prompts cannot be combined if user credentials involve a digital certificate, though the system still ensures that the username is the same on both servers.
Customize authentication server prompts	(Available only when **Combine authentication prompts on one screen** is selected, and only for Windows clients.) When configuring an authentication server, you have the option of customizing the prompts that users see. When two such servers are chained together, you can present the user with a combined authentication prompt that includes customized **Title**, **Message**, and **Identity** fields. The name for the password fields is picked up from each authentication server configuration. If this customization setting is not selected, the user sees the prompts that are configured for the two authentication servers.

Chained Authentication Login Example

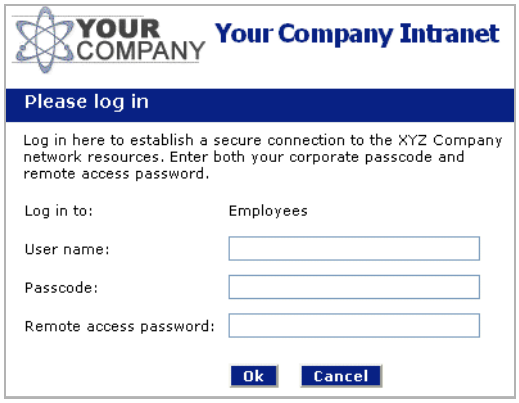
In this example, the system administrator has set up two authentication methods for a realm named *Employees*:

The primary authentication server uses RADIUS; the **Proof** prompt (on the **Configure Authentication Server** page, under **Advanced** settings) was customized to read *Passcode*.

The secondary authentication server uses LDAP; the **Proof** prompt was customized to read *Remote access password.*

The **Advanced** settings on the **Configure Realm - Employees** page show customized **Title**, **Message**, and **Identity** prompts.

Based on these AMC settings, the login screen that users see would look like this:



Because the user names on both authentication servers are the same, the user types his or her username only once.

NOTE:

- If the user makes an error while entering username or password information, an error message appears (`The credentials provided were invalid`) and only the prompts for the secondary authentication server are displayed. To re-enter his or her credentials, the user must first go to the original login page by clicking the browser's **Back** button.
- When a username and password are used for both authentication methods, the usernames do not need to be the same (although they typically are). If the primary username is mapped to a role in AMC, such as the AMC Administrator Role, the secondary username does not need to be assigned to the same role. If authentication succeeds on both servers for both usernames, the user is granted access corresponding to the role of the primary username.

Enabling Group Affinity Checking in a Realm

The appliance supports group affinity checking, a network environment in which a user authenticates against one server, and a second directory provides information on what groups (if any) a user belongs to. This is a common requirement when RADIUS SecurID tokens are used for authentication but the user's group information comes from an LDAP or Active Directory server. (In contrast, chained authentication requires users to authenticate against two authentication servers. See Configuring Chained Authentication for more information.)

Group membership is an important part of access control: you can set up the appliance to reference user groups stored in your directory, and then reference those groups in access control rules.

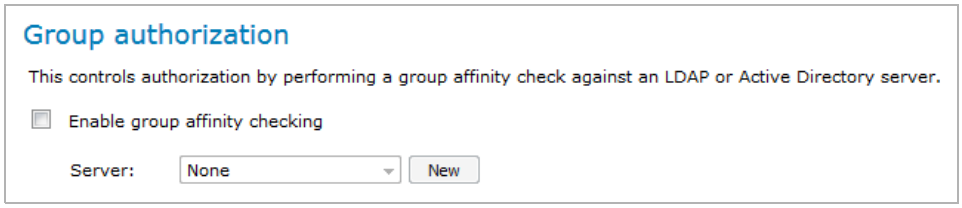
NOTE: When an Active Directory (AD) server is used as an LDAP server, ACL checks cannot be performed. Short names (SN) or common names (CN) are not supported on LDAP servers. They are only supported on AD servers.

To enable group affinity checking:

1 From the main navigation menu in AMC, click **Realms**.

2 Click the name of the realm you want to modify.

3 Click **Advanced**. In the **Group authorization** area, select the **Enable group affinity checking** checkbox.



4 in the **Server** drop-down menu, select the name of the LDAP or Active Directory server that stores the group information. You can also click **New** to define a new group affinity server.

If group authorization checking is disabled for an authentication server, the server will not appear in the list of available affinity servers. See Disabling Authorization Checks for more information.

5 Click **Save**.

If you are enabling group affinity checking during the process of creating the realm, the available buttons are different:

- Click **Next** to display the **Communities** tab on the **Configure Realms** page.
- Click **Finish** to return to the **Authentication** page.

Using One-Time Passwords for Added Security

A one-time password (OTP) is a randomly generated password that is used only once. Using an OTP as the second factor for authentication provides additional security for users: after standard user name and password credentials are submitted, the system generates a one-time password, which is sent to the user at a predefined SMS or email address. The user then logs in to that email account to retrieve the OTP and enters it when prompted. The likelihood of the password being compromised is reduced because a new OTP is generated after each successful, cancelled, or failed login, or when a login attempt has timed out.

To configure authentication that includes an OTP, you must do the following:

- Configure your mail server. If one-time passwords are going to be delivered to external domains (for example, an SMS address or external webmail address), you may have to configure the SMTP server to allow passwords to be sent from the appliance to the external domain.
- Configure an OTP in the **Advanced** area of the authentication server configuration. Specify the directory attributes that store the email addresses to which OTPs are sent.

Topics:

- Configuring SMTP to Deliver One-Time Passwords
- Configuring an Authentication Server for One-Time Passwords
- Configuring the AD or LDAP Directory Server

Configuring SMTP to Deliver One-Time Passwords

If the email addresses to which you want to deliver one-time passwords are in an external domain (such as SMS addresses or external web mail addresses), you must configure your SMTP server to allow passwords to be sent from the appliance to the external domain.

To configure Microsoft Exchange to support one-time passwords:

1 Navigate to **Exchange System Manager**.

2 Expand **Servers > Protocols > SMTP**.

3 Right-click on either **Default SMTP Virtual Server** or the appropriate SMTP server instance.

4 Click **Properties**.

5 Select the **Access** tab.

6 Click **Relay** in the **Relay Restrictions** area.

7 Select **Only the list below**.

8 Click **Add**.

9 Enter the IP address of your SMA appliance (for example, `10.50.165.5`).

10 Click **OK**. Your appliance should be listed with a status of *Access Granted*.

11 Click **OK**.

Configuring an Authentication Server for One-Time Passwords

If the email addresses to which you want to deliver one-time passwords are in an external domain (such as SMS addresses or external web mail addresses), you must configure your SMTP server to allow passwords to be sent from the appliance to the external domain, as described in Configuring SMTP to Deliver One-Time Passwords.

For each authentication server, you must also specify the directory attribute that stores the email addresses to which OTPs are sent. You must specify a primary attribute; alternatively, you can specify a secondary attribute that is queried when the first one cannot be found.

To configure an authentication server to support one-time passwords:

1 From the main navigation menu in AMC, click **Authentication Servers**.

2 Click **Edit** next to the AD (**Microsoft Active Directory** or **Microsoft Active Directory Tree**), LDAP, or local authentication server you want to reconfigure.

3 Select a **Credential type**, if applicable.

4 Click **Continue...**.

5 Expand the **Advanced** area,

6 Select **Use one-time passwords with this authentication server**.

7 Enter the directory attribute for the email address to which one-time passwords will be sent. If the primary attribute exists on the authentication server, it is used, otherwise the secondary attribute, if specified, is queried.

Configuring the AD or LDAP Directory Server

The schema for your AD or LDAP directory server must include an attribute that contains the email address to which a one-time password will be sent. The local authentication store uses the **primaryEmail** attribute, which can be configured per user by editing the local user account. See Managing Local User Accounts.

This address is not necessarily the user's corporate email address. In order to complete authentication, a user has to be able to open the email containing the OTP; if it is sent to a corporate address the user may not yet have access to the account.

One-time passwords can be configured to be sent in an email message directly to SMS-capable phones. Contact your cell phone service provider for further information about enabling SMS.

The schema for your directory server (AD or LDAP) must be changed to accommodate an attribute (for example, **SMSphone**) that contains the SMS address for a given user. The address that you use depends on the user's

number and service provider. The attribute value for a Verizon phone with a U.S. domestic number, for example, looks like this: `<10-digit number>@vtext.com`.

Configuring Personal Device Authorization

With Personal Device Authorization users connecting to the corporate network with a personal device that is not registered with the appliance are prompted to register the device. They must agree to the personal device corporate policies and privacy policies to access corporate resources.

After the user consents to the corporate policies for a device, the device's unique Device ID is determined and the appliance registers the device to the user. Subsequent connections from this device do not require device authorization.

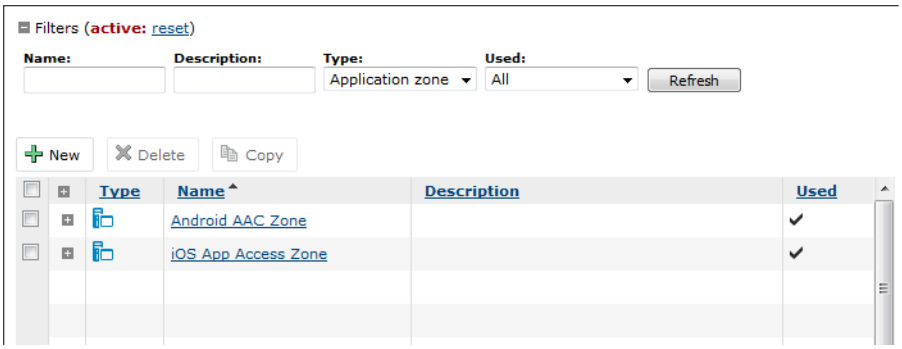
In addition, you can monitor usage of personal devices that have accessed the appliance, as explained in Viewing User Access and Policy Details

To create an Application Zone for Personal Device Authorization:

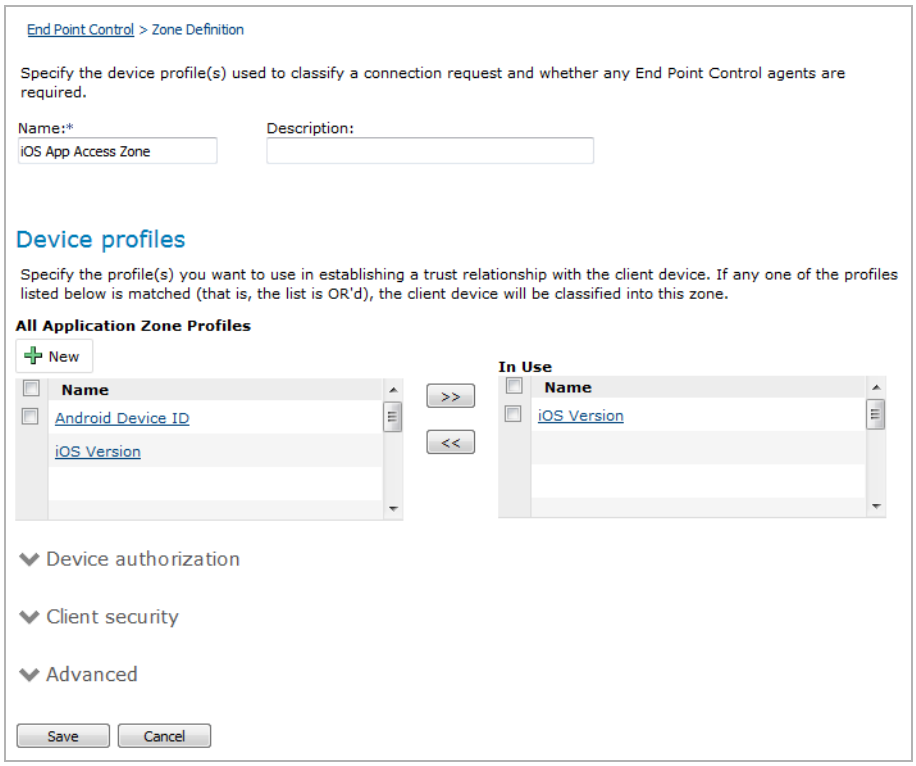
1 Navigate to the **Managed Appliances > Configure > Define Policy > End Point Control** page

2 In the **Zones and Profiles** section, click **Edit** next to **Zones**.

3 Select **Application zone** from the **Filters Type** drop-down menu, and then click **Refresh**. All application zones display.



4 Click on any application zone to display **Device profiles**. Only those profiles that are Application Access Control aware are included in the profiles.

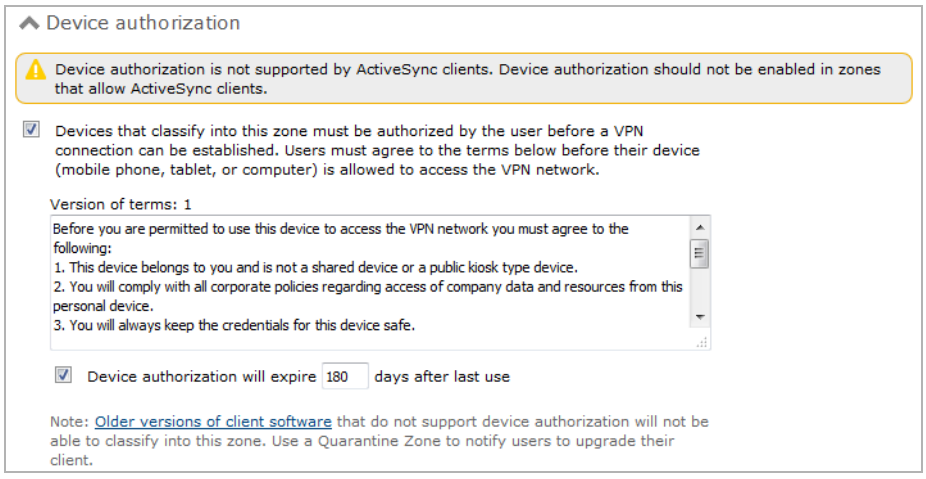


5 In the **All Application Zone Profiles** list, select the checkbox for any profiles that you want to require in the zone.

6 Click the right arrow (**>>**) button. Only one of the profiles in the **In Use** list needs to match for the application to be placed in the zone you are creating.

If there are no device profiles for this zone, click **New** to add one.

7 Expand **Device authorization**.



8 Check the top checkbox in the **Device Authorization** area to require users to authorize their personal device before a VPN connection is established. By default, this checkbox is checked when EPC is enabled for application zones.

9 To change the authorization terms that users must agree to, type the desired authorization terms in the **Terms** section of the **Device Authorization** area. The **Device Authorization** checkbox must be checked to edit the terms.

10 By default, a user authorization expires **180** days after the device was last used. When device authorization is enabled, you can disable zone authorization expiration by unchecking the expiration checkbox or change the number of days before expiration by typing the desired number of days.

11 By default, user connections to a zone are not dropped when the connection is inactive. However, a inactivity timer can be set In the **Inactivity timer** area to end the connection after a set period of inactivity. The inactivity timer interval can be set from 3 minutes to 10 hours.

12 Add the zone to a community as explained in Using End Point Control Restrictions in a Community.

Biometric Identification

Topics:

- About Biometric Identification
- Configuring Biometric Identification
- Using APIs in the Command Line Interface (CLI)

About Biometric Identification

This feature provides the option to use biometric identification to unlock cached credentials on Mobile Connect devices.

Credential caching allows the user to establish a connection to the SMA appliance without having to reenter authentication credentials. Credential caching provides convenience, but it could allow an unauthorized user to access a corporate network if the user device is used by someone other than the owner. Biometric identification can be used to control who can access these cached credentials.

With biometric identification, a user can use a face or fingerprint to unlock their cached credentials.

Administrators can enable biometric identification on iOS devices and Android devices. End users can choose to require biometric identification in addition to their cached credentials for authentication.

Administrators can:

- Choose to enable credential caching.
- Choose to allow certain types of clients (iOS, Android, or both) to use credential caching.
- Choose to allow credential caching only in conjunction with biometric identification.

You can prevent any user from using another person's biometric identification to access a corporate network by disabling biometric identification for that user in their configuration settings. We recommend that you include a *Terms-of-Use* statement that states that a device using biometrics to unlock cached credentials only contains biometric signatures for the individual whose credentials are cached. With this feature, you can only use biometric identification to unlock cached credentials, and then use the cached credentials for authentication.

NOTE: Biometric Identification is not supported with the Connect Tunnel client or web access methods (Mobile Connect only).

Configuring Biometric Identification

You can configure biometric identification using the SMA user interface (UI).

To enable Allow Biometric ID:

1. On the SMA appliance, go to **Realms > Configure Community > Access Methods > Network Tunnel Client Configure > Connect Tunnel** > **User interface > Use cached credentials** page.
2. Select one of the following options:
    a. **Always** - Always use cached credentials
    b. **At user's discretion** - choose **no caching**, **biometric unlock required**, or **auto login from cache**.
    c. **Only with biometric verification** - Only use credential caching when biometric verification is supported and enabled. Cached credentials are only used after biometric identification verification.
3. If you selected **Only with biometric verification**, choose at least one of the following options:
    a. **Touch ID** - on iOS devices
    b. **Fingerprint authentication** - on Android devices
    c. **Never** - Never use cached credentials

Using APIs in the Command Line Interface (CLI)

You can get the current state of the biometric identification, and enable and configure biometric identification in the Command Line Interface (CLI) using the following APIs.

- Attribute(s): `autoCredentialLogon: require_biometrics`
- Attribute(s): `clientSettings`

Refer to these SMA 12.1 API guides:

- *Secure Mobile Access Authentication API*
- *Secure Mobile Access Appliance Management Console Setup API*
- *Secure Mobile Access Appliance Management Console API*

Next Steps

After you have performed the basic network setup, obtained an SSL certificate for the appliance, and configured authentication settings, you are ready to start managing users and user groups, defining resources, and configuring access control rules.

Part 5

Administration

- Security Administration
- System Administration

Security Administration

- Creating and Managing Resources
- Access Control Rules

Creating and Managing Resources

Managing security is perhaps your most important job as an administrator. The Appliance Management Console (AMC) makes it easy for you to manage the fundamental elements of security administration: resources and access control rules.

This section explains how to create and manage individual resources, resource groups, and configuration settings for resources. You can define a resource before referencing it in an access control rule, or define it directly from the access control rule interface. (For more information about the latter, see Adding Users and Resources From Within Access Control Rules.)

There's a tool you can use on the appliance command line to see whether you reference any hosts that cannot be resolved in DNS, or whether your access control rules contain any unreferenced resources. See Validating Hosts for more information.

Topics:

- Resource Types
- Resources and Resource Groups
- Using Variables in Resource and WorkPlace Shortcut Definitions
- Creating and Managing Resource Groups
- Web Application Profiles
- Creating Forms-Based Single Sign-On Profiles
- Kerberos Constrained Delegation
- Configuring SMA Support for Microsoft Outlook Anywhere

Resource Types

The SMA appliance provides access to a wide variety of corporate resources, which fall into these categories:

- Built-In Resources
- Web Resources
- Client/Server Resources
- File Share Resources

Built-In Resources

There are several resources that are built into your appliance to help you get a WorkPlace portal set up quickly. These built-in resources cannot be deleted—access to some of them is granted through WorkPlace shortcuts:

Secure Mobile Access WorkPlace (Resource Type: URL)

The WorkPlace portal gives users access to Web-based resources. This particular resource is used by another built-in item, which you can modify: an access permit-all rule that allows any user from any zone to have access to the default WorkPlace portal.

Value: `http://127.0.0.1:8085/workplace/`

Connect Tunnel (Resource Type: URL)

Connect Tunnel is an application that provides broad access to network resources. You determine how users access the Connect Tunnel client:

- Allow users to download the Connect Tunnel client and activate it from a link (shortcut) in WorkPlace. Keep in mind that when you give users access to this resource, you allow them to both install and use the client: a user without access to this resource cannot use Connect Tunnel for access to network resources. The WorkPlace shortcut for this resource (*Install Connect Tunnel*) can be modified or deleted; the resource itself cannot.
- Deploy the Connect Tunnel client setup package without requiring users to log in to Secure Mobile Access WorkPlace.

Value: `http://127.0.0.1:8085/ctdownload/`

Network Explorer (Resource Type: Network Share)

Network Explorer is a Web-based extension, accessible from WorkPlace, that provides access to any Windows file system resources that the user has permission to use (even from desktop browsers on non-Windows platforms). These resources can include servers, computers, workgroups, folders, and files. The WorkPlace shortcut for this resource (*Network Explorer*) can be modified or deleted; the resource itself cannot.

Value: `smb://127.0.0.1/networkexplorer/`

Web Resources

Web resources include Web-based applications or services that are accessed using HTTP or HTTPS. Examples include Microsoft Outlook Web Access and other Web-based email programs, Web portals, corporate intranets, and standard Web servers.

Web traffic is proxied through the Web proxy service, a secure gateway through which users can access private Web resources from the Internet. When you define a Web resource as a destination in an access control rule, make sure that **Web browser** is among the client software agents available for the rule. For more information, see Resolving Invalid Destination Resources.

A Web resource can be defined in various ways, as shown in the Web resource example definitions table

Web resource example definitions

URL Type	Example
Standard URL	`http://host.example.com/index.html`
Standard URL with port number	`http://host.example.com:8445/index.html`
URL for secure site	`https://host.example.com/index.html`
URL containing IP address	`http://192.0.34.0/index.html`

Web resource example definitions

URL Type	Example
Matching URL	Use wildcards to refer to a group of Web resources: `http://mailserver*.company.com/` **NOTE:** Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.
URL with path and query string matching	Block email attachments, or prevent a Web-based application from displaying restricted data by matching a path element or query string value to a particular URL: `http://www.patient-records.com/reports.aspx?last_name=`

NOTE: Some Web-based applications use Java applets or other browser extensions using protocols other than HTTP. Although these applications are accessed using a Web browser, they must be defined as client/server (not Web resources), and they must be accessed using either a network tunnel client or client/server proxy agent. Examples of such applications include Citrix NFuse, Oracle J-Initiator, and certain versions of SAP and PeopleSoft.

Client/Server Resources

Client/server resources are enterprise applications that run over TCP/IP (including applications that use UDP). Examples include thin-client applications such as Citrix; full client/server applications such as Microsoft Outlook; Lotus Notes; SAP; and terminal servers.

You define these types of client/server applications by specifying a host name, an IP address or IP range, a subnet IP address, or a DNS domain. These resources can also be used to define a network object containing multiple Web resources (such as a domain), or to define a network object that can be used to control access based on the source of a connection request.

the Resource type syntax table explains the syntax used to define each of these resource types. Host names can be fully qualified or unqualified.

Resource type syntax

Resource type	Example
Domain	`private.example.com`
Host name	`bart.private.example.com`
Host IP address	`192.0.34.72`
IP range	`192.0.34.72 - 192.0.34.74`
Subnet	`192.0.34.0 / 255.255.255.0`

Example

In this example, a Web development team has a single Web server with three virtual Web servers, one for each stage in their development process. Each virtual Web server listens on a different port.

Rather than creating three different URL resources, the Web development team can define the Web server, which proxies traffic on all ports, as a resource type of **Host name or IP** (for example, `webdev.yourcompany.com`). In addition, they attach a single sign-on Web application profile to it, and now all three of the virtual Web servers are defined at once, and they share the same SSO profile:

`webdev.yourcompany.com`

`webdev.yourcompany.com:8080`

`webdev.yourcompany.com:8443`

NOTE: Microsoft Outlook connects to Microsoft Exchange using an unqualified host name. When defining a Microsoft Exchange server as a resource, define it as an unqualified name (for example, CorpMail).

To use Exchange on Symbian, Android, iPad and iPhone devices, create a URL resource of the type ActiveSync for Exchange.

File Share Resources

When users log in to WorkPlace, they have access to file system resources that you set up. These can include computers containing shared folders and files and Windows network servers.

You can define a specific file system share by typing a UNC path, or you can define an entire Windows domain:

- A specific file system resource can be an entire server (for example, `\\ginkgo`), a shared folder (`\\john\public`), or a network folder (`\\ginkgo\news`).
- Defining an entire Windows domain gives authorized users access to all the network file resources within the domain. These resources are the same ones you would see if you were to browse the network using Windows Explorer (**My Network Places > Entire Network > Microsoft Windows Network**).

You can use resource variables to dynamically reference multiple folders on the network. For example, to give each user access to a personal folder, create a resource using a variable for the user name, and then use that variable when you create a shortcut on WorkPlace. See the example in Using Session Property Variables for more information.

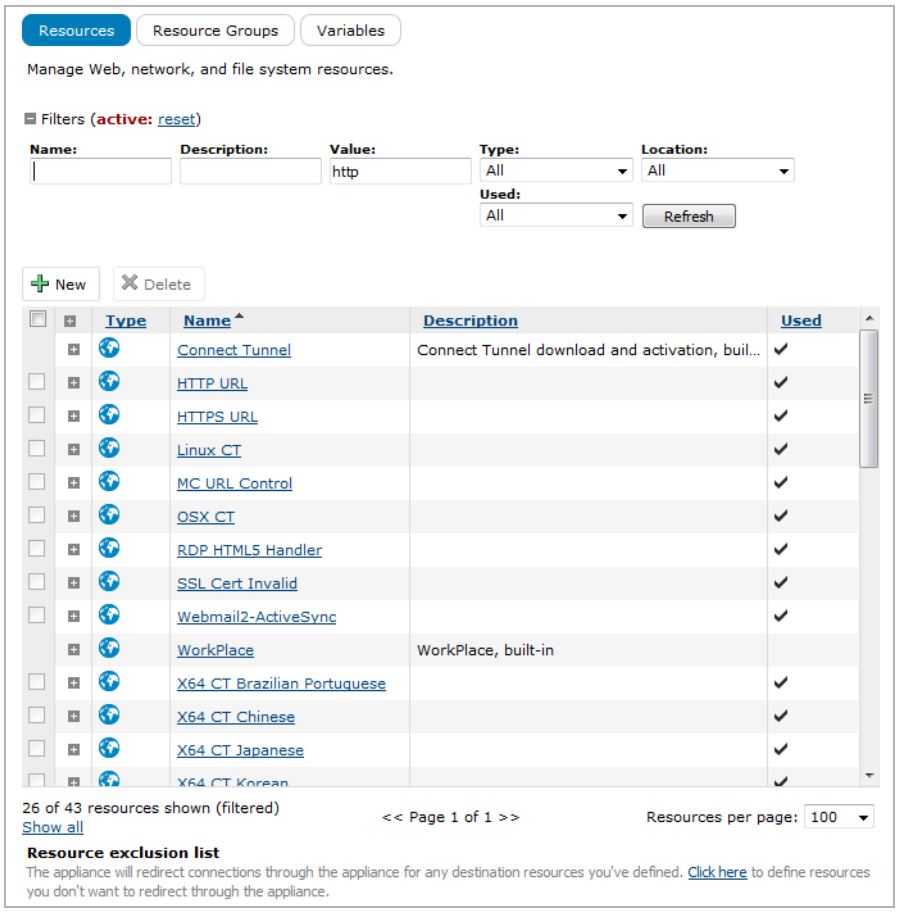
Resources and Resource Groups

Topics:

- Viewing Resources and Resource Groups
- Adding Resources
- Example: Specifying a URL Alias
- Example: Blocking Email Attachments
- Example: Supporting Exchange on iPhones
- Example: Restricting Access to Sensitive Data
- Editing Resources
- Deleting Resources
- Using the Resource Exclusion List

Viewing Resources and Resource Groups

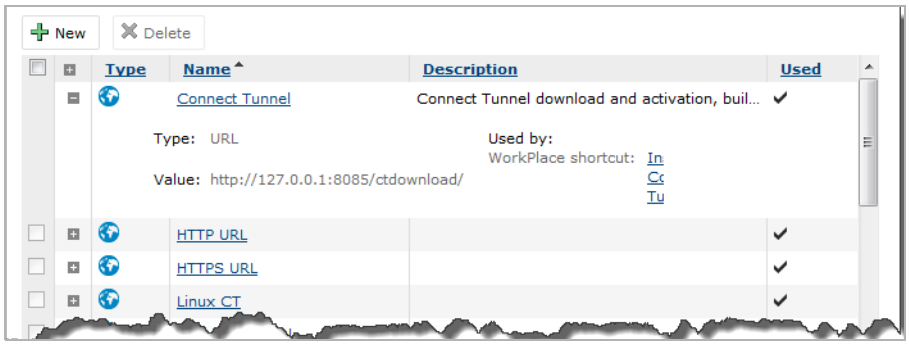
You can view and define individual resources or groups of them in AMC by selecting **Security Administration > Resources**.



To view the list of available resources and resource groups:

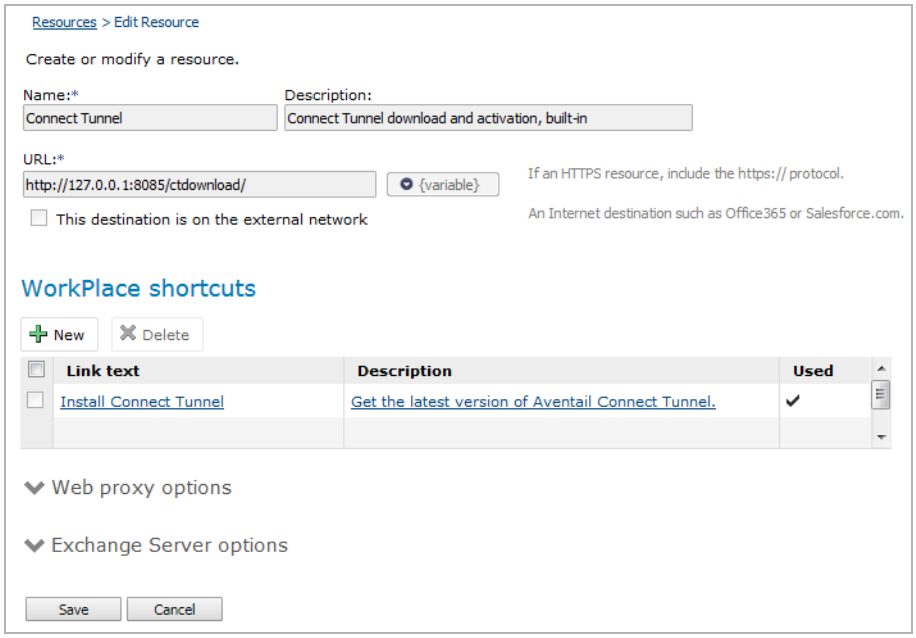
1. From the main navigation menu in AMC under **Security Administration**, click **Resources**.
2. On the **Resources** tab, review the list of available individual resources. (The **Resource Groups** tab displays collections of resources.)
3. Use the **Filters** settings at the top of the page to filter the resources that are displayed here. For information about using filters, see Filters:
    - The **Type** column displays the type of each resource (such as **Domain name**, **Host name**). Remember that a client/server resource can contain both Web and client/server applications.
    - The **Used** column indicates whether a resource has been specified in a shortcut on WorkPlace.

4 For an overview of a particular resource, click the plus sign (+) next to it. This shows the resource type, its value, and whether it is used by a WorkPlace shortcut or access rule.



NOTE: By default, there are some read-only resource definitions included with the appliance, for example, Secure Mobile Access WorkPlace and Connect Tunnel Download. These definitions are required by the appliance services and cannot be deleted (a read-only resource has no checkbox next to it).

5 To edit a resource, click its link in the resource list.



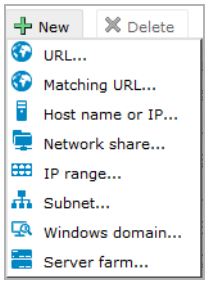
Adding Resources

Creating application resources—Web, client/server, and file share resources—is the first step in forming access policies for your users.

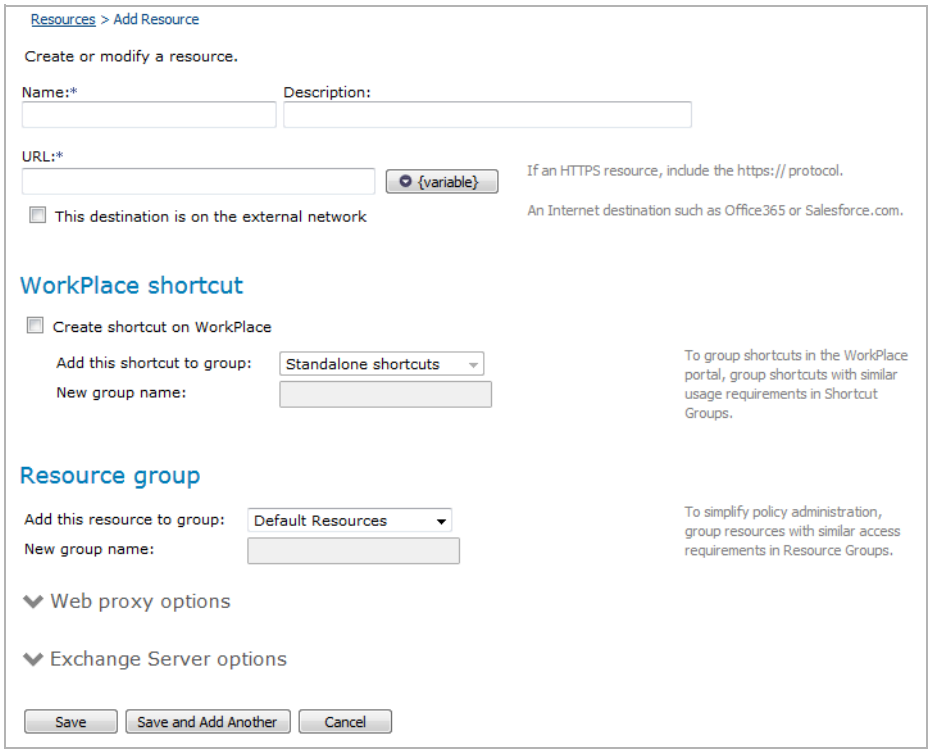
To add a resource:

1 From the main navigation menu in AMC under **Security Administration**, click **Resources**.

2 Click **New** and then choose a resource type from the drop-down menu:



3 The **Add Resource** page is displayed. The options you see on the **Add Resource** page depend on the resource type you selected.

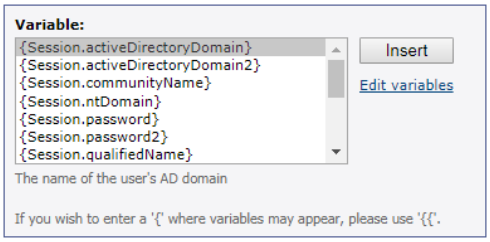


The options shown in the Shared options table are shared across the specified resource types:

Shared options

Option	Description	Resource type
Name	Resource name	All
Description	Resource description	All
URL	URL of the resource	
This destination is on the external network.	Select this option if this resource is on an external network.	

Shared options

Option	Description	Resource type
Variable	Select a variable from the menu to define dynamic resources; see Using Variables in Resource and WorkPlace Shortcut Definitions. 	• Citrix server farm • Domain • Host name or IP • Matching URL • Network share • URL
Create shortcut in WorkPlace	Add a shortcut to a Web resource in WorkPlace. The name you assign to the resource will appear in the list of **Shortcuts** on the **Secure Mobile Access WorkPlace** page. You can add the shortcut to a new or existing shortcut group in order to keep shortcuts with similar usage requirements together on the WorkPlace portal page.	• Domain • Network share • URL
Web application profile (Web proxy options or Advanced area)	This list contains preconfigured Web profiles that are recommended for several popular Web applications, custom Web profiles, and a default Web profile. If you are unsure about which profile to select, choose *Default*. To see a profile, click **View selected profile**. Also see Adding Web Application Profiles.	• Domain • Host name or IP • IP range • Matching URL • Subnet • URL

The options shown in the URL resource type unique options table are unique to the **URL** resource type:

URL resource type unique options

Option	Description
URL	If you do not enter a protocol identifier, AMC automatically inserts `http://` before the URL. If this is a URL for a secure site, you must include the `https://` protocol identifier. For example, type `https://example.domain.com`.
Custom access area (Web Proxy Options)	You can choose to **Translate this resource** or **Access this resource on a custom port** or **Access this resource using a custom IPv4 or IPv6 FQDN**. Translation uses URL rewriting, but the other alternatives provide clientless Web application access and do not incur the limitations of URL rewriting. URL rewriting can have problems with Web programming technologies such as AJAX. The options below will vary according to your choice.

URL resource type unique options

Option	Description
Alias name (Web proxy)	Specify a public alias to represent a private URL. The alias name is visible to users—make it short and descriptive so that it is easy to remember. You should specify an **Alias name** if: • You want to obscure the internal host name for this resource. • The URL resource is not contained within a search domain configured for **Name resolution** on the **Network Settings** page. • You normally redirect traffic through a network agent, but in this case you want to force the resource to be proxied using translated Web access. See Adding Web Shortcuts for more information. **NOTE:** • The private URL that you are representing with the alias must point to a directory on the back-end server, not a particular file. • Use ASCII characters when specifying an alias. Users who connect to WorkPlace using translated Web access will see an error message if non-ASCII characters are used. • Creating an alias works only for URLs (addresses with an `http` or `https` prefix); you cannot specify an alias for a UNC path or FTP resource (`ftp://`), for example. Also see Example: Specifying a URL Alias for a detailed description of how an alias is used.
Port (Web proxy)	The **Port** option is available when you select **Access this resource on a custom port** under **Custom access**. Enter the custom port number. The resource becomes available at that port on each WorkPlace site. The port must be open on any firewalls and must not be already in use on the external side of the appliance. Actual delivery of Web content depends on policy checks in accordance with normal appliance operation.
Custom FQDN (Web proxy)	The **Custom FQDN** option is available when you select **Access this resource using a custom FQDN** under **Custom access**. Type the **Custom FQDN name** (such as `custom.mydomain.com`) to be hosted by an externally accessible Web server on the appliance. By default, AMC listens on all interfaces for all services and connects the request to the correct service based on the FQDN being requested. The host name cannot be relative to any WorkPlace site. A maximum of 32 IPv4 or IPv6 addresses for externally defined host names are allowed between independently hosted Web application names and WorkPlace sites, supporting up to 64 total host names. Custom FQDN mapped Web access provides Single Sign-on support. If the host name or IP address on the certificate does not match the Custom FQDN or IP address that you specified for this site, a security warning is displayed when users access the site. Custom FQDNs are handled similar to configuring a WorkPlace site, as explained in To add a WorkPlace site:.

URL resource type unique options

Option	Description
Listen on an additional IP address (Web proxy)	**(Migrated/imported configurations only)** `https://10.4.124.222/workplace/assets/help/index.html`. An additional listening address can be specified if AMC was upgraded from a previous version where a virtual IP address is configured for the WorkPlace site or the CEM is used. To listen on an additional address, check the **Listen on an additional IP address** checkbox and type the IP address. For new installations, the Listen on an additional IP address fields are hidden. On a partial import, virtual IP address information is lost, and applying pending changes forces the Administrator to fix any WorkPlace site or URL resource configured to use a different IP address. In this case, the **Listen on an additional IP address** fields are visible, with the checkbox checked to enable listening on an additional address. Either enter an IP address or uncheck the checkbox. For migrated/imported configurations with existing virtual hosts, the UI section is visible, but the Administrator cannot create new virtual addresses. If necessary, use CEM to create virtual host addresses in a new or migrated/imported configuration. If the host name or IP address on the certificate does not match the **IP address** that you specified for this site, a security warning is displayed when users access the site.
IP address (Web proxy)	(Migrated/imported configurations only) Select an existing IP address or select **(New)** to add an IP address in the **New IP address** field.
New IP address (Web proxy)	Type in the IP address of the resource in dotted decimal form (`w.x.y.z`). This address must be on the same subnet as the appliance interface.
SSL certificate (Web proxy)	Select an existing SSL certificate or select **(New)** to add a new SSL certificate for this resource. If a certificate that matches the name is already available on the appliance, it is selected. Otherwise, select one from the **SSL certificate** list or import a certificate.
Organization (Web proxy)	Type in your company or organization name.
Country (Web proxy)	Type in the 2-letter abbreviation for your country (such as US or AU).
Synonyms (Web proxy)	Define alternative names for the URL resource name. This is convenient for users if they access the server using a different name (perhaps an unqualified or condensed name), or if a Web page contains links pointing to a DNS alias and the name is not properly translated by the Web proxy service. Separate multiple synonyms with semicolons. The appliance automatically defines a shortened name for the resource as a synonym. For example, if the URL is `http://mail.example.com`, the appliance adds the synonym `mail`. This synonym does not, however, appear in the **Synonyms** field. When **Translate this resource** is selected and you specify **Synonyms**, there must be something in the **Alias name** field. For the other Custom access options, the **Synonyms** field is independent of other fields.
Provide Exchange ActiveSync and Outlook Anywhere access to this resource (Exchange Server)	Select this checkbox to allow Exchange ActiveSync and Outlook Anywhere access to this resource. For more information, see Exchange ActiveSync Web Access. For an example use case, see Example: Supporting Exchange on iPhones. For Outlook Anywhere, see Configuring SMA Support for Microsoft Outlook Anywhere.

URL resource type unique options

Option	Description
Exchange server FQDN (Exchange Server)	Type the **Exchange server FQDN** (IPv4 or IPv6) name (such as `custom.mydomain.com`) to be hosted by an externally accessible Web server on the appliance. By default, AMC listens on all interfaces for all services and connects the request to the correct service based on the FQDN being requested.
Listen on an additional IP address (Web proxy)	(Migrated/imported configurations only) An additional listening address can be specified if AMC was upgraded from a previous version where a virtual IP address is configured for the WorkPlace site or the CEM is used. To listen on an additional address, check the **Listen on an additional IP address** checkbox and type the IP address. For new installations, the Listen on an additional IP address fields are hidden. On a partial import, virtual IP address information is lost, and applying pending changes forces the Administrator to fix any WorkPlace site or URL resource configured to use a different IP address. In this case, the **Listen on an additional IP address** fields are visible, with the checkbox checked to enable listening on an additional address. Either enter an IP address or uncheck the checkbox. For migrated/imported configurations with existing virtual hosts, the UI section is visible, but the Administrator cannot create new virtual addresses. If necessary, use CEM to create virtual host addresses in a new or migrated/imported configuration. If the host name or IP address on the certificate does not match the **IP address** that you specified for this site, a security warning is displayed when users access the site.
IP address (Exchange Server)	(Migrated/imported configurations only) Select an existing IP address or select **(New)** to add a new IP address.
Realm (Exchange Server)	Select the realm from the drop-down list. ActiveSync access requires the use of a realm that uses a single Active Directory authentication server. The realm must be already configured.
Fallback Exchange server URL (Exchange Server)	Enter the URL for the Exchange Server you want to use as the fallback server. See Configuring Fallback Servers for details on configuring a fallback server.

The options shown in the Matching URL resource type unique options tableare unique to the **Matching URL** resource type.

Matching URL resource type unique options

Option	Description
URL	If you do not enter a protocol identifier, AMC automatically inserts `http://` before the URL. If this is a URL for a secure site, you must include the `https://` protocol identifier. For example, type `https://example.domain.com`. The wildcard characters "*" and "?" can be used within address segments (between periods) of a **Matching URL** resource. Do not use the "?" character after the domain name—it indicates a URL query string. Use wildcard characters in the following situations: • Type `www.yourcompany*.com` to reference several domains that begin with `yourcompany` and end with `.com`, or type `www.yourcompany.*` to reference both `http://www.yourcompany.com` and `http://www.yourcompany.de`. • Create an entry, such as `mail*.yourcompany.com`, that gives the user access to anything in the `yourcompany` domain that begins with `mail`. This example provides access to `mail.yourcompany.com` and `mail2.yourcompany.com`, but not to `mail3.wemmet.yourcompany.com`. The URL is not case-sensitive. **NOTE:** Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.
Path and query string matching	These options allow you to block email attachments, or prevent a Web-based application from displaying restricted data by matching a path element or query string value to a particular URL. See Example: Blocking Email Attachments and Example: Restricting Access to Sensitive Data for more information. The **Query string** value is case-sensitive, while the **Path element** is not.

The options shown in the Host name or IP resource type unique options table are unique to the **Host name or IP** resource type:**.**

Host name or IP resource type unique options

Option	Description
Host name or IP	A host can include any computer on your network; for example, `bart.private.example.com` or `192.0.34.72`. When you specify a host name, the wildcard characters "*" and "?" can be used within an address segment (between periods). For example, the entry `mail*.yourcompany.com` gives the user access to anything in the `yourcompany` domain that begins with `mail` (for example, (`mail.yourcompany.com` and `mail2.yourcompany.com`), but not to `mail3.wemmet.yourcompany.com`. The host name is not case-sensitive. **NOTE:** Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

The option shown in the Network share resource type unique options table is unique to the **Network share** resource type:

Network share resource type unique options

Option	Description
Network share	Type a UNC path. This can be an entire server (for example, `\\ginkgo`), a shared folder (`\\john\public`), or a network folder (`\\ginkgo\news`).

The option shown in the IP range resource type unique options table is unique to the **IP range** resource type:

IP range resource type unique options

Option	Description
IP range	An IP range typically identifies a partial range of computers within a subnet; for example, `192.0.34.72-192.0.34.74`.

The options shown in the Subnet resource type unique options table is unique to the **Subnet** resource type:

Subnet resource type unique options

Option	Description
Subnet IP	A subnet is a portion of a network that shares a common address component. For example, `192.26.34.0`.
Subnet mask	For example, `255.255.255.0`.

The options shown in the Domain resource type unique options table are unique to the **Domain** resource type:

Domain resource type unique options

Option	Description
Domain	A domain encompasses one or more hosts. If the **Windows domain** checkbox is cleared, the domain name must be in DNS syntax. For example, `sampledomain.com`.
Windows domain	To define an entire Windows domain, select the **Windows domain** checkbox, and then type the name of the **Domain** in either NetBIOS or DNS syntax (such as `example` or `example.com`). Defining a domain gives authorized users access to all the network file resources within the domain.

The option shown in the Server farm resource type unique option table is unique to the **Server farm** resource type:

Server farm resource type unique option

Option	Description
Server farm list	Specify the **Host name or IP address** and service **Port** of up to six Citrix servers running the XML service or VMware servers running the XML service or VMware servers running the broker service. For more information, see Adding Citrix Server Farm Resources or Adding VMware View Resources.

4 After you've finished defining a resource, click **Save**.

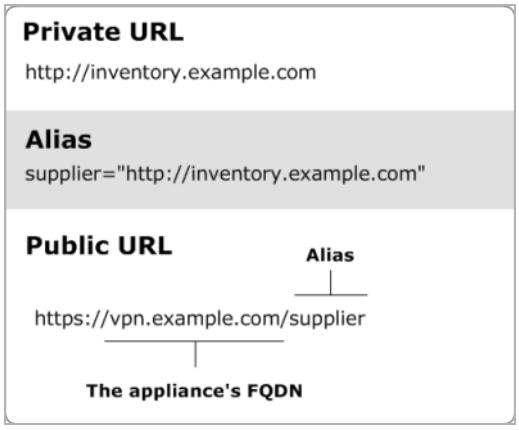
Example: Specifying a URL Alias

Any Web resource—such as a Web application, a Web portal, or a Web server—can be defined as a URL resource. Defining a Web resource as a URL provides several advantages:

- You can create a Web shortcut for WorkPlace to give users quick access to a URL resource.
- You can define very specific access rules to control which users can access the URL.
- You have the option of obscuring (or “aliasing”) the internal host name so it is not publicly exposed. When a user accesses an alias, the request is proxied to the downstream Web resource and its private URL is translated using the alias you specify. The user sees only the public (or aliased) URL.

Private address translated to a public URL illustrates how the private address for an inventory application might be translated into a public URL.

Private address translated to a public URL



The private URL for this resource is `http://inventory.example.com`, and the administrator has created an alias for it named `supplier`.

Instead of using the private URL (which would publicly expose a sensitive host name), suppliers access a public URL: `https://vpn.example.com/supplier`.

A public URL consists of the following:

- An `https://` prefix rather than `http://`: this is because all traffic to and from the SMA appliance is secured using SSL
- The appliance’s fully qualified domain name (in this example, `vpn.example.com`)
- The resource’s alias name (in this example `supplier`)

NOTE:

- Some Web-based applications use Java applets or other browser extensions that submit traffic using protocols other than HTTP. Examples of such applications include Citrix NFuse and certain versions of SAP. Although accessed using a Web browser, these applications may need to be defined as a client/server resource and proxied through OnDemand using the client/server access service.
- The private URL for which you create an alias must be a directory on the back-end server; it cannot be a file, and it must begin with either `http://` or `https://`.
- Use ASCII characters when specifying an alias. Users who connect to WorkPlace using translated Web access will see an error message if non-ASCII characters are used.
- For information on defining URL resources, see Adding Resources.

Example: Blocking Email Attachments

Your organization may need to restrict access to sensitive data for users working from an unmanaged or untrusted public system. For example, you may want to allow users to view email messages, but prevent them from downloading email attachments that could be left behind on the computer and accessible to unauthorized users.

The following example demonstrates how to use an access control rule, together with a **Matching URL** resource and End Point Control zone, to block attachments from being downloaded to untrusted devices. For an overview of access control, see Access Control Rules.

The example assumes that you have an EPC zone configured (named *Untrusted* in this example) into which devices that are not IT-managed are classified; see Managing EPC with Zones and Device Profiles for information about configuring and using zones.

To block email attachments using a Matching URL resource:

1. From the main navigation menu under **Security Administration** in AMC, click **Access Control**.
2. Click **New**. The **Add/Edit Access Rule** page appears.
3. In the **Position** field, type a number to specify the rule's position in the access rule list.
4. Use the **Action** buttons to specify **Deny**. This will deny users access to any resource that matches the pattern you specify in the next step.
5. Complete the information under **Basic settings**:
    a. Leave **User** selected (so that the rule users trying to access a resource).
    b. The **From** field specifies the users to whom the rule applies. For this example, leave the value as **Any user**.
    c. In the **To** field, click **Edit** to specify the target resource for this rule. A **Resources** window appears.
    d. Click **New**, and then select **Matching URL**. The **Add Resource - Matching URL** page appears.
    e. Type a name for the resource. For example, `Block email attachments`.
    f. In the **URL** box, type the URL address of your mail server.
    g. In the **Path and query string matching** area, select **Exchange/OWA attachments** from the **Type of match** list.
    h. Click **Save**. The **Add Resource - Matching URL** dialog closes.
6. In the **End Point Control zones** area, click **Edit** to select the zone from which you will deny access to the resource (*Untrusted*).
7. When you create a rule that specifies a Matching URL resource type, the user must be allowed to use a browser as an access method. On the **Advanced** tab, in the **Access method restrictions** area, make sure that the **Client software agents** are either set to **Any**, or that **Web browser** is among the selected agents.
8. Click **Finish**.

NOTE:

- Some Web-based applications automatically redirect users to other Web pages. Be certain to use the target URL address (the Web page to which users are redirected) when configuring the appliance to block email attachments. See Example: Working with a URL Redirect for more information.
- You cannot configure a Matching UR*L* resource to block attachments for users who connect to the appliance using OnDemand Tunnel or Connect Tunnel.

Example: Supporting Exchange on iPhones

Exchange ActiveSync Email and related functions are supported on Android, Windows Mobile, and Apple iPad and iPhone.

The following example describes configuring a URL resource to support iPhone users who wish to access Microsoft Exchange.

NOTE: This example assumes you have a realm which uses single Active Directory authentication.

Allow iPhone users to access corporate Exchange server:

1. From the main navigation menu under **Security Administration** in AMC, click **Resources**.
2. Click **New**. Select **URL**. The **Add Resource URL** page appears.
3. Enter the name, description, and externally-facing URL. Enter only the server name without a starting or index page. In this example, we will use `internalexchangeserver.SMA.com`.
4. Choose a group to add this resource to. In this example, we have left this in the default group.
5. Click **Exchange Server options**. The **Exchange Server options** section appears.
6. Select the **Enable Exchange ActiveSync and Outlook Anywhere access to this resource** checkbox.
7. In the **Host and domain name** field, type the external host name and domain that will be accessed by iPhone users.
8. Select the realm from the **Realm** drop-down menu. Only realms that use Active Directory for authentication are available as choices.
9. Click **Save**.
10. To configure an ActiveSync device profile for iPhones, click **End Point Control in** the main navigation menu in AMC.
11. On the **Device Profiles** tab, click **New** and select **Exchange Activesync**.
12. Enter a name and description for the device profile in the **Name** and **Description** fields.
13. In the **Add attribute(s)** section, select **Equipment ID** for the **Type**.
14. In the **Device identifier** field, enter the user attribute variable that contains the device identifier. For iPhone, the identifier is the serial number of the device. For details, see the Equipment ID table under Device Profile Attributes.
15. Click **Save**.
16. Notify your iPhone users of the externally-facing URL and instruct them to log in using their Active Directory credentials. Users must configure ActiveSync for Exchange on the device:
    a. On the iPhone, navigate to **Settings > Mail > Contacts and Calendars > Add Account > User's account info**.
    b. Set the server name to the URL (external host name and domain) provided by the administrator.

NOTE: To ensure that your Exchange server is correctly configured to work with iPhones, it is recommended that you test iPhone access with the Exchange server directly. After confirming iPhone access to email, then add the SMA appliance between the iPhone and the Exchange server. If your Exchange server is not accessible from the Internet, you can set up a WiFi access point to test iPhone access to it.

For details about setting up an Exchange server for iPhone access, refer to the *iPhone OS Enterprise Deployment Guide*, available at: http://images.apple.com/ie/iphone/business/docs/Enterprise_Deployment_Guide.pdf.

Example: Restricting Access to Sensitive Data

The following example demonstrates how to use an access control rule, together with a Matching URL resource and End Point Control zone, to prevent a Web-based application from displaying restricted data to untrusted devices.

- For an overview of access control, see Access Control Rules.
- The example assumes that you have an EPC zone configured (named *Untrusted* in this example) into which devices that are not IT-managed are classified; see Managing EPC with Zones and Device Profiles for information about configuring and using zones.

Prevent a Web-based application from retrieving data using a** Matching URL **resource:

1. From the main navigation menu in AMC under **Security Administration**, click **Access Control**.
2. Click **New**. The **Add/Edit Access Rule** page appears.
3. In the **Position** field, type a number to specify the rule's position in the access rule list.
4. Use the **Action** buttons to specify **Deny**. This will deny users access to any resource that matches the pattern you specify in the next step.
5. Complete the information under **Basic settings**:
    a. Leave **User** selected (so that the rule applies to users trying to access a resource).
    b. The **From** field specifies the users to whom the rule applies. For this example, leave the value as *Any user*.
    c. In the **To** field, click **Edit** to specify the target resource for this rule. A **Resources** dialog appears.
    d. Click **New**, and then select **Matching URL**. The **Add Resource - Matching URL** page appears.
    e. Type a name for the resource. For example, `Patient Records`.
    f. In the **URL** field, type the URL address of your Web-based application. For example, `www.patient-records.com`.
    g. In the **Path and query string matching** area, select *Custom* from the **Type of match** list.
    h. Click **New**, and then select **Path element**. Type `reports.aspx` and then click **OK** (the path is not case-sensitive).
    i. Click **New** again, and select **Query string**. Type `last_name=`, and then click **OK** (the query string is case-sensitive).
    j. Click **Save**. The **Add Resource - Matching URL** dialog closes.
6. In the **End Point Control zones** area, click **Edit** to select the zone from which you will deny access to the resource (**Untrusted**).
7. When you create a rule that specifies a Matching URL resource type, the user must be allowed to use a browser as an access method. On the **Advanced** tab, in the **Access method restrictions** area, make sure that the **Client software agents** are either set to **Any**, or that **Web browser** is among the selected agents.
8. Click **Finish**.

After you save and apply your changes, users who attempt to open the *Patient Records* resource (using a URL that matches `http://www.patient-records.com/reports.aspx?last_name=`) and who are classified into the **Untrusted** zone will be denied access.

NOTE:

- Some Web-based applications automatically redirect users to other Web pages. Be certain to use the target URL address (the Web page to which users are redirected) when configuring the appliance to block email attachments. See Example: Working with a URL Redirect for more information.
- You cannot configure a Matching URL resource to restrict access to sensitive data for users who connect to the appliance using OnDemand Tunnel or Connect Tunnel.

Editing Resources

Before modifying a resource, carefully examine any **Access Control** rules associated with it to understand how your changes will affect your security policy.

To edit a resource:

1. From the main navigation menu in AMC under **Security Administration**, click **Resources**.
2. Click the name of the resource that you want to edit.
3. On the **Add/Edit Resource** page, make your edits as needed.
4. Click **Save**.

NOTE: You cannot change an existing client/server resource's definition setting (for example, change a host name to an IP range); instead, you must create a new resource and apply the appropriate definition setting.

Deleting Resources

You cannot delete a resource that is referenced in an access control rule, resource group, or WorkPlace shortcut. Before deleting a resource, you must first remove it from any rules in which it is referenced. See Deleting Referenced Objects for more details.

To delete a resource:

1. From the main navigation menu in AMC under **Security Administration**, click **Resources**.
2. On the **Resources** page, select the checkbox to the left of any resources that you want to delete.
3. Click the **Delete** button. If this resource is still referenced by an access control rule, resource group, or WorkPlace shortcut, AMC displays an error message. Click the link in the error message to see a list of all references to this resource.

Using the Resource Exclusion List

By default, access agents and Web browsers redirect connections through the appliance for destination resources that you've defined in AMC. This redirection is a little different, depending on the user's means of access:

- The tunnel access agent redirects connections through the appliance for any destination resource that the user is permitted to access.
- A Web browser redirects to the appliance all destination resources that have been defined in AMC; if the user does not have access, a "permission denied" Web page is displayed.

There may, however, be resources that you don't want redirected through the appliance. For example, a user starts Outlook Web Access through the appliance and reads an email message with a link to a public site that is within a domain resource configured on the appliance. The traffic generated by following that link would be sent through the appliance. You can prevent this by specifying the public resource in the exclusion list.

Use the resource exclusion list to specify any resources (including host names, IP addresses, or domains) from being redirected through the appliance. When specifying a domain, you can also use the wildcard characters asterisk (*) and question mark (?). This list is global and all access services.

NOTE: Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

The resource exclusion list does not affect access control or security. If you want to prevent access to particular resources, add a Deny rule to the access control list.

To see which resources are configured to be redirected through the appliance, click the **Show network redirection list** link. This displays the **Redirection List** page.

To delete a resource from the exclusion list, select its checkbox and then click **Delete**.

If you exclude a resource by specifying its fully qualified domain name (FQDN), users who connect to WorkPlace from a realm that provides access using translated Web mode can still access the resource if they type its unqualified domain name in the WorkPlace **Intranet Address** field.

To add a resource to the resource exclusion list:

CAUTION: If you create a Domain resource in AMC (for example, `win.yourcompany.com`) and you exclude a resource from that domain using its IP address (`10.20.30.40`), the resource can still be accessed using its FQDN (`server.win.yourcompany.com`). This note of caution applies only to agents that use the Web proxy service, not the tunnel clients.

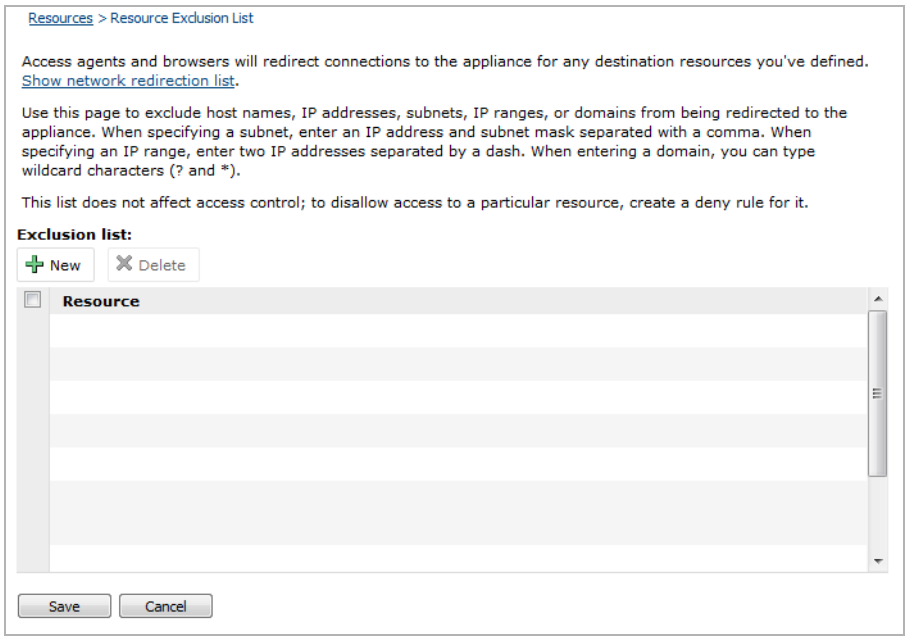
1 From the main navigation menu in AMC under **Security Administration**, click **Resources.**

2 Click the **Click here** link under **Resource exclusion list** at the bottom of the page.

3 In the **Exclusion list** field, click **New**, and then type the host name, IP address, or domain that you want to exclude from being redirected through the appliance. Wildcard characters (* and ?) are permitted.

NOTE: Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

For example, if you have three public web servers (`www.YourCompany.com`, `www2.YourCompany.com`, and `www3.YourCompany.com`), you can allow the network traffic associated with them to avoid the appliance, which will improve performance. Add all three public sites to the **Exclusion list** by using a wildcard character: `www*.YourCompany.com`. Resources in this list can also contain variables; see Using Variables in Resource and WorkPlace Shortcut Definitions for more information.



4 Click **OK** after each addition to the **Exclusion list**.

5 Click **Save**.

Using Variables in Resource and WorkPlace Shortcut Definitions

Using variables, you can define a single resource or WorkPlace shortcut that derives its value from a property that is unique for each user. Variables can be defined by a property associated with the session a user has started (the user name, for example, or the name of the zone to which he or she has been assigned), or by querying an external LDAP store for a specific set of attributes, such as a group or computer name.

Variables can be used for all resource types except **IP range** and **Subnet**. If a variable resolves to nothing, any configuration item using it will be undefined. For example, you might query an LDAP store for a user's IMEI number (the built-in ID number on a mobile device). In the case of a user who does not have an IMEI number, the variable would not resolve to anything during that user session. A WorkPlace shortcut that uses the variable would not be displayed, for example, and a policy rule that uses it will also fail.

Topics:

Using Session Property Variables

After a user has started a WorkPlace session by logging in, there are several session properties that are known, such as the name of the community to which the user has been assigned. You can use these properties to create dynamic resources.

For example, you might want mobile users to have access to a different network share than users with desktop computers. The way you would do this is as roughly as follows:

- Define two communities (`Mobile` and `Desktop`).
- Set up two file shares on your network. For example, `\\company\Mobile` and `\\company\Desktop`.
- Define a resource for WorkPlace: `\\company\{Session.communityName}`.

A single resource can in this manner present both kinds of users with the link that's appropriate for their devices. Use the variables in the Built-in variables table.

Built-in variables

Built-in variables	Description
{Session.activeDirectoryDomain}	The FQDN or IP address of the AD domain to use as a search base.
{Session.activeDirectoryDomain2}	The FQDN or IP address of a second AD domain to use as a search base (if you're using chained authentication).
{Session.communityName}	The name of the community to which the user was assigned when he or she logged in. The community controls which access agents are available and the end point.
{Session.ntDomain}	The login domain. For example, `server3` in this FQDN: `server3.uk.company.com`.
{Session.password}	The password from the first authentication method.
{Session.password2}	The password from the second authentication method, if used.

Built-in variables

Built-in variables	Description
{Session.qualifiedName}	For your primary (or only) authentication method, this is the fully qualified user name (`username@userdomain.company.com`).
{Session.qualifiedName2}	For your secondary authentication method, this is the fully qualified user name.
{Session.realmName}	The name of the realm the user is logged in to.
{Session.remoteAddress}	The IPv4 or IPv6 address of the user's host as seen by the appliance.
{Session.userName}	The short name for the user from the first authentication method. The short name is usually used for both the user's email address and home folder.
{Session.userName2}	The user's short name from the second authentication method, if used.
{Session.zoneName}	The name of the zone to which the user has been assigned, based on the profile of his or her device.

To create a WorkPlace shortcut to a network share based on user name:

1. From the main navigation menu in AMC under **Security Administration**, click **Resources**.
2. Click **New**, and then select **Network share**.
3. Give this resource a name (for example, `Personal Folder`), and then type the UNC path for the user folders on your network in the **Network share** field. For example, `\\marine_lab\users\`.
4. Click **{variable}** and select **Session.userName** to add a variable that represents the short login name for the user. When you click **Insert**, the entry for **Network share** looks like this: `\\marine_lab\users\{Session.userName}`
5. Select the **Create shortcut on WorkPlace** checkbox, and then click **Save**. By default, the resource you created will be displayed as a link in WorkPlace titled **Personal Folder**. If you want to change the link text, go to the **WorkPlace** page in AMC, and then click the link for the new shortcut.

When the user `jdoe` connects to WorkPlace, the variable is automatically replaced with the name entered during login and provides access to a folder named `\\marine_lab\users\jdoe`. When user `rsmith` follows the same link, he has access to the `\\marine_lab\users\rsmith` folder.

NOTE:

- For instructions on defining a new variable based on an LDAP query, see Using Query-Based Variables.
- There is an additional built-in variable named {URL_REF_VALUE}, which is the value of the first variable in the URL of a shortcut. See Displaying a Series of Shortcuts Using a Single Definition for an example of how to use this.

Using Query-Based Variables

When you configure a realm to use an Active Directory or LDAP authentication server, resources can be defined by querying the external LDAP store for a specific attribute or set of attributes. For example, you can use an LDAP query to create a single resource offering each user a WorkPlace link to his or her personal desktop from home or elsewhere, using the remote desktop protocol (RDP) that is built into Windows.

Topics:

- Creating a Resource Pointing to Users' Remote Desktops
- Creating a WorkPlace Link Giving Users Access to Their Remote Desktops
- Creating a Variable Containing a Variable

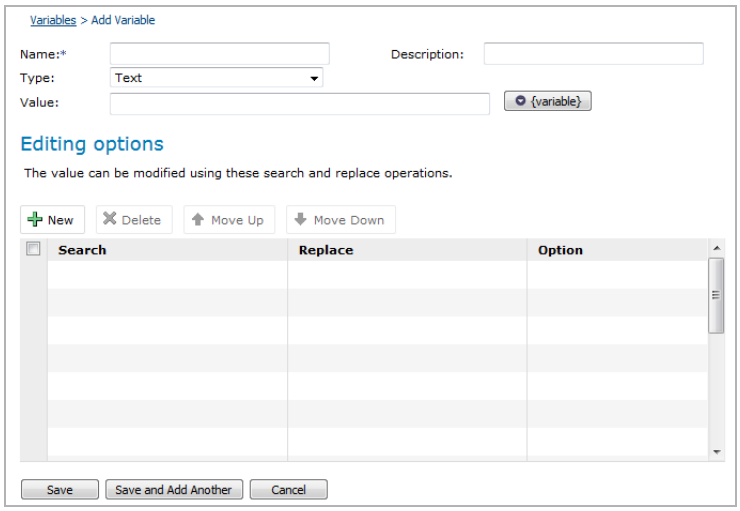
Creating a Resource Pointing to Users' Remote Desktops

In order to create a resource that points to users' remote desktops, you need to modify your LDAP store and add an attribute named `rdp`.

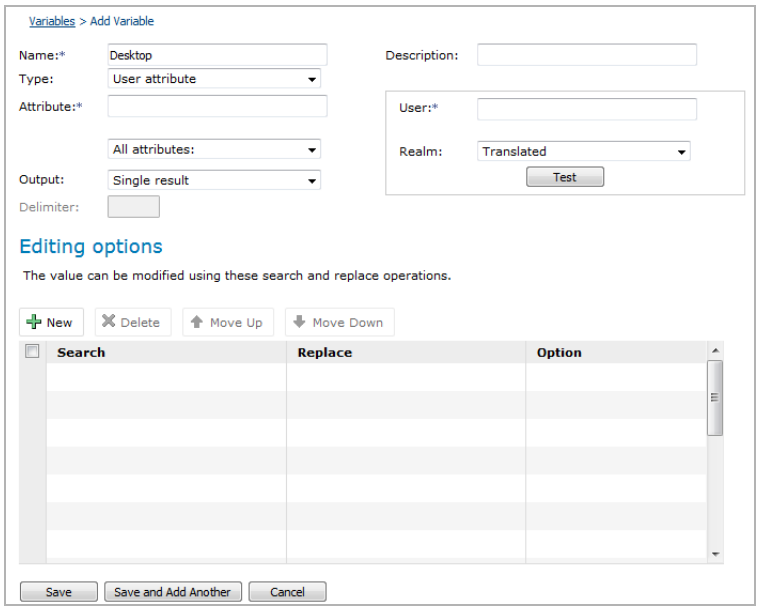
To create a resource variable that points to users' remote desktops:

1 From the main navigation menu in AMC under **Security Administration**, click **Resources**.

2 Click the **Variables** tab, and then click **New**.



3 Enter a name for the variable (for example, `Desktop`), and then select **User attribute** as the **Type**. The options change.

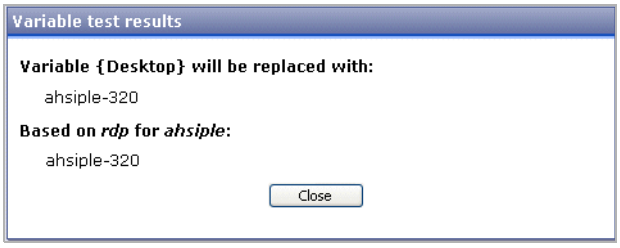


4 Enter `rdp` in the **Attribute** field.

5 From the **Output** drop-down menu, leave **Single result** (default) selected if each user has only one computer associated with him or her in the LDAP store.

6 Select the realm to which this new variable applies, and then enter the username of someone who has access to that realm in the **User** field.

7 Click **Test** to make sure that the user attribute you specified returns a value for this user.



8 Click **Save.**

9 On the **Resources** tab, click **New**, and then select **Host name or IP**.

10 Give a name to this resource (for example, `Personal computer`).

11 In the **Host name or IP address** field click **{variable}**, and then select *`{Desktop}`*, the variable you created earlier. Click **Insert**.

12 Edit the entry for **Host name or IP address** to add the portion of the address that the personal computers on your network share. The completed entry might look something like this:

`{Desktop}.dept.company.com`

As each user logs in, *`{Desktop}`* is replaced by the machine name associated with him or her in the LDAP store using the **rdp** attribute.

13 Click **Save**.

Creating a WorkPlace Link Giving Users Access to Their Remote Desktops

To create a WorkPlace link to give users access to their remote desktops:

1 From the main navigation menu in AMC under **User Access**, click **WorkPlace**.

2 Click **New**, and then select **Graphical terminal shortcut.**

3 In the **Resource** list, select **Personal computer**, and then specify what the link text will be in WorkPlace. For example, `My remote desktop`.

4 Click **Save**. By default, the resource you created will be displayed as a link in WorkPlace titled *My remote desktop*.

When the user John Doe connects to WorkPlace from home or on the road, **{Desktop}** is replaced by the contents of the **rdp** attribute associated with him in the LDAP store, and he sees a WorkPlace link (*My remote desktop*) that points to his office computer (`john_doe-340.dept.company.com`). When Paula Smith follows the same link, she has access to `paula_smith-452.dept.company.com`. If the **rdp** attribute is empty for a given user, then that user will not see a WorkPlace shortcut when he or she logs in.

Creating a Variable Containing a Variable

To create a variable that contains a variable:

You can simplify the creation of user-specific links or shortcuts by using one or more variables to define another one. For example, in the procedure above, a **Host name or IP address** resource was defined as follows, using a variable named **{Desktop}** followed by a string, in this case the path:

```
{Desktop}.dept.company.com
```

You could instead create a variable named **{Desktop_path}** that resolves to the entire path above.

In another example of using multiple variables to create a single variable, you could replace *dept* in the path above with the user's *ou* (organizational unit) attribute in the LDAP store. the AMC variables table summarizes the possibilities in the examples outlined here:

AMC variables

AMC variable name	Resolves to...	Based on...
{Desktop}	*john_doe-340*	*rdp* (LDAP attribute)
{dept}	*Sales*	*ou* (LDAP attribute)
{Desktop_path}	*john_doe-340.dept.company.com*	AMC variable defined as follows: `{Desktop}.dept.company.com`
{Desktop_by_dept}	*john_doe-340.Sales.company.com*	AMC variable defined as follows: `{Desktop}.{ou}.company.com`

Variables cannot be nested more than two deep: you cannot create a variable that refers to a variable that in turn refers to another variable.

Modifying Query Results

You can create a variable by querying an external AD/LDAP store for a specific attribute or set of attributes. To make the query results more useful, you can automatically extract data from them: after the query is sent and the full variable string has been determined, you can perform search and replace operations on its value.

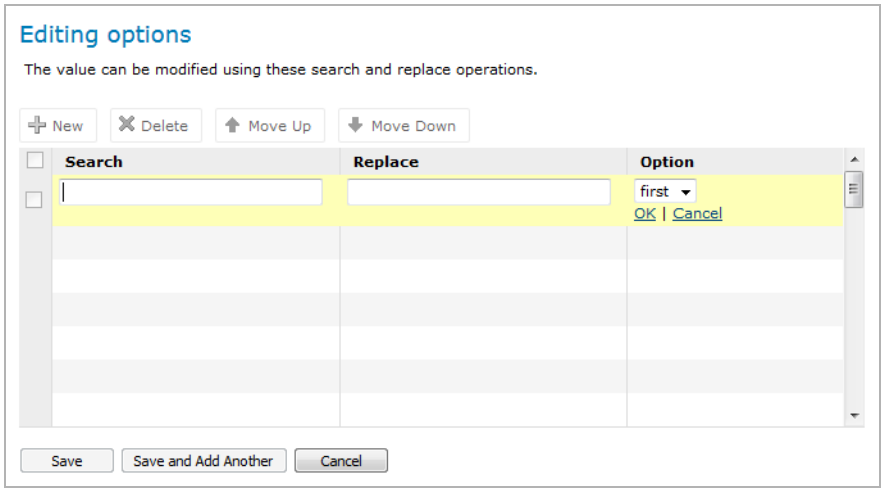
For example, let's say you have a company with offices in multiple locations, and each office uses a different Exchange server for email. Using some editing options, you can define a single variable that represents both Exchange servers, regardless of location.

To define a variable by automatically editing the results of a query:

1. From the main navigation menu in AMC under **Security Administration**, click **Resources**.
2. Click the **Variables** tab, and then click **New**.
3. Enter a name for your variable. For example, `Exchange_server`.
4. In the **Type** list, select **User attribute**.
5. Select the appropriate realm from the list: it should point to the AD/LDAP store that you will query.
6. In the **Attribute** list, select **msExchHomeServerName**.
7. Query the directory server for two different employees—for example, one at headquarters in London, and one in California—by entering the user name and clicking **Test** for each one. In this example the only difference is in the server name at the end of the resulting strings:

   ```
   /o=Your Company, Inc./ou=UK/cn=Configuration/cn=Servers/cn=LN0EXL09
   /o=Your Company, Inc./ou=UK/cn=Configuration/cn=Servers/cn=CA0EXV08
   ```

8 Modify the query results by clicking **New** in the **Editing options** area:



a In the **Search** field, enter:

```
/o=Your Company, Inc./ou=UK/cn=Configuration/cn=Servers/cn=
```

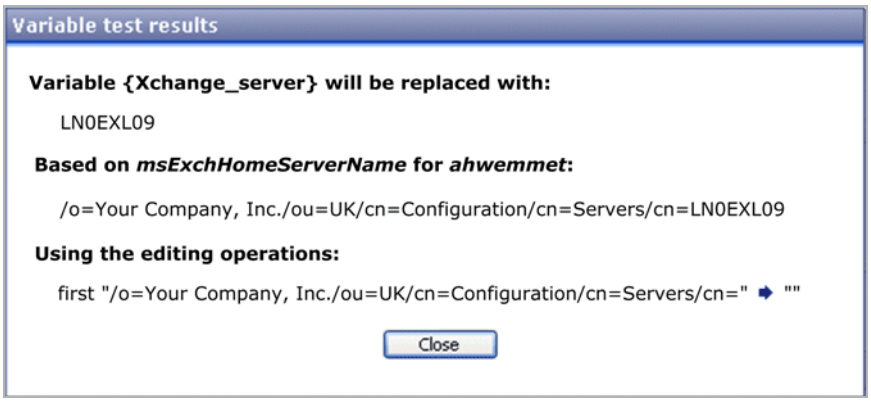
b Leave the **Replace** field empty, and then click **OK**.

For an employee in the London office or one in California, the variable named **Exchange_server** will contain the appropriate name, either `LN0EXL09` or `CA0EXV08`, depending on the user.

Using the same query, you can create an additional variable that indicates where an employee is based. For example, create a new variable named *Location* and replace the name of each directory server with its location.

The *Location* variable will resolve to *London* or *California*, depending on the user.

For example, when you enter a London employee's name in the **User** field and click **Test**, you'll see the following results:



Displaying a Series of Shortcuts Using a Single Definition

When you create a variable based on a user's session properties or the results of a query, the variable can resolve to one value per user attribute (for example, **sAMAccountName** and **lastLogon**), or multiple values (such as a list of groups to which a user belongs, or the workstations a user is permitted to log in to). When a variable can have multiple values, you have the option of creating one shortcut for it that is automatically displayed as a series of shortcuts in WorkPlace.

In this example, we'll create a single shortcut that will result in a series of WorkPlace shortcuts, one for each workstation the user is allowed to access. Here's an overview of the process:

Shortcut creation process

Step	Description
A	Create a variable named *User_workstations* that points to a multi-valued attribute in an AD or LDAP server named *userWorkstations*. In the directory store, this attribute lists the workstations a user is allowed to access. For example, a user might have a personal workstation at work, and another workstation that's used for order inventory.
B	Create a host resource named *Workstation_list* that points to the *User_workstations* variable. For the user in this example, the resource has two possible values.
C	Create a WorkPlace graphical terminal shortcut that points to the *Workstation_list* resource. The link for this shortcut will refer to a special, built-in variable named *{URL_REF_VALUE}*, which will automatically result in separate links in WorkPlace for each of the workstations a user is permitted to use.
D	Test WorkPlace. If the shortcut does not appear, it may be because the directory store query is not returning any results. Testing it will also help you see whether you need to adjust the location of the shortcuts in your WorkPlace layout.

A: Create a variable that points to a user attribute in the AD server:

1. From the main navigation menu in AMC under **Security Administration**, click **Resources**, and then go to the **Variables** page.
2. Click **New**, and then enter a name for the variable: `User_workstations`.
3. Select **User attribute** in the **Type** list, and then specify the realm that uses the directory store you want to query.
4. In the drop-down menu of attributes returned from the AD store, select *userWorkstations*.
5. In the **Output** list, select *Multiple results*.
6. In the **User** field, enter the name of a representative user (someone who is likely to use this shortcut), and then query the AD/LDAP store for the values of *userWorkstations* by clicking **Test**.
7. The test results will indicate what character (for example, a comma or a semicolon) you should enter in the **Delimiter** field.
8. Click **Save**. The new variable (*{User_workstations}*) appears in the list and can now be used to define or describe other variables, resources, or WorkPlace shortcuts.

B: Create a host resource that points to the {User_workstations} variable:

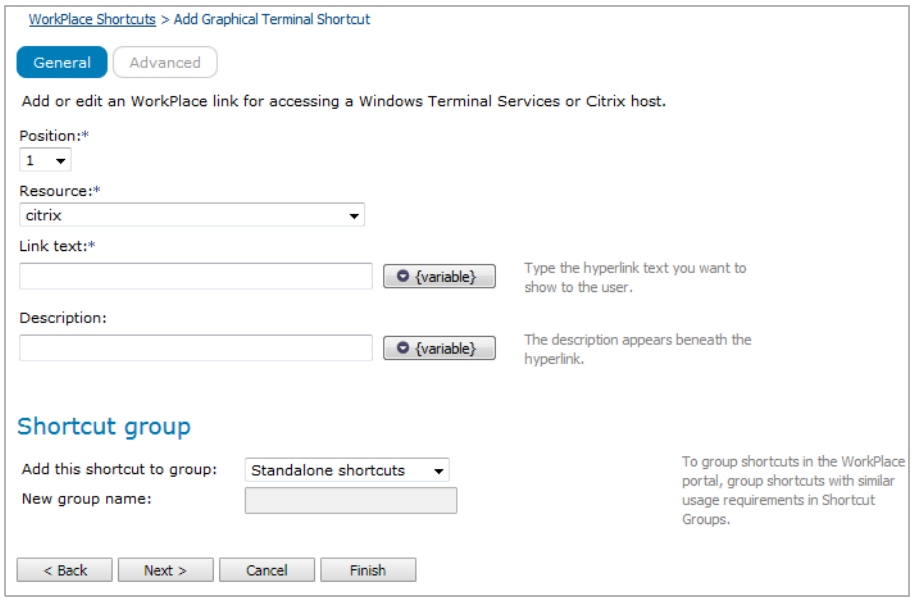
1. From the main navigation menu in AMC under **Security Administration**, click **Resources**.
2. Click **New**, and then select **Host Name** or **IP Address**.
3. Enter `Workstation_list` as the resource name.
4. In the **Host name or IP address** field, click **{variable}**, and then select **{User_workstations}**, the variable you created in step A.
5. Click **Insert**, and then click **{variable}** again to close the list.
6. Edit the entry for **Host name or IP address** to add the portion of the address that the computers on your network share. The completed entry might look something like this:

```
{User_Workstations}.dept.company.com
```

C: Create a WorkPlace shortcut that points to the Workstation_list resource

1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 On the **Shortcuts** page, click **New**, and then select **Graphical terminal shortcut** from the list. The **General** tab of the **Add Graphical Terminal Shortcut** page appears.



3 In the **Position** field, specify the shortcut's position in the list. The default is **1**. (It's possible to change its position later in your WorkPlace layout.)

4 In the **Resource** drop-down menu, select the resource to which this shortcut will be linked: **Workstation_list**.

5 In the **Link text** field, type the first part of the hyperlink users will see. For example, enter `My workstation(s):` followed by a space.

6 Using a variable you can have the link end in each succeeding value for **Workstation_list;** if there is more than one, then more than one shortcut will be displayed in WorkPlace. Click **{variable}**, and then select **{URL_REF_VALUE}** from the list. Click **Insert** to add the variable to the link text, and then close the list by clicking **{variable}** again. The entry for **Link** now looks like this:

```
My workstation(s): {URL_REF_VALUE}
```

7 Click **Finish** to save the shortcut. (For a description of the settings on the **Advanced** page, see Adding Graphical Terminal Shortcuts to Individual Hosts.)

This shortcut will automatically result in separate links in WorkPlace for each of the workstations a user is permitted to use. The two WorkPlace links in our example—one to a personal workstation and one to a workstation for entering orders—would look like this for the user *ageorge*.

D: Troubleshooting WorkPlace

1 If users log in to WorkPlace and do not see the shortcut you created, check the following:

- Is the user in the right community? In the main navigation menu in AMC, click **User Sessions**, and then click the user's name to get session details. The user may not be assigned to the right community, or there may be a rule preventing him or her from accessing the resource.
- Does the variable return a result for this user? In the main navigation menu in AMC, click **Resources**, and then go to the **Variables** page. Click the variable named **User_workstations**, enter the name of the person who is not seeing the shortcut, and then click **Test**. If no result is returned, the shortcut will not be displayed.

2 Check your WorkPlace layout. When you create a shortcut, you have the opportunity to add it to a group of shortcuts or to the default group (**Standalone shortcuts**). To change the position of the shortcut, click **Realms**, and then click the name of the community to which this user belongs. The WorkPlace Appearance page indicates which layout is being used. To modify page content, click **Manage layouts**.

Creating and Managing Resource Groups

You can define individual resources or manage them in resource groups, which are collections of individual resources. Grouping resources provides a convenient way to manage access to a set of resources with similar characteristics. For example, you might define a resource group containing applications that are important only to your remote employee, simplifying the process of managing access to those resources.

There is no limit to the number of resources that a resource group can contain. When you create a new resource group, it is added to your list of available resources and groups; you can then use the resource group in access control rules.

Topics:

- Adding Resource Groups
- Example: Working with a URL Redirect
- Editing and Deleting Resource Groups

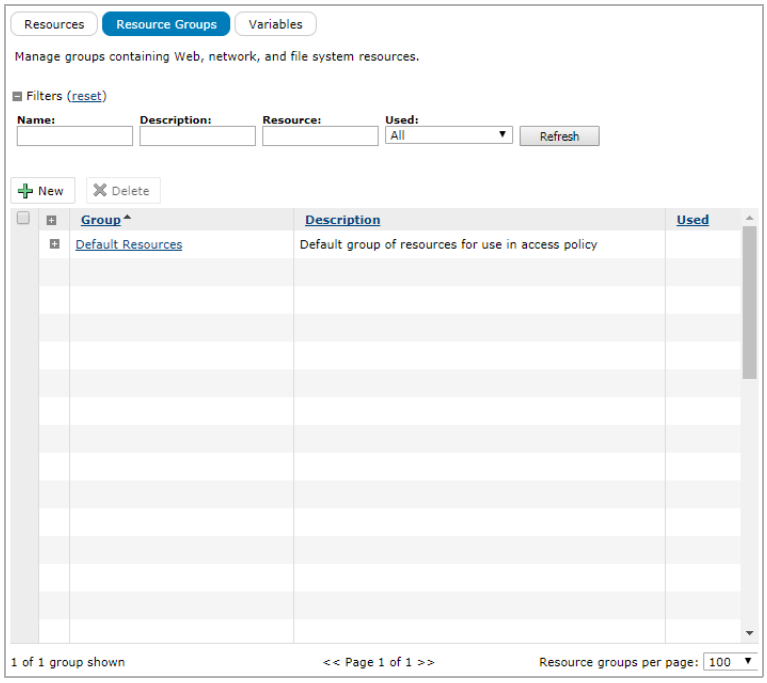
Adding Resource Groups

When you create a new resource group, it is added to the list of available groups on the **Resource Groups** tab of the **Resources** page.

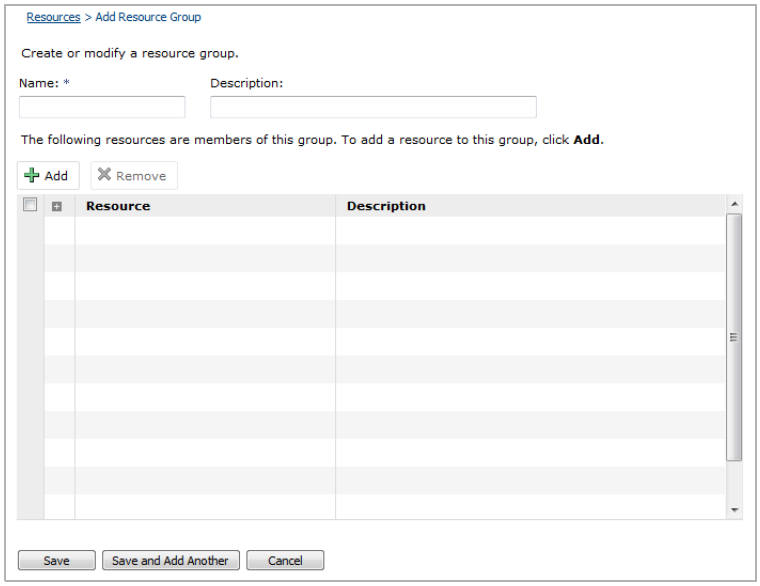
To add a resource group:

1 From the main navigation menu in AMC under **Security Administration**, click **Resources**.

2 Click the **Resource Groups** tab.



3 Click **New** to add a resource group.



4 Type a **Name** for the resource group.

5 In the **Description** field, type a descriptive comment about the group.

6 Select the checkbox for each resource you want to include in the group, or leave the group empty and add resources to it later. There is no limit to the number of resources that a group can contain.

7 After you have finished, click **Save**.

Example: Working with a URL Redirect

Some Web-based applications automatically redirect users to other Web pages. A user accessing the application may browse to a particular Web address, but then be redirected to a different address.

For example, an organization has a mail server with the following URL:

```
http://domino.example.com/dwa.nsf
```

A user who accesses this site is then automatically redirected to a different URL:

```
http://domino.example.com/mail/dwa1.nsf
```

To give users access to the application using the SMA appliance, you need to add both the original and the redirected URLs as resources.

The following example demonstrates how to add your Web-based application as a pair of URL resources, how to group the resources together, and then how to define an access control rule so that your users have access to the application.

Configure URL resources for your Web-based application:

1 From the main navigation menu in AMC under **Security Administration**, click **Resources**.

2 Click **New**, and then select *URL* from the drop-down menu. The **Add/Edit Resource – URL** page appears.

3 In the **Name** field, type a name for the resource. For example, `Mail Web App`.

4 In the **URL** field, type the address of the mail server. For example,

```
http://domino.example.com/dwa.nsf.
```

5 Click **Save**.

6 Repeat Step 2 through Step 5 to create a second Web resource specifying the redirected URL address. If your application uses more than one redirected URL, create an additional URL resource for each address; this example assumes there are only two URLs involved.

Create a resource group for both URL resources:

1 From the main navigation menu in AMC under **Security Administration**, click **Resources**.

2 Click the **Resource Group** tab, and then click **New**. The **Add/Edit Resource Group** page appears.

3 In the **Name** field, type a name for the group resource. For example, `Mail Web App Group`.

4 Select the checkboxes for each of the Web resources previously created.

5 Click **Save**.

Define an access control rule for the resource group:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**.

2 Click **New**. The **Add/Edit Access Rule** page appears.

3 In the **Position** field, type a number to specify the rule's position in the access rule list.

4 Use the **Action** buttons to specify **Permit**. This will allow users to access the group resource that you specify in the next step.

5 Complete the information under **Basic settings**:

   a Leave **User** selected (so that the rule applies to users trying to access a resource).

   b The **From** field specifies the users to whom the rule applies. For this example, leave the value as **Any user**.

   c In the **To** field, click **Edit** to specify the target resource for this rule. A **Resources** dialog appears.

   d Select the resource group previously created. In this example, *Mail Web App Group*.

6 Click **Save**.

For an overview of access control, see Access Control Rules.

Editing and Deleting Resource Groups

Before modifying a resource group, carefully examine the associated rules to understand how your changes will affect your security policy. You cannot delete a resource group that is referenced in an access control rule. Before deleting a resource group, you must first remove it from any rules in which it is referenced. See Deleting Referenced Objects for more details.

Web Application Profiles

Web application profiles provide single sign-on and translation control for Web applications that use Windows NTLM authentication (v1 and v2 are both supported), or basic authentication.

- With a Web application that uses Windows NTLM authentication, access is granted only to users whose Windows credentials can be verified. Support for NTLM is built into Microsoft IIS (Internet-based services for Windows machines) and supported in Internet Explorer.
- Basic authentication is supported on a wide variety of platforms (note, however, that it sends passwords in the clear across the network).

You can also configure the Web proxy service in AMC to support forms-based authentication, in which users authenticate by filling out a standard HTML form Web using any combination of browser and Web server. See Creating Forms-Based Single Sign-On Profiles for more information.

Topics:

- Viewing Web Application Profiles
- Adding Web Application Profiles
- Preconfigured Web Application Profiles
- Web Application Profile Examples
- Editing and Deleting Web Application Profiles

Viewing Web Application Profiles

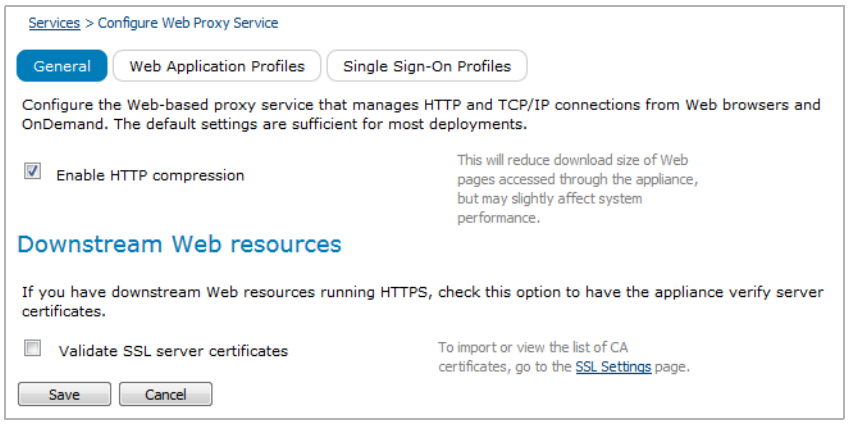
Web application profiles are listed on the **Configure Web Proxy Service** page.

To view your list of available Web application profiles:

1 From the main navigation menu in AMC under **System Configuration**, click **Services**.

2 In the **Access Services** area, click the **Configure** link for **Web proxy service**.

3 To view your available Web profiles, click the **Web Application Profiles** tab. The **Configure Web Proxy Service** page appears.



4 The list includes preconfigured Web application profiles that are recommended for several popular Web applications, any custom Web profiles you created, and a default Web profile. To view the settings for a Web application profile, click its name.

Adding Web Application Profiles

IMPORTANT: The Web translation that AMC performs is more complete and robust in recent versions of the appliance software. Beginning in version 10.x, it is no longer possible to revert to the legacy translation for Web application profiles that worked in version 8.6.x.

Web application profiles control single sign-on characteristics, as well as content translation options for a particular Web resource. Each Web resource should have a Web application profile associated with it.

- **Single sign-on** options control whether and how a user's login credentials are forwarded to downstream Web applications. These options are disabled by default. In addition, one of the following is required to configure single sign-on:

- Click **Use Web content translation** on the **Configure WorkPlace** page in AMC.
- Define a WorkPlace link as an aliased URL. This is the approach you should take if you normally redirect traffic through a network agent, but in this case you want to force the resource to be proxied using translated, custom port mapped, or Exchange server FQDN mapped Web access for single sign-on.

For more information, see Web Shortcut Access and Configuring WorkPlace General Settings.

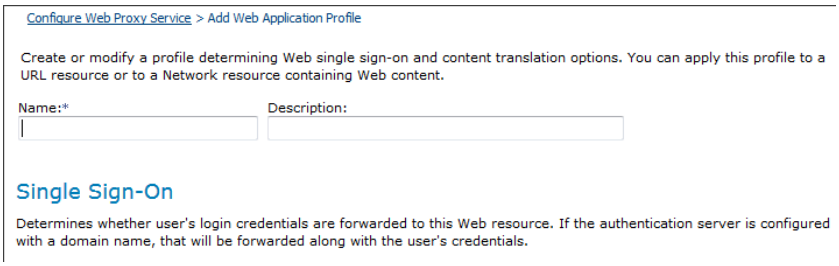
NOTE: You can configure single sign-on when you create a WorkPlace shortcut for accessing a Windows Terminal Services or Citrix host. See Adding Graphical Terminal Shortcuts to Individual Hosts.

- **Content translation** options control whether hyperlinks in JavaScript code, in cookie bodies, and in cookie paths are translated by the Web proxy service. The options are used only by the translated Web access agent: they are ignored by standard Web access.

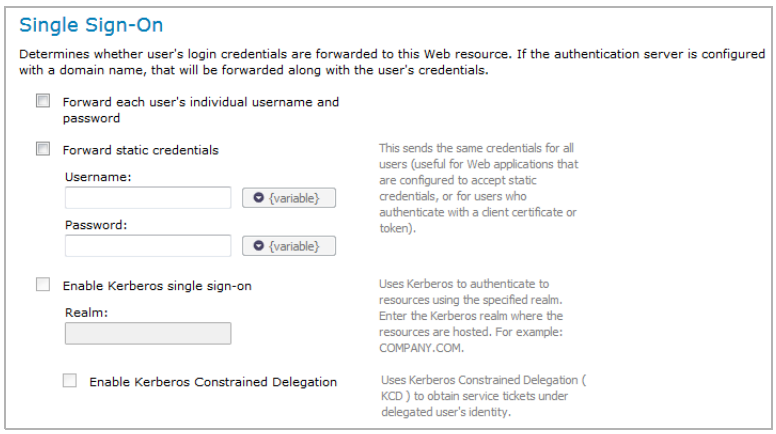
Web application profiles are not used if **Web shortcut access** is set to **Redirect through network agent** on the **Configure WorkPlace** page in AMC. See Configuring WorkPlace General Settings.

To add a Web application profile:

1. From the main navigation menu in AMC under **System Configuration**, click **Services**.
2. In the **Access Services** area, click the **Configure** link for **Web proxy service**. The **Configure Web Proxy Service** page appears.
3. Click the **Web Application Profiles** tab, and then click **New**. The **Add Web Application Profile** page appears.

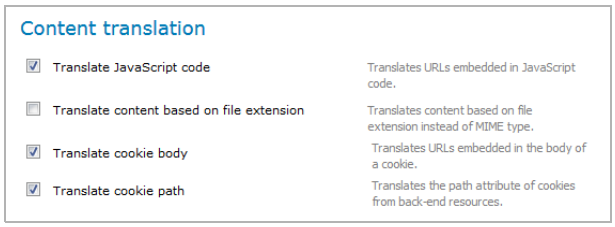


4. In the **Name** field, type a name for the profile. If you are creating a profile to associate with a specific application, you might want to give it a name similar to that of the application.
5. In the **Description** field, type a descriptive comment about the profile.
6. In the **Single Sign-On** area, specify if and how you want user credentials to be passed along to the Web resource. Forwarding user credentials prevents the user from having to log in multiple times (once to get to the appliance, and again to access an application resource).



- If you select the **Forward each user's individual username and password** checkbox, the username and password used to authenticate to WorkPlace are forwarded to the back-end Web server.
- If you select the **Forward static credentials** checkbox, the appliance forwards the same username and password for all users. This is useful for Web sites that require HTTP basic authentication, but don't provide personalized content for each user based on the login name. It's also useful for users who authenticate with a client certificate or token.
- If you do not select either option, single sign-on functionality is disabled. If you select both options, the individual username and password option takes precedence. For example, if the user provides a username/password pair, it is forwarded, but if username/password is not provided, the Web proxy service forwards the static credentials.
- If you select the **Enable Kerberos single sign-on** checkbox and specify the Kerberos realm where the resources are hosted, WorkPlace and Connect Tunnel users can access http resources. This realm is used for authenticating environments like Active Directory, Active Directory Tree, and Active Directory Forest where Kerberos is configured as a preferred authentication mechanism.

7 In the **Content translation** area, select the items that you want the Web proxy service to translate.



- Select the **Translate JavaScript code** checkbox if you want the Web proxy service to translate links embedded in JavaScript code used by the Web resource. This is useful for JavaScript that contains absolute URLs or absolute references (`/to/path/xyz`), or that dynamically generates URLs (for example, `location="http://" + host name + "/index.html"`). This improves compatibility with Microsoft Outlook Web Access and other applications that rely on JavaScript. This option is enabled by default.

  However, if you notice problems with searching mail based on the Subject, From, or Sent To fields, or if you see an error after logging in when you access OWA using a WorkPlace shortcut, clear the **Translate JavaScript code** checkbox for the OWA profile.
- Select the **Translate content based on file extension** checkbox if you want the Web proxy service to determine content type by examining the file extension, not the MIME type. Normally, the Web proxy service translates certain content types (including text and HTML). It determines the content type from the MIME type in the HTTP header. If a Web resource is sending the incorrect MIME type, select this option and the Web proxy service will decide whether or not to translate a file based on its file extension. This option is disabled by default.
- Select the **Translate cookie body** checkbox if you want the Web proxy service to translate URLs embedded in the body of a cookie. If a Web resource uses embedded URLs in the body of a cookie (which is not common practice), and you do not have this option enabled, users can experience problems. A common symptom is being unexpectedly redirected to another URL. This option is enabled by default.
- Select the **Translate cookie path** checkbox if you want the Web proxy service to translate the path attribute of cookies sent by back-end resources. The browser uses cookie paths to determine when to send a cookie back to the server. The appliance changes the path that the browser sees, so if the cookie path is not translated, the browser will never send the cookie. A common symptom of this situation is a user being prompted repeatedly for login credentials after already entering valid ones. If this occurs, you should enable this option. This option is enabled by default.

8 Click **Save**.

Preconfigured Web Application Profiles

Several preconfigured Web application profiles are included with the appliance and are recommended for certain commonly used Web applications. (More can be added; see Adding Web Application Profiles.) Preconfigured profiles are shown in the Preconfigured Web Application profiles table.

Preconfigured Web Application profiles

Web application profile	Description
Default	A default profile that you can use for most Web applications or sites that don't use NTLM or basic authentication single sign-on
Domino Web Access 6.x	A profile for Lotus Domino Web Access (versions 6.x only)
iNotes 5.x	A profile for Lotus iNotes (versions 5.x only)
Onyx CRM	A profile for the Onyx CRM Employee Portal (versions 4 and later)
OWA/Single Sign-On	A profile for Microsoft Outlook Web Access and other sites that use NTLM or basic authentication single sign-on
WorkPlaceCfg	A read-only profile for WorkPlace

Web Application Profile Examples

This section explains how the appliance determines which Web application profile to apply to an incoming request, and demonstrates the flexibility of using profiles when specifying resources.

How Requests for Web Resources are Evaluated

Because Web resources can be defined quite broadly, the appliance follows a rule for determining which Web application profile to apply to an incoming request: it chooses the profile associated with the most specific resource.

For example, suppose you've defined these two resources:

- A DNS domain (*xyz.com*) with *Web application profile A* attached
- A specific Web server (*web1.xyz.com*) with *Web application profile B* attached

If a user request comes in for ***https://web1.xyz.com/timesheet.html***, the appliance uses *Web application profile B* because it is associated with a more specific resource (the Web server) than *Web application profile A* (the domain). The actual order that the appliance uses is as follows:

URL —> Host name —> IP address —> Subnet/IP range —> DNS domain

Associating one profile with an entire domain

If you want to associate the same Web application profile to all resources within a single domain, associate a profile with that domain, and then select *None* as the profile for any individual resources you define that are within that domain. The individual resource will inherit the domain's profile. If there is no profile associated with a particular resource, and there is no profile to inherit, the appliance uses the system defaults for the profile.

Editing and Deleting Web Application Profiles

Before modifying a profile, confirm that the changes will be compatible with its associated applications.

If a profile is still associated with one or more resources, AMC prevents you from deleting it. You must remove all associations before you can delete the profile. See Deleting Referenced Objects for more details.

Creating Forms-Based Single Sign-On Profiles

Many Web applications use forms-based authentication, in which the user enters a set of credentials into HTML form fields, and a session token is stored in a browser cookie. This type of authentication is popular because it is supported on any combination of browser and Web server. The other benefit is that you can customize the login page.

Use AMC to set up a single sign-on profile that will forward a user's appliance credentials to a Web application that uses forms-based authentication. This process is not automated and may require help from SonicWall Technical Support; you should be familiar with the HTML code and know things like the form element names and the name of the cookie that stores user credentials.

There are also some built-in profiles that you can modify for your environment:

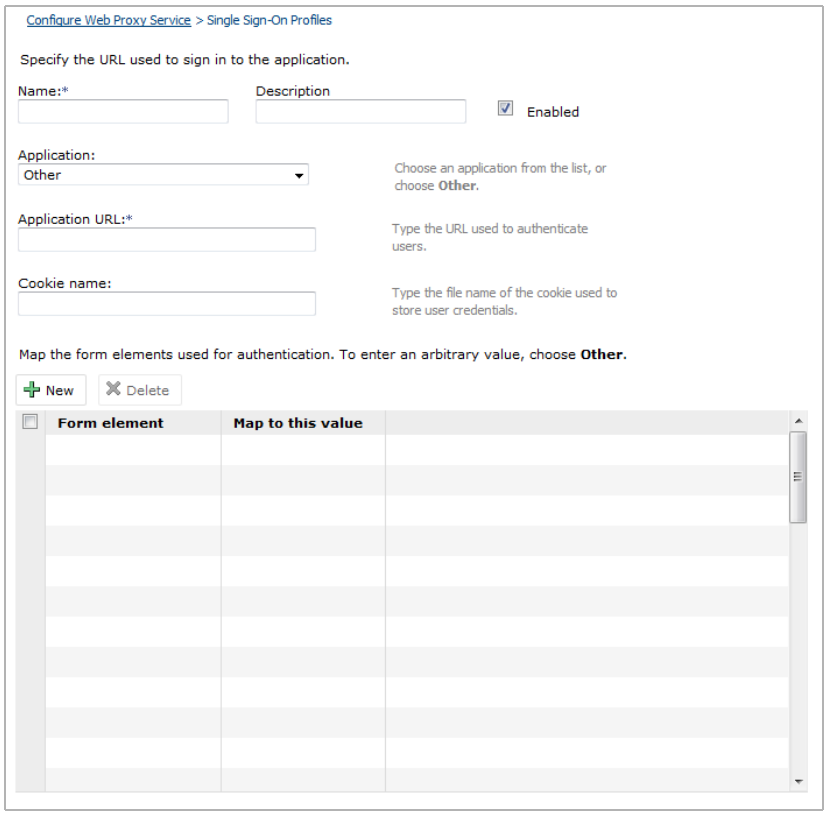
- OWA 2003
- OWA 2007/2010
- OWA 2013
- Citrix Nfuse 1.7
- Citrix XenApp
- Citrix XenDesktop

To modify the built-in single sign-on profile for Outlook Web Access:

1 From the main navigation menu in AMC under **System Configuration**, click **Services**.

2 In the **Access services** area, under **Web proxy service**, click **Configure**.

3 Click the **Single Sign-On Profiles** tab, and then click **New**. The **Configure Single Sign-On Profile** page appears.



4 Type a **Name** and **Description**, and then select the applicable OWA (Outlook Web Access) application from the **Application** list. (To start from scratch and specify elements from a custom form, select **Other**.)

5 In the **Application URL** field, type the URL for the application type (for example, the Citrix XenApp/XenDesktop site or the Microsoft Exchange OWA form-based authentication DLL). For an OWA DLL this is usually the FQDN of your Exchange server followed by `/exchweb/bin/auth/owaauth.dll`. For example:

```
https://owaserver.domain.com/exchweb/bin/auth/owaauth.dll
```

6 In the **Cookie name** field type the file name of the cookie used to store user credentials. The cookie name for OWA 2013 is **cadata**.

7 Make changes to the form elements by clicking a link. (At a minimum, you must change the destination element to match the **Application URL**.)

8 Click **Save**.

After a profile is set up, a user's credentials are automatically sent to the back-end server every time the user logs in, regardless whether the WorkPlace link is clicked. This can be a problem where there is a limit to the number of allowed licenses.

When a user logs in, his or her credentials are sent to all Web applications for which an a single sign-on profile is configured. Unlike a Web application profile, a single sign-on profile is not associated with a resource in AMC—the application resource is defined within the profile.

For information on configuring SSO for a Web application that uses Windows NTLM or basic authentication, see Web Application Profiles.

Kerberos Constrained Delegation

SMA supports Kerberos Constrained Delegation (KCD). Kerberos Constrained Delegation (KCD) provides authentication support using an existing Kerberos infrastructure, which does not need to trust front-end services to delegate a service.

With Kerberos Constrained Delegation (KCD), users who are authenticated using non-Kerberos methods, such as Certificate, Smart Card, or RADIUS, can gain access to Kerberos protected resources without having to enter any additional credentials. For example, a user that authenticates using Single Sign-On (SSO), rather than Kerberos, is allowed access to Kerberos protected web resources.

Most Single Sign-On (SSO) methods rely on the conventional username/password credentials. However, these credentials do not work with Certificate, Smart Card, or RADIUS authentication. With Kerberos Constrained Delegation (KCD), the administrator configures the usernames and passwords for Kerberos Constrained Delegation (KCD).

Microsoft's Kerberos v5 extension is called Services for Users (S4U) and is compromised of two parts:

- S4U2Self
- S4U2Proxy

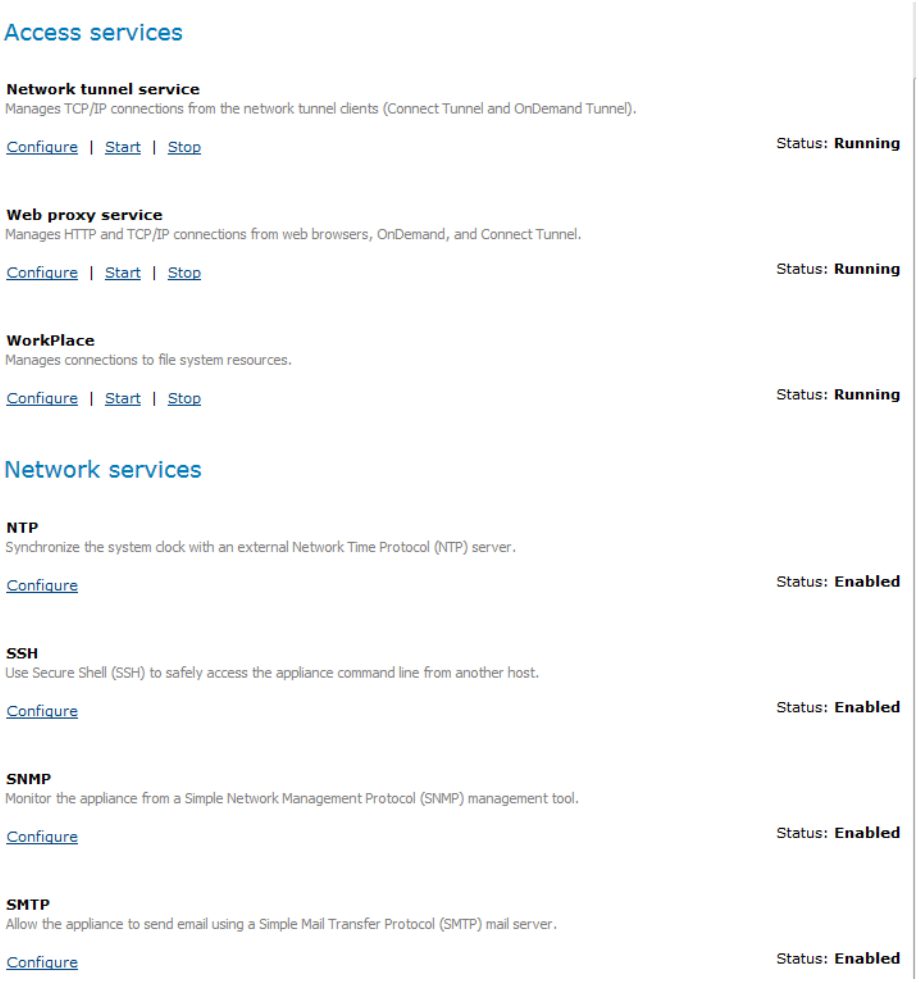
S4U2Self allows a service to obtain a service ticket to itself on behalf of a client and is usually used with a client certificate. S4U2Self is the Kerberos Protocol Transition extension.

S4U2Proxy allows a service to obtain a service ticket to an arbitrary service on behalf of a user with only the user's service ticket. The services are constrained by the administrator. S4U2Proxy is the Kerberos Constrained Delegation (KCD) extension.

Configuring Kerberos Constrained Delegation

To enable Kerberos Constrained Delegation (KCD):

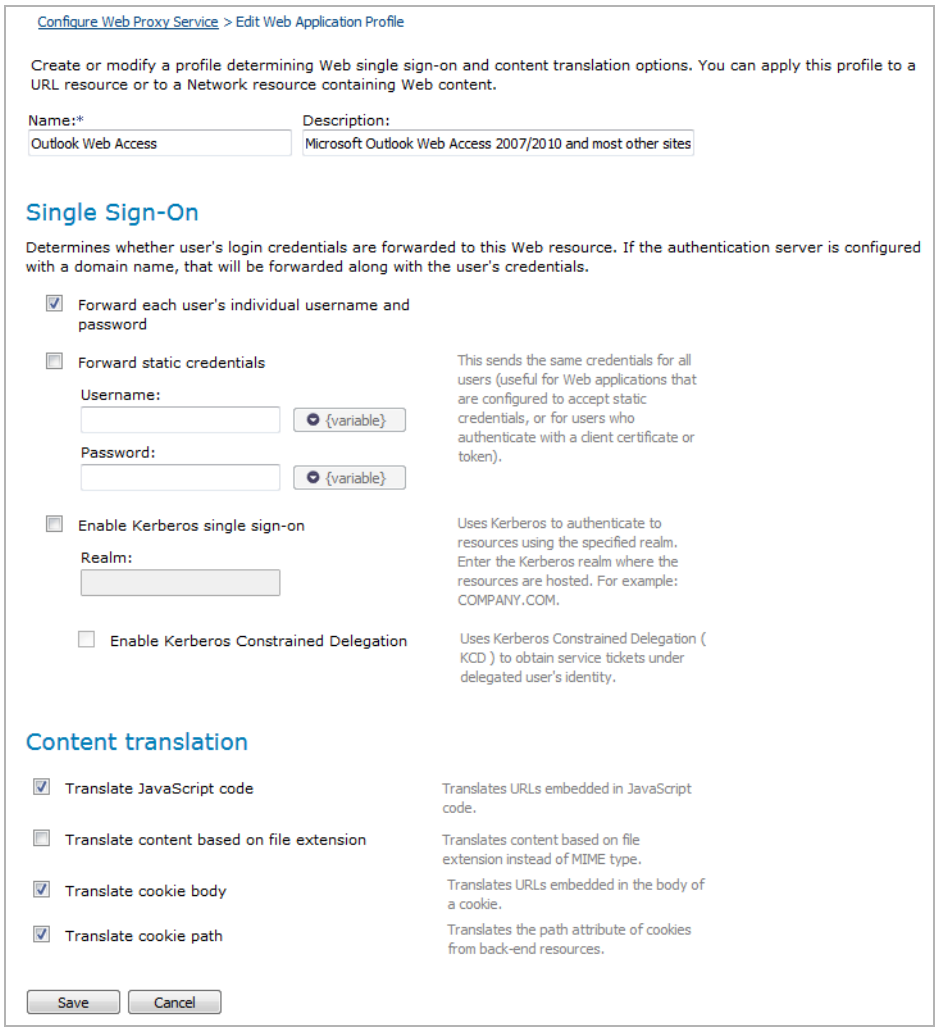
1 Go to the **Services > Access services** page.



2 Under **Web proxy service**, click **Configure**.

3 In the **Configure Web Proxy Service** dialog, select **Web Application Profiles**.

4 From the list of **Web Proxy Services**, select the **Web Proxy Service** you want. The **Edit Web Application Profile** dialog appears.



5 Select the checkboxes for the options you want:

- **Enable Kerberos Constrained Delegation** – The **Enable Kerberos Constrained Delegation** option should be checked only if the **Kerberos Single Sign-On** option is checked.
- **Enable fallback** fl The **Enable fallback** option should be checked only if the **Enable Kerberos Constrained Delegation** option is checked.

  The **Enable fallback** option prompts the user to enter their credentials again if KCD has failed for some reason. If **Enable fallback** is unchecked and KCD has failed, an error page is displayed.

  NOTE: On Firefox, **Enable fallback** works only if both Negotiate and NTLM are enabled on the backend resource, in their respective order. **Enable fallback** does not work on Safari in this case. Safari displays a prompt to re-enter credentials, but it keeps failing. **Enable fallback** works only when **NTLM** is the only authentication provider on the backend, which is not a supported configuration for KCD.

6 Click **Save**.

Configuring SMA Support for Microsoft Outlook Anywhere

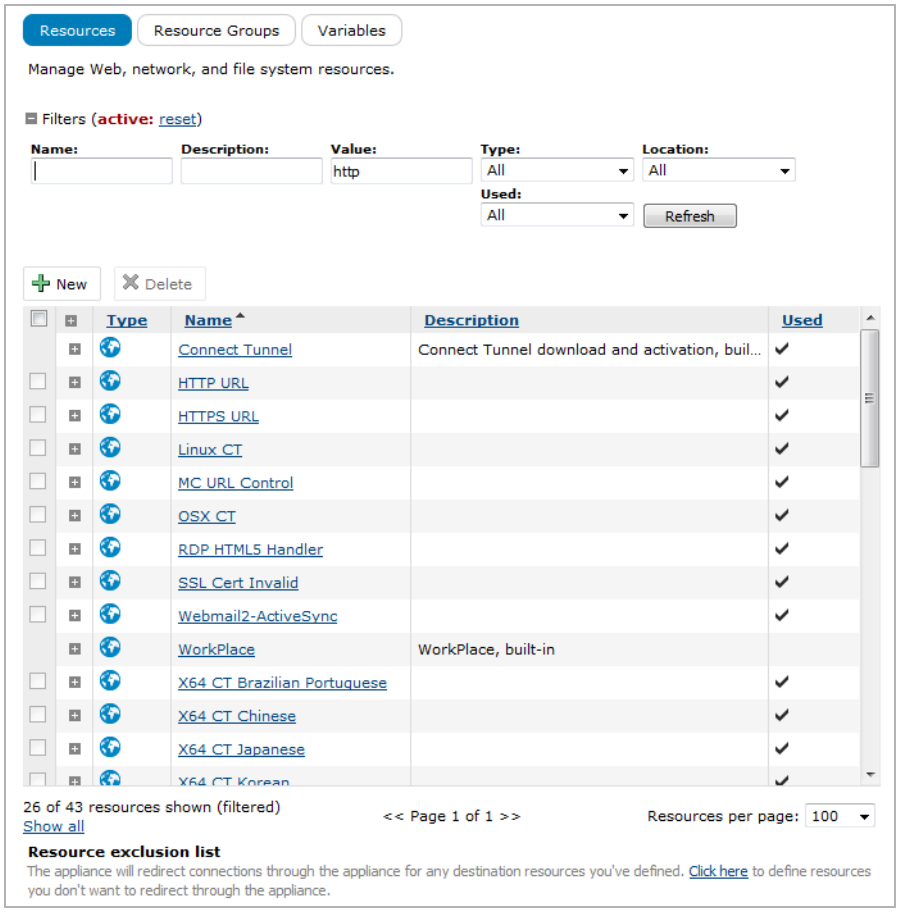
SMA supports Microsoft Outlook Anywhere for Windows Outlook Clients. Outlook Anywhere is basically an Outlook client that connects to the Microsoft Exchange server using one of these protocols:

- Remote Procedure Call (RPC) over HTTP
- MAPI over HTTP

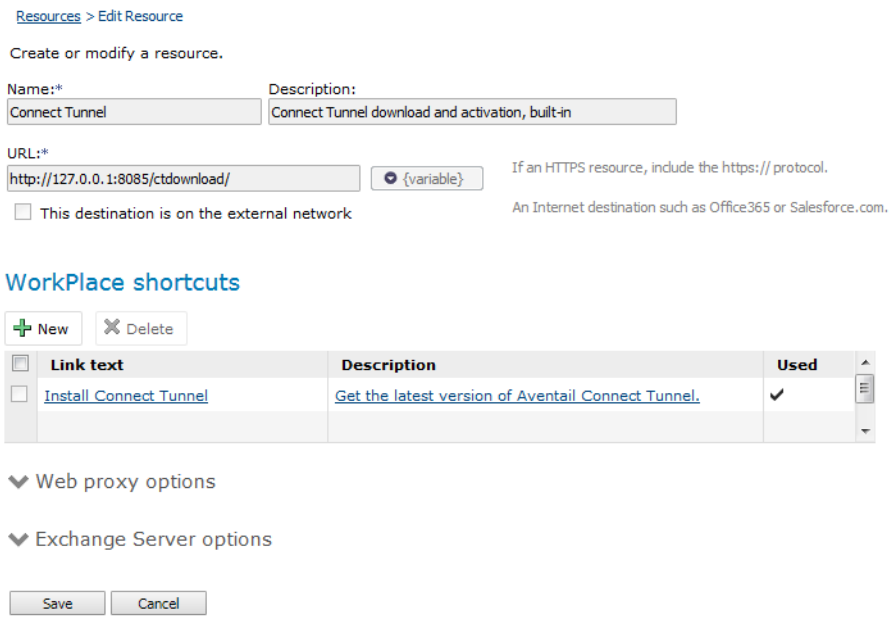
Microsoft Outlook Anywhere allows end users with Microsoft Office Outlook to connect to their Exchange servers over the Internet from outside the corporate network.

To configure SMA Support for Outlook Anywhere:

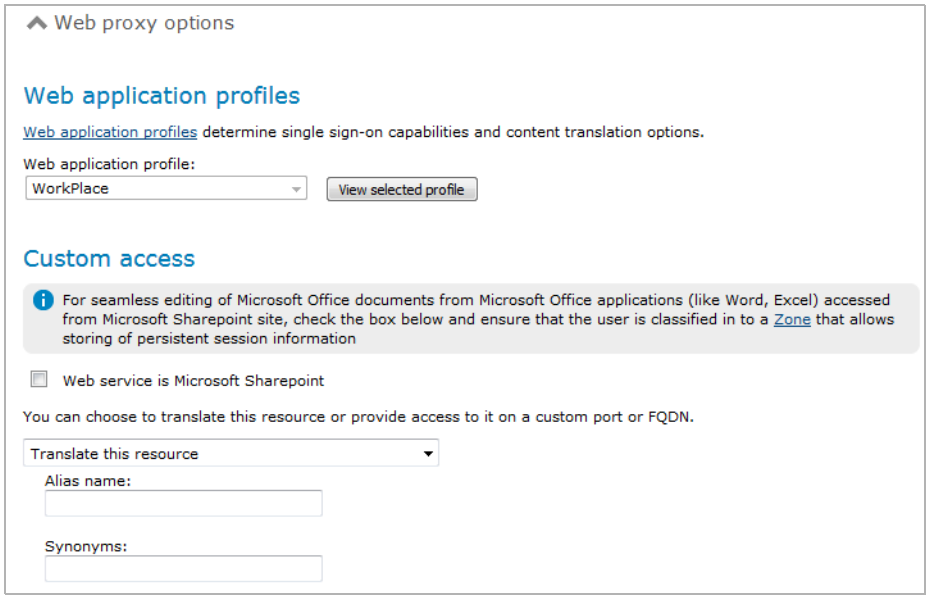
1 On your SMA device, go to the **Security Administration > Resources** page.



2 Click on the resource you want to edit. The **Edit Resource** dialog appears.



3 Click on the **Web proxy options** panel to open it.



4 In **Web application profile** drop-down menu, select **OWA/Single Sign-on**.

5 Click on the **Exchange Server options** panel to open it.

6 Select the checkbox for **Enable Exchange ActiveSync and Outlook Anywhere access to this resource**.

7 In the **Exchange server FQDN** field, enter the external FQDN URL of the user's Exchange server.

This should be the same value that is configured as the external FQDN URL for Outlook Anywhere services (RPC/HTTP and MAPI/HTTP protocols and EWS service) at the Exchange server.

8 In the **Realm** drop-down menu, select the **Realm** that you want.

9 In the **Exchange Autodiscover FQDN**, enter the FQDN of the Exchange Autodiscover service, for example: **autodiscover.example.com**.

The Autodiscover FQDN is used by the Outlook client to determine the Autodiscover service which enables Outlook to configure the Outlook options by just accepting the user's Email address. For example, the email address, `user@yourcompany.com`, would have an Autodiscover FQDN of `autodiscover.yourcompany.com`.

The name autodiscover.yourcompany.com must be configured in a public DNS server with the public IP address of the appliance.

10 Leave the **Fallback Exchange server URL** field blank for Outlook Anywhere.

NOTE: For Outlook Anywhere using RPC over HTTP, only basic authentication is supported. So, the backend exchange server should be configured to support basic authentication for Outlook Anywhere - ExternalClientAuthenticationMethod. For MAPI over HTTP, any authentication method can be configured.

NOTE: For requests coming from the Outlook client, zone classification is done without any attributes, and the user is classified into whichever zone it matches.

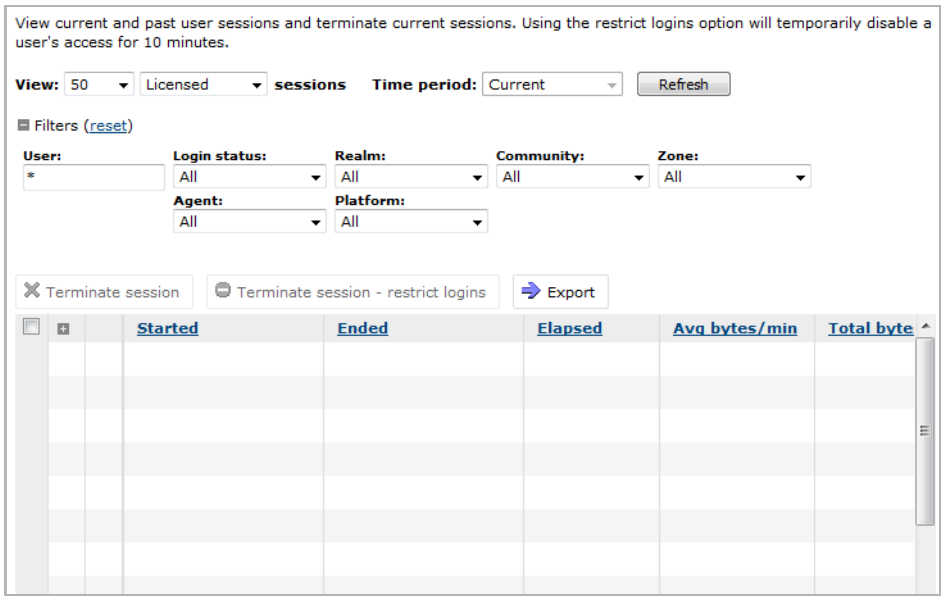
The Autodiscover FDQN is also displayed on the **System Configuration > Network Settings** page.

Viewing User Sessions

SMA users that are using Exchange ActiveSync and Outlook Anywhere can be displayed on the **Monitoring > User > Sessions** page by selecting **Exchange** as the filter from the **Agents** drop-down menu. The **Exchange** filter will filter Exchange ActiveSync and Outlook Anywhere users. The detailed view will show what the Access Agent is for that user.

To view Outlook Anywhere user sessions:

1 Go to the **Monitoring > User Sessions** page.



2 In the **Agents** drop-down menu, select **Exchange**.

If you hover over the **Exchange Server** option, it shows that Exchange ActiveSync and Outlook Anywhere users will be displayed for this option.

3 Click **Refresh** to see the new list of users.

4 To see a detailed view of any user listed, click on that user.

The **Access Agent** field in the detailed view shows which agent the user is using. Outlook Anywhere will be shown in the **Access-Agent** field.

Access Control Rules

Access control rules determine which resources are available to users or groups. Rules can be defined broadly to provide access using any method, or defined narrowly so that only a specific access method—Web browser, Connect and OnDemand, or Network Explorer—is permitted.

In addition to evaluating whether users can access resources based on who they are, access control rules can also factor in the trustworthiness of users' access points using End Point Control zones and device profiles, which are described in Managing EPC with Zones and Device Profiles.

Topics:

- Configuring Access Control Rules
- Resolving Deny Rule Incompatibilities
- Resolving Invalid Destination Resources

Configuring Access Control Rules

As your network changes over time, you will need to configure the access control rules that determine what application resources are available to your various users and groups.

Before adding an access control rule, carefully examine your existing rules; you might find that you can modify a rule instead of creating a new one. You can also copy an existing rule and then modify its parameters.

If you add a new rule, review your current configuration to determine where the new rule should fit in the rule order. New rules are added to the top of the list by default; you can then move them to their proper positions.

Topics:

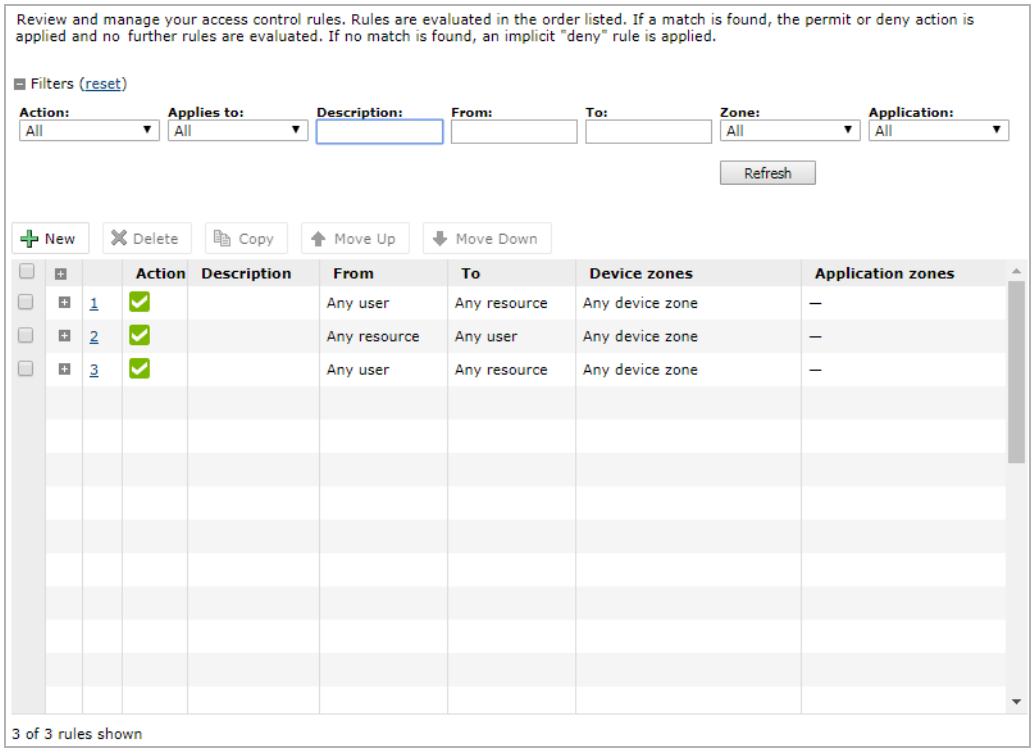
- Viewing Access Control Rules
- Access Control Rules for Bi-Directional Connections
- Requirements for Reverse and Cross-Connections
- Securing Application Ports for Reverse Connections
- Adding Access Control Rules for a Forward Connection
- Specifying Advanced Access Control Rule Attributes
- Adding Access Control Rules for a Reverse Connection
- Adding a Pair of Access Control Rules for a Cross-Connection
- Adding Access Control Rules for Application Access Control
- Configuring Advanced Access Control Rule Attributes
- Access Methods and Advanced Options
- Adding Users and Resources From Within Access Control Rules
- Editing, Copying, and Deleting Access Control Rules

Viewing Access Control Rules

Access control rules are displayed in numerical order on the **Access Control** page. The appliance evaluates the rules in numbered order. All access control rules are displayed by default, but you can use the **Filters** settings to filter them by resource type or other criteria.

To view access control rules:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**.



2 By default, all rules that you have created, regardless of resource type, are displayed. Use the **Filters** section to display a subset of rules. For information about using filters, see Filters. To see a particular rule set, select one of the following from the **Method** drop-down menus in **Filters**; see the Rule set descriptions table.

Rule set descriptions

Method	Description
Web browser	Display rules controlling access to Web-based (HTTP and HTTPS) resources.
Connect Tunnel/OnDemand Mapped Mode	Display rules controlling access to client/server (TCP/IP) resources.
Network Explorer	Display rules controlling access to Windows file system resources using WorkPlace.

3 Review the data shown in the access control rule list:

- Use the checkbox column to select one or more rules to delete, copy, or reorder (using the **Move Up** and **Move Down** buttons).
- The number column indicates the order in which the rule will be evaluated. To edit a rule, click its corresponding number.

- To display configuration details and the objects referenced in a rule, click the plus sign (**+**) next to it.
- The **Action** column indicates whether a rule permits or denies access, or is ignored; see the Rule action indicators table.

Rule action indicators

Indicator	Description
Green	Access is permitted.
Red	Access is denied.
Gray	The rule is not evaluated. (Disabling a rule is a convenient way to temporarily stop using a rule without deleting it.)

- The **Description** column lists the descriptive text you typed when creating the rule.
- The **From** column indicates the users to whom the rule applies (**Any**: all users). In the case of a reverse connection, this column indicates the resource that is connecting to a user or group. See Access Control Rules for Bi-Directional Connections.
- The **To** column lists the destination resources to which the rule applies (**Any**: all users). In the case of a reverse connection, this column can also indicate the user or group that is connecting back to a resource. See Access Control Rules for Bi-Directional Connections.
- The **Method** column indicates whether a specific access method is associated with a rule. A globe icon signifies Web browser-based HTTP access; a globe icon with a folder represents Network Explorer, which provides Web access to file system resources; the Secure Mobile Access logo indicates access using the Connect Tunnel or proxy clients, or the OnDemand Tunnel or proxy agents. **Any** indicates that the rule applies to all access methods.
- The **Zone** column indicates whether an access rule is associated with a particular End Point Control zone. EPC zones are used to classify a connection request based on the attributes of the client device. *Any* indicates the rule applies to all EPC zones; a red **Restricted** icon indicates that the rule controls access for one or more specific zones.

Access Control Rules for Bi-Directional Connections

VPN connections typically involve forward connections, which are initiated by a user to a client/server resource. However, if you deploy SonicWall's network tunnel clients (Connect Tunnel or OnDemand Tunnel) to your users, bi-directional connections are enabled.

With the SonicWall VPN, bi-directional connections encompass:

- Forward connections from a VPN user to a client/server resource. See Adding Access Control Rules for a Forward Connection.
- Reverse connections from a client/server resource to a VPN user. An example of a reverse connection is an SMS server that "pushes" a software update to a user's machine. See Adding Access Control Rules for a Reverse Connection.
- Cross-connections refer specifically to VoIP (Voice over Internet Protocol) applications that enable one VPN user to telephone another VPN user. Cross-connections require a pair of access control rules: one for the forward connection and one for the reverse connection. See Adding a Pair of Access Control Rules for a Cross-Connection.

Other examples of bi-directional connections include an FTP server that downloads files to or uploads files from a VPN user, and remote Help Desk applications.

Requirements for Reverse and Cross-Connections

Before you can configure access control rules for reverse connections and cross-connections, these requirements must be met:

- The network tunnel service must be running on the appliance. On the **Services** page in AMC, check the status for **Network tunnel service**; it should be **Running**.
- An IP address pool for the network tunnel clients must be configured. See Configuring IP Address Pools for information on how to set one up.
- Users who have access to a VoIP application must belong to a community that is configured to deploy the network tunnel clients (Connect Tunnel or OnDemand Tunnel) to their computers. See Creating and Configuring Communities.

Securing Application Ports for Reverse Connections

By default, reverse connections from resources to users have access to all ports on users' computers. For enhanced security, create access control rules for reverse connections that confine access to the ports that an application specifically uses. Consult the application's documentation for information about which firewall ports must be open in order to use the application.

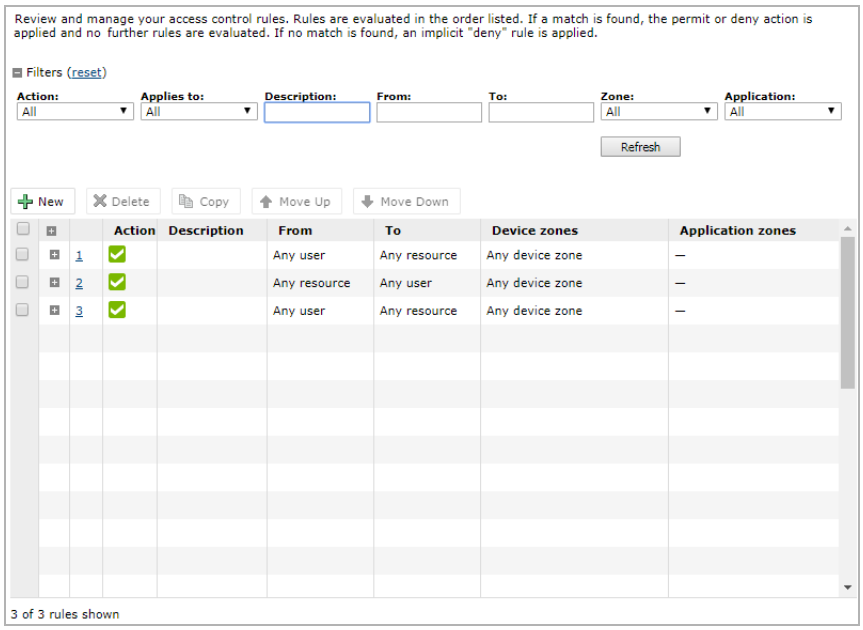
When configuring an access rule for a reverse connection, use the **Destination restrictions** option to confine access to the ports required by the application making the reverse connection. See Configuring Advanced Access Control Rule Attributes for information on this option.

Adding Access Control Rules for a Forward Connection

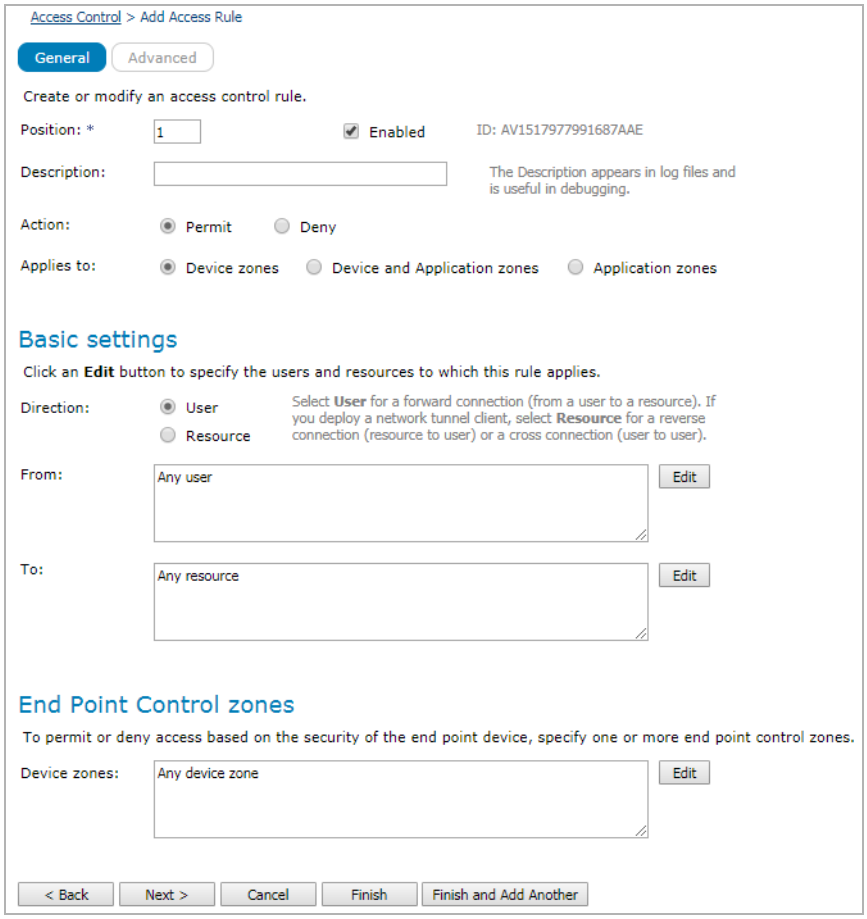
Perform the following steps to add an access control rule for a forward connection from users to destination resources. For information about creating an access control rule for a cross-connection (for example, for a VoIP application), see Adding a Pair of Access Control Rules for a Cross-Connection.

To add an access control rule for a forward connection:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**.



2 Click **New**. The **Add Access Rule** page appears.



3 Type a number in the **Number** field to specify the rule's position in the access rule list. By default, new rules are added to the top of the list, but you can use this box to place the rule anywhere you want. For example, if you assign the number 3 to a new rule, the new rule will be inserted before the current rule **3** (which will become rule **4**). This field is required.

To the right of the **Number** field is a unique identifier for the rule, which you can use for troubleshooting. When you add or change a rule, for example, the Management Console audit log shows a record of the change using this ID. Logging is described in detail in System Logging and Monitoring.

4 In the **Description** field, type a descriptive comment about the rule. This step is optional, but a description can be helpful when viewing your list of rules later; it also appears in log files where can be useful for debugging. The **ID** is a unique identifier automatically assigned by AMC; it cannot be edited.

5 Use the **Action** buttons to specify whether the rule will be used to **Permit** or **Deny** access, or if the rule is **Disabled**.

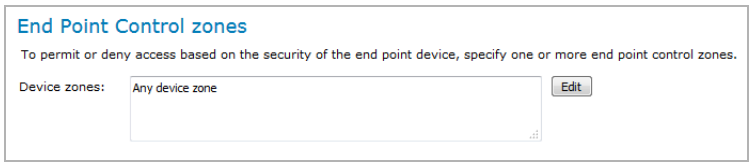
6 Complete the information listed under **Basic settings**:

- Click **User** to configure a forward connection (from a user to a resource).
- If you deploy a network tunnel client, click **Resource** to create a rule controlling a reverse connection (resource to user) or a cross-connection (user to user). The network tunnel service must be configured with an IP address pool before you can use reverse connections (see Configuring IP Address Pools).
    - The **From** field specifies the users or user groups to whom the rule applies. Click **Edit** to select from a list of users and groups. If no users or groups are specified, the value for this field is **Any** *user*.

- The **To** field specifies the destination resources or resource groups for the rule. Click **Edit** to select from a list of resources. If no destination resources are selected, the value for this field is **Any** *resource*. A warning appears if the destination resource contains a wildcard indicating a Mobile Connect incompatibility.

NOTE: Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

7 In the **End Point Control zones** area, select the zones from which you will permit or deny access to the resources. Click **Edit** to select from a list. The default for this field is **Any** zone. See Managing EPC with Zones and Device Profiles for information about configuring and using zones.



8 Click **Next** to configure additional settings (see Specifying Advanced Access Control Rule Attributes), or click **Finish** to save the current settings.

Specifying Advanced Access Control Rule Attributes

For most rules, a basic configuration that includes users or groups, destination resources, and access methods is sufficient. However, additional options are available to provide even tighter access. For example, you can control a connection based on the location of the user (by IP address). Source networks are referenced in an access rule to permit or deny a connection to a destination resource based on the location from which the request originates, provides even greater security.

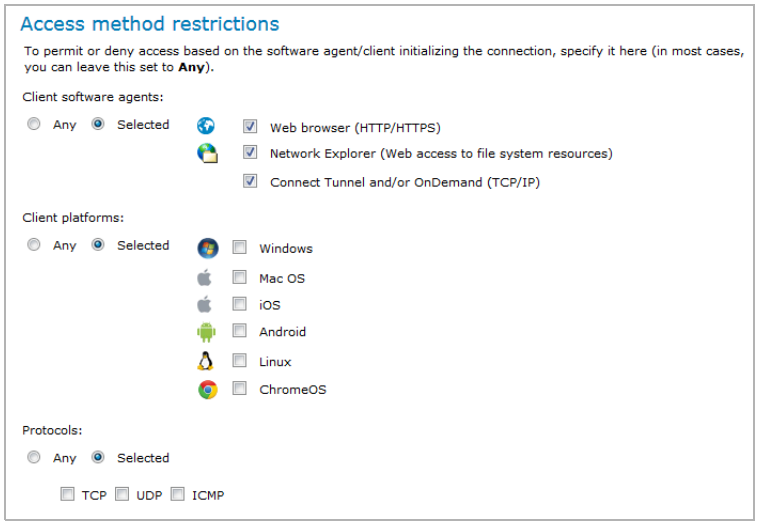
To configure advanced settings for an access control rule:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**.

2 Click **New**. The **Add Access Rule** page appears.

3 Click **Next** to display the **Advanced** tab.

4 In the **Access method restrictions** area, select one or more methods for access to the resource. **Any** is the recommended setting in most circumstances, unless your security environment requires you to use a particular method for access to a resource.



a When you select access methods, the advanced options are enabled or disabled based on whether they apply to the methods you specified. Click **Selected** to choose the access methods this rule will require; see the Client software agents table.

Client software agents

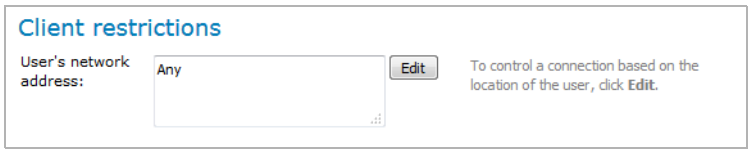
Access method	Description
Web browser (HTTP/HTTPS) 	Manages access from HTTP or HTTPS resources for users connecting using a Web browser. The available **Advanced** settings are: • User's network address • Time and date restrictions
Network Explorer 	Manages access from Windows file system resources for WorkPlace users connecting using Network Explorer. The available **Advanced** settings are: • User's network address • Read/write permissions • Time and date restrictions
Connect Tunnel and/or OnDemand (TCP/IP)	Manages access from TCP/IP resources such as client/server applications, file servers, or databases, for users connecting with one of the following: • The Connect Tunnel or proxy clients • The OnDemand Tunnel or proxy agents For example, suppose you want to provide access to a network domain for users who have Connect or OnDemand, but you don't want to allow browser access to Web resources within that domain. You can do that by creating a rule that specifies **Connect Tunnel and/or OnDemand Mapped Mode** as the only access method, and specifies the network domain in the **Client restrictions** area. The available **Advanced** settings are: • Protocols • User's network address • Destination restrictions (ports) • Time and date restrictions

b Click **Selected** to specify the **Protocols** (see the Protocol selecting table) that the network tunnel or proxy service will accept from the client. A brief description of each command is included here, but for more details, see http://www.ietf.org/rfc/rfc1928.txt.

Protocol selecting

Protocol	Description
TCP	Enables normal TCP connections (for example, SSH, telnet, SCP, and so forth).
UDP	Allows the network tunnel or proxy service to make a UDP data transfer. This is necessary for operations such as streaming audio and Microsoft Outlook new-mail notification.
ICMP	(Internet Control Message protocol) Enables the ping and traceroute network troubleshooting commands. Selecting this option will configure the network tunnel or proxy service to allow these operations on your behalf. This option also enables ICMP packets to flow through the network tunnel or proxy service.

5 Under **Client restrictions**, in the **User's network address** field, specify the names of any source networks you want evaluated in the rule.



This is useful for controlling access based on the origin of the connection request. Click **Edit** to select from the list of resources. If no source network is specified, the default value of this field is **Any**. For reverse connections, this option can be used to block access requests to users' computers that originate from specific ports or application resources.

6 Use **Destination restrictions** to restrict access over individual **Ports** or a range of ports. To enable access on any port, click **Any**. To specify multiple ports, click **Selected** and type the port numbers, separated by semicolons. To specify a port range, type the beginning and ending numbers separated by a hyphen. For example, if you are building a policy to control access to an SMTP mail server, you might allow access only over port 25 (the well-known port for SMTP traffic). A list of the latest port number assignments is available at http://www.iana.org/assignments/port-numbers.

Use **Permissions** to specify whether the rule will allow **Read** or **Read/Write** access to the file system resources. These access privileges work in conjunction with Windows access control rules. For a user to have certain file permissions, both entities (that is, Windows and the appliance) must allow them. If you disable file uploads, no user can write to a file, although users with write access will be able to move and delete files. These settings are ignored by reverse connections.

7 Under **Time and date restrictions**, specify when the rule will be in effect. (The time zone for the time restriction fields is your local time.) You can specify a **Shift** or a **Range**, or you can specify that the rule remain in effect at all times.

8 Click **Save** or, if you want to define another rule, click **Finish and Add Another**.

Because AMC gives you the flexibility to assign multiple access methods to resources, situations may arise in which there is a mismatch between access methods and resources. This happens if you create a rule that assigns an access method that is incompatible with the specified resource. For example, designating **Web browser** as the method for accessing a Windows domain resource will trigger an "Invalid destination resources" error message in AMC. For more information, see Resolving Invalid Destination Resources.

In some cases you can create a Deny rule that contains a mix of resources and access methods that may prevent subsequent rules from being evaluated. This could inadvertently block user access to other resources referenced in the access policy. The logic used to determine access method and resource compatibility is described in Resolving Deny Rule Incompatibilities.

Reverse connections are available only when IP address pools are configured for the network tunnel clients. AMC displays an error message if you attempt to change the rule from a forward connection to a reverse connection and no IP address pools are configured.

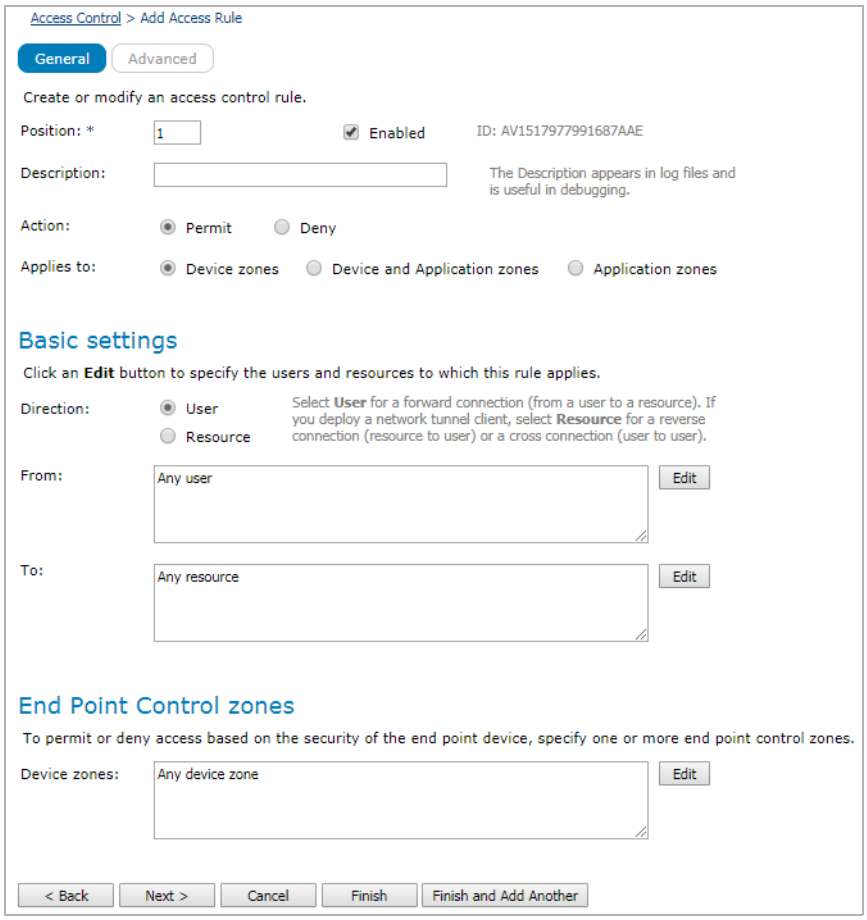
Adding Access Control Rules for a Reverse Connection

Perform the following steps to add an access control rule for a reverse connection from a destination resource to users. Examples of reverse connections include IBM's Tivoli provisioning products, and Microsoft's Systems Management Server (SMS). For more information, see Requirements for Reverse and Cross-Connections.

To add an access control rule for a reverse connection:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control.**

2 Click **New**. The **Add Access Rule** page appears.

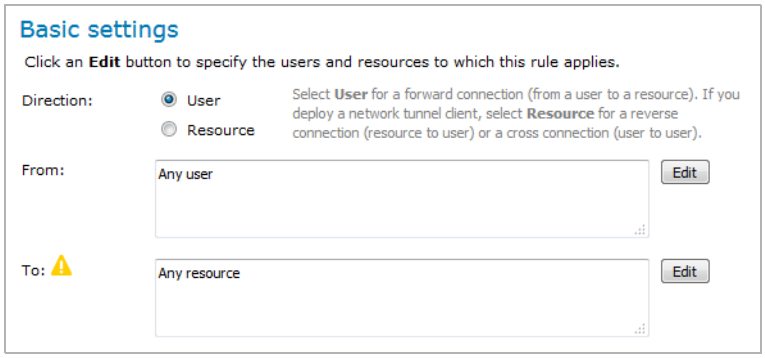


3 In the **Number** field, type a number to specify the rule's position in the access rule list. By default, new rules are added to the top of the list, but you can use this box to place the rule anywhere you want. For example, if you have four rules and you assign the number 3 to a new one, it is inserted before the current rule 3 (which will become rule 4). This field is required.

4 In the **Description** field, type a descriptive comment about the rule. This step is optional, but a description can be helpful when viewing your list of rules later, and also appears in log files where it is useful in debugging. The **ID** is a unique identifier automatically assigned by AMC; it cannot be edited.

5 Use the **Action** buttons to specify whether the rule will be used to **Permit** or **Deny** access, or if the rule is **Disabled**.

6 Complete the information listed under **Basic settings**:



- Select the **Resource** button to create a rule controlling a reverse connection from a resource to a user. The **User** and **Resource** buttons toggle between forward-connection and reverse-connection rules.

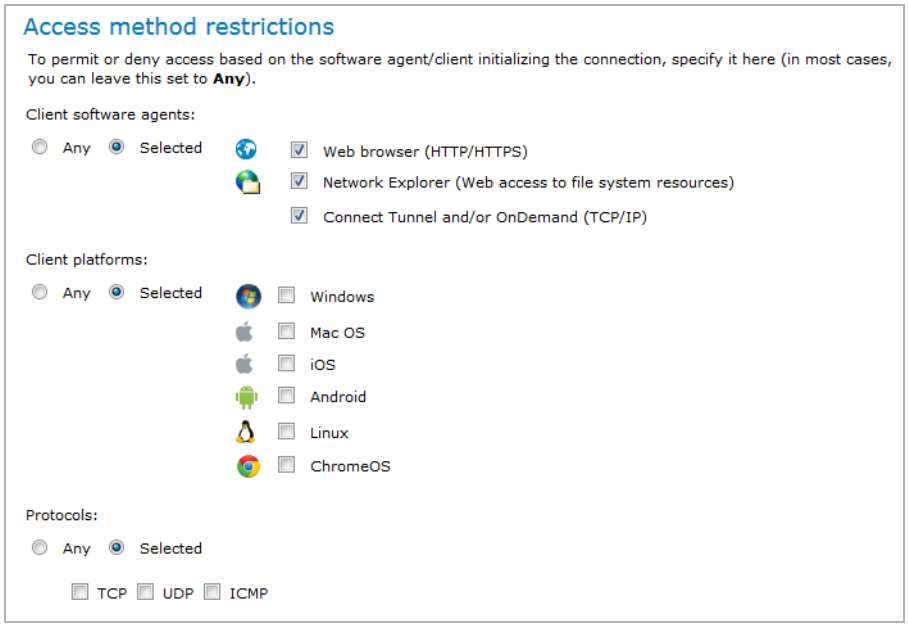
  Reverse connections are available only when IP address pools are configured for the network tunnel clients. If you attempt to create a reverse connection with no IP address pools configured, AMC displays an error message. For more information, see Access Control Rules for Bi-Directional Connections.

- The **From** field specifies the resources that will connect to users. Click **Edit** to select from a list of resources. If no resources are specified, the default value for this field is **Any resource**.

- The **To** field specifies the users to which the resource will connect. Click **Edit** to select from a list. If no users are selected, the default value for this field is **Any user**.

7 Click **Next** to display the **Advanced** page.

8 In the **Access methods** area, select **Any** to automatically manage access to all resources in the rule regardless of the access method making the request. This ensures that either the Connect Tunnel client or the OnDemand Tunnel agent, which is required for reverse connections, is managed by the rule. The other access methods do not support reverse connections and will be bypassed.



9 When you are finished creating the rule, click **Save**.

Adding a Pair of Access Control Rules for a Cross-Connection

Most of the steps involved in creating an access control rule for a cross-connection are the same as those for creating a rule for a forward connection or a reverse connection. However, there are some key differences and requirements.

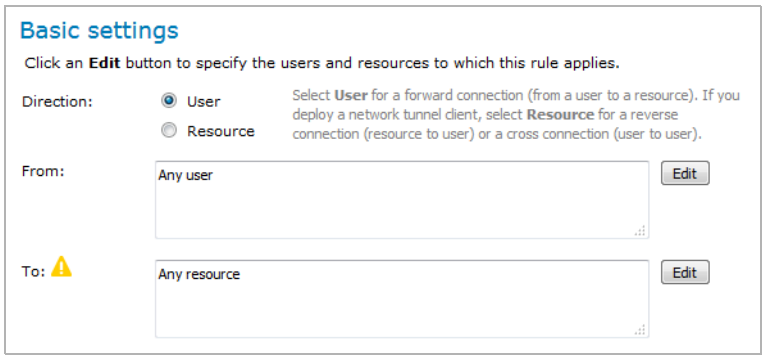
For example, to permit your VPN users to call each other using a VoIP application, create one rule for your users to connect to an IP address pool on the appliance, and a second rule for the IP address pool to connect to the users.

You would also need to follow this procedure to create a pair of rules to permit bi-directional connections between an FTP server and users.

To add an access control rule for a cross-connection:

1. Ensure that the requirements for configuring a reverse connection are met. For more information, see Requirements for Reverse and Cross-Connections.
2. From the main navigation menu in AMC under **Security Administration**, click **Access Control**.
3. Click **New**. The **Add Access Rule** page appears.
4. Type a number in the **Position** field to specify the rule's position in the access rule list. By default, new rules are added to the top of the list, but you can use this box to place the rule anywhere you want. For example, if you have four rules and you assign the number 3 to a new one, it is inserted before the current rule **3** (which will become rule **4**). This field is required.
5. In the **Description** field, type a descriptive comment about the rule. This step is optional, but a description can be helpful when viewing your list of rules later. The description also appears in log files where it is useful when examining logs to determine why a connection did not match a specific rule. The **ID** is a unique identifier automatically assigned by AMC; it cannot be edited.

   Since a cross-connection requires a pair of forward-connection and reverse-connection rules, you should assign similar names to the two rules to make it easy to locate them in the list of access control rules.
6. Use the **Action** buttons to specify whether the rule will be used to **Permit** or **Deny** access, or if the rule is **Disabled**.
7. Under **Basic settings**, use the **User** and **Resource** buttons to select forward-connection or reverse-connection rules.



   - To create a forward-connection rule from the users to the IP address pool, click **User**.
   - To create a reverse-connection rule from the IP address pool to the users, click **Resource**.
8. In the **From** field under **Basic settings**, specify the users or resources to which this rule applies:
   - For a forward-connection rule, specify the users or user groups to whom the rule applies. Click **Edit** to select from a list of users or groups. The default value is *Any user.*

- For a reverse-connection rule, specify the address pool that will be used for the VoIP application. Click **Edit** to select the address pool from a list of resources. The default value is **Any resource**.

9 In the **To** box under **Basic settings**, specify the users or resources to which this rule applies:

- For a forward-connection rule, specify the address pool that will be used for the VoIP application. Click **Edit** to select the address pool from a list of resources. The default value is **Any resource**.
- For a reverse-connection rule, specify the users to whom the rule applies. Click **Edit** to select from a list of users or groups. The default value is **Any user**.

10 In the **Access method restrictions** area, select **Any**. This enables the appliance's Smart Access feature to determine the appropriate access method for the users' end point devices, which for a reverse connection is either the Connect Tunnel client or the OnDemand Tunnel agent. The other access methods do not support cross-connections or bi-directional connections and will be bypassed.

11 In the **Access method restrictions** area, select **Any** to automatically manage access to all resources in the rule regardless of the access method making the request. This ensures that either the Connect Tunnel client or the OnDemand Tunnel agent, which are required for reverse connections, are managed by the rule. The other access methods do not support reverse connections and will be bypassed.

12 Click **Finish** after you have created the first rule in the pair of cross-connection rule, and then create and save the second rule. (Alternatively, you can save the first rule in the pair, make a copy of it, and then reverse the user and resource settings.)

After you have configured the forward-connection rule and the reverse-connection rule that make up the cross-connection rule pair, you should position the two rules next to each other in the access control list. That will make it easier to identify them as related rules.

AMC displays an error message if you attempt to create a cross-connection rule with no IP address pools configured. For more information, see Access Control Rules for Bi-Directional Connections.

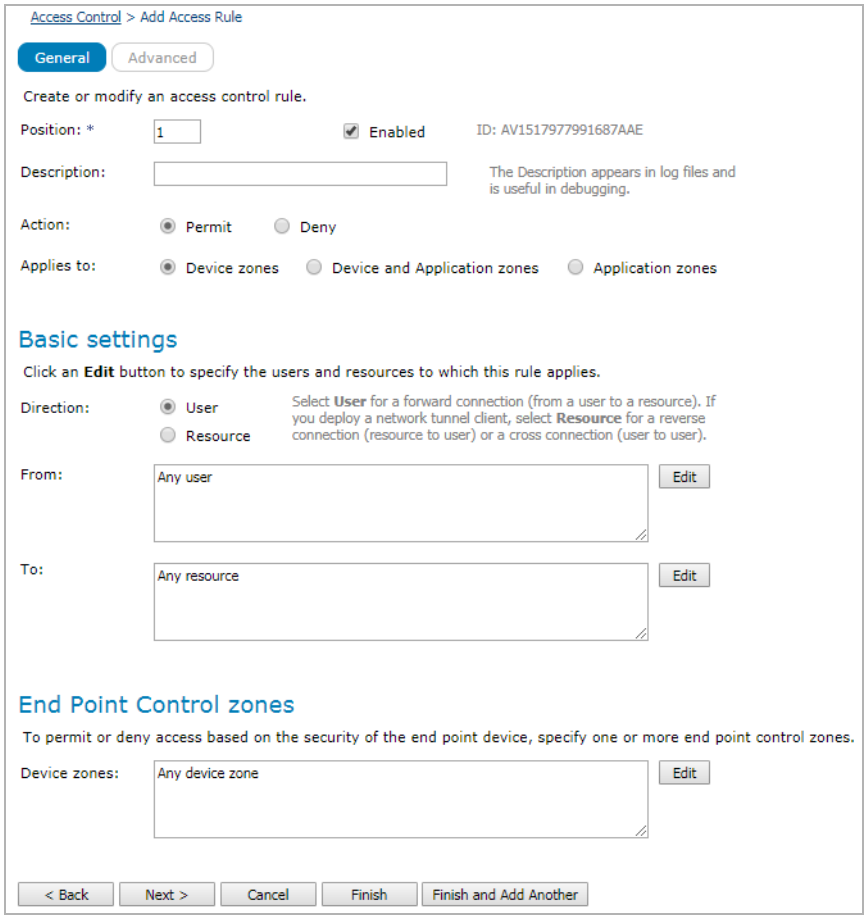
Adding Access Control Rules for Application Access Control

Perform the following steps to add an access control rule to control which users or groups are allowed to access which resources using a specific application from a personal device (within the context of a specific Application Zone). For more information, see Application Access Control.

To add an access control rule for Application Access Control:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control.**

2 Click **New**. The **Add Access Rule** page appears.



3 In the **Position** field, type a number to specify the rule's position in the access rule list. By default, new rules are added to the top of the list, but you can use this box to place the rule anywhere you want. For example, if you have four rules and you assign the number 3 to a new one, it is inserted before the current rule 3 (which will become rule 4). This field is required.

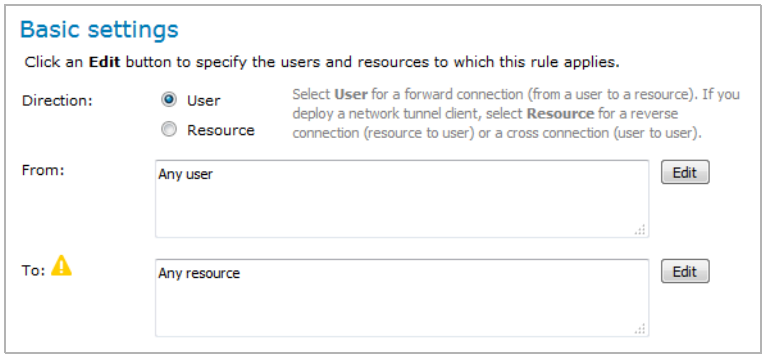
4 In the **Description** field, type a descriptive comment about the rule. This step is optional, but a description can be helpful when viewing your list of rules later, and also appears in log files where it is useful in debugging. The **ID** is a unique identifier automatically assigned by AMC; it cannot be edited.

5 Use the **Action** field to specify whether the rule will be used to **Permit** or **Deny** access. The default is **Permit**.

6 In the **Applies to** field, select **Device zones**, **Device and Application zones**, or **Application zones** as the type of zone associated with the rule. The default is Device Zones.

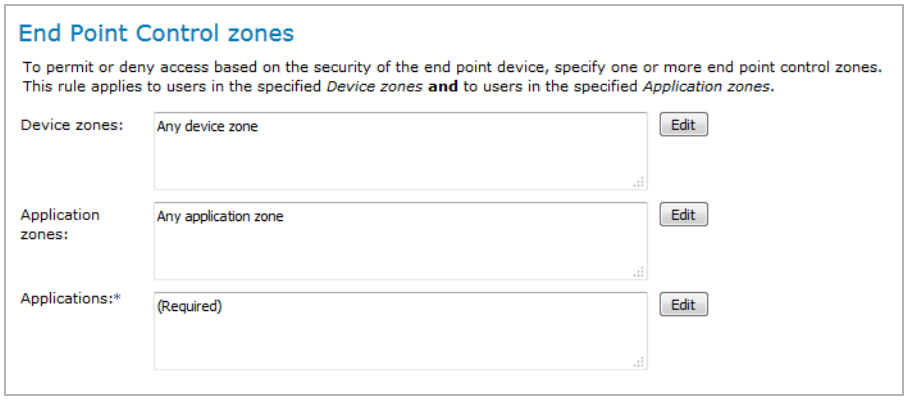
NOTE: Access Control rules can apply to Device zones, Application zones, or Device and Application zones (any of the Applies to options). Individual user connections apply to a single Device zone or Application zone at any given time. Thus, user connections apply for a single zone at any one time, but the Access Control List can be written to apply to Device zones, Application zones, or Device and Application zones.

7 Complete the information listed under **Basic settings**:



- Select the **Direction** to create a rule controlling a connection from a resource or a user. The **User** and **Resource** buttons toggle. The default is **User**.
- The **From** field specifies the users or groups allowed or denied access to the related Resource list using an application on the selected Application list. Click **Edit** to select from a list. If no resources are specified, the default value for this field is **Any user**.
- The **To** field specifies the required resources to which the user or group can access using an application on the selected Application list. Click **Edit** to select from a list. If no users are selected, the default value for this field is **Any resource**.

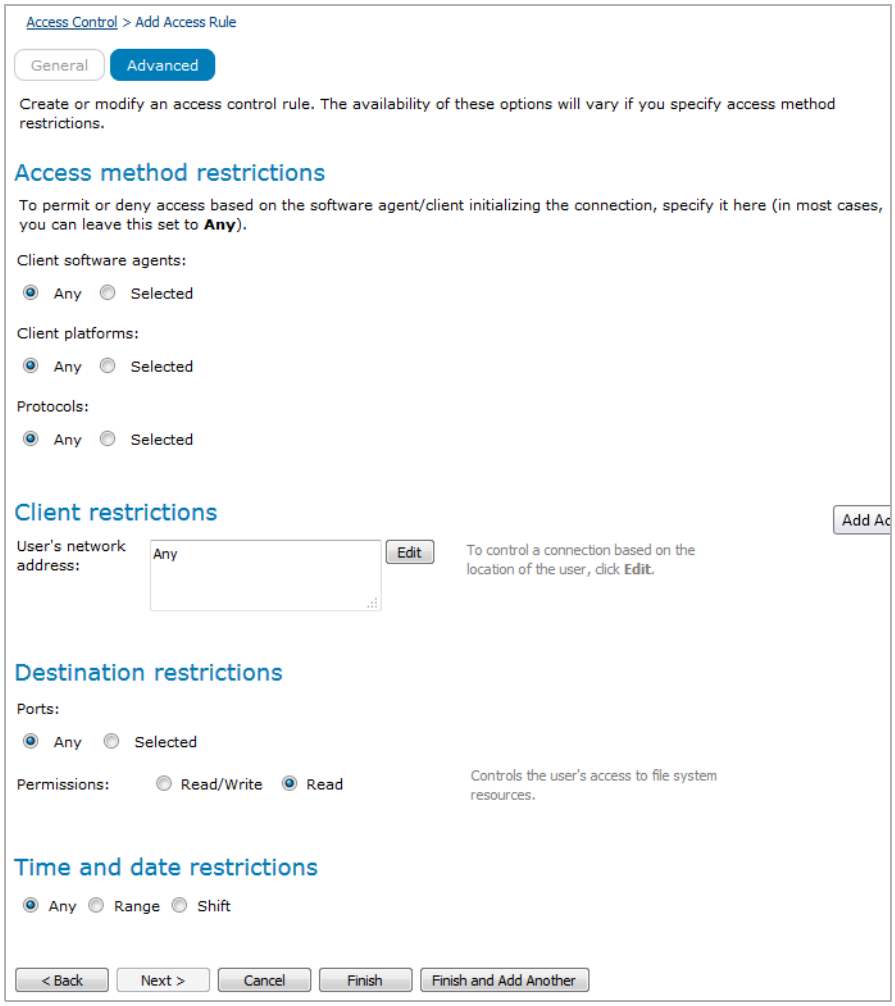
8 Complete the information listed under **End Point Control zones**.



- For **Applications zones** either use the default of **Any application zone** or click the Application zone **Edit** button and select the application zones that will use this rule.
- For **Applications** click the Applications **Edit** button and select at least one application that users are permitted to use when contacting the corporate network with this rule. You must choose at least one application from the displayed list before the rule can be saved.

NOTE: Applications must be learned before they are listed, as explained in Application Access Control

9 Click the **Next>** button at the bottom to display the **Advanced** tab.



10 In the **Access method restrictions** section, select **Any** or **Selected** for Client software agents, Client platforms, and Protocols to permit or deny access based on the software agent or client initializing the connection. If you choose **Selected**, check all desired types from the options that are displayed; see the Option types table.

Option types

Client software agents	Client platforms	Protocols
Web browser (HTTP/HTTPS)	Windows	TCP
Network Explorer (Web access to file system resources)	Mac OS	UDP
Connect Tunnel and/or SonicWall OnDemand VPN Connection (TCP/IP)	iOS	ICMP
	Android	
	Linux	
	ChromeOS	

11 In the Client restrictions section either use the default of Any User's network address or click the **Edit** button and select the resources that will use this rule.

12 In the Destination restrictions section either use the default of **Any** port to enable access on any port or select **Selected** to restrict access over individual **Ports** or a range of ports and type the ports to allow. For example, if you are building a policy to control access to an SMTP mail server, you might allow access

only over port 25 (the well-known port for SMTP traffic). A list of the latest port number assignments is available at http://www.iana.org/assignments/port-numbers.

To specify multiple ports, separate the port numbers with a semicolon. To specify a port range, type the beginning and ending numbers separated by a hyphen.

13 In the **Permissions** field specify whether the rule will allow **Read** or **Read/Write** access to the file system resources. These access privileges work in conjunction with Windows access control rules. For a user to have certain file permissions, both Windows and the appliance must allow them. If you disable file uploads, user cannot write to a file, although users with write access will be able to move and delete files.

14 In the **Time and date restrictions** section, specify when the rule will be in effect. (The time zone for the time restriction fields is your local time.) You can specify a **Shift**, **Range**, or use the default of **Any** to use the rule at all times.

15 Click **Finish** to save your entries.

Configuring Advanced Access Control Rule Attributes

For most rules, a basic configuration that includes users or groups, destination resources, and access methods is sufficient. Settings that provide even tighter access are available on the **Advanced** page for **Add/Edit Access Rule**.

For example, if you want to restrict connections to those coming from an individual IP address, select the **User's network address** option. Source networks are referenced in an access rule to permit or deny a connection to a destination resource based on the location from which the request originates, which provides you with even greater security.

To configure advanced settings for an access control rule:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**.

2 Click the link for an existing rule.

3 On the **Edit Access Rule** page, click the **Advanced** tab.

4 Under **Access method restrictions**, permit or deny access based on the software agent or client initializing the connection. In most cases, you can leave this set to **Any**.

5 To restrict the **Protocols** that the network tunnel or proxy service will accept from the client, click **Selected**. A brief description of each command is included in the Advanced Access Control Rule Attributes table, but for more details, see http://www.ietf.org/rfc/rfc1928.txt.

Advanced Access Control Rule Attributes

Protocol	Description
TCP	Enables normal TCP connections (for example, SSH, telnet, SCP, and so forth).
UDP	Allows the network tunnel or proxy service to make a UDP data transfer. This is necessary for operations such as streaming audio and Microsoft Outlook new-mail notification.
ICMP	(Internet Control Message protocol) Enables the ping and traceroute network troubleshooting commands. Selecting this option will configure the network tunnel or proxy service to allow these operations on your behalf. This option also enables ICMP packets to flow through the network tunnel or proxy service.
Accept bind requests from server	Used in protocols that require the client to accept connections from the server. FTP is a notable example: bind usually occurs with a Connect/Bind pair of connections.

6 Specify the names of any source networks you want evaluated in the rule with the **User's network address option**. This is useful for controlling access based on the origin of the connection request. Click **Edit** to select from the list of resources. If no source network is specified, the default value of this field is *Any.* For reverse connections, this option can be used to block access requests to users' computers that originate from specific ports or the application resources.

7 Use **Destination restrictions** to restrict access over individual **Ports** or a range of ports. For example, if you are building a policy to control access to an SMTP mail server, you might allow access only over port 25 (the well-known port for SMTP traffic). A list of the latest port number assignments is available at http://www.iana.org/assignments/port-numbers.

   To enable access on any port, click **Any**. To specify multiple ports, click **Selected** and type the port numbers, separating each with a semicolon. To specify a port range, type the beginning and ending numbers separated by a hyphen.

8 Use **Permissions** to specify whether the rule will allow **Read** or **Read/Write** access to the file system resources. These access privileges work in conjunction with Windows access control rules. For a user to have certain file permissions, both entities (that is, Windows and the appliance) must allow them. If you disable file uploads, no user can write to a file, although users with write access will be able to move and delete files. These settings are ignored by reverse connections.

9 Under **Time and date restrictions**, specify when the rule will be in effect. (The time zone for the time restriction fields is your local time.) You can specify a **Shift** or a **Range**, or you can specify that the rule remain in effect at all times.

10 When you are finished creating the rule, click **Save**.

Access Methods and Advanced Options

When you restrict your access methods, the advanced options are enabled or disabled based on which ones remain selected (if you select **Any** as the access method, all the advanced options are available). When AMC validates the rule it prevents you from selecting rule attributes that are not relevant to the access methods. the Access method advanced options table shows the advanced options that apply to each access method.

Access method advanced options

Access method	Applicable advanced options
Web browser (HTTP/HTTPS)	• User's network address • Time and date restrictions
Network Explorer (Web access to file system resources)	• User's network address • Read/write permissions • Time and date restrictions
Connect Tunnel and/or OnDemand (TCP/IP)	• Protocols • User's network address • Destination restrictions (ports) • Time and date restrictions

Adding Users and Resources From Within Access Control Rules

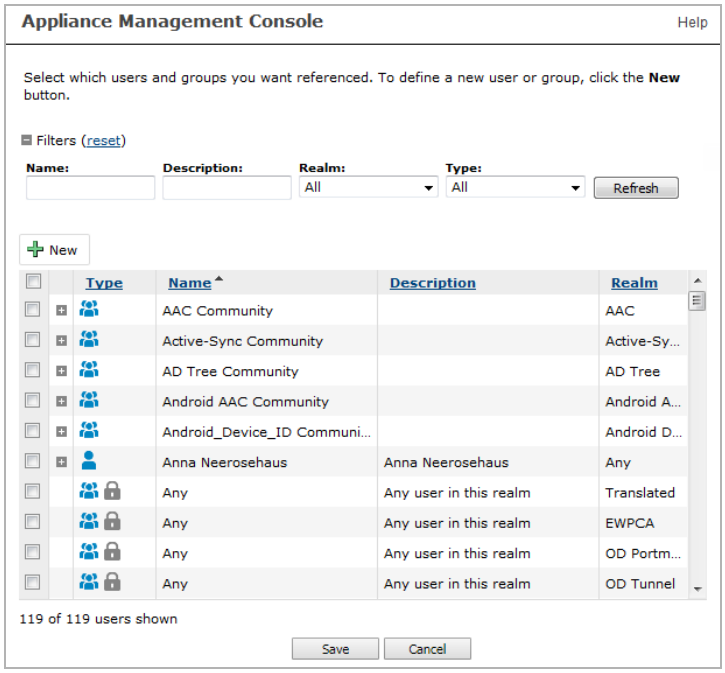
Some administrators prefer to define all policy objects (users, groups, and resources) before creating access control rules. Although this structured approach works particularly well for the initial configuration, you may find it inconvenient for ongoing management. If so, you can define new resources directly from the interface used to create access control rules.

To add a user or resource to an existing access control rule:

1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**.

2 Click the link for an existing rule. The **Edit Access Rule** page appears.

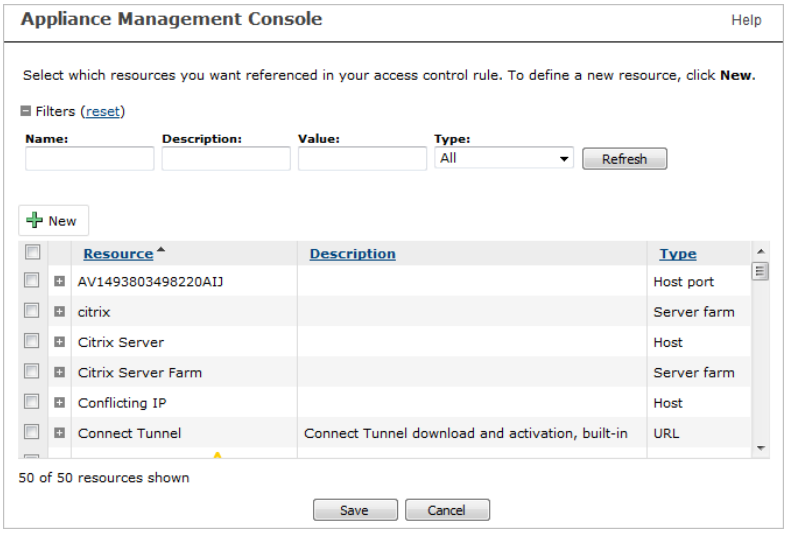
3 In the **Basic settings** area, click **Edit** beside the **From** field. A separate page appears displaying your current users and groups. For the meaning of the icons, see the Icon descriptions table.



Icon descriptions

Icon	Description
	Community
	Any user belongs to the specific realm
	User or local user

4 In the **Basic settings** area, click **Edit** beside the **To** field. A separate page appears displaying your resources and resource groups.



5 Click **New**. The page displayed next depends on the type of object you are creating.

6 Define the settings for the new user, group, or resource.

7 When you are finished creating the object, click **Save**.

8 Select the checkbox beside the object you want to add to the access rule and then click **Save**.

Editing, Copying, and Deleting Access Control Rules

Before modifying or deleting an access control rule, carefully examine your existing rules to understand how your changes will affect your security policy.

CAUTION: Use caution when deleting rules because you are not prompted to confirm the deletion.

- You can reorder the placement of rules in the access control list. But before you do any reordering, carefully examine them to understand how the new order will affect your security policy.
- Rather than creating a new access control rule from scratch, you can save time by making a copy of an existing rule and changing some parameters to fit the new rule. Choose a rule that shares characteristics with the rule you plan to create.

  Copying is also useful when experimenting with a new access rule: you can edit the copied rule and disable the original rule during your testing. This way you can roll back to your original rule if necessary.

For more information on editing, deleting, and copying access control rules, see Deleting Referenced Objects.

When you use the **Filters** settings to filter the view of the access rules by a specific access method or other criteria, you cannot use the **Move Up** and **Move Down** buttons to reorder the list. You can move an access control rule only when **Method** is set to **All**.

To move a rule more than one position in the list, it's usually faster to change the **Number** box on the **Add/Edit Access Rule** page.

Resolving Deny Rule Incompatibilities

In a Permit rule, you can safely mix and match resources and access methods. However, Deny rules containing specific combinations of resources and access methods may prevent subsequent rules from being evaluated. This can inadvertently block user access to resources referenced later in your access policy.

During its policy evaluation, the appliance may in some cases be unable to determine whether a Deny rule matches an incoming connection request. As a security precaution, it stops processing your rule set and blocks user access.

If you attempt to define a Deny rule referencing any of the three combinations described in the following table, AMC displays this warning message:

> "Some of the resources in this rule are not supported by the selected access method(s), which could inadvertently deny access to some resources."

the Rule Incompatibilities table lists the rule combinations that trigger this warning>

Rule Incompatibilities

Rule action	Resource type	Access methods
Deny	Windows domain	• Any • Connect and OnDemand • WorkPlace

Rule Incompatibilities

Rule action	Resource type	Access methods
Deny	URL	• Any • Connect and OnDemand
Deny	File share	• Any • Connect and OnDemand

Example

Suppose you create a Deny rule blocking access to a Windows domain and you leave **Access methods** set to *Any*. A Windows domain is accessible from WorkPlace, so when the appliance receives a connection attempt from WorkPlace, it matches the rule and denies access.

However, if the user makes a connection request from Connect or OnDemand, the appliance is unable to determine whether the Windows domain rule matches the request (regardless of which destination resource is requested). The appliance then stops evaluating any further rules in your policy and immediately denies access. If the Windows domain rule is at the top of your access control rule list, it prevents the user from accessing any VPN resources. And if the next rule in the list is a Permit rule allowing the user to access a VPN resource, it is not evaluated.

Resolving the Problem

To resolve rule incompatibilities, modify the rule so it doesn't reference indeterminate access methods. In the case of a Windows domain or network share, select **Network Explorer** as the only access method. For a URL, select only **Web browser** or **Connect Tunnel and/or OnDemand Mapped Mode**.

Resolving Invalid Destination Resources

If you attempt to create a rule that assigns an access method to an incompatible destination resource, AMC prevents the conflict and displays an `Invalid resources` warning.

the Invalid access method/destination resource combinations table lists the access method/destination resource combinations that trigger this warning.

Invalid access method/destination resource combinations

Access method	Invalid destination resource
Web browser	• Windows domain • Network share
Network Explorer	• URL (and Matching URL)
Connect or OnDemand	• URL (and Matching URL) • Windows domain

Invalid Resource Examples

AMC will not permit you to save a rule that contains a method/resource conflict: if you click **Save**, AMC removes the invalid resource from the rule. If the rule contains only one mismatched resource, it is replaced with **Any**. Examples of method/resource conflict are:

- If a rule specifies **Web browser** as the *only* available access method, it cannot refer to a Windows domain resource. (A Windows domain resource is one that has **Domain** as its type, and for which the **Windows domain** checkbox is selected).

- A rule that specifies a **Matching URL** resource requires **Web browser** as an access method; if the allowed access methods for a rule don't include **Web browser**, the `Invalid resource` warning appears.

To resolve a destination resource error, modify the rule so that the type of access method is compatible with the destination resource. The simplest way to avoid an access method/destination resource conflict is to remove any **Access method restrictions** on the **Advanced** tab of the **Add/Edit Access Rule** page by leaving both **Client software agents** and **Protocols** set to **Any**.

7

System Administration

Optional Network Configuration

This section describes how to configure and use system logging and monitoring, and how to configure Secure Sockets Layer (SSL) encryption options. It also describes how to use a variety of tools to upgrade, roll back, or reset software versions and to back up or reset configuration files.

It explains how to enable SSH access from remote hosts, and how to enable Internet Control Message Protocol (ICMP) so you can ping the appliance. It also describes how to configure the time settings on the appliance.

For information about configuring and using SNMP, see SNMP Configuration.

Topics:

Enabling SSH Access from Remote Hosts

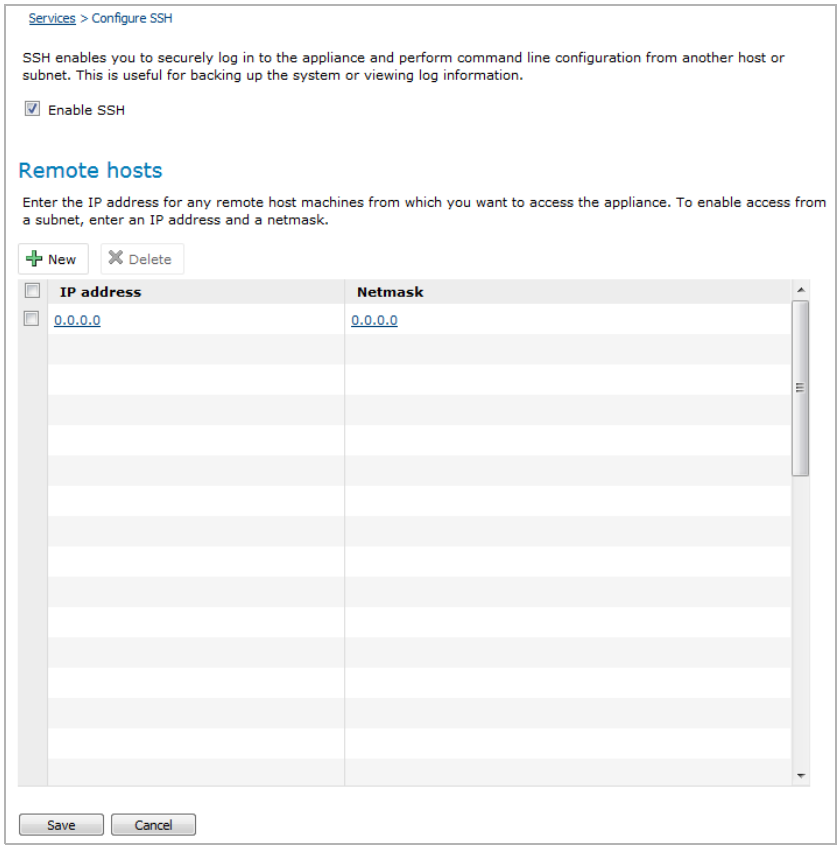
Enabling SSH provides an easy way to access the appliance console from another system. You can enable SSH access from your internal or external network. The local SSH server daemon (sshd) listens on port 22 (the well-known port number for SSH).

To enable SSH access

1 From the main navigation menu under **System Configuration**, click **Services**.

2 In the **Network Services** area, click the **Configure** link for **SSH**.

3 To enable SSH, select the **Enable SSH** checkbox.



4 To add a host from which you want to enable SSH access, click **New**, type the IP address and subnet mask for the host you want to add, and then click **OK**.

5 Click **Save**.

To delete a host:

1 Select the checkbox to left of any hosts you want to remove.

2 Click **Delete**, and then click **Save**.

NOTE: You can enable SSH access from any host by typing 0.0.0.0 for both the IP address and the subnet mask. Keep in mind, however, that the trade-off for this convenience is decreased appliance security.

Enabling ICMP

Enabling ICMP allows you to use the ping command to test network connectivity to the appliance from another computer on the same subnet. This will not enable broadcast pings.

CAUTION: Enabling ICMP makes it possible to ping the appliance from both network interfaces (external and internal). Unless you suppress ICMP Echo Request traffic using a firewall or other network device, it will be possible to discover the appliance from the Internet.

To enable ICMP:

1 From the main navigation menu under **System Configuration**, click **Network Settings**.

2 In the **Basic** area, click the **Edit** link. The **Configure Basic Network Settings** page appears.

3 In the **ICMP** area, select the **Enable ICMP pings** checkbox.

4 Click **Save**.

Configuring Time Settings

IMPORTANT: Changing the time or time zone immediately restarts the appliance. All current user sessions will be closed.

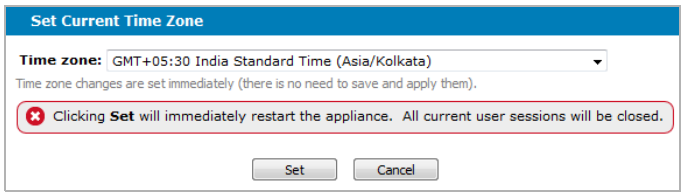
To set the date and time referenced on the appliance and in system logs, select a time zone and then set the local time, if necessary. There are two ways to set the current time: manually, or by synchronizing with one or more Network Time Protocol (NTP) servers.

To change the time zone:

1 From the main navigation menu under **System Configuration**, click **General Settings**.

2 In the **Appliance options** area, click **Edit**.

3 In the **Date/time** area, click **Change** for **Time zone**. The **Set Current Time Zone** dialog displays.



4 Select your current local time zone from the **Time zone** drop-down menu, which shows the time as Greenwich Mean Time (GMT).

5 Apply your pending changes.

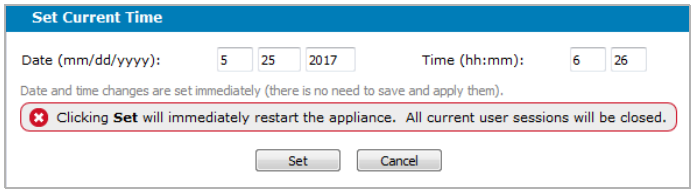
To manually configure the system time:

NOTE: If you are using a SonicWall-provided evaluation license, do not move your system time backward from the current time; doing so will disable all services on your appliance for licensing reasons.

1 From the main navigation menu under **System Configuration**, click **General Settings**.

2 In the **Appliance options** area, click **Edit**.

3 In the **Date/time** area, click **Change** for **Current time**. The **Set Current Time** dialog displays.

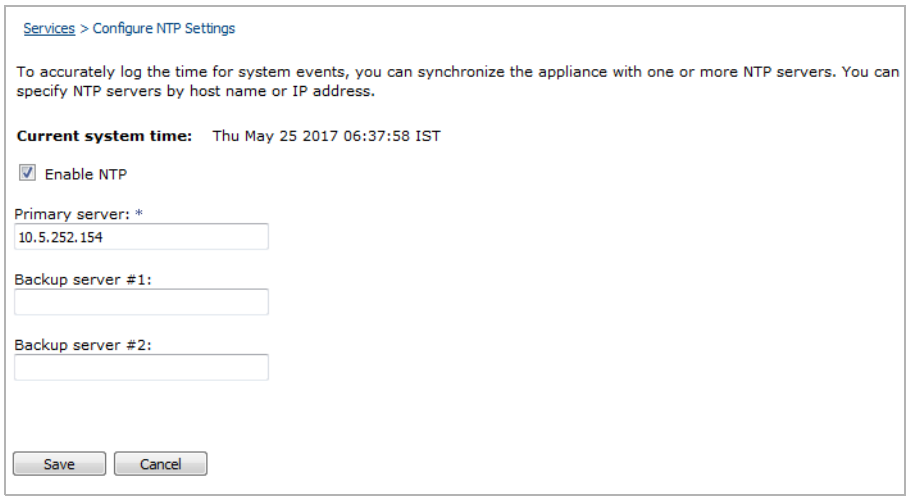


4 Enter the current date and time. Click **Set** to apply your changes immediately.

To configure the system time using NTP:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 In the **Network services** area, click the **Configure** link for **NTP**. The **Configure NTP Settings** page displays.



3 To enable NTP, select the **Enable NTP** checkbox.

4 To configure NTP, type the IP addresses for one or more NTP servers in the **Primary server** and **Backup server** fields. The appliance attempts to synchronize with the primary server, and uses the secondary servers as needed if the primary server is unavailable.

5 Click **Save**.

NOTE: The appliance does not use NTP authentication keys, making it possible for someone to spoof an NTP server and provide the appliance with incorrect time settings. We recommend that you synchronize only with NTP servers on your internal network.

System Logging and Monitoring

The SMA appliance logs a variety of useful information, including user access, system events, and changes in AMC. This section explains how to configure and view logs in AMC, and how to send messages to an external syslog server. It also describes the system status information displayed by AMC.

If a central syslog server is not available, you can review log files from the command-line interface on the appliance itself using standard UNIX commands. For information on how to manually view and interpret raw log data, see Log File Output Formats.

Topics:

- Overview: System Logging and Monitoring
- Log Files
- Monitoring the Appliance
- SNMP Configuration

Overview: System Logging and Monitoring

The appliance logs data for the operation of AMC and the services on the appliance; it also collects data on how administrators have used and changed the system. All system logs are collected and stored in the syslog format, and log messages are handled using an updated version of the standard syslog format.

The appliance is initially configured to store log files locally. If you configure it to send log files to a central syslog server, you can monitor system-level events in near real time, and receive notifications about significant events. You can also export log message data to a comma-separated values (`.csv`) file for viewing and analysis with other applications.

Log Files

The appliance generates several types of log files that can be viewed and exported from the **Logging** page in AMC. There are also two log files related to WorkPlace that can't be viewed in AMC; they are described in WorkPlace Logs.

Topics:

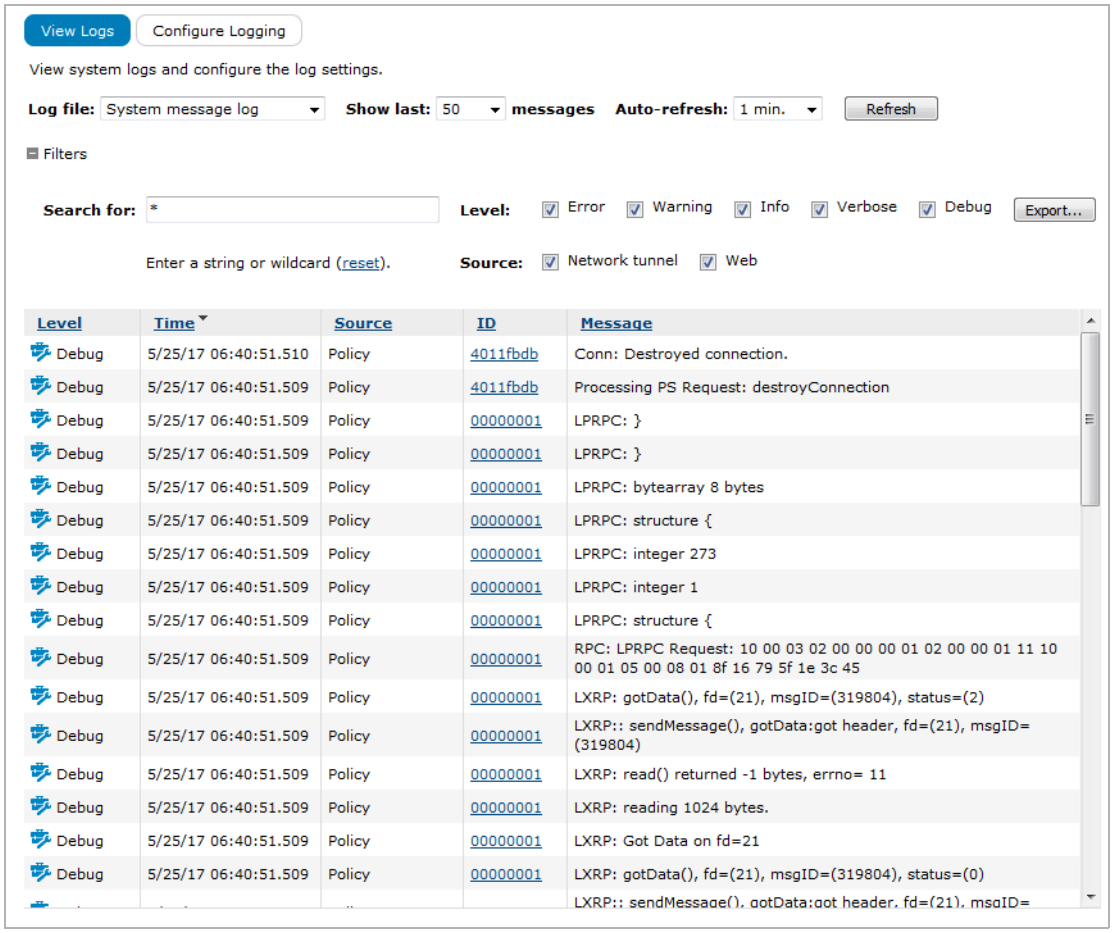
- Viewing Logs
- Sorting, Searching, and Filtering Log Messages
- Exporting Log Files
- Configuring Log Settings
- System Message Log
- Management Message Log
- Management Audit Log
- Network Tunnel Audit Log
- Web Proxy Audit Log
- Client Installation Logs (Windows)

Viewing Logs

There are several log files generated by the SMA appliance, and AMC enables you to sort, search, and filter them.

To view logs:

1 From the main navigation menu under **Monitoring**, click **Logging**. The **View Logs** page appears.



2 Select the system or service log file you want to view from the **Log file** drop-down menu. The columns of information displayed are different for each type of log file, as described in the Log file descriptions table

Log file descriptions

Log file	Description
System message log	Displays server processing and diagnostic information about the network tunnel service and the Web proxy service. It also provides detailed messages about all access control decisions: each time a user request matches a policy rule, a log file entry is recorded explaining the action taken. For details, see System Message Log.
Management message log	Displays entries regarding the operation of AMC, including when the console was started and stopped, and what errors occurred during administration of the appliance. For details, see Management Message Log.
Management audit log	Displays an audit history of configuration changes made in AMC by administrators, showing when changes were made and by which administrator. For details, see Management Audit Log.

Log file descriptions

Log file	Description
Network proxy/tunnel audit log Web proxy audit log	There are two access service audit logs: one for the Web proxy service (called **ExtraWeb** in the log files), and one that combines messages from both the network proxy and network tunnel services (called **Anywhere VPN** in the log files). These two logs provide detailed information about connection activity, including a list of users and the amount of data transferred. For details, see Network Tunnel Audit Log and Web Proxy Audit Log.
Client installation logs	If something goes wrong during client or agent installation on a computer running Windows, the error is recorded in a client installation log. These logs are automatically uploaded to the appliance and listed in AMC if the user has Secure Endpoint Manager installed. For details, see Client Installation Logs (Windows).
Unregistered device log	Displays a list of login attempts from users on devices that are not registered. You can export the list to an XML format that can be used to register these devices.

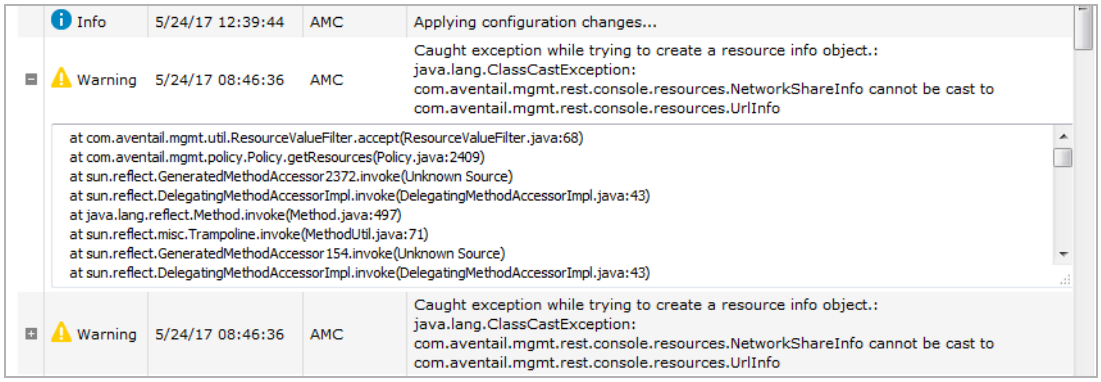
3 Use the **Show last** drop-down menu to select the number of log messages you want to display. You can choose **50** (default), **100**, **250**, **500**, or **1000** messages.

4 Click the **Refresh** button to update the page to show the most recent log messages, or to view the results of any filtering selections you've made.

By default, the log viewer's **Auto-refresh** option is set to **1 min**. You can optionally set the refresh time to **30 sec.**, **5 min.**, **10 min.**, **15 min.,** or turn it **Off** during your AMC session.

5 Use the optional **Search for** and **Level**, **Source**, and **Status** sorting options to find log messages that meet specific criteria. See Sorting, Searching, and Filtering Log Messages.

6 A plus sign (**+**) is displayed in the first column when a log entry is more than a few lines long: click it to expand the entry.



NOTE: When **Auto-refresh** is set to any time interval other than **Off** and the **View Logs** page is displayed, the refresh activity prevents the AMC session from automatically timing out after the default inactivity period (**15** minutes). This means that if you leave AMC unattended while the **View Logs** page is displayed and in auto-refresh mode, AMC will not time out. A good security practice is to always switch to another page in AMC when you are done viewing log messages. See Appliance Sessions for more information.

Sorting, Searching, and Filtering Log Messages

The AMC log viewer allows you to customize the display of log message data using sorting, searching, and filtering options. You can use these options separately or in any combination.

Sorting

Data displayed in each of the columns in the log table can be sorted in ascending or descending order by clicking the column heading. By default, log messages are sorted by the **Time** column, with the most recent messages shown at the top.

Searching

To search for text strings in the log files, such as an IP address or a user ID, type the (case-sensitive) search criteria in the **Search for** field and then click **Refresh** to view the results. You can use the wildcard characters * and ? in your search criteria. To clear the search criteria, click the **reset** link.

When you're viewing a system message log, you can click a session ID number in the **ID** column to automatically search for all log messages that share the same session ID. For information on session ID see the table of field descriptions in System Message Log.

In the Web proxy audit log and the network proxy/tunnel audit log, you can click a user ID in the **Username** column to automatically search for all log messages about a specific user.

Filtering

With the filtering options, you can include or exclude certain types of logging data for each log file. For example, if you want to see Management message log entries that are not AMC-related (such as system control authority messages), select all of the **Level** checkboxes and make sure the **AMC** checkbox under **Source** is cleared. The available options vary depending on the type of log file you are viewing.

Exporting Log Files

If you need to perform additional analysis of the log message data, or display the data differently, you can export selected data to files for use by another application, such as Microsoft Excel (in the case of logs with comma-separated values) or an XML editor (in the case of the log for unregistered devices).

You can reduce the size of the exported file by first applying filter or search criteria. The **Show last <n> messages** setting determines the maximum number of messages included in the exported log file.

To export a log file:

1. From the main navigation menu under **Monitoring**, click **Logging**. The **View Logs** page appears.
2. Use the **Log file** list to select the system or service log file you want to view.
3. Apply any filter or search criteria to the log data. See Sorting, Searching, and Filtering Log Messages.
4. Click **Export**.
5. You are prompted to save or open the file. Click **Save**.
6. In the **Save As** dialog box, browse for the location where the file will be saved, optionally rename the file, and then click **Save**. By default, AMC assigns the file names shown in the File names for the exported logs table to the exported files:

File names for the exported logs

File name	Description
`sysmessage.csv`	System message log
`management.csv`	Management message log
`consoleaudit.csv`	Management audit log
`netaudit.csv`	Network proxy/tunnel audit log

File names for the exported logs

File name	Description
`webaudit.csv`	Web proxy audit log
`UnregisteredDevices.xml`	Log of devices with an equipment ID that is not recognized. For the steps necessary for collecting device identifiers in this log, see Collecting Equipment IDs from Unregistered Devices.

Configuring Log Settings

If you are debugging the system, you can set the message log level for the services in AMC. Additionally, you can configure the appliance to send log files to an external syslog server.

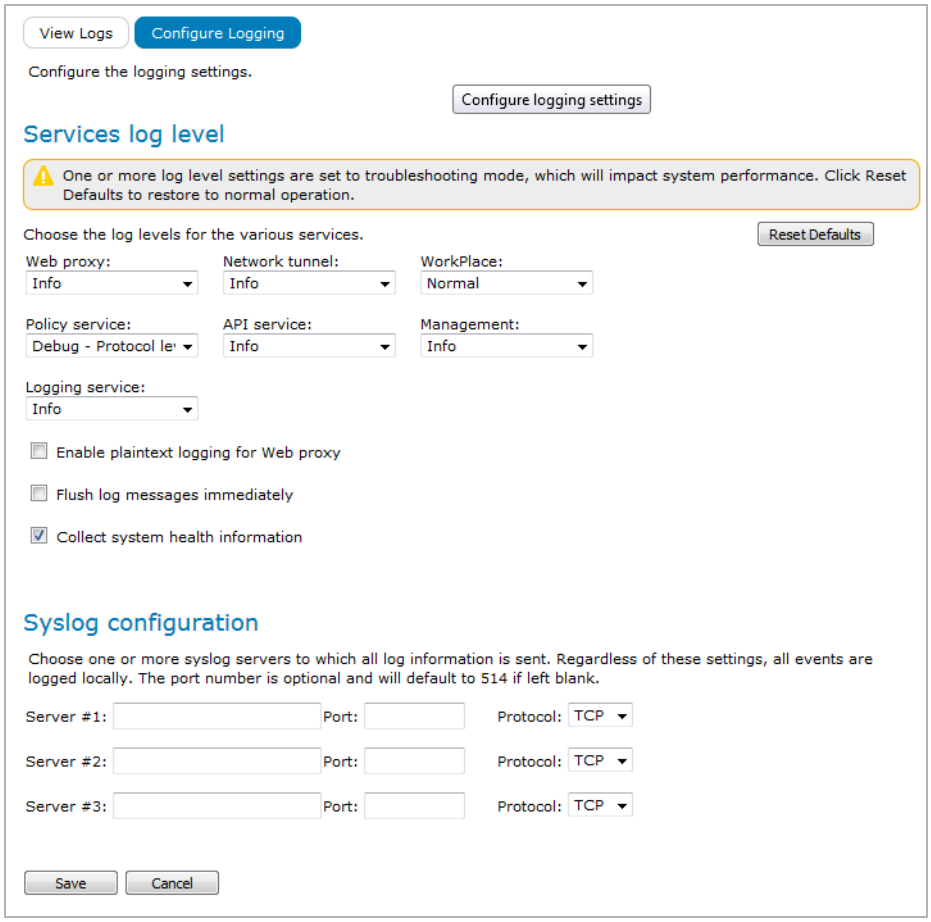
Setting Log Levels

You can specify how much detail is written to the message logs for each service. Increasing the message log detail requires more disk space and has a greater impact on system performance.

To set the logging level:

1 From the main navigation menu under **Monitoring**, click **Logging**. The **View Logs** page appears.

2 Click the **Configure Logging** tab.



3 Select the appropriate level of message detail for the services on the appliance, which are listed in order of increasing detail. The highest detail log levels (**Verbose** and **Debug**) are valuable for troubleshooting

purposes, but they require more disk space and can have a significant performance impact: they should not be used in normal operation.

4 You can also configure the appliance to send system logs to one or more syslog servers. Type the IP addresses and port numbers for the syslog servers in the **Syslog configuration** area. port **514** is the standard syslog-ng port, but you can use another port as needed to match your server configuration. Regardless of whether you configure syslog, all system events are logged locally.

5 Click **Cancel** to discard any changes you've made, or click **Save**.

Sending Log Files to a Syslog Server

The SMA appliance can send system logs to a syslog server. Regardless of whether you configure syslog, all system events are logged locally. To avoid flooding the network with log information, the appliance forwards log messages for only the three highest severity levels (fatal, error, and warning).

For information on the syslog protocol, see RFC 3164 (http://www.ietf.org/rfc/rfc3164.txt).

To send log files to a syslog server:

1 From the main navigation menu, click **Logging**. The **View Logs** page appears.

2 Click the **Configure Logging** tab.

3 Under **Syslog configuration**, type the IP address and port numbers for one or more syslog servers. The default for the syslog-ng port is **514**, but you can use another port as needed to match your server configuration. Use the **Protocol** list to specify whether the appliance will communicate with syslog using the TCP or UDP protocol.

4 Click **Cancel** to discard any changes you've made, or click **Save**.

NOTE: Because syslog data is not encrypted, sending log messages to an external server is a potential security issue.

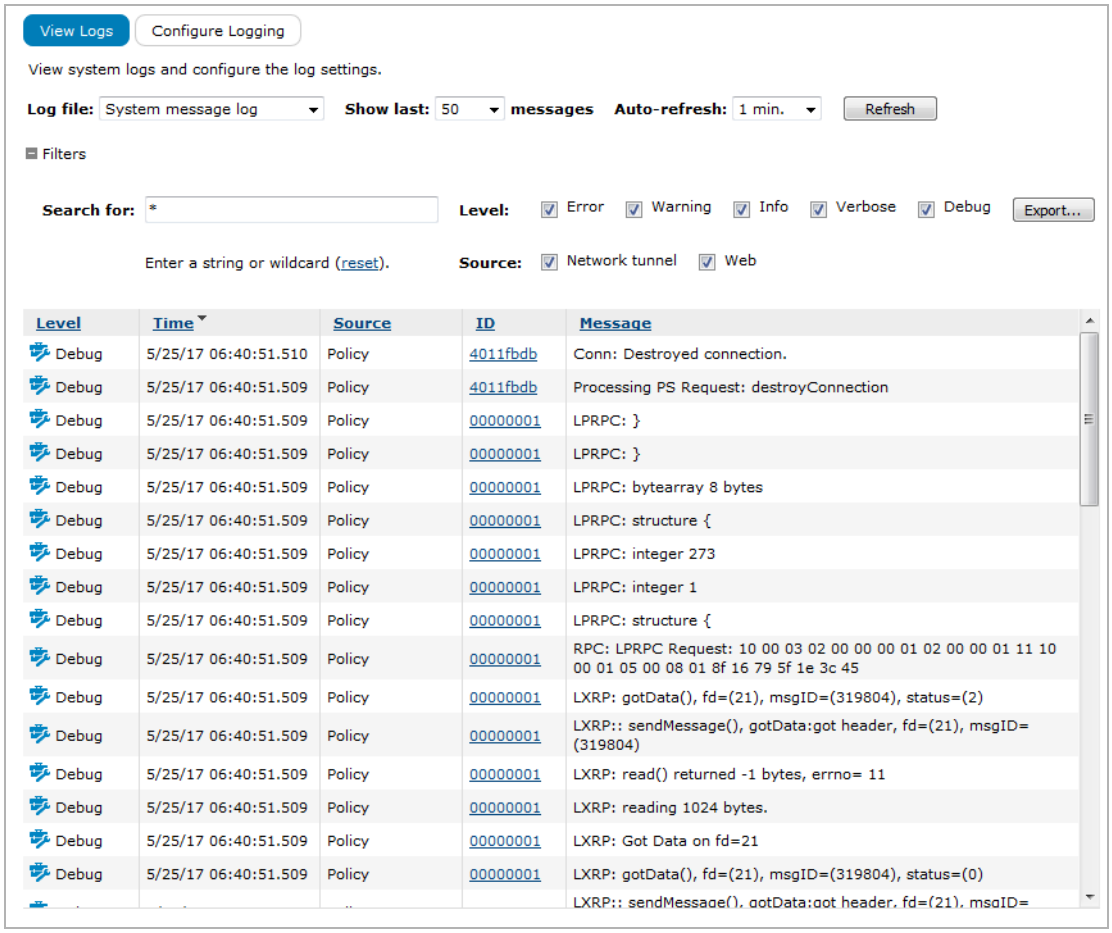
System Message Log

The system message log displays server processing and diagnostic information about the Web proxy service, network proxy, and the network tunnel service. It also provides detailed messages about all access control decisions: each time a user request matches a policy rule, a log file entry is recorded explaining the action taken.

To view the System Message log:

1 From the main navigation menu, click **Logging**. The **View Logs** page appears.

2 Select **System message log** from the **Log file** drop-down menu.



The **View Logs** page displays the information shown in the System message log file information table from the system message log file.

System message log file information

Column	Description
Level	Log message detail level: **Fatal**, **Error**, **Warning**, **Info**, **Debug**, or **Verbose**.
Time	Date and time when the message was generated by the service.
Source	Indicates which service generated the message: **Network proxy**, **Network tunnel**, **Web proxy**, or **Policy** server.
ID	The unique ID number assigned to each user session. Click a session ID number to automatically search for all log messages associated with it. For more information on session ID numbers, see System Message Log.
Message	Message text.

NOTE: For information on manually reviewing log files from the command-line interface on the appliance, see System Message Log.

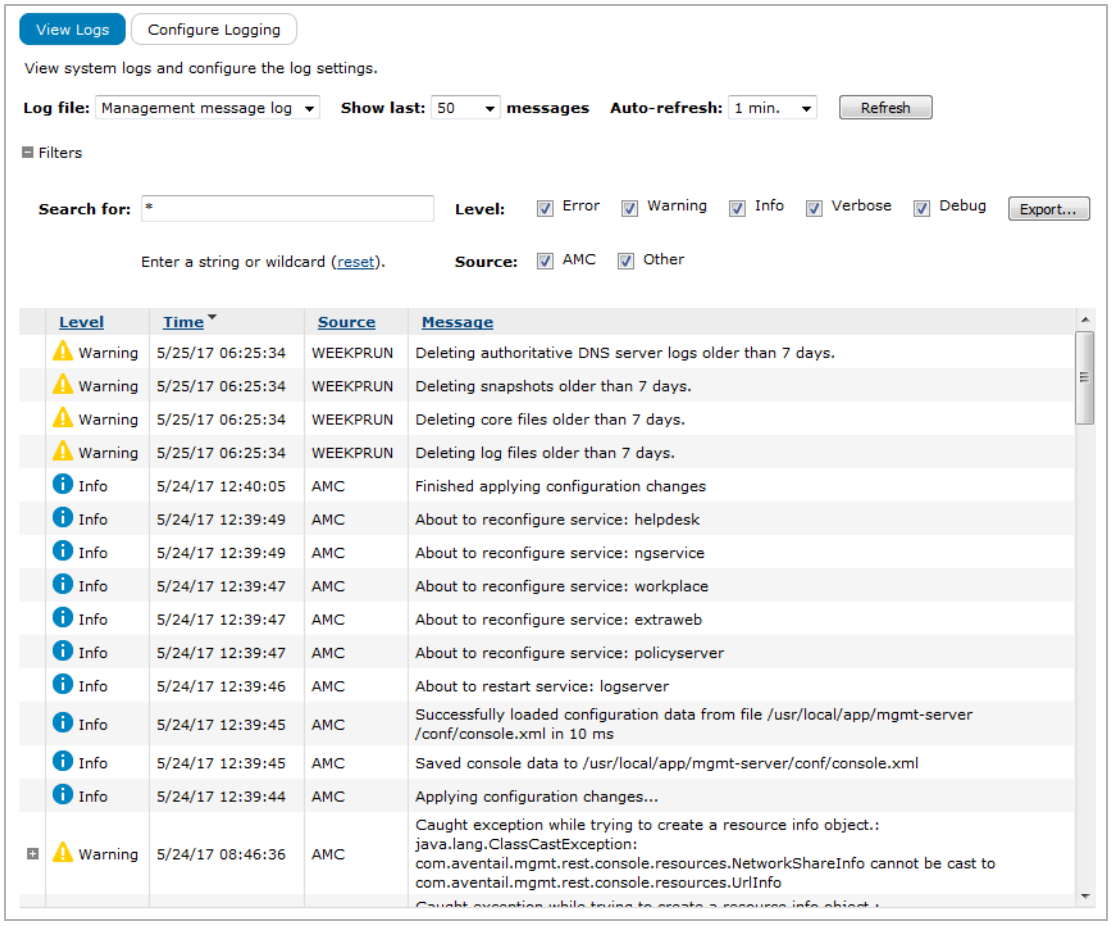
Management Message Log

The Management message log contains entries regarding the operation of AMC, including when the console was started and stopped, and what errors occurred during administration of the appliance.

To view the Management Message log:

1 From the main navigation menu, click **Logging**. The **View Logs** page appears.

2 Select **Management message log** from the **Log file** drop-down menu.



The **View Logs** page displays the information shown in the Management message log information table about the Management message log.

Management message log information

Column	Description
Level	Log message detail level: **Error**, **Warning**, **Info**, **Verbose**, or **Debug**.
Time	Date and time message was logged.
Source	Shows the source for the change: **AMC** or **Other**, which includes *WEEKPRUN* and *sysctrl*.
Message	Describes the log entry in more detail.

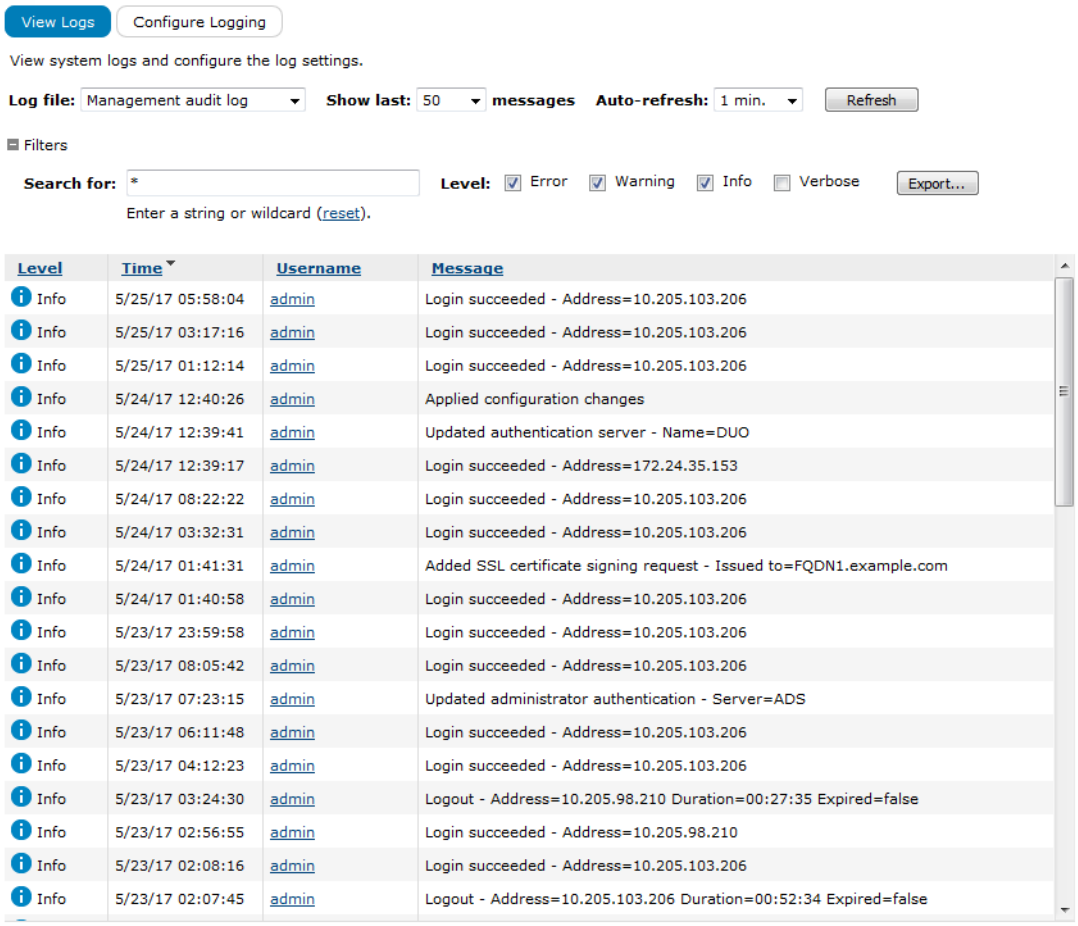
Management Audit Log

The Management audit log provides an audit history of configuration changes made in AMC by administrators, showing when changes were made and by which administrator. Configuration changes are either active or pending:

- **Active configuration:** Configuration items that precede the log message `Applied configuration changes` are ones that have been applied and are currently active.
- **Pending changes:** As changes are made, they are saved to disk but not immediately applied. In the Management audit log, these pending changes follow the `Applied configuration changes` message and can be discarded. See Discarding Pending Configuration Changes to find out how to do so.

To view the Management Audit log:

1. From the main navigation menu, click **Logging**. The **View Logs** page appears.
2. Select **Management audit log** from the **Log file** drop-down menu.



Level	Time	Username	Message
Info	5/25/17 05:58:04	admin	Login succeeded - Address=10.205.103.206
Info	5/25/17 03:17:16	admin	Login succeeded - Address=10.205.103.206
Info	5/25/17 01:12:14	admin	Login succeeded - Address=10.205.103.206
Info	5/24/17 12:40:26	admin	Applied configuration changes
Info	5/24/17 12:39:41	admin	Updated authentication server - Name=DUO
Info	5/24/17 12:39:17	admin	Login succeeded - Address=172.24.35.153
Info	5/24/17 08:22:22	admin	Login succeeded - Address=10.205.103.206
Info	5/24/17 03:32:31	admin	Login succeeded - Address=10.205.103.206
Info	5/24/17 01:41:31	admin	Added SSL certificate signing request - Issued to=FQDN1.example.com
Info	5/24/17 01:40:58	admin	Login succeeded - Address=10.205.103.206
Info	5/23/17 23:59:58	admin	Login succeeded - Address=10.205.103.206
Info	5/23/17 08:05:42	admin	Login succeeded - Address=10.205.103.206
Info	5/23/17 07:23:15	admin	Updated administrator authentication - Server=ADS
Info	5/23/17 06:11:48	admin	Login succeeded - Address=10.205.103.206
Info	5/23/17 04:12:23	admin	Login succeeded - Address=10.205.103.206
Info	5/23/17 03:24:30	admin	Logout - Address=10.205.98.210 Duration=00:27:35 Expired=false
Info	5/23/17 02:56:55	admin	Login succeeded - Address=10.205.98.210
Info	5/23/17 02:08:16	admin	Login succeeded - Address=10.205.103.206
Info	5/23/17 02:07:45	admin	Logout - Address=10.205.103.206 Duration=00:52:34 Expired=false

The **View Logs** page displays the information shown in the Management audit log information table about the Management audit log.

Management audit log information

Column	Description
Level	Log message detail level: **Fatal, Error**, **Warning**, or **Info**.
Time	Date and time of the AMC configuration change.

Management audit log information

Column	Description
Username	Shows the name of the administrator as it is configured on the **Manage Administrator Accounts** page.
Message	Shows configuration changes made in AMC.

NOTE: For information on manually reviewing log files from the command-line interface on the appliance, see Management Console Audit Log.

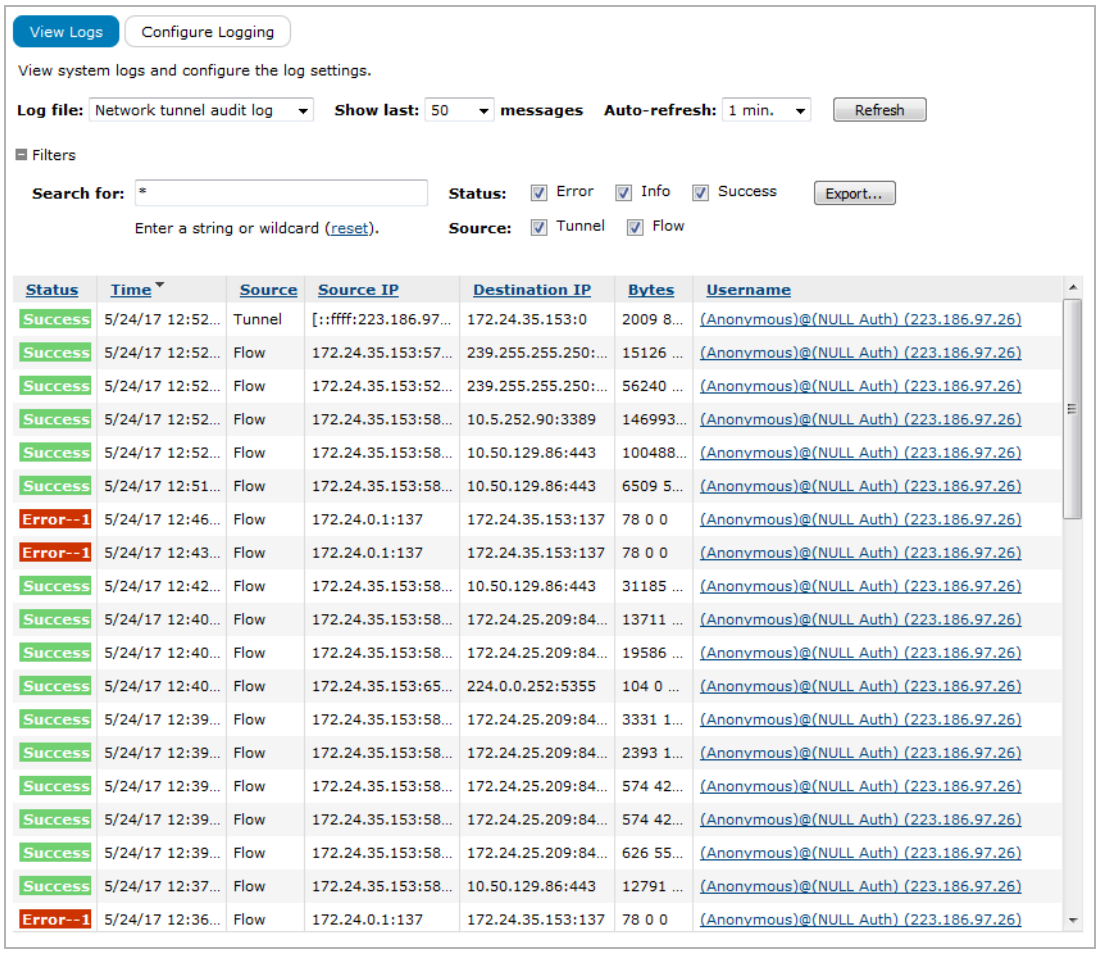
Network Tunnel Audit Log

The network proxy/tunnel audit log provides detailed information about connection activity for users who are accessing resources using Connect Tunnel or OnDemand Tunnel, including a list of users and the amount of data transferred.

To view the Network Tunnel Audit log:

1 From the main navigation menu, click **Logging**. The **View Logs** page appears.

2 Select **Network tunnel audit log** from the **Log file** drop-down menu.



The **View Logs** page displays the information shown in the Network proxy/tunnel audit log information table about the network proxy/tunnel audit log file.

Network proxy/tunnel audit log information

Column	Description
Status	Displays color-coded connection status for each connection request: • Red: Error • Orange: Information • Green: Success When you move the pointer over a connection status code for a specific log message, AMC displays explanatory text below the message.
Time	Date and time of the connection.
Source	Indicates which service generated the message: **Network proxy**, **Network Tunnel**, **Web proxy**, or **Policy** server.
Source IP	The IP address and port number of the computer using the network proxy or tunnel service.
Destination IP	Indicates the IP address and port number of the resource being accessed.
Bytes	Shows three sets of values: • The number of bytes sent • The number of bytes received • The connection duration (in seconds)
Username	The user who requested the resource. You can search for all log messages for a specific user by clicking a username link.

NOTE: For information on manually reviewing log files from the command-line interface on the appliance, see Network Tunnel Audit Log.

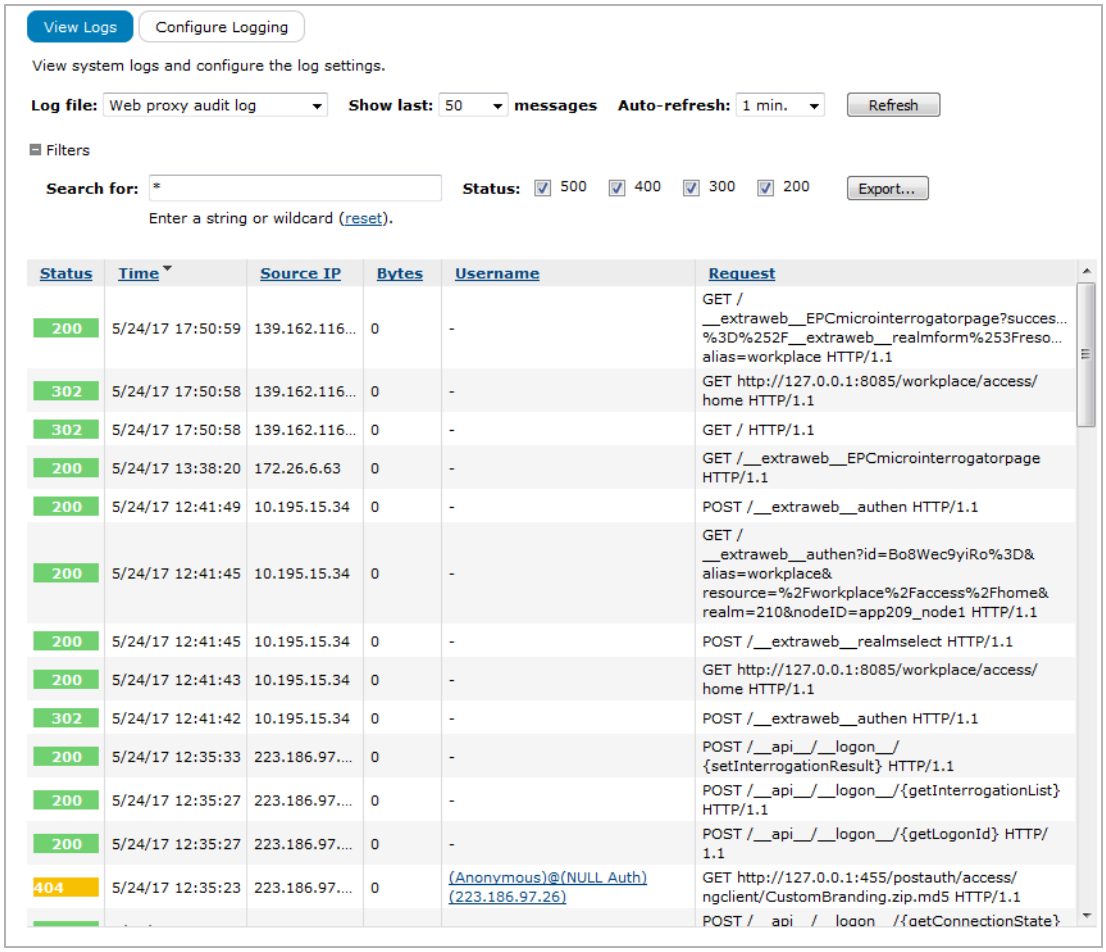
Web Proxy Audit Log

The Web proxy audit log provides detailed information about connection activity for users who are accessing resources using Web Proxy Access or Translated Access, including a list of users and the amount of data transferred.

To view the Web Proxy Audit log:

1 From the main navigation menu, click **Logging**. The **View Logs** page appears.

2 Select **Web proxy audit log** from the **Log file** drop-down menu.



The **View Logs** page displays the information shown in the Web Proxy audit log information table about the Web proxy audit log file.

Web Proxy audit log information

Column	Description
Status	Displays color-coded return codes for each HTTP request. Move the pointer over an HTTP return code number to see explanatory text. The code numbers are in the following ranges and colors: • 500: server error (red) • 400: client error (orange) • 300: redirection (green) • 200: success (green)
Time	The date and time at which the request was received by the appliance.
Source IP	The IP address and port number of the computer that used the Web proxy service.
Bytes	The number of bytes sent in the body of the response, excluding the size of the HTTP headers.
Username	The name with which the user authenticated to the Web proxy service. You can search all log messages related to a specific user by clicking a username link.
Request	Shows the first line of the HTTP request, which contains the HTTP command (such as GET or POST), the requested resource, and the HTTP version number.

NOTE: For information on manually reviewing log files from the command-line interface on the appliance, see Web Proxy Audit Log.

Client Installation Logs (Windows)

When users log in to a realm, the access methods available to them depend on a few different things:

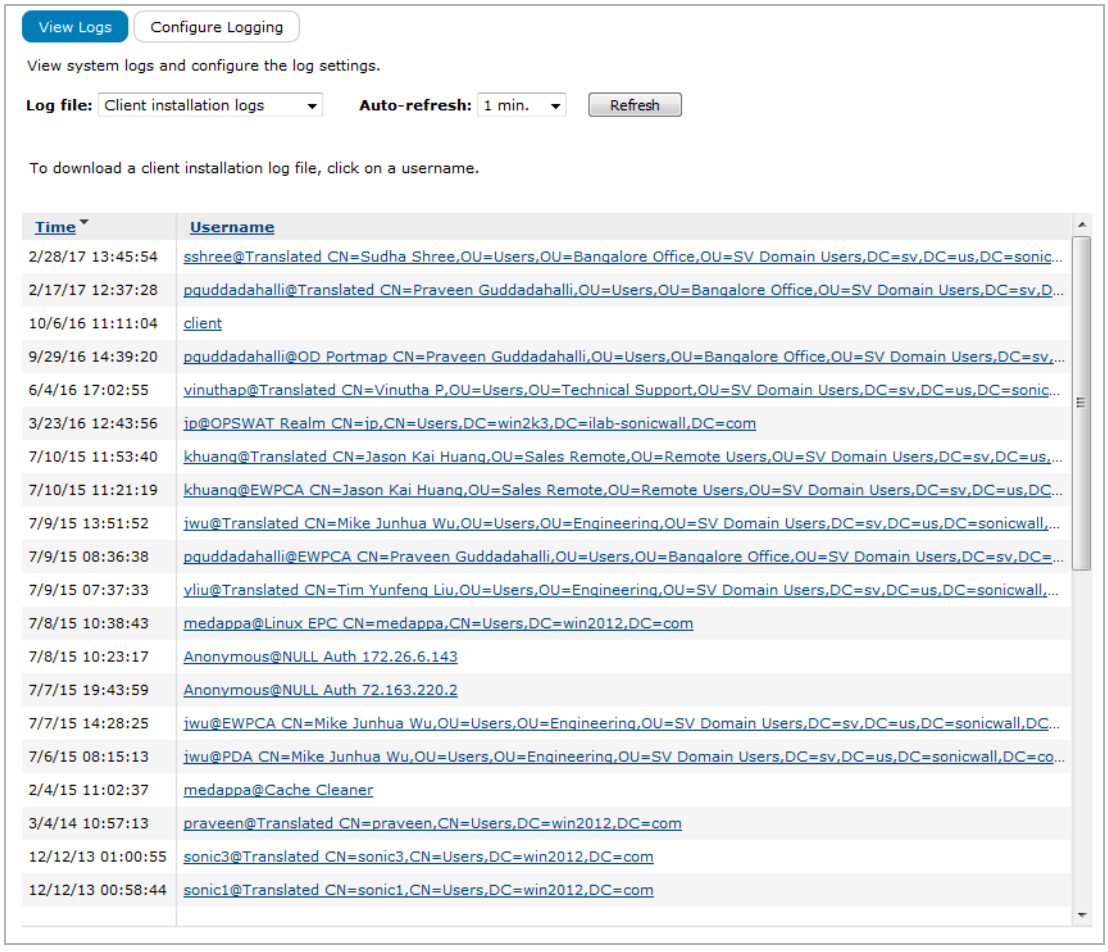
- The network access agents or clients that are permitted for a particular community, which is something that you specify when you set up a realm
- The user's environment: the operating system, browser, the availability of ActiveX or Java, and whether any clients or agents are already present

If something goes wrong during client or agent installation on a computer running Windows, the error is recorded in a client installation log. These logs are automatically uploaded to the appliance and listed in AMC if the user has Secure Endpoint Manager installed. See Client and Agent Provisioning (Windows) for details about Secure Endpoint Manager.

To view the list of client logs for all users:

1 From the main navigation menu, click **Logging**. The **View Logs** page appears.

2 Select **Client installation logs** from the **Log file** drop-down menu.



You can sort the client installation logs by time or username; to download a log file, click on it. The log appends information about each step in the provisioning process: bootstrapping, provisioning new components, and interrogating the device (for device profile matching). The last set of information is probably where the installation problem occurred.

When troubleshooting, first look at a user's client installation log in AMC, and then (if necessary) the log file, `epiBootstrapper.log`, stored on the user's local machine in the `\Documents and Settings\<username>\Application Data\SMA1000\LogFiles` folder.

Monitoring the Appliance

AMC displays a variety of information that is helpful in monitoring basic system settings, disk and memory usage, current connections, and network bandwidth use.

This section describes how to monitor system status and active users, and how to terminate VPN connections for selected users.

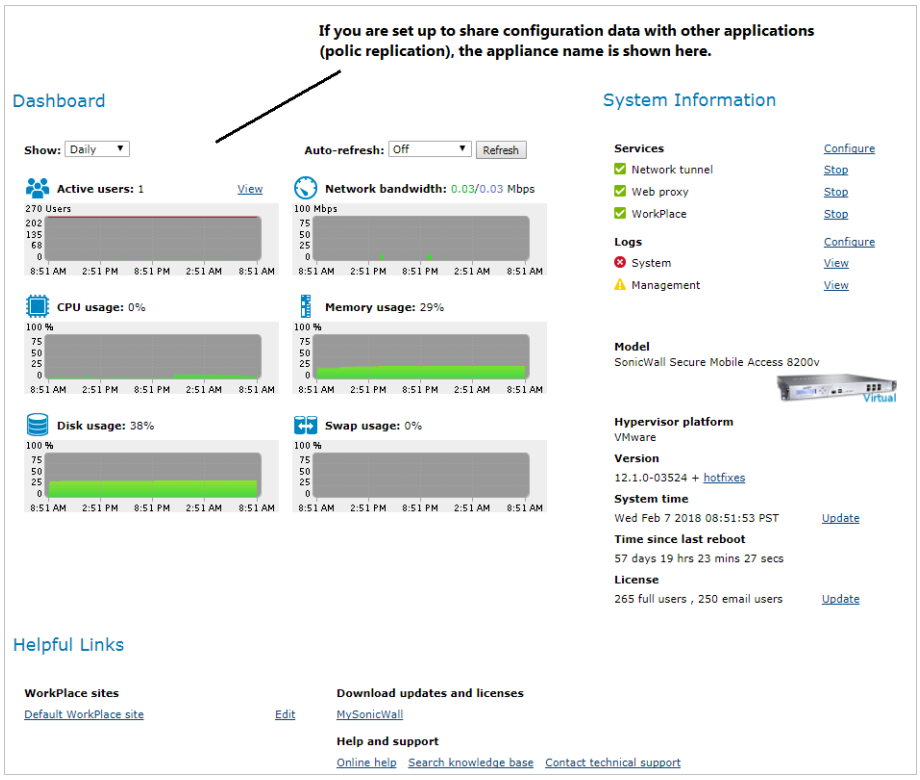
Topics:

Monitoring Overall Activity

The AMC home page (also known as Dashboard) displays a graphical summary of information that is helpful in monitoring system status. The graphs show average usage for the selected interval and is optionally refreshed at intervals based on your Auto-refresh selection.

NOTE: Warnings are displayed based on the selected interval. Change the interval to increase or decrease warnings.

AMC home page

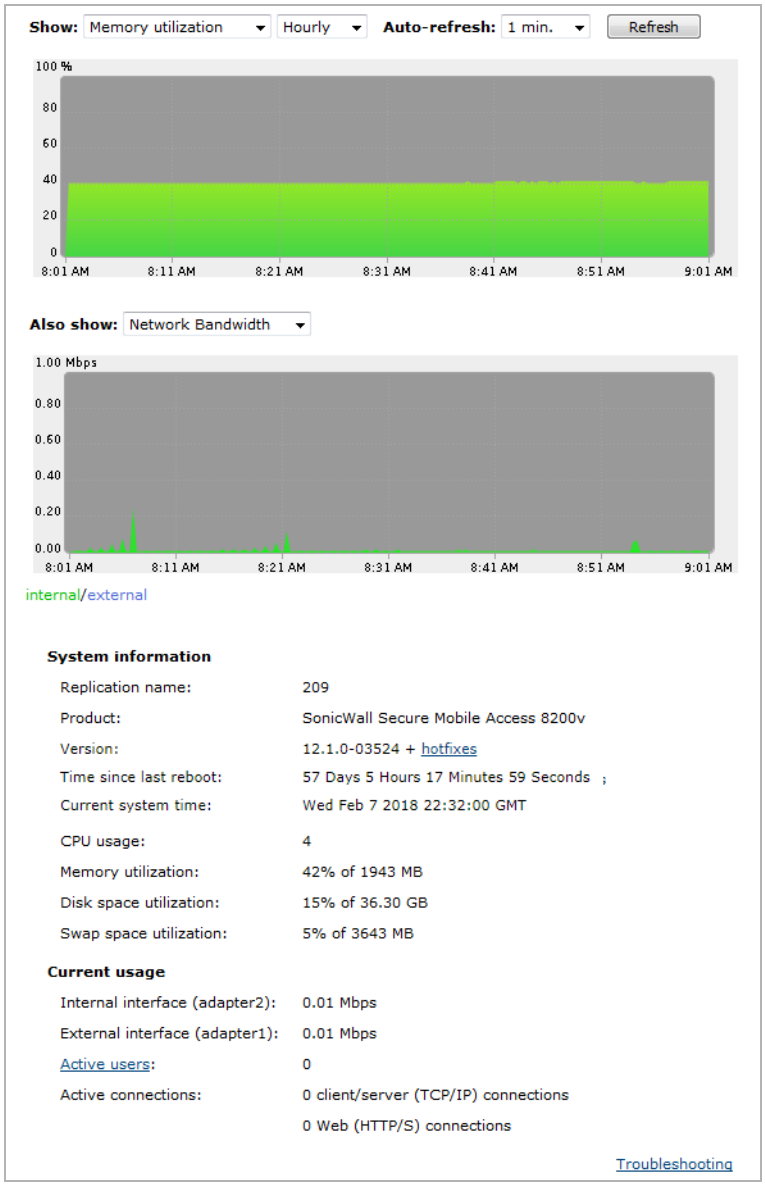


Click the **Home** link at the top right of an AMC page to display the AMC home page. In addition to the system status graphs, this page provides a convenient access point to:

- Often used functions, such as starting and stopping services and viewing logs.
- Hardware and licensing information.
- Links to the default WorkPlace, MySonicWall.com, online help, and support options.

Monitoring System Status

1 From the main navigation menu under **Monitoring**, click **System Status**. The **System Status** page appears, displaying information about the appliance's current status, such as memory utilization.



2 In the **Show** drop-down menu, select the type of data you want to view; see the System status data table.

System status data

Type of data	Description
Active users (default)	Displays the number of active user sessions for the specified time period. This graph includes a horizontal line that indicates the maximum number of concurrent users allowed by your license. **NOTE:** Active user sessions are not the same as licensed ones; for more information, see Open vs. Licensed Sessions.
CPU utilization	Displays the percentage of the CPU capacity that was used for the specified time period.
Memory utilization	Displays the percentage of memory that was used for the specified time period. The percentage is calculated from information returned by the `meminfo` utility on the appliance: `((MemTotal - Cached - MemFree) / MemTotal) * 100`
Network bandwidth	Displays the network bandwidth in Mbps for the specified time period. If both the internal and external interfaces are enabled, graph data for the internal interface is represented by a green line and data for the external interface is displayed in blue. The scale of this graph automatically adjusts to reflect the amount of traffic (for example, the graph might use a 1 Mbps scale or a 100 Mbps scale, depending on traffic).
Swap utilization	Displays the amount of free swap space available for the specified time period.
Disk space utilization	Displays the percentage of disk space used for the specified time period.

3 In the second **Show** drop-down menu, indicate the time interval you want to show; see the Time interval selection table.

Time interval selection

Interval	Description
Hourly	Displays average activity during the last hour based on samples collected every 20 seconds.
Daily	Displays average activity for the last day based on samples collected every ten minutes.
Weekly	Displays average activity for the last week based on samples collected every 60 minutes.
Monthly	Displays average activity for the last 32 days based on samples collected every four hours (six samples per day).

4 In the **Auto-refresh** drop-down menu, select a value that indicates how often AMC will automatically update the selected data.

5 Optionally, in the **Also show** drop-down menu, you can select another type of data graph. This can be useful if you want to compare two types of data for a given time period. The default is **None**.

6 To update the page at any time, click **Refresh**.

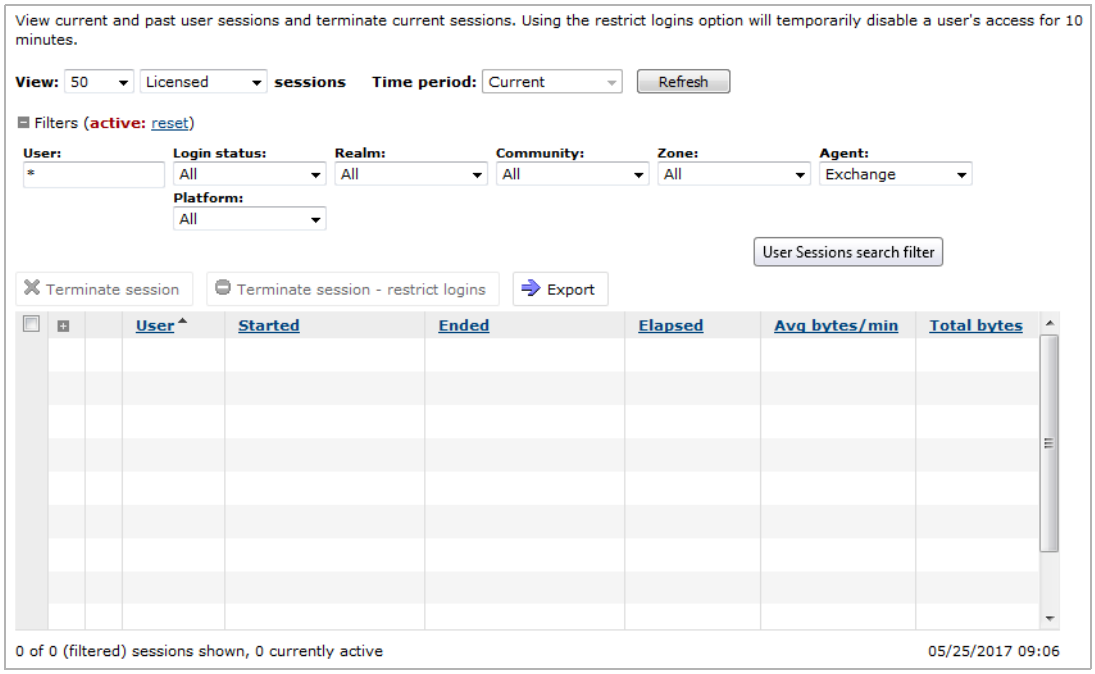
NOTE: When **Auto-refresh** is set to any time interval other than **Off** and the **System Status** page is displayed, the refresh activity prevents the AMC session from automatically timing out after the default inactivity period (15 minutes). This means that if you leave AMC unattended while this page is displayed and in auto-refresh mode, AMC will not time out. A good security practice is to always switch to another page in AMC when you are done reviewing status. See Appliance Sessions for more information.

Viewing User Sessions

You can monitor, troubleshoot or terminate user sessions on your appliance, or HA pair of appliances, in AMC. By sorting through the list and filtering the sessions—by user name, realm (authentication server), community, access agent, traffic load, and so on—you can narrow your search to particular sessions and view further details about them. Here are two filtering examples.

To view all open user sessions:

1 From the main navigation menu under **Monitoring**, click **User Sessions**.



You can get a quick read on what state a session is in by looking at its icon. See Open vs. Licensed Sessions for a complete description of each state.

2 In the **View** list, select **All open** sessions. This displays sessions that are either licensed or idle. An idle session is one that can be resumed: its license is released after the connection is inactive for more than 15 minutes, but up until that moment the session can be resumed. See Open vs. Licensed Sessions for more information on what sessions are considered open.

3 You can filter your list of sessions further using a combination of other properties, such as realm and zone. Click **Refresh** to update the list of sessions based on your filters.

4 Review the session list. To resort the list, click the heading at the top of a column.

5 For a quick summary of a particular session, expand the item in the session list.

For complete session details, such as the resource a user attempted to access and what policy rules were applied in the process, click the username link. See Viewing User Access and Policy Details for more information on this troubleshooting tool.

To search for sessions with a high traffic load:

1 From the main navigation menu, click **User Sessions**.

2 In the **View** list, select **All** sessions.

3 If you plan to end sessions that are taking up too much bandwidth, restrict the list to licensed sessions: in the **Filters** area, select **Licensed** in the **Status** list, and then click **Refresh**.

4 To isolate the time range you're interested in, make a selection in the **Time period** drop-down menu. Select:

- **All** to see data from sessions that are up to one week old.
- **Last 24 hours** to see user activity for the last day.
- **Custom** to specify a particular range by date and time.

5 Click **Refresh** to view updated results.

6 To find out which sessions involve the most traffic, sort the list by clicking **Avg data** (the amount of traffic for the last hour) or **Total data** (the total amount for the session) at the top of the column.

Open vs. Licensed Sessions

When you look at user sessions in AMC it's important to understand the distinction between different types of sessions. For example, if a user has a question about access to a resource, you will want to see all sessions associated with that user (even the failed ones), not just the ones that are licensed. Session types are defined as:

- Licensed Sessions
- All Open Sessions
- Authorization Terms Not Accepted
- All Sessions

Licensed Sessions

A licensed session does not represent a person, but rather a user authentication. A user who is logged in on two devices, for example, consumes two licenses as soon as a resource protected by the appliance is accessed.

Until the user explicitly logs out of a session or the session has timed out (after 15 minutes of inactivity), a license is consumed (simply closing the browser window in WorkPlace, for example, does not free up a license).

All Open Sessions

An open session is defined as a session that is either licensed or that can be resumed. This idle, can-be-resumed, state is different for browser and tunnel sessions:

- A browser session will have its license released after the connection is inactive for more than 15 minutes.
- A Connect Tunnel session will have its license released 15 minutes after the tunnel has been disconnected due to a network event, for example, when a mobile user moves out of range or a laptop lid is closed. (Even when the user has stopped using a tunnel session, it remains active because of network traffic, such as keep-alive packets.)

Unlicensed sessions in this open state can be resumed as long as the authentication token remains valid and a license is available when the session is resumed. By default, the authentication token is valid several hours after a session is started.

Authorization Terms Not Accepted

This category is used for sessions that were blocked because the user was using a personal device and did not accept the authorization terms.

All Sessions

This category includes all open sessions, plus sessions that were ended or where the login has failed after successive retries. If the user abandons his or her login attempts before receiving a final failure message, no information about those attempts is displayed in this list. Data about sessions that ended more than 7 days ago is discarded.

NOTE: See How Licenses Are Calculated for more information.

Ending User Sessions

You can immediately terminate a user's session, even if the user has multiple connections on different services or nodes, or temporarily disable a user's network access for 10 minutes (the user can log in to the network again after that period if your access policy allows it). To permanently prevent a user from logging in to your VPN, you must do one of the following:

- Modify the applicable access control rules
- Modify or delete the applicable user and group definitions
- Delete the user from your user directory

To end open user sessions:

1. From the main navigation menu, click **User Sessions**.
2. In the **View** lists, select the number of sessions you want to display, and then select **All open** (only sessions that are open can be terminated).
3. You can filter the list of sessions using a combination of other properties:
    - **User**: Enter all or part of a user name. You can use wildcard characters (* or ?) anywhere in the search string.
    - **Realm**: Select a realm, or all realms.
    - **Community**: Select a community, or all communities. If you selected a realm, the communities you see in this list are restricted to those that are associated with it.
    - **Zone**: Select a zone, or all zones.
    - **Agent**: Select an agent or All access agents, or specify that none have been activated (translation only).
    - **Platform**: Select a platform or All platforms.
4. There are two ways to terminate sessions manually in AMC. Only open sessions—those for which there is either a license or those that can be resumed—can be terminated. Select the checkbox next to any session you want to end, or select the checkbox at the top to select all the users in the list, and then click one of the session termination buttons:
    - **Terminate session** – When you click **Terminate session**, all connections associated with the selected sessions are terminated. This is a good way to free up a license from an idle session, for example. Termination occurs on a session-by-session basis, so if a user has several sessions you can be selective about which ones you end. The user whose session was terminated can immediately reauthenticate and log in to the appliance.
    - **Terminate session - restrict logins** – This type of termination is the same as above, but there is a ten-minute interval during which the user is not allowed to generate new sessions. If there are any existing sessions, they can be used, but until ten minutes elapse, no new sessions can be created. This is the type of termination you would use, for example, if you wanted to end all of a user's sessions and prevent any new ones from being established while you remove his or her credentials from the authentication store.

Viewing User Access and Policy Details

If a user is experiencing trouble with a session—for example, he is logged in but cannot establish a connection or is denied access to resources—you can use the **Session Details** page to diagnose the problem. It enables you to troubleshoot a session, whether or not it's still active, by assessing its status, determining why a user's device is classified into a particular zone, and discovering what policy rules are applied, editing them as needed.

To view user session details:

1. From the main navigation menu, click **User Sessions**.
2. Click the username link for the session you want more details about; if needed, narrow the displayed list by setting filters, and then click **Refresh**.
    - To troubleshoot access to resources, look at the **Access requests** list. You can expand a list item to see the access control rule that determined whether this particular connection request should be allowed or denied. If the rule still exists, you'll also see a link for editing the item.
    - Information for resources accessed using application access control identify the client software and platform for the session, the application used to access the resource, and the rule that allowed or denied access.
    - An End Point Control zone classifies a connection request based on the presence or absence of a device profile. On the **Zone classification** page you can see what EPC zones (if any) were evaluated during this session and what the outcome of each evaluation was. In this example, the mobile device was placed in the *Pocket PC* zone, but it did not match the *Equipment ID* device profile.
    - If the user's session has any current Connect Tunnel connections, they are listed by IP address on the **Active connections** page. Other access agents are not listed here because they do not keep the VPN connection open.
    - If the user connected using a personal device, device and authorization information is provided on the **Device Authorization** page. Users who were denied access because they did not accept the authorization terms are also identified on this page.
    - If the user connected using application access control, information about the applications found on the end point that are under control are also identified.

Exporting User Session Data

User session data can be exported from AMC to a comma-separated (CSV) file that can be displayed and edited in Microsoft Excel. Once user session data is exported to a CSV file, you may archive user session data indefinitely, create custom reports without using Secure Mobile Access Advanced Reporting (AAR), or use the file for any other special needs.

To export user session data to a CSV file:

1. From the main navigation menu, click **User Sessions**.
2. Optionally, filter the displayed user data so that only the data you want to export is displayed. See Viewing User Sessions for additional filtering information.
3. Click the **Export** button located at the top of the user session data.

    NOTE: The Export button is enabled only if the Administrator has view access to the **User Sessions** page.

4. When the Windows File Download dialog appears, click the **Save** button.

5 Select the location on the local computer and file name where user data should be saved or use the defaults. The default file name is UserSessions.csv and default location is your `Downloads` folder.

6 Click the **Save** button to export user session data to the csv file. All user sessions that meet the current filter criteria are exported.

The CSV file may include the information shown in the User session data table for each user session, depending on the filters used.

User session data

Type of data	Description
System Version	Secure Mobile Access version number
Session ID	Unique numeric ID used to identify the session internally
State	State of user session: **Login Failed**, **Licensed**, **Idle**, or **Ended**
Username	Short username
Long Username	Full username and realm, including Common Name (CN) for AD/LDAP sessions
Start Time	Session start time in MM/DD/YYYY HH:MM:SS format, uses appliance local time
End Time	Session end time in MM/DD/YYYY HH:MM:SS format or blank if session is Idle or Licensed
Elapsed Seconds	Seconds between the session start and end times or start and current time for active and idle sessions
Average Bytes per Minute (Last Hour)	Average bytes (upload and download) per minute used by session over the last hour, used to determine high-usage users/sessions
Total bytes	Total number of bytes uploaded and downloaded by session
Realm	Realm name used to authenticate the user
Community	Community name the user was placed in
Zone	Zone the user/device was placed in
EPC Agent	End Point Control Agent used: Cache Cleaner
Access Agents	Access Agents used: Web only, Tunnel, Tunnel (ESP), OnDemand, Web Proxy, or Exchange
Remote Address	IP address of the client computer
Local Address	Local address assigned to the client connection, left blank for non-tunnel sessions

Following is an example of a user session `CSV` file generated by AMC:

Version,SessionID,State,Username,LongUsername,StartTime,EndTime,ElapsedSeconds,AverageBytesPerMinute LastHour,TotalBytes,Realm,Community,Zone,EPCAgent,AccessAgents,RemoteAddress,LocalAddress

```
10.6.1-auto404320,7,Ended,"ljones@am.us.sonicwall.com","(ljones)@(snwl) (CN=Laura
Jones,OU=Users,OU=Engineering,OU=AM Domain
Users,DC=am,DC=us,DC=sonicwall,DC=com)",03/09/2012 03:35:05,03/09/2012
03:36:41,96,120750,205276,"snwl","Default community","Default Zone","","Web
only",10.10.10.1,
```

SNMP Configuration

If you have an SNMP (Simple Network Management Protocol) tool, you can use it to monitor the appliance as an SNMP agent. The appliance supports SNMP versions 2 and 3, and provides a variety of management data in Management Information Base (MIB) II format.

You can enable SNMPv2 or SNMPv3, but not both at the same time. When SNMPv2 is enabled, SNMPv3 requests are ignored. When SNMPv3 is enabled, SNMPv2 requests are ignored. You can also disable SNMP support entirely, in which case any SNMP request directed at the system will be ignored and no traps will be generated.

SNMPv3 addresses the security deficiencies that have plagued both SNMPv1 and SNMPv2. SNMPv3 supports all the operations defined by versions 1 and 2. The new security functionality provided by SNMPv3 can be generally divided into three principle areas: authentication, privacy (encryption), and access control.

Where authentication in SNMPv2 was provided, insecurely, by the clear text community string, authentication in SNMPv3 uses the SHA algorithm to provide secure authentication. For each SNMP user, both a username and a passcode as well as the desired algorithm are configured on the agent (in our case, the SMA appliance) and must match the username, passcode, and algorithm choice provided to the management software that will be communicating with the appliance.

Prior to SNMPv3, all communications were unencrypted. In SNMPv3, the AES algorithm is used to encrypt and decrypt SNMP messages. As with authentication, a username, password and encryption algorithm are used to seed the encryption and must be configured on both the agent and the management station.

The combined authentication and encryption levels supported by Secure Mobile Access for SNMPv3 are shown in the Combined authentication and encryption levels table.

Combined authentication and encryption levels

Level	Authentication	Encryption	Effect
noAuthNoPriv	Username	No	Uses a username match for authentication.
authNoPriv	SHA	No	Provides authentication based on the HMAC-SHA algorithm.
authPriv	SHA	AES	Provides authentication based on the HMAC-SHA algorithm. Provides AES encryption in addition to authentication.

The SMA EX Series supports a subset of SNMPv3 functionality, designed to utilize the security benefits of the protocol while minimizing administrative complexity. At this time, access control as defined in the SNMPv3 specification is not supported. The addition of SNMPv3 functionality does not change in any way the management information that is reported by the appliance – this is exactly the same as it was in prior releases.

Topics:

- Configuring SNMP
- Downloading the MIB File
- Retrieving Management Data Using SNMP
- MIB Data

Configuring SNMP

This section describes how to configure SNMP settings in AMC.

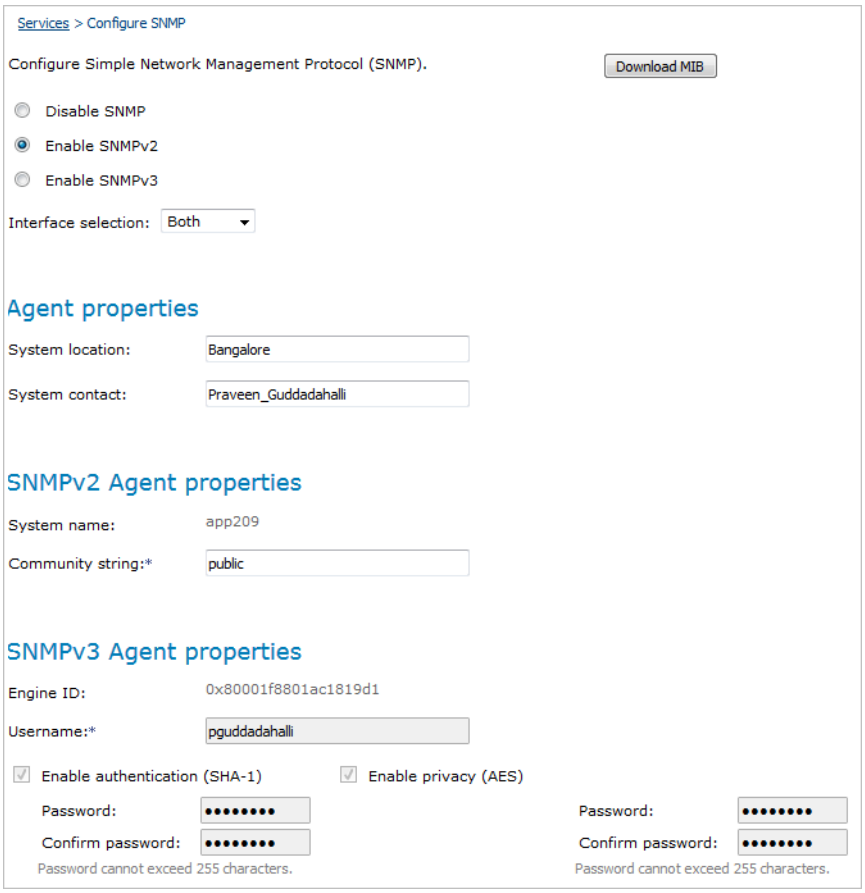
NOTE:

- You must configure your SNMP manager with the Management Information Base (MIB) used by the appliance. The appliance supports version 4.2.3 of the University of California, Davis (UCD) MIB, and MIB II. For SNMPv2, you must also configure your SNMP manager with the community string required to query the appliance. For SNMPv3, configure your SNMP manager with the same username, passcode, and algorithm choice as configured on the appliance.
- Ensure that your internal firewalls are configured to allow port 161/udp traffic.

To configure SNMP:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 Under **Network services**, click the **Configure** link for **SNMP**.



3 To enable SNMP, select either the **Enable SNMPv2** or the **Enable SNMPv3** radio button. (If you leave this page to configure SNMP hosts before clicking **Save**, the status of this setting will not be saved.) To disable SNMP, select the **Disable SNMP** radio button and then click **Save**.

4 Select the network interface you want SNMP to use by selecting the appropriate option (**Internal**, **External**, or **Both**) from the **Interface selection** drop-down menu.

5 Under **Agent properties,** describe the appliance agent in the **System location** and **System contact** fields. For example, you might specify the physical location of the appliance (for example, *Server lab*) and the system administrator contact information (such as *Jim Jamerson, 206-555-1212*)**.**

6 If using SNMPv2, under **SNMPv2 Agent properties**, type the string your network management tool uses to query the SMA appliance in the **Community string** field. This field is required, and set to **public** by

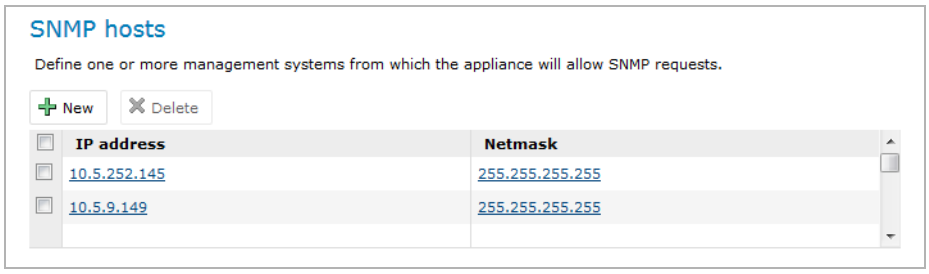
default. It is a good security practice to change your community string to a different passphrase because **public** is not secure.

7 If using SNMPv3, under **SNMPv3 Agent properties**, type the user name your network management tool uses to query the SMA appliance in the **Username** field.

8 To enable secure authentication, select the **Enable authentication (SHA-1)** checkbox, and type the password into the **Password** and **Confirm password** fields. MD5 is not supported, as SHA-1 is more secure.

9 To enable encryption for privacy, select the **Enable privacy (AES)** checkbox, and type the password into the **Password** and **Confirm password** fields. DES is not supported, as AES is more secure.

10 Under **SNMP Hosts**, define the management systems from which the appliance will allow SNMP requests. You can allow the request to come from any host by typing `0.0.0.0` for both the IP address and the subnet mask. Keep in mind, however, that the trade-off for this convenience is decreased appliance security.



a In the **SNMP hosts** area, click **New**.

b Type the **IP address** and a **Netmask** for the host, and then click **OK**.

11 Under **Trap receivers**, select the **Enable support for SNMP traps** checkbox to enable traps being sent. You can clear the checkbox to disable traps from being sent.

If traps are enabled then all traps will be sent to all hosts defined in the list. If traps are disabled then the list of hosts will be ignored.

12 Define the management systems to which the appliance will send SNMP traps.

a In the **Trap receivers** area, click **New**.

b Type the **IP address** and a **Netmask** for the host, and then click **OK**.

13 Click **Save**.

Downloading the MIB File

AMC enables you to download the Secure Mobile Access MIB file, which adds VPN-specific data to already supported MIBs. See MIB Data for details on the information provided by the MIB.

To download the MIB:

1 From the main navigation menu, click **Services**.

2 Under **Network Services**, click the **Configure** link for **SNMP**.

3 Click the **Download MIB** button. A file download message appears.

4 Click **Save**, browse to the correct directory, and then save the `SMA1000CustomMibs.tar` file.

Retrieving Management Data Using SNMP

SNMP data is arranged in a standardized hierarchy made up of structured text files that describe valuable management data. These text files (called MIBs) contain descriptions of specific data variables, such as system information or status.

NOTE: For more information on MIB II (including an explanation of the MIB II variable names), see http://www.ietf.org/rfc/rfc1213.txt.

To retrieve information through SNMP, you query the system for an object identifier, or OID. Each OID includes a text name, but is usually referenced using a number. For example, the OID for system uptime (**sysUpTime**) is `1.3.6.1.4.1.674.3`.

If you don't have an SNMP management package, you can retrieve SNMP data by connecting to the appliance, logging in as *root*, and then running the **snmpwalk** or **snmpget** command. For example, to retrieve information about disk space availability, you could type the following **snmpwalk** command to query OID `1.3.6.1.4.1.2021.9`:

```
# snmpwalk -v 2c -c public localhost 1.3.6.1.4.1.674.9
```

To view a list containing all MIB variables, type:

```
snmpwalk -v 1 -O n localhost -c public |more
```

This command returns a list like this:

```
.1.3.6.1.2.1.1.1.0 = Linux E-Class SRAvpn 2.4.20_004 #1 SMP Thu Apr 10 14:35:50 PDT
2017 i686
.1.3.6.1.2.1.1.2.0 = OID: .1.3.6.1.4.1.2021.250.10
.1.3.6.1.2.1.1.3.0 = Timeticks: (1707979) 4:44:39.79
.1.3.6.1.2.1.1.4.0 = Root < root@localhost> (configure /etc/snmp/snmp.local.conf)
.1.3.6.1.2.1.1.5.0 = E-Class SRAvpn
.1.3.6.1.2.1.1.6.0 = Unknown (configure /etc/snmp/snmp.local.conf)
.1.3.6.1.2.1.1.8.0 = Timeticks: (7) 0:00:00.07
.1.3.6.1.2.1.1.9.1.2.1 = OID: .1.3.6.1.2.1.31
..
```

To view a list containing all MIB names (which are helpful for use with the **snmpget** command) type:

```
snmpwalk -O S localhost -c public |more
```

This command returns a list like the following:

```
SNMPv2-MIB::sysDescr.0 = Linux E-Class SRAvpn 2.4.20_004 #1 SMP Thu Apr 10 14:35:50
PDT 2003 i686
SNMPv2-MIB::sysObjectID.0 = OID : SNMPv2-SMI::enterprises.2021.250.10
SNMPv2-MIB::sysUpTime.0 = Timeticks: (1712451) 4:45:24.51
SNMPv2-MIB::sysContact.0 = Root (configure /etc/snmp/snmp.local.conf)
SNMPv2-MIB::sysName.0 = E-Class SRAvpn
SNMPv2-MIB::sysLocation.0 = Unknown (configure /etc/snmp/snmp.local.conf)
SNMPv2-MIB::sysORLastChange.0 = Timeticks: (7) 0:00:00.07
SNMPv2-MIB::sysORID.1 = OID: IF-MIB::ifMIB
..
```

MIB Data

The MIB modules reference object identifiers (OIDs) or text names that provide information about the SMA appliance; see the MIB data table.

MIB data

MIB data	For more detailed information
System information	MIB Data: System Information Module
System health	MIB Data: System Health Module
Service health	MIB Data: Service Health
Security history	MIB Data: Security History Module
Network tunnel service	MIB Data: Network Tunnel Service Module
System traps	MIB Data: Traps
Other SNMP data	MIB Data: Other SNMP Data

MIB Data: System Information Module

The OIDs in the System Information module provide basic information about the appliance.

MIB Data: System Information module

Item	OID	Description
version	`1.3.6.1.4.1.674.1.1.0`	The version of Secure Mobile Access firmware running on this node in `major.minor.micro-hotfix-build` format (for example, `12.1.1.1-128`).
Hardware model	`1.3.6.1.4.1.674.1.2.0`	The model number of the appliance (for example, EX9000, EX7000, EX6000, SMA 7200, or SMA 6200). New model numbers may be added in the future.

MIB Data: System Health Module

The OIDs in the System Health module provide information about the operational status of the appliance.

MIB Data: System Health module

Item	OID	Description
Currently logged in	`1.3.6.1.4.1.674.2.1.1.0`	The number of currently authenticated active user sessions.
Maximum licensed users	`1.3.6.1.4.1.674.2.1.3.0`	The maximum number of active user sessions for which the appliance (or cluster of appliances) is licensed.
Current connections	`1.3.6.1.4.1.674.2.2.1.0`	The number of concurrent connections currently being serviced by the appliance (or cluster of appliances).
CPU utilization	`1.3.6.1.4.1.674.2.3.0`	The percentage of the CPU (or sum of CPUs, on a dual-processor machine) being used on a single appliance node over a time span of five seconds.
RAM utilization	`1.3.6.1.4.1.674.2.4.1.0`	The current virtual memory (RAM) percentage in use.

MIB Data: System Health module

Item	OID	Description
Swap utilization	1.3.6.1.4.1.674.2.4.2.0	The current virtual memory (swap) percentage in use.
Log utilization	1.3.6.1.4.1.674.2.9.0	The percentage of the log file disk partition being used.
Peak logged in	1.3.6.1.4.1.674.2.1.2.0	The maximum number of authenticated, active user sessions since the last reset; the reset interval is 24 hours.
Peak connections	1.3.6.1.4.1.674.2.2.2.0	The maximum number of concurrent appliance connections since the last reset; the reset interval is 24 hours.
Internal interface current throughput	1.3.6.1.4.1.674.2.5.1.0	Over a time span of five seconds, the current VPN throughput (inbound and outbound) in megabits per second as measured on the internal interface of the node.
Internal interface peak throughput	1.3.6.1.4.1.674.2.5.2.0	The peak VPN internal interface throughput (inbound and outbound) in megabits per second since the last reset.
External interface current throughput	1.3.6.1.4.1.674.2.5.3.0	Over a time span of five seconds, the current VPN throughput (inbound and outbound) in megabits per second as measured on the external interface of the node.
External interface peak throughput	1.3.6.1.4.1.674.2.5.4.0	The peak VPN external interface throughput (inbound and outbound) in megabits per second since the last reset.
Cluster interface current throughput	1.3.6.1.4.1.674.2.5.5.0	Over a time span of five seconds, the current mean average VPN cluster interface throughput (inbound and outbound) in megabits per second. The reset interval is 24 hours.
Cluster interface peak throughput	1.3.6.1.4.1.674.2.5.6.0	The peak VPN cluster interface throughput (inbound and outbound) in megabits per second since the last reset. The reset interval is 24 hours.

MIB Data: Service Health

The OIDs in the Service Health module shown in the MIB Data: Service Health module table provide information about the status of each service running on the appliance. For each service, the MIB provides a service ID, service description, and a service state of up or down.

MIB Data: Service Health module

Item	OID	Description
Service ID	1.3.6.1.4.1.674.3.1.1.1.1	The service ID for the AMC is 1.
	1.3.6.1.4.1.674.3.1.1.1.3	The service ID for the SonicWall Web proxy service is 3.
	1.3.6.1.4.1.674.3.1.1.1.4	The service ID for WorkPlace is 4.
	1.3.6.1.4.1.674.3.1.1.1.5	The service ID for syslog-ng (the process that writes out the E-Class SMA appliance log files) is 5
Service description	1.3.6.1.4.1.674.3.1.1.2.1	Appliance Management Console (AMC)

MIB Data: Service Health module

Item	OID	Description
	1.3.6.1.4.1.674.3.1.1.2.2	(Obsolete) Client /Server Access Service (AVPN)
	1.3.6.1.4.1.674.3.1.1.2.3	Secure Web access service (ExtraWeb). This is also referred to as “Web proxy service.”
	1.3.6.1.4.1.674.3.1.1.2.4	ASAP WorkPlace; this is the same as WorkPlace.
	1.3.6.1.4.1.674.3.1.1.2.5	Syslog-ng (the process that writes out the E-Class SMA appliance log files)
Service state	1.3.6.1.4.1.674.3.1.1.3.1	The current state of AMC: **1** (up) or **2** (down).
	1.3.6.1.4.1.674.3.1.1.3.3	The current state of the Web proxy service: **1** (up) or **2** (down).
	1.3.6.1.4.1.674.3.1.1.3.4	The current state of WorkPlace: **1** (up) or **2** (down).
	1.3.6.1.4.1.674.3.1.1.3.5	The current state of syslog-ng: **1** (up) or **2** (down).

MIB Data: Security History Module

The OIDs in the Security History module provide information on login and access denials.

MIB Data: Security History module

Item	OID	Description
Number of login denials	1.3.6.1.4.1.674.4.1.0	The number of login denials in the last 24 hours.
Last user denied login	1.3.6.1.4.1.674.4.2.1.0	The last user who was denied authentication, shown in the format `user@realm`.
Last denied login time	1.3.6.1.4.1.674.4.2.2.0	The time and date when the last user was denied authentication. The string is in the form `Wed May 30 21:49:08 2017`, in the same time zone for which the appliance is configured.
Number of access denials	1.3.6.1.4.1.674.4.3.0	The number of access denials in the last 24 hours.
Last user denied access	1.3.6.1.4.1.674.4.4.1.0	The last user who was denied access, shown in the format `user@realm`.
Last resource access denied	1.3.6.1.4.1.674.4.4.2.0	The URL, `host:port` or `host` of the last resource to which access was denied.
Last access denied time	1.3.6.1.4.1.674.4.4.3.0	The time and date when the last user was denied access. The string is in the form `Wed May 30 21:49:08 2017`, in the same time zone for which the appliance is configured.

MIB Data: Network Tunnel Service Module

The OIDs in the NG Server module provide information status of the network tunnel service.

MIB Data: Network Tunnel Service module

Item	OID	Description
NG server state	1.3.6.1.4.1.674.5.1.0	The current state of the network tunnel service: Active, Down, or Crashed.
Number of client address pools	1.3.6.1.4.1.674.5.2.0	The number of client address pools assigned to the network tunnel service.
Client address pool range table	1.3.6.1.4.1.674.5.3	A table showing how many IP address pools are currently active and their IP address ranges.
Client address pool entry	1.3.6.1.4.1.674.5.3.1	The number of currently active IP address pools.
Client address pool ID	1.3.6.1.4.1.674.5.3.1.1.0	An ID number assigned to an IP address pool.
Client address pool utilization	1.3.6.1.4.1.674.5.3.1.2.0	Percentage of virtual IP addresses (VIPs) that are issued from a client address pool.
Client IP address pool start range	1.3.6.1.4.1.674.5.3.1.3.0	The starting IP address of a client IP address pool range
Client address pool end range	1.3.6.1.4.1.674.5.3.1.4.0	The ending IP address of a client IP address pool range.
Number of NG SLL tunnels	1.3.6.1.4.1.674.5.4.0	Total number of active network tunnels.
SSL tunnel table	1.3.6.1.4.1.674.5.5	A table showing network tunnel statistics.
SSL tunnel ID	1.3.6.1.4.1.674.5.5.1.1.0	An ID number assigned to a network tunnel session.
SSL tunnel user	1.3.6.1.4.1.674.5.5.1.2.0	The user name associated with a network tunnel session.
SSL tunnel VIP	1.3.6.1.4.1.674.5.5.1.3.0	The virtual IP address (VIP) associated with a network tunnel session.
Number of flows per tunnel	1.3.6.1.4.1.674.5.5.1.4.0	The number of data flows in a network tunnel session.
SSL Tunnel Uptime	1.3.6.1.4.1.674.5.5.1.5.0	Uptime statistics for a network tunnel session.

MIB Data: Traps

A trap is a message the SNMP agent sends to indicate that a significant event has occurred that needs an administrator's attention. To download the Secure Mobile Access MIBs, click **Services** in the main navigation menu, and then click **Configure** in the **SNMP** area. Click **Download MIB** to save a copy of the file (`SMA1000CustomMibs.tar`).

MIB Data: Traps

Item	MIB filename	Description
ngServerStateChange	*SonicWallNGServer*	The server core functionality depends on user space processes (*avssld* and *avpsd*) and two *avevent* kernel threads. The SNMP agent monitors these processes and when any of these go down this trap is triggered. The trap description specifies the component; for example, *avssld(0)*.

MIB Data: Traps

Item	MIB filename	Description
ngclientAddrPoolUtilizationWarning	*SonicWallNGServer*	This trap is triggered when the use of the client address pool exceeds the threshold.
asapServiceUp	SonicWallServiceHealth	A service on a single node system, identified by the IP address from which the trap is sent, is up. The *serviceDescription* OID is sent along with the trap.
asapServiceDown	SonicWallServiceHealth	A service on a single node system, identified by the IP address from which the trap is sent, has gone down. The *serviceDescription* OID is sent along with the trap.
cpuCapacityWarning	SonicWallSystemHealth	The heuristically determined percentage of CPU capacity used on a single node system has exceeded the capacity for a single node (*cpuCapacityUtilization*). *cpuCapacityUtilization* OID is sent along with the trap.
memoryCapacityWarning	SonicWallSystemHealth	The heuristically determined percentage of memory capacity used on a single node system has exceeded 90 percent of capacity (*memoryCapacityUtilization*). memoryCapacityUtilization OID is sent along with the trap.
logCapacityWarning	SonicWallSystemHealth	The percentage of log file disk space used on a single node system has exceeded 90 percent of the total capacity. logUtilization OID is sent along with the trap.
userLimitWarning	SonicWallSystemHealth	Notification is generated if the concurrent number of authenticated users on a single node system (*currentlyLoggedIn*) has reached 90 percent of the license capacity limit. currentlyLoggedIn OID is sent along with the trap.
userLimitReached	SonicWallSystemHealth	The number of currently authenticated, active user sessions on a single node system (*currentlyLoggedIn*) has reached the current license capacity limit. currentlyLoggedIn OID is sent along with the trap.
userLimitExceeded	SonicWallSystemHealth	The number of concurrent, authenticated users on a single node system has reached the current license capacity limit (*currentlyLoggedIn*) for authorized users. currentlyLoggedIn OID is sent along with the trap.
asapSystemUp	SonicWallSystemInfo	For a single appliance (not in an HA pair): the appliance from which the notification is sent (identified by IP address) is back online.
asapSystemDown	SonicWallSystemInfo	For a single appliance (not in an HA pair): the appliance from which the notification is sent (identified by IP address) is going offline.

MIB Data: Other SNMP Data

the MIB Data: Other SNMP data table shows some other information about the appliance that you can retrieve from the standard MIB file using SNMP.

MIB Data: Other SNMP data

Item	OID	Description
Service status table	1.3.6.1.4.1.674.2	Checks the status of any of the following services. The return data references the following process names. If a process status is listed as not running, an error is flagged. • apache2 (Web proxy service) • logserver (log server) • syslog-ng (syslog) • policyserver (policy server) In appliance version 8.9.0 and later, srvcmond (cluster manager) is replaced with a service named AVFM (Secure Mobile Access Flow Manager). AVFM does not appear in a process list on the appliance because it is run as a kernel module.
Disk space availability table	1.3.6.1.4.1.674.9	Checks disk space availability for the following partitions: "/", "/var/log", and "/upgrade". If the disk space on a partition drops below 10MB, an error is flagged.
Load average checks table	1.3.6.1.4.1.674.10	Checks the load average for intervals of one, five, or 15 minutes. An error is flagged if the load average is greater than 12 at the one-minute interval, or greater than 14 for the five- and 15-minute intervals.
Software version number table	1.3.6.1.4.1.674.50	Checks the current version of the SonicWall system software.
System name	1.3.6.1.4.1.674.0	Checks the name of the system.

Managing Configuration Data

The configuration data for your appliance is stored in a single export archive (.aea) file that includes the types of configuration data shown in the Configuration Data types table.

Configuration Data types

Type of configuration data	Description
Access policy	Rules, resources, users and groups, WorkPlace shortcuts, and EPC signatures and zones.
Certificates	Certificates, private keys, and certificate passwords.
WorkPlace customization	General appearance settings, custom content, and custom templates.
Node-specific and network-specific settings	Host names, IP addresses, default route information, DNS settings, and cluster settings.

It's a good practice to back up the configuration data on your appliance, especially if you are working on system changes and may need to revert to an earlier configuration. For example, if you plan to add new access control rules, first save your configuration, and then make your changes: you can then revert to the saved (working) configuration if the new rules don't work as expected.

There are several options for saving and restoring configuration data:

- Export configuration data to a local machine, and later import it. Exporting involves the complete set of configuration data, but it is possible to do just a partial import. See Exporting the Current Configuration to a Local Machine and Importing Configuration Data for more information.

- Save and restore configuration data files on the appliance. This involves the complete set of configuration data: you cannot save or restore a partial configuration. For more information, see Saving the Current Configuration on the Appliance and Restoring or Exporting Configuration Data Stored on the Appliance.
- You can export the policy from an older SonicWall Secure Mobile Access appliance and import it to a newer one, provided the older appliance, in general, predates the newer one by no more than three versions. See the *SMA 12.1 Upgrade Guide* for information on supported platforms and see Updating the System for a description of the version number conventions that SonicWall uses.

CAUTION: Only configuration data that was generated by AMC is saved or exported. If you have made manual edits (by editing the SonicWall files on your appliance directly), these changes are not included. Manual changes are rare and usually done with the help of SonicWall Technical Support.

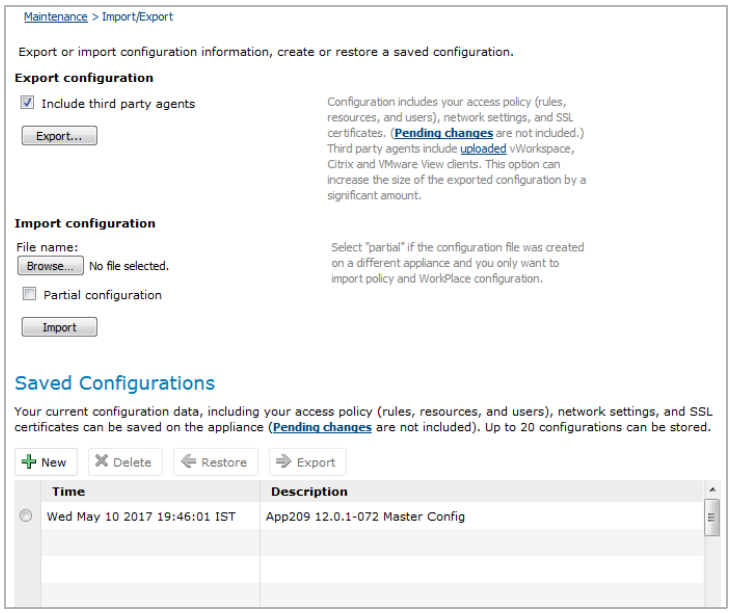
Topics:

Exporting the Current Configuration to a Local Machine

You can export your complete set of appliance configuration data to a local machine (you cannot export a partial configuration). Only saved changes are included; changes that are pending when you export a configuration are discarded.

To export the current configuration:

1. From the main navigation menu under **System Configuration**, click **Maintenance**.
2. In the **System configuration** area, click **Import/Export**.



3 Click **Export**. The **Export Configuration** page appears, and a **File Download** dialog prompts you to open the `SonicWallSMAAppliance-<date>-<nnn>.aea` file or save it to your hard drive.

4 Click **Save**, browse to the correct directory, and then save the `.aea` file.

5 Click **OK** on the **Export** page.

Saving the Current Configuration on the Appliance

In contrast to exporting, saving configuration data stores it on your appliance (up to 20 saved configurations can be stored). You cannot save a partial configuration, and only changes that have been applied are included.

To save configuration data on the appliance:

1 From the main navigation menu, click **Maintenance**.

2 In the **System configuration** area, click **Import/Export**.

3 Click **New** in the **Saved Configurations** list.

4 Describe this configuration in the **Description** field and (if there are multiple administrators) it is a good practice to identify who is saving it. For example, an entry might read as follows: `Saved by MIS before adding access control rules for mobile devices.`

5 Click **Save**. The current configuration data is stored on the appliance and added to the **Saved Configurations** list.

Importing Configuration Data

Exporting always involves the complete set of configuration data, but it is possible to do just a partial import (for example, if you want to import only policy and WorkPlace settings).

the Configuration Data for importing table describes the types of data that you can import into an existing AMC configuration:

Configuration Data for importing

Type of configuration data	Description
Partial configuration	• **Access policy:** Includes rules, resources, users and groups, and EPC device profiles and zones. • **WorkPlace customization:** Includes general appearance settings, custom content, shortcuts, and custom templates. • **CA certificates:** Includes the CA certificates that are used to secure authentication server connections, or back-end Web resources, with SSL. • **End Point Control:** If you use client certificates in device profiles, a partial configuration includes the CA that issued them to your users.
Entire configuration	• Partial configuration data (see the Partial configuration table). • **SSL certificates:** Includes certificates for AMC and the appliance, along with private keys and passwords. • **Node-specific and network-specific settings:** Includes host names, IP addresses, default route information, DNS settings, administrator accounts, and cluster settings.

To import a full or partial configuration:

1 From the main navigation menu, click **Maintenance**.

2 In the **System configuration** area, click **Import/Export**.

3 In the **File name** box, type the path of the appropriate file (`SonicWallSMAApplianceVPN-<date>-<nnn>.aea`), or click **Browse** to locate it.

4 Click **Partial configuration** if you want to import just the items listed in the table above.

5 Click **Import**. To activate the imported configuration, you must apply changes. See Applying Configuration Changes for more information.

NOTE:

- If an import fails, you can view details in the `Management message log` file.
- If you import a configuration while other configuration changes are pending in AMC, the pending changes are overwritten.
- You can import the policy from an older Secure Mobile Access appliance, provided the older appliance predates the newer one by no more than three versions. For example, you cannot import the policy configuration from versions earlier than 11.4 to your 12.1 appliance.
- You cannot import a configuration from a single node onto a high-availability cluster, or from a cluster configuration onto a single node.

Restoring or Exporting Configuration Data Stored on the Appliance

Follow these steps to restore a configuration file that is stored on the appliance. (To specify configuration data that is stored on a local machine instead of the appliance, use the import feature. See Importing Configuration Data for more information.) Only a full configuration data file can be restored; you cannot restore a partial configuration.

To restore or export configuration data stored on the appliance:

1 From the main navigation menu, click **Maintenance**.

2 In the **System configuration** area, click **Import/Export**.

3 Select a configuration from the **Saved Configurations** list.

4 Restore the configuration or export it to a local machine:

- Click **Restore**. Restoration of the selected configuration begins immediately. After the restore is complete, click **Pending changes** to apply the new configuration. The restored configuration remains in the list.
- Click **Export** to save a copy of the configuration to a local machine.

Upgrading, Rolling Back, or Resetting the System

SonicWall periodically offers software updates that add new functionality or address existing issues. An update is delivered as a compressed `.bin` file and can be in the form of:

- A *hotfix*, which addresses issues with a particular version of the appliance software and typically contains only the files that have changed from the original version.
- An *upgrade*, which is a new version of the software (the version number on the appliance is incremented).

Installing either kind of update, or rolling back to a previous version, can be done using AMC.

To view the current version of the system, click **System Status** or **Maintenance** from the main navigation menu. If any hotfixes have been applied, you can view the list by clicking the **hotfixes** link.

Topics:

- Updating the System
- Rolling Back to a Previous Version
- Resetting the Appliance

Updating the System

You can find system updates (hotfixes and upgrades) on the MySonicWall Web site. To access www.mysonicwall.com, you must first create an account, which is described in Creating a MySonicWall Account. After you have an account, new system updates and documentation are available in the **Download Center** on the Web site.

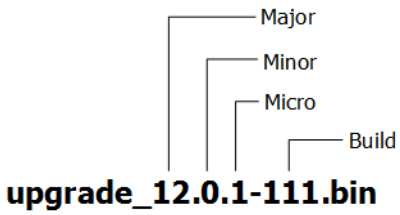
Topics:

- Naming Conventions for Upgrades
- Naming Conventions for Hotfixes
- Installing System Updates

Naming Conventions for Upgrades

SonicWall uses this syntax, described in Naming conventions for upgrades to describe version numbers for upgrade files:

```
upgrade-<major>.<minor>.<micro>-<build>.bin
```



NOTE: To find out if any hotfixes have been applied, click **System Status** or **Maintenance** from the main navigation menu.

The version number for AMC (displayed in the bottom-left corner of every AMC page) and client software follows a similar pattern:

```
<major>.<minor>-<micro>-<build>
```

Naming conventions for upgrades

Name	Description
major	The major release number. If this is the only number that is present, it indicates that this release contains significant new features plus fixes. It also indicates that it contains a full image of the entire system.
minor	The minor release number. If the version number contains only the major and minor numbers, it indicates that this release contains incremental features plus fixes. It also indicates that it contains a full image of the entire system.
micro	The micro release number. If the version number contains only the major, minor, and micro numbers, it indicates that this release contains a small number of features plus fixes. It also indicates that it contains a full image of the entire system.
build	An internal build number used by SonicWall. All releases contain a build number.

Naming Conventions for Hotfixes

Between releases, SonicWall may issue a hotfix that replaces a subset of the software files on your SMA appliance. Hotfix filenames use this naming convention:

`<component>-hotfix-<version>-<hotfix number>`

where the Naming conventions for hotfixes table defines `<component>`.

Naming conventions for hotfixes

Component	Description
Pform	Appliance Management Console
clt	Client software

NOTE: To check whether any hotfixes have been applied, click **System Status** or **Maintenance** from the main navigation menu. If any hotfixes have been incorporated, you'll see a **hotfixes** link next to the version number. Click the link for more information about which ones have been applied.

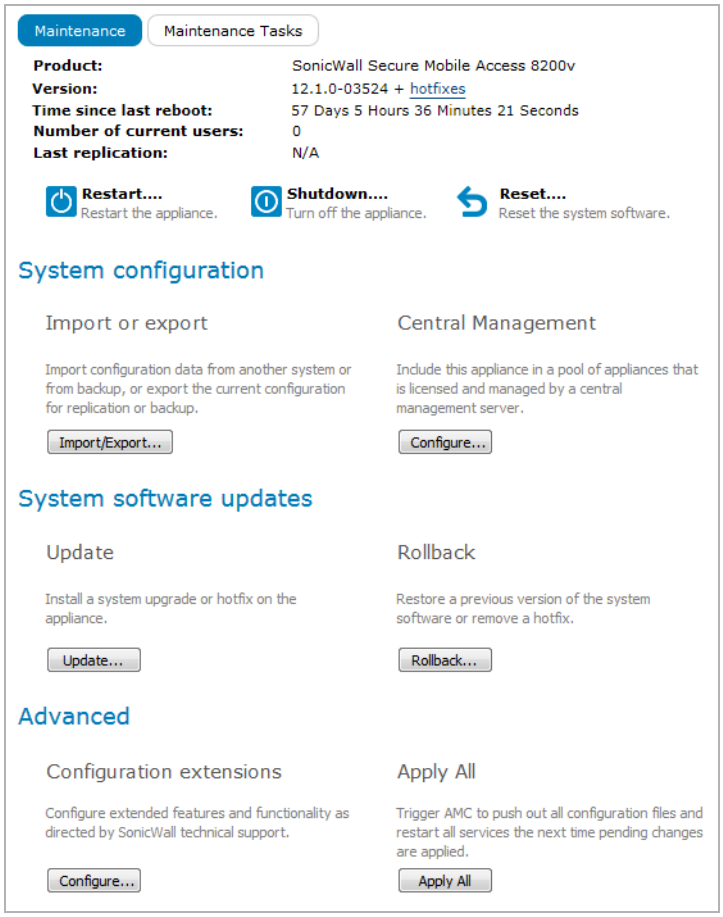
For example, `Pform-hotfix-12.1.1,1-279` is hotfix 001 for version 12.1 that fixes a problem in Appliance Management Console.

Installing System Updates

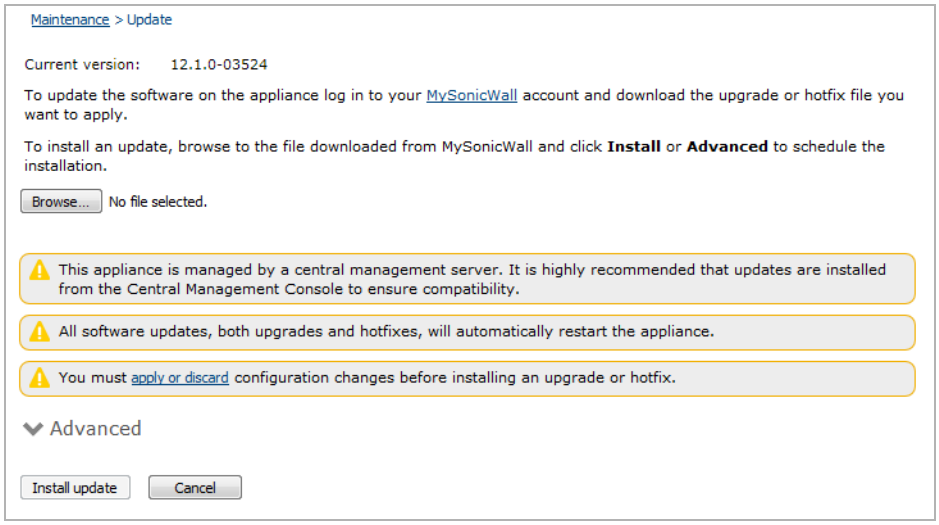
You can use AMC to install version upgrades and hotfixes manually or automatically at a scheduled time.

To download and install a system upgrade or hotfix manually:

1 From the main navigation menu in AMC under **System Configuration**, click **Maintenance**.



2 In the **System software updates** area, click **Update**.



3 If you have not already downloaded the upgrade or hotfix file, click the Web site link (login required) and download the appropriate file from www.mysonicwall.com to your local file system.

4 Type the path of the file, or click **Browse** to locate it.

5 Click **Install Update**. A file upload status indicator appears. If necessary, you can click **Cancel** to stop the upload process.

   After the file upload process is complete, the update is automatically installed on the appliance. You cannot cancel the installation process. After the installation process is complete, the appliance automatically restarts.

6 After the appliance restarts, log in to AMC and verify the new version number in the bottom-left corner of the AMC home page.

NOTE: If you see an error message indicating that a upgrade file is invalid or corrupt, follow the steps in Verify a Downloaded Upgrade File to see if the checksum for the file is correct.

Rolling Back to a Previous Version

From AMC, you can undo the most recent update installed on the system. If you experience problems after installing an upgrade or hotfix, you may want to use this feature to roll back to a known state. Each time you roll back, the most recent update is removed.

CAUTION: If you have made any configuration changes since you updated the appliance they will be lost if you restore a previous version of the system software. When you remove a hotfix, on the other hand, your configuration changes are preserved.

To roll back to a previous version:

1 From the main navigation menu in AMC, click **Maintenance**.

2 In the **System configuration** area, click **Rollback**.

3 To roll back to the version displayed on the **Rollback** page, click **OK**. After the rollback process is complete, the appliance automatically restarts and applies the changes.

4 After the appliance restarts, verify the new version number in the bottom-left corner of the AMC home page.

Resetting the Appliance

From AMC, you can reset your appliance using one of three reset levels. The mildest level erases your configuration information, log files, and the current firmware, but leaves you the option to roll back to a previous version, if one is loaded.

The second level removes all configuration, log files, and firmware from the appliance. With this option, you cannot roll back to a previous version.

The third level also removes all configuration, log files, and firmware from the appliance, and then securely erases the hard drive, which can take up to 45 minutes. If you select this option, you cannot roll back to a previous version.

There are a couple of scenarios in which a reset may be appropriate:

- You want to completely clean the machine and reuse it elsewhere.
- The appliance is in an unrecoverable state. In this case, you should contact SonicWall Technical Support and confirm that there is no other solution to your problem. A reset should be used only as a last resort to restore the appliance to a working condition.

To configure the appliance after it has been reset, you will need to use the LCD panel or serial console.

To reset the appliance:

1 Back up the configuration data on the appliance. You can do this:

- In AMC (see Exporting the Current Configuration to a Local Machine).
- By using Backup Tool (see Saving Configuration Data).

2 From the main navigation menu in AMC, click **Maintenance**.

3 Near the top of the page, click **Reset**.

4 On the **Maintenance > Reset** page, select one of the following three radio buttons under **Reset Options**:

- **Reset the current configuration** – This option erases your current configuration. If you upgraded from a previous version, selecting this option retains the ability to roll back.
- **Reset the entire appliance** – This option erases your configuration and deletes all firmware versions on the appliance. If you select this option, you cannot roll back to a previous version.
- **Securely erase the hard drive and reset the entire appliance** – This option erases your configuration, deletes all firmware versions, and securely erases the hard drive. If you select this option, you cannot roll back to a previous version.

  NOTE: Securely erasing the hard drive can take up to 45 minutes.

5 At the bottom of the page, click **Reset** to proceed with the reset. To cancel the reset, click **Cancel**.

To reset the appliance with a different version of the firmware:

NOTE: The purpose of the firmware downgrade capability is to permanently "downgrade" an appliance to a different base firmware version therefore it does **NOT** migrate the existing configuration or save any data / files from the appliance. It is the equivalent of a complete factory reset to an entirely new firmware base. All files and settings stored on the appliance will be permanently overwritten and the appliance will be set to factory defaults.

For more information and instructions on how to perform a firmware downgrade, see https://www.sonicwall.com/en-us/support/knowledge-base/170502558229507.

SSL Encryption

Encryption is used to ensure data security for all traffic on the appliance. The appliance encrypts all data using SSL. You must configure at least one cipher to be used with SSL to secure your network traffic. Select the "best" cipher from the available set, balancing security and performance trade-offs (security is weighted much more heavily than performance).

SSL provides some degree of protection from downgrade attacks, but in general you should configure your servers to permit only those ciphers that you consider strong enough for your needs. The cipher order, from most to least preferred, is:

- AES 256-bit, with SHA-256
- AES 128-bit, with SHA-256
- AES 256-bit, with SHA-1
- AES 128-bit, with SHA-1
- Triple DES, with SHA-1

NOTE: It may appear that the AMC always uses the AES 256-bit with SHA256 cipher for SSL handshaking irrespective of the cipher that is selected. However, the AMC actually uses the highest secure cipher for SSL handshaking, no matter which cipher is selected.

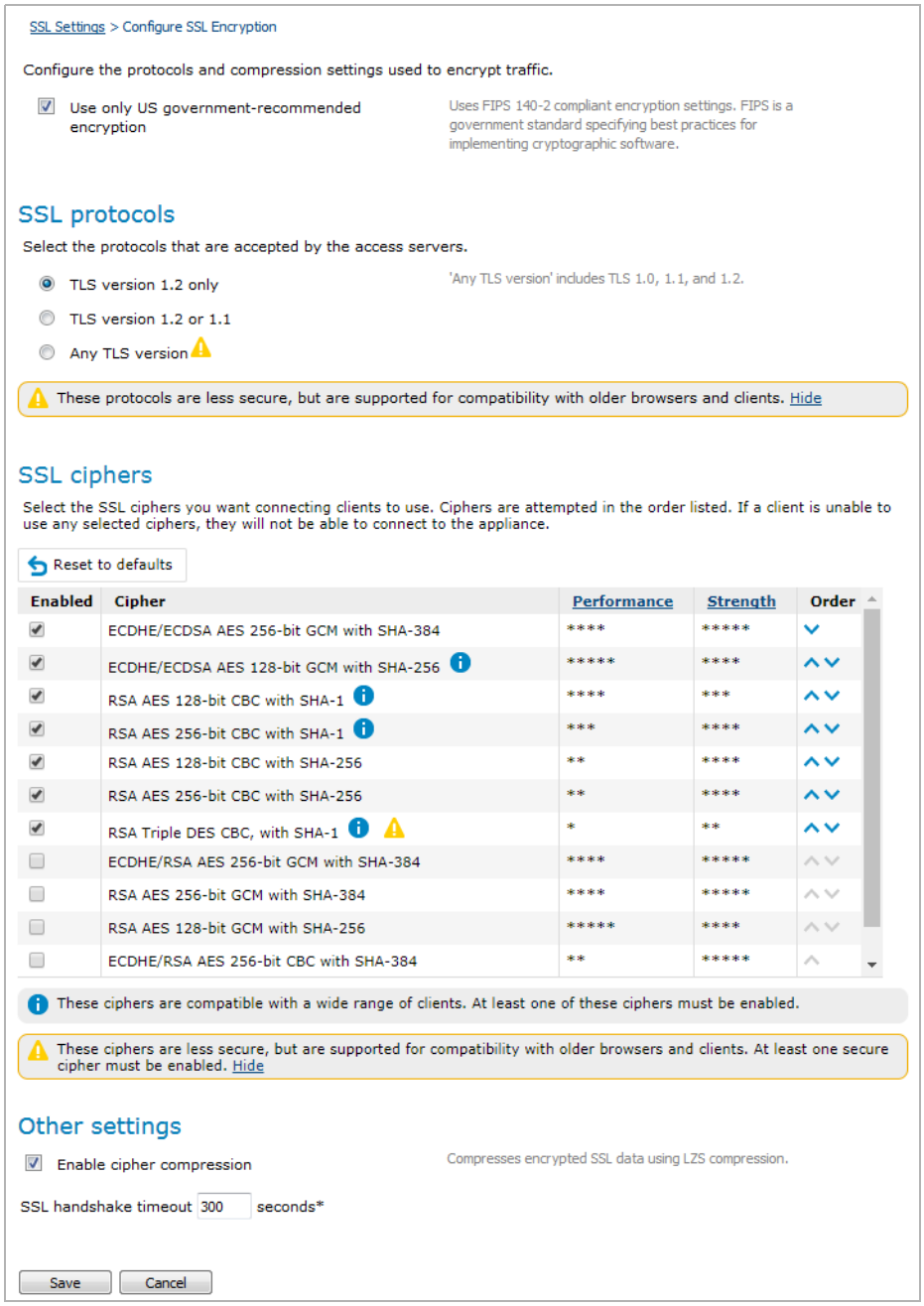
Configuring SSL Encryption

The appliance uses SSL encryption and other cryptographic algorithms—or ciphers—to secure data transfer. When configuring the encryption settings for the appliance, you must enable at least one cipher to be used in conjunction with SSL to secure your network traffic. The default settings are typically sufficient for most deployments.

To configure SSL encryption settings:

1 From the main navigation menu under **System Configuration**, click **SSL Settings**.

2 Click the **Edit** link in the **SSL encryption** area. The **Configure SSL Encryption** page appears.



3 Check the Use only government-recommended encryption checkbox to enable FIPS 140-2 compliant encryption settings. This configures the appliance to use only the TLS protocol and enables only FIPS-compliant ciphers.

   This option is often used to disable TLS 1.1 and 1.2 and the corresponding certificate notifications when SSL and CA certificates haven't been upgraded from TLS 1.0.

4 To enable FIPS 140-2 compliant encryption, check the transport protocols used to encrypt traffic. This configures the appliance to use only the TLS protocol and enables only FIPS-compliant ciphers.

5 Select the version of TLS transport protocol that the appliance will use.

6 Select the ciphers that the access services (Web proxy, network proxy, and network tunnel) on the appliance will accept for SSL connections.

7 To compress encrypted SSL data using LXS compression, check the **Enable cipher compression** checkbox.

8 In the **SSL handshake timeout** box, type the number of seconds that an SSL handshake can last before timing out. The default is **300**.

9 Click **Save**.

FIPS Certification

This section describes configuring your SMA appliance to use FIPS mode.

FIPS (Federal Information Processing Standard) 140-2 Level 2 is a validation standard for evaluating cryptographic modules, and includes stringent reviews of source code, algorithms, physical security, and operational testing on cryptographic security products. The United States Federal Government is required to purchase cryptographic products validated to the FIPS 140-2 standard. In the international marketplace, ISO19790 is being adopted as a standard and is a direct adaptation of FIPS 140-2.

The SonicWall E-Class SMA EX9000, EX7000, EX6000, SMA 7200, and SMA 6200 appliances have FIPS 140-2 Level 2 certification from NIST (the National Institute of Standards and Technology, the United States FIPS 140-2 Cryptographic Module Validation Authority) and CSE (the Communications Security Establishment, the Canadian FIPS 140-2 Cryptographic Module Authority).

NOTE: Version 10.7.2 and later are FIPS certified.

FIPS mode is transparent to end users. Internally, FIPS mode enforces secure communication and system integrity.

Topics:

- Requirements for FIPS
- Managing FIPS-Compliant Certificates
- FIPS Violations
- Enabling FIPS
- Exporting and Importing FIPS-Compliant Certificates
- Disabling FIPS
- Zeroization

Requirements for FIPS

These items are required to properly configure FIPS for full compliance:

- An EX9000, EX7000, EX6000, SMA 7200, or SMA 6200 appliance. No other appliances are FIPS-certified.

CAUTION: If you have purchased an EX9000, EX7000, EX6000, SMA 7200, or SMA 6200 appliance with 140-2 Level 2 FIPS certification, the tamper-evident sticker affixed to it must remain in place.

- A license to run FIPS
- A secure connection to your authentication server
- A strong administrator password, which should be at least 14 characters long and contain punctuation characters, numbers, and a combination of uppercase and lowercase letters. In addition, you must specify an authentication server when you set up a realm; `null auth` is not allowed.
- When in FIPS mode, the Grub shell MUST be disabled in order to prevent a user from gaining unauthorized access to its shell.

CAUTION: Modification of any Grub configuration files IS NOT allowed. Modification makes the device Non-FIPS compliant and causes the device to become inoperable.

These states prevent FIPS from being activated, or from reaching full compliance:

- Unsecured connections with authentication servers
- Use of RADIUS authentication servers
- Use of LDAP authentication servers without using SSL connections employing only FIPS approved ciphers
- Use of Active Directory single domain authentication servers without using SSL connections employing only FIPS approved ciphers
- Use of RSA ClearTrust authentication servers without using SSL connections employing only FIPS approved ciphers
- Use of RSA Authentication Manager authentication servers without strong passwords as shared secrets
- Use of USB devices for any purpose
- Loading or unloading of any kernel modules via the shell command line
- Installation of third party software via the shell command line
- Firmware upgrades via the shell command line
- Use of Debug 1, Debug 2, Debug 3 or plaintext logging
- Use of certificates with private/public key-pairs generated by a non-FIPS-compliant system
- Use of the zeroization procedure without the primary administrator being physically present until the procedure completes; see Zeroization

FIPS mode is not automatically enabled after you import your license. You must set it up as described in Enabling FIPS.

Managing FIPS-Compliant Certificates

Any keys generated on an EX9000, EX7000, EX6000, SMA 7200, or SMA 6200 appliance running in FIPS mode will be FIPS compliant. If you import certificates (and their associated public and private keys) to the appliance, it is your responsibility to make sure that they are also FIPS compliant. Certificates must be exported and then reimported when you switch FIPS mode on or off. For the export and import procedure, see Exporting and Importing FIPS-Compliant Certificates.

The best way to ensure that the certificates you're using are FIPS compliant is to generate all CSRs (certificate signing requests) on a FIPS-enabled appliance.

FIPS Violations

Your appliance validates its integrity several ways:

- A self test is performed at each power-on cycle to verify all FIPS approved cryptographic algorithms are functioning properly. If any of the self tests fail, the **Alarm LED** on the front panel will remain lit, a message detailing the specific failure will be displayed on the serial console and logged in `/var/log/aventail/fips.log`, and the appliance will be halted. You should power-cycle the appliance once to see if it recovers. If it does not, you will need to contact SonicWall Customer Support for further instructions.
- A continuous self test is performed on the random number generator and on the generation of new Certificate keys to verify the integrity of cryptographic operations. If any of these self tests fail, a message detailing the specific failure will be displayed on the serial console and logged in `/var/log/aventail/fips.log`, and the appliance will be immediately power-cycled via a reboot in order to perform the rigorous self-tests for system integrity.
- All critical security binaries are signed and hashed. Alterations to any of these binaries will be detected at each reboot and immediately on a running system. If this occurs during the power-cycle self tests, the **Alarm LED** on the front panel will remain lit, a message detailing the specific tampering will be displayed on the serial console and logged in `/var/log/aventail/fips.log`, the system will be halted and you will need to contact SonicWall Customer Support for further instructions. If this tampering is detected on a running system, the appliance will be immediately power-cycled via a reboot in order to perform the rigorous self-tests for system integrity.
- All critical security configuration files are signed and hashed. Manual alterations (as opposed to alterations made using the AMC) to any of the configuration files will cause the appliance to immediately transition into an error state. If this tampering is detected on a running system, the appliance will be immediately power-cycled via a reboot in order to perform the rigorous self-tests for system integrity. Otherwise, if it is detected during power-cycle self-tests, a message detailing the specific tampering will be displayed on the serial console and logged in `/var/log/aventail/fips.log`, the **Test LED** on the front panel remain lit and the system will be placed in single user mode with networking disabled. The primary administrator will need to log in via the serial console and restore tampered configuration files with valid backup copies or perform a configuration reset prior to power-cycling the appliance.
- Firmware upgrade files are signed and hashed. If an upgrade file fails its integrity check, the upgrade process is aborted without making any state changes to the appliance, a message detailing the failure is displayed on the AMC Web page, and the appliance remains fully functional.

Enabling FIPS

Before you enable FIPS mode, you must have a strong password, a secure connection to your authentication server, and a valid license.

Obtain your FIPS license as described in Software Licenses.

To be FIPS-compliant, your password must be at least 8 characters long, but it is recommended that you use at least 14 characters. Although this requirement is not enforced by the software, having a weak administrator password leaves you vulnerable. A strong password includes a mix of letters, numbers and symbols. Think of this as a phrase, not just a password. For instance, `I never saw @ purple cow, I never hope 2C1` has a combination of all three types of characters.

Only administrators with System rights can change the FIPS mode. When in FIPS mode, you will not be able to select non-compliant SSL algorithms.

To use your existing, FIPS-compliant certificates while in FIPS mode, export the certificates before enabling FIPS and then import them again after FIPS is enabled. See Exporting and Importing FIPS-Compliant Certificates.

To enable FIPS:

1 In the main navigation menu, click **General Settings**, then click **FIPS Security**.

2 Click **Edit**.

3 If you have imported your license, select the **Enable FIPS mode** checkbox.

NOTE: Existing certificates will be deleted from the system in the next step. To preserve your FIPS-compliant certificates, ensure that you have exported them.

4 Click **Save** and then apply your Pending changes.

CAUTION: When in FIPS mode, you cannot edit system configuration files.

If your appliance configuration is not FIPS-compliant, in the upper-right corner you will see an alert link that says **FIPS-compliance warning**. Click on the link for more information on how to bring your appliance configuration into FIPS-compliance.

CAUTION: The lack of this alert does not mean your environment is FIPS compliant. It is your responsibility to ensure all FIPS prerequisites are met in order to be FIPS compliant.

Exporting and Importing FIPS-Compliant Certificates

If you know your existing Certificate keys were generated on a FIPS-compliant system and you want to use them after FIPS is enabled, you must export them before enabling FIPS and then import them after FIPS is enabled.

Similarly, if you plan to disable FIPS mode on your system and you want to use your FIPS-compliant certificates after disabling FIPS, you must export them before disabling FIPS and then import them after FIPS is disabled.

To export Certificates before the FIPS-mode transition:

1 In AMC, navigate to **SSL Setting > SSL Certificates**.

2 For each certificate to export, do the following:

a On the **Certificates** table, select a certificate and click the **Export** button.

b Enter a password for encrypting the exported `.p12` file.

c Click the **Save** button.

To import certificates after the FIPS-mode transition:

1 In AMC, navigate to **SSL Settings > SSL Certificates**.

2 For each certificate to import:

a On the **Certificates** table, select **New > Import certificate...**.

b Select the certificate file to import.

c Enter the password with which the `.p12` file was encrypted.

d Click the **Import** button.

Disabling FIPS

Turning off FIPS disables the FIPS feature and removes all constraints imposed by the FIPS mode prerequisites.

CAUTION: Warning: To be fully FIPS compliant, no FIPS critical security parameters can be used outside of the FIPS approved mode of operation. A few of these parameters are burned into the firmware itself and thus to be fully compliant, zeroization must be performed. If you wish to continue using your system rather than returning the hardware to SonicWall for zeroization, and you are willing to knowingly skip zeroization, you can disable FIPS mode in the AMC. This will logically destroy all configurable parameters.

To use your existing, FIPS-compliant certificates after disabling FIPS mode, export the certificates before disabling FIPS and then import them again after FIPS is disabled. See Exporting and Importing FIPS-Compliant Certificates.

To disable FIPS:

1. From the main navigation menu, click **General Settings**, then click **FIPS Security**.
2. Click **Edit**.
3. Clear the box next to **Enable FIPS mode**.

   IMPORTANT: Existing certificates will be deleted from the system in the next step. To preserve your FIPS-compliant certificates, ensure that you have exported them.

4. Click **Save**, and then apply your **Pending changes**.

CAUTION: Your appliance will be rebooted to apply these changes. Any connections will be terminated.

Zeroization

Zeroization is the practice of permanently destroying all critical security parameters. This is accomplished by overwriting the entire disk with zeros. Zeroization makes it very hard to retrieve sensitive data from the appliance. It is used before recycling hardware, or in other cases where data security is more important than retaining the data. After this operation is completed, the appliance can no longer be used at your site and must be returned to SonicWall for replacement hardware to restore service.

To zeroize the appliance:

1. Select **Maintenance** from the main navigation pane of the management console.
2. Select **Reset**.
3. On the **Reset** page, select the type of reset you want to perform as explained in To reset the appliance:.
4. When the reset begins, stay physically present with the appliance until the appliance halts.

CAUTION: Your appliance can take up to 45 minutes to complete the zeroization process.

Software Licenses

This section describes how to manage software licenses for appliance components. The SMA appliance uses different types of licenses:

- **Administration test license:** When you receive your SMA appliance, you must log in to MySonicWall to retrieve your initial user license, which is valid for one user (the administrator plus one end user) for an

unlimited number of days. This allows you to become familiar with the AMC, which you will use to upload an appliance license file for additional users or other components.

- **Appliance licenses:** This license is used to monitor and enforce concurrent user counts. If you exceed your concurrent active user limit, user access is restricted until the active user count drops below the licensed user limit.

  Concurrent user support by SMA appliances is shown in the Concurrent user support by SMA appliance table:

  Concurrent user support by SMA appliance

This appliance	Supports concurrent users up to
EX9000	20,000
EX7000	5,000
SMA-8200v	5,000
SMA-7200	10,000
SMA-6200	2,000

  Depending on your licensing arrangements, however, you may be allowed to exceed the limit by a certain number of user sessions. In this case, user access is still allowed, but the excess usage is logged.

  If user access is restricted, users attempting to log in to your VPN see an error message indicating that the license count may have been exceeded, and they are denied access to your network.

- **Component licenses:** If the license for an appliance component has expired, users attempting to use that component see an error message in WorkPlace. In the case of a Spike License, the number of days remaining on it and how many users are covered by it are displayed in AMC.
- **Pooled licenses:** The pooled licensing model allows central user licenses to be shared among the managed appliances so that central user licensing is resilient to the failure of (or communication loss with) the CMS or any one appliance. For more information, see “Central User Licensing” in the *SMA 12.1 CMS Administration Guide*.

All license files must be retrieved from www.mysonicwall.com and imported to the appliance, as described in Managing Licenses.

Topics:

- How Licenses Are Calculated
- Viewing License Details
- Managing Licenses

How Licenses Are Calculated

A user license for the appliance does not represent a person, but rather a user authentication. If a user logs in to WorkPlace on a desktop computer, for example, and is also logged in on a mobile device, two licenses are consumed as soon as the user accesses a resource that’s protected by the appliance.

A license is released when a connection has been inactive for 15 minutes. How this inactivity is measured depends on the user’s access method:

- With translated, custom port mapped, or custom FQDN mapped Web access, the license is released after 15 minutes during which no resources are accessed.

- When Connect Tunnel is running, the connection to the appliance is kept open, which means that the license is in use as long as the tunnel is up. Once the tunnel is disconnected, the license is released after 15 minutes.

There are a few ways to restrict or end sessions:

- Restrict the number of licenses that a person can have on a per-community basis. When the limit is reached, no further appliance sessions (and no access to resources) are allowed. The user can start a new session only by terminating all existing sessions. For a description of the **Maximum active sessions** setting, see Assigning Members to a Community.
- Have tunnel client sessions terminate—on a per-community basis—when the time period set for **Credential lifetime** (on the **Configure General Appliance Options** page) is reached. For a description of the **Limit session length to credential lifetime** setting, see Ending User Sessions.
- Terminate a user session manually. See Viewing User Sessions for information on how to end user sessions in AMC. Also see Open vs. Licensed Sessions for more on the distinction between different types of sessions.

NOTE: Users who reach the limit of their appliance licenses and then attempt to authenticate with just a client certificate are not prompted to terminate all existing sessions. These users must terminate an existing session in order to free up a license and start a new one. The best method for terminating a session is for the user to log out, otherwise he or she must wait 15 minutes for the session to time out and a license to be released.

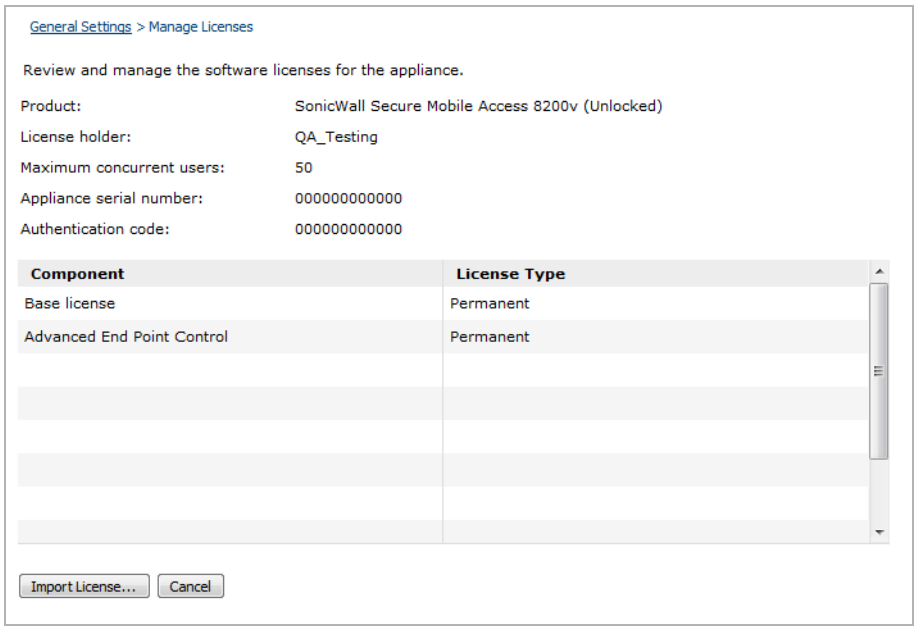
Viewing License Details

In AMC, you can view the status of your base appliance license and the licenses for any other appliance components you may have purchased, such as OnDemand or Spike License. This section describes how to view details about the status of your licenses.

To view license details:

1 From the main navigation menu under **System Configuration**, click **General Settings**.

2 Click the **Edit** link in the **Licensing** area. The **Manage Licenses** page appears.



3 Review the information provided, as shown in the Licence information table:

Licence information

License information	Description
Product	The type of SMA appliance to which the license applies.
License holder	The name of the entity to whom the appliance is licensed.
Maximum concurrent users	The maximum number of concurrent user sessions allowed by the base appliance license. A concurrent user is a single login from a single IP address. Users are not counted once they log off, or when their credentials expire. If a Spike License is in effect, you'll see the total number of allowed users, the number of days remaining for the license, and at what time the next day begins. For example: `Spike license: 100 users, 60 days Active: Currently on day 2 of 60. Day 3 will begin at 10:15 PM on 9/23/09.` You can pause the Spike License as needed; see Managing a Spike License for more information.
Appliance serial number	The serial number derived from the license file imported onto the appliance. This number is displayed at the bottom of the main navigation menu in AMC; you will need it if you contact Technical Support.
Authentication code	This is the appliance hardware identifier. The license you obtain from www.mysonicwall.com will be valid only for the appliance with this authentication code. See Managing Licenses for information on obtaining your license file.
Component and license type	Details about any individual software component licenses. If the license is a temporary or evaluation license, the expiration date is displayed. If a license expiration date is approaching, or if a license has expired, a warning message is displayed in this area and in the AMC status area.

Managing Licenses

This section describes how to obtain your appliance licenses from www.mysonicwall.com. You must have a base appliance license file if, for example, you want to replace an evaluation license with a permanent license after deciding to purchase an appliance. There are also some components—such as Connect and Spike License—that require a separate purchase and license.

Before you can enable your appliance or a component that requires a separate purchase and license, you must follow these steps:

1 Create a MySonicWall account, if you don't already have one. You need an account to register your appliance. (MySonicWall registration information is not sold or shared with any other company.) See Creating a MySonicWall Account for more information.

2 Register your device on MySonicWall. Registration provides access to essential resources, such as your license file, firmware updates, and technical support information. See Registering Your SMA Appliance for more information.

3 Use your MySonicWall account to apply the license for your appliance. If you have a high-availability cluster, you must apply a separate license to each appliance. See Retrieving Your Secure Mobile Access License for more information.

4 Apply your license file in AMC; see Applying Your SMA License for more information.

CAUTION: You should ensure that the appliance's date and time settings are configured correctly for your time zone before importing a license file. For information about configuring the system clock settings, see Configuring Time Settings.

Topics:

Creating a MySonicWall Account

To create a MySonicWall account, complete the short online registration form. Registration information is not sold or shared with any other company.

To create a MySonicWall account

1 In your Web browser, go to the MySonicWall Web site: https://www.mysonicwall.com/.

2 In the **User Login** section, follow the link for unregistered users.

3 Enter your account information, personal information, and preferences, and then click **Submit**. Be sure to use a valid email address.

4 Follow the prompts to finish creating your account. SonicWall will send a subscription code to the email address you entered in Step 3.

5 When you return to the login screen, log in with your new username and password.

6 Confirm your account by entering the subscription code you received in email.

Registering Your SMA Appliance

Registration provides access to essential resources, such as your license file, firmware updates, documentation, and technical support information.

To log in to your MySonicWall account and register your appliance:

1 In your Web browser, go to the MySonicWall Web site and log in with your username and password: https://www.mysonicwall.com/

2 Locate your software **Serial Number**, which is printed on the back of your SMA appliance.

3 Enter your serial number, and then click **Next**. Follow the on-screen instructions.

4 Confirm your **Serial Number**.

5 Enter a name for this appliance.

6 Enter the authentication code for this appliance, which is the hardware identifier for the appliance you purchased. The authentication code is displayed in AMC: click **General Settings** from the main navigation menu, and then look in the **Licensing** area.

7 Click **Register** to continue.

Follow the online prompts to fill out the survey and complete the registration process.

Retrieving Your Secure Mobile Access License

To retrieve the license file for your appliance, log in to your MySonicWall account. If you have a high-availability cluster, you must download a separate license for each appliance.

To retrieve the license file for your appliance:

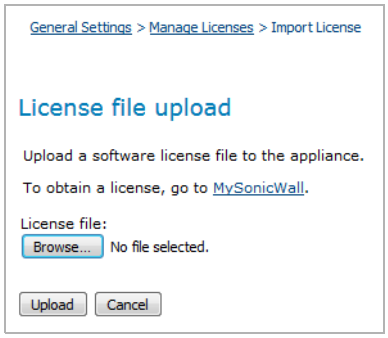
1. In your Web browser, go to the following Web site and log in with your username and password: https://www.mysonicwall.com/
2. Click the link for the appliance that requires a license.
3. On the **Service Management** page, select the appliance software version from the drop-down list for the license you are retrieving.
4. Click the link for the license file (`.xml`) and save it to your computer. After you get your appliance up and running, you must import this license file using AMC.

Applying Your SMA License

The SMA appliance ships with a single administration test license that supports 1 user indefinitely; to test or deploy the appliance with additional users, or to enable separate components, such as a Spike License, you must apply a valid license file. Log in to your MySonicWall account, retrieve the license file, and import it in AMC.

To retrieve the license file from MySonicWall and import it:

1. In your Web browser, go to the MySonicWall Web site and log in with your username and password: https://www.mysonicwall.com/
2. Click the link for the appliance that requires a license.
3. On the **Service Management** page, select the appliance software version from the drop-down menu for the license you are retrieving.
4. Click the link for the license file (`.xml`) and save it to your computer.
5. From the main navigation menu in AMC, click **General Settings**, and then click the **Edit** link in the **Licensing** area. The **Manage Licenses** page appears.
6. Click **Import License**.



7. In the **License file** field, type the path for the license file, or click **Browse** to locate it.
8. Click **Upload**, and then apply the change by clicking the **Pending changes** link in the upper-right corner.

Managing a Spike License

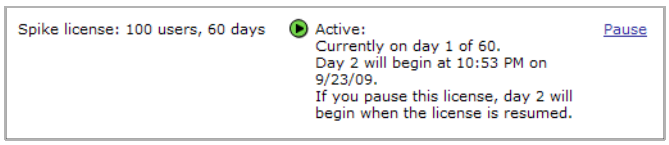
A Spike License enables you to temporarily increase the number of remote users you can support in the event of a disaster or other business disruption. Licensed separately, this feature helps you accommodate spikes in remote access traffic during planned or unplanned events.

When you buy a Spike License it is valid for a given number of users and days (this is the total number of users who are supported when the Spike License is activated, not in addition to your base license number). You can suspend and resume the use of the license as needed.

To activate, pause, and resume a Spike License:

1 Retrieve your Spike License from MySonicWall and import it to the appliance, as described in Applying Your SMA License.

2 The Spike License is listed as **Available** on the **Manage Licenses** page in AMC. When you need to accommodate more users, click **Activate**. The maximum number of possible users is updated, and the time line for your Spike License is displayed.



3 Click **Pause** to suspend use of the Spike License, and click **Resume** to continue using it.

NOTE:

- You can upload more than one Spike License to your appliance, but you cannot have more than one active at a time.
- Whenever you activate or pause a Spike License, the number of days for which it is valid decreases by one, even if fewer than 24 hours have elapsed.

Part 6

Access Control

- End Point Control

8

End Point Control

About End Point Control

The SMA appliance includes support for End Point Control, which you can use to protect sensitive data and ensure that your network is not compromised when accessed from devices in untrusted environments. End Point Control works by:

- Verifying that the user's environment is secure
- Removing user data from a personal computer after a session
- Controlling access to sensitive resources

Traditional VPN solutions typically provide access only from the relative safety of a corporate laptop. In that environment, one of the biggest security concerns is unauthorized network access. An SSL VPN, on the other hand, enables access from any Web-enabled system, including devices in untrusted environments. A kiosk at an airport or hotel, or an employee-owned computer, increases the risk to your network resources.

End Point Control reduces your exposure from untrusted environments in three ways:

- **Verifying that the user's environment is secure** – Corporate IT departments configure computers under their control with antivirus software, firewalls, and other safeguards designed to protect them from malicious software (malware). In contrast, unmanaged computers can easily contain keystroke recorders, viruses, Trojan horses, and other hazards that can compromise your network.

  Secure Mobile Access lets you define zones of trust that provide different levels of access depending on the level of trust at the user's end point. Connection requests are compared against device profiles you set up in AMC and then assigned to the appropriate zone.

- **Removing user data from a PC after a session** – It's easy to inadvertently leave sensitive data on an untrusted PC. For example, a user logged in to a public kiosk leaves a variety of data in the PC's cache after logging out, including passwords, browser cookies, and bookmarked URLs. Users may also accidentally leave files or email attachments on the hard disk. Secure Mobile Access's data protection agents automatically remove session data from the PC.

- **Controlling access to sensitive resources** – You can reference End Point Control zones in access control rules. For example, a connection originating from a less trusted EPC zone can be denied access to sensitive resources.

End Point Control and OESIS

The OESIS framework is a cross-platform software development kit used within Secure Mobile Access to help secure and manage endpoints connected to the infrastructure. For Secure Mobile Access 12.1, the OESIS framework was upgraded to Version 4, which allows for faster execution of code, more frequent updates and

the ability for out-of-the-band definition updates. Customers having versions 11.4.x and 12.0.x should update to 12.1 to get the full advantage of these benefits.

All newly created profiles will be OESIS V4 compliant, but if you upgraded from a prior version, it is recommended that you delete the existing profiles and recreate them so they will be V4 complaint as well. If you have a business reason where you need to keep an OESIS V3 compliant device profile, you can override the default behavior by adding a CEM value in the management console: MGMT_ALLOW_NEW_OPSWAT_V3=true. However, this is not recommended.

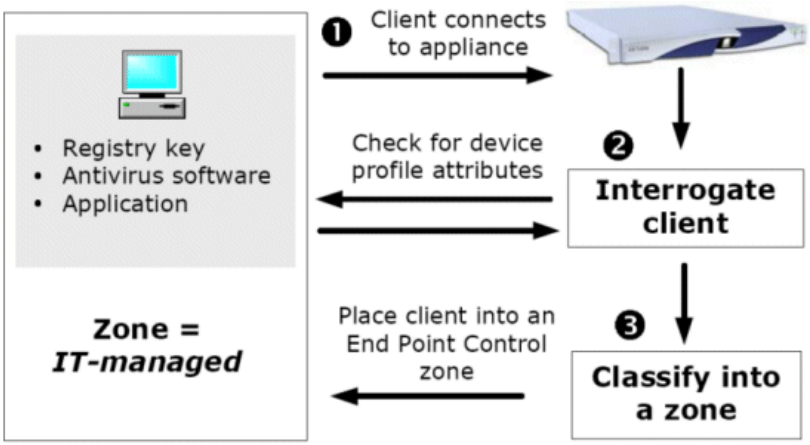
In OESIS V4, a new category, **Anti-Malware Program**, has been developed. It replaces the Anti-Virus Program and the Anti-Spyware Program since many products qualify in both categories these days.

NOTE: The OESIS V3 libraries have already been declared out of support by OPSWAT. However, for existing customers like SonicWall, OPSWAT will continue supporting them for a period of time. Refer to this Knowledge Base article for more information: https://www.sonicwall.com/support/knowledge-base/171004181702551.

How the Appliance Uses Zones and Device Profiles for End Point Control

End Point Control is managed and deployed at the community level on the appliance. An authentication realm—the entry point to the appliance for users—references one or more communities, which are collections of users or groups with similar access needs. A community in turn references one or more EPC zones. EPC zones can reference one or more device profiles, which define the attributes that must be present on a client computer. The EPC process works this way:

End Point Control for zone IT-Managed



1 A user connects to the appliance:

   a The user logs in to an authentication realm.

   b The appliance assigns the user to a community that belongs to that realm.

2 The appliance interrogates the user's computer to determine if it has attributes (contained in a device profile) that match those defined in one of the community's EPC zones.

3 If the device matches a profile, the appliance classifies the computer into a particular EPC zone and deploys the EPC tools configured for that zone.

4 If the user is connecting with a personal device, they may optionally be prompted to authorize the VPN connection.

In this case, the user's device profile matches an End Point Control zone named *IT-managed*. For a more detailed description of this process, see Scenario 1: Employees Connecting from IT-Managed Laptops.

NOTE:

- End Point Control has some specific Web browser requirements (for example, Safari is recommended over Mozilla Firefox on Apple Macintosh systems); see Client Components for detailed requirements.
- During client interrogation, the device profile attributes that the appliance is checking for and whether they were found is recorded in the system message log, provided the log level is set to verbose. See End Point Control Interrogation for more information.

Defining Zones

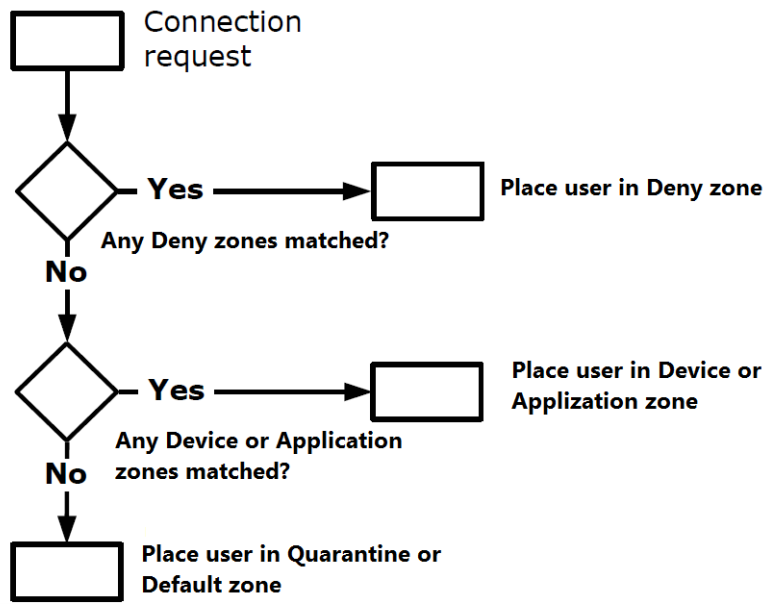
There are three categories of zones that you can customize, plus a built-in zone (**Default**); see the Types of zones table. A community can include **Deny**, **Standard**, and **Quarantine** zones; the **Default** zone, on the other hand, is global. See Adding Communities to a Realm for more information about communities.

Types of zones

Zone type	Description
Deny	Deny zones are evaluated first. The appliance tries to find a match in the list of **Deny** zones, starting with the one at the top. If there is a device profile match (for example, a certain file is found on the device), the user is denied access to the network. See Creating a Deny Zone for more information.
Device	If the device does not match the criteria for a **Deny** zone, the appliance tries to find a match in the list of Standard zones, starting with the one at the top. The standard zone category contains the **Device** zone. If the device matches the criteria, it is placed in a zone of trust. If no match is found, the device is placed in the **Default** zone or in a **Quarantine** zone (if one is defined). See Creating a Device Zone for more information.
Application	If the application does not match the criteria for a **Deny** zone, the appliance tries to find a match in the list of Standard zones, starting with the one at the top. The Standard zone category contains the Application zone. If the Application matches the criteria, it is placed in a zone of trust. If no match is found, the device is placed in the Default zone, or in a Quarantine zone (if one is defined). See Creating an Application Zone for more information.
Quarantine	A device for which there is no profile match is placed in either the Default zone or in a Quarantine zone. You can customize the message users see; for example, you may want to explain what is required to bring the user's system into compliance with your security policies. There can be only one Quarantine zone in a community. See Creating a Quarantine Zone for more information.
Default	This zone is global and implicitly present in every community configured in AMC. If a device does not match any other profile, you choose whether it should "fall through" to the Default zone or to a Quarantine zone. You can customize the Default zone to some extent, but you cannot delete it. See Configuring the Default Zone for more information.

Zone evaluation order illustrates the order in which zones are evaluated. Only the **Default** zone is required:

Zone evaluation order

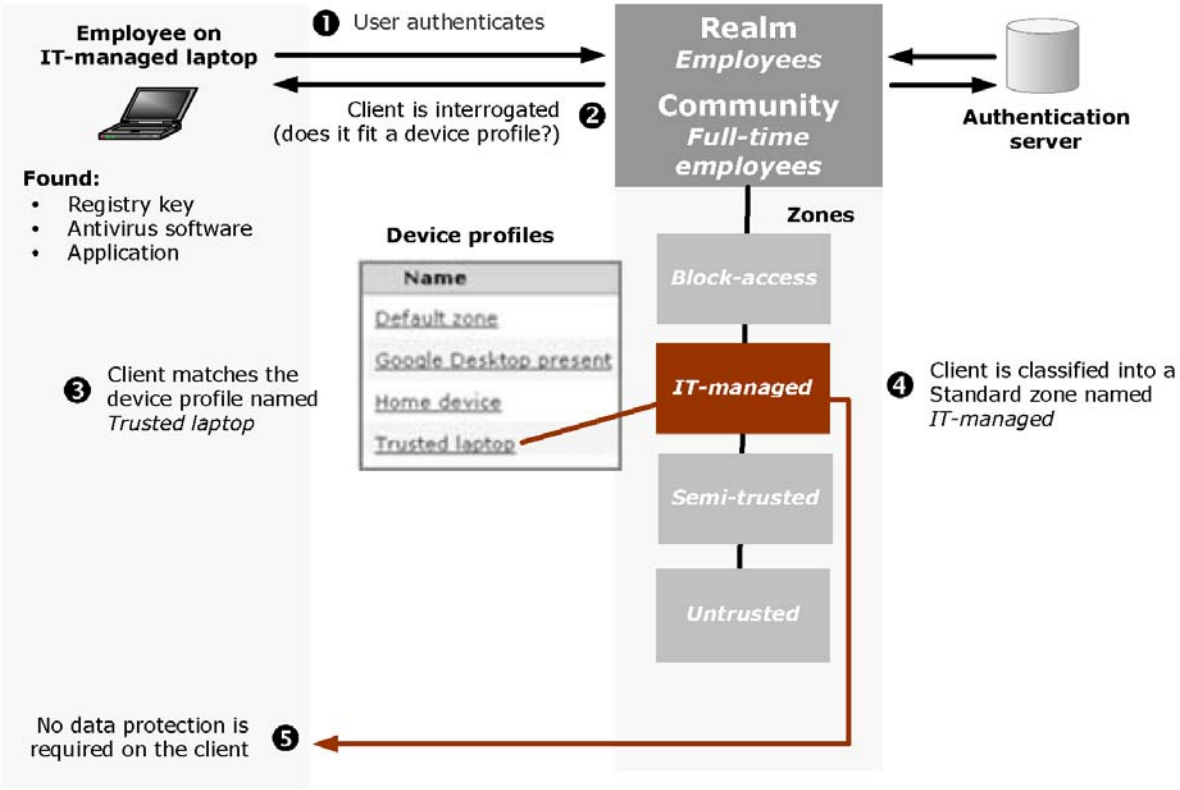


End Point Control Scenarios

This section describes some typical End Point Control scenarios that use zones and device profiles to classify connection requests and deploy End Point Control tools to clients.

Topics:

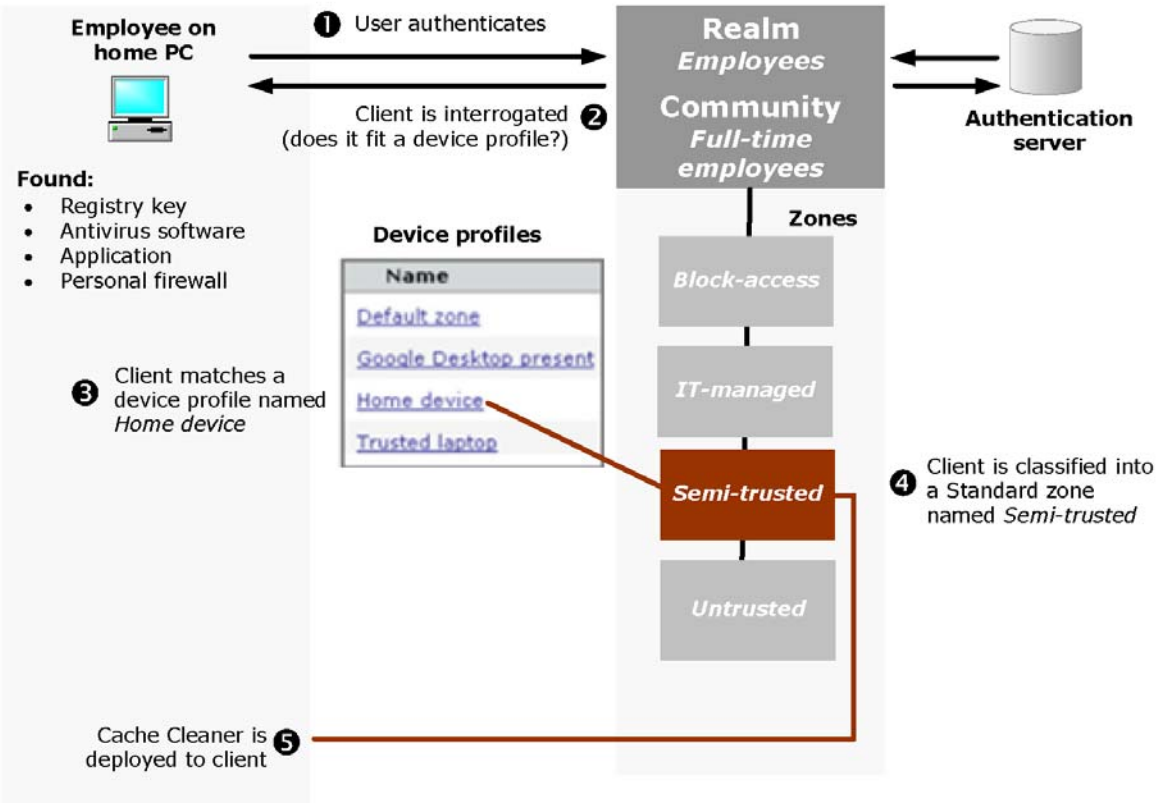
Scenario 1: Employees Connecting from IT-Managed Laptops



This scenario begins with an employee connecting to the appliance using an IT-managed laptop:

1. The user connects to the appliance, logs in to the realm *Employees*, and is assigned to the *Full-time employees* community.
2. After the user authenticates, the client device is interrogated to determine if it matches any device profiles belonging to the zones referenced by the *Full-time employees* community. Device profiles are evaluated by zone, starting with any Deny zones and then proceeding through the zones listed for the community.
3. The appliance finds that the client doesn't match the device profile for the **Deny** zone (*Block-access*), so it proceeds to check the profile for the *IT-managed* zone. The *IT-managed* zone references a device profile named *Trusted laptop*. The appliance determines that the user's device attributes match that particular device profile (a registry key entry, antivirus software, and an application).
4. Based on that match, the appliance classifies the device into the *IT-managed* zone and doesn't evaluate the subsequent zones in the list for that community.
5. The *IT-managed* zone is not configured to require a data protection tool on the client. The appliance then provisions the access agent configured for the *Full-time employees* community, and the user is able to access the appropriate network resources.

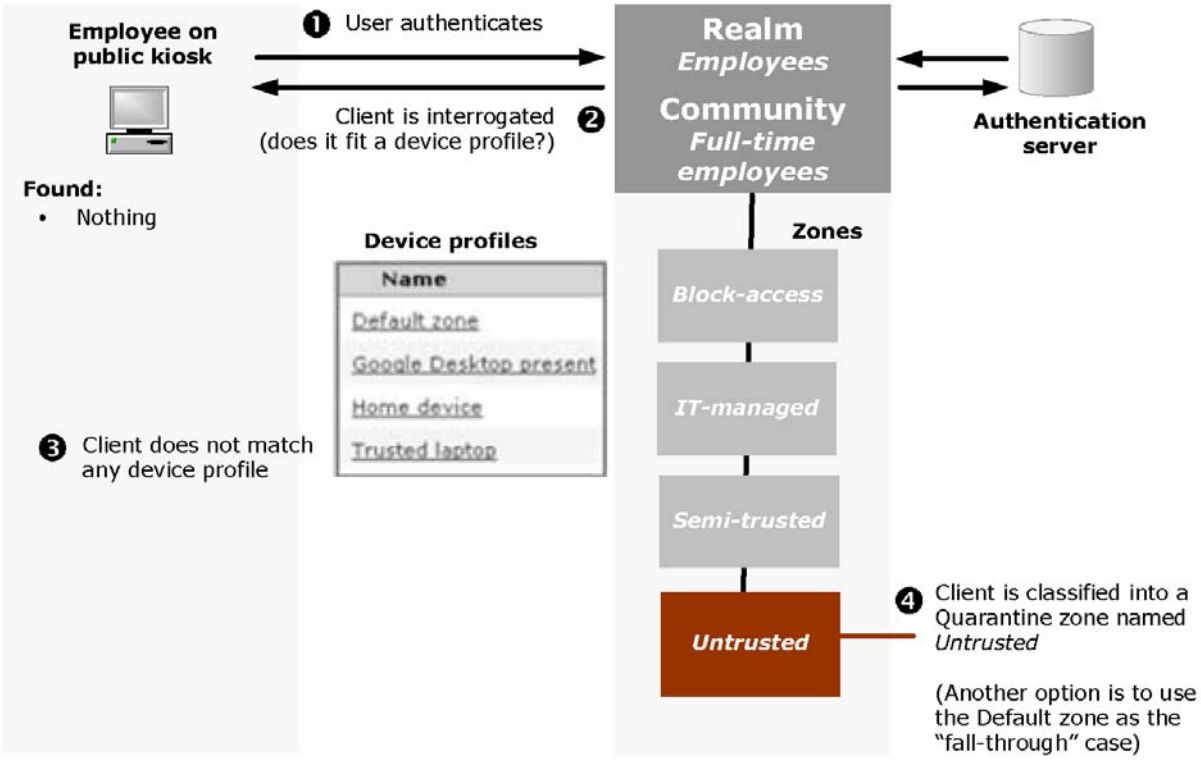
Scenario 2: Employees Connecting from a Home PC



This scenario begins with an employee connecting to the appliance from a home PC:

1. The user connects to the appliance, logs in to the realm *Employees*, and is assigned to the *Full-time employees* community.
2. Once the user is authenticated, the client device is interrogated to determine if it matches any device profiles belonging to the zones referenced by the *Full-time employees* community. Device profiles are evaluated by zone, starting with any Deny zones and then proceeding through the others listed for the community.
3. In this scenario, the appliance finds that the client doesn't match the device profile for the Deny zone (*Block-access*) or the Standard zone named *IT-managed*, so it continues to the next one in the list: *Semi-Trusted*.
4. The *Semi-trusted* zone references a device profile named *Home device*. The appliance determines that the user's device attributes (a registry key entry, antivirus software, an application, and a personal firewall) match that device profile.
5. Based on that match, the appliance classifies the device into the *Semi-trusted* zone and doesn't evaluate the subsequent zones in the community.
6. Because the *Semi-trusted* zone is configured to require a data protection tool on the client, the appliance deploys Cache Cleaner to the client. The appliance then provisions the access agent configured for the *Full-time employees* community, and the user is able to access the appropriate network resources.

Scenario 3: Employees Connecting from a Public Kiosk



This scenario begins with an employee connecting to the appliance from a public kiosk:

1 The user connects to the appliance, logs in to the realm *Employees*, and is assigned to the *Full-time employees* community.

2 After the user authenticates, the client device is interrogated to determine if it matches any device profiles belonging to zones referenced by the *Full-time employees* community, starting with any Deny zones and proceeding through the others listed for the community.

3 In this scenario, the appliance finds that the client doesn't match any of the configured device profiles. There are a couple of ways to handle this sort situation: classify the client into a **Quarantine** zone, or into the **Default** zone. In this example, the **Quarantine** zone *Untrusted* is used. The only resources a user has access to are those that you have set up: you might, for example, display a customized page with links to Web resources for bringing a system into compliance with your security policies.

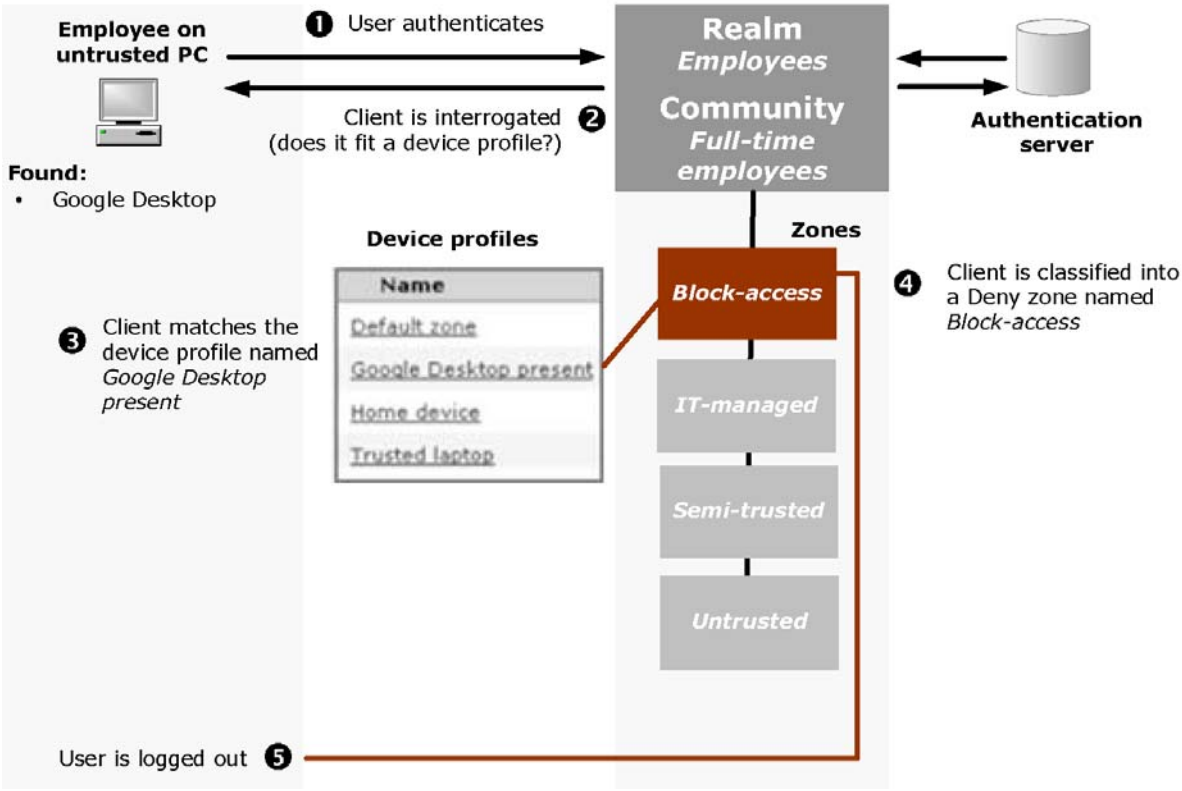
   a If the untrusted device (for example, a PC in a public kiosk) is running Windows 7, Windows Vista, or Windows 2008 Server, and a supported browser, the user is required to download and install the client component manager, Secure Endpoint Manager. The client component manager automatically deploys Cache Cleaner for the user. The appliance then provisions the access agent configured for the *Full-time employees* community, and the user can access the appropriate network resources.

   b If the device's operating system and browser are not compatible with Cache Cleaner, a message is displayed.

   c If Cache Cleaner cannot be deployed on the client, the user's connection request is denied.

See Configuring the Default Zone for information on the setup options for this zone.

Scenario 4: Employee Connects from a PC with Google Desktop



An employee connects to the appliance from a PC outside of the corporate office:

1 The user connects to the appliance, logs in to the realm *Employees*, and is assigned to the *Full-time employees* community.

2 After the user authenticates, the client device is interrogated to determine if it matches any device profiles belonging to the zones referenced by the *Full-time employees* community, starting with any Deny zones.

3 In this case the appliance determines that the PC is running Google Desktop, which makes it a match for the Google Desktop present device profile. The device is classified into the Deny zone named *Block-access*.

4 No other zones are evaluated and the user's access request is denied.

5 The user is logged out.

Scenario 5: Employee Connects from a Mobile Device

In this scenario an employee connects to the appliance from a mobile device outside of the corporate office. To establish an association between a particular user and his or her device (in case the device is misplaced or lost), the administrator has collected the user name and IMEI (International Mobile Equipment Identity) number for each device, and has added the IMEI number for user accounts on the Active Directory server. The administrator has also created a device profile named *Mobile resources* that verifies that user/IMEI association.

Here's the sequence of events when a user logs in:

1 The user connects to the appliance, logs in to the realm *Employees* by entering a user name and password, and is then assigned to the *Mobile employees* community.

2 After the user authenticates, the client device is interrogated (using a device profile for the zone referenced by the *Mobile employees* community) and its IMEI number is determined.

3 The IMEI number is compared against the one that is associated with the user in the AD directory. If there's a match, the user is allowed access to mobile device-specific links; otherwise he or she is denied access.

4 Optionally, the user may be prompted to authorize the VPN connection from the personal device.

NOTE: Checking for an IMEI number works only on wide area networks (WAN), not WiFi, and the WAN service must be on for the post-authentication process to determine the IMEI number on the mobile device.

To track service by mobile device and user you can process audit log files for network proxy, Web proxy, or tunnel clients.

Managing EPC with Zones and Device Profiles

Device profiles can include any combination of the following attributes to identify a client and assign it to a "zone of trust," quarantine it, or deny it access altogether:

- Application
- Client certificate
- Directory name
- Equipment ID (the identifier for a device; for example, the IMEI number of a mobile device)
- File name, size, or timestamp
- Windows domain
- Windows registry entry
- Windows version

If you have Advanced EPC, you have additional attributes for identifying security programs on client devices:

- Antivirus program
- Antispyware program
- Personal firewall program

And, you can define fallback detection for these types of security programs using the EPC library. See Advanced EPC: Using Fallback Detection for configuration instructions.

An EPC zone can reference one or more device profiles. Multiple device profiles are useful if there are users with similar VPN access needs who use different computer platforms. For example, you could configure an EPC zone that references a device profile for Windows computers, and another zone for Macintosh computers. AMC supports device profiles for Windows, Macintosh, Linux, Windows Mobile-powered devices, and other mobile devices (such as PDAs and smart phones). You can create as many additional zones and device profiles as needed to accommodate different access scenarios and levels of trust, such as separate zones for employees and business partners or contractors.

AMC includes a predefined zone and some device profiles:

- You can configure the **Default** zone to some extent, but you cannot delete it. A device that cannot be classified into any of the zones you have configured is placed in either the **Default** zone, or a **Quarantine** zone. (When you configure a community, you choose which of these will be the fallback zone; see Using End Point Control Restrictions in a Community for how to do this.) See Configuring the Default Zone for more information.

- To help you get started with Advanced EPC, the appliance includes some preconfigured device profiles designed for common access scenarios. You can use these as is, or customize them to meet your needs; see Advanced EPC: Using Preconfigured Device Profiles for more information.

Communities are used to specify which zones are available to users after they authenticate. For information on linking zones to communities, see Using End Point Control Restrictions in a Community. In addition, you can tie zones to your access policy in much the same way as users, groups, and resources.

Topics:

- Enabling and Disabling End Point Control
- Configuring and Using Zones and Device Profiles
- Creating Zones for Special Situations
- Using End Point Control Agents

Enabling and Disabling End Point Control

You can globally enable or disable End Point Control in AMC. Here are two examples of situations where you might want to temporarily disable EPC:

- You have upgraded your version of antivirus software company-wide from version 2.x to 3.x. You could temporarily disable EPC in order to change the device profile that specifies the antivirus software.
- You can create new device profiles and zones on a production appliance without disrupting users.

When End Point Control is disabled (which is the default setting), the appliance does not perform the following EPC actions:

- Evaluate the attributes of client devices
- Classify connection requests into zones
- Enforce zone restrictions in access control rules

To enable End Point Control:

1. From the main navigation menu, click **End Point Control**.
2. Click the **Edit** link in the General section. The **Configure End Point Control** page appears.
3. Check the **Enable End Point Control** checkbox.
4. Click **Save**.

NOTE: When EPC is enabled, you can specify (on a per-zone basis) how often EPC checks are done: only once (at login), or at login and then every <*n*> minutes for the duration of the session. See Creating a Device Zone or Configuring the Default Zone for more information.

Configuring and Using Zones and Device Profiles

Topics:

- Viewing Zones
- Viewing Device Profiles
- Creating a Device Zone
- Creating an Application Zone

- Creating a Deny Zone
- Creating a Quarantine Zone
- Configuring the Default Zone
- Defining Device Profiles for a Zone
- Device Profile Attributes
- Advanced EPC: Extended Lists of Security Programs
- Advanced EPC: Using Fallback Detection
- Advanced EPC: Using Preconfigured Device Profiles
- Using Comparison Operators with Device Profile Attributes
- Using End Point Control with the Connect Tunnel Client
- Performing Recurring EPC Checks: Example

Viewing Zones

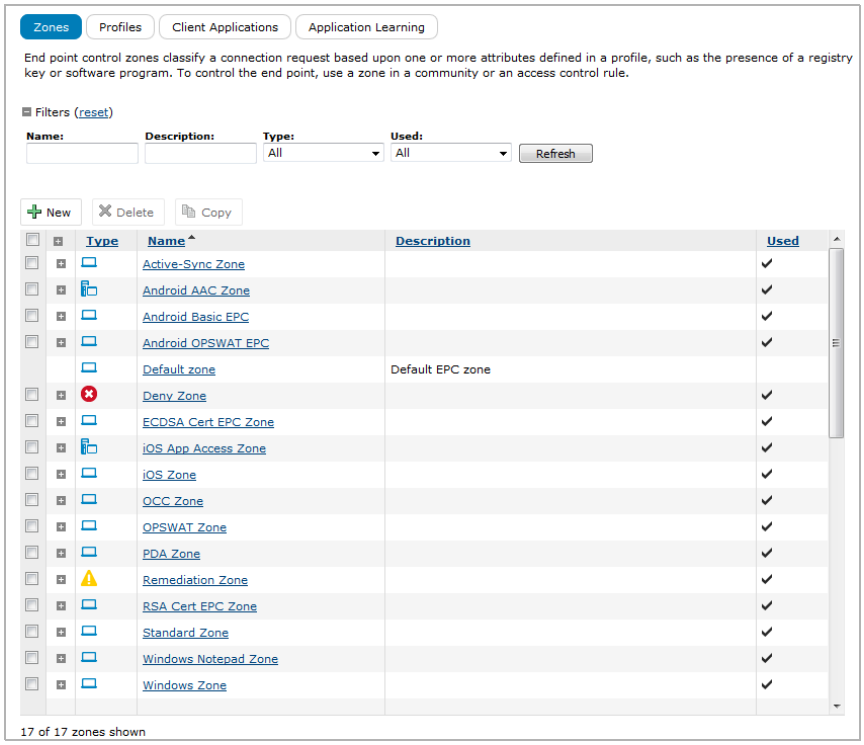
You can see the list of End Point Control zones in AMC and quickly determine what types they are and whether there are any communities associated with them.

To view configured zones:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Zones**.

3 The **Configure Zones and Profiles** page appears to provide a summary of the zones configured in AMC and a summary of the EPC agent status. The SMA appliance comes with a preconfigured zone named **Default zone**.



You can see information about each zone in the list:

- The plus sign (**+**) column expands a selected zone to display the device profiles and communities the zone is associated with. Clicking the plus sign in the table header expands the display of every zone.
- The **Type** column identifies whether a given zone is a **Default**, **Standard**, **Deny**, or **Quarantine** one (these zone types are described in detail in Defining Zones).
- The **Name** column displays the name you assigned when creating a zone; edit a zone by clicking its name.
- The **Description** column lists any descriptive text for the zone.
- The **Used** column indicates whether the zone is referenced by any communities. A blue dot indicates it is being used by one or more communities. If a zone is not referenced, this field is blank.

4 Click the name of a zone to view or edit its settings.

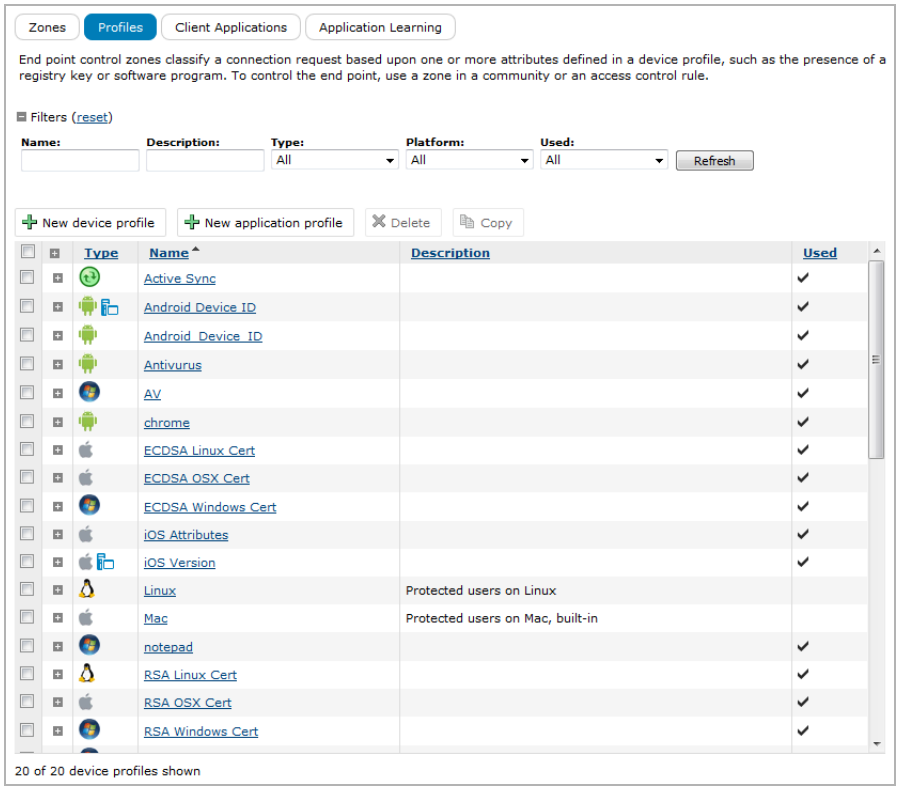
Viewing Device Profiles

Device profiles specify the attributes used to identify a client, such as the presence of a registry key or software program. They are referenced by End Point Control zones.

To view configured device profiles:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Profiles**. The **Configure Zones and Profiles** page displays.



- The **Name** column displays the name you assigned when creating the device profile; edit a device profile by clicking its name.
- The **Description** column lists any descriptive text for the device profile.
- The **Type** column displays an icon representing the platform the device profile supports: **Microsoft Windows**, **Mac OS X**, **Linux**, **Windows Mobile**, and **Other mobile device**.
- The **Used** column indicates whether the profile is referenced by any clients. A blue dot indicates it is being used by one or more clients. If a zone is not referenced, this field is blank.

3 In the **Device Profiles** section, review the list of configured profiles. If you have Advanced EPC, this list includes several preconfigured device profiles.

Creating a Device Zone

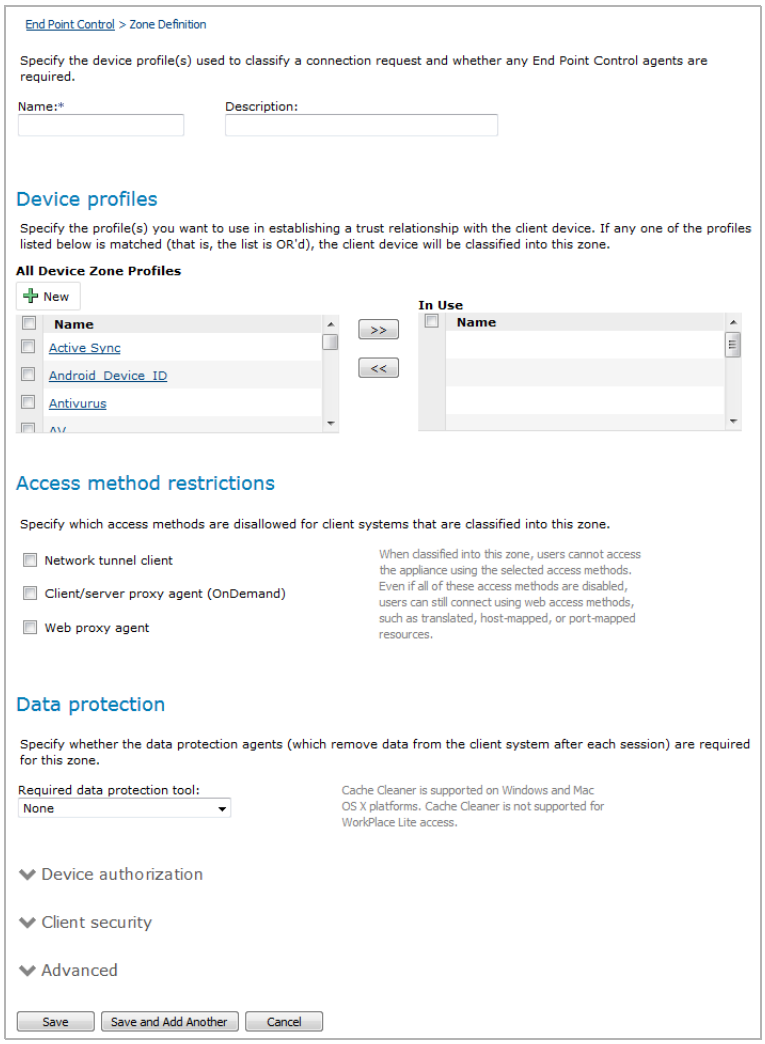
Device zones are evaluated after **Deny** zones. You could create a device profile, for example, named *Windows firewall* that would require that a personal firewall be running. When this End Point Control policy is in place, any device that is a match is placed in a zone of trust.

To define a Device zone:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Zones**. The **Configure Zones and Profiles** page displays.

3 Click **New** and select **Device zone** from the drop-down menu. The **Zone Definition - Device Zone** page appears.



4 In the **Name** field, type a meaningful name for the zone (for example, *Windows firewall required*). If a zone will be referenced by mobile device users, keep the name short so that all of it is visible on the mobile device.

5 (Optional) In the **Description** field, type a descriptive comment about the zone.

6 In the **All Device Zone Profiles** list, select the checkbox for any device profiles that you want to require in the zone, and then click the right arrow (**>>**) button. Only one of the profiles in the **In Use** list needs to match for the device to be placed in the zone you are creating.

7 If there are no device profiles for this zone, click **New** to add one. See Defining Device Profiles for a Zone for more information on creating profiles.

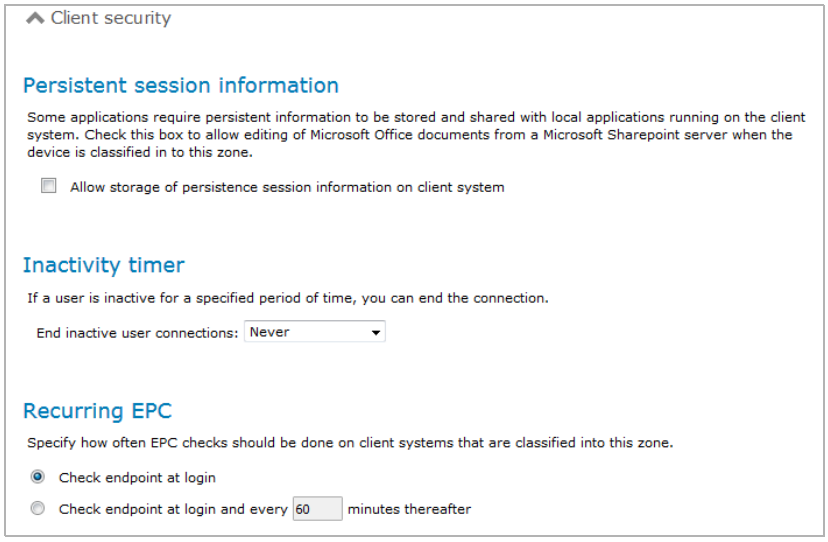
8 In the **Access method restrictions** area, select which access methods, if any, will not be allowed for clients that are classified into this zone.

9 Specify whether a **Data protection** agent is required. Cache Cleaner provides enhanced protection on all platforms except Linux platforms.

10 Check the top checkbox in the **Device Authorization** area to require users to authorize their personal device before a VPN connection is established. By default, this checkbox is checked when EPC is enabled for device zones.

11 To change the authorization terms that users must agree to, type the desired authorization terms in the **Terms** section of the **Device Authorization** area. The **Device Authorization** checkbox must be checked to edit the terms.

12 Expand the **Client security** area.



13 By default, a user authorization expires 180 days after the device was last used. When device authorization is enabled, you can disable zone authorization expiration by unchecking the expiration checkbox or change the number of days before expiration by typing the desired number of days.

14 By default, user connections to a device zone are not dropped when the connection is inactive. However, a inactivity timer can be set In the **Inactivity timer** area to end the connection after a set period of inactivity. The inactivity timer interval can be set from 3 minutes to 10 hours (default is **Never**).

NOTE: In earlier releases, the Inactivity Timer was part of Community attributes.

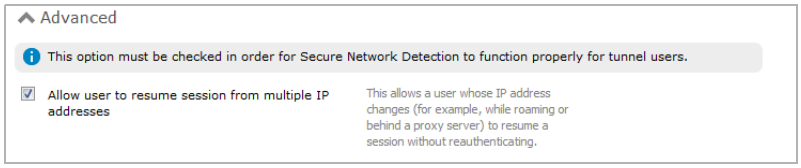
15 In the **Recurring EPC** area, you can select how often EPC checks are done:

- **Check endpoint at login** (default) – only once (at login)
- **Check endpoint at login and then every *<n>* minutes for the duration of the session**

See Performing Recurring EPC Checks: Example for a description of a scenario where the appliance repeatedly checks for the presence of a USB device: when the check fails, the session ends. By default, the end point is checked at login.

16 The connection between devices and the appliance can handle interruptions—such as suspending a session and later resuming it, or temporarily losing connectivity—without requiring that users reauthenticate, as long as the device is using the same IPv4 or IPv6 IP address.

To allow users to resume sessions from a different IP address—for example, when roaming from one IP subnet to another by plugging into another part of your network—select the **Allow user to resume session from multiple IP addresses** checkbox in the **Advanced** area.



17 When you are finished configuring the zone, click **Save**.

NOTE: For information on how to copy or delete an EPC zone, see Adding, Editing, Copying, and Deleting Objects in AMC.

Creating an Application Zone

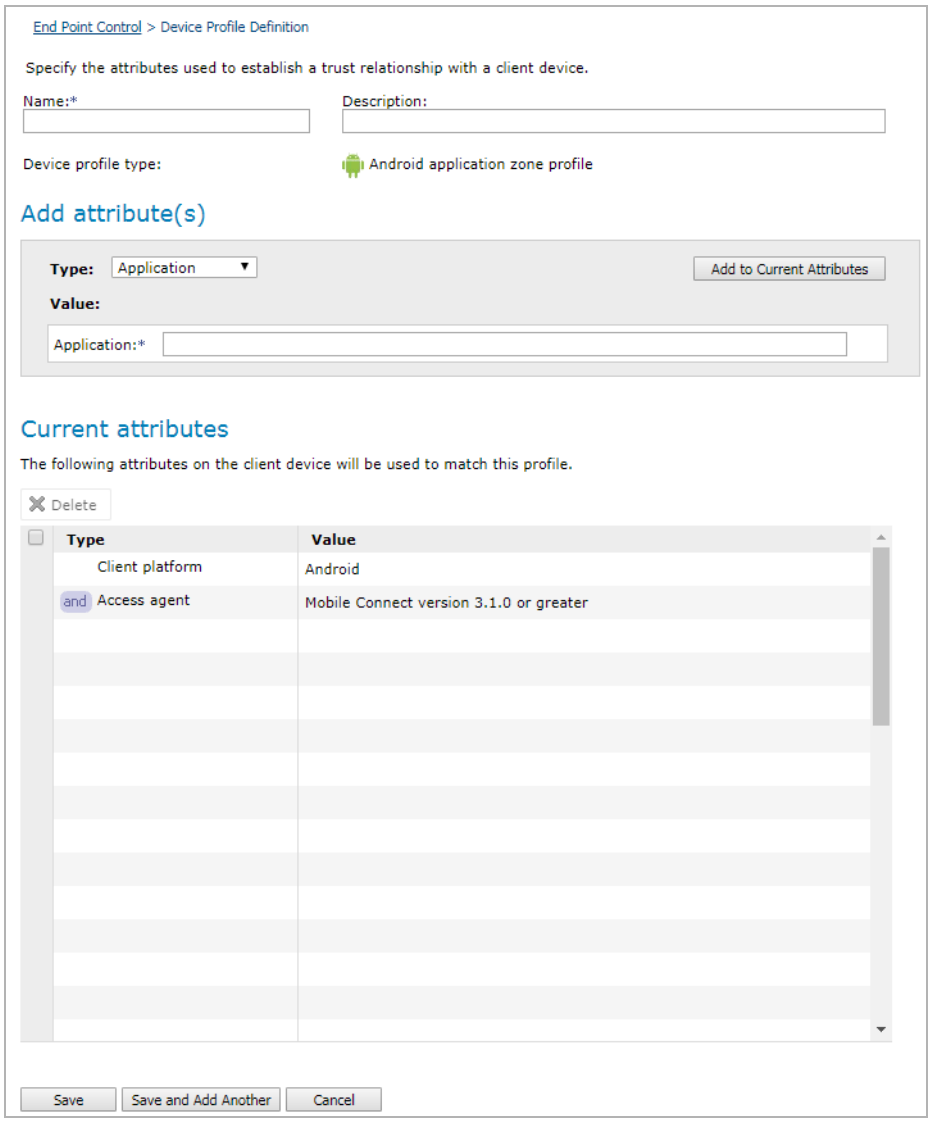
Application zones are evaluated after **Deny** and **Device** zones. You could create an application zone that allows only specific users to access the corporate network while running a specific application. When this End Point Control policy is in place, any device that is a match is placed in a “zone of trust.”

To define an Application zone profile:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Profiles**. The **Configure Zones and Profiles** page displays.

3 Above the **Profiles** table, click **New application profile** and then select **Android** from the drop-down menu, which displays the **Device Profile Definition** page.



4 In the **Name** field, type a meaningful name for the profile (for example, *Unmanaged Android Devices*).

5 (Optional) In the **Description** field, type a descriptive comment about the zone.

6 If the desired attributes are not listed in the **Current attributes** section, select the type of application from the **Type** drop-down menu. Any number and combination of attributes can be associated with the

definition; see the Application zone attributes table. The remainder of the **Add attributes** section varies, depending on the type selected:

Application zone attributes

Type	Attributes
Antivirus app	• Select the app from the **Product Name** drop-down menu OR Check **Any product from this vendor** checkbox to add all products from the identified vendor. • In the **Product version** fields, select the version number to allow and the qualifier (>, >=, =, <, <=) from the drop-down menus. • To only use the app as a filter when the app is running, check the **App must be running** checkbox
Personal Firewall App	• Select the app from the **Product Name** drop-down menu OR Check **Any product from this vendor** checkbox to add all products from the identified vendor.
Application	• Select the device profile definition from the **Application** drop-down menu.
Client certificate	• Select the **CA certificate** drop-down menu. You may need to import a new certificate or modify an existing certificate if the desired certificate is not displayed.
Directory name	• Type the directory name in the **Directory Name** field**.**
Equipment ID	• Select whether to match the device identifier (either literal value of variable evaluated at runtime) to the profile if the user is not using a registered device. For example, if the equipment ID is used, the device profile will be used to control access to applications by all devices matching the equipment ID.
File name	• Type the file name in the **File name** field.
Android version	• In the **Operator** field, select the qualifier (>, >=, =, <, <=) from the drop-down menu. • In the **Major** field, type the major version number to use as a filter. • Optionally, in the **Minor** field, type the minor version number to use as a filter. • Optionally, in the **Build** field, type the build number to use as a filter.

7 Click the **Add to Current Attributes** button, which transfers the attribute to the **Current attributes** section of the page.

8 Click **Save**.

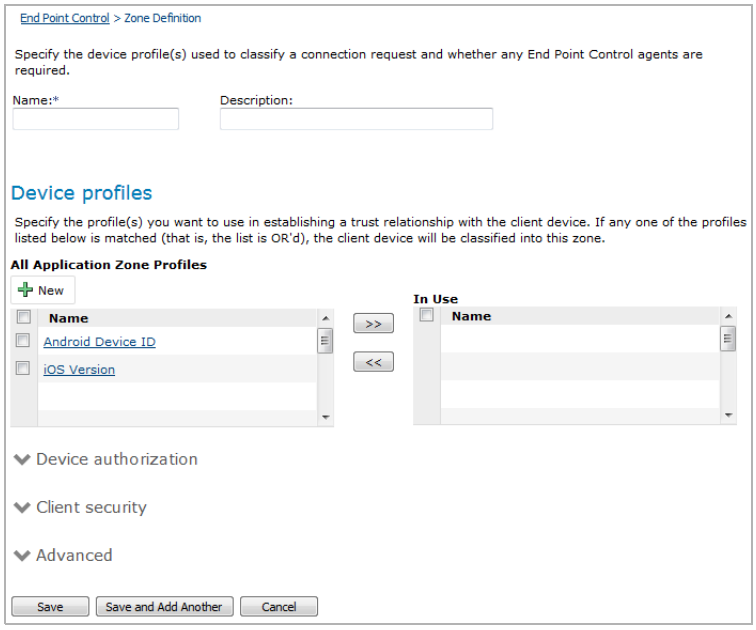
To create an Application zone:

NOTE: Every Application zone must have at least one Application Zone Profile assigned to it. The profile is used to determine if a connecting device is application control aware and whether to enforce policy at the Device or Application level.

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Zones**. The **Configure Zones and Profiles** page displays.

3 Click **New**, and then select **Application zone** from the drop-down menu. The **Zone Definition - Application Zone** page appears.



Only those profiles that are Application Access Control aware are included in the profiles.

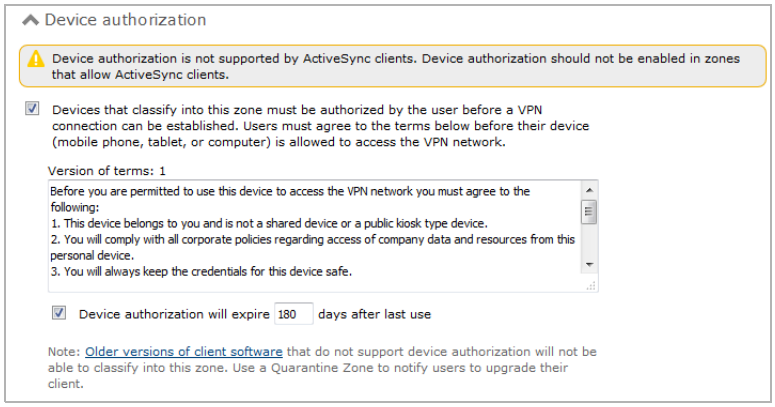
4 In the **Name** field, type a meaningful name for the zone. If a zone will be referenced by mobile device users, keep the name short so that all of it is visible on the mobile device.

5 (Optional) In the **Description** field, type a descriptive comment about the zone.

6 In the **All Application Zone Profiles** list, select the checkbox for any profiles that you want to require in the zone, and then click the right arrow (**>>**) button. Only one of the profiles in the **In Use** list needs to match for the application to be placed in the zone you are creating.

7 If there are no device profiles for this zone, click **New** to add one. See Defining Device Profiles for a Zone for more information on creating profiles.

8 Expand the **Device authorization** area.

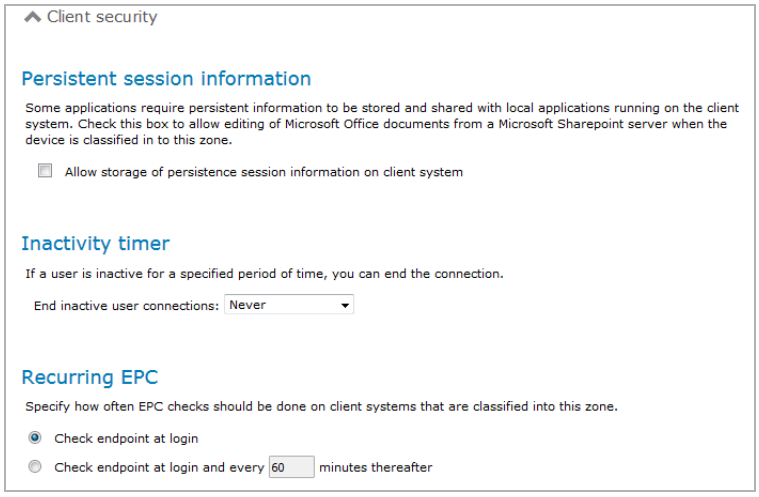


9 Check the top checkbox in the **Device Authorization** area to require users to authorize their personal device before a VPN connection is established. By default, this checkbox is checked when EPC is enabled for application zones.

10 To change the authorization terms that users must agree to, type the desired authorization terms in the **Terms** section of the **Device Authorization** area. The **Device Authorization** checkbox must be checked to edit the terms.

11 By default, a user authorization expires 180 days after the device was last used. When device authorization is enabled, you can disable zone authorization expiration by unchecking the expiration checkbox or change the number of days before expiration by typing the desired number of days.

12 Expand the **Client security** area.

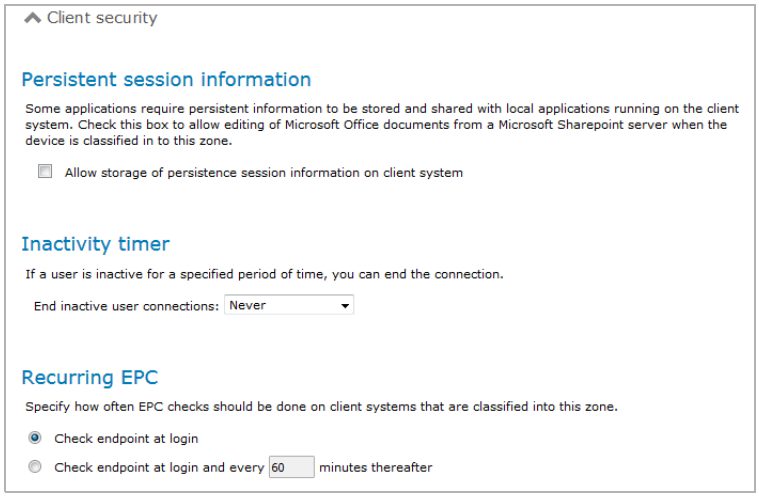


13 By default, user connections to a zone are not dropped when the connection is inactive. However, a inactivity timer can be set In the **Inactivity timer** area to end the connection after a set period of inactivity. The inactivity timer interval can be set from 3 minutes to 10 hours.

14 In the **Recurring EPC** area, you can specify how often EPC checks are done: only once (at login), or at login and then every *<n>* minutes for the duration of the session. See Performing Recurring EPC Checks: Example for a description of a scenario where the appliance repeatedly checks for the presence of a USB device: when the check fails, the session ends.

15 The connection between devices and the appliance can handle interruptions—such as suspending a session and later resuming it, or temporarily losing connectivity—without requiring that users reauthenticate, as long as the device is using the same IPv4 or IPv6 IP address.

To allow users to resume sessions from a different IP address—for example, when roaming from one IP subnet to another by plugging into another part of your network—select the **Allow user to resume session from multiple IP addresses** checkbox in the **Advanced** area.



16 When you are finished configuring the zone, click **Save**.

Creating a Deny Zone

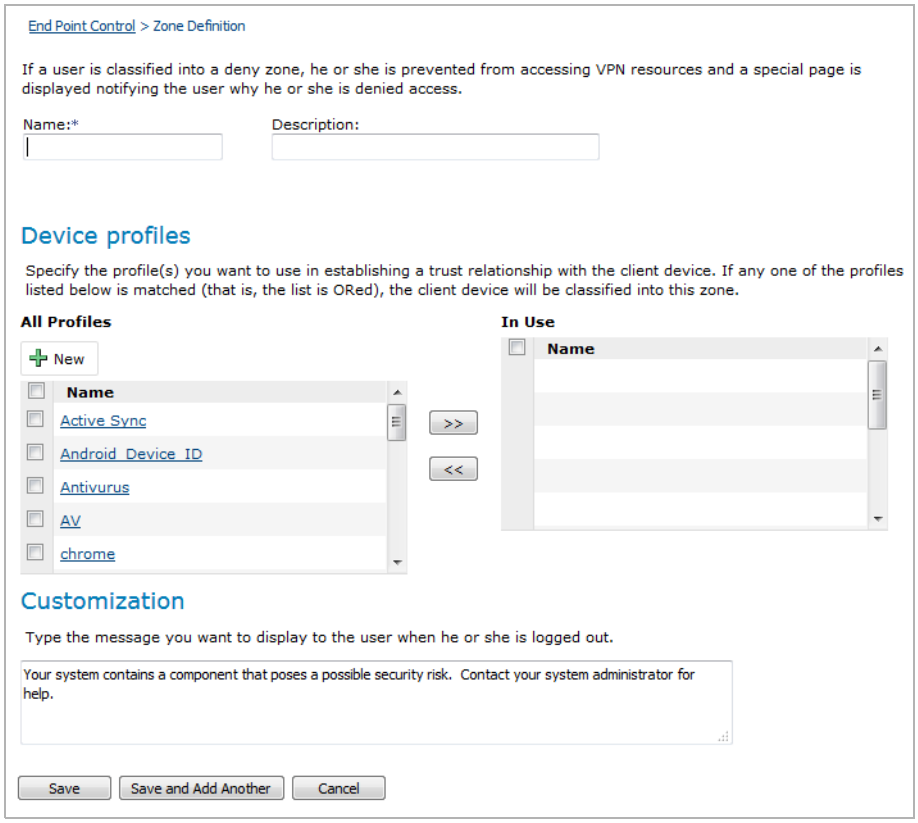
Deny zones are evaluated first. If there is a device profile match (for example, if a certain file or registry key is found on the device), the user is denied access and logged out.

To define a Deny zone:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Zones**. The **Configure Zones and Profiles** page displays.

3 Click **New**, and then select **Deny zone** from the menu. The **Zone Definition - Deny Zone** page appears.



4 In the **Name** field, type a meaningful name for the zone (for example, *Google Desktop present*).

5 (Optional) In the **Description** field, type a descriptive comment about the zone.

6 In the **All Profiles** list, select the checkbox for any device profiles that you want to require in the zone, and then click the right arrow (**>>**) button. (Only one of the profiles in the **In Use** list needs to match in order for the device to be placed in the Deny zone you are creating.)

For example, the device profile definition might require that the application `GoogleDesktop.exe` be running. If `GoogleDesktop.exe` is found on the device, the device is a match for the **Deny** zone you named *Google Desktop present*, and the user is denied access and logged off.

7 If there are no device profiles appropriate for this zone, click **New** to add one. See Defining Device Profiles for a Zone for more information on creating profiles.

8 At the **Customization** section at the bottom of the **Zone Definition** page, you can customize the message that denied users see when they are logged out (for example, `Your system is running Google Desktop, which poses a security risk`).

9 When you are finished configuring the zone, click **Save**.

For information on how to copy or delete an EPC zone, see Adding, Editing, Copying, and Deleting Objects in AMC.

Creating a Quarantine Zone

For devices that cannot be classified—that is, they do not match any of the **Deny** or **Standard** zone profiles—you can create a **Quarantine** zone. You can offer a user whose device is classified into this zone Web links and an explanation, for example, of how to bring his or her device into compliance with your security policies, or how to configure a system for EPC interrogation.

Only one **Quarantine** zone per community can be defined (you can create multiple **Deny** and **Standard** zones).

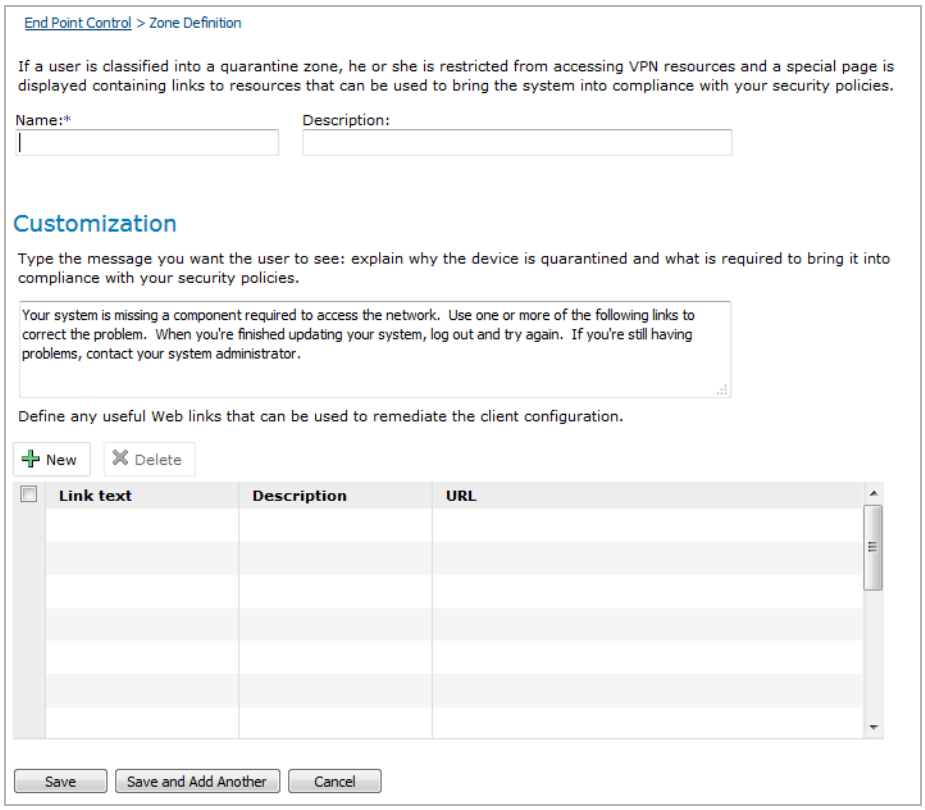
When you configure a community, you choose the fallback zone for devices that cannot be classified: they can either be placed in the **Default** zone or a **Quarantine** zone. For more information, see Using End Point Control Restrictions in a Community

To define a Quarantine zone:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Zones**. The **Configure Zones and Profiles** page displays.

3 Select **New**, and then select **Quarantine zone** from the menu. The **Zone Definition - Quarantine Zone** page appears.



4 In the **Name** field, type a meaningful name for the zone.

5 (Optional) In the **Description** field, type a descriptive comment about the zone.

6 In the **Customization** area, type the message you want quarantined users to see. You might offer an explanation for why a device was placed in quarantine and what is required to make it comply with your security policies.

Remediation steps for devices that are placed in a **Quarantine** zone should probably include information on how to configure a system for EPC interrogation. For most users, this means enabling Java in the browser, enabling ActiveX, or downloading the Java Runtime Environment (JRE). Your message for users could include some or all of the following:

- Verify that Java or JavaScript is enabled in the Web browser on the computer (in most browsers, Java is enabled by default). End point interrogation can't take place if ActiveX and Java are both disabled in the user's browser.
- If you are using Microsoft Windows and Internet Explorer, verify that ActiveX is enabled: start Internet Explorer, and then click **Internet Options** on the **Tools** menu. On the **Security** tab, click the Internet logo at the top of the tab, and then click **Custom Level** to configure ActiveX controls and plug-ins.
- JRE allows Java applications or Java applets to run on personal computers. To see if it is running on your machine, type `java -server` at the command prompt.

7 Add any Web links that can help users bring their devices into compliance. This can be a mixture of public and private URLs:

- A public address might reference an Internet URL from which the user can download a software component, such as a Java Virtual Machine. Public resources are normally redirected through the appliance; prevent this redirection by adding the resource in the exclusion list. See Using the Resource Exclusion List for instructions.
- A private address might reference an intranet URL containing the latest virus definitions. In this case, rules are automatically created to give users access to the URL you specify and to prevent them from accessing any other resources.

8 Click **Save**, or **Save and Add Another**.

Configuring the Default Zone

AMC provides a global **Default** zone that serves as a fail-safe to either allow or block VPN access for any connection requests that don't match the other zones you set up. When the appliance receives a connection request that it can't classify into a zone—meaning it can't identify the client device's operating system, browser, or other attributes—that device is automatically placed in the **Default** zone. You can choose whether to grant or deny VPN access to users whose devices are assigned to the **Default** zone.

Unlike other zones, the **Default** zone does not include device profiles, but it can be configured to require the presence of a data protection agent. The **Default** zone is implicitly present in every community configured in AMC.

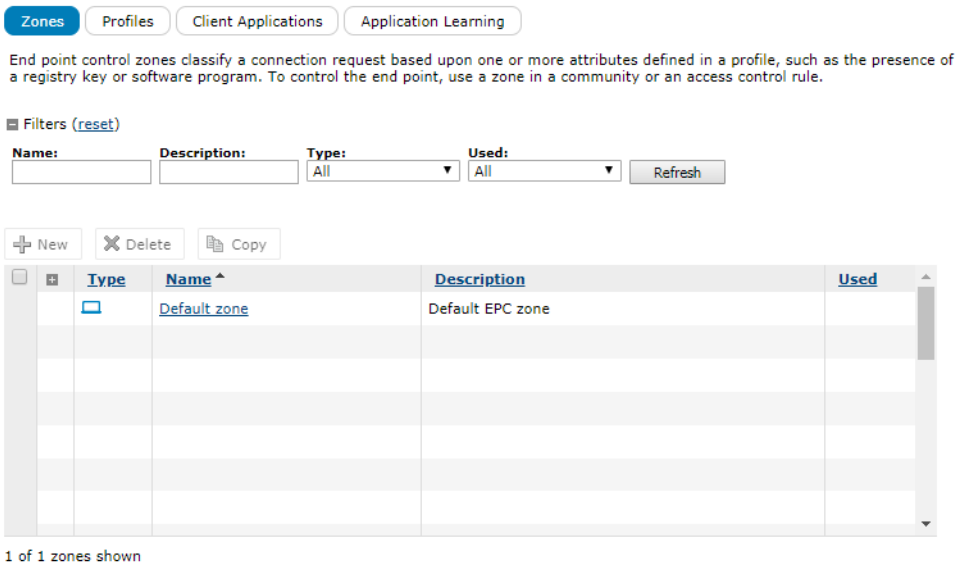
To provide a limited degree of access to users whose connection requests don't meet your criteria for a trusted relationship, you can include the **Default** zone in a restrictive access control rule. For example, you could let users access their email by including the **Default** zone in a "permit" access control rule limited to Web browsers connecting to Outlook Web Access.

If a restrictive access policy that requires a high degree of trustworthiness and does not allow connection requests unless they are explicitly defined, setting the **Default** zone to **Block VPN access** is the best strategy. Keep in mind that if your other zones and access control rules inadvertently omit legitimate users, the **Default** zone will block them without exception.

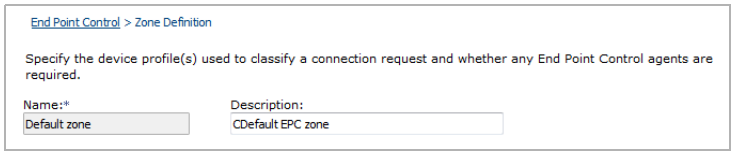
To configure the Default zone:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Zones**. The **Configure Zones and Profiles** page displays.

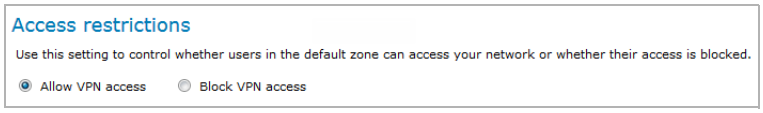


3 Click **Default zone** in the **Zone** table. The **Zone Definition - Default Zone** page displays.

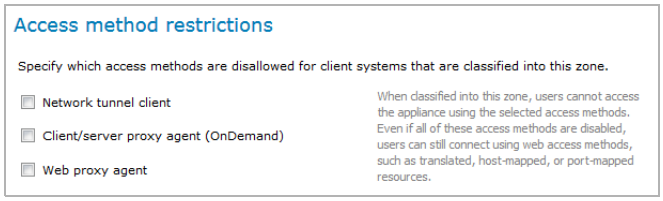


The **Name** field is dimmed as the name for this zone cannot be changed.

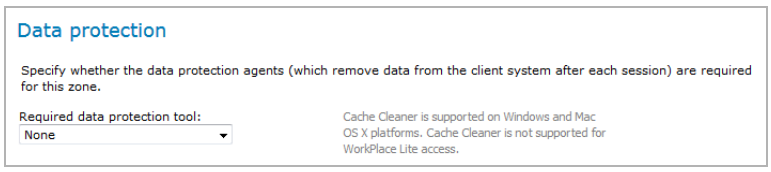
4 In the **Access restrictions** section, select whether the appliance will **Allow VPN access** or **Block VPN access** for devices that are placed in the **Default** zone. If you select **Block VPN access**, users who are assigned to the **Default** zone are logged off of the appliance.



5 In the **Access method restrictions** section, specify which access methods, if any, will not be allowed for clients that are classified into this zone.



6 In the **Data protection** section, select whether client devices placed in the **Default** zone are required to have *Cache Cleaner* to connect. Cache Cleaner provides enhanced data protection on all platforms except Linux platforms,



7 Expand the **Client security** section.

8 In the **Recurring EPC** section, you can specify how often EPC checks are done. Select:

- **Check endpoint at login** to perform an EPC check only once (at login)
- **Check endpoint at login and every** *<n>* **minutes thereafter** at login and then every *<n>* minutes for the duration of the session.

9 Expand the **Advanced** section.

10 The connection between devices and the appliance can handle interruptions—such as suspending a session and later resuming it, or temporarily losing connectivity—without requiring that users reauthenticate, as long as the device is using the same IPv4 or IPv6 IP address.

To allow users to resume sessions from a different IP address—for example, when roaming from one IP subnet to another by plugging into another part of your network—select the **Allow user to resume session from multiple IP addresses** checkbox in the **Advanced** area.

NOTE: For Secure Network Detection to work, this checkbox must be checked to allow users to resume sessions from multiple IP addresses.

11 Click **Save**.

Defining Device Profiles for a Zone

A device profile establishes a trust relationship with a client device by looking for one or more attributes, such as an antivirus program, application, or Windows registry entry. Device profiles can be referenced by one or more zones.

A device profile can be defined to detect only one attribute on a client computer, or it can require multiple attributes. When a device profile references multiple attributes, each of those attributes must be present on a client computer for there to be a match.

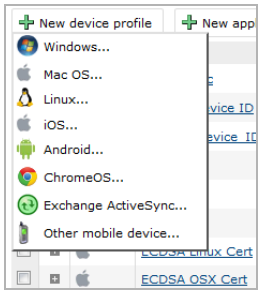
NOTE: For information on how to copy or delete a device profile, see Adding, Editing, Copying, and Deleting Objects in AMC.

To define a device profile for a zone:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **Zones and Profiles** area of the page, click the **Edit** link next to **Profiles**. The **Configure Zones and Profiles** page displays.

3 Click the **New device profile** button.



4 From the **New device profiles** menu, select one of the SMA EPC-supported device profiles:

- Microsoft Windows
- Apple Mac OS
- Linux operating systems
- Apple iOS mobile operating system
- Android mobile operating system
- Google ChromeOS

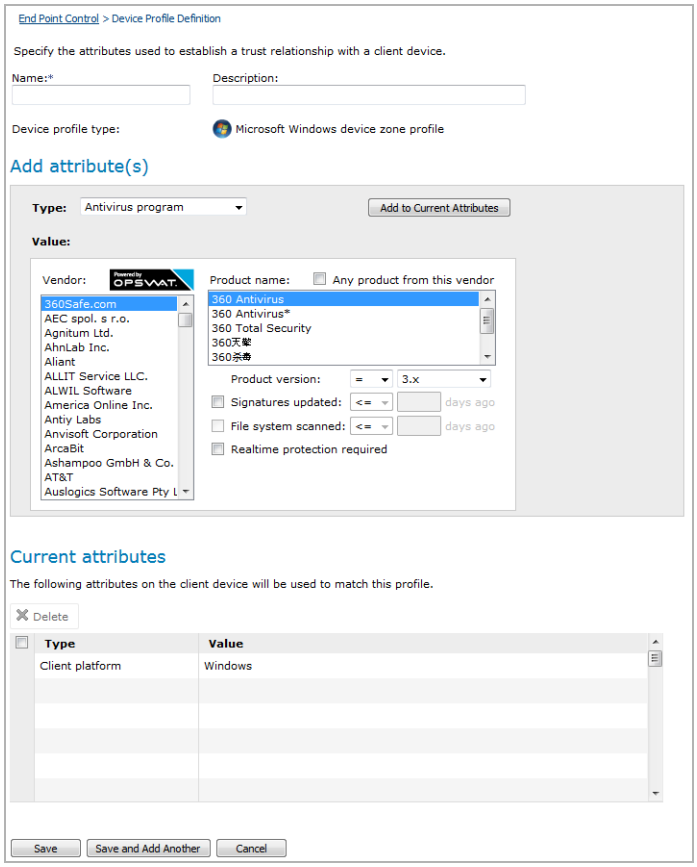
  NOTE: You can also match a policy for **ChromeOS** as a Platform in an Access Control Rule, which does not require End Point Control.

- Exchange ActiveSync
- Other mobile devices

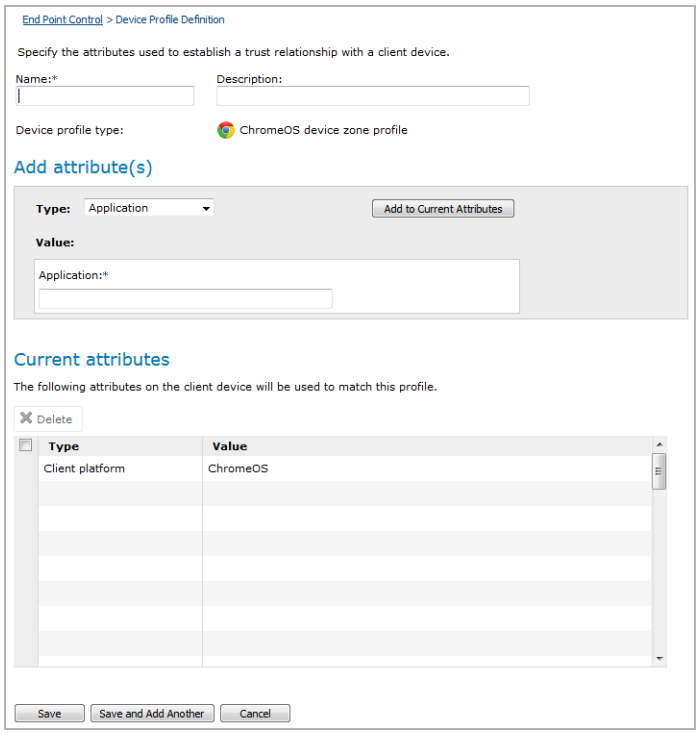
The **Device Profile Definition** dialog for that device appears; for example:

- Device Profile Definition dialog for Microsoft Windows
- Device Profile Definition dialog for ChromeOS.

Device Profile Definition dialog for Microsoft Windows



Device Profile Definition dialog for ChromeOS.



5 In the **Name** field, enter a name for the device profile.

6 (Optional) In the **Description** field, enter a descriptive comment about the device profile.

7 From the **Value** section, select the attributes that you want for the device profile.

8 After selecting each attribute, click **Add to Current Attributes**. The attribute is added to the **Current attributes** list at the bottom of the page.

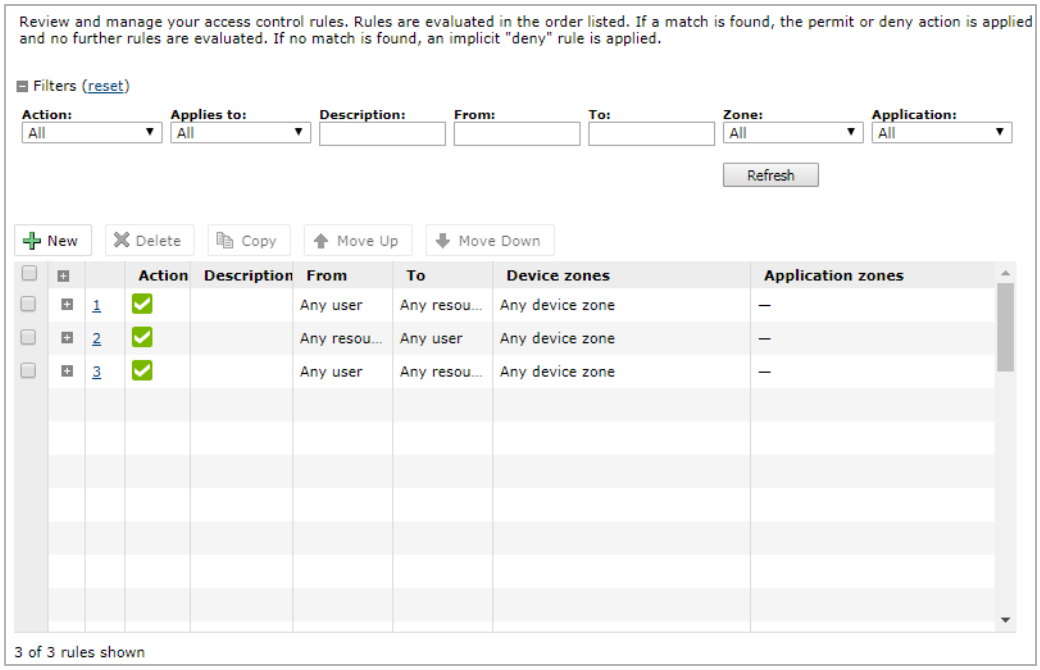
- The available attributes depend on the device profile you selected; *Client certificate*, for example, is not available as an attribute in a *Linux* profile, and *Antispyware program* is available only for users who have Advanced EPC.
- Where multiple entries are allowed for an attribute, note whether a device profile must match *all* (**and**) or match *any* (**or**) items on the device.

Detailed descriptions of the attributes and the platforms on which they are available are in Device Profile Attributes.

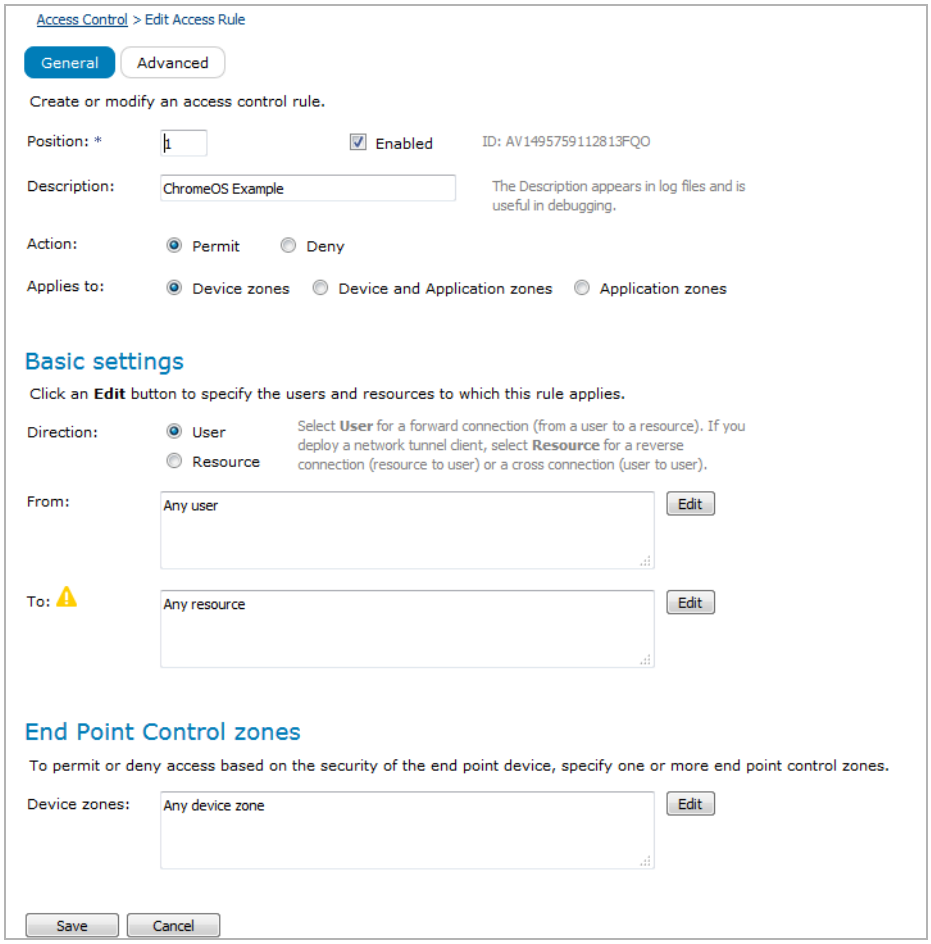
9 Click **Save**.

To define ChromeOS as a Platform in Access Control Rules:

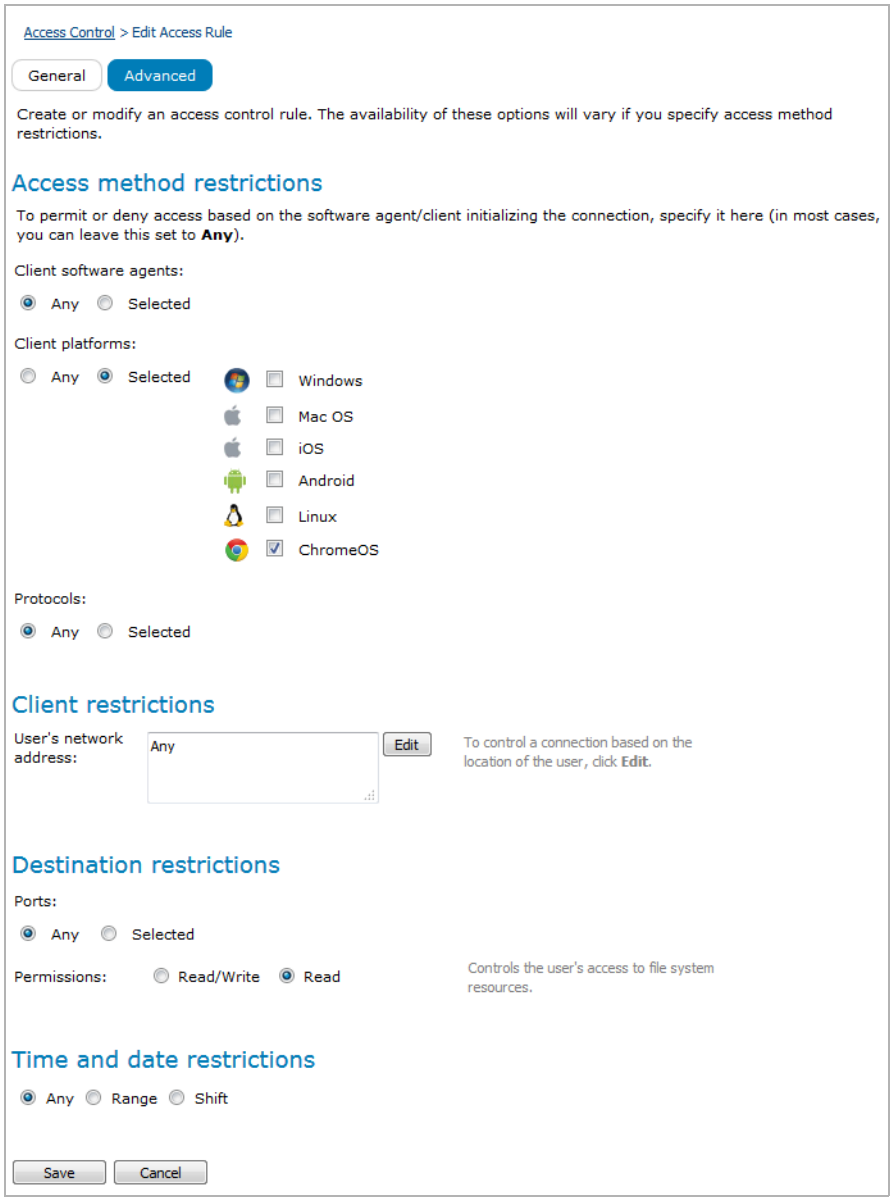
1 From the main navigation menu in AMC under **Security Administration**, click **Access Control**. The **Access Control** page displays.



2 Click on the **Access Control Rule** you want to edit. The **Edit Access Rule > General** page appears.



3 Click the **Advanced** tab. The **Edit Access Rule > Advanced** page appears.



4 Under **Client platforms**, select **Selected**, and then select **ChomeOS**.

5 Click **Save**.

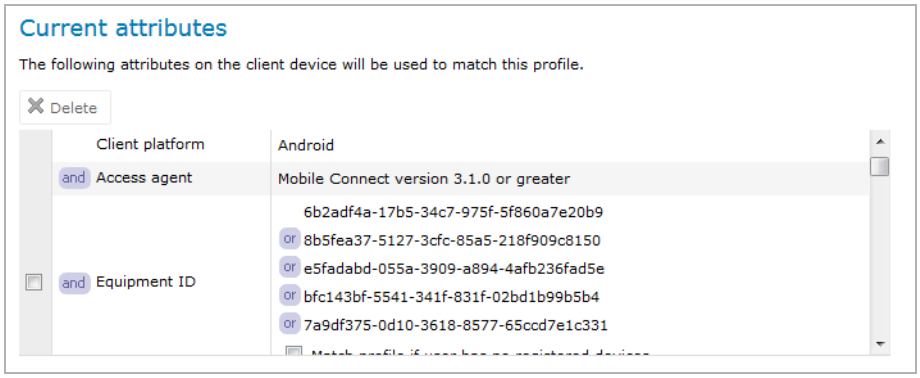
Device Profile Attributes

A device profile can have several attributes: the platforms on which it can be used and whether multiple attributes of the same type (where allowed) are ORed or ANDed:

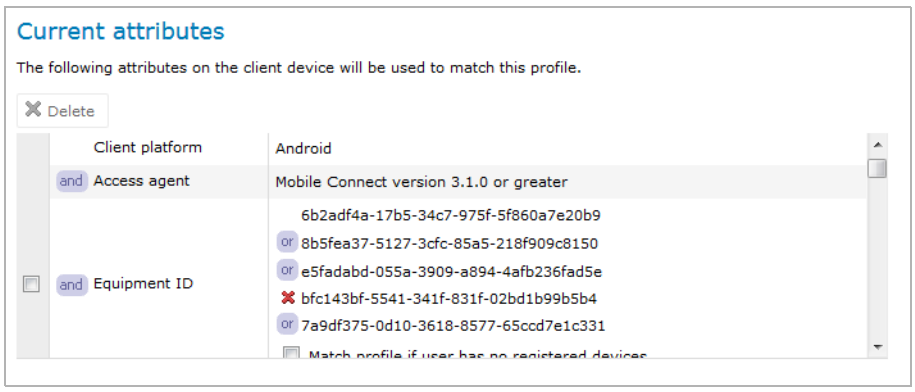
- the Device Profile Attributes: ChomeOS version table
- the Device Profile Attributes: Android application table
- the Device Profile Attributes: Android version table
- the Device Profile Attributes: Antivirus program (Advanced EPC only) table
- the Device Profile Attributes: Antispyware program (Advanced EPC only) table
- the Device Profile Attributes: client certificate table
- the Device Profile Attributes: directory name table
- the Device Profile Attributes: iOS version table
- the Device Profile Attributes: Mac OS X version table
- the Device Profile Attributes: Personal firewall program (Advanced EPC only) table
- the Device Profile Attributes: Windows domain table
- the Device Profile Attributes: Windows registry entry table

There are a few things to note about these attributes:

- The attributes from which you can choose differ, depending on the platform you selected for your device profile.
- Users who have Advanced EPC can pick from a wide range of security programs.
- Where multiple entries are allowed for an attribute, a device profile must either match *all* (**and**) or *any* (**or**) items on the device.



- To delete an item in the list, select the checkbox in the left column and click **Delete**. To delete a single (**or**) item, for example, *Norton AntiVirus* but not *eTrust EZ Antivirus*, move your pointer to the left of the item you want to delete and click the red **X** that appears.



Device Profile Attributes: ChomeOS version

ChromeOS version	Platform
Type the major and minor versions, and the build number for the operating system. The comparison **Operator** applies to all three values. To specify all versions, enter "greater than or equal to" (**>=**) as the **Operator**, and then type the major version number in the **Major** field and the minor version number in the **Minor** field. You can also specify the **Build** and the **Patch** numbers. For more information, see Using Comparison Operators with Device Profile Attributes.	ChromeOS

Device Profile Attributes: Android application

Android Application	Platform	Match
Select one or more Android applications that EPC should check for in this profile. To do so, select the vendor from the **Vendor** list, which displays the vendor's mobile security product and current version number. If the vendor has more than one mobile security product, all mobile security products are listed in the **Product name** list. Select the mobile security product that EPC should check for in this application. Next, The most current version of the selected product is displayed. Select the **Operator** used to compare the product version number. The default is all versions greater than the most current version. To specify the current version and all future versions, select **>=** (greater than or equal to) from the **Operator** drop-down menu. For more information, see Using Comparison Operators with Device Profile Attributes.	Android	or (Match any) and (Match all)

Device Profile Attributes: Android version

Android version	Platform
Type the major and minor versions, and the build number for the operating system. The comparison **Operator** applies to all three values. To specify all versions, enter "greater than or equal to" (**>=**) as the **Operator**, and then type the major version number in the **Major** field and the minor version number in the **Minor** field. For more information, see Using Comparison Operators with Device Profile Attributes.	Android

Device Profile Attributes: Antivirus program (Advanced EPC only)

Antivirus program	Platform	Match
(This attribute is available only if you have Advanced EPC.) Select the antivirus programs that EPC should check for in this profile. See Advanced EPC: Extended Lists of Security Programs for more information. If you don't have Advanced EPC, or if you don't see the security programs that your users require, you can still specify programs by adding them to a device profile using another attribute, such as *Application* or *Windows registry entry*.	Windows Mac OS Linux	or (Match any)

Device Profile Attributes: Antispyware program (Advanced EPC only)

Antispyware program	Platform	Match
(This attribute is available only if you have Advanced EPC.) Select an antispyware vendor on the left, and the name and parameters for the program on the right. If you don't have Advanced EPC, or if you don't see the security programs that your users require, you can still specify programs by adding them to a device profile using another attribute, such as *Application* or *Windows registry entry*.	Windows Mac OS X	If you add more than one antispyware program, specify whether it should match *any* item in your list (**or**), or *all* of them (**and**).

Device Profile Attributes: client certificate

Client certificate	Platform	Match
Select a Certificate Authority from the drop-down menu in the **CA certificate** area. (See Importing CA Certificates if the CA you want to use is not listed). A client device will match this profile as long as the appliance is configured with the root certificate for the CA that issued the client certificate to your users (an intermediate certificate will not work). Select the certificate store(s) you want searched: • **System store only** specifies that only the system store (*HKLM\SOFTWARE\Microsoft\SystemCertificates*) is searched • **System store and user store** specifies that the system store is searched first, followed by the user store (*HKCU\Software\Microsoft\SystemCertificates*) **NOTE:** • A device profile can contain only one client certificate attribute. • A Windows Mobile-powered device has only one user, which means that any client certificates in the local user store are always the same. (On a desktop or laptop device, there can be multiple users.) • The system store cannot be searched unless the user has administration privileges on the client device.	Windows Mac OS X Windows Mobile Apple iOS Android	or (Match any)

Device Profile Attributes: directory name

Directory name	Platform	Match
Type the name of a directory that must be present on the hard disk of the device. Directory names are not case-sensitive. • For jailbroken Apple iOS devices, the directory name is `/Applications/Cydia.app`. **NOTE:** When creating a device profile for jailbroken iOS devices, be sure to configure a denied EPC zone for the profile and bind this zone to at least one community.	Windows Mac OS X Linux Windows Mobile Apple iOS Android	and (Match all)

Device Profile Attributes: Equipment ID

Equipment ID	Platform	Match
Type the identifier for the device or use variables to define the identifier based on user attributes. You can choose to allow access to users who do not have any registered devices on the external AD/LDAP server. Typically this would be done to allow a user access until their device identifier can be registered. Whether or not you choose to allow access, all requests for access that come from unregistered devices will be logged in the Unregistered Device Log.	Windows Mac OS X Linux Windows Mobile Apple iOS Android	and (Match all)

Device Profile Attributes: file name

File name	Platform	Match
Type the name of a file (including its extension and full path) that must be present on the hard disk of the device. File names are not case-sensitive. You can use environment variables (such as `%windir%` or `%userprofile%`), or wildcard characters (* and ?). You can optionally specify a **File size** or the date and time (GMT) the file was **Last modified**. Both of these options use a comparison **Operator**; for more information and examples, see Using Comparison Operators with Device Profile Attributes. The file's modification date and time can be specified as an **Absolute** or **Relative value**. The device profile can be configured to **validate file integrity** using an MD5 or SHA-1 hash (valid on all platforms), or use a Windows catalog file to validate Windows system files. Device profiles that check for the name of the file(s) used by jailbroken or rooted devices include: • For jailbroken Apple iOS devices, the file name is `cydia`. • For rooted Android devices, the file names are `/system/bin/su` and `/system/xbin/su`. **NOTE:** If creating a device profile for jailbroken iOS devices or rooted Android devices, be sure to configure a denied EPC zone for each profile and bind each of these zones to at least one community.	Windows Mac OS X Linux Windows Mobile Apple iOS Android	and (Match all)

Device Profile Attributes: iOS version

iOS version	Platform
Type the major and minor versions, and the build number for the operating system. For example, enter **Major** 5, **Minor** 0, and **Build** 9A405 for the iOS 5.0.1 build 9A405 version. The comparison **Operator** applies to all three values. To specify all versions of 5.0, for example, enter "greater than or equal to" (**>=**) as the **Operator**, and then type `5in` the **Major** and `0` in the **Minor** fields. For more information, see Using Comparison Operators with Device Profile Attributes.	Apple iOS

Device Profile Attributes: Mac OS X version

Mac OS X version	Platform
Type the major and minor versions, and the build number for the operating system. Examples of versions for the Mac OS are: • v10.2 (Jaguar) • v10.3 (Panther) • v10.4.4 (Tiger) • v10.5.6 (Leopard) The comparison **Operator** applies to all three values. To specify all versions of Leopard, for example, enter "greater than or equal to" (>=) as the **Operator**, and then type `10` in the **Major** and `5` in the **Minor** fields. For more information, see Using Comparison Operators with Device Profile Attributes.	Mac OS X

Device Profile Attributes: Personal firewall program (Advanced EPC only)

Personal firewall program	Platform	Match
(This attribute is available only if you have Advanced EPC.) Select the firewall programs that EPC should check for in this profile. See Advanced EPC: Extended Lists of Security Programs for more information. If you don't have Advanced EPC, or if you don't see the security programs that your users require, you can still specify programs by adding them to a device profile using another attribute, such as *Application* or *File name*.	Windows Mac OS X Linux	or (Match any)

Device Profile Attributes: Windows domain

Windows domain	Platform	Match
Type the domain name the computer belongs to in NetBIOS syntax (for example, `mycompany`), without a DNS suffix. Separate multiple entries with a semicolon. The domain can contain wildcard characters (* and ?). **NOTE:** Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.	Windows	or (Match any)

Device Profile Attributes: Windows registry entry

Windows registry entry	Platform	Match
Type the **Key name**, and optionally enter a **Value name** and **Data**, and then select a comparison **Operator** for the **Data** field. See Using Comparison Operators with Device Profile Attributes for more information. Wildcards can be used for the value and data, but not for the key. To enter a special character (such as a wildcard or back slash), you must precede it with a back slash.	Windows Windows Mobile	and (Match all)

Device Profile Attributes: Windows version

Windows version	Platform
Type the major version, minor version, and build number for the operating system. Example major/minor versions for Windows are: • Windows Vista: 6/0 • Windows 2000: 5/0 The comparison **Operator** applies to all three values. For more information, see Using Comparison Operators with Device Profile Attributes.	Windows Windows Mobile

Advanced EPC: Extended Lists of Security Programs

Advanced EPC is an optional component—licensed separately—that provides an extended and detailed list of security programs. You can configure EPC device profiles to check for personal firewall, antivirus, and spyware programs on clients running Microsoft Windows or Mac OS X, and to check for personal firewall and antivirus programs on clients running Linux.

Advanced EPC includes a built-in list of device profiles you can use as is or modify; see Advanced EPC: Using Preconfigured Device Profiles for more information.

NOTE: The version of OESIS libraries on the client will always be the same as that of OESIS libraries configured on the connecting appliance. If there is any version mismatch, the client provisions the OESIS libraries from the appliance.

To add attributes using Advanced EPC:

1. From the main navigation menu in AMC, click **End Point Control**.
2. Click the **Edit** link in the **Zones and Device Profiles** section. The **Configure Zones and Devices** page appears.
3. In the **Device Profiles** section, click **New**, and then select an operating system from the list.
4. After giving the profile a **Name** (a **Description** is optional), select the **Type** of program for which EPC should check (for example, *Antivirus program*). (On the Linux platform, *Antispyware program* is not available.)
5. Select a **Vendor and Product name**. In Windows device profiles, select the **Any product from this vendor** checkbox, available for antivirus, antispyware, and personal firewall program vendors, to select all product names and create a profile that does not require updating every time the vendor releases a new version. When this option is selected, you can still specify additional criteria, such as signatures updated, file system scanned, and real-time protection enabled, as long as all the versions of all the products in the list support that functionality.
6. Specify an absolute or relative **Product version**.

Some products are known by several different names. For example, McAfee Inc. offers a core product named *McAfee VirusScan* that is also known as *McAfee VirusScan 2004* and *McAfee VirusScan 2005*. (When you select a product name that has an asterisk, you'll see a footnote indicating its "core" product name.) Using the name indicated in the footnote is recommended so that you don't have to update your device profile every time a core product is marketed under a new name.

7 There are optional parameters you can use to more narrowly define the security program settings that the device profile requires (not all parameters are available for each program choice—any that are not available are dimmed):

- **Signatures updated**: Defines how recently the list of antispyware or antivirus signatures was updated on the client device.
- **File system scanned**: Defines how recently the client device's disk was scanned using this antispyware or antivirus program.
- **Realtime protection required**: If the device profile requires that realtime scanning for viruses and spyware is enabled, select this checkbox.

8 Click the **Add to Current Attributes** button to add an entry to the list at the bottom of the page. When you add additional programs (for example, if you want the device profile to check for any of several programs), the device profile must match *all* (**and**) or *any* (**or**) items on the device:

- Additional antivirus programs are grouped together, but the device profile requires just one of the programs for a match.
- When you specify more than one antispyware program, you can specify whether all of them are required (**and**), or just a single one (**or**).

9 Click **Save**.

NOTE: The product names you can choose from include some that use Far Eastern language characters. If you do not have international support enabled on your operating system, these characters may be displayed as boxes or question marks. The name of one of the Symantec products you can choose, for example, may look like this if the appropriate font support is missing:

Symantec AntiVirus Client
Symantec AntiVirus □□□
Symantec AntiVirus Server

With international support enabled, it looks like this:

Symantec AntiVirus Client
Symantec AntiVirus 用户端
Symantec AntiVirus Server

Advanced EPC: Using Fallback Detection

Fallback detection uses advanced EPC to detect newer vendor software versions than are recognized by OESIS, which allows zone classification to succeed. Fallback detection supplements your fully trusted profiles with EPC definitions for the versions you want to determine fully (for example, Microsoft Security Essentials version 4.x or higher).Fallback detection, which uses the Windows Security Center (WSC), can be configured for Windows-based Antivirus, Antispyware and Personal Firewall products.

For example, users are put in the Trusted zone when they log in with McAfee Antivirus. When they update to a newer version of McAfee and log in, the WSC fallback will match for the Trusted Fallback zone, and they will be allowed access.

When Secure Mobile Access supports the new McAfee version, you can simply update the policy for the Trusted zone to include the new version. This allows the admin to easily distinguish between devices that match a specific antivirus version and those that do not, but do match the Fallback logic.

NOTE: To use Fall back Detection, device profiles for the Primary EPC zone must be configured with specific versions of antivirus, antispyware, and firewall products and NOT with the **Any product from this vendor** option.

To configure Fallback Detection:

1 Create a new device profile for trusted fallbacks with these value:

   a From the main navigation menu in AMC, click **End Point Control**.

   b Click the **Edit** link in the **Zones and Device Profiles** section. The **Configure Zones and Devices** page appears.

   c In the **Device Profiles** section, click **New** and then select **Microsoft Windows**.

   d Type the **Name** of the new device profile.

   e From the **Type** drop-down menu, select **Antivirus program**, **Antispyware program**, or **Personal firewall program**.

   f From the **Vendor** drop-down menu, select the vendor that provides the product.

   g From the **Product** drop-down menu, select **Other** <***vendor***> <***type***> (for example, **Other Aliant Firewall**).

   Do **NOT** use the **Any product from this vendor** checkbox.

   h Set the **Product version** to **>=** *x*.

   i If applicable, enable **Signatures updated** and **Realtime protection required**.

   j Click **Save**.

2 Create a new Trusted Fallback zone and add the Trusted Fallback profile to this zone.

   Optionally, Trusted and Trusted Fallback profiles can be combined into one zone, depending on your security requirements. However, using a separate Trusted Fallback zone allows you to easily determine when users update software that is not matched by the Trusted zone, so you will know when to add new versions to the Trusted zone.

3 In your community, add the Trusted Fallback zone to the Realms list directly below the Trusted zone.

Advanced EPC: Using Preconfigured Device Profiles

To help you get started with End Point Control, there are several preconfigured device profiles, grouped by operating system, that you can use as is or copy and modify to suit your access policy and resource requirements. Click **End Point Control** in the main navigation menu in AMC, and then click the **Edit** link in the **Zones and Device Profiles** section to see the list:

Preconfigured Device Profiles

Windows	Mac OS X	Linux
Windows	Mac	Linux
Windows - Home Users	Mac OS X - Home Users	Linux - Antivirus
Windows - McAfee Corporate	Mac OS X - McAfee Corporate	
Windows - Norton Corporate	Mac OS X - Norton Corporate	
Windows - Sophos Corporate		
Windows - Trend Micro Corporate		

The device profile named *Windows - McAfee Corporate*, for example, is a Windows device profile preconfigured to require McAfee VirusScan Enterprise (version 7.50.0 or later), and either one of the specified personal firewall products shown in the Preconfigured McAfee Corporate profile table.

Preconfigured McAfee Corporate profile

Attribute type	Product name
Antivirus program	McAfee VirusScan Enterprise, version >= 7.5.0.x
AND	
Personal firewall	McAfee Personal Firewall Express, version >= 5.x
	OR
	McAfee Personal Firewall Plus, version >= 5.x

You can use these predefined profiles as a starting point for your own. Copy one that matches your environment the closest, and then modify it, changing (for example), the acceptable product versions and the requirement for how recently the list of antispyware or antivirus signatures was updated on the client device. To delete an entire row in the list of current attributes, select the checkbox for that row and click **Delete**. To delete an item in an ORed list (one of the personal firewall products in the *McAfee Corporate* profile, for example), move your mouse cursor over the “or” and then click the red “X” that appears.

Using Comparison Operators with Device Profile Attributes

Some device profile attributes can be modified using comparison operators shown in the Available comparison operators table, which is useful in situations such as these:

- Keeping a device profile current with software that is automatically updated on client devices—you don’t need to manually change the profile each time the software is updated
- Specifying that a specific file detected on client machines has a timestamp greater than a certain date and time
- Specifying that the Windows operating system detected on the client device be greater than or equal to a certain version

Available comparison operators

Operator	Description
<	Less than
<=	Less than or equal to
=	Equal to
>=	Greater than or equal to
>	Greater than
!=	Not

Comparison operators can be used in conjunction with these device profile attributes:

- File date or time stamp for a specific file
- File size for a specific file
- Registry entry (when value data is selected for a registry key)
- Windows version
- Advanced End Point Control

Example

This example show how to find a file on a PC running Microsoft Windows that has recently been updated.

To specify a relative or absolute file date:

1. From the main navigation menu in AMC, click **End Point Control**.
2. Click the **Edit** link in the **Zones and Device Profiles** section, and then click **New** in the **Device Profiles** section.
3. Select **Microsoft Windows** on the menu.
4. Type a meaningful name for the device profile in the **Name** field.
5. (Optional) In the **Description** field, type a descriptive comment about the device profile.
6. In the **Add** attribute(s) area, select **File name** in the **Type** list.
7. In the **File name** field, type `weekly_timesheet.xls`. Here are two examples of how to specify a time stamp for the file:
   - To specify that *weekly_timesheet.xls* has been updated within the last five days, select <= in the **Last modified** list, click **Relative**, and then type 5 in the field.
   - To specify that the file was updated after June 1, 2017, select >= in the **Last modified** list, click **Absolute**, and then type `06/01/2017` in the fields.
8. Click **Add to Current Attributes**, and then click **Save**.

Using End Point Control with the Connect Tunnel Client

You can use End Point Control on devices that connect to the appliance using the Connect Tunnel client. As with other access methods, EPC for the Connect Tunnel client supports the use of device profiles and EPC zones. However, the Connect Tunnel client does not support Cache Cleaner; this data protection option is ignored by the Connect Tunnel client.

Performing Recurring EPC Checks: Example

A connection request is classified into an EPC zone based on attributes defined in a device profile. This check is always performed when the user logs in; in addition, you have the option of checking at regular intervals whether a device continues to match the profile for a particular zone.

An example illustrates how this setting might be used. In this scenario the system administrator has given each systems engineer in the organization a USB device that provides access to resources protected by the SMA appliance. This provides two-factor authentication: During a user's session, the appliance repeatedly checks for the presence of a client certificate associated with a USB device: if the check fails, the session ends. Since an essential part of the user's authentication (the client certificate) is on the USB device, authentication data does not remain on the system when the systems engineer removes the key.

Here's how it looks from the systems engineer's perspective:

1. Insert your personal USB device into any desktop or laptop device (trusted or untrusted). If the device is running Windows Vista and Internet Explorer 7, Protected Mode must be off.
2. Enter your PIN number.

3 Log in for access to the VPN and authenticate. The SMA appliance checks for your client certificate when you log in and at regular intervals thereafter (the interval is set by the SMA appliance administrator). When the USB device is removed, the check fails and the connection is ended.

NOTE: It's important for users to understand that their connectivity depends on the presence of the USB device. For this reason they should also not leave the USB device plugged in and unattended.

Here's an overview of the configuration steps the administrator must take:

1 To establish a trust relationship between the USB device and the appliance, you must reference a root CA certificate in the EPC device profile. If it's not already present, import the certificate to the appliance (click **SSL Settings** in the main navigation menu, and then click **Edit** in the **CA Certificates** area).

2 Using Appliance Management Console, create a device profile for Windows, Mac, or Linux devices to check for the presence of a client certificate on the USB devices you plan to distribute. The certificate must descend from the root certificate from Step 1. When creating a device profile for Windows, ensure both system and user certificate stores are searched.

3 Create an EPC Standard zone that requires the device profile from the preceding step.

4 When you are defining the zone, specify in the **Recurring EPC** area at what intervals EPC will check the client systems that are classified into this zone. In this case, you might want to perform frequent checks (for example, every minute).

5 A device for which there is no profile match—the client certificate does not descend from the root CA certificate identified in the first step, or the USB device has no certificate—will "fall through" to either the **Default** zone or a **Quarantine** zone:

- To deny access to any connection requests that don't meet your criteria, configure the Default zone to simply deny access. In the **Access restrictions** area on the **Zone Definition** page, select **Block VPN access**.
- If you prefer, you can create a **Quarantine** zone and customize the message users see; for example, you may want to explain what is required to bring the user's system into compliance with your security policies.

Creating Zones for Special Situations

While the majority of connection requests—those involving Microsoft Windows and Internet Explorer, Google Chrome, or Mozilla Firefox—can be accommodated by Standard zone configurations, you may need to address special situations involving other operating systems and browsers, or connection requests that don't match any of the zones you've defined. You can use zones and device profiles to address the following types of situations:

- Clients that don't match the criteria for any defined zones and device profiles.
- Clients that don't support the EPC interrogation necessary for classifying a client into an EPC zone.
- Clients running certain Web browsers (anything other than Internet Explorer, Google Chrome, and Firefox) on Windows, or users running earlier Windows versions.
- Special classes of users who require access regardless of the client device they're running.

Be sure to configure the global **Default** zone, which is implicitly present in every community configured in AMC

Topics: .

Defining Zones for Certain Browsers or Earlier Versions of Windows

When a user connects to the SMA appliance, the appliance interrogates the user's computer and determines (among other things) what operating system it's running and what Web browser is in use. EPC requires Windows 7 (or later) and Internet Explorer, but you can define a special zone for users who don't meet those requirements. This prevents them from being placed in the Default zone, which might block their access. The only attribute used to distinguish this type of zone is the presence of the Windows system.

This configuration can also be used to define a zone for users who are running a version of Microsoft Windows that was released before Windows 7.

To define a zone for clients with non-standard browsers:

1. From the main navigation menu in AMC, click **End Point Control**.
2. In the **Zones and Device Profiles** section of the **End Point Control Settings** page, click the **Edit** link. The **Configure Zones and Devices** page appears.
3. Click **New** in the **Zones** section, and then select **Standard zone** from the menu. The **Zone Definition** page appears.
4. In the **Name** field, type a meaningful name for the zone.
5. In the **Description** field, type a descriptive comment about the special browser zone.
6. Click **New** in the **Device Profiles** section, and then select **Microsoft Windows** from the menu. The **Device Profile Definition** page appears.
7. In the **Name** field, type a meaningful name for the device profile.
8. In the **Description** field, type a descriptive comment about the device profile.
9. In the **Add attribute** area, select **Windows version** from the **Type** list, and then click **Add to current attributes**. Do not specify any other attribute settings.
10. Click **Save**.
11. Select the checkbox for the browser **Device profile** that you want to include in the zone.
12. Use the **>>** button to move the items to the **In use** list.
13. If you want the device profile to require the presence of a data protection component, select **Cache Cleaner** from the **Required data protection tool** list.

    Cache Cleaner is not supported on Linux platforms.
14. When you are finished configuring the zone, click **Save**.

Collecting Equipment IDs from Unregistered Devices

Every Windows desktop and mobile device has a unique identifier, and you can use this identity in a device profile to ensure that only certain devices have access to protected resources. But before you can add equipment ID data to your directory server as a user attribute, you must first collect the data. You can do this in several ways:

- By creating device profiles for unregistered devices and having users log in: the device ID is collected in the `Unregistered device log`. See Creating Device Profiles that Allow Unregistered Devices.
- By creating a device profile that uses a device identity, but does not have the **Match Profile if user has no registered devices** option enabled. See Disabling Match Profile if User has no Registered Devices in the Device Profile.

- By creating a quarantine zone associated with a device profile that matches users who log in using an unregistered device. See Quarantining Unregistered Devices.
- By creating a deny zone associated with a device profile that matches users who log in using an unregistered device. See Locking Out Unregistered Devices.
- By exporting the log messages for login attempts by unregistered devices to an external machine, where an IT administrator can view the list and register the devices or they can be automatically registered. See Exporting the Unregistered Device Log for External Processing.

NOTE: When selected, the **Match profile if user has no registered devices** checkbox is applicable when the user has no devices registered in the back end AD or LDAP server and there are no hard coded devices in the device profile.

For example, consider the case where two attributes have been created for user *test* in the AD/LDAP server, and these attributes are mapped to two policy variables. A device profile is created containing these two variables and the equipment ID *4JV5DQH1*. The checkbox is selected. This device profile is a part of a zone called *std_desc*. Unlike user *test*, user *test1* has no representation in the backend LDAP/AD server.

User *test* logs in with a device that is registered in the backend server. The zone classification is *std_desc*. However, user *test1* logs in with the same device and is classified into the default zone. The checkbox does not apply to user *test1* in this case.

However, if you remove the device ID *4JV5DQH1* from the device profile, leaving just the two policy variables, you will see a different zone classification for user *test1*. In this case, user *test* logs in with a registered device and is classified into the *std_desc* zone. User *test1* logs in and is also classified into the *std_desc* zone. The checkbox applies in this case because user *test1* has no devices registered, the two policy variables in the device profile of the zone return with NULL values, and there isn't the third hard-coded device in the device profile.

If you are using mobile devices, you may already have the device identities entered into your database. In this case, you could simply refer to them in a profile. Users logging in from one of these devices will match this profile and qualify for the associated zone.

The device identifier is usually an attribute in the authentication directory represented by a variable; for example, {`device_identity`}. The format of the identifier differs, depending on the kind of device used:

- For a Microsoft Windows device, the identifier is a unique hard-drive serial number; for example, *WD-WMAM9SK79685*.
- For a Mac OS X device, the Universal Unique Identifier (UUID) is used. A UUID is a 128-bit number that combines references to the network address of the host that generated the UUID, the timestamp, and a random number. An example of a UUID is: *951A240E-F502-5632-BDAB-D1ECA43FA371*.
- For a Linux device, the UUID is the device identifier.
- For a Virtual Machine, the UUID is the device identifier.
- For a Windows Mobile 6 device, the identifier is the unique 15-digit IMEI (International Mobile Equipment Identity) code for the device; for example, *350077-52-323751-3*.
- For a Nokia Symbian device, the identifier is the unique 15-digit IMEI.
- For a Google Android device, the device serial number is the identifier.
- For an Apple iPhone/iPad, the device serial number is the identifier.
- In the case of the Apple iPhone, the device prepends `Appl` to its device ID/serial number when it communicates with Exchange servers. For example: *Appl828315FLY7H*.

Another method to get the correct device ID for a smart phone is to view the POST message in the AMC log after the phone attempts to connect to the appliance. Navigate to the **Logging** page, and select *Web proxy audit log* in the **Log file** drop-down menu on the **View Logs** tab. The POST message looks like this:

```
http://10.10.11.12/Microsoft-Server-ActiveSync?User=jt&DeviceId=Appl828315FLY7H&Dev
iceType=iPhone&Cmd=Sync
```

Use the DeviceId value in your database for profiles to refer to.

Your directory server may be set up with a different attribute for each of these types of identifiers, or you can store the data in a single attribute. In this example, a single attribute and variable is used.

Creating Device Profiles that Allow Unregistered Devices

To collect equipment IDs from unregistered devices by using a device identity variable with device profiles

1. Identify or set up the AD or LDAP authentication server and realm you want users with unregistered devices to log in to. If you're starting from scratch, see Creating Realms for more information. In this example, the realm is named *Employees*.
2. Create a variable named *device_identity* that points to an attribute in the directory server specified in Step 1 (you can create the variable and capture data even if the attribute it points to doesn't exist yet):
    a. From the main navigation menu in AMC, click **Resources**.
    b. On the **Variables** tab, click **New**, and then type the name for the variable; for example, `device_identity`.
    c. Select **User attribute** from the **Type** list, and then make sure **Employees** is selected in the **Realm** list.
    d. If the user attribute that holds device ID data already exists, enter a valid user name in the **User** field, and then select the attribute from the **Attribute** list. If it doesn't exist yet, just enter its name in the **Attribute** field.
    e. If it's possible that some users will be associated with more than one device (for example, a desktop computer and a laptop), select **Multiple results** in the **Output** list.
3. Now create device profiles and a zone for unregistered devices. If you are collecting data from all three types of devices, you'll need one device profile for each one:
    a. From the main navigation menu in AMC, click **End Point Control**; make sure that EPC is enabled.
    b. Click the **Edit** link next to **Profiles** in the Zones and Device Profiles section of the Device Profiles page, click **New device profile** in the Profiles tab, and then select the platform for which youo want to create the new device profile.
    c. Give the device profile a name (for example, Unregistered - Windows), and then select **Equipment ID** in the attribute **Type** list.
    d. Select **Matches** as the **Value**. You'll create a Standard zone later in this procedure.
    e. Click the **{variable}** button next to the **Device identifier** field, select the variable you created in step 2, and then click **Insert**. Click **{variable}** again to close the list.
    f. In the **Unregistered devices** area, select the **Match profile if user has no registered devices** checkbox. Devices that are not already registered on the external AD/LDAP server will be a match for this profile and their identifiers will be recorded in the *Unregistered device log*. If you haven't already defined the variable, you'll see a warning (*Undefined: {device_identity}*), which can be ignored for now.
    g. Click the **Add to Current Attributes** button, and then click **Save**.
    h. Add a device profile for each of the other types of devices you want to accommodate. For example, Unregistered - WinMobile, or Unregistered - ActiveSync.
4. Create a Standard zone named *Data collection* that uses the device profiles that you created. See Creating a Device Zone for more information.

5 Now create a community named *New devices* in the *Employees* realm. On the **End Point Control Restrictions** page for that community, move the *Data collection* zone to the **In use** list. See Creating and Configuring Communities if you need help setting up a community.

6 When you apply and save your changes, click **End Point Control** in the main navigation menu.

7 When an unregistered device is detected during login, the user is placed in the *Data collection* zone because the device matches the *Unregistered* profile. To see device identity details, select **Unregistered device log** on the **Logging** page in AMC.

8 Select **No devices** in the **Device count** list, and then click **Refresh**, so that you're sure to capture all new users.

9 If you need to do any additional analysis of the logged data, export it to an XML file. You can reduce the size of the exported file by first applying filter or search criteria. The **Show last <n>** messages setting determines the maximum number of messages included in the exported log file.

Disabling Match Profile if User has no Registered Devices in the Device Profile

If you create a device profile that uses a device identity and disable the **Match Profile if user has no registered devices** option, a user with a new device (even if some devices are registered to that user) will not match this profile and will not be qualified into this zone. The unregistered device ID will be collected and placed into the unregistered devices list, provided that the user met all other (non-device) criteria to match the profile. The administrator can collect the device information from the unregistered device list and then register the device semi-automatically. Thus, with no user interaction, the next time the user attempts to log in using the device they may be able to classify into the zone.

Quarantining Unregistered Devices

You can create a device profile that specifies that the user does not match any of the device IDs currently registered for this user. A user with a new device will match this profile and be placed into the quarantine zone. You can configure a message to the user that the current device is unregistered, but that the device information was collected from their login attempt and their device will be registered for them, allowing their next login to qualify for the usual (non-quarantine) zone.

Locking Out Unregistered Devices

You can use a deny zone to lock out a particular device. To do this, create a device profile that contains an Equipment ID attribute and select the **Does not match** checkbox when adding the Device Identifier. This feature allows you to lock out, for example, a device that you suspect has been compromised, while not completely locking out the user who owns that device. The device information is collected from the login attempt.

Exporting the Unregistered Device Log for External Processing

There are unregistered device log messages for every new unregistered device that is used in a login attempt. These messages can be exported in XML format to an external machine either from the **Logging** page in the AMC or by using a *curl* or *wget* command from an external machine. See Unregistered Device Log Messages for more information. This export feature allows you to collect these messages and then either automatically register each device, or inform a help desk of each new unregistered device that was used by each user.

- **Advanced**: If you need be notified immediately when a user attempts to log in using an unregistered device, you can configure a Syslog server on the Configure Logging page in AMC. The appliance will generate a log message with the following format when a login or login attempt occurs:
- **New Equipmen**t: user '#1', platform '#2', device '#3', existing Devices '#4' where:
  - #1 is the name of the user
  - #2 is the name of the platform

- #3 is the ID of this device or piece of user equipment
- #4 is the number of devices already registered for this user

Defining Zones for Special Classes of Users

Another method for preventing special classes of trusted users from being assigned to the **Default** zone (and potentially being denied access) involves creating a zone that contains no device profiles, and then assigning that zone to a community to which only those trusted users belong.

For example, if you want system administrators to be able to access network resources regardless of the client device they're using, you could assign them to a community that contains a no-profile zone. Then when system administrators select a realm that references that community and log in, they are placed in the no-profile zone, instead of the global **Default** zone, which may be set up to block unrecognized clients.

To create a no-profile zone:

1. From the main navigation menu in AMC, click **End Point Control**. The **End Point Control Settings** page appears.
2. In the **Zones and Device Profiles** section, click **Edit**.
3. Click **New** in the **Zones** section and select **Standard** zone to create. The **Zone Definition** page appears.
4. In the **Name** field, type a meaningful name for the zone.
5. In the **Description** field, type a descriptive comment about the zone.
6. You can optionally select a **Required data protection tool** for the zone. However, if you want this special class of trusted users to have flexibility regarding the types of devices they're connecting with, leave this field set to **None**.
7. Click **Save**.

After you've defined the no-profile zone, you must create a realm specifically for this special class of trusted users. Configure the realm with a dedicated community so that only this special class can log in to it. For more information, see Assigning Members to a Community.

Using End Point Control Agents

Use End Point Control Agents to perform common EPC tasks such as enabling or disabling the virtual keyboard and clearing remote data from the client system after each user session.

End Point Control tasks

Item	Description
Enable virtual keyboard	
Require use of keyboard	
End inactive user connections	Select the length of time a connection is inactive before disconnecting it. Options range from 3 minutes to Never, with **10** minutes being the default inactivity time.
Enable Cache Cleaner	Check this checkbox to enable Cache Cleaner, which clears the browser cache after each user session. Cache Cleaner is available for Windows and Mac platforms only and only when End Point Control is enabled.

End Point Control tasks

Item	Description
Allow user to disable Cache Cleaner	Check this checkbox to allow the user to close Cache Cleaner and bypass the cache-cleaning function
Clean session items only Clean all items	Specify whether all browser items should be cleared, or just those related to the current session

Using the Virtual Keyboard to Enter Credentials

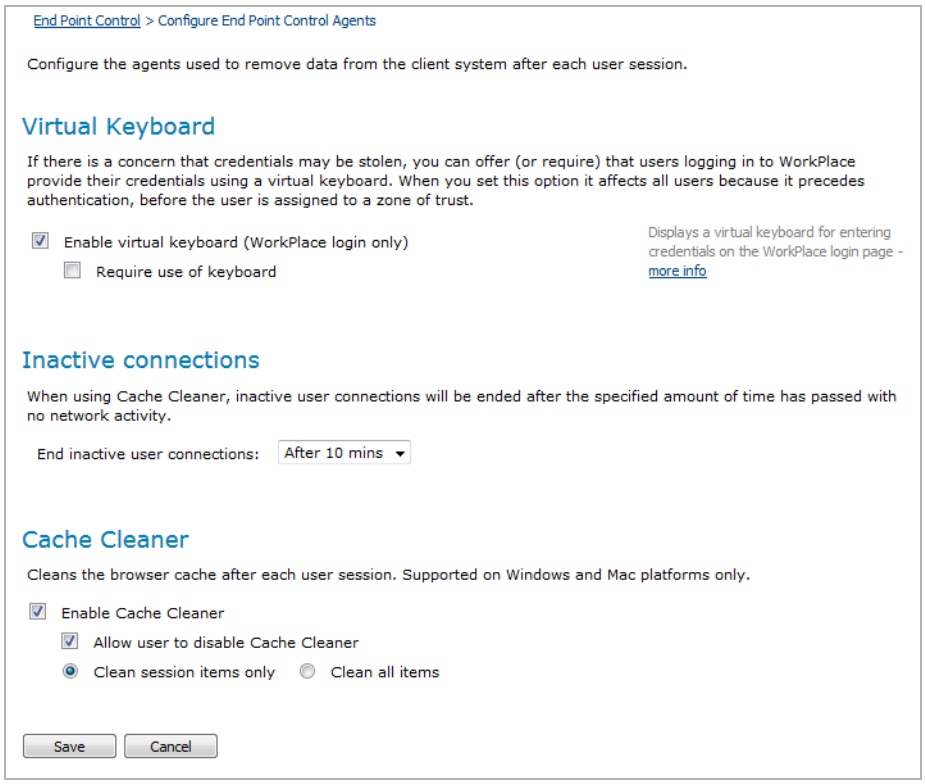
If there is a concern that credentials may be stolen, you can offer (or require) that users logging in to WorkPlace provide their credentials by pointing to characters on a keyboard display instead of typing them.

Because the virtual keyboard is used before a user is authenticated (and before a realm is chosen), the way in which it's configured applies to all realms: you can't offer the virtual keyboard to just certain groups of users, or require it only in certain cases. End Point Control does not have to be enabled in order for the virtual keyboard to be used.

The virtual keyboard settings do not apply to small form factor devices, such as smart phones; for information about optimizing WorkPlace for these devices, see Optimizing WorkPlace for Display on Small Form Factor Devices.

To configure the virtual keyboard in WorkPlace:

1. From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.
2. In the **End Point Control agents** section, click **Edit**. The **Configure End Point Control Agents** page appears.



3 Check **Enable virtual keyboard (Workplace login only)** checkbox to let users enter WorkPlace login credentials using a virtual keyboard, which reduces the risk of credentials being stolen. When this setting is enabled, all WorkPlace users, regardless of login realm, have this option.

4 If the virtual keyboard is enabled, check the **Require use of keyboard** checkbox to require users to use a virtual keyboard to enter their WorkPlace login credentials.

5 Click **Save**.

Configuring Data Protection

Cache Cleaner is included with your appliance license.

IMPORTANT: Cache Cleaner is not supported on Linux platforms.

About Cache Cleaner

When Cache Cleaner is enabled and the user logs into WorkPlace, the Cache Cleaner icon appears in the task bar notification area. Users can access network resources as needed.

When the user ends the Cache Cleaner session, Cache Cleaner deletes all data associated with the session. All browser windows are closed by Cache Cleaner upon logout. A dialog warns users that all browser windows will be closed on logout.

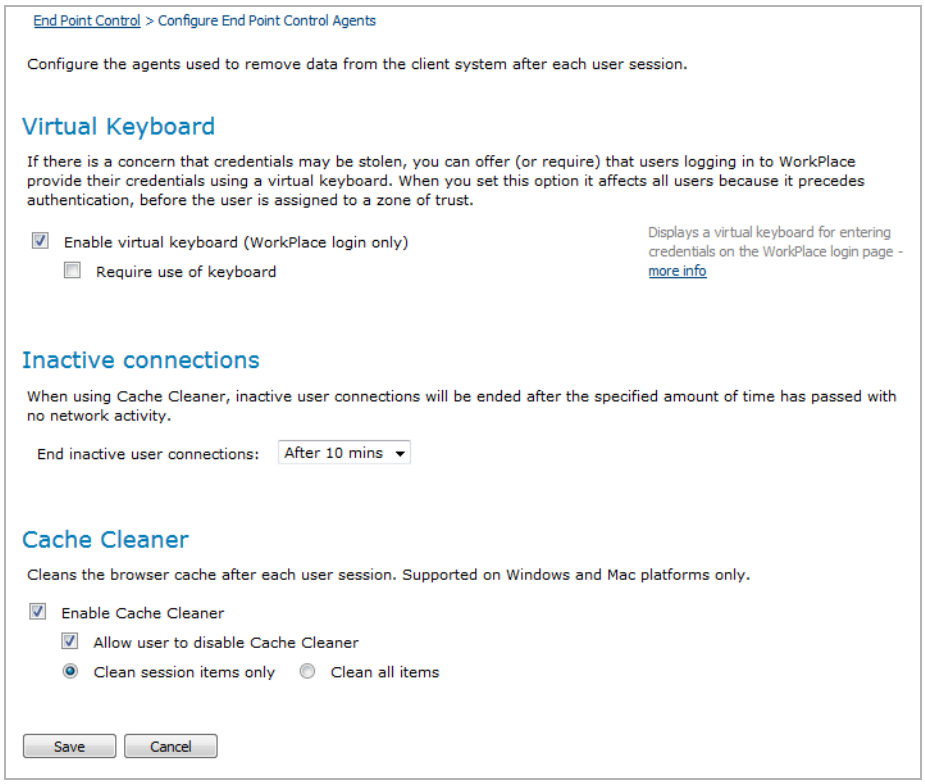
NOTE: Because Cache Cleaner closes all browser windows on logout, make sure your users are aware: if someone is filling out a form, for example, anything that isn't submitted when the browser window closes will be lost.

Configuring Data Protection Settings

To configure data protection in WorkPlace:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 In the **End Point Control agents** section, click **Edit**. The **Configure End Point Control Agents** page appears.



3 In the **End inactive user connections** drop-down menu, select a timeout to automatically end inactive user connections and remove data from the client. This minimizes your exposure in case a user forgets to log out from a kiosk or other shared computer.

4 Select the **Enable Cache Cleaner** checkbox to clean the user's browser cache after each session.

5 To allow the user to close Cache Cleaner and bypass the cache-cleaning function, select the **Allow user to disable Cache Cleaner** checkbox.

6 Specify whether all browser items should be cleared, or just those related to the current session: **Clean session items only** or **Clean all items**.

7 Click **Save**.

Application Access Control

Companies want to empower their employees to be productive and responsive from anywhere at anytime using their own personal devices. However, companies must balance this openness with the need to ensure that corporate data and networks are not compromised and that corporate compliance and legal requirements are met. As companies open up to BYOD devices, they must make sure that:

- Corporate data and network resources are secure
- Users are made aware of and agree with corporate policies and privacy ramifications associated with personal device accessing corporate networks
- Administrators can keep track of and monitor the use of personal devices by employees

Application Access Control addresses all these concerns. It allows administrators to control which applications can access enterprise data resources from a personal device by combining the power of SonicWall Mobile Connect on the client and Secure Mobile Access on the appliance.

Topics:

- Client (SonicWall Mobile Connect)
- Appliance (SonicWall Secure Mobile Access)

Client (SonicWall Mobile Connect)

Application Access Control uses SonicWall Mobile Connect on supported client devices (iOS/Mac OS/Android) to handle applications as follows:

- Applications selected from an application list - traffic destined for the corporate network from those applications is allowed to enter the tunnel. Information is provided to the server to identify the application.
- Applications on the list that are unchecked (or any other application on the device) - traffic destined for the corporate network is blocked and dropped by Mobile Connect and will NOT enter the tunnel.
- All applications (whether they are on the application list or not) - if the traffic is NOT destined for the corporate network the traffic is sent using the device's default interface.

Appliance (SonicWall Secure Mobile Access)

After an application zone has been created and users with the proper devices can classify into the zone, configure the following:

- Applications that should be granted access to the corporate network,
- Users who can use each allowed application
- Destinations on the corporate network that each application can access.

Application Access Control is available for iOS 7+, Mac OS Mavericks 10.9+, and Android 4.0+ devices.

Topics:

- How Application Access Control Works
- Configuring Application Access Control
- Creating a Client Application List
- Identifying a Trusted Learning Device
- Learning an App
- Approving a Learned App
- Viewing User Sessions

How Application Access Control Works

Secure Mobile Access and Mobile Connect work together as follows to provide a secure and manageable environment where personal devices can be used to easily access corporate resources:

1 The Administrator creates an application zone that enables the appliance to allow personal devices to access the corporate network and resources.

2 The user connects using a personal device that is not registered with the appliance. The user is prompted to register the device and agree to the personal device corporate policies and privacy policies to access corporate resources.

   Once the user consents to the corporate policies for a device, the device's unique Device ID is determined and the appliance registers the device to the user. Subsequent connections from this device do not require device authorization.

3 The user accesses network resources allowed by the application zone used to grant access.

4 The Administrator monitors usage of personal devices that have accessed the appliance.

Configuring Application Access Control

To configure Application Access Control:

1 Create an Application Zone Profile, as explained in To define an Application zone profile:

2 Configure an Application Zone, as explained in To create an Application zone:.

3 Add the Application Zone to a Community. To do so, on the **End Point Control Restrictions** page for the community, move the *Application* zone to the **In use** list. See Creating and Configuring Communities if you need help setting up a community.

4 Create a Client Application List, as explained in Creating a Client Application List

5 Create or modify an Access Control Rule for the Application zone, as explained in Adding Access Control Rules for Application Access Control. Access Control rules control which applications can send data through the tunnel and the destinations on the corporate network those applications are allowed to access.

6 Identify a trusted learning device, as explained in Identifying a Trusted Learning Device. A trusted learning device is bestowed special rights to perform signature lookups as a part of learning application version information.

7 Learn the apps, as explained in Learning an App.

8 Approve adding learned apps to the Client Application List, as explained in Approving a Learned App.

9 View user access, as explained in Viewing User Sessions.

Creating a Client Application List

A Client Application List contains a list of applications and their version and signatures used by platforms to identify them. Applications in this list are referenced in Access Control rules and are enforced by Mobile Connect when a user attempts to access the remote network using an application defined in the list and referenced in the Access Control rule.

Some common apps, like Safari and Email, are preconfigured in every list. To find and add additional apps to the Client Application List used by a zone, you must first identify the App ID of the apps you want to add.

Topics:

- Downloading an App
- Creating the Client Application List

Downloading an App

Topics:

- From an iOS or Mac OS Device
- From an Android Device

From an iOS or Mac OS Device

To add an iOS or Mac OS app:

1 Use the **Search** link on the **End Point Control > Add Client Application** page to search for an app from within AMC.

2 Alternatively, search the iTunes Store for an app, at https://itunes.apple.com.

SMA uses the *bundleid* field received from the iTunes store as the App ID value.

3 Download the app to an iOS or Mac OS device.

From an Android Device

To add an Android app:

1 On an Android device, download and install an app, like APK Extractor, that will extract and read Apk files from apps. Apk Extractor is a free app that can be downloaded from the Google Play store.

2 Launch the extractor app, and scroll down until you find the application you want to add to the zone.

Using Chrome as an example, the App ID is `com.android.chrome`.

Creating the Client Application List

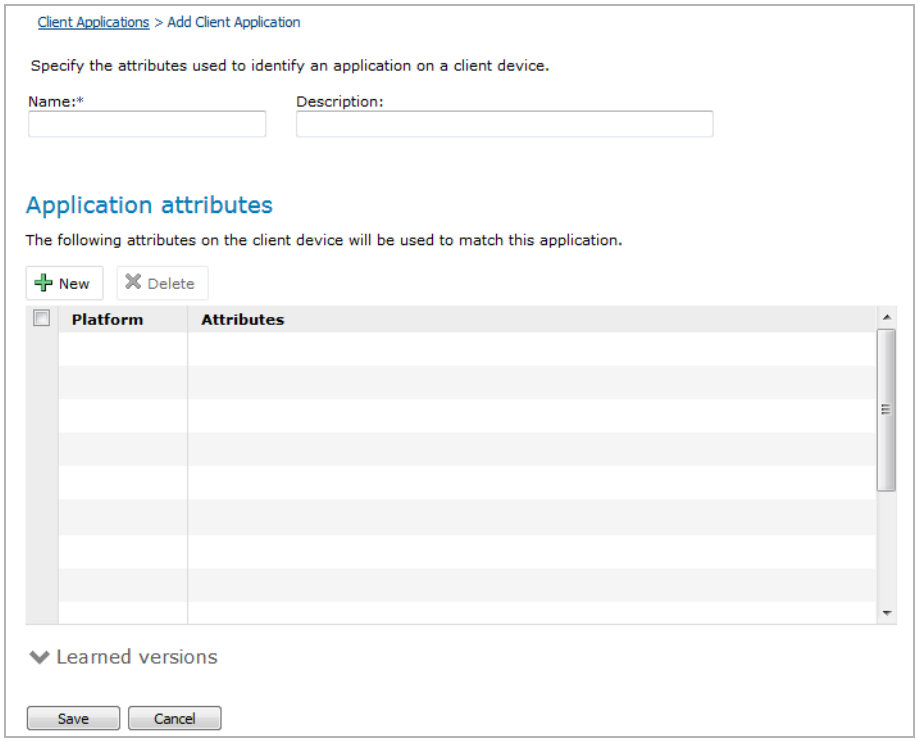
After you identify the App ID of each app you want to add to the Client Application List, create the list.

To create the Client Application List:

1 From the main navigation menu in AMC under **User Access**, click **End Point Control**. The **End Point Control** page displays.

2 Under the **Application Control** section, click **Edit** next to **Client Applications**.

3 Click **New**. The **Add Client Application** page displays.



4 In the **Name** field, type a friendly name for the app that will be used to identify the app to users.

5 (Optional) In the **Description** field, type a brief description to further identify the app.

6 In the **Application attributes** section of the **Add Client Application** page, click **New**, and then select the required platform the signature applies to (iOS, Mac OS, or Android) from the drop-down menu.

7 In the Application ID field, type the App ID of an app you want to add to the list. The remaining attributes will be detected when the app is learned.

NOTE: All versions of an app must share the same signature.

8 Click **OK**.

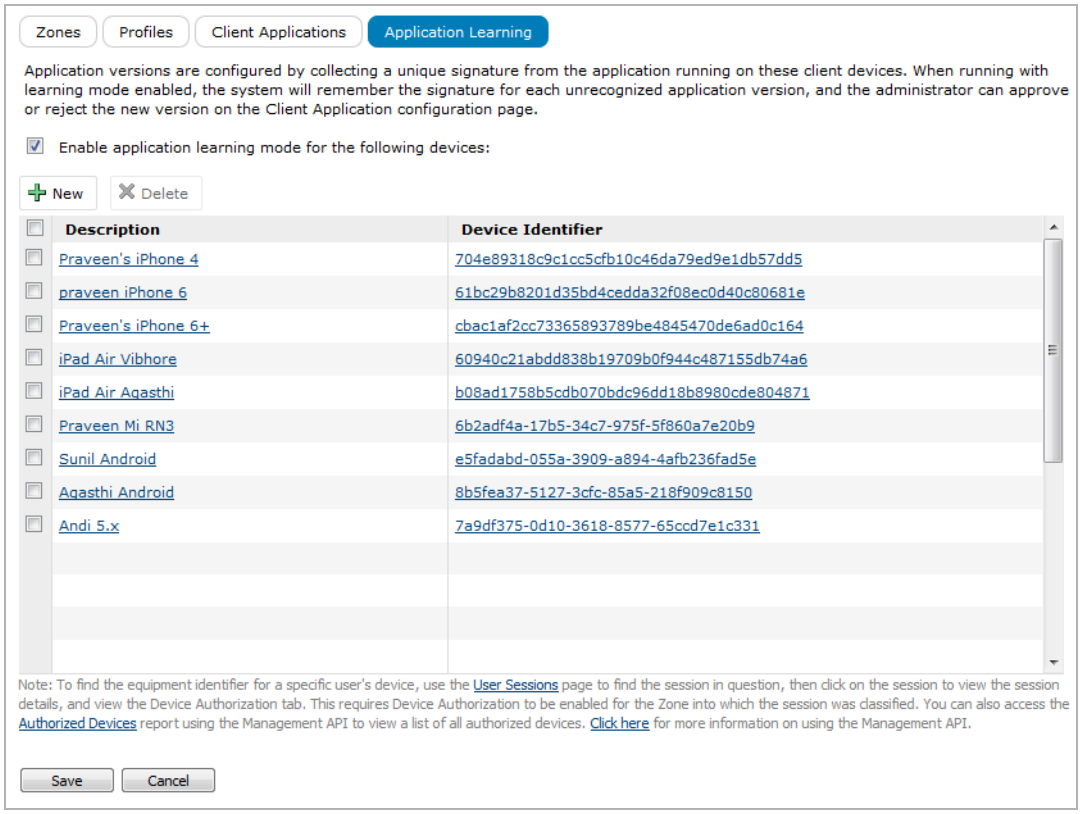
Identifying a Trusted Learning Device

A trusted learning device is assigned special privileges to perform signature lookups as a part of learning application version information. A trusted device is also used by End Point Control to check attributes on an endpoint device to discover its security state. Once a device is added to the Application Learning tab the device can learn application versions.

To identify a trusted learning device:

1 From the main navigation menu under **User Access**, click **End Point Control**.

2 Click **Edit** in the **Profiles** section under **Zones and Profiles**, and then click the **Application Learning** tab.



3 Click **New** to display the entry fields.

4 In the **Description** field, type a brief description to identify the device.

5 In the **Device Identifier** field, type the device ID of the device you want to make a trusted learning device.

6 Check the **Enable application learning mode for the following devices** checkbox to enable the appliance to recognize the device as a trusted learning device.

7 Click **Save**.

Learning an App

After you have configured Application Access Control, added any additional apps, and identified the learning device, learn each app configured for Application Access Control.

NOTE: Due to Apple limitations, the version for iOS apps cannot be learned with a trusted learning device and must be configured manually. The version is shown as **Unknown** on all AMC pages.

To learn an app:

1 Launch Mobile Connect on a trusted device and connect to the SMA appliance. After the device is successfully authenticated, applications that need versions to be learned are displayed.

2 Launch an application in the list.

3 Access a corporate network resource.

4 Verify that the application has a version pending approval by refreshing the display and confirming that a **Pending** icon is displayed next to the application.

5 Pull down the main screen to refresh the Mobile Connect display.

6 Repeat Step 1 through Step 5 for each listed application.

7 When a version number is displayed in the **Pending Versions** list, login to AMC to approve the application:

   a Navigate to **User Access > End Point Control > Client Applications**.

   b Select your application.

   c Select the item from the Learned Versions list and click **Approve**.

   d Click **Save** to save the client application.

   e Approve each application awaiting approval.

   f Apply the changes.

8 When the client application version(s) is approved, return to the trusted device and refresh the Mobile Connect display. The **Pending** icon should change to an **Approved** icon, which indicates the application is ready for general use.

Approving a Learned App

Apps are added to the Learned Versions section of the Client Application page when they are learned. You must approve a learned app before it can be added to the list.

To approve a learned app:

1 In AMC, navigate to **User Access > End Point Control > Client Applications** tab.

2 Select the **Client Application List** where the app will be used to display the **Edit Client Application** page.

3 Expand the **Learned.Versions** section, select a learned app, and click the **Approve** button to add it to the application list. Only the most recent entry for each version is displayed.

4 (Optional) To remove an app from the list, select an app, and then click **Discard**.

5 Click **Save**.

Viewing User Sessions

The **User Sessions** page provides an aggregate view of all users logged in to the appliance along with information about each users Realm, Community, EPC, Access Agent, and License status. This page also shows the connected duration, average speed, and total bytes transferred.

Part 7

Components

- The WorkPlace Portal
- User Access Components and Services

9

The WorkPlace Portal

A Quick Tour of WorkPlace

This section gives a general overview of WorkPlace from the customer perspective.

The WorkPlace portal provides your users with dynamically personalized access to Web-based (HTTP) resources. It also gives users access from their Web browsers to files and folders on Windows file servers, and to TCP/IP resources through Secure Mobile Access agents that can be provisioned from WorkPlace.

The SMA appliance includes a default WorkPlace portal that you can modify. Additional sites can be set up for different user populations, each with its own appearance; see WorkPlace Sites for more information. For details on client system requirements for WorkPlace, see System Requirements.

When users log into the browser address for WorkPlace, they will be presented with an Authentication Page. Users then log in to the **Authentication** page, using their Username and Password. This page also allows users the option of changing their password.

If users authenticating with a client certificate do not see this page, in lieu of the **Authentication** page, a one-time password may be required. The administrator sends an email containing the password, which is requested through this screen,

NOTE: If you've configured the system to use End Point Control, see End Point Control and the User Experience for information on how it affects the way users access the system.

After supplying their authentication credentials, WorkPlace checks for a current licensing agreement. If there is a problem with licensing, a message appears, indicating this is a licensing failure and not some other kind of authentication failure, such as a mis-typed password. Users should contact their administrator.

Depending on how the system is configured, users may be required to agree to an Acceptable Use Policy or other licensing agreement.

The AUP may display specific messages or instructions the user needs to agree to. Users who do not accept the license agreement will not be able to access WorkPlace.

NOTE: If a realm is configured with an AUP, login attempts from tunnel clients older than version 11.4 will fail. Users must upgrade their client to version 12.1 or better to connect. If tunnel client auto-upgrades are enabled in the AUP realm users will be unable to connect to upgrade. In this case, the Administrator must configure a separate realm without an AUP (to allow for automated client upgrades) or upgrade the clients via other means.

Topics:

Home Page

After a user has provided authentication, providing licensing is up-to-date, the WorkPlace home page appears. WorkPlace could include a personal bookmarks area, with relevant links to other resources.This area may contain pre-configured bookmarks from the administrator, or users can add their own links to resources or web sites.

NOTE: If you are using Firefox on a Linux system with Java 1.7u71 installed, you will not be able to launch Workplace. You will get an error message, `Unable to authorize request. Zone classification process has not completed`.

Configurable WorkPlace Elements

Most of the features on the home page are configurable; see the Configurable WorkPlace elements table.

Configurable WorkPlace elements

WorkPlace element	Description
Layout	WorkPlace page content and layout can be customized on a per-community basis. These layout elements include: • Content (what shortcuts and shortcut groups are displayed) • Pages (single vs. multiple) • Columns (single vs. multiple) • Navigation (on the left or along the top) See Modifying the Appearance of WorkPlace for details.
Shortcuts Shortcut groups	These are administrator-defined shortcuts to the Web, file system, and terminal server resources that the user is allowed to access. Shortcuts are dynamically displayed based on your access policy: each user sees only those resources he or she has privileges to use. Each type of shortcut behaves differently: • **Web resource:** Opens in a new browser window. • **Terminal server resource:** Opens in a new browser window and the appropriate graphical terminal agent is automatically started or, if necessary, provisioned. • **Shared folder or file:** Opens the WorkPlace Network Explorer page, which appears in a new browser window. Network shortcuts, which point to file system resources, do not appear if you have disabled all access to file system resources (disabling access to file system resources is described in Configuring WorkPlace General Settings). • **Bookmarks**: Provides all basic bookmark functionality (RDP, Citrix, VNC, Telnet, and SSHv2) of Workplace User defined bookmarks. • **Custom Shortcuts**: Behaves according to the custom configuration. For information about creating shortcuts, see Working with WorkPlace Shortcuts.
Connect Tunnel	You can define custom connections for the Connect Tunnel client from the WorkPlace portal.
Help button	The Help system included with WorkPlace contains all the basic information that a user will need. If you would like to make a custom HTML help file available to users instead, you can specify it when you confiigure your WorkPlace style. This is a convenient way to add information that is unique to your environment (for example, information about the resources available on your VPN, and technical support details). This file must be a well-formed, single HTML file.

Built-In WorkPlace Elements

When you set up a WorkPlace portal for users, you can choose from among several built-in resources and WorkPlace elements; see the Built-in WorkPlace elements table. If you offer these resources, they can be configured on a per-community basis.

Built-in WorkPlace elements

WorkPlace element	Description
Intranet Address	You can specify whether you want this box to appear and configure whether it can be used to access Web resources (by typing a URL), file system resources (by typing a UNC path name), or both. See Intranet Address Field for details.
Personal Bookmarks	You can allow users to create and manage personal links (similar to bookmarks) that point to URLs and other resources, such as SMB hosts, protected by the SMA appliance. Personal links are stored on the appliance; users have access to them whenever they are logged in to WorkPlace, regardless of the computer they are using. See Bookmarks for more information.
Connect Tunnel	You can make the built-in **Install Connect Tunnel** shortcut available to enable users to download and install the Connect Tunnel client from the WorkPlace portal.
Network Explorer	You can offer users the ability to browse a Windows network containing shared folders and files. See Network Explorer Page for more information.

WorkPlace Status Bar

The WorkPlace pages have a status bar; see the WorkPlace status bar elements table.

WorkPlace status bar elements

WorkPlace element	Description
Access	Indicates which user access methods are currently running. For more information about user access agents, see User Access Components and Services.
User	The username used during login.
Session start	The time at which the current session began, in 24-hour format.
Log out button	Users can log out of WorkPlace using this button, but this does not necessarily log them out of any applications that are running (depending on which user access agent is being used). To increase security, users should log out of or quit applications when they finish working with them, particularly when working on computers that are shared with other users.
Details	Users can click this button for system status information (not items appear for all users): • **Zone:** Security zones are used to allow or deny access to members of each community. • **Realm:** A realm allows users to authenticate using credentials stored on an external authentication server. • **Community:** Communities allow you to group realm members based on different security needs. • **Data protection:** Cache Cleaner.

NOTE:

- For users accessing WorkPlace on small form factor devices, the WorkPlace appearance varies depending on the capabilities of the device. For more information, see End Point Control and the User Experience.
- On Windows systems, using browser toolbars with popup blocking enabled may prevent WorkPlace from closing any open Network Explorer and graphical terminal session windows when the main WorkPlace window is closed.
- Logging out of Outlook Web Access (OWA) during a WorkPlace session also logs the user out of WorkPlace. This is because the OWA logoff script clears all browser cookies, including the one used by WorkPlace. Users can simply close the browser window instead of logging out of OWA to work around this issue.

Intranet Address Field

If enabled, the **Intranet Address** field appears along the bottom of the WorkPlace page, except on small form factor devices, and gives users an alternate method to access Web resources, Windows network resources, and terminal servers.

When you set up communities within a realm (for example, a community of employees and one of partners), you can give each one a unique appearance, using WorkPlace styles and layouts. The WorkPlace layout determines whether the **Intranet Address** box is displayed for a particular community. See Creating or Editing a WorkPlace Layout for more information.

Configuring the functionality of the **Intranet Address** field is a global configuration setting. Depending on the configuration, users can type URLs to reach Web resources if WorkPlace is running in translated mode, or they can type UNC paths to reach file system resources. (If WorkPlace is running in non-translated mode, users can type URLs directly in the Internet Explorer **Address** field.) This is especially useful if you have defined an entire DNS or Windows domain as a resource and want to give a group of users direct access to all the resources in that domain.

To access a Web resource or terminal server when WorkPlace is running in translated mode, the user types the URL in the **Intranet Address** field, and then clicks **Go**. If the user has appropriate access privileges, the resource then opens in a new browser window.

The **Intranet Address** field accepts a variety of user input for accessing Web resources and terminal servers. Here are some guidelines, as shown in the Intranet address input guidelines table.

Intranet address input guidelines

Element	Description
Resource address	A user can access a resource by typing a complete URL (domain and host name) or just a host name. For example, a user could access a resource named *CRM* on a host named *fred* using a full URL (such as `http://fred.example.com/CRM/`) or a host name (such as `http://fred/CRM/ or fred/CRM/`).
UNC path	To access a file system resource, the user types the UNC path (for example, `\\jax\software\download`) in the **Intranet Address** field, and then clicks **Go**. If the user has appropriate access privileges, the Network Explorer page appears, displaying the contents of the requested file system resource.

Intranet address input guidelines

Element	Description
Protocol	The user does not need to include the `http://` protocol identifier to access a standard Web resource. To access a secure Web site, however, the user must include the `https://` protocol identifier. When specifying a terminal server resource name, users must include the appropriate protocol identifier in the URL. Supported terminal server types are Windows Terminal Services, which uses the `rdp://` identifier, and Citrix, which uses `citrix://`.
Port number	To access a Web resource on a non-standard port (that is, other than 80), the user must type the port number after the host name. For example, *`fred:8080/SAP`* and *`https://fred:443/SAP`* are both valid entries.

For information about configuring the **Intranet Address** field to allow access to UNC pathnames, URLs, or both, see Configuring WorkPlace General Settings.

Bookmarks

Users can create personal links in WorkPlace for quick access to any resources that they have privileges to use. This can include Workplace user-defined Web URL, RDP, VNC, Citrix, FTP, SSH, and Telnet bookmarks. Users can also minimize their bookmark list, edit the bookmark list, and edit individual RDP bookmarks

WorkPlace personal links are similar to Web browser bookmarks or favorites lists except that they are stored on the SMA appliance, while standard browser bookmarks are stored on a specific computer. Users can access and manage their WorkPlace personal links whenever they are logged in to WorkPlace, regardless of the computer they are using.

When you set up communities within a realm (for example, a community of employees and one of partners), you can give each one a unique appearance, using WorkPlace styles and layouts. The WorkPlace layout determines whether the *Personal Bookmarks* group is displayed for a particular community. See Creating or Editing a WorkPlace Layout for more information.

NOTE: To access non-HTTP resources (for example, an SMB host) through WorkPlace bookmarks, users must be running an access agent, such as one of the tunnel clients. For more information, see User Access Agents.

Custom RDP Bookmarks

Custom settings for user remote desktop links are managed through the Custom RDP Link window. Screen resolution and color depth can be controlled by either the user or administrator. Single sign-on allows the administrator to customize the user sign on to request specific credentials or enable specific domains.

Network Explorer Page

When a user accesses a file system resource (by clicking a network shortcut, typing a UNC path in the **Intranet Address** box, or clicking the **Network Explorer** link on the WorkPlace home page), the Network Explorer page appears. The capabilities of the Network Explorer depend on whether the user has Sun JRE Version 1.6 update 34 or newer installed. If this Java version is present, the enhanced form appears. If these updates are not installed, the html version of Network Explorer appears. This html version is limited in capability. To take full advantage of the enhanced Network Explorer, download the latest Java updates. The Network Explorer page is not available on small form factor devices.

NOTE: The latest Java and JRE versions can be downloaded from http://www.java.com.

Topics:

- The HTML-Based Network Explorer
- The Java-Based Network Explorer

The HTML-Based Network Explorer

The HTML-based Network Explorer is the default interface on all devices. The HTML-based Network Explorer enables users to work with network files and folders on a network using a Web browser much as if they were working locally on the network. The Network Explorer page displays shared folders or files that users have permission to access.

- Users can browse these domains, servers, shares, folders, and files by clicking links on the Network Explorer page.
- The navigation pane at the left displays a list of resources available to the user on your network.
- The pane on the right enables the user to work with folders and files.
- If the administrator has enabled upload functionality, and the user has write privileges, the user can upload files. See Configuring WorkPlace General Settings for more information.

For more detailed information about the HTML-Based Network Explorer, see the *Secure Mobile Access 12.1 Workplace User Guide*.

The Java-Based Network Explorer

The Java-Based Network Explorer leverages the Java platform browser plug-in to increase usability by mimicking the common Windows Explorer interface, featuring drag and drop and multiple file selection capabilities. With the help of the HTTPS protocol, Network Explorer securely transfers encrypted files and information to and from the EX-Series appliance. The appliance communicates this data to the individual machines on the remote network.

NOTE: To use the Java-based Network Explorer, users must have JRE installed on their local computer. JRE Version 1.6.0 Update 24 or newer is recommended. To download the latest Java and JRE versions, visit http://www.java.com.

- The Java-based Network Explorer displays the file system on the local machine in the left pane and the remote location in the right pane.
- The right pane allows users to browse network domains and computers, and their associated file shares.
- Using the two panes, users can manipulate files and copy between the remote and local file systems. (Moving resources will cause all resources under them to be transferred recursively.)
- Users can also set up bookmarks from within Network Explorer to quickly navigate through networks from the portal level.

For more detailed information about the Java-Based Network Explorer, see the *Secure Mobile Access 12.1 Workplace User Guide*.

RDP, VNC, SSH, and Telnet Using HTML5

Topics:

About HTML5 and RDP, VNC, SSH, and Telnet

HTML5 clients can connect to backend systems using RDP, VNC, SSH, and Telnet. HTML5 clients can use Single Sign-On (SSO), copy and paste, multiple language keyboard support, scroll back, and dynamic window resizing. Users also have wider connectivity, such as cross-browser, cross-OS support.

NOTE: RDP, VNC, SSH and Telnet using HTML5 can be configured in SMA 12.1 on an SMA 1000 series appliance or in SMA 12.1 WorkPlace.

HTML5 clients eliminate the management of the endpoint clients, such as Java and ActiveX.

the HTML5 features table shows the HTML5 features for RDP, SSH and Telnet, and VNC.

HTML5 features

RDP	SSH and Telnet	VNC
Keyboard - AMC Support	SSO	SSO
Keyboard enhancements	Scroll back	Performance improvements for Mac screen sharing
TLS/NLA - AMC Support RDP Certificate identity warning	Dynamic Window Resize (remove Window size AMC option)	Window Control
Copy-Paste	Copy-Paste	Encoding, Compression Level, JPEG iMage Quality, Cursor Shape Update, Use CopyRect, Restricted Colors, View Only, Share Desktop
Optimize for tablets/phones	Zoom-in and Zoom-out	
Per Device License	Host Key - SSH default font size	

RDP Using HTML5

Topics:

Server Authentication for RDP

Server authentication verifies that users are connecting to the intended remote computer or server.

You can choose what actions the system will take if server authentication fails by setting the certificate verification options.

On the **Graphical Terminal Shortcut > Advanced** page of the AMC, you can select from these options:

- Connect and do not warn the user
- Warn the user
- Do not connect

On the **Remote Desktop Connection** page of your RDP device, you can select from these options:

- Connect and don’t warn me
- Warn me
- Do not connect

Keyboard Support for RDP

Keyboard support for WorkPlace and AMC has been enhanced with support for additional languages. You can select the keyboard language from a drop-down menu in WorkPlace and in AMC. The language that the browser is set to, is used as the default keyboard language.

These keyboard languages are supported in SMA 12.1:

- Danish
- Dutch
- English (United Kingdom)
- English (United States)
- Finnish
- French (Belgium)
- French (Canada)
- French (France)
- French (Switzerland)
- German (Germany)
- German (Switzerland)
- Hungarian
- Italian
- Luxembourgish
- Norwegian
- Russian
- Spanish
- Swedish

Copy and Paste in HTML5 RDP

You can copy and paste text from one RDP device to another as follows:

- Local to local
- Local to Remote
- Remote to local

VNC Using HTML5

Topics:

Adding or Editing VNC Options

On the **Add Graphical Terminal Shortcut > Advanced** page, you can add or edit the VNC Single Sign On (SSO) options and choose the type of VNC display password to use:

- None (prompt user)
- Use user's session password
- Use custom password

Configuring VNC Display Properties

On the **Add Graphical Terminal Shortcut > Advanced** page, you can configure the following VNC display properties:

- Encoding
- Compression Level
- JPEG iMage Quality
- Cursor Shape Update
- Use CopyRect
- Restricted Colors
- View Only
- Share Desktop

Scaling the VNC Window

You can scale the VNC window by choosing from the following options:

- **No scaling**: The size of the VNC window is fixed. The size of the browser window can be changed by user actions, but the screen size of the VNC remote desktop window will stay the same value as specified by the VNC server.

- **Scale to window**: The size of the VNC window is not fixed. It is scaled to the size of the browser window. The user can change the VNC window size by changing the browser window size.
- **Full screen**: When the browser is in full screen mode, the VNC window will also be scaled to the same size of browser window. This option will not be shown on browsers which do not support full screen mode, such as Safari on iOS.
- **Keep aspect ratio**: The aspect ratio of the VNC window stays the same as specified by the VNC server. This option is only available when **Scale to window** or **Full screen** is selected.

SSH and Telnet Using HTML5

Topics:

Configuring Single Sign On for SSH and Telnet

You can configure Single Sign On (SSO) for SSH or Telnet on the **Add Text Terminal Shortcut > Advanced** page.

You can configure SSO with the following options:

- None (prompt user)
- Forward user's session credentials
- Forward static credentials
  You must define a static username and password.

Scrolling and Zoom in SSH and Telnet

Scrolling is possible in SSH and Telnet. You can scroll backward and forward and see all the entries and text in the current SSH or Telnet window session. You can also zoom in and out on the text and resize the window itself.

Copy and Paste for SSH and Telnet

You can copy and paste to or from an SSH window or a Telnet window to or from another window.

Configuring the Host Key and Font Size for SSH

In SSH only, you can configure the following options (in WorkPlace or in AMC):

- Automatically accept host key
- Default font size

Web Shortcut Access

The SMA appliance offers two options for providing access to basic Web (HTTP) resources through WorkPlace shortcuts for users who are running the OnDemand Tunnel agent:

- **Redirect through network agent:** When this method is enabled, Web content is proxied through the appliance for users running the OnDemand Tunnel agent, provided that the agent is loaded. In this method, Web traffic from Workplace links does not use translation, does not support single sign-on, and does not use URL-based rules to control access. However, this method generally provides better application compatibility than the **Web content translation** option does.

  If you enable this setting, you can optionally configure selected WorkPlace resources to be translated by defining aliases for those specified resources. You can also enforce policy at the URL level and support single sign-on using this approach. For more information, see Adding Web Application Profiles.

- **Web content translation:** Web content is translated using the Secure Mobile Access Web translation engine, a reverse proxy that provides single sign-on and fine-grained access control. When this method is enabled, you can provide single sign-on and use URL-based rules to control access; however, this method provides more limited application compatibility than the **Redirect through network agent** option does. To provide single sign-on, you must specify an alias to the resource; for more information, see Adding Resources.

The Web shortcut access method you choose will depend on several factors, including the network protocols used by your applications, your security requirements, convenience for end users, and the target platforms. This option is configured on the WorkPlace **Settings** page.

Configuring WorkPlace General Settings

This section describes how to configure the WorkPlace general settings that apply to any WorkPlace site that you create. You decide here whether to enable access to UNC pathnames, URLs, or both in the **Intranet Address** box, but your WorkPlace layout determines whether the **Intranet Address** box is displayed for a particular community.

You can customize WorkPlace to varying degrees:

- You can modify the appearance of WorkPlace by setting up a style that uses a particular logo, color scheme, and greeting text. For a consistent look, this same style can be specified for the site's login, error, and notification pages. See WorkPlace Sites for more information.
- For sites that require even more control over the look and feel of WorkPlace, see Fully Customizing WorkPlace Pages.

To configure WorkPlace general settings:

1. From the main navigation menu under **System Configuration**, click **Services.**
2. In the **Access services** section, under **WorkPlace**, click **Configure**. The **Settings** tab for **WorkPlace** appears.
3. Select one of the **Web shortcut access** options. This setting determines how URL resources are accessed if WorkPlace activates the tunnel agent. For information about these options, see Web Shortcut Access.
   - **Redirect through network agent:** Web content is proxied through the appliance for users running the OnDemand Tunnel agent.
   - **Use Web content translation:** Web content is translated using the Secure Mobile Access Web translation engine.

4 If the layout specified for your WorkPlace site includes the **Network Explorer** resource, users will have access to file system resources from the Network Explorer page in WorkPlace. Select **Enable file uploads to < > megabytes** to enable users to upload files to a Windows file system resource. This setting takes precedence over any permissions you set in a file system access control rule. If an access rule grants a user write access to a file system but file uploads are disabled for the WorkPlace service, the user can only move and delete files, not write to them.

   A single file upload cannot exceed the number of megabytes you specify. Enabling users to upload large files may have a negative effect on the performance of the appliance.

5 In the **Intranet Address box** area, specify settings that control the functionality of the **Intranet Address** box in WorkPlace. (Whether the I**ntranet Address** field is available is specified in your WorkPlace layout and also depends on your device: it cannot be displayed on mobile devices.)

Select **Enable access to UNC pathnames** and **Enable access to URLs** if you want to enable users to reach a Web resource by typing its UNC pathname or URL in the **Intranet Address** field on WorkPlace. This can be useful if, for example, you have defined an entire DNS domain as a resource and want to provide access to all Web servers within the domain without needing to define each individual Web resource in the domain. This setting applies only when WorkPlace is running in translated mode.

For information about defining Web resources, see Adding Resources.

NOTE:

- The settings that you specify in the **Intranet Address** field have no effect on your access control policy. For a detailed discussion of this feature, see Intranet Address Field.
- If you are concerned that user credentials may be stolen, you can offer (or require) that users logging in to WorkPlace provide their credentials by pointing to characters on a keyboard display instead of typing them. See Using the Virtual Keyboard to Enter Credentials for more information.

Topics:

Working with WorkPlace Shortcuts

WorkPlace enables users with appropriate access privileges to use a Web browser to access Web resources, terminal servers, and files and folders on a Windows file server. Even though you may have defined your resources in AMC, none of them appear in WorkPlace until you create corresponding shortcuts. This section explains how to create and manage the shortcuts and shortcut groups in WorkPlace.

For information about enabling access to file system resources, file uploads, and the **Intranet Address** field, see Configuring WorkPlace General Settings.

Viewing Shortcuts

As the administrator, you see the entire list of shortcuts you have configured in AMC; however, when a user logs into WorkPlace, the list is filtered to display only the resources that he or she has permission to use, based on your policy and the type of device for which the shortcut is enabled. All types of shortcuts (Web, network, and graphical terminal) and groups of shortcuts are displayed in AMC and WorkPlace. How they are laid out is determined by the WorkPlace layout in use for a given community.

To view shortcuts in AMC:

1. From the main navigation menu under **User Access**, click **WorkPlace**.
2. Optionally use the **Filters** settings to display only the objects you are interested in. For information about using filters, see Filters.
3. Review the data in the **Shortcuts** list:
4. Use the checkboxes to select the shortcuts you want to move or delete.
    - To display configuration details about a shortcut, click the plus sign (**+**) next to it. You'll see the description, what shortcut group it belongs to, if any, whether it is restricted by device type, and the names of any WorkPlace layouts to which it belongs.
    - The number indicates the order in which the shortcut is listed in WorkPlace. You can change this order here, or edit the list of shortcuts associated with a layout on the **Configure WorkPlace Layout** page. For more information, see Creating or Editing a WorkPlace Layout.
    - The **Link text** column displays the hyperlink text that users see.
    - The **Resource** column displays the name of the resource as defined on the **Resources** page in AMC. For more information about configuring resources, see Creating and Managing Resources.
    - The **Type** column indicates the type of shortcut. The supported shortcut types are Web, network, and graphical terminal.
    - The **Used** column indicates whether the shortcut is included in a group or WorkPlace layout.

Viewing Shortcut Groups

To view shortcut groups in AMC:

1. From the main navigation menu under **User Access**, click **WorkPlace**.
2. Click the **Shortcut Groups** tab.
3. Optionally use the **Filters** settings to display only the objects you are interested in. For information about using filters, see Filters.
4. Review the data in the list of groups:
5. Use the checkboxes to select the groups you want to move or delete.
    - To display configuration details about a shortcut group, click the plus sign (**+**) next to it. You'll see what shortcuts it includes, and the names of any WorkPlace layouts to which it belongs.
    - The number indicates the order in which the shortcut group is listed in WorkPlace; you can change this order here, or edit the list of groups associated with a layout on the **Configure WorkPlace Layout** page.
    - The **Name** column displays the group heading that users see.
    - The **Description** column contains the description, if any, that you gave this group.
    - The **Used** column indicates whether the shortcut group is used by a WorkPlace layout.

Adding Web Shortcuts

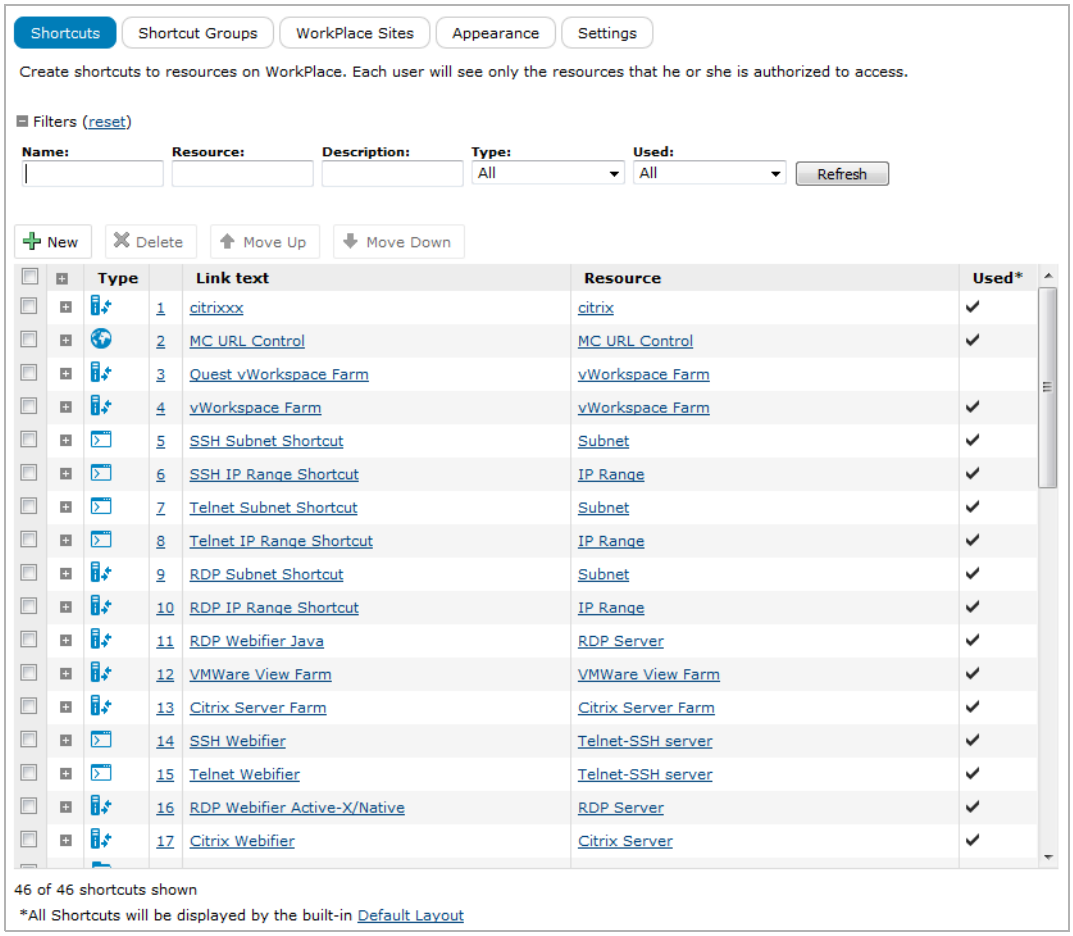
Web shortcuts give your users quick access to Web resources. Before you can create a shortcut to a Web resource, you must first define the resource; for more information, see Adding Resources.

To add a Web shortcut:

1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 Click on the **Shortcuts** tab.

3 Click **New**. A drop-down menu appears.



4 Then select **Web shortcut** from the list. The **Add Web Shortcut** page appears.

5 In the **Position** field, type a number that specifies the shortcut's position in the list.

6 In the **Resource** drop-down menu, select the resource to which this shortcut will be linked. This list contains the available URL resources that are defined on the **Resources** page in AMC. For example, when adding a shortcut to SharePoint, you could define a URL resource specifying the resource Name as *SharePoint* and the resource URL as `http://intranet.sharepoint.com`. Then, you would select *SharePoint* in the **Resource** drop-down menu.

For more information about defining resources, see Creating and Managing Resources.

7 Specify the link and descriptive text that users will see in WorkPlace. The entries can include variables to make them even more user- or session-specific; see Using Variables in Resource and WorkPlace Shortcut Definitions for more information.

- In the **Link text** field, type the hyperlink text that users will click to access the Web resource. The **Link text** should be no longer than 25 characters.
- In the **Description** field, type a descriptive comment about the shortcut. Although optional, a description helps users identify the Web resource. The comment appears next to the link.

8 Use the **Shortcut group** area to either add this shortcut to an existing group, or put it in a new one. Groups are one of the organizational elements in a WorkPlace layout. You could, for example, put all client downloads for users in a group, and then (on the **Configure WorkPlace Layout** page) put the group in a column or on its own WorkPlace page.

9 To specify additional options, click **Next**. The **Advanced** tab of the **Add Web Shortcut** page appears.

10 Under **Make link available to these devices**, associate the WorkPlace shortcut with the device types that can be used to access it:

- If you select **All devices**, the shortcut will appear on all devices types, regardless of whether the Web resource itself is supported on all device types.
- To restrict display of the shortcut to only certain types of devices, clear the **All devices** checkbox, and then select just the device types that are supported.

For example, WorkPlace supports a variety of small form factor devices, but not all Web resources are compatible with all devices. Outlook Web Access is available only on standard browsers, while Outlook Mobile is available only on small form factor devices. So if you have Outlook Mobile set up as a resource, you should select both the basic and advanced mobile devices.

11 Use the **Start page** field, if necessary, to append more specific information to the selected URL. For example, if you want the link to point to a directory or file other than the root, type a relative path in the **Start page** field.

This is useful for Web applications that store their content in a location other than the root. For example, if the selected URL is for Outlook Web Access and it points to `mail.example.com`, you could set the start page to `/exchange/root.asp`. The resulting URL would be `https://mail.example.com/exchange/root.asp`.

For SharePoint, set the start page to the extended path, such as `Pages/Default.aspx` or `SitePages/Home.aspx`. For SharePoint shortcuts, the basic hostname/<IP address> of the SharePoint server is defined on the **Resources** page in AMC. The extended path is configured here as the **Start Page**.

Creating a Group of Shortcuts

You can group Web and network shortcuts together for better WorkPlace organization and a more streamlined look. The WorkPlace user has the option of collapsing a group of file shares.

Users see only the groups to which they are permitted access. To create a group, you select from among existing WorkPlace shortcuts (not resources). Shortcuts can be members of more than one group.

To create a group of shortcuts:

1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 On the **Shortcut Groups** tab, click **New**.

3 Enter a name and (optionally) a description for the group. The description appears below the group's name in WorkPlace. In the example above, *Domain and stand-alone shares* is the description.

4 In the **Position** field, type a number that specifies the shortcut group's position in the list. The order of shortcuts and groups can be changed later in the layout you choose for this WorkPlace site, on the **Configure WorkPlace Layout** page.

5 Existing shortcuts are listed: select the ones that you want to add to this group and click **Save**. An individual shortcut can be a member of more than one group. You can also opt to save an empty group (without any shortcuts selected), and then edit it later.

Adding Network Shortcuts

Network shortcuts provide your users with quick access to file system resources. Before you can create a shortcut to a file system resource, you must first define the resource (see Adding Resources for more information).

To add a network shortcut:

1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 Click on the **Shortcuts** tab.

3 Click **New**. A drop-down menu appears.

4 Select **Network shortcut** from the menu. The **Add Network Shortcut** page displays.

5 In the **Position** field, type a number that specifies the shortcut's position in the list.

6 In the **Resource** drop-down menu, select the file system resource to which this shortcut should be linked. This menu contains the file system resources that are defined on the **Resources** page in AMC; *Network Explorer*, for example, is a built-in resource for which you can configure a shortcut here. For more information about defining resources, see Creating and Managing Resources.

7 Specify the link and descriptive text that users will see in WorkPlace. The entries can include variables to make them even more user- or session-specific:

- In the **Link text** field, type the hyperlink text that users will click to access the file system resource. The **Link text** should be no longer than 25 characters.
- In the **Description** field, type a descriptive comment about the shortcut. Although optional, a description helps users identify the file system resource. This comment appears beside the link in WorkPlace.

8 Groups are one of the organizational elements in a WorkPlace layout. Use the **Shortcut group** area to either add this shortcut to an existing group, or put it in a new one. You could, for example, put all file system-related shortcuts in a group, and then (on the **Configure WorkPlace Layout** page) put the group in a column or on its own WorkPlace page.

Web Only Access

The Web Only Access feature for SMA supports HTML5 and enables users to access HTML5 Web sites. Web Only Access for SMA also enables users to access on-demand computing services using only a web browser. Users can use Connect Tunnel (CT) and Native Access Methods (NAMs) to access back-end applications.

Web Only Access for SMA supports the following clientless NAM applications:

- Remote Desktop Protocol (RDP)

  NOTE: On Terminal Server connections, HTML5 RDP bookmarks are not supported for *per-device* licensing. HTML5 RDP bookmarks are only supported for *per-user* licensing. ActiveX and Java RDP bookmarks are supported for both *per-user* and *per-device* licensing on Terminal Server connections.

- Secure Shell (SSH)
- Telnet

- Virtual Network Computing (VNC)
- Citrix

NOTE: SMA 11.3 and higher do not support Java clients, and Java deprecation warnings are shown on AMC screens.

WorkPlace Lite is an access mode for the Secure Mobile Access (SMA) appliance that bypasses all Access and EPC Agents and logs the user in to WorkPlace. The only prerequisite for logging in to a WorkPlace Lite enabled WorkPlace site is that you must use a modern web browser that supports HTML5. Web only access is more commonly referred to as Reverse Proxy access.

The AMC administrator can:

- Grant the user access to WorkPlace Lite.
- Force the user to use WorkPlace Lite only.
- Disable the user from accessing WorkPlace Lite.

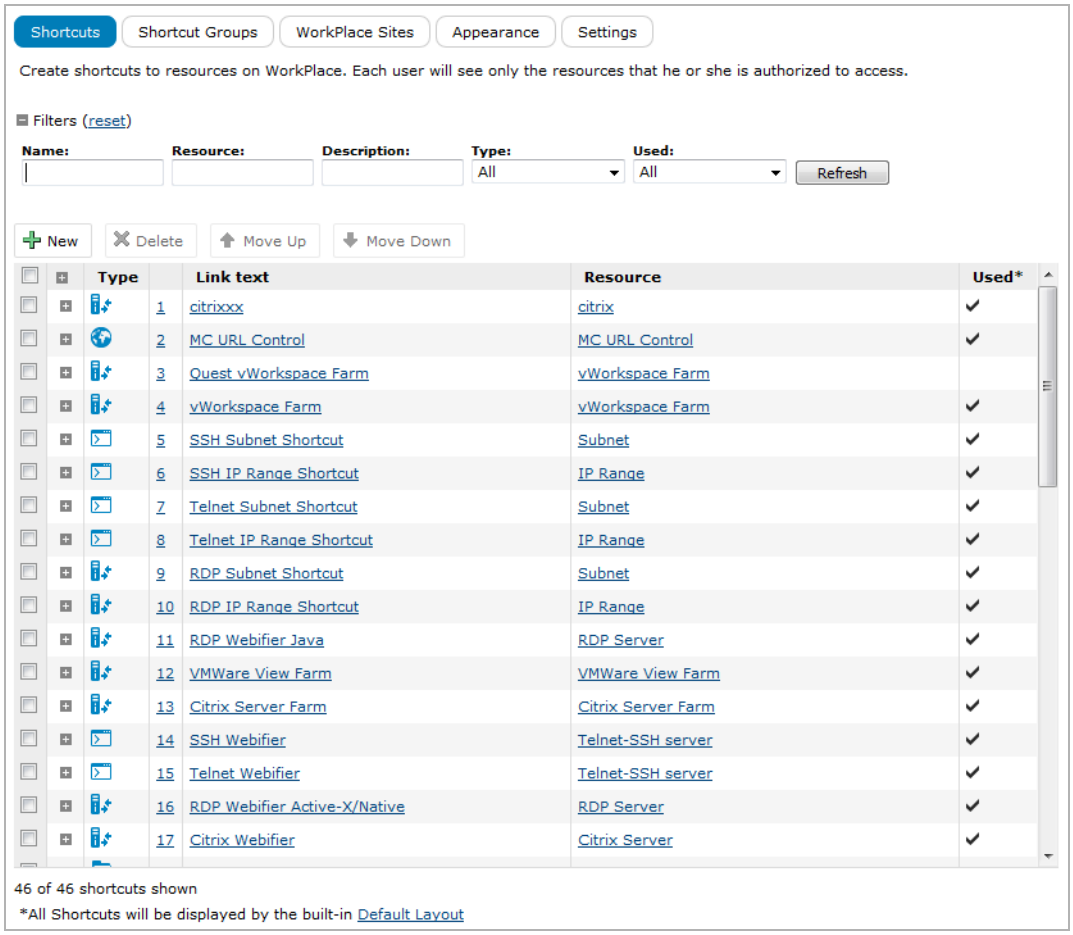
Users can select a checkbox or go to a specific WorkPlace site for Lite access. If the user checks WorkPlace Lite mode, then the system allows access to browser based graphical and text-terminal shortcuts as well as Web URL and HTML file share shortcuts.

Topics:

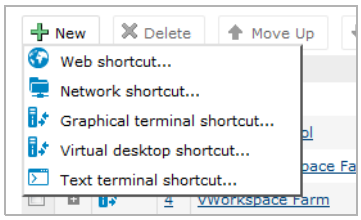
Adding a Text Terminal Shortcut using SSH or Telnet

To add a Text Terminal Shortcut that uses SSH or Telnet:

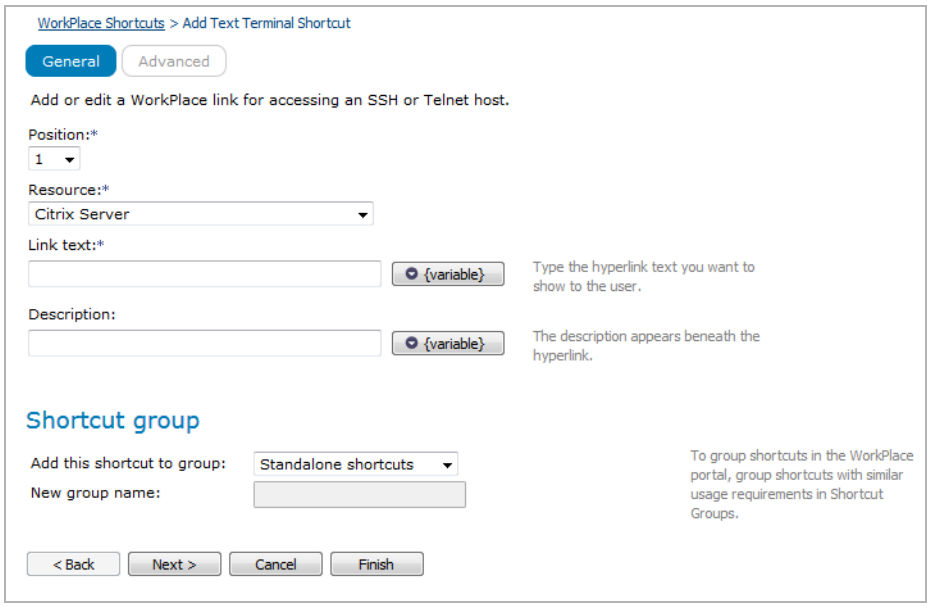
1 Go to the **User Access > WorkPlace > Shortcuts** page.



2 Click the **New** button. The **New** drop-down menu appears.



3 From the **New** drop-down menu, select **Text terminal shortcut**. The **Add Text Terminal Shortcut** page appears.



4 From the **Resources** menu, select the resource you want for this shortcut.

5 In the **Link** text field, enter the text you want to display for this shortcut.

6 (Optional) In the **Description** field, enter a description of this shortcut.

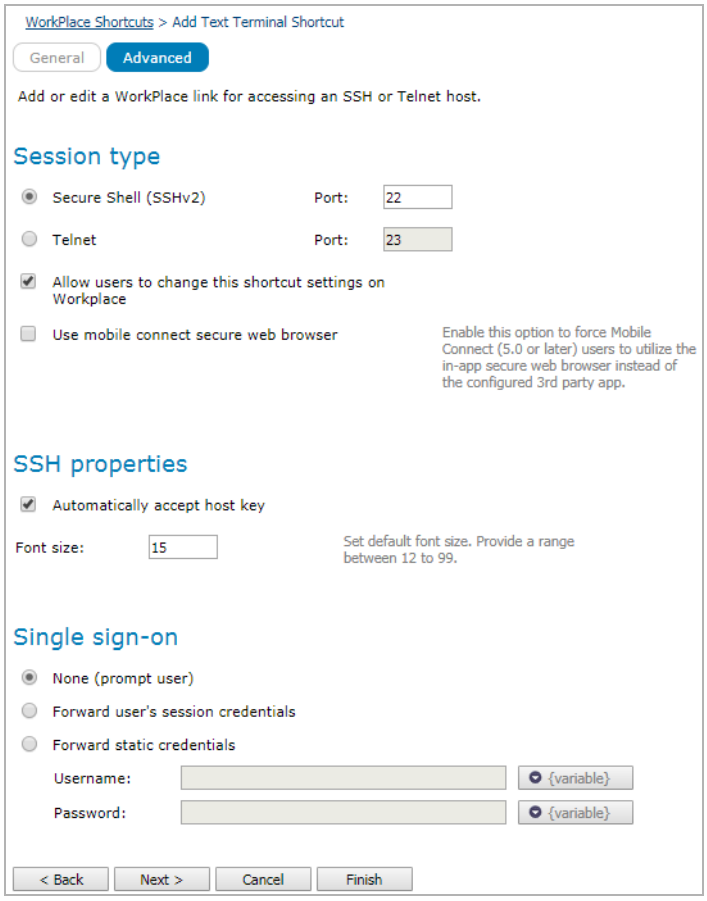
7 In the **Add this shortcut to group** drop-down menu, select one of the following options:

   a If you do not want to make this shortcut part of a group, select **Standalone shortcuts**.

   b If you want to make this shortcut part of an existing group, select one of the existing groups from the list.

   c If you want to create a new group, enter a name for the new group in the **New group name** field.

8 Click **Next**. The **Add Text Terminal Shortcut > Advanced** page appears.



9 Select the **Session type** that you want, **Secure Shell (SSHv2)** or **Telnet**.

10 In the **Port** field, enter the port number.

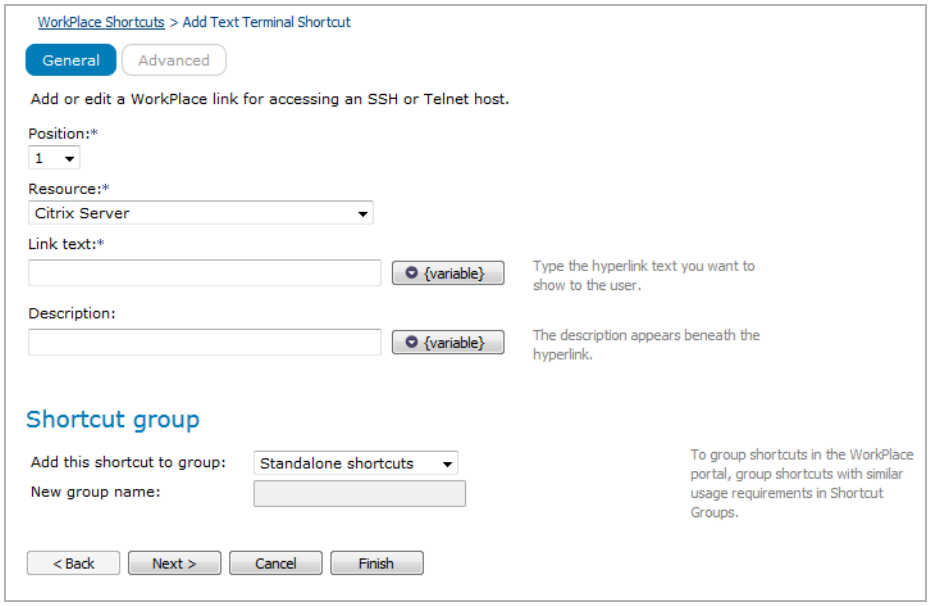
11 Click **Finish**. The **Shortcuts** page appears with the new shortcut listed at the top.

Adding a Graphical Terminal Shortcut for a VNC

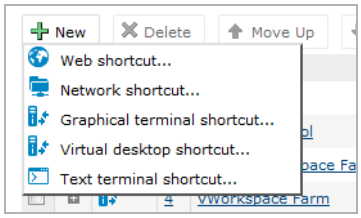
Graphical terminal shortcuts provide your users with quick access to gain easy access to backend servers (Microsoft RDP, Citrix, VNC), regardless of the type of transport (proxy or tunnel). Most often, some type of Single Sign-On (SSO) credentials will be enabled so that the user does not have to re-enter their username and password after launching the GTS. Some Graphical Terminal Shortcuts have very basic features configured by the AMC Administrator, such as IP/Hostname and Port. Others have very complex configurations (custom configuration file uploads (.RDP/.ICA), multi-monitor support, high-resolution display support, for example).

To add a Graphical Terminal Shortcut to a VNC:

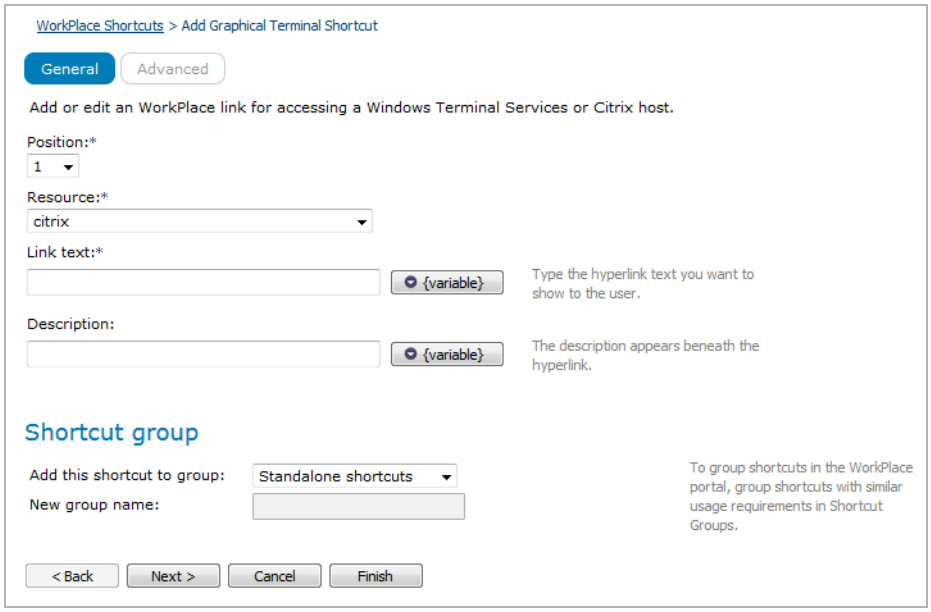
1 Go to the **User Access > WorkPlace > Shortcuts** page.



2 Click the **New** button. The **New** drop-down menu appears.



3 From the **New** drop-down menu, select **Graphical terminal shortcut**. The **Add Graphical Terminal Shortcut > General** page appears.



4 From the **Position** drop-down menu, select the position number for the link to appear in Workplace.

5 From the **Resources** drop-down menu, select the resource you want for this shortcut. If necessary, configure the resource, as explained in Security Administration.

6 In the **Link** field, enter the hyperlink text you want to display for this shortcut.

7 (Optional) In the **Description** field, enter a description of this shortcut.

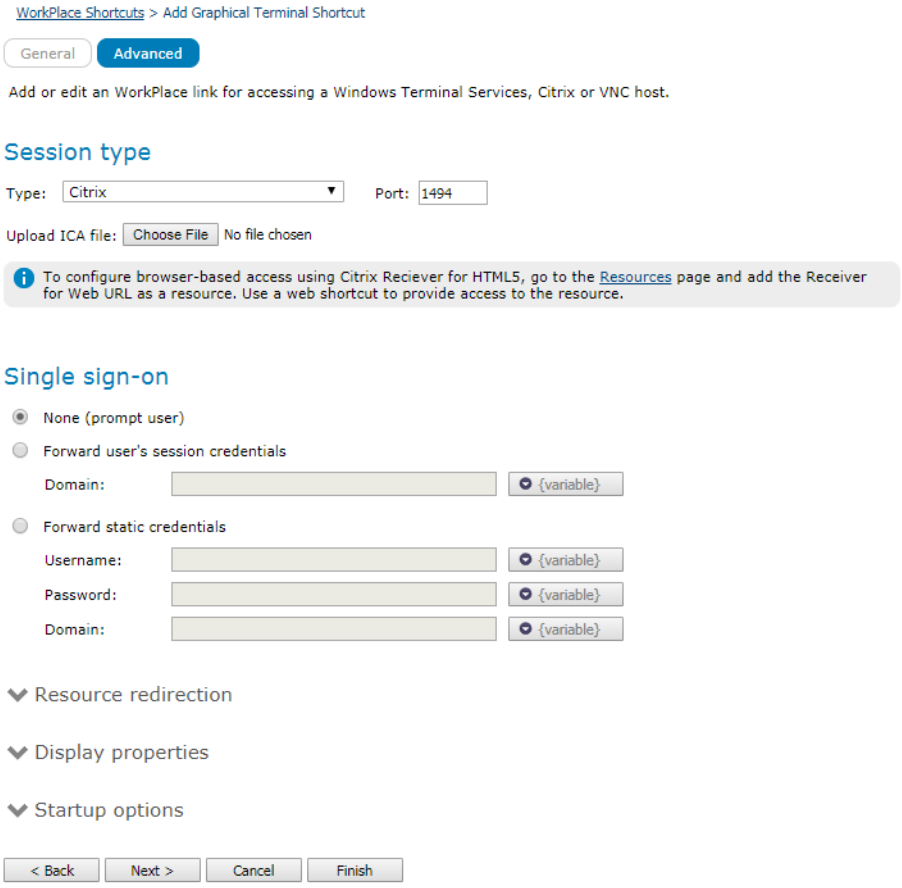
8 In the **Add this shortcut to group** drop-down menu, select one of the following options:

   a If you do not want to make this shortcut part of a group, select **Standalone shortcuts**.

   b If you want to make this shortcut part of an existing group, select one of the existing groups from the list.

   c If you want to create a new group, enter a name for the new group in the **New group name** field.

9 Click **Next**. The **Add Graphical Terminal Shortcut > Advanced** page appears.



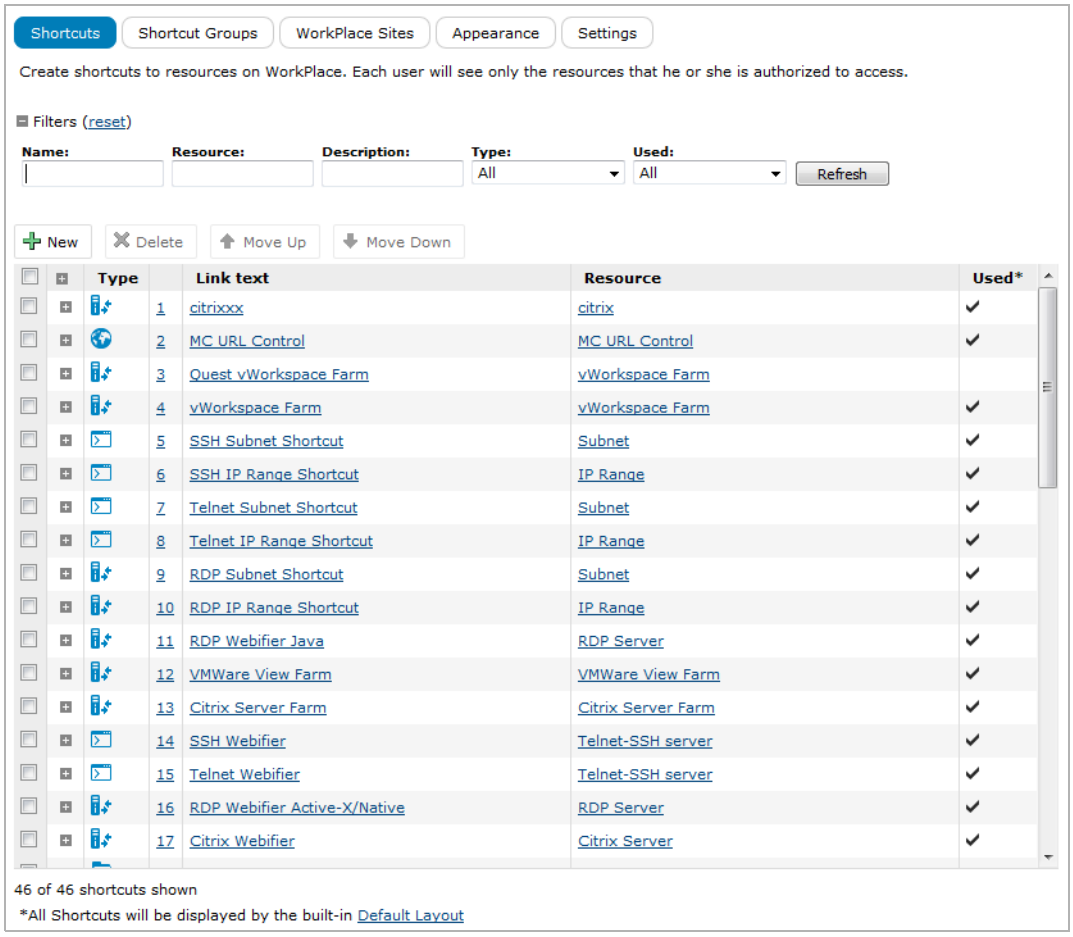
10 Click **Finish**. The **Shortcuts** page appears with the new shortcut listed at the top.

Configuring Windows Terminal Services

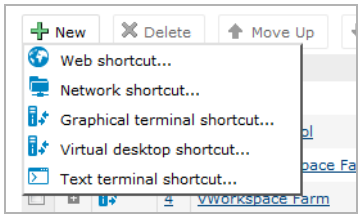
NOTE: ActiveX and Java RDP bookmarks are supported for both *per-user* and *per-device* licensing on Terminal Server connections.

To configure Windows Terminal Service:

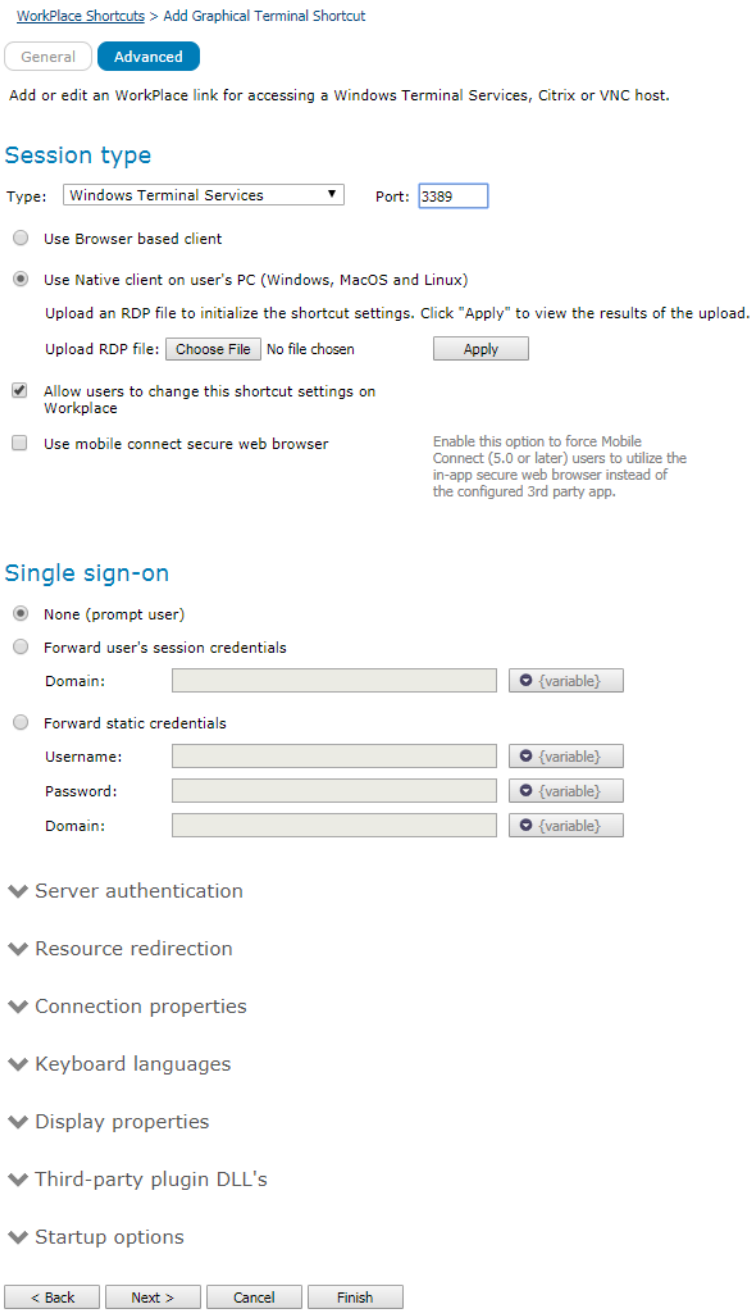
1 Go to the **User Access > WorkPlace > Shortcuts** page.



2 Click the **New** button. The **New** drop-down menu appears.



3 From the shortcut drop-down menu, select **Graphical terminal shortcut**. The **Add Graphical Terminal Shortcut > General** page appears.



4 From the **Position** drop-down menu, select the position number for the link to appear in Workplace.

5 From the **Resources** drop-down menu, select the resource you want for this shortcut. If necessary, configure the resource, as explained in Security Administration.

6 In the **Link** field, enter the hyperlink text you want to display for this shortcut.

7 (Optional) In the **Description** field, enter a description of this shortcut.

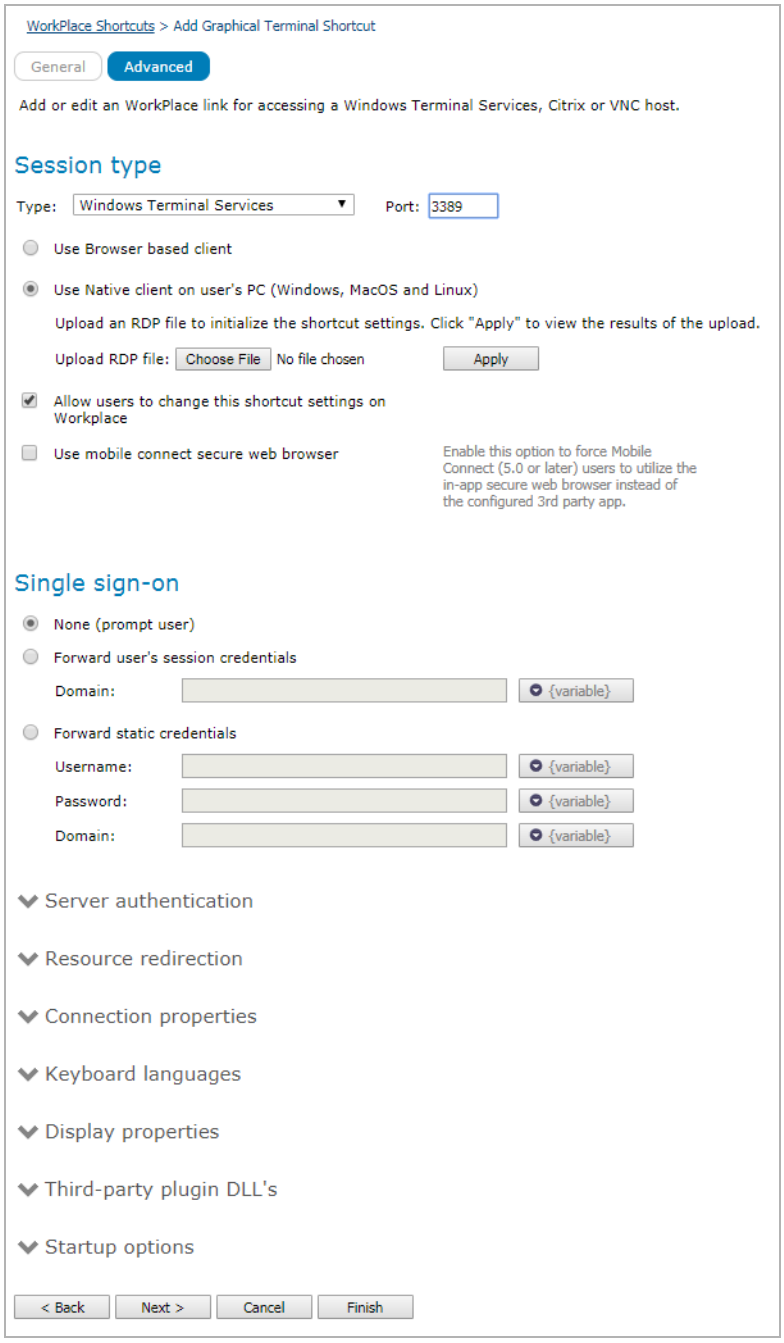
8 In the **Add this shortcut to group** drop-down menu, select one of the following options:

   a If you do not want to make this shortcut part of a group, select **Standalone shortcuts**. This is the default.

b If you want to make this shortcut part of an existing group, select one of the existing groups from the list.

c If you want to create a new group, enter a name for the new group in the **New group name** field.

9 Click **Next**. The **Add Graphical Terminal Shortcut > Advanced** page appears.



Topics:

- Session Type
- Single Sign-On
- Server Authentication
- Resource Redirection

- Connection Properties
- Keyboard Languages
- Display properties
- Third-Party Plugin DLLs
- Startup Options

Session Type

NOTE: Options change with the **Resources** selection on the **General** page. For some selections, only the **Port** field is available.

1 From the **Type** drop-down menu, select **Windows Terminal Services**.

2 In the **Port** field, type the port number to use for RDP communication. The default is **3389**.

3 Select the type of RDP client used by the shortcut:

- **Use Browser based client** — All end point devices will use a browser-based RDP client. A browser-based RDP client does not support advanced session options such as Forms.
- **Use Native client on user's PC (Windows/Mac/Linux)** — (default) Makes the shortcut use whatever is the native RDP client on the user's PC.
    - **Upload RDP file** — Browse to the location where the RDP file is located and upload the RDP file.

Single Sign-On

1 Select one of the following options for how end users will sign on:

NOTE: If you are concerned that user credentials may be stolen, you can offer (or require) that users logging in to WorkPlace provide their credentials by pointing to characters on a keyboard display instead of typing them. See Using the Virtual Keyboard to Enter Credentials for more information.

- **None (prompt user)** - Prompts the end-user for credentials.
- **Forward user's session credentials** - Uses the user's session credentials (username/password) to login to the backend RDP machine. In the **Domain** field, specify the Windows domain that should be forwarded to the backend RDP machine when attempting to log on.
- **Forward static credentials** - Defines static credentials (either manually or via policy variables) to be sent to the backend server during the logon request. To forward static credentials, specify the static **Username**, **Password**, and **Domain** to be used.

Server Authentication

1 From the **If the identity of the remote computer cannot be verified** drop-down menu, select whether remote user access is allowed or disallowed when server authentication fails:

- **Connect and do not warn the user**
- **Warn the user, who must choose whether or not to proceed with the connection** (default)
- **Do not connect**

Resource Redirection

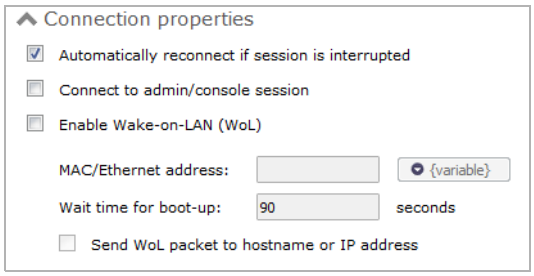
1 Select the **Bring remote audio to local computer** checkbox to enable users to access remote audio during the session. Note that audio redirection is network intensive and can affect performance. The default is off.

2 Select the **Share clipboard between local and remote computers** checkbox to enable clipboard copy/paste in both directions for the user. The default is to allow this feature.

3 Under **Allow access to local**, select the checkboxes for the devices the user will be able to access during the session:

- Drives
- Printers
- SmartCards (used for authentication)
- Plug-and-play devices
- Ports (port redirection from the local computer to the remote computer).

Connection Properties



1 Check the **Automatically reconnect if session is interrupted** checkbox to have the RDP client reconnect without prompting when the connection is dropped.

2 Check the **Connect to admin/console session** checkbox to allow the AMC Administrator to define whether the AMC session should be used to establish a connection.

3 To send Wake-on-LAN packets to the corresponding MAC address and/or the resource's hostname/IP address, check the **Enable Wake-on-LAN (WoL)** checkbox and type the **Mac/Ethernet address**, which is the corresponding hardware address that the WoL packet should be sent to. To change the **Wait time for boot-up**, type the number of seconds (default 90) to wait to see if the client machine has woken up from the WoL packet.

4 Check the **Send WoL packet to hostname or IP address** checkbox to also send the WoL packet to this resource's associated hostname/IP address.

Keyboard Languages

1 From the **Keyboard Layout** drop-down menu, select a language. The default is **Use browser locale**.

Display properties

1 From the **Screen resolution** drop-down menu, select the desired screen resolution, or select **Custom** and enter the custom resolution (default **1024 x 768 pixels**). The administrator can also let the Workplace User choose.

2 From the **Color Depth** drop-down menu, Select the color depth for the display (default **16-bit**).

3 Select any of the other display properties that you want:

- **Show connection bar** - Allows the AMC Administrator to define whether the connection bar at the top of the screen is displayed, once the GTS session is successfully established. Default: **Checked**
- **Multiple monitor support** - Controls whether RDP7 multi-monitor support is enabled. If RDP7 is not available, and multi-monitor is enabled, the GTS falls back to RDP6 dual-monitor mode. Default: **Unchecked**
- **Remote application** - Allows the AMC Administrator to launch an application remotely, via the GTS session (without actually launching the terminal). Default: **Unchecked.**

  IMPORTANT: Remote applications through an RDP file are not supported with ODMM or HTML5.

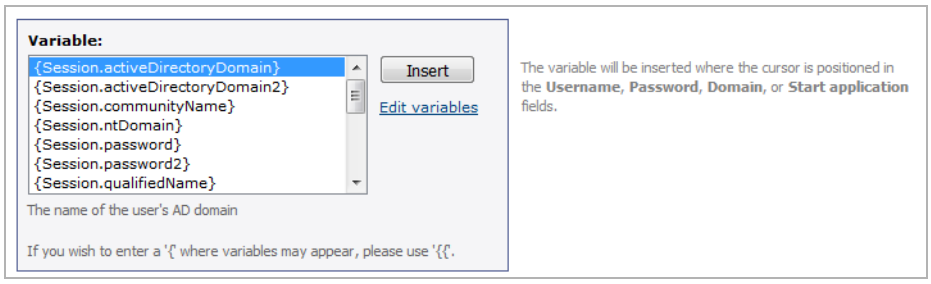
  NOTE: If this is enabled, **Start application**, **Application Arguments**, and **Working directory** in the **Startup Options** section must be defined.

Third-Party Plugin DLLs

NOTE: DLLs must be pre-installed on the client machine. The terminal service does not do any provisioning of DLLs.

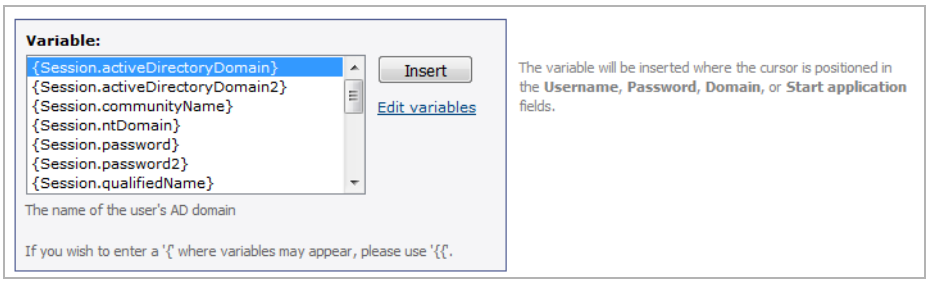
1 To load third-party plugin DLLs into WorkPlace when the RDP GTS session starts, select the **Enable third-party plugin DLLs** checkbox.

2 Enter the DLLs to load, separating them with commas. By clicking on the **{variable}** button, you can select pre-defined variables from the pop-up list:



Startup Options

NOTE: For any of these options, you can use pre-defined variables by clicking the {variable} button associated with the option:



1 To start an application when the GTS RDP session is started, in the **Start application** field, type the full path to an application on the client machine.

2 To add any command line arguments that must be specified to start the application correctly, in the **Arguments** field type the application arguments.

3 If you specified a start application, in the **Working directory** field, enter the directory from which to start the application.

4 Click **Finish** to save the settings, **Cancel** to delete your entries, or **Back** to return to the **General** tab.

NOTE: The startup options are supported via HTML5 RDP.

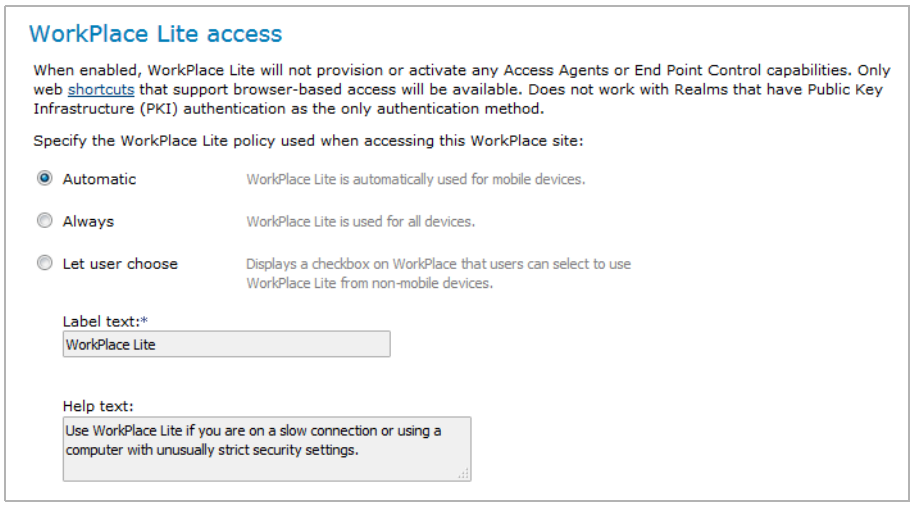
NOTE: Java-based RDP is not supported in SMA 11.3 and higher.

Configuring WorkPlace Lite

WorkPlace Lite mode is configured on a per-WorkPlace site basis.

To configure WorkPlace Lite:

1 In AMC browse to **User Access > WorkPlace > WorkPlace Sites > *<Your WorkPlace Site>* > Advanced**.



2 Under **WorkPlace Lite access**, select one of these options:

- **Automatic** — The user-selection checkbox for WorkPlace Lite mode on WorkPlace is not visible and WorkPlace Lite access will be enabled for mobile devices only. This is the default for upgrades from previous firmware versions and new installations. **Label** and **Help** text controls are disabled.
- **Always** — The user-selection checkbox for WorkPlace Lite mode on WorkPlace is not visible, but WorkPlace Lite access is always enabled when the user logs in to this WorkPlace site. **Label** and **Help** text controls are disabled.
- **Let user choose** — The checkbox on WorkPlace for enabling or disabling WorkPlace Lite access is visible, along with the label text and help text. The AMC Administrator can modify or adjust the **Label** and **Help** text as needed.

3 Click **Save**.

TLS and NLA support for HTML5 RDP

Secure Mobile Access (SMA) provides Transport Layer Security (TLS) and Network Level Authentication (NLA) for HTML5 browser clients that want to connect to remote hosts via the Remote Desktop Protocol (RDP).

RDP negotiates the encryption level between a remote client and the RDP host server. You can enhance the security of RDP sessions by configuring RDP to use TLS to identify the RDP host server and encrypt all communication between the RDP host server and the client. You can also configure RDP to use NLA, which forces the client to present user credentials for authentication before the RDP host server will create a session for that user.

To enable TLS and NLA for HTML5 browser support for RDP, you must configure TLS and RDP on the RDP host server and then set the keyboard language for the client's browser locale on the **Manage Bookmarks** page in WorkPlace.

TS-Farm servers enable RDP sessions to be load balanced. TS-Farm consists of numerous remote desktop servers (farm servers) with additional licensing capabilities and a session broker. The session broker does the book keeping and makes the load balancing decisions.

Configuring TLS and NLA Support for HTML5 RDP

To configure TLS and NLA on an RDP host server:

1 On your RDP host server, open the **RDP-Tcp Properties** dialog.

2 In the **Security layer** drop-down menu, select **SSL (TLS 1.0)**.

3 Select the checkbox for **Allow connections only from computers running Remote Desktop with Network Level Authentication**.

4 Click **Apply**.

5 Click **OK**.

Citrix Configuration

Selecting Citrix from the drop-down menu alters the **Advanced** options menu and pre-populates that section with default settings.

To configure a Citrix server farm:

1 In the **Port** field, type the port number that should be used for Citrix server farm (default **1494** for Citrix).

2 In the **Single Sign-on** section, select how end users will sign on:

NOTE: Single sign-on fields on the **Advanced** page can be completed with absolute values or by clicking the **Variable** button to the right of the field, selecting the desired variable from the displayed list, and clicking **Insert**.

- **None (prompt user)** - Prompts the end-user for credentials.
- **Forward user's session credentials** - Uses the user's session credentials (username/password) to login to the backend RDP machine. In the **Domain** field, specify the Windows domain that should be forwarded to the backend RDP machine when attempting to log on.
- **Forward static credentials** - Defines static credentials (either manually or via policy variables) to be sent to the backend server during the logon request. To forward static credentials, specify the static **Username**, **Password**, and **Domain** to be used.

3 Select the **Enable SSO to Citrix application** checkbox to allow credentials to be submitted to the published applications. The default is off.

4 Select the B**ring remote audio to local computer** checkbox to enable users to access remote audio during the session. The default is off.

NOTE: Audio redirection is network intensive and can affect performance.

5 Select the **Share clipboard between local and remote computers** checkbox to enable clipboard copy/paste in both directions for the user. The default is to allow this feature.

6 To change the **Screen resolution**, select the desired screen resolution from the drop-down menu or select **Custom** and type the custom resolution (default **1024 x 768**). The administrator can also let the Workplace User choose.

7 To change the color depth for the display, select the desired color depth from the **Color Depth** drop-down menu (default **16-bit**).

8 Click **Finish to save the settings, Cancel to delete your entries, or Back to return to the General tab**.

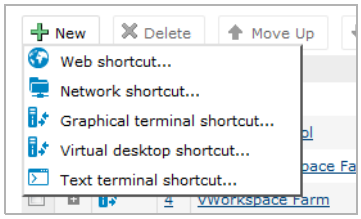
Adding a Virtual Desktop Shortcut

Use this page to create or edit the virtual desktop shortcuts appearing in WorkPlace. These shortcuts enable users to easily connect to VMware View resources.

To add a virtual desktop shortcut:

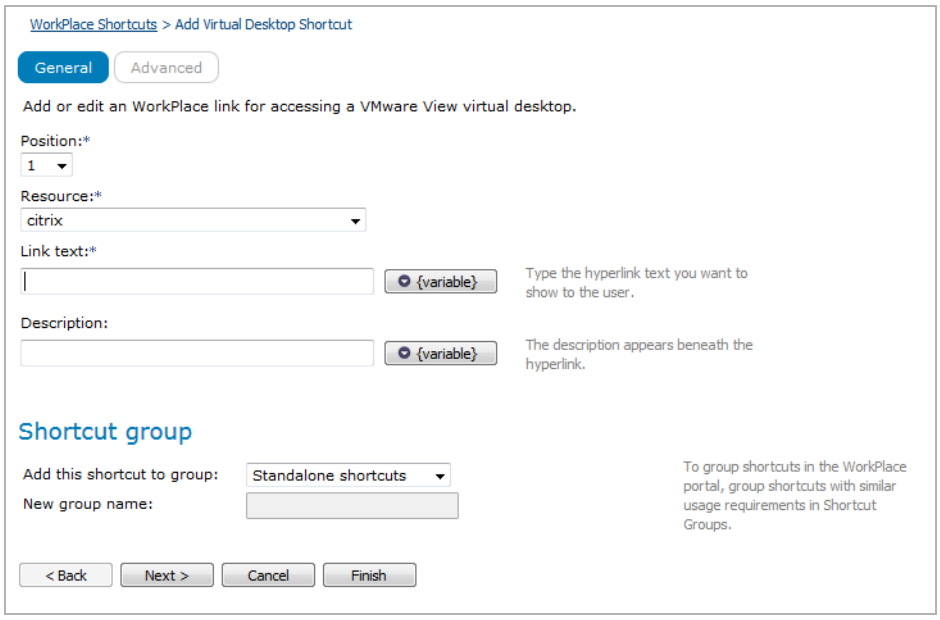
1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 On the **Shortcuts** page, click **New**. A drop-down menu appears.



3 Select **Virtual Desktop Shortcut**. The **Add Virtual Desktop Shortcut** page displays.

4 On the **General** tab, select the resource from the **Resources** list.



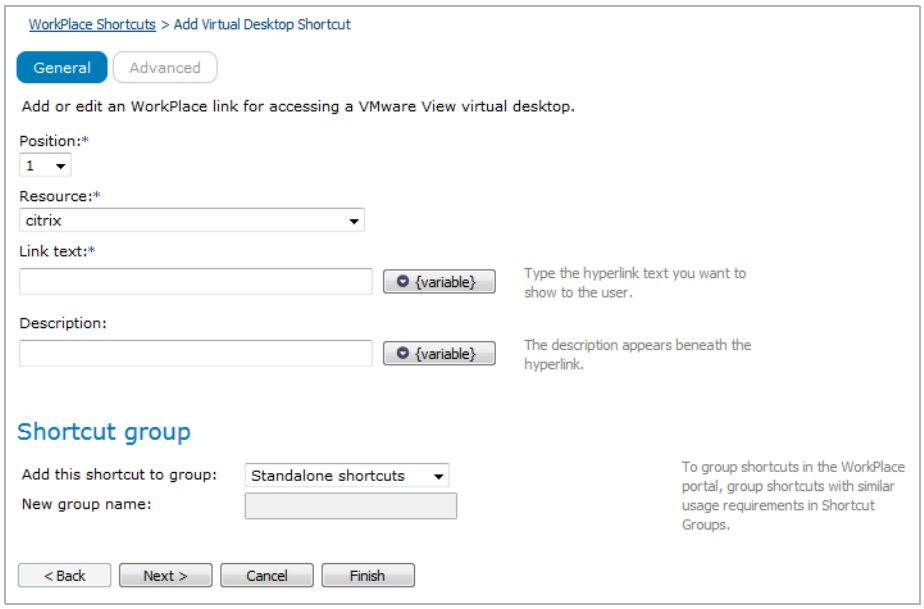
5 In the **Link Text** field, type in the hyperlink text that will appear as the shortcut for a VMware View host.

6 Type a description for the shortcut into the **Description** field.

7 In the **Add this shortcut to group** drop-down menu, select **Standalone shortcuts** if you do not want to make this shortcut part of a group, or select an existing group from the list. To create a new group, select **New**.

8 If you selected **New**, type a name for the new group in the **New group name** field.

9 Click **Next**. The **Advanced** tab displays.



10 Select the session type, such as **Citrix XenDesktop** or **VMware View**.

11 In the **Single sign-on** area, specify how you want user credentials to forwarded to the host:

- Click **None** to disable single sign-on and prompt the user for credentials.
- Click **Forward user's session credentials** to pass the username and password used to authenticate to WorkPlace along to the host.
- Click **Forward static credentials** to forward the same username and password for all users. Type the static **Username**, **Password,** and **Domain** to be forwarded for all users.
- Click the associated **{variable}** button to expose the variable list and insert a variable into the above fields.

12 In the **Resource redirection** area, specify how you want the Virtual Desktop to interface with the to the host:

a To play audio generated by the remote device on the local computer, check the **Bring remote audio to local computer** checkbox.

b To copy the clipboard contents between computers, check the **Share clipboard between local and remote computers** checkbox.

c To access drives and/or printers on the remote device, check the **Drives** and/or **Printers** checkbox.

13 In the Display properties area, specify how you want the Virtual Desktop display to look:

a Use the **Screen resolution** drop-down menu to select the screen resolution for the Virtual Desktop display.

b Use the **Color depth** drop-down menu to select the color depth for the Virtual Desktop display.

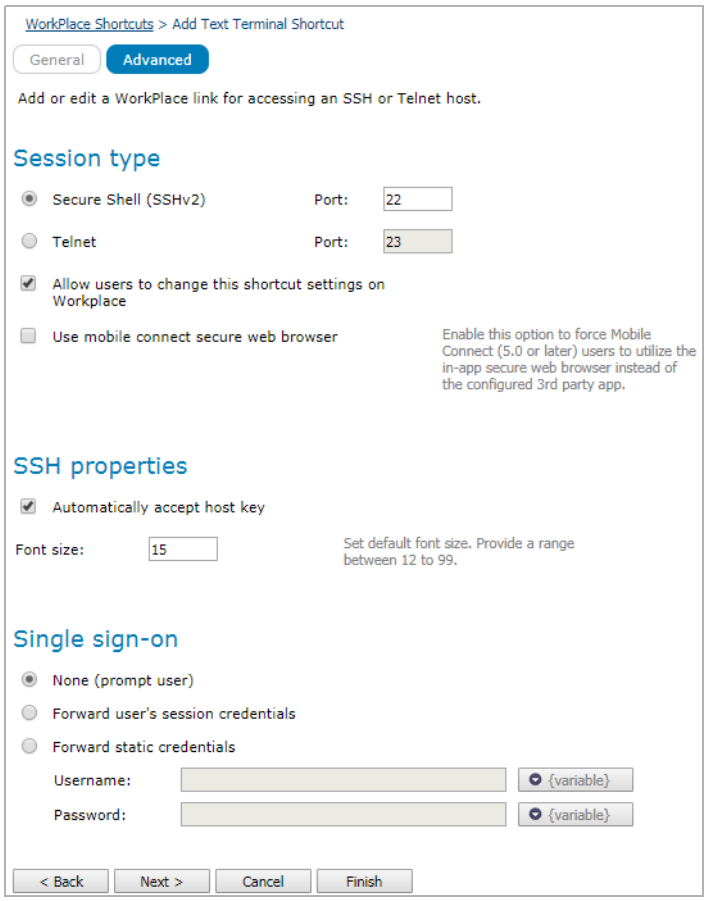
14 Click **Finish**.

Adding a Text Terminal Shortcut

Use this page to create or edit the text terminal shortcuts appearing in WorkPlace. These shortcuts enable users to easily connect to SSH or Telnet resources.

To add a text terminal shortcut:

1. From the main navigation menu under **User Access**, click **WorkPlace**.
2. On the **Shortcuts** page, click **New**. A drop-down menu appears.
3. Select **Text Terminal Shortcut**. The **Add Text Terminal Shortcut** page displays.
4. On the **General** tab, select the resource from the **Resource** drop-down menu.
5. In the **Link Text** field, type in the hyperlink text that will appear as the shortcut for a SSH or Telnet host.
6. Type a description for the shortcut into the **Description** field.
7. In the **Add this shortcut to group** drop-down menu, select **Standalone shortcuts** if you do not want to make this shortcut part of a group, or select an existing group from the list. To create a new group, select **New**.
8. If you selected **New**, type a name for the new group in the **New group name** field.
9. Click **Next**. The **Advanced** tab displays.



SSHv2 Configuration

The **Secure Shell (SSH)** session type affects the **Advanced** tab options section, and pre-populates that section with appropriate default settings.

The **Port** defines which port should be used for FTP communication. Default: **22**

In the **Advanced Session Options** area, checking:

- **Automatically accept host key** lets the administrator control whether or not a mis-matched host-key displays an acceptance prompt to the Workplace user. Default: **Checked**
- **Bypass username for SSHv2 only** controls whether the username field should be ignored/empty during login. Only valid for Secure Mobile Access firewalls. Default: Not selected

To return to the **General Menu**, click **Back**. To enable the new settings, click **Finish**.

Telnet Configuration

The **Telnet** session type affects the options section and pre-populates it with default settings.

The **Port** option defines which port should be used for Telnet communication. Default: **23**

To return to the General Menu, click **Back**. To enable the new settings, click **Finish**.

Editing Shortcuts

You can create new WorkPlace shortcuts when defining resources, but to edit or delete them, you must use the **Shortcuts** page.

To edit a shortcut:

1. From the main navigation menu, click **WorkPlace**.
2. Click the number or the link text of the shortcut that you want to edit.
3. Make edits as needed, and then click **Save**.

If you delete a shortcut, users will no longer see it in WorkPlace. To delete a shortcut, you must use the **Shortcuts** page.

To delete a shortcut:

1. From the main navigation menu, click **WorkPlace**.
2. Select the checkbox to the left of any shortcuts that you want to delete, and then click **Delete**. Deleting a shortcut does not delete the resource to which it refers.

WorkPlace displays the list of shortcuts in the same order as they appear on the **Shortcuts** page. You can move one or more shortcuts at the same time. The order of shortcuts (and groups of shortcuts) can be changed later in the layout you choose for your WorkPlace site, on the **Configure WorkPlace Layout** page.

To move one or more shortcuts:

1. From the main navigation menu, click **WorkPlace**.
2. Select the checkbox to the left of any shortcuts that you want to move.
3. Click **Move Up** or **Move Down** as appropriate. Each click of the button moves the selected shortcuts up or down one row.

To reorder an individual WorkPlace shortcut, an alternative method is to click its number or link text and then type its new list position in the **Position** field.

WorkPlace Sites

You can create multiple WorkPlace sites for different user segments, such as employees, business partners, and suppliers. Each site can have a unique external URL and a unique appearance, or bypass the WorkPlace portal and redirect the user to a different start page.

For example, you could create a WorkPlace site for your employees with a customized title and logo, and a URL of `http://employees.headquarters.com`, and create a different site for your partners at `http://partners.subsidiary.com`. If you create multiple WorkPlace sites with unique external URLs, you can import a wildcard certificate to the appliance and designate it as the server certificate for multiple WorkPlace sites, or procure a separate SSL certificate for each site whose FQDN is different from the appliance's domain name. For more information, see Certificates.

NOTE: Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

Optionally, if you have configured multiple realms, you can associate a WorkPlace site with a realm; this enables users to bypass the portion of the authentication process in which they would normally specify a realm to log in to. If you associate a WorkPlace site with a realm, users cannot select a different realm to log in to; a user who does not belong to the specified realm cannot log in to the specified WorkPlace site.

You can customize the following components of WorkPlace:

- Company logo
- WorkPlace title
- Greeting at top of page
- Color scheme
- Help file
- Font family

You can have users bypass the WorkPlace portal and go directly to a different start page, provided that the realm they log in to allows translated, custom port mapped, or custom FQDN mapped Web access exclusively. See Adding WorkPlace Sites for more information.

You may also want to set up custom licensing agreements that they will have to accept before getting started.

The URL a user types to log in to WorkPlace is preceded by the `http://` protocol identifier. The Web session is then redirected to a site that uses secure HTTP (HTTPS) and uses the `https://` protocol identifier.

NOTE:

- If you do not specify a custom WorkPlace site, or if users access the appliance using its default name, the default WorkPlace site is automatically used.
- Rather than creating a new WorkPlace site from scratch, you can save time by making a copy of an existing site and changing some parameters to fit the new site. For information about copying a WorkPlace site, see Adding, Editing, Copying, and Deleting Objects in AMC.
- You can delete a WorkPlace site if you no longer need it, but you cannot delete the default WorkPlace site. For information about deleting WorkPlace sites, see Adding, Editing, Copying, and Deleting Objects in AMC.

Topics:

- Adding WorkPlace Sites
- Modifying the Appearance of WorkPlace
- WorkPlace and Small Form Factor Devices

Adding WorkPlace Sites

AMC includes a preconfigured default WorkPlace site. You can create additional WorkPlace sites as needed; this section describes how to do so.

You can make WorkPlace look different, on a per-community basis, if you set up different styles and layouts. For more information, see Modifying the Appearance of WorkPlace. For information about configuring WorkPlace sites for small form factor devices, see WorkPlace and Small Form Factor Devices.

The fully qualified domain name (FQDN) for the WorkPlace site can include one of the following:

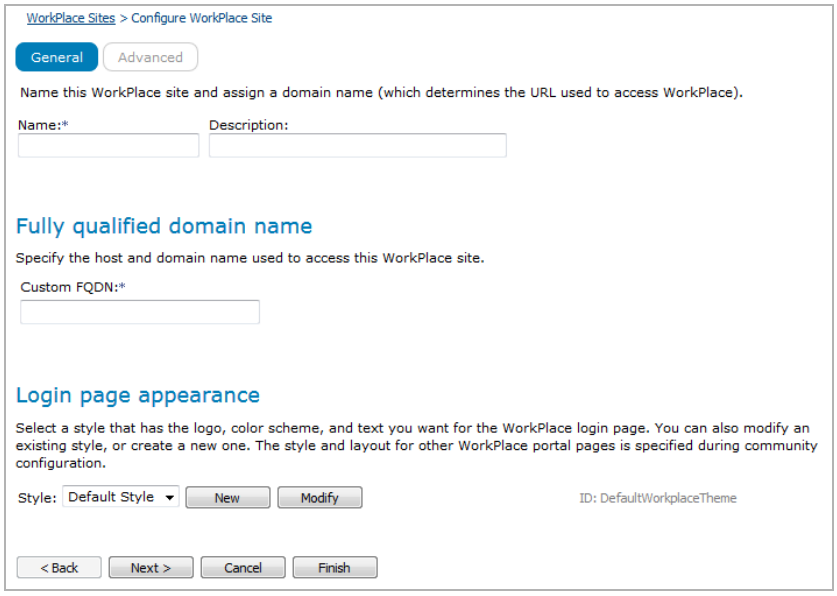
- A host within the same domain name as the SMA appliance. Optionally, you can configure a separate SSL certificate for this type of site.
- A custom FQDN. This option can use a wildcard SSL certificate when its IP address is the same as another WorkPlace site that uses the wildcard certificate, or you can use a separate SSL certificate for the site. Before creating the site, you must obtain the certificate. For more information, see Certificates.

  NOTE: Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

In either case, you must communicate the external FQDN to users so they know how to access WorkPlace. You must also add this FQDN to your public DNS.

To add a WorkPlace site:

1. On the main navigation menu under **User Access**, click **WorkPlace**, and then click the **WorkPlace Sites** tab.
2. Click **New**. The **Configure WorkPlace Site** page opens with the **General** settings displayed.



3. In the **Name** field, type a unique name for the WorkPlace site.

4 (Optional) In the **Description** field, type a descriptive comment about the WorkPlace site.

5 Type the IPv4 or IPv6 **Custom FQDN** name. By default, AMC listens on all interfaces for all services and connects the request to the correct service based on the FQDN being requested.

6 **(Migrated/imported configurations only)** An additional listening address can be specified if AMC was upgraded from a previous version where a virtual IP address is configured for the WorkPlace site or the CEM is used. To listen on an additional address, check the **Listen on an additional IP address** checkbox and type the IP address.

For new installations, the Listen on an additional IP address fields are hidden. On a partial import, virtual IP address information is lost, and applying pending changes forces the Administrator to fix any WorkPlace site or URL resource configured to use a different IP address. In this case, the **Listen on an additional IP address** fields are visible, with the checkbox checked to enable listening on an additional address. Either enter an IP address or uncheck the checkbox.

For migrated/imported configurations with existing virtual hosts, the UI section is visible, but the Administrator cannot create new virtual addresses. If necessary, use CEM to create virtual host addresses in a new or migrated/imported configuration.

On a partial import, virtual IP address information is lost, and applying pending changes will force the Administrator to fix any WorkPlace site or URL resource configured to use a different IP address. In this case, the UI should be visible, with the checkbox checked to enable listening on an additional address, (New) selected as the IP address, and no IP address entered in the address field. The Administrator can choose to either enter an IP address or uncheck the checkbox.

If the host name or IP address on the certificate does not match the **Custom FQDN** or **IP address** that you specified for this site, a security warning is displayed when users access the site.

7 Select a style—which includes the logo, color scheme, and text—for the WorkPlace login page. The style and layout for other WorkPlace portal pages is specified during community configuration; see Modifying the Appearance of WorkPlace for information on modifying or creating a style.

8 Click **Next** to open the **Advanced** page.

9 In the **Realm** area, select one of these options:

- **Log in using this realm**: Users are not prompted to select a realm, and only members of the specified realm can access the WorkPlace site.
- **Prompt user for realm**: Offer users a list of realms from which to choose. You can offer them all configured realms, or clear the **All realms** selection and choose the ones that should be in the list. Any authorized user can access the WorkPlace site after selecting a realm during login.

10 In the **Start page** area, select **Display this page after authentication** if you want users to bypass the default WorkPlace home page after authentication. For example, if you have someone who will submit content using a Web-based content management system, this setting allows you to present the writer with the CMS interface immediately after he or she logs in.

This setting is available only if the realm specified in the **Realm** area offers translated, custom port mapped, or custom FQDN mapped Web access exclusively. The URL you enter in this text box will be automatically prefixed with `http://`. If this is a URL for a secure site, you must include the `https://` protocol identifier.

If you specify an alternate page for users and they bypass the default WorkPlace portal, the user's session is valid as long as the browser window is open, or until the session times out. Unlike the WorkPlace portal, the alternate page will not include a **Log out** option.

11 Click **Finish** to save your WorkPlace site settings.

NOTE: You can enter a URL alias in the **Start page** area (if you don't want users to see the complete URL in WorkPlace), provided that you create a URL resource for it. For example, if you define a URL resource as `http://intranet.mycompany.com` with an alias of intranet, you can specify the start page for WorkPlace here simply with intranet (or a more specific path, such as intranet/some/path). When users authenticate, they are redirected to `https://<appliance>/intranet` or `https://<appliance>/intranet/some/path`.

Modifying the Appearance of WorkPlace

When you create a new WorkPlace site, you have control over the look-and-feel of the pages and the organization of resource shortcuts and other elements, such as intranet browsing and Network Explorer. The appearance of WorkPlace is controlled by the following design elements, which can be created and reused:

- A *WorkPlace style* determines the color scheme, fonts, and images used in WorkPlace. A style can be applied to two groups of pages: those that contain user resources, and the login, error, and notification pages.

  An important thing to remember is that WorkPlace login, error, and notification pages are assigned a style when you configure a *WorkPlace site* (see Adding WorkPlace Sites for more information), and the portal pages are assigned a style when you configure a *community* (see Creating and Configuring Communities for more information).

- A *WorkPlace layout* determines elements like WorkPlace navigation, the number of columns on a page, whether users see the **Intranet Address** box, and which shortcuts appear and how they are arranged. A layout applies only to WorkPlace resource pages.

  If your site requires a complete overhaul of the way WorkPlace looks and you are familiar with creating Web content and style sheets (`.css`), you can upload a complete style to the appliance and then select it when you create your site and assign it a style. See Fully Customizing WorkPlace Pages for more information. To do further customization—for example, to insert a use agreement into the login process—see About Custom WorkPlace Templates.

NOTE: The Default Style and Default Layout for WorkPlace cannot be deleted.

Topics:

- Creating or Editing a WorkPlace Style
- Creating or Editing a WorkPlace Layout

Creating or Editing a WorkPlace Style

To create a new WorkPlace style:

1 On the main navigation menu, click **WorkPlace**, and then click the **Appearance** tab.

2 In the **Styles** area, choose an existing style to base your new one on (select its checkbox, and then click **Copy**), or click **New**.

3 In the **Name** field, type a unique name for the WorkPlace style.

4 (Optional) In the **Description** field, type a descriptive comment about the style.

5 In the **Font family** list, select the type of font you want to use (**Serif** or **Sans-serif**).

6 In the **Color scheme** drop-down menu, click the name of the color scheme you want to use. If you select **Custom**, you can set custom colors for the WorkPlace **Page background**, **Subheadings**, and **Main**

heading. Specify color settings by typing the applicable hexadecimal RGB value, or by clicking a color swatch and then selecting a color from the **Please choose a color** dialog.

7 To replace the Secure Mobile Access logo that is displayed in WorkPlace with a different image, use the **Replace with** field to enter or browse for the `.gif` or `.jpg` file you want to use. For best results, the image should not exceed 200 pixels wide by 50 pixels high.

8 When **Display gradient background behind logo** is selected, the accent color of your **Color scheme** is displayed at the top of each WorkPlace page, gradually going from dark (at the top of the page) to light. Any heading that you have appears in white.

9 On small form factor devices, the logo specified in the **Images** area is resized by default, but for best results you may want to specify an alternate image that does not exceed 40 pixels by 100 pixels. Type the path of the image file, or click the **Browse** button to select the image file you want to use. The logo is automatically omitted from WAP and i-mode devices, so this setting does not affect the display on those devices.

10 In the **Title** field, type the text that will appear as the title on the page and in the browser's title bar. The title must be no longer than 25 characters.

11 In the **Greeting** field, type the introductory text that should appear below the title. The greeting must not exceed 250 characters, but you may want to use a shorter one, especially if you want it to appear on small form factor devices.

12 To further assist the user, you could specify a custom **Help file** that provides more detailed information about the resources available on your VPN, or describe how to get technical support. Click **Browse** to specify a well-formed HTML file that contains custom Help information. Your custom Help content is integrated with the default WorkPlace Help system. To make changes to your custom help content, edit the file locally and upload it to the appliance again.

13 Click **Save** to save your WorkPlace site settings, or click **Reset Defaults** to restore the factory-default settings.

Creating or Editing a WorkPlace Layout

To create a new WorkPlace layout:

1 On the main navigation menu, click **WorkPlace**, and then click the **Appearance** tab.

2 In the **Layouts** area, click **New**.

3 In the **Name** field, type a unique name for the WorkPlace layout.

4 (Optional) In the **Description** field, type a descriptive comment about the layout.

5 In the **Initial content** area, select a layout for your current WorkPlace content (any shortcuts and shortcut groups that you've defined), or choose to set up an initial structure for your content and add WorkPlace resources later. No matter how you decide to lay out your initial content, you can change it later by adding, removing, or rearranging pages and page content.

6 In the **Page navigation** area, specify the kind of navigation controls that will be displayed if your content requires more than one page.

7 Specify whether the **Intranet Address** field will be displayed when this layout is used. It gives users access to resources by typing a resource name (a UNC path, URL, or both). Click **Next**.

8 Click the **Edit page properties** link to change the basic properties of this WorkPlace page: its name (for example, *Home*) and a short description.

9 Use the page, column, and shortcut controls to add pages, content, and rearrange the elements on each page. Rearranging items in a layout or deleting them from a layout does not affect the resource itself, just its appearance in WorkPlace.

10 Click **Next** to move to the **Device Preview** page. This page allows you to see how your layout will appear on different types of devices with different display capabilities. On a mobile device, for example, the **Intranet Address** field cannot be displayed, even if it is configured to be part of a layout.

WorkPlace and Small Form Factor Devices

WorkPlace provides support for a variety of small form factor devices, including PDAs, Pocket PCs, smart phones, WAP 2.0-compatible phones, and i-mode phones. This section explains how to configure the appliance to support these devices.

Topics:

About WorkPlace and Small Form Factor Devices

When a user logs in to WorkPlace from a small form factor device, WorkPlace detects the device type and automatically transforms to best match the capabilities of the client device. This transformation affects several aspects of the user experience:

- **WorkPlace functionality:** Some WorkPlace features available from a standard desktop browser are omitted on small form factor devices:
  - The **Network Explorer** page is not available for accessing network shares.
  - The **Intranet Address** box is not available for typing a URL or UNC path name.
- WorkPlace http and https bookmarks are supported.
- SonicWall access agents are not supported, including the OnDemand access agent, the EPC data protection agents, and terminal server agents.
- The custom online Help file is not available.
- **WorkPlace look and feel:** The standard WorkPlace appearance (including any customization you've made) is automatically modified for optimal display on small form factor devices.

  NOTE: For information about configuring the appearance of WorkPlace on a small form device, see Optimizing WorkPlace for Display on Small Form Factor Devices.

- **Resource availability:** You can control which WorkPlace shortcuts will appear on a small form factor device. This allows you to omit Web resources that are incompatible with a particular type of device.

  For example, you might want to hide the link for Outlook Web Access and instead provide a link to Outlook Mobile Access. This setting is controlled when creating a WorkPlace shortcut; for more information, see Adding Web Shortcuts.

- **End Point Control classification:** To restrict access based on device type, you can create an EPC zone for a specific type of Windows mobile device and then reference that zone in an access control rule. For more information, see Defining Zones.

The appliance is preconfigured to classify most common small form factor devices into one of several categories. The default settings should be sufficient for most deployments, but you can modify the configuration to change

the classification or recognize other devices, as needed. For more information on how devices are classified, see About Browser Profiles.

NOTE:

- Some small form factor devices do not display error pages, but instead return an error code (such as a `500` error) from the Web server, without any descriptive error text.
- Users attempting to log in to WorkPlace from an unsupported device will receive an error message.
- For users who connect to the appliance from small form factor devices, you should configure the appliance with a certificate from a leading CA (such as VeriSign), or else import the CA certificate to your users' small form factor devices—many devices will fail to connect when presented with a certificate from an unknown CA and will not provide any error message. For more information, see CA Certificates.

Optimizing WorkPlace for Display on Small Form Factor Devices

The general WorkPlace appearance, including any customization you've made, is automatically modified for optimal display on small form factor devices. The results are sufficient for most deployments, but you may want to manually configure a few settings to improve the display. Most of the settings are configured as part of a WorkPlace *style*; when you configure a WorkPlace *layout* you'll be able to see how page navigation and other elements will work on different mobile devices.

To optimize a WorkPlace site for display on small form factor devices:

1. On the main navigation menu, click **WorkPlace**, and then click the **Appearance** tab.
2. In the **Styles** drop-down menu, select a style you want to modify, or click **New** to start from scratch.
3. In the **Images** area, specify a logo for WorkPlace. For optimum results on smaller devices, the image should not exceed 100 pixels by 40 pixels. By default, the logo specified in the **Standard logo image file** box is used. To specify an alternate image, type the path of the `.gif`, `.jpg`, or `.png` file in the **Replace with** field, or click **Browse** to locate it. Graphics are automatically omitted from WAP and i-mode devices: this setting does not affect the display on those devices.
4. To reduce the amount of vertical scrolling required, clear the **Display greeting on small form factor devices** checkbox in the **Text and Files** area.
5. Click **Save** or **Finish** to save your WorkPlace site settings, or click **Reset Defaults** to restore the factory default WorkPlace site settings.

NOTE: If you are using a mobile device that doesn't support UTF-8, such as the Sanyo W32SA handset, localized content is displayed using illegible characters. To log in, the user must enter his or her credentials in ASCII format.

To preview a WorkPlace layout on a small form factor device:

1. On the main navigation menu, click **WorkPlace**, and then click the **Appearance** tab.
2. In the **Layouts** drop-down menu, select the layout you plan to use, or click **New** to configure one.
3. **General** settings: If your layout contains more than one page, you can specify the kind of navigation controls that will be displayed. Only an advanced mobile device, which is defined as one that has a browser that supports JavaScript, supports multiple pages. An example is a Pocket PC running Windows Mobile Professional.
4. **Device preview**: There are two approaches to lay out a community on smaller devices.
   - You can have the appliance accommodate smaller devices automatically. For example, the **Intranet Address** field (if it is part of the layout) is automatically not displayed on mobile devices, and whatever logo you have specified is scaled down.

- If the automatic results are not acceptable, you can create a different layout, intended only for mobile devices, and then specify it when you configure the community. See Configuring the Appearance of WorkPlace for more information.

About Browser Profiles

The appliance is preconfigured to recognize most popular desktop browsers and many common small form factor devices. When a user connects to WorkPlace, it uses this profile information to classify the device into one of several categories. This in turn determines how WorkPlace appears, which shortcuts are visible on the device, and how the device is classified for use with EPC.

The browser profile is determined by examining a variety of information sent from the client, including the Web browser's user-agent string and HTTP headers. The classification details are shown in the Browser profile classification details table.

Browser profile classification details

Client device examples	WorkPlace classifications
• Windows, Mac, or Linux	*Desktop (JavaScript enabled)*
• Apple iPhone	*Desktop (JavaScript disabled)* Because JavaScript is disabled, the appliance cannot interrogate the iPhone to determine which EPC zone it belongs in.
• Windows Pocket PCs • Windows Smartphone Professional • Many Windows CE devices • Many Palm OS devices	*Advanced mobile (Touch screen and JavaScript enabled)*
• Windows Smartphone Standard	*Standard mobile (JavaScript enabled)*
• Any Smartphone without JavaScript • Some Palm OS devices	*Standard mobile (No JavaScript)*
• Any WAP 2.0-compliant phone (includes many Symbian-based phones)	*WAP Phone v2.0*
• Mobile browser using cHTML (no cookie support)	*i-mode phone (cHTML)*

The market for mobile phones and handheld devices is evolving rapidly, and you may need to modify the default appliance settings. For example, you might need to configure the appliance to support a new type of smartphone purchased by your sales organization. Or you might want to override the appliance's default profile to accommodate a PDA vendor whose user-agent string has changed. Any browser profiles you define will take precedence over the built-in profiles configured on the appliance.

AMC's browser profiles enable you to configure the appliance to support the latest small form factor devices. A browser profile maps a particular user-agent string to a device type. As mentioned in About WorkPlace and Small Form Factor Devices, the profile is used to determine three things, as shown in the Browser profile features table.

Browser profile features

Feature specified in browser profile	For more information
How WorkPlace is rendered on the device	See About WorkPlace and Small Form Factor Devices.
Which links appear on WorkPlace	See Adding Web Shortcuts.
How the device is classified into an End Point Control zone	See How the Appliance Uses Zones and Device Profiles for End Point Control.

The appliance evaluates browser profiles in the order listed until it finds a match. If there is no match for a defined user-agent string, the appliance checks its built-in list of profiles. If no match is found in either list, the device is classified as *Desktop (JavaScript enabled)* and includes full browser capability.

Adding Browser Profiles

The appliance is preconfigured to recognize many popular small form factor devices. To override or supplement this information, you can create a browser profile that determines how WorkPlace is transformed. A profile is a mapping between the user-agent string sent by the browser and one of several device types defined in AMC. Any profiles you define take precedence over the built-in profiles configured on the appliance.

To add a browser profile:

1. On the main navigation menu, click **Agent Configuration**.
2. In the **Other Agents** area, under **Web browser profiles**, click **Edit**. The **Browser Profiles** page appears.
3. Click **New**, and then, in the **User-agent string** field, type a distinguishing portion of the user-agent string used by the device. You can use the standard * and ? wildcard characters when defining a user-agent string. For example, a user-agent string of *do** would match *DoCoMo*, and a string of *MSI?* would match any of the *MSIE* possibilities.

   NOTE: Due to client operating system limitations, Mobile Connect cannot convert host name, URL, or domain type resources containing wildcards to an IP address and, therefore, cannot redirect them to the appliance.

4. In the **Device type** drop-down menu, select the entry that most closely matches the client information of the device identified by the user-agent string. For more information on classifying devices, see About Browser Profiles.
5. (Optional) In the **Description** field, type a descriptive comment about the browser profile.
6. Click **OK**. The new profile is added to the bottom of the list.
7. Click **Save**.

NOTE: The appliance evaluates browser profiles in the order listed, until it finds a match. See Moving Browser Profiles for more information.

Moving Browser Profiles

Browser profiles are matched in the order listed. Once the appliance matches a profile, it stops evaluating the list. You can reorder the placement of one or more profiles as needed to ensure that a particular small form factor device is properly recognized.

To move a browser profile:

1. On the main navigation menu, click **Agent Configuration**.
2. In the **Other Agents** area, under **Web browser profiles**, click **Edit**. The **Browser Profiles** page appears.
3. Select the checkbox for any profiles you want to move.
4. Click **Move Up** or **Move Down** as needed; each click of the button moves the selected profiles up or down one position in the list.
5. Click **Save**.

Fully Customizing WorkPlace Pages

The WorkPlace customization that can be done in AMC (described in Configuring WorkPlace General Settings) are a convenient way to change the general look and feel of WorkPlace, but they may not provide enough control for some deployments.

This section describes two levels of customization:

- WorkPlace style and layout can be configured in AMC, as described in Modifying the Appearance of WorkPlace. To take this customization a step further and, for example, use a background image for your WorkPlace pages, or change the size of the header area, download an existing style, edit it locally, and upload it back up to your appliance. See WorkPlace Style Customization: Manual Edits for more information.
- If you need to do more advanced customization, such as adding a use agreement or end-user license agreement to the login process, you can customize specific pages in WorkPlace, including authentication, error, and notification pages. See About Custom WorkPlace Templates for more information.

Topics:

WorkPlace Style Customization: Manual Edits

WorkPlace style and layout can be configured in AMC, as described in Modifying the Appearance of WorkPlace. If you are familiar with creating Web content and style sheets (`.css`), you can take this customization a step further and, for example, make your login and logoff pages visually consistent with your corporate standards, or modify the error pages (which appear if a resource is unavailable or a user provides invalid credentials) to include detailed support or troubleshooting information.

The most efficient way to create a new style is to download an existing style, edit it locally, and upload it back up to your appliance.

To fully customize a WorkPlace style:

1. On the main navigation menu, click **WorkPlace**.
2. In the **Styles** drop-down menu on the **Appearance** page, select a style that you want to use as your starting point, and then click **Download**. (Styles can be downloaded only one at a time.)
3. The style is downloaded as a compressed (`.zip`) file, and its filename is a combination of `WorkPlace_Style` followed by the current style name.
    - If you plan to create a new style, rename the `.zip` file when you save it.
    - If you plan to overwrite an existing style with your changes, keep the current filename.
4. Make edits to the cascading style sheets (one for desktop devices and one for mobile devices) and graphics. You can use the sample WorkPlace and login HTML pages to see how page elements are classified.
5. Gather your edits into a `.zip` file name `WorkPlace_Style_<your style name>.zip`, and then click **Upload** on the WorkPlace **Appearance** page.

6 On the **Upload Style** page, select whether you are uploading changes to an existing style, or adding a new WorkPlace style. Uploading a style in the form of a `.zip` file overwrites all style files.

7 If you are uploading a new WorkPlace style, give it a name; for example, *Corporate Branding*.

8 In the **Style zip file** field, enter the name of the `.zip` file you edited or created. If your new style is named *Corporate Branding*, for example, the name of the corresponding file must be *`WorkPlace_Style_Corporate_Branding.zip`*.

9 Click **Upload** to transfer the style-related files to your appliance.

About Custom WorkPlace Templates

There are situations in which you need to completely customize the way that WorkPlace looks and what steps are involved in the login process. For example:

- You may want to use your existing corporate portal (where that portal application has been defined as a resource) instead of WorkPlace. Here you would customize the login, logoff, notification, and error pages to match the look and feel of your existing portal.
- You might want to provide access to a specific application (which has been defined as a resource) to a business partner. Here you would customize the login, logoff, notification, and error pages to match the look and feel of the application.

The templates you can customize fall into three categories, see the Custom WorkPlace template types table. If you modify the ones in one category, you should probably also modify the others to ensure consistency.

Custom WorkPlace template types

Template type	Description
Authentication	The pages used to gather a user's credentials, including selecting a realm and entering a username, password, or passcode. You might use these templates to provide the user with on-screen information about how to log in to your network.
Error	The pages displayed when an error occurs, such as invalid user input (an authorization-denied message or a failed login), or an error in the appliance. You might use these templates to provide the user with support information, such as administrator contact information and where to find user guides.
Notification	The pages that provide the user with basic information required to interact with the system, including the logout page (confirming successful logout) and pages containing messages from the authentication module (such as a password-expiration warning).

Although you can redesign the layout or add graphics and text on these pages, you cannot modify or remove the existing elements. For example, on the authentication page you cannot rename the **Login** button. These elements are dynamically generated by WorkPlace.

The WorkPlace pages that are presented to the user after login cannot be customized manually; they are controlled from AMC.

How Template Files are Matched

You can customize templates globally, or on a per-WorkPlace site basis. For example, you might customize the global templates to use one design, and then override that design on a site-by-site basis by modifying its templates.

When a user connects to a WorkPlace site, the appliance first looks for the most specific template. If one is not found, it checks for the generic template for the category (authentication, error, or notification). If neither is found, the default WorkPlace template (the one under AMC's control) is used.

The following tables list the templates available for full-screen devices (desktops and laptops), along with the corresponding file names. For small form factor devices, prefix the file names as follows:

- For smartphone and PDA devices, prefix the file name with `compact-`.
- For WAP devices, prefix the file name with `micro-`.

For example, to customize the page users see when selecting a realm, edit `realm-select.tmpl`. The equivalent pages for smaller devices are `compact-realm-select.tmpl` (for smart phones and PDAs), and `micro-realm-select.tmpl` (for WAP devices).

Authentication

Template files: authentication

Description	File name
User selects a realm	*realm-select.tmpl*
User provides login credentials	*authentication-request.tmpl*

Error

Template files: errors

Description	File name
Realm selection failed	*realm-error.tmpl*
Invalid credentials supplied	*authentication-error.tmpl*
Access to resource is denied	*authorization-error.tmpl*
Appliance license capacity exceeded	*licensing-error.tmpl*
EPC error	*epc-error.tmpl*

Status

Template files: status

Description	File name
Authentication notification (such as password expiration)	*authentication-status.tmpl*
Logoff successful page	*logoff-status.tmpl*
EPC successful logoff page	*epc-logoff.tmpl*

Generic

Template files: generic

Description	File name
EPC download page	*epc-launch.tmpl*
User provides login credentials	*authentication.tmpl*

Template files: generic

Description	File name
General errors	*error.tmpl*
General status	*status.tmpl*
General page (applied if no other specific template is found)	*custom.tmpl*

NOTE: The default WorkPlace template files (named `extraweb.tmpl`, `compact-extraweb.tmpl`, and `micro-extraweb.tmpl`) should never be edited: your changes will be overwritten the next time you customize WorkPlace in AMC.

Customizing WorkPlace Templates

The appearance of WorkPlace is controlled using several templates. To customize the templates, you create an HTML file (or, in the case of a small form factor device, an xHTML or cHTML file) using any standard Web design tool or text editor.

If your customization includes graphics, upload them to this folder:

```
/usr/local/extranet/htdocs/__extraweb__/images
```

If an `images` directory is not already present, you can create it by typing the following command:

```
mkdir -p /usr/local/extranet/htdocs/__extraweb__/images
```

The file names you must use are described in How Template Files are Matched. For small form factor devices, a prefix is added:

- For smartphone and PDA devices, prefix the file name with `compact-`.
- For WAP devices, prefix the file name with `micro-`.

To customize the WorkPlace templates for desktop devices:

1. Create an HTML file containing the desired layout, and add the WorkPlace-specific tags:
   - Within the BODY tag, add an HTML COMMENT tag containing the word EXTRAWEB:

     ```
     <!-- EXTRAWEB -->
     ```

     This tag is required; it determines where to place content dynamically generated by the appliance. Without it, the user trying to log in to WorkPlace will be repeatedly sent back to the beginning of the authentication process.
   - Add a reference to the external JavaScript file:

     ```
     <script language="javascript"
     src="/__extraweb__/template.js"></script>
     ```
   - To have your templates display any WorkPlace content (including the `.css` file or the custom logo you configured in AMC), modify your HTML code to reference the `/__extraweb__/images/` path. For example:

     ```
     <img src="/__extraweb__/images/mylogo.gif">
     ```
2. Save the file with the appropriate file name using a `.tmpl` file extension.

To customize the WorkPlace templates for small form factor devices:

1. Create a file in xHTML (for smart phones or PDAs) or cHTML (for WAP devices) format containing the desired layout, and add the WorkPlace-specific tags:
   - Within the BODY tag, add a COMMENT tag containing the word EXTRAWEB:

```
<!-- EXTRAWEB -->
```

This tag is required: it determines where to place content dynamically generated by the appliance. Without it, the user trying to log in to WorkPlace will be repeatedly sent back to the beginning of the authentication process.

- To have your templates display any WorkPlace content (including the `.css` file or the custom logo you configured in AMC), modify your code to reference the `/__extraweb__/images/` path. For example:

```
<img src="/__extraweb__/images/mylogo.gif">
```

2 Save the file with the appropriate file name using a `.tmpl` file extension.

Giving Users Access to WorkPlace

Because WorkPlace is a Web application, users can access it through a standard Web browser. You can also incorporate WorkPlace links into a Web page or a portal hosted on your own network.

You must tell users which URL to use to access WorkPlace. You can give users the default WorkPlace URL, or you can give them a URL for a customized WorkPlace site; see the WorkPlace site types table.

WorkPlace site types

WorkPlace site type	URL	Description
Default WorkPlace site	`https://<server_name>`	*<server_name>* is the fully qualified domain name (FQDN) contained in the appliance's SSL certificate. For more information, see Certificates.
Custom WorkPlace site	`http://<custom_fqdn>`	*<custom_fqdn>* is the external FQDN associated with the WorkPlace site. For more information, see WorkPlace Sites.

If users will be accessing WorkPlace from a Web page or portal hosted on your network, you may want to provide a **Log out** button to preserve the security of user accounts. To do this, give users the following WorkPlace site URL:

`https://<server_name>/__extraweb__logoff`

The *<server_name>* is the actual FQDN from your appliance's SSL certificate.

End Point Control and the User Experience

When Secure Mobile Access End Point Control components are enabled, the WorkPlace login process includes additional steps, which vary depending on whether Cache Cleaner is used. For more information, see About End Point Control.

How Cache Cleaner Works

With Cache Cleaner, the typical WorkPlace session looks like this:

1 In a Web browser, the user types the appropriate WorkPlace URL.

2 The user logs in to WorkPlace.

3 The user must accept any Secure Mobile Access security warnings that appear. The Cache Cleaner icon appears in the task bar notification area.

4 The user accesses network resources as needed.

5 When the user ends the Cache Cleaner session, Cache Cleaner deletes all data associated with the session. All browser windows are closed by Cache Cleaner upon logout. A dialog warns users that all browser windows will be closed on logout.

NOTE: Because Cache Cleaner closes all browser windows on logout, and if you configure Cache Cleaner to close other browser windows at startup, make sure your users are aware: if someone is filling out a form, for example, anything that isn't submitted when the browser window closes will be lost.

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User Access Components and Services

About User Access Components and Services

The SMA appliance includes several components that enable users to access resources on your network. This section describes each of the user access components and the services that control them.

Many of these components are provisioned or activated from the WorkPlace portal. For more information about WorkPlace, see The WorkPlace Portal.

User Access Agents

User access agents are deployed to client devices based on the community to which the user belongs. Most agents are deployed automatically when the user logs in to the WorkPlace portal using a browser. The installation package for these two access agents can also be made available for download from a file share on your network or deployed through applications such as Microsoft's Systems Management Server (SMS) or IBM's Tivoli. For more information, see Selecting Access Methods for a Community.

When deployed automatically—when a user logs in using a browser—the access agents are both deployed and activated on the first visit. This generally requires the user to accept a download for the Secure Endpoint Manager (SEM), which will in turn manage the access agent installation and future access agent updates. On subsequent visits to the WorkPlace portal from the same client device using the same browser, the access agents are automatically activated without user intervention. See Client and Agent Provisioning (Windows) for more information.

the Access agent comparison table compares the capabilities of access agents and lists their requirements. For other system-requirement information, see Client Components.

Access agent comparison

	Network tunnel access (IP protocol)		Proxy access (TCP protocol)	Web access (HTTP protocol)	
	OnDemand Tunnel agent	Connect Tunnel client	OnDemand Mapped Mode	Web Proxy Agent	Translated, Custom Port mapped, Custom FQDN mapped Web access
Application support					
TCP-based client/server applications	x	x	x		
TCP- or UDP-based client/server applications	x	x			
URLs and Web applications	x	x	x	x	x
Windows networking					
Web-based file access	x			x	x
Native Windows file access (Network Neighborhood)	x	x			
Mapped network drives	x	x			
Windows domain logon		x			
Connection types					
Forward connections	x	x	x	x	x
Reverse connections (such as FTP or SMS)	x	x			
Cross-connections (such as VoIP)	x	x			
Operating systems					
Windows	x	x	x	x	x
Linux or Macintosh	x	x	x		x
Windows Mobile					x
Administrator privileges required to install client/agent	x	x			
Deployment					
Auto-activated from WorkPlace	x		x	x	x
Provisioned from WorkPlace	x	x	1	x	
Provisioned outside of WorkPlace		x			

1. Port-mapped mode requires ActiveX or Java. For a user without administrator rights who can't run ActiveX, the Java Runtime Environment (JRE) is used.

Topics:

- Client and Agent Provisioning (Windows)
- WorkPlace
- Tunnel Clients
- Web Access

Client and Agent Provisioning (Windows)

Secure Endpoint Manager is a component that enables you to provision Windows users with EPC and access agents reliably when they log in to WorkPlace. It provides better application compatibility for applications that need an agent, and more reliable EPC interrogation; in addition, most client updates do not require administrator privileges. If something goes wrong during provisioning, the error is automatically recorded in a client installation log (identified by username) that you can view in AMC.

Installing Secure Endpoint Manager is a one-time step and does not require that the user have administrator privileges. The only other time users will be (briefly) aware of it once it's installed is when an access agent or the Access Manager itself needs to be updated. Installing Secure Endpoint Manager is also not required, but users without it will have just Web-only access to resources in WorkPlace, or be forced to log out, depending on how you configure the community.

Topics:

- Secure Endpoint Manager
- Installing Secure Endpoint Manager
- Enabling Secure Endpoint Manager Software Update Policies
- Provisioning and Personal Firewalls
- Client Installation Logs

Secure Endpoint Manager

Secure Endpoint Manager (SEM) is a software component that is installed on a client device. It is installed when the SMA product is accessed from a Web browser. SEM enables a user on a client device to log in to an SMA appliance and perform tasks using a Web browser.

SEM provides the installation and activation of several client components, such as OnDemand Tunnel, End Point Control, OnDemand Mapped Mode, and Native Access Modules.

SMA provides an update policy for Secure Endpoint Manager (SEM) and its associated sub-components, such as Native Access Modules, End Point Control, OnDemand Tunnel, Web Proxy, and OnDemand Mapped Mode.

SEM installation and software update policies are supported on Windows, Mac OSX, and Linux client operating systems.

After the server-side firmware has been updated, SMA administrators can control and update specific user Groups and Communities individually, eliminating the need to update thousands of client devices simultaneously.

SEM software updates can be triggered using Web access or Tunnel access methods or using both methods.

Installing Secure Endpoint Manager

Users are normally required to install a Secure Mobile Access agent or client before they are granted access to network resources when they log in to WorkPlace. This is the recommended setting: it provides better compatibility for applications that need an agent, which means broader access for users and fewer Help Desk calls for you.

Users logging in to WorkPlace are offered these choices when this setting is enabled:

- **Install:** Secure Endpoint Manager is installed on the user's computer. Users will need to do this only once.
- **Logout:** The user's session is ended.

If you configure the community such that an agent or client is *not* required, users are offered these choices when they log in:

Install: Secure Endpoint Manager is installed on the user's computer. Users will need to do this only once.

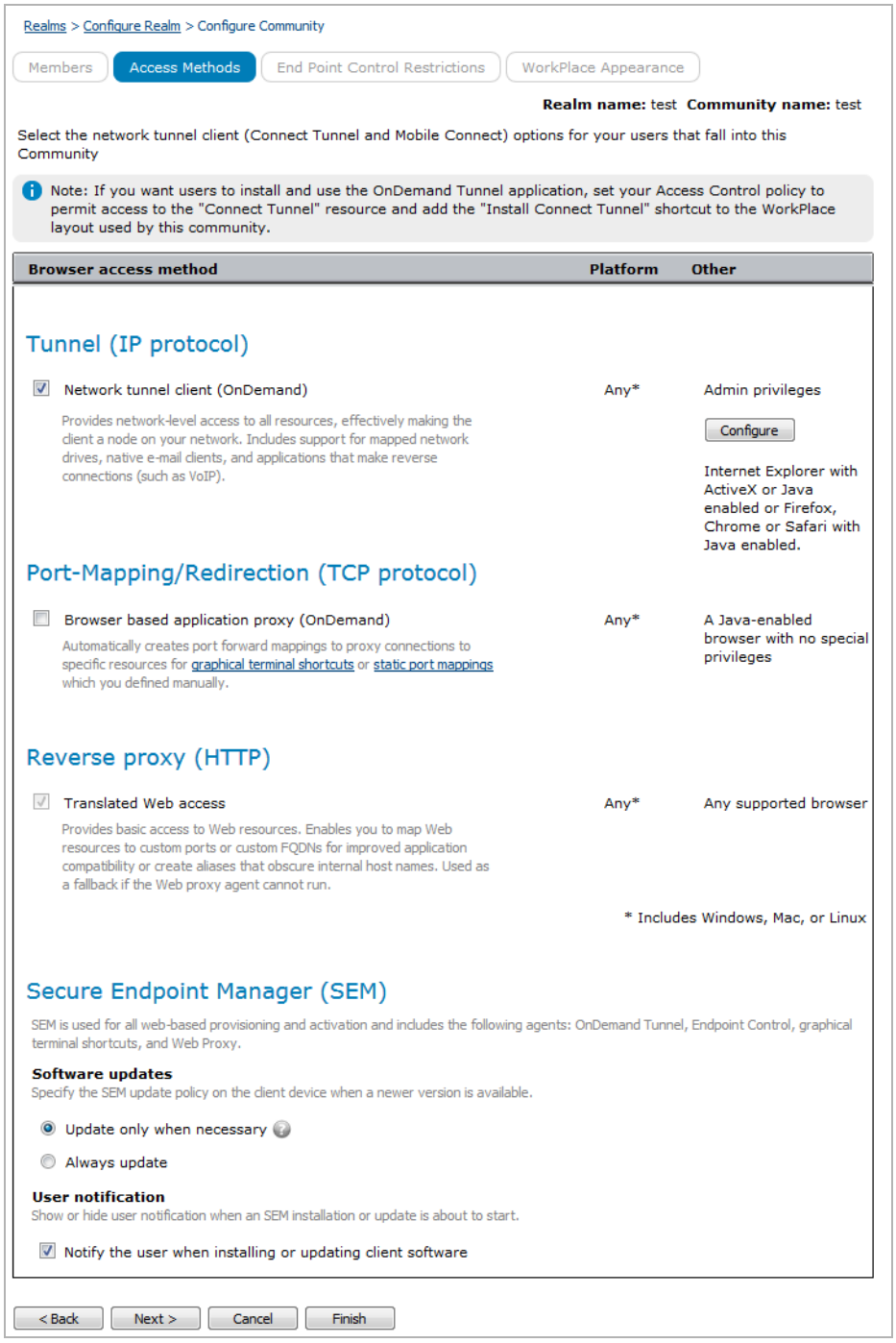
> **CAUTION: In this scenario (assuming EPC is enabled), the user is placed in either the Default zone or a Quarantine zone, depending on how the community is configured. A Quarantine zone may be too restrictive, and the Default zone probably needs to accommodate many other types of users. You might want to create a unique, Web-only zone for users who don't require an agent. See Scenario 3: Employees Connecting from a Public Kiosk for ideas on how to set up this kind of zone.**

Installing Secure Endpoint Manager on a Computer Running Vista

When users install Secure Endpoint Manager for the first time on a computer running the Microsoft Vista operating system, they see an additional consent dialog that are not seen by users with earlier Windows versions. Users should follow the on-screen instructions and select **Do not show me the warning for this program again**, and then click **Allow**.

Enabling Secure Endpoint Manager Software Update Policies

Software update policies for Secure Endpoint Manager (SEM) are enabled at the Community level.



450

To enable an automatic software update policy for Secure Endpoint Manager:

1 Log in to AMC.

2 Go to the **Realms >** ***{Your Realm}*** **> Communities >** ***{Your Community}*** **> Access Methods** page**.** The Secure Endpoint Manager (SEM) panel is near the bottom of the page.

There are three options that can be configured for the SEM Software Update Policy:

- **Update only when necessary** – Select this option if you want the SEM to be updated on client devices based on the following criteria whether or not it is necessary. The following criteria triggers an update:
    - When Personal Device Authorization is not enabled on any client version 11.4 and older. Clients running versions 12.X.X are not prompted for updates.
    - When Personal Device Authorization is enabled on any client version 11.4 and older.

  When the **Update only when necessary** option is selected, updates and installations are performed whenever an update is **required** by the **system** or whenever an update is required by the administrator.
- **Always update** - Select this option if you want the SEM to always be kept up-to-date on client devices. This includes differences in hotfix, maintenance, and major releases (any differences in those triggers an update).

  When the **Always Update** option is selected, when a user logs in, they are given a choice to update the SEM or log out.
- **Notify user** - Select the **Notify the user when installing or updating client software** option if you want notifications to be sent to the user about the SEM during an installation or an update. This is controlled by the AMC administrator and applies to both installations and updates of the SEM.

  The only time a user, that cannot make it to **Land on WorkPlace**, will not get notification is if the AMC Administrator has enabled notifications, but the user has opted out by clicking **Logout**.

  In cases where SEM is required, either Access Agents or EPC must be provisioned. Otherwise, the SEM installation or update will fail.

Automatic Installation of SEM Components

If SEM or any of its subcomponents are not present on a device, they will be installed during the update process, regardless of which option is selected in the SEM Software Update Policy. Access to WorkPlace resources cannot be guaranteed unless SEM and its subcomponents are installed properly.

- If SEM is **not installed**, you are prompted to **Accept Installation** of the SEM components.
    - If you select **Yes**, SEM is installed.
        - If the SEM Installation is **Successful**, you can continue to **Land on Workplace**.
        - If the SEM Installation **Fails**, you are **Logged Out**.
    - If you select **No**, you are **Logged Out**.

Provisioning and Personal Firewalls

Some third-party firewall products regulate outbound connections by process (in addition to port and protocol). These firewalls may raise a security alert dialog regarding Secure Endpoint Manager during the provisioning of agents or EPC components. In most cases, the user should be instructed to “unblock” or “permit” the outbound connection.

There are a few firewalls, such as one supplied by Trend Micro, that do not permit a user with restricted rights to override firewall settings. For corporate systems on which users have limited access rights, you may want to update the firewall settings before deploying the Secure Mobile Access VPN so that users won’t have to respond to these security dialog prompts. See Using Personal Firewalls with Agents for more information.

Client Installation Logs

If something goes wrong during client or agent installation on a computer running Windows, the error is recorded in a client installation log on the user's local computer. These logs are automatically uploaded to the appliance and listed in AMC if the user has Secure Endpoint Manager installed. For more information, see Client Installation Logs (Windows).

WorkPlace

WorkPlace is a Web-based portal that provides dynamically personalized access to Web resources protected by the Web proxy service. After a user logs in to WorkPlace, a home page appears that contains an administrator-defined list of shortcuts. These shortcuts point to Web-based file shares, Web-based applications, and terminal server resources to which the user has access privileges.

All Secure Mobile Access user access components are provisioned or activated through the WorkPlace portal. WorkPlace is accessible from any standard Web browser. For more information, see The WorkPlace Portal.

Network Explorer

Network Explorer, available through WorkPlace, is a Web-based user interface that provides access to any shared Windows file system resources a user has permission to access (even from a computer that isn't running Windows). These resources can include domains, servers, computers, workgroups, folders, and files.

Network Explorer is an optional component that can be controlled through policy or completely disabled. It is supported on any browser supported by WorkPlace. For more information, see The WorkPlace Portal.

Tunnel Clients

The Secure Mobile Access tunnel clients provide secure access for TCP and UDP traffic; bi-directional traffic, such as remote Help Desk applications; cross-connections, such as VoIP applications; and reverse connections, such as SMS. The clients all provide network-level access to all resources, effectively making the user's computer a node on your network:

- OnDemand Tunnel agent is a browser-based, Web-activated agent.
- Connect Tunnel client is a Web-installed client. The tunnel clients are managed from AMC using the network tunnel service. Configuring this service to manage TCP/IP connections from the network tunnel clients requires setting up IP address pools that are used to allocate IP addresses to the clients.

Topics:

- OnDemand Tunnel Agent
- Connect Tunnel Client

OnDemand Tunnel Agent

The OnDemand Tunnel agent enables you to provide complete network and application access through a Web browser to resources protected by the network tunnel service. The OnDemand Tunnel agent is a lightweight agent that provides the same broad application and protocol access as the Connect Tunnel client, but it is integrated into the WorkPlace portal and automatically starts each time users log in to WorkPlace.

The OnDemand Tunnel agent is supported on Windows, Linux, and Macintosh, and requires Internet Explorer with ActiveX or Java enabled, or Mozilla Firefox or Safari with the Java Runtime Environment (JRE).

Connect Tunnel Client

The Connect Tunnel client provides full access to resources protected by the network tunnel service, and to any type of application, including those that use TCP, and non-TCP protocols such as VoIP and ICMP. Connect Tunnel also includes split-tunneling control, granular access controls, proxy detection, and authentication.

The Connect Tunnel client can be deployed in a number of ways (for more information, see Client Installation Packages):

- Offer users a shortcut in WorkPlace for downloading and installing the client; the link points to the *Connect Tunnel* resource, described in Built-In Resources.
- If you don't want to require users to log in to WorkPlace, have them download and install the Connect Tunnel client components from a network location (such as a Web server, FTP server, or file server).
- Distribute installation packages using an application such as SMS or Tivoli.
- Create a master image of a Connect Tunnel install and copy it to user systems using a third-party disk-image copying utility such as Norton Ghost.

The Connect Tunnel client is supported on Windows, Linux, and Macintosh operating systems, and installation of the Connect Tunnel client requires users to have administrator privileges. All Connect Tunnel configuration and management is performed in AMC.

The Connect Tunnel client supports command-line utilities, such as `ngdial`, that can modify the normal run-time behavior of the client and enable you to perform troubleshooting and diagnostic tasks without using the standard graphical user interface. For more information, see Command Line Access to Connect Tunnel with NGDIAL.

When Connect Tunnel is active, a **Connect Tunnel** icon is displayed in the system task bar.

You can configure the Windows version of the Connect Tunnel client software to be automatically updated on users' computers whenever a new version becomes available. For more information, see Windows Tunnel Client Automatic Client Updating.

NOTE: A user logged in as a guest on a computer running the Windows Vista operating system will not be able to run Connect Tunnel. A guest account is for users who don't have a permanent account on your computer or domain—it allows them to use your computer without giving them access to your personal files.

Support for Quest Desktop Workspace

Moka5 Suite is an enterprise desktop management platform that is used to create and administer layered virtual desktop images called LivePCs, which execute as guests on a Type-2 Hypervisor.

SonicWall provides a pre-installed SMA VPN client (Windows) on the virtual windows OS image that is created using the Moka5 Creator.

The windows SMA Connect Tunnel client can be integrated with the Moka5 Creator by making changes to the SMA Connect Tunnel client (Windows) as specified in the Moka5 Integration Guide.

The SMA Connect Tunnel client works well with the Quest KACE K1000 Management Appliance.

Web Access

This section provides an overview of the Web Proxy Agent and zero-client Web access methods such as translated Web access, custom port mapped Web access, and custom FQDN mapped Web access. A section describing Exchange ActiveSync Web access is also included.

Topics:

Web Proxy Agent

The Web Proxy Agent provides access through the WorkPlace portal to any Web resource—including Web-based applications, Web portals, and Web servers—as well as Windows network shares. The Web Proxy Agent provides improved application compatibility over Translated Web access, but provisioning the Web Proxy Agent can take a little extra time when a user first logs in to WorkPlace. The Web Proxy Agent requires Internet Explorer with ActiveX enabled.

NOTE: The Web Proxy Agent is being deprecated.

In the absence of a Web Proxy agent, the administrator should select the **Network tunnel client** option on the **User Access > Realms > Configure Community > Access Methods > Tunnel IP Protocol** page, for a given user community. Unlike the Web Proxy Agent, which provides access only to Web-based resources, the **Network tunnel client** provides access to all types of resources.

NOTE: You must have Administrator privileges to install the Network tunnel client option. See Tunnel Clients.

Translated ActiveSync Web Access

By default, the appliance is configured to deploy a Microsoft ActiveX control (the Web Proxy Agent) on Microsoft Windows systems running Internet Explorer. If the Web Proxy Agent cannot run, Translated Web access can be used as a fallback. Translated Web provides basic access to Web resources, and enables you to create aliases that obscure internal host names. It proxies Web content directly through the appliance and provides access to any Web resource that is specifically configured to run with WorkPlace, as well as access to Windows network shares. Translated Web access works on any Web browser that supports SSL and has JavaScript enabled. It uses URL rewriting, which may have limitations with some Web applications, such as AJAX. Custom port mapping or custom FQDN mapping may be used as an alternative to URL translation.

Custom Port Mapped Web Access

Custom port mapping involves mapping the backend resource or server to a port number at the EX Series appliance. Apache listens on this port and all HTTPS traffic received on it is terminated at the appliance. A new HTTP request is made to retrieve the mapped backend resource. The HTTP reply is transmitted using plain text to facilitate translation of absolute URLs. URL rewriting is not used. When using custom port mapping, any firewalls in the network must be configured to keep the specific ports open. Custom port mapping does not require installation of a client agent, and works with any Web browser.

Custom FQDN Mapped Web Access

Custom FQDN mapping means that the backend resource or server is mapped to an external fully qualified domain name (host and domain). The resource should be accessed with the FQDN name rather than with the IP address. The FQDN name should be resolvable to an IP address in the public domain. Apache listens on port 443 at this IP address. All HTTPS traffic is terminated at this socket. A new HTTP request is made to retrieve the mapped backend resource. The HTTP reply is transmitted using plain text to facilitate translation of absolute URLs. URL rewriting is not used.

Notes for Custom Port Mapped or Custom FQDN Mapped Web Access

These access methods are ideal for all well written applications that predominantly use relative URLs. Ajax and Flash applications may also behave better with these access methods than the Translated Web Access.

The following applications are recommended for Custom Port Mapped or Custom FQDN Mapped Web Access over Translated Web Access:

- Share Point 2010, SharePoint 2013
- Outlook Web Access 2013
- Dominos Web Access
- Complex web applications (Java applets/AJAX/Flash/other advanced web technologies)

Topics:

- Configuration Requirements
- Known Behavior

Configuration Requirements

- Each resource should be configured using only one of the access methods. Do not mix translated, custom port mapped and custom FQDN-mapped modes.
- Do not include a path in the URL. For example, do not use a URL like:

  ```
  http(s)://backend_hostname(:portNumber)
  ```

  To set the complete path on WorkPlace, specify the start page on the Edit WorkPlace ShortCuts > Advanced page, as explained in Adding Web Shortcuts.
- Use of valid Certificates is highly recommended.
  - Single sign-on for the appliance might not work with Internet Explorer when a custom FQDN mapped resource with an invalid certificate is accessed from WorkPlace. For example, this could happen when a user logs in to WorkPlace and clicks a custom FQDN mapped resource that has a self-signed certificate or otherwise does not have a valid certificate on the appliance. A JavaScript certificate warning is popped up to the Internet Explorer user. After the user accepts the certificate, Internet Explorer does not transmit the “referrer” HTTP header to the initial page. This referrer value is required for single sign-on functionality. This issue does not occur when using browsers other than Internet Explorer, or when there is no certificate warning, or when wildcard or SAN certificates are used.

    This Internet Explorer issue is described at:

    http://connect.microsoft.com/IE/feedback/ViewFeedback.aspx?FeedbackID=379975

- Custom Port Mapped resource may get redirected to Workplace Portal in case of certificate warning while accessing with Internet Explorer.

- The resources should be configured and accessed using host and domain name only, not via IP address.

Known Behavior

Logging out of applications like OWA, DWA and SharePoint from an Internet Explorer browser may log you out of Workplace.

NOTE: Logging out does not affect other active WorkPlace shortcut sessions. Only the browser is logged off as the backend application clears all cookies (including appliance-specific cookies) on logoff.

Seamless Editing in SharePoint

The SonicWall Secure Mobile Access (SMA) platform supports Microsoft SharePoint access using reverse proxy, as well as seamless editing of Office documents while in SharePoint. SMA accomplishes this by allowing persistent cookie information to be stored on appropriate zones. Administrators can enable or disable persistent cookie information on the user's system.

NOTE: Editing SharePoint documents from a zone that allows persistent session storage is available only for Microsoft Internet Explorer (IE).

NOTE: In cases where legal regulations require the consent of the user before storing persistent cookies, the Administrator can create an Acceptable Use Policy (AUP).

NOTE: If there are zones where a user could go to unsafe zones (such as kiosk mode zones), persistent cookies should not be enabled for those zones.

Configuring seamless editing in SharePoint is done in three parts:

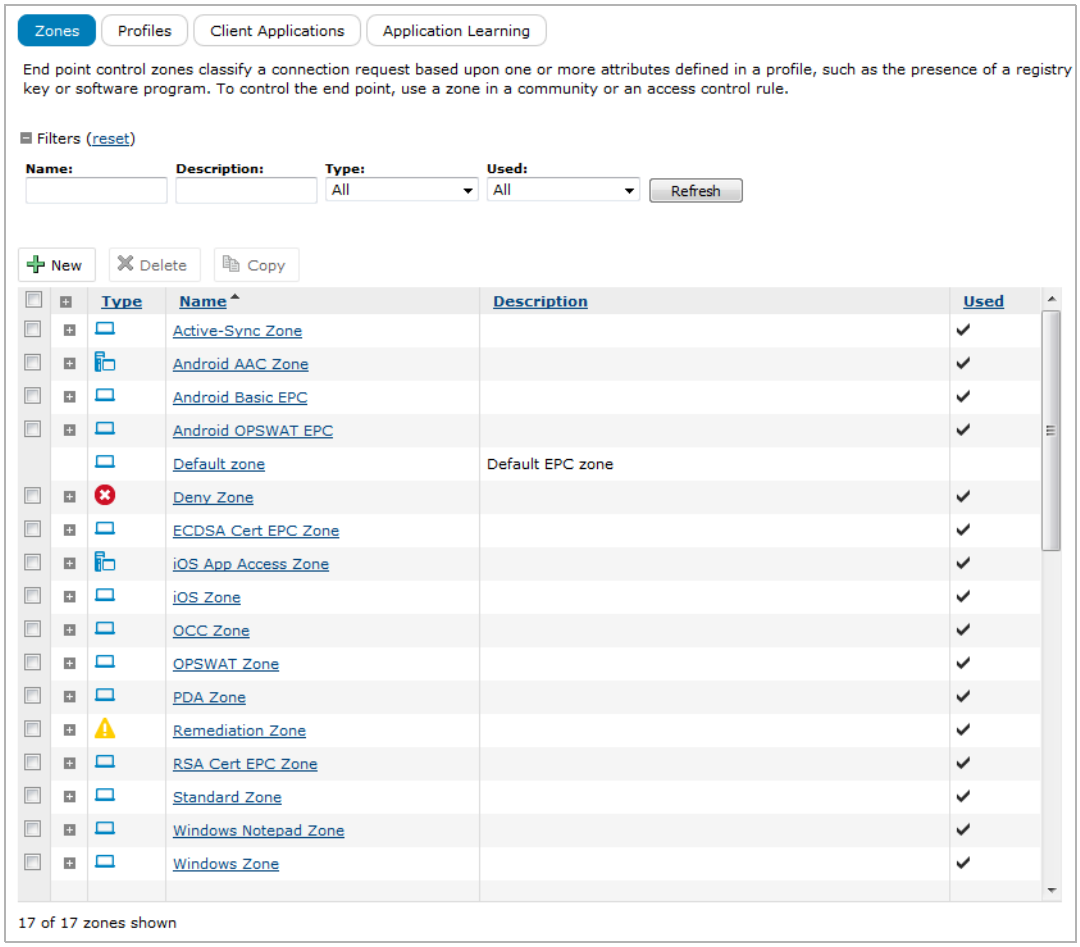
- Enabling Storage of Persistent Session Information
- Configuring a Resource as a SharePoint Web Service
- Modifying a Zone to Allow Storing of Persistent Session Information

Enabling Storage of Persistent Session Information

To enable Persistent Cookie information on a user's system:

1 Go to the **User Access > End Point Control** page.

2 In the **Zones and Profiles** panel, click **Edit** for **Zones**. The **Zones** page appears.

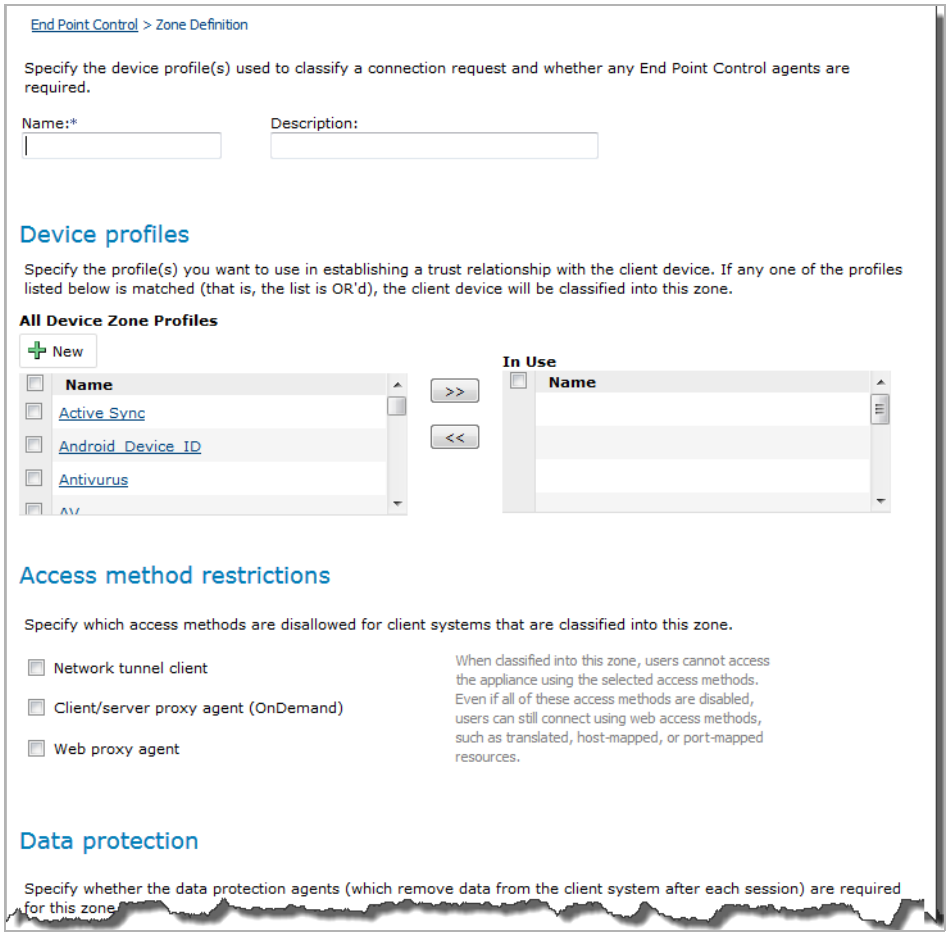


3 Select a zone or create a new zone as follows:

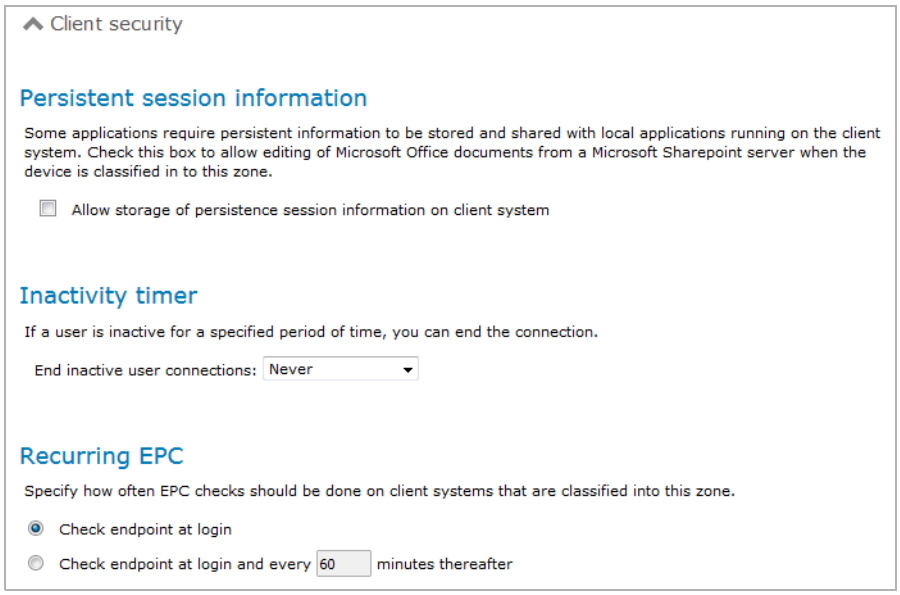
a If you want a new zone, see Creating a Device Zone.

b If you want to change one of the existing zones, click on that zone in the table.

The **Zone Definition - Device Zone** page appears.



4 Scroll down to the **Client Security** panel and open it.

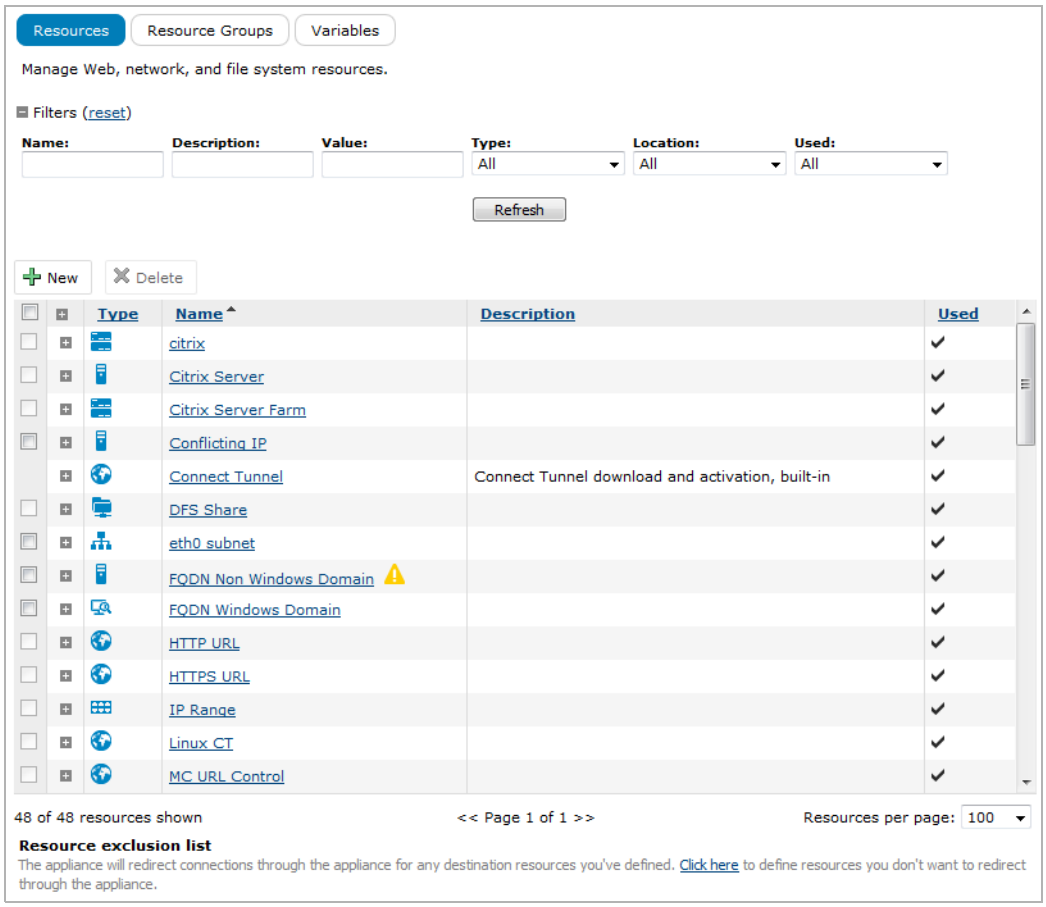


5 Under **Persistent session information**, select the **Allow storage of persistence session information on client system** checkbox.

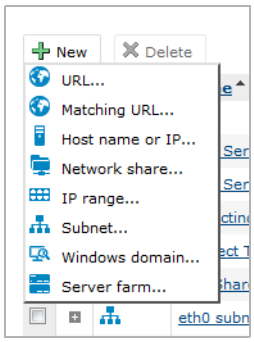
Configuring a Resource as a SharePoint Web Service

To configure a resource as a SharePoint Web Service:

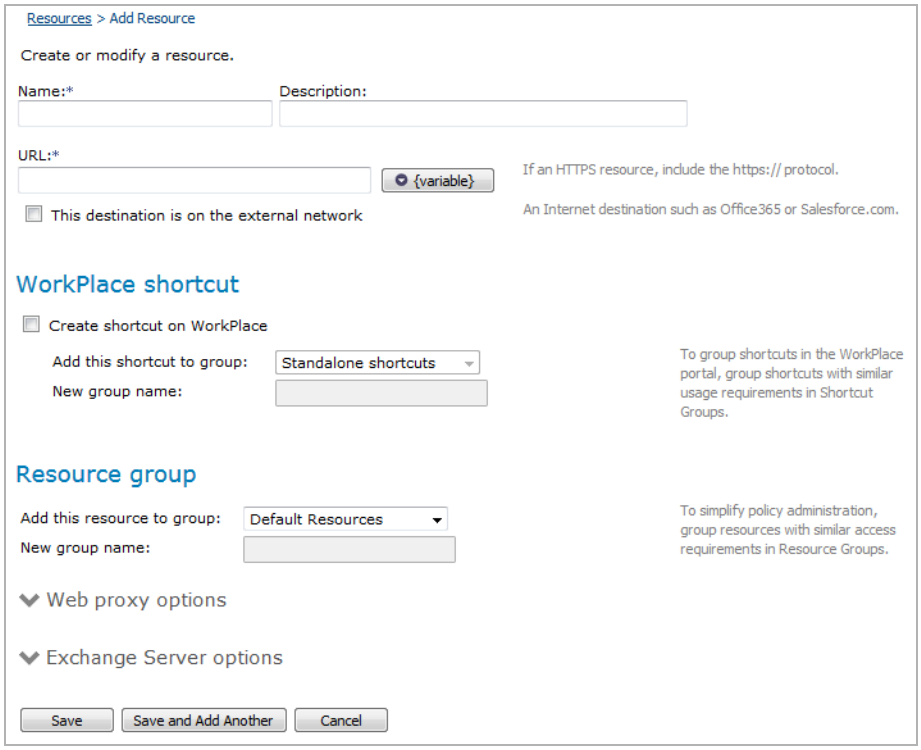
1 Go to the **Security Administration > Resources** page.



2 Click **New**, then select **URL** from the drop-down menu.



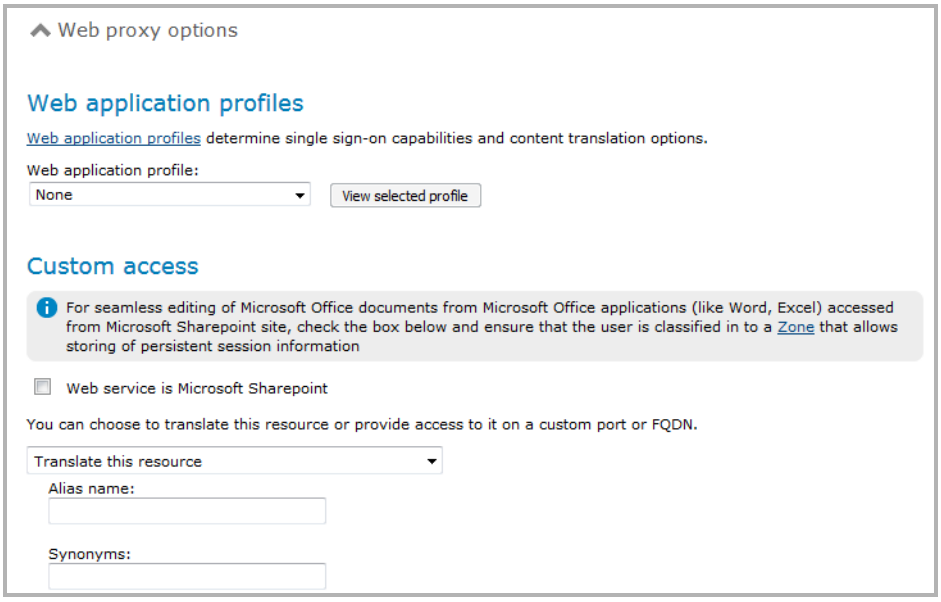
The **Add Resource - URL** page appears.



3 Enter the **Name** and the **URL** for this resource.

4 If this resource is on the external network, select the checkbox for **This destination is on the external network**.

5 Scroll down to the **Web proxy options** panel and open it.



6 From the **Web application profile** drop-down menu, select **SharePoint**.

7 Select the **Web service is Microsoft Sharepoint** checkbox.

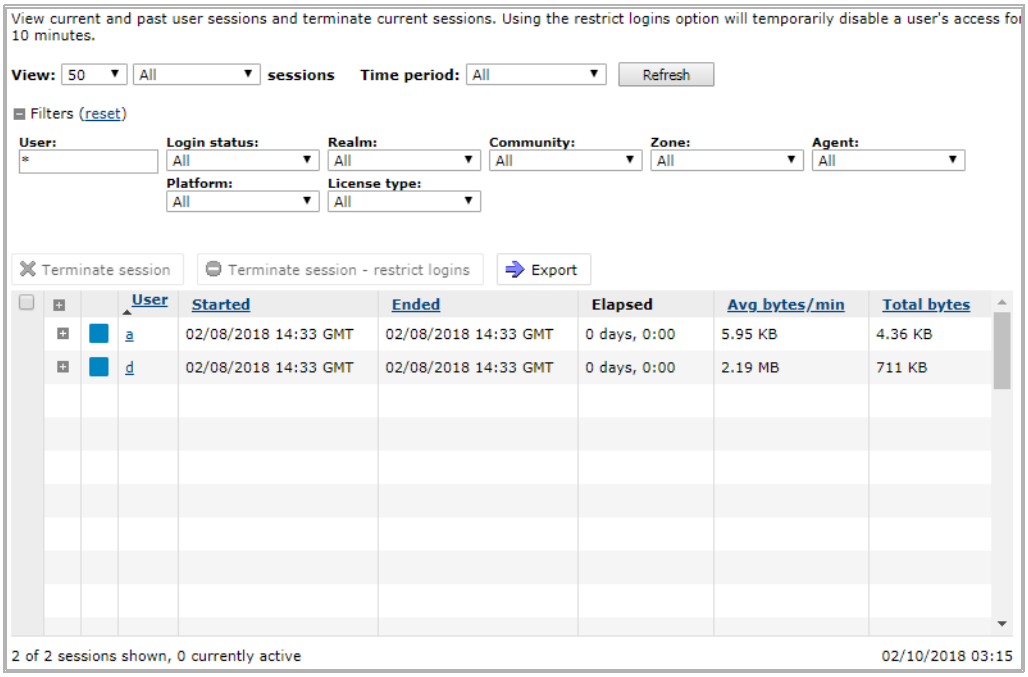
8 Select **Access this from resource using a custom FQDN**.

9 In the **Custom FQDN** field, enter the FQDN.

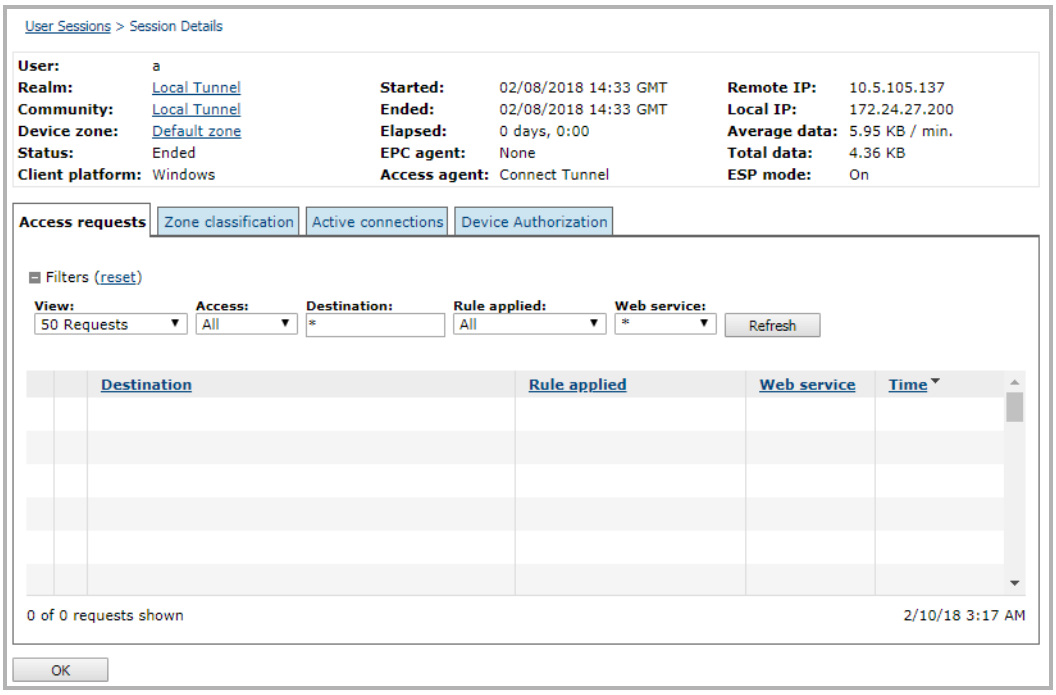
Modifying a Zone to Allow Storing of Persistent Session Information

To modify a zone to allow storing of persistent session information on a client system:

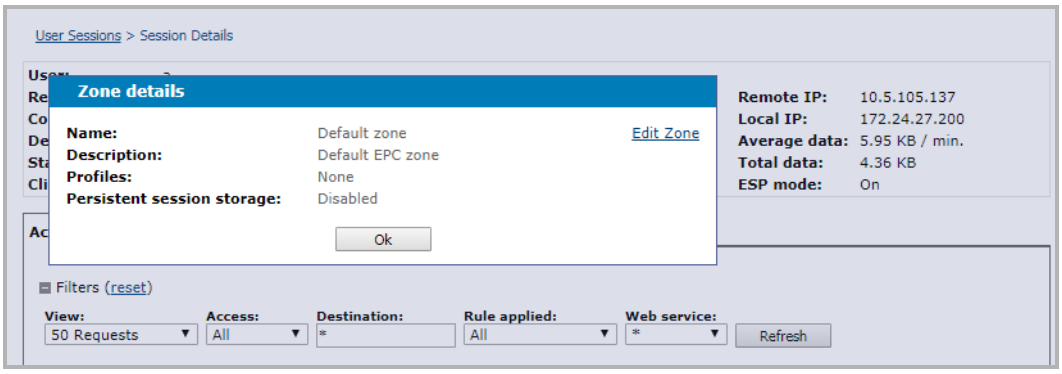
1 Go to the **Monitoring > User Sessions** page.



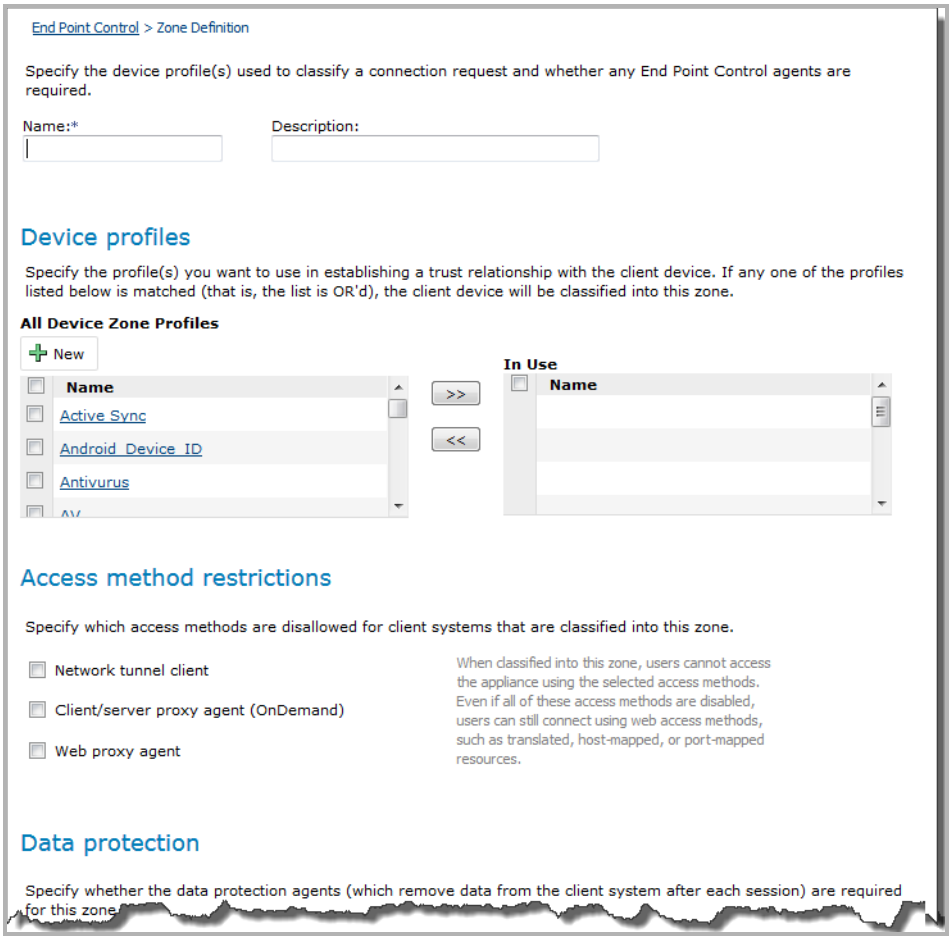
2 Click on the User Session that you want. The **Session Details** page appears.



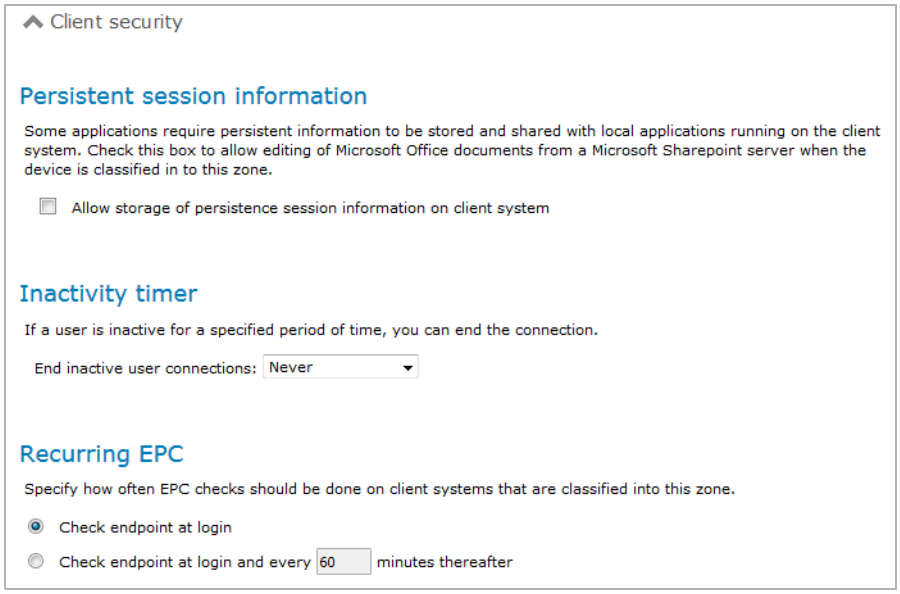
3 Click on the zone that you want. The **Zone Details** page appears.



4 Click **Edit Zone**. The **Zone Definition - Device Zone** page appears.



5 Scroll down to the **Client Security** panel and open it.



6 Under **Persistent session information**, select the **Allow storage of persistence session information on client system** checkbox.

Exchange ActiveSync Web Access

Secure Mobile Access supports Exchange ActiveSync for Apple iPhones/iPads and smart phones or tablets that run Android 2.1/2.2/2.3+ or the Symbian 9.x operating system.

Symbian is an open OS that acts as host to many devices. A few popular devices that run the latest Symbian OS versions and support Exchange ActiveSync (branded as “Mail for Exchange” on Nokia devices) are:

- Symbian OS 9.1 – Nokia E65, N71
- Symbian OS 9.3 – Nokia E72
- Symbian OS 9.4 – Nokia X6, Samsung Omnia HD

After the administrator configures the SMA appliance, a user with a supported smart phone or tablet can configure the device to access email using Exchange ActiveSync.

To do this, the user enters an email account name, server, domain, user name and password. The user turns on ActiveSync for this account. The results are saved as a new email account on the device.

With ActiveSync turned on, the device gives the user notice when new mail arrives.

When the user syncs the iPhone or Symbian device to a computer that is connected to the Exchange server through the SMA appliance, the mail, contacts and calendar are updated. On Symbian, Tasks and Out Of Office settings are also supported.

Topics:

- Enabling Exchange ActiveSync access on the appliance
- Exchange ActiveSync sessions
- Notes for Exchange ActiveSync device profiles

Enabling Exchange ActiveSync access on the appliance

The administrator can enable Exchange ActiveSync access for a community of iPhone or Symbian device users. This involves the following tasks:

- Create a realm that uses an Active Directory authentication server. Realms that use chained authentication are not supported for Exchange ActiveSync.
- Create a resource for Exchange ActiveSync using the **Exchange Server Options** section of the **Resources Add/Edit** page for a URL resource.

  The **Exchange Server Options** section allows the administrator to specify a custom FQDN, IP address, SSL certificate, and realm to use for providing Exchange ActiveSync access.

  The custom FQDN, IP address, and SSL certificate options function in the same way as those for Workplace sites that use these options. The custom FQDN provides a host/domain name through which ActiveSync connections or sessions can be established.

  The IP address is a virtual IP address hosted by the appliance, and must be on the same subnet as the external interface (or the internal if single-homed) of the SMA appliance so that it is reachable via the public interface of the appliance.

  The SSL certificate can be a wildcard certificate or you can configure a server certificate that matches the host name.

  The only realms that appear in the Realm drop-down menu are those that use an Active Directory authentication server. Realms that use chained authentication do not appear in the menu. A realm used for Exchange ActiveSync cannot be changed to provide chained authentication or to use an authentication server other than Active Directory.
- Define a Device Profile for end point control of Exchange ActiveSync devices from the **EPC** page in AMC. You can select Exchange ActiveSync as the device profile type.

  The only attribute that can be configured for this device profile is **Equipment ID**. The device serial number is used as the identifier. Equipment ID retrieval uses the underlying operating system hard disk drivers. All driver updates should be applied to ensure that Equipment ID retrieval works reliably.

  The Exchange ActiveSync device profile can be included in any zone for evaluation.

  NOTE: ActiveSync clients will not be able to connect on zones that have Device authorization enabled.
- View the **Network Settings** page to see all custom IP addresses used for virtual hosting, the FQDNs that listen on these addresses, and the associated Resources or WorkPlace Sites.

  The **Resources** and **WorkPlace Site** items are links to the configuration page for easy navigation and editing.
- View the **User Sessions** page, which displays Exchange ActiveSync sessions as belonging to the Exchange ActiveSync Access Agent. **Exchange ActiveSync** is an option in the **Agent** list under **Filters**.

Exchange ActiveSync sessions

Initial connections to the ActiveSync Exchange Server FQDN name cause a username and password challenge by the appliance.

If the user successfully authenticates, the ActiveSync session is established with the Exchange server without further user interaction.

For users connecting to Exchange 2007, the device IMEI serial number is parsed out of the ActiveSync stream during session initialization. The administrator of the Exchange system might need to make configuration changes that result in the device identifier being sent.

Authentication methods from the appliance to the Exchange server use basic authentication.

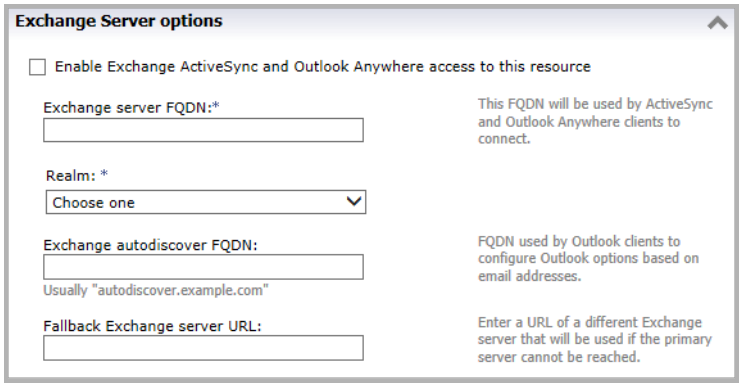
Notes for Exchange ActiveSync device profiles

- Device authorization is not supported by ActiveSync clients. ActiveSync clients will not be able to connect on zones that have Device authorization enabled.
- The profiles only work with an ActiveSync stream because that is the only way to obtain the device value.
- The profiles only work on ActiveSync streams that are interacting with Exchange 2007 servers.
- Only ActiveSync for Exchange is supported in this release.

ActiveSync Resource Configuration with SAN Certificates

SAN certificates can be used for different host names on the same IP address. If you do not want to use a SAN certificate and instead want to continue configuring ActiveSync resources as in previous versions, however, the same can be achieved with CEM variable, `MGMT_ALLOW_LEGACY_VIRTUAL_HOSTS`, being set to `TRUE`.

To use a SAN certificate, configure the IP address on the **Exchange Server** options page.



Outlook Anywhere Web Access

SMA supports Outlook Anywhere for Microsoft Outlook clients on Windows. After the administrator configures the SMA appliance, a user can configure the Microsoft Outlook Client to access Emails using Outlook Anywhere and can use the Out-of-Office service as well.

Configuring Outlook Anywhere on the Appliance

You can enable Outlook Anywhere access for Microsoft Outlook Client users. This involves the following tasks:

- Create a realm that uses an Active Directory authentication server. Realms that use chained authentication are not supported for Outlook Anywhere.
- Create a resource for Outlook Anywhere using the Exchange Server Options section of the Resources Add/Edit page for a URL resource.

  The Exchange Server Options section allows the administrator to specify the Exchange Server FQDN and realm to use for providing Exchange access. The Exchange Server FQDN should be same as the one configured at the exchange server for Outlook Anywhere RPC over HTTP or MAPI over HTTP and should resolve to the SMA appliance public IP.

  The realms that appear in the Realm drop-down list are those that use an Active Directory authentication server. Realms that use chained authentication do not appear in the list. A realm used for Outlook Anywhere cannot be changed to provide chained authentication or to use an authentication server other than Active Directory.

Microsoft Outlook will try to connect to the Exchange Autodiscover FQDN when configuring the Email account. For example, the Email address, user@example.com, would have an Autodiscover FQDN of autodiscover.example.com. The name autodiscover.example.com must be configured in a public DNS server with the public IP address of the appliance.

The **User Sessions** page displays Exchange sessions as belonging to the Outlook Anywhere Access Agent.

Outlook Anywhere Session

When connecting to Outlook Anywhere, users must submit their username/password credentials to the appliance. If the user authenticates successfully, the OA session is established with the exchange server.

The username/password is extracted from the basic authorization headers from the client and is authenticated with the Active Directory server to establish a session to appliance. Then, the connection to the exchange server is established after successful authentication.

If non-basic authentication headers come in the initial requests, the client is prompted again for the basic headers. Then, the username/password is extracted and authenticated against the Active Directory server. Once authentication is successful, the session is established with the exchange server.

If Autodiscover is enabled, the Outlook Anywhere client will automatically update the server information using the Email ID. This may take some time while the server is updated.

Microsoft Outlook Client Configuration

Topics:

- Configuring a New Microsoft Outlook Client Account
- Configuring An Existing Microsoft Outlook Client Account
- Viewing Outlook Anywhere Sessions of the Outlook Anywhere Access Agent

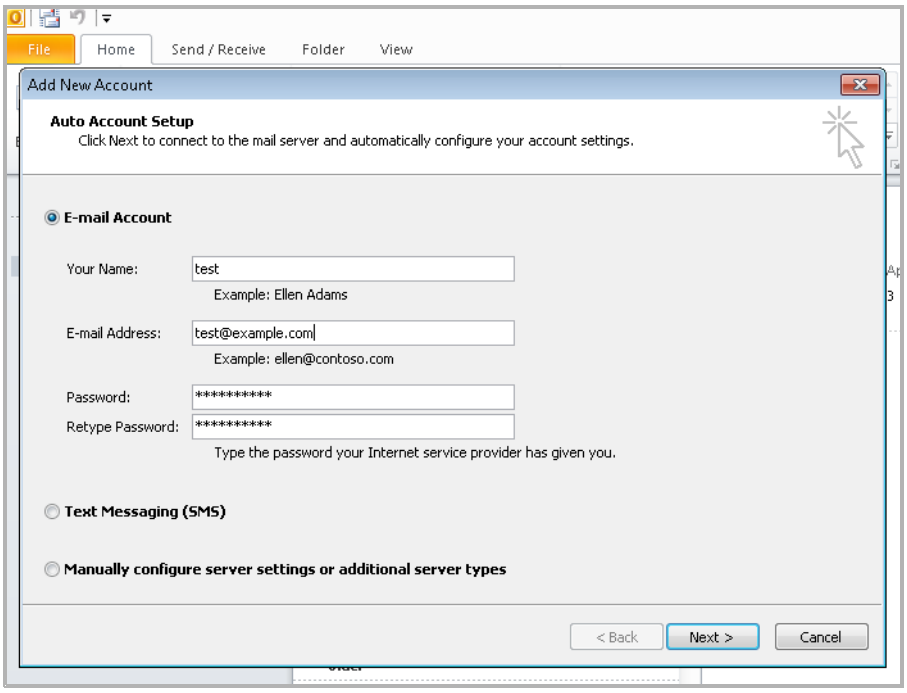
Configuring a New Microsoft Outlook Client Account

To configure a new Microsoft Outlook client account:

1 Open Microsoft Outlook.

2 Go to the **File** > **Info** page.

3 Click the **Add Account** button. The **Add New account** page appears.



4 Enter **Your Name**, **Email Address**, and **Password**.

The client will automatically fetch the server information using autodiscover and setup the account. Make sure the autodiscover URL at AMC and Exchange server are configured properly.

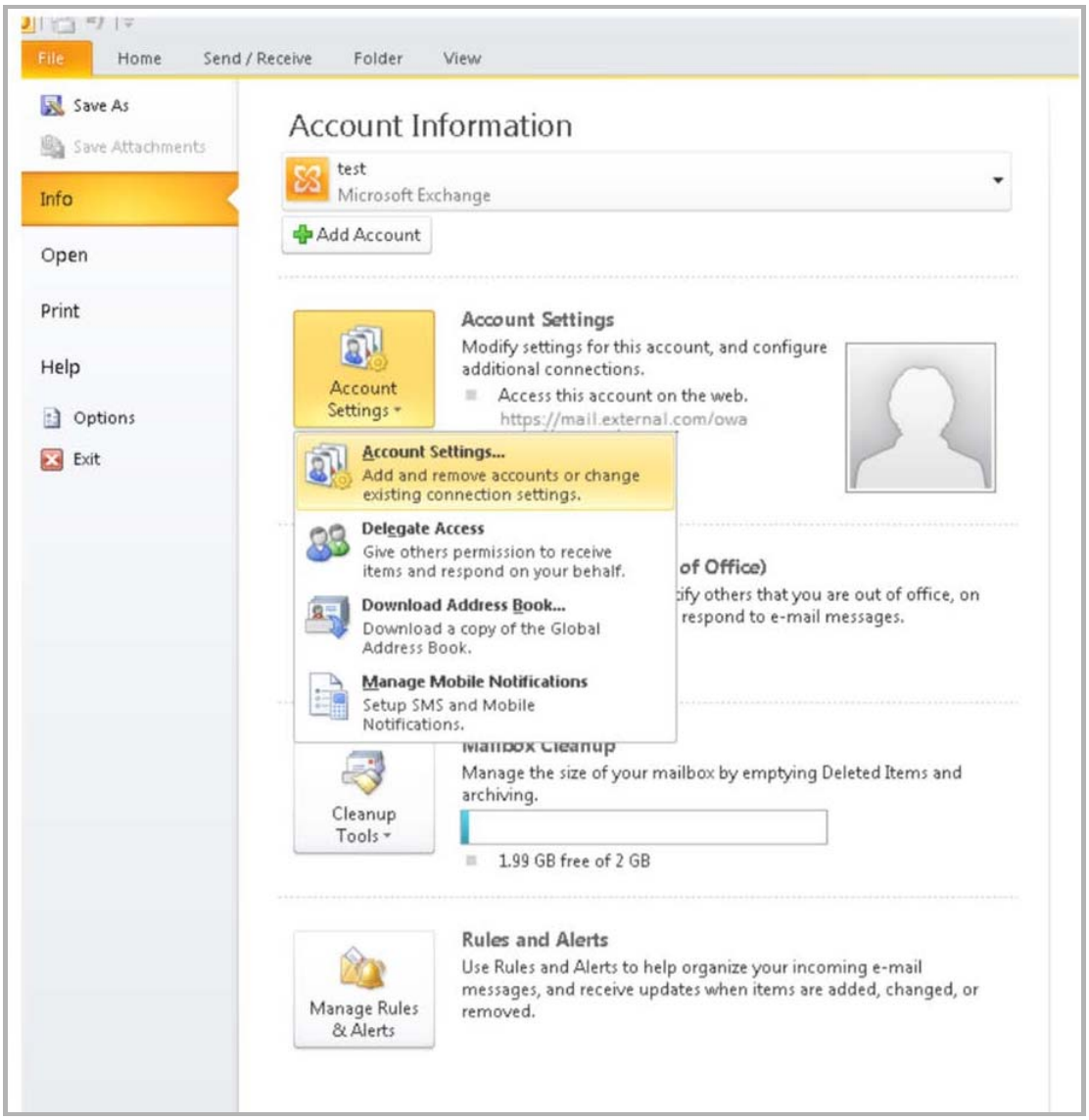
For RPC/HTTP you can manually configure the Outlook Anywhere settings at Microsoft Outlook client, though it automatically updates with the latest server information if autodiscover is enabled.

Configuring An Existing Microsoft Outlook Client Account

To configure an existing Microsoft Outlook client account:

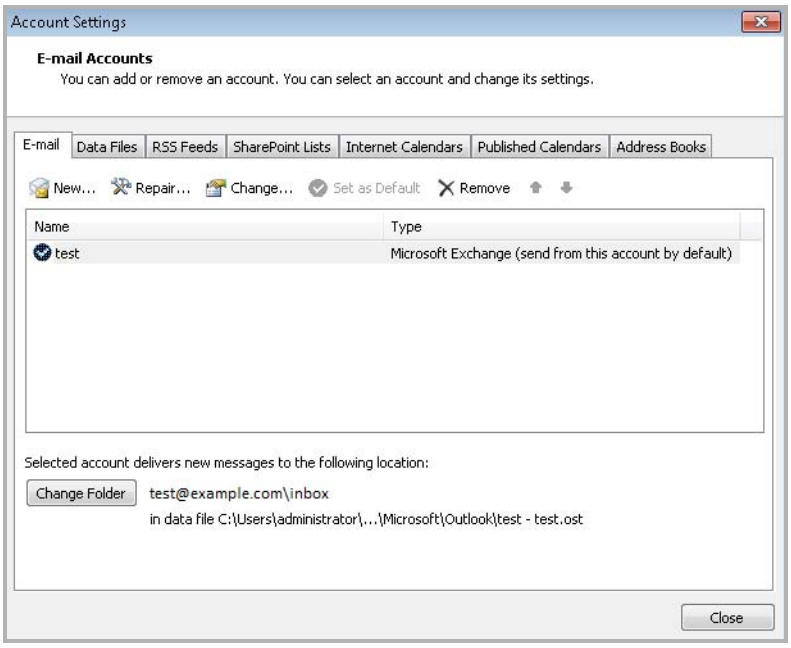
1 Open Microsoft Outlook.

2 Click on **File** > **Info** page.

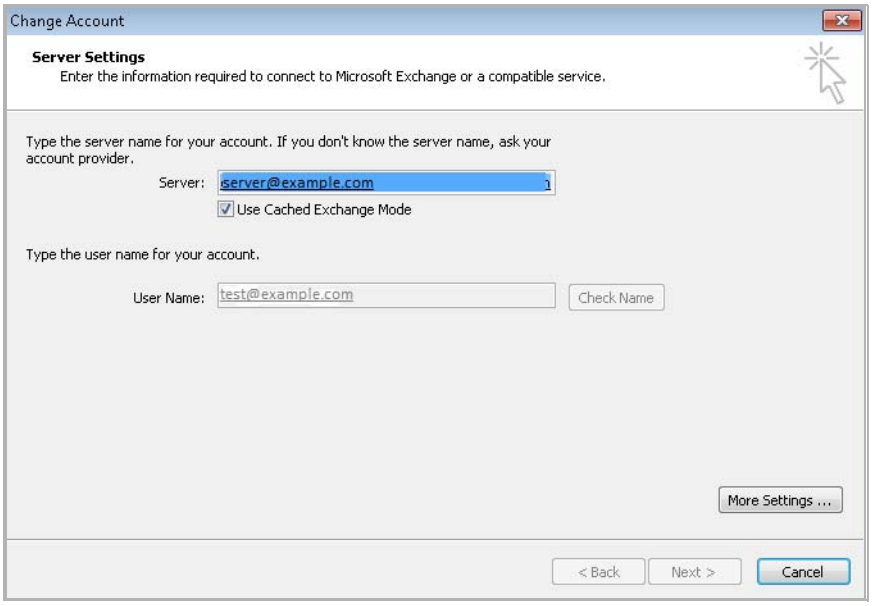


3 Click **Account Settings**.

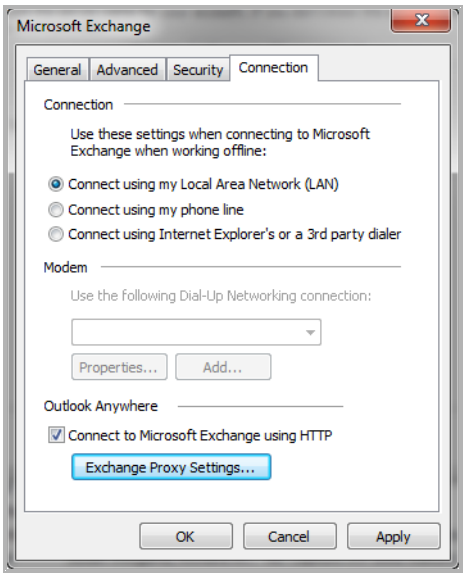
The **Account Settings** dialog appears.



4 Click **Change...** The **Change Account** dialog appears.



5 Click the **More Settings...** button. The **Microsoft Exchange** dialog appears.

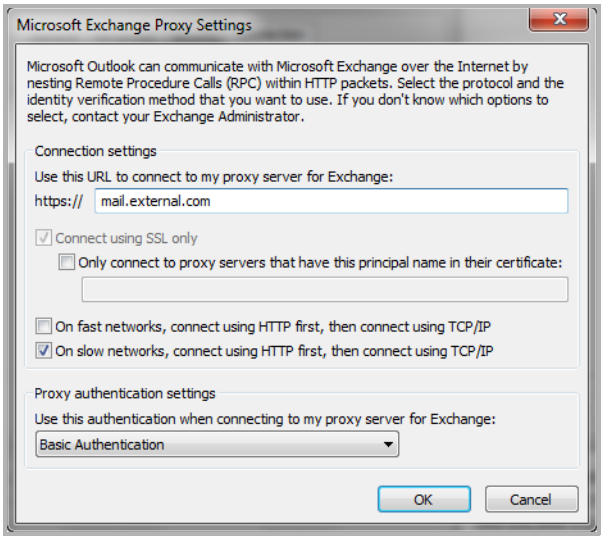


6 Select the **Connection** tab.

> **NOTE:** The **Connection** tab is not available for MAPI/HTTP. It gets the server information automatically.

7 Under **Outlook Anywhere**, select **Connect to Microsoft Exchange using HTTP**.

8 Click the **Exchange Proxy Settings** button. The **Microsoft Exchange Proxy Settings** dialog appears.



9 In the **Use this URL to connect to my proxy server for Exchange** field, enter the Outlook Anywhere FQDN.

10 Under **Proxy authentication settings**, from the drop-down menu, select **Basic Authentication**.

> **NOTE:** As Basic Authentication is supported only for RPC/HTTP in SMA, you must make sure that Basic Authentication is configured for Outlook Anywhere RPC/HTTP at the Exchange server.

11 Click **OK** to save the configuration.

12 Exit Microsoft Outlook.

13 Open Microsoft Outlook to start a new session.

Viewing Outlook Anywhere Sessions of the Outlook Anywhere Access Agent

To view the Outlook Anywhere sessions belonging to the Outlook Anywhere Access Agent:

1. Go to the **Monitor > Users Session** page.
2. Under **Filters**, in the **Agent** list, select the **Exchange** option.

Client Installation Packages

You can make the Connect Tunnel client components available for users to download and install from another network location (such as a Web server, FTP server, or file server) without requiring them to log in to WorkPlace. You can also push the Connect Tunnel client installation package to users through an application such as Tivoli or SMS, or create a master image of a client install and copy it to user systems using a third-party disk-image copying utility.

The client setup packages are available for you to download from AMC. With the Windows-based packages (Connect Tunnel for Windows), you also have the option of configuring various client settings in an `.ini` configuration file before distributing the client to users.

NOTE: The easiest way to ensure that users are running the latest version is to make client updates automatic; see Windows Tunnel Client Automatic Client Updating for more information.

Topics:

- Downloading the Secure Mobile Access Client Installation Packages
- Customizing the Configuration for the Connect Tunnel Client
- Command Line Access to Connect Tunnel with NGDIAL
- Command Syntax
- Running Connect as a Service

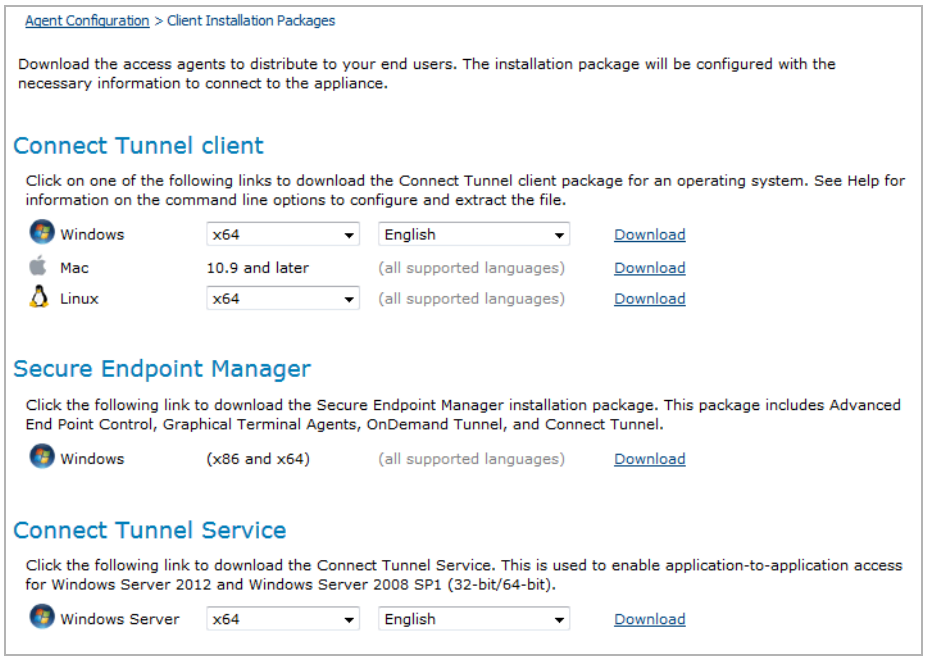
Downloading the Secure Mobile Access Client Installation Packages

This section describes how to download the installation package for the Connect Tunnel client to your local workstation.

To download a client installation package:

1. From the main navigation menu under **User Access**, click **Agent Configuration**.
2. In the **Secure Mobile Access access agents** area, under **Client installation packages**, click **Download**. The **Client Installation Packages** page appears.

3 Select the language for the installation packages. Each package includes translated user interface elements and online help.



4 Download the client installation files for the platforms you plan to support (*<xx>* represents the language you selected):

Download links

Download link	Installation package
Windows	*ngsetup_<xx>.exe*
Linux x86	*SMA1000Connect-Linux.tar*
Mac OS X 10.5.x	*SMA1000Connect-OSX.dmg*
Windows Mobile	*cmsetup.exe*
Windows service (Connect Tunnel Service)	*ctssetup_<xx>.exe*

5 The **Download Client Package** page appears, and a **File Download** dialog prompts you to save the file to your local computer.

6 Click **Save**, browse to the appropriate directory, and then click **Save** again.

7 Click **OK** on the **Download Client Package** page to return to the **Client Installation Packages** page.

Customizing the Configuration for the Connect Tunnel Client

The Connect Tunnel client setup package that you download from the appliance is not configured. You can customize the Connect Tunnel configuration file (an `.ini` file) before deploying the setup package to users. This allows you to speed things up for users by preconfiguring the client with the host name or IP address of the appliance, the realm name used during log in, and other client options. If you skip this step, the package uses the default appliance settings.

To customize the Connect Tunnel configuration file:

1 Download the Connect Tunnel installation file onto a Windows computer as described in Downloading the Secure Mobile Access Client Installation Packages.

2 Open a Windows command prompt by typing `cmd` in the **Start > Run** field.

3 Browse to the directory where you saved `ngsetup_<xx>.exe`, and then extract the installation files by typing the following command. The destination for the unpacked files will be the current working directory unless you specify a <*path*> with the `expand` parameter:

```
ngsetup_<xx>.exe -expand=<path>
```

4 Open the `ngsetup.ini` file in a text editor, and specify the appropriate configuration settings.

5 Save and then close the modified `ngsetup.ini` file. The `.ini` customizations you made will be incorporated during setup if the file is copied to the same directory in which you saved *ngsetup_<xx>.exe*. To specify a different location for the `.ini` file, use the following command:

```
ngsetup_<xx>.exe -f=<path>\<configuration file name>
```

You can also log installation data to a file named *ngmsi.log* in the `%ALLUSERSPROFILE%\Documents and Settings\All Users\Application Data\SMA1000` folders. Type the following for a list of all the possible parameters:

```
ngsetup_<xx>.exe -?
```

6 the Configuration options table describes the configuration options, followed by a sample `.ini` file. Some of these options are available only when Connect Tunnel is installed from WorkPlace. For any optional components that you do not specify, default values are used.

Configuration options

Option	Description
`[Connectoid number] section`	(Required) This controls the basic settings for accessing the appliance. To enable the user to access multiple appliances, copy this configuration block and increment the *number* (`[Connectoid 1]`, `[Connectoid 2]`, and so on).
`ConnectionName=name`	(Optional) The name for the connection as it will appear in the client user interface. If you do not specify a value, the default connection name is used (**`SMA1000 VPN Connection`**).
`VpnServer=host name | IP address`	(Optional) The host name or IP address of the appliance. If you do not specify a value, users must manually type the host name or IP address of the appliance.
`StartMenuIcon=[0 | 1]`	(Optional) Determines whether to add a shortcut named **Secure Mobile Access VPN Connection** to the **Secure Mobile Access** Start menu folder. The default value is **`1`** (add a shortcut).
`DesktopIcon=[0 | 1]`	(Optional) Determines whether to add a shortcut to the desktop. The default value is **`1`** (add a shortcut).
`UserRealm=name`	(Optional) Determines the default realm that users will log in to. Type the realm name exactly as it appears in AMC.
`DefaultAuthType= [ADUNPW | LDAPUNPW | RADIUSUNPW | RADIUSCRAM | UNIX]`	(Obsolete) This setting determines which type of user authentication to perform. It applies only when accessing an E-Class SMA appliance that predates v8.7.0.
`StatusDlg=[0 | 1]`	(Optional) Determines whether to display a status dialog box when connecting to the appliance. The default value is **`1`** (status display enabled).

Configuration options

Option	Description
`Taskbar=[0 | 1]`	(Optional) Determines whether to display an icon in the task bar notification area when connected to the appliance. The default value is **1** (icon display enabled).
`RunAtStartup=[0 | 1]`	(Optional) Determines whether to automatically start the connection at Windows startup. The default value is **1** (enable automatic startup).
`[Install Settings] section`	(Optional) This section contains information about the type of MSI installation to perform. Each `.ini` file can include only one `[Install Settings]` section.
`UILevel=[FULL | REDUCED | BASIC | NONE]`	(Optional) Determines the level of user interface to include during installation. The default value is **NONE**.

`ProductCode=key`
`PackageCode=key`
`FileSize=bytecount`
`ProductVersion=x.yy.zzz`
	These settings are preconfigured and required. They should not be modified.

Sample ngsetup.ini file

```
[Install Settings]
UILevel=FULL
ProductCode={A814B50B-B392-458A-8C31-51697E1EBB7A}
PackageCode={A77CB50B-0384-5D8A-DE3D-61099E9EB37C}

Branding=C:\Users\Admin\AppData\Roaming\SMA1000\CustomBranding.zip
BrandingMD5=1fc1a7b361c3b7e81e29842372f5e875
```

NOTE: The value of Branding should specify the absolute path of your Custom Branding file. The value of Branding MD5 can be obtained using any MD5 tool.

```
[Connectoid 1]
ConnectionName="XYZ Company Network"
VpnServer=64.94.142.134

[Connectoid 2]
ConnectionName="Test Network"
VpnServer=64.94.142.134
StartMenuIcon=1
DesktopIcon=1
UserRealm="employees"
StatusDlg=1
Taskbar=1
RunAtStartup=1
```

NOTE: On a computer running the Windows operating system, there is a registry key that enables you to launch programs once, after which the reference is deleted so that the program is not run again. After Connect Tunnel is installed, any program that is listed in:

`HKEY_Local_Machine\Software\Microsoft\Windows\CurrentVersion\RunOnce`

is executed.

NOTE: The file cannot include certain items—such as authentication type and custom prompts—until a connection has been made to the VPN appliance. This means that first-time users are presented with dimmed authentication prompts. There are a few workarounds:

- Have users install from WorkPlace.
- Have users click **Properties** in the Connect dialog box and select a realm.
- Refer to *Customizing a Connect Tunnel Initialization File vs. Installing from WorkPlace* (SW2831) for an explanation of how to obtain a complete configuration file from a WorkPlace installation and modify it for your users.

Command Line Access to Connect Tunnel with NGDIAL

The NGDIAL command-line utility establishes a connection to a remote network using Connect Tunnel, much like the Windows RASDIAL utility does with other network connections.

The NGDIAL command-line utility can also create, delete, and modify network connection phone book entries. Issuing the NGDIAL command without any parameters will list all RAS connections.

Linux and Macintosh configurations support Connect Tunnel and the Connect Tunnel Extensibility Toolkit.

Command Syntax

Command syntax

Option	Description
<*connection name*>	The name of the network connection; if the name includes a space, enclose it in quotes.
<*public*>	The user's public credential (username) for authentication; if the name includes a space, enclose it in quotes. For example: `ngdial report_server "Jen Bates"` The public and <*private*> portions of the credentials must correspond correctly with the authentication type specified by the authentication realm on the E-Class SMA appliance.
[<*private*>|* [<*auth type*>]]	The private credentials (password) and authentication type to be used when authenticating the user (the <auth type> parameter is required only for logging in to a pre-v8.7.0 appliance). If the <private> portion of the credential is omitted or an asterisk (*) is specified, the NGDIAL command prompts the user to enter the password. If you do not specify an <auth type> when logging in to a pre-v8.7.0 appliance, the default authentication type for the realm is used. Values for <auth type> are: • NULL: No authentication required • LDAPUNPW: LDAP username/password credential • LDAPCERTIFICATE: LDAP certificate credential • RADIUSCRAM: RADIUS token/securID credential • RADIUSUNPW: RADIUS username/password credential • UNIX: UNIX username/password credential • TEAM: SMA TEAM credential • ADUNPW: Active Directory username/password credential
-create	Generates a new network connection, or updates an existing network connection, with the information passed on the command line.
-delete	Deletes the specified network connection entry from the specified phone book. You must have system administrator privileges to perform this operation.
[-connection=<connection name>|<*connection list friendly name*>]	Loads the connection entry for dial from connection list.
-disconnect | -d	Causes the VPN to disconnect from the <connection name> remote network.
[-gui]	If additional information is necessary to establish the VPN network connection, use this parameter to allow RAS to prompt the user with a graphical user interface (GUI). For example, the user could be prompted to accept the appliance's server certificate if there are any problems with the certificate, or the user might need to be notified regarding password expiration or required changes. If the -gui option is not specified in such a case, the NGDIAL utility fails and returns an error code to the caller.
-help | -?	Displays the command-line syntax for the NGDIAL command. When combined with the -gui option, displays the online Help.

Command syntax

Option	Description
[-icon[=enable|disable]]	Controls the display of an icon in the task bar notification area that allows the user to manage the VPN network connection and receive connection notifications. See Notes.
[-login=<login group>]	The name of the login group (authentication realm) used to authenticate the user. If a login is specified without specifying an <auth type> for the credentials (in a connection to a pre-v8.7.0 appliance), NGDIAL uses an <auth type> of ADUNPW.
[-phonebook=<phonebook>]	Specifies the file name of the phone book where the <connection name> is defined. The file name must include the fully qualified path to the phone book file. If a path is not specified, NGDIAL looks in the directory that contains the system phone book (rasphone.pbk) for the specified phone book file.
[-list=<connection name>]	Displays all connections in list when used without an argument. Displays detail of connection list when used with an argument.
-prompt	Causes the NGDIAL command to prompt the user to connect to the <connection name> remote network.
[-proxycredential=<username>[,<password>|*]]	If a proxy server is required for access to the appliance, use this option to specify the username and password credentials for it. If the password is omitted, or entered as an asterisk (*), the NGDIAL command prompts the user for a proxy password.
[-server=<server name>|<server IP>]	Specifies the appliance name or IP address. If a server is specified, and it is different from the server defined in the phone book entry, the server and login group (if specified) are saved to the phone book entry.
[-editserver=<server name>]	Edits server name in custom connection list
[-editrealm=<realm name>]	Edits realm name in custom connection list
[-status[=enable|disable]]	Controls the display of a connection status dialog box when the VPN network connection takes more than two seconds to connect.
[-nocerterrors]	Suppresses the server certificate errors.

```
ngdial <connection name> <public> [<private>|* [<auth type>]]
        [-phonebook=<phonebook>]
        [-server=<server name>|<server IP>]
        [-login=<login group>]
        [-proxycredential=<username>[,<password>|*]]
        [-status[=enable|disable]] [-icon[=enable|disable]] [-gui]
ngdial <connection name> <public> [<private>|* [<auth type>]]
        [-phonebook=<phonebook>]
        [-connection=<connection name>|<Connection list friendly name>]
        [-proxycredential=<username>[,<password>|*]]
        [-status[=enable|disable]] [-icon[=enable|disable]] [-gui]
        [-nocerterrors]
ngdial <connection name> -disconnect|-d
```

```
ngdial <connection name> -prompt
         [-phonebook=<phonebook>]
ngdial <connection name> [-list= <connection name>]
ngdial <connection name> [-editserver= <server name>]
ngdial <connection name> [-editrealm= <realm name>]
ngdial <connection name> -create
         [-phonebook=<phonebook>]
         [-server=<server name>|<server IP>]
         [-login=<login group>]
         [-status[=enable|disable]] [-icon[=enable|disable]]
ngdial -help | -?
```

Examples

```
NGDIAL "ACME Corp" -create -server=remote.acme.com -icon -status
NGDIAL "ACME Corp" "Jen Bates" * -login="Business Partners" -icon -gui
NGDIAL "ACME Corp" jdoe password
NGDIAL "ACME Corp" -disconnect
```

NOTE: Although the `ngdial -help` usage statement indicates that the `-icon=disable` flag is an option without the `-create` flag, in some cases the `-create` flag is necessary to disable the icon.

To disable the icon so that it does not appear on the task bar, you can use either of the following two methods:

- Set `taskbar=0` in the `ngsetup.ini` file, and then type a command such as:

  ```
  ngdial "SMA VPN Connection" -server=<server IP address> -login="Realm name"
  username password -icon=disable -gui
  ```

- Type a command using the -create option with the -icon=disable option to store the icon parameter, and then type the command to connect, such as:

  ```
  ngdial "SMA VPN Connection" -create -server=<server IP address>
  -icon=disable -gui
  ```

  ```
  ngdial "SMA VPN Connection" -server=<server IP address> -login="Realm name"
  username password -icon=disable -gui
  ```

Running Connect as a Service

The Connect Tunnel client is a Windows client component of Secure Mobile Access's VPN solution that enables secure, authorized access to Web-based and client/server applications, and to Windows file shares.

In a server environment, you can install and configure an add-on component—Connect Tunnel Service—so that the VPN connection starts automatically without user intervention: no user login is required, and no user interface or icons are displayed. For example, you may want to synchronize data between a remote system in the field and a file server secured behind the VPN at corporate headquarters. On the remote system (running the Windows Server platform), Connect Tunnel Service is configured to run at a specific time, connect to the corporate file server, and synchronize its database with the master database at headquarters.

NOTE: Connect Tunnel has the capability to establish a dial-up connection before it makes a connection to an E-Class SMA appliance. The Connect Tunnel Service, on the other hand, does not support this option; it requires an always-on, non-dialup network connection.

Topics:

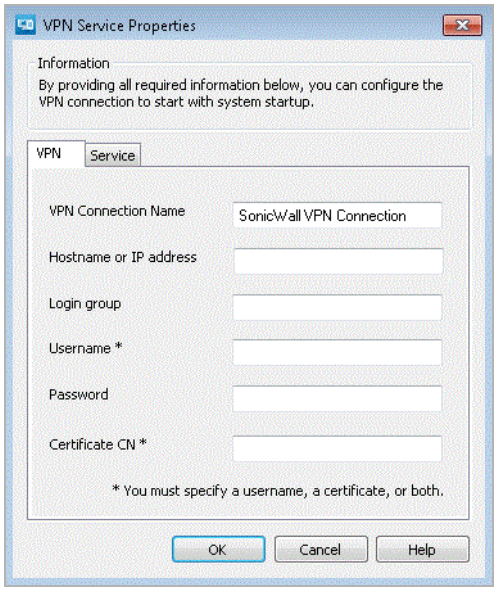
- the Installing Connect Tunnel Service table
- the Windows Services and Scripting Options table
- the How to use Windows Services to Configure and Run Connect Tunnel Service table
- the Using a Command or Script to Run Connect Tunnel Service table
- the Troubleshooting table
- the Deploying Client Installation Packages for Connect Tunnel table

Installing Connect Tunnel Service

Using the Connect Tunnel Service involves installing both Connect Tunnel and Connect Tunnel Service.

To install and configure Connect Tunnel Service:

1. On the **Client Installation Packages** page in AMC (**Agent Configuration** > **Download**), select a language, and then download the installation packages for both the Connect Tunnel (`ngsetup_<xx>.exe`) and Connect Tunnel Service (`ctssetup_<xx>.exe`).
2. Install Connect Tunnel first (`ngsetup_<xx>.exe`). A shortcut named *Secure Mobile Access VPN Connection* will be created on desktop.
3. Install Connect Tunnel Service (`ctssetup_<xx>.exe`). A shortcut named *Secure Mobile Access VPN Service Options* will be created on desktop.
4. On the desktop, double-click the **Secure Mobile Access VPN Service Options** shortcut. Alternatively, double-click **VPN Service Options** in the Control Panel. The **VPN Service Properties** dialog appears.



5 On the **VPN** tab, configure these settings:

VPN tab settings

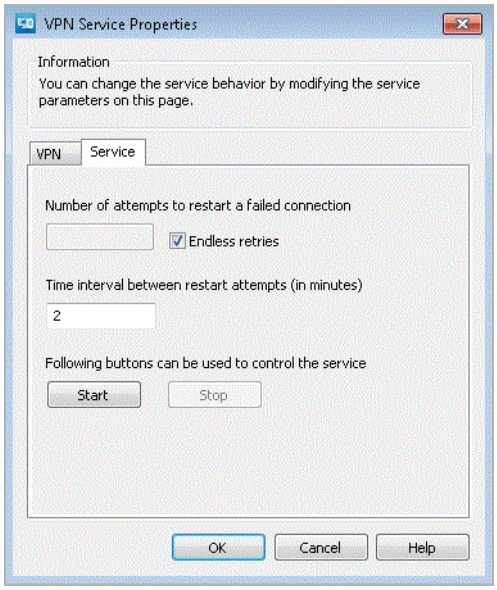
Setting	Description
VPN Connection Name	Type the name of the Connect client connection object exactly as it appears in the Windows **Network Connections** window (**Start|Connect To|Show All Connections**). By default, this is **VPN Connection**.
Hostname or IP address	Type the host name or IP address of the E-Class SMA appliance to log in to.
Login group	Type the name of the realm to log in to.
Username and Password	Type the credentials for a user in this **Login group** (realm).

6 On the **Service** tab, configure these settings:

Service tab settings

Setting	Description
Number of attempts to restart a failed connection	Specify how many times to attempt restarting if an initial connection attempt fails.
Time interval between restart attempts	Specify the amount of time (in minutes) to wait between restart attempts.

7 Click the **Start** and **Stop** buttons to control the service.



8 To verify that Connect Tunnel started, open the **VPN Connection** shortcut on the desktop. You should see the established connection. Alternatively, you can issue the `ipconfig` command on the command line to verify that you have a virtual IP address for the VPN connection.

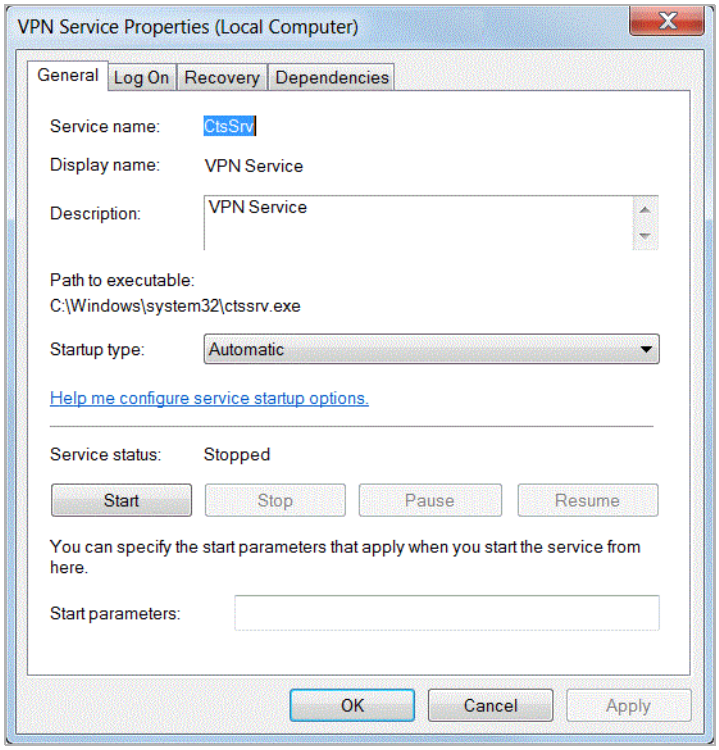
Windows Services and Scripting Options

You can use Windows Services to manage Connect Tunnel Service on a local or remote computer.

How to use Windows Services to Configure and Run Connect Tunnel Service

To use Windows Services to configure and run Connect Tunnel Service:

1 On the computer running the Windows Server platform and Connect Tunnel Service, run Windows Services, and then open the **VPN Service Properties** dialog (**Control Panel > Administrative Tools > Services > VPN Service**).



2 Use these settings to control the service (start, stop, pause, resume, or disable it), set up recovery actions in case of service failure, or disable the service for a hardware profile.

Using a Command or Script to Run Connect Tunnel Service

You can use the Windows *sc.exe* utility to communicate with Service Controller (*services.exe*) from the command prompt or in a batch file. This enables you, for example, to automate the startup and shutdown of the VPN service. Or, in an environment where you want users to be able to start the VPN connection by clicking on a shortcut (and without being aware of the credentials), you could also create a shortcut on the desktop that launches a command or batch file.

For example, start and stop the service on a remote computer with the following commands:

```
sc \\SERVERNAME start ctssrv
sc \\SERVERNAME stop ctssrv
```

To start or stop the Connect Tunnel Service from the command line or a third-party application, invoke these commands:

```
%windir%\system32\sc.exe start ctssrv
%windir%\system32\sc.exe stop ctssrv
```

Troubleshooting

Use the Windows Event Viewer (**Control Panel > Administrative Tools > Event Viewer> Application > CTS**) to view any information, warning, or error messages related to running Connect Tunnel Service. For more detailed messages, look in the service log. The default location is:

```
%ALLUSERSPROFILE%\Application Data\SMA1000
```

NOTE: If your environment includes an outbound HTTP proxy for access to the Internet, you must use one that does not require authentication, otherwise you will see this error message in the log file for Connect Tunnel Service (ctssrv.log): `Direct internet access is not available`. You must also configure Connect Tunnel Service to run under a Windows user account with administrative privileges.Distributing Secure Mobile Access Client Setup Packages

You can deploy the Connect Tunnel client setup package to users from a network location (such as a Web server, FTP server, or file server) without requiring them to log in to WorkPlace.

For the Connect Tunnel client, you can also push an installation package to users through a configuration management application such as Microsoft Systems Management Server (SMS) or IBM Tivoli Configuration Manager, or distribute a disk image that includes a preconfigured Connect Tunnel installation.

If you configured the client's `.ini` file, you should distribute it along with the setup program (if you distribute the setup program by itself the client will use the default settings).

Deploying Client Installation Packages for Connect Tunnel

The Connect Tunnel client can be installed as an `.exe` file, deployed using a Microsoft Installer (`.msi`) file, or distributed as part of a disk image.

Topics:

- Deploying as an .exe File
- Deploying using an .msi File
- Specifying a Per-Machine Installation to Support MSI Updates
- Deploying as a Disk Image

Deploying as an .exe File

To deploy the Connect Tunnel client as an .exe file:

Distribute the *ngsetup_<xx>.exe* file to users (*<xx>* represents the language you selected). If you modified the `ngsetup.ini` file (as described in Customizing the Configuration for the Connect Tunnel Client), distribute this file as well. To invoke the `.ini` file, pass it as a command-line parameter to the setup program by typing the following command:

```
ngsetup_<xx>.exe -f=<path>\<configuration file name>
```

To simplify the user experience, you might write a batch file that calls the setup program with this parameter.

Deploying using an .msi File

If you install the Connect Tunnel client this way (rather than running *ngsetup_<xx>.exe*), you must set the Windows Installer to do a per-machine, rather than a per-user, installation; see Specifying a Per-Machine Installation to Support MSI Updates. (A per-user installation does not make the registry entries that are necessary for later updates.)

To deploy the Connect Tunnel client using an .msi file:

1 Set up your configuration management software program (such as Microsoft SMS or IBM Tivoli) to deploy the `.msi` installation package and the modified `ngsetup.ini` file (if you created one).

Specifying a Per-Machine Installation to Support MSI Updates

To specify a per-machine installation so that subsequent MSI updates will be supported:

1 Download *ngsetup_<xx>.exe* from the **Client Installation Packages** page in AMC, and then extract the installation files by typing the following command. The destination for the unpacked files will be the current working directory unless you specify a `<path>` with the `expand` parameter:

```
ngsetup_<xx>.exe -expand=<path>
```

2 Modify the `ngsetup.ini` file (as described in Customizing the Configuration for the Connect Tunnel Client) as needed.

3 To run Windows Installer, type the following:

```
msiexec.exe /i ngvpn.msi ALLUSERS=1 NGSETUP=1 CONFIGURATIONFILE=<path>\
<.ini file name>
```

Deploying as a Disk Image

Disk cloning is a common method for distributing Windows operating systems and applications. If you decide to use this distribution method for Connect Tunnel, you must run the Windows System Preparation Tool (`Sysprep.exe`) to prepare the disk image for duplication. Without Sysprep, the computer's security ID (SID) remains unchanged and Connect Tunnel's unique identifier is then duplicated, resulting in IP address conflicts. Here is a broad outline of how to prepare and distribute disk images:

To deploy the Connect Tunnel client as a disk image:

1 Install Connect Tunnel for Windows on a reference system and configure it as needed.

2 Run the Windows System Preparation Tool and shut down the computer.

3 Duplicate the master disk using a third-party application or disk duplicator.

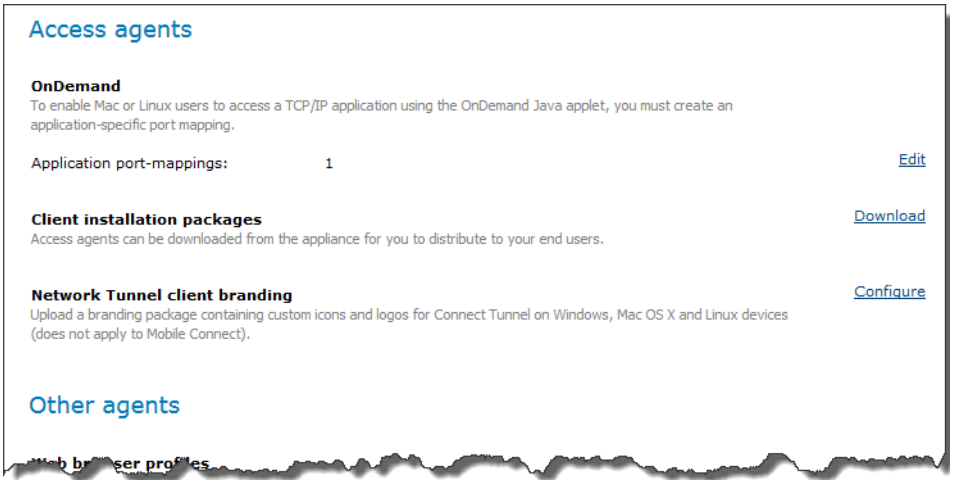
4 When the disk is inserted into the destination computers, Mini-Setup will prompt the user for information (for example, the computer name). You can automate this step by creating an "answer file" (`sysprep.inf`). For more information about using System Preparation Tool, refer to the Microsoft Web site: http://support.microsoft.com/kb/302577.

Network Tunnel Client Branding

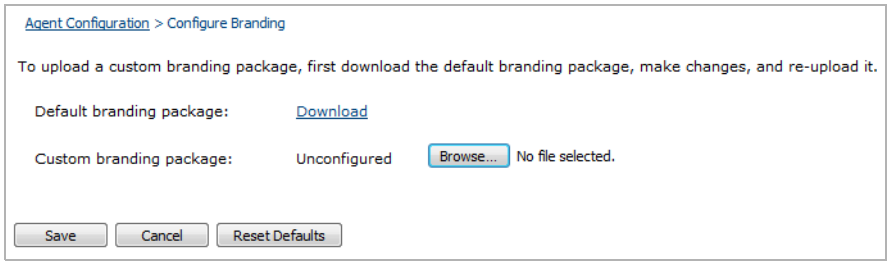
Custom branding is available for the Connect Tunnel user interface. This feature allows companies to replace the SonicWall branding in Connect Tunnel windows with their own company names and logos. Connect Tunnel branding is available on Windows, Mac OS X, and Linux platforms and is done on a per-appliance basis.

To upload customized branding graphics and guidelines:

1 On the main navigation menu under **User Access**, select **Agent Configuration** and then click **Configure** next to **Network Tunnel client branding**.



2 Click **Download** next to **Default branding package** and select the download location.



3 Click **OK** to return to the **Configure custom branding package** page.

4 Unzip the downloaded file, which contains a folder of branding files for each platform (Windows, Linux, and Mac). Using the `README.txt` file as a guide, replace the default files with custom branding files, and then zip the files.

5 On the **Configure custom branding package** page, click the **Browse** button and select the zip file containing the custom branding files.

6 After saving the file, click **Save**. All Connect Tunnel windows and icons are then updated with custom branding.

The OnDemand Proxy Agent

The OnDemand Proxy Agent is a secure, lightweight agent that provides access to TCP/IP resources. It uses local loopback proxying to redirect communication to protected network resources according to routing directives defined in AMC (it does not support UDP applications).

Note that the OnDemand Proxy Agent does not scale as effectively as the OnDemand Tunnel agent. The OnDemand Proxy Agent is not recommended for usage as a broad VPN agent, but instead should be targeted for access to specific applications through WorkPlace. In situations where you want to provide broad access to applications through the WorkPlace portal for more than 500 concurrent users at a time, we recommend that you deploy the OnDemand Tunnel agent instead. Note that you can use OnDemand Proxy as a fallback for OnDemand Tunnel in case OnDemand Tunnel cannot be installed (perhaps due to issues around administrative

rights). In that scenario, you would configure both OnDemand Tunnel and OnDemand Proxy within a community.

This section provides an overview of OnDemand and describes how to configure and deploy it.

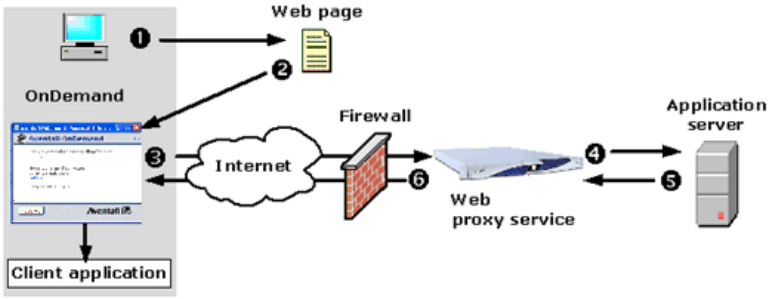
Topics:

- About OnDemand Proxy
- How OnDemand Redirects Network Traffic
- Configuring OnDemand to Access Specific Applications
- Configuring Advanced OnDemand Options
- Client Configuration

About OnDemand Proxy

OnDemand Proxy is a loopback-based proxy solution that secures communication between a client application and an application server. OnDemand Proxy connection sequence illustrates the connection sequence.

OnDemand Proxy connection sequence



1 OnDemand starts automatically when the user logs in to WorkPlace.

2 OnDemand runs within the WorkPlace window.

3 OnDemand waits for application requests on the local loopback address (`127.0.0.1`) and redirects the traffic to the Web proxy service.

4 The Web proxy service proxies the traffic to an application server using the application's required port(s).

5 The application server sends application traffic to the Web proxy service.

6 The Web proxy service sends the application traffic to OnDemand, which then passes it to the client application.

OnDemand supports TCP applications that use one or multiple ports, including applications that dynamically define ports (it does not support UDP-based applications). the Applications accessed using OnDemand table lists applications typically accessed using OnDemand.

Applications accessed using OnDemand

Application	Examples
Resident client/server Typically, these client applications are installed locally on the client computer	Internet email applications: • Microsoft Outlook • Outlook Express • Lotus Notes • Netscape Mail • Eudora Terminal emulation applications: • WRQ Reflection • NetManage RUMBA PC-to-Host Remote office connectivity applications: • Citrix ICA/Xenapp • Microsoft Windows Terminal Services

By default, OnDemand is configured to run automatically when the user connects to WorkPlace. For optimum performance, OnDemand is installed on the user's computer the first time it is accessed, minimizing download time for returning users.

Topics:

- OnDemand Mapped Mode
- Activating OnDemand

OnDemand Mapped Mode

By default, OnDemand starts automatically when users log in to WorkPlace. Mapped mode enables users to click a shortcut that is configured for a specific application. Optionally, you can configure OnDemand to automatically launch a specified Web URL when users click a shortcut. This is useful for starting an application (such as a thin-client application) when OnDemand runs. You must manually create any shortcuts to specific applications. Mapped mode is supported on Windows, Macintosh, and Linux platforms.

On Windows PCs, when a user logs in to WorkPlace for the first time, WorkPlace automatically downloads, installs, and launches OnDemand on the user's computer (assuming the community the user belongs to is configured to do so). On subsequent WorkPlace logins, WorkPlace automatically starts OnDemand.

Activating OnDemand

By default, when OnDemand is enabled, it starts automatically when users log in to WorkPlace and runs within the WorkPlace window. Users must keep the WorkPlace window open while working with OnDemand in this embedded mode.

NOTE:

- Users cannot start an application from the OnDemand window. Unless you configure a URL to launch automatically when users start OnDemand, users must manually start applications as they would normally.
- Users may need to configure their personal firewalls to allow OnDemand traffic.

How OnDemand Redirects Network Traffic

OnDemand uses the local loopback address to redirect and secure traffic through the appliance. This section provides an overview of loopback proxying and describes the various redirection methods.

Topics:

Overview: Loopback Proxying

OnDemand uses local loopback proxying to securely submit application traffic through the Web proxy service. For example, suppose a Windows user wants to connect to the appliance and run a Citrix application:

1. The user logs in to WorkPlace, and OnDemand automatically starts.
2. OnDemand dynamically maps the local loopback address to the host name for the Citrix server.
3. The user runs the Citrix application, which attempts to connect to *citrix.example.com*. OnDemand resolves the Citrix host name to `127.0.0.1` and routes the traffic to the Web proxy service.
4. OnDemand encrypts the Citrix traffic using SSL and securely routes it to the SMA appliance, which in turn forwards it to the Citrix server.
5. The Citrix server responds, sending data back through the SMA appliance.
6. The appliance forwards the response to OnDemand over SSL.
7. OnDemand forwards the information to the Citrix application.

Hosts File Redirection

To redirect traffic to destination servers, modify the hosts file on the user's computer. This redirection method is supported on Windows, Macintosh, and Linux platforms, provided the user has administrator privileges on the local computer.

Modifying the hosts file on a user's system maps a destination server to a local loopback address. When an application attempts to resolve a host name, traffic is redirected to the loopback address on which OnDemand is listening.

the Hosts files table shows a typical hosts file, with host names mapped to IP addresses, followed by a hosts file modified for use by OnDemand.

Hosts files

Typical Hosts File	
	`192.168.1.135 telnet.example.com telnet`
	`192.168.1.140 mailhost.example.com mail`
	`192.168.1.143 citrix.example.com citrix`
OnDemand Hosts File	
	`127.0.0.1 telnet.example.com telnet`
	`127.0.0.1 mailhost.example.com mail`
	`127.0.0.1 citrix.example.com citrix`

NOTE: The OnDemand host names are mapped to the local loopback address, not the host's IP address. For application-specific configurations, these loopback addresses would match the addresses you specify when configuring OnDemand in AMC; for more information, see Configuring OnDemand to Access Specific Applications.

Configuring OnDemand to Access Specific Applications

If you are deploying OnDemand to users on non-Windows platforms, or want to automatically use the launch URL feature to start a thin-client application when users run OnDemand, you must define an application-specific configuration in AMC. This involves mapping the port numbers for the client and server, a process called port mapping.

Topics:

- About Port Mapping
- Configuring an Application for Use with OnDemand

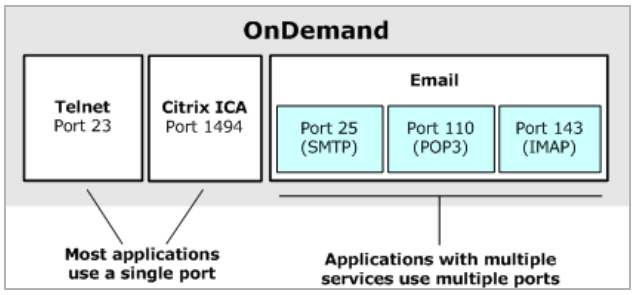
About Port Mapping

To configure OnDemand to redirect traffic for a specific application, you need to know the port numbers the application uses for the client and server, and then map those ports in AMC. OnDemand listens for incoming requests on specific ports on the client and then proxies them to the appliance, which forwards the information to an IP address and port on the application server.

For example, you might configure an IP address and port on the client (such as `127.0.1.1:23`) to the host or IP address and port on the destination server, such as `telneta.example.com:23`.

Some applications—such as email—use multiple ports for different protocols. In this case, you must configure OnDemand to listen on several different ports. This configuration can also be useful for configuring OnDemand to work with several different applications. Example: OnDemand configuration shows OnDemand configured to work with three applications over five different ports.

Example: OnDemand configuration



In this example OnDemand is configured to listen on port 23 for telnet and port 1494 for Citrix. For email requests it is listening on port 25 (SMTP), port 110 (POP3), and port 143 (IMAP).

Configuring an Application for Use with OnDemand

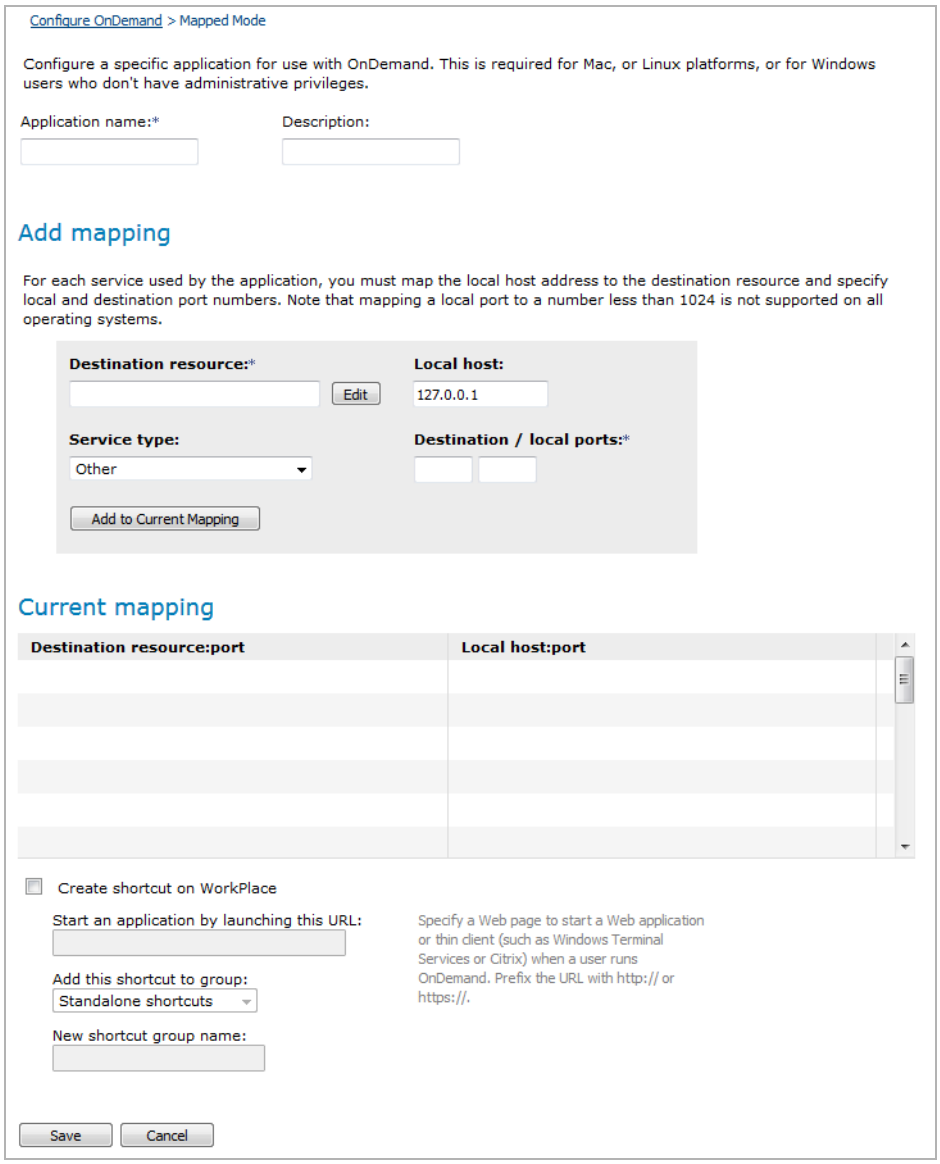
To configure an application, you need to know the protocols it uses for each service and map the source address and ports on the client to those on the destination host. You also have the option of specifying a URL to open a Web page, which is useful for automatically starting an application, when the user runs OnDemand.

To configure an application for use with OnDemand:

1 On the main navigation menu of AMC under **User Access**, click **Agent Configuration**.

2 In the **OnDemand** area under **Access agents**, click **Edit**. The **Configure OnDemand** page appears.

3 In the **Mapped mode** area, click **New**.



4 In the **Application name** field, type the name to use for the application. This name is displayed to the user in WorkPlace. Use a short, descriptive name.

5 In the **Description** field, type a descriptive comment about the application.

6 Configure each service used by the application in the **Add mapping** area.

   a Click the **Edit** button beside the **Destination resource** field, select the network resource you want to configure, and then click **Save**. Alternatively, you can create a new network resource by clicking the **New Resource** button in the **Resources** dialog.

b If the IP address/port combination of the service conflicts with that of another service, you can modify the IP address displayed in the **Local host** field, or you can map the ports as described below. You can change the **Local host** value to any IP address in the `127.x.y.z` address space.

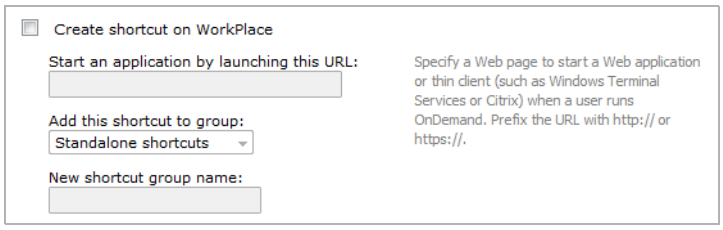
> **NOTE:** On MacOS, **OnDemand** works only when using IP address `127.0.0.1` for the local host.

c In the **Service type** drop-down menu, select the type of service used by the application. This populates the **Destination/local ports** fields with the well-known port for that service. If the service uses a destination port that differs from that of the local port, map the ports to each other by editing the information in the **Destination/local ports** boxes as needed.

d Click **Add to Current Mapping**. This adds the mapping to the **Current mapping** list.

7 If the application uses multiple services, repeat Step 6 to configure each one. Most applications use only one service, but some (like email) use multiple protocols, which requires multiple services.

8 Select the **Create shortcut on WorkPlace** checkbox.



- If you want OnDemand to open a Web page automatically (which is useful for automatically starting a thin-client application), type the URL of the appropriate page in the **Start an application by launching this URL** field. You must specify either an `http://` or an `https://` protocol identifier. The URL you specify automatically opens in a new browser window after OnDemand loads.
- In WorkPlace you can set up groups to organize resources for your users, or have shortcuts appear singly. In the **Add this shortcut to group** drop-down menu, select a new or existing group to which to add your shortcut, or select **Standalone shortcuts** if you want it to appear on its own. (The order in which shortcuts appear can be changed on the **Configure WorkPlace Layout** page; see Creating or Editing a WorkPlace Layout for more information.)

> **NOTE:** After you initially configure the Create shortcut on WorkPlace option, you can view its setting only on the Mapped Mode page; you cannot edit it on this page. After initially configuring this setting, shortcuts are managed from the Shortcuts page in AMC. For more information, see Working with WorkPlace Shortcuts.

Configuring Advanced OnDemand Options

This section describes how to access the appliance using its external IP address and add debug messages to the OnDemand logs.

Topics:

- Accessing the Appliance Using Its External IP Address
- Adding Debug Messages to the OnDemand Logs

Accessing the Appliance Using Its External IP Address

By default, OnDemand accesses the appliance using the FQDN contained in the appliance's SSL certificate. This works in a production environment—where the FQDN is added to public DNS—but may be an issue in a test environment for one of two reasons:

- You have not added the FQDN for the appliance to DNS.
- The external IP address does not match the external network address on the appliance because your environment uses Network Address Translation (NAT).

In either case, you will need to configure OnDemand to use the IP address for the external network interface.

To configure OnDemand to use the appliance's external IP address:

1. From the main navigation menu in AMC, click **Agent Configuration**.
2. In the **Access agents** area, to the right of **OnDemand**, click **Edit**. The **Configure OnDemand** page appears.
3. Click to expand the **Advanced** area and then, in the **Appliance FQDN or IP address** field, type the IP address for the external network interface.

Before moving the appliance into production, make sure this value contains the FQDN from the appliance's SSL certificate. Whenever you update the appliance's SSL certificate, AMC automatically inserts the FQDN in this field (overwriting any value you've previously specified).

The first time a user starts OnDemand, the Web browser displays a security warning asking the user to grant permissions to run OnDemand. For information on configuring the browser, see Suppressing the Java Security Warning.

Adding Debug Messages to the OnDemand Logs

Normally, the OnDemand logs show just information and warning messages. You can also log debug messages, but this should be done only when you are troubleshooting (otherwise the log file becomes too large).

To add debug messages to the OnDemand logs:

1. From the main navigation menu in AMC, click **Agent Configuration**.
2. In the **Access agents** area, to the right of **OnDemand**, click **Edit**. The **Configure OnDemand** page appears.
3. Click to expand the **Advanced** area, and then select the **Enable debug OnDemand log messages** checkbox.

Client Configuration

This section explains client-side configuration that may be useful for working with OnDemand.

Topics:

Suppressing the Java Security Warning

When OnDemand starts, the Web browser displays a security warning asking the user to grant permission to run OnDemand. This warning varies, depending on the operating system and browser. The user must accept this certificate to run OnDemand.

OnDemand includes a Java code-signing certificate that ensures the validity of the applet. For Windows and Mac OS X, the certificate includes a Class 3 Digital ID from Thawte, which is widely used by commercial software publishers.

To prevent the security prompt from appearing each time OnDemand is started, users can configure their systems to trust the Secure Mobile Access certificate. After this is done, the browser trusts all subsequent software downloads from Secure Mobile Access.

Configuring a Proxy Server in the Web Browser

When passing an outbound connection over a proxy server, OnDemand uses the Web browser's settings to determine the proxy server address and port. This configuration requires the user to configure his or her Web browser, either by specifying the outbound proxy server address and port or by enabling automatic proxy detection.

If a user enables both automatic proxy detection and manual proxy identification, OnDemand checks for proxy server settings in this order:

1. If the **Automatically detect settings** option is enabled, OnDemand attempts to automatically detect the proxy server settings.
2. If OnDemand is unable to automatically detect the proxy server settings, it checks to see if the **Use automatic configuration script** option is enabled.
3. If OnDemand is unable to detect the proxy server settings through a configuration script, it uses the proxy server settings that the user manually specified.

To configure automatic proxy detection in Internet Explorer for Windows:

1. On the **Tools** menu, click **Internet Options**.
2. On the **Connections** tab, click **LAN Settings**.
3. Under **Automatic Configuration**, enable one or both of the options:
   - To automatically detect proxy-server settings, select the **Automatically detect settings** checkbox. (This option is supported only for users running Internet Explorer with the Microsoft Virtual Machine.)
   - To use configuration information contained in a configuration file, select the **Use automatic configuration script** checkbox and then, in the **Address** field, type the URL or path for the configuration file.

To manually specify proxy server settings in Internet Explorer for Windows:

1. On the **Tools** menu, click **Internet Options**.
2. On the **Connections** tab, click **LAN Settings**.
3. Under **Proxy Server**, select the **Use a proxy server** checkbox, and specify the IP address and port for it.

   If a different proxy server is used for different protocols, click **Advanced** and specify the necessary information; be sure to specify proxy servers for both **HTTP** and **Secure**.

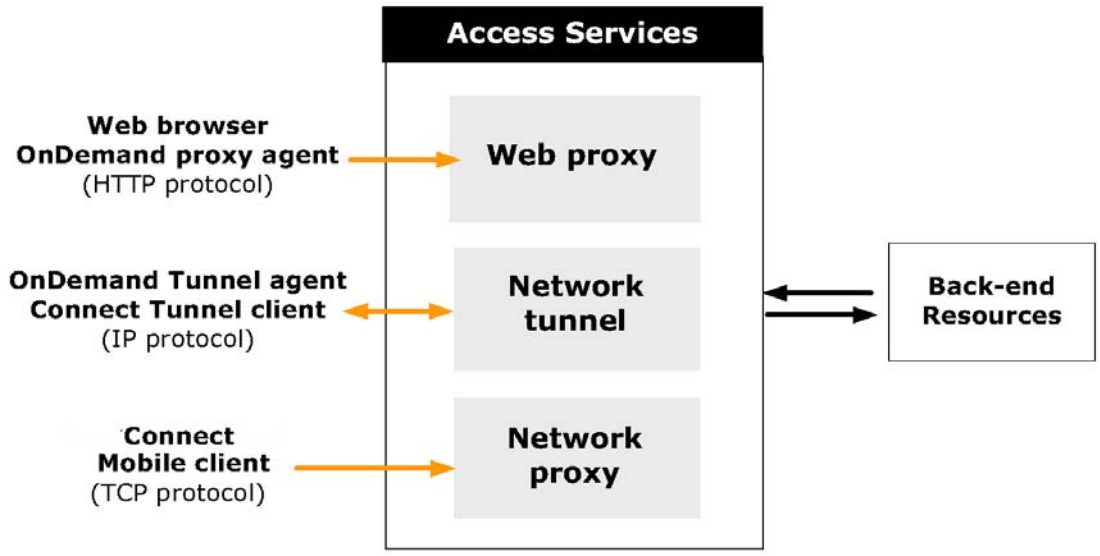
CAUTION: Enabling either of the automatic settings in the LAN Settings dialog (Automatically detect settings or Use automatic configuration script) may override the proxy server settings; clear these two checkboxes to ensure that proxy detection works correctly.

Managing Access Services

This section provides an overview of the access services, and describes how to start, stop, and configure the services.

Topics:

About Access Services



Users can access VPN resources secured by the SMA appliance using three primary methods, or access services. This section describes each of the access services and the types of resources they provide access to.

- **The network tunnel service** is a network routing technology that provides secure network tunnel access to a wide range of client/server applications, including those that use non-TCP protocols such as VoIP and ICMP, reverse-connection protocols, and bi-directional protocols, such as those used by remote Help Desk applications. It works in conjunction with the Connect Tunnel client and the OnDemand Tunnel agent to provide authenticated and encrypted access. The network tunnel service can traverse firewalls, NAT devices, and other proxy servers that can interfere with traditional VPN devices.

  When Web resource filtering is enabled for the network tunnel service, policies for tunnel sessions can use URL-based rules in addition to IP-based rules.

- **The WorkPlace service** controls access to network file shares accessed from a Web browser. The WorkPlace service communicates with Windows file servers and network shares (including Microsoft Distributed file system, or Dfs, resources) using the Server Message Block (SMB) file-sharing protocol. For information about configuring the WorkPlace service, see Configuring WorkPlace General Settings.

the Relationships between SMA access services and user access components table illustrates the relationships between the Secure Mobile Access access services and the user access components that they control.

Relationships between SMA access services and user access components

Service	User access components	Description
Network tunnel service	• OnDemand Tunnel agent • Connect Tunnel client	• Manages TCP/IP and non-TCP (such as VoIP and ICMP) connections from the network tunnel clients. • Provides network-level access to all resources, effectively making the user's computer a node on your network. • Includes support for mapped network drives, native email clients, and applications that make reverse connections, such as VoIP.
Web proxy service	• Web Proxy Agent • Translated Web access • Custom port mapped Web access • Custom FQDN mapped Web access	• Manages HTTP and TCP/IP connections from Web browsers.
WorkPlace service	• WorkPlace portal	• Provides a Web-based portal that is available from any Web browser. • Provides access to file-system resources. • Provisions and deploys all user access components.

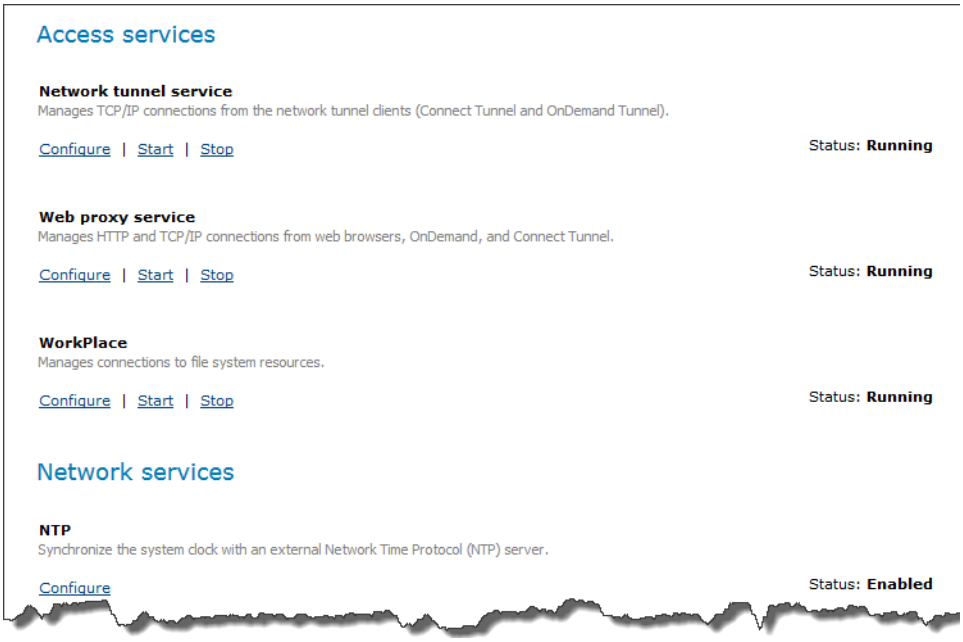
Stopping and Starting the Secure Mobile Access Services

You may occasionally want to temporarily stop one of the Secure Mobile Access services.

CAUTION: SonicWall recommends stopping the services only during scheduled maintenance periods or during off hours. Also, you should give your users advance warning that the service will be going down.

To start or stop a service:

1 From the main navigation menu under **System Configuration**, click **Services**.



2 Under **Access Services**, click the appropriate link:

- Click **Stop** to stop the service. All existing user connections will be terminated.
- Click **Start** to start the service.

Configuring the Network Tunnel Service

The network tunnel service controls access from the Connect Tunnel client and the OnDemand Tunnel agent. In order to deploy the network tunnel clients to users, you must first make one or more IP address pools available to the community. Configuring the network tunnel service requires setting up IP address pools that are used to allocate IP addresses to the clients; these IP addresses become the clients' end points on VPN connections.

Network tunnel service configuration also allows you to enable Web resource filtering so that you can enforce the same URL-based rules that administrators define for ExtraWeb in tunnel sessions. Web resource filtering also allows you to leverage single sign-on functionality when accessing Web applications.

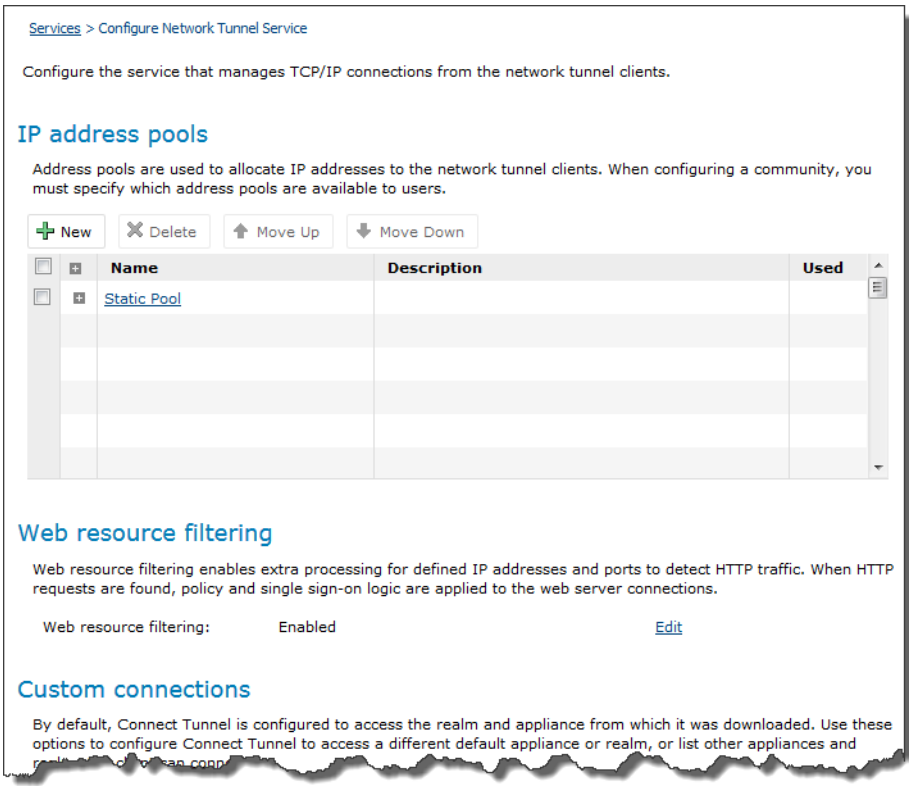
You can add custom connections to configure Connect Tunnel to access a different default appliance or realm, or list other appliances and realms the client can connect to. By default, Connect Tunnel is configured to access the realm and appliance from which it was downloaded.

You can also set up fallback servers to give network tunnel clients a list of servers to contact in the event of a connection failure.

To configure the network tunnel service:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 Under **Access services**, in the **Network tunnel service** area, click **Configure**. The **Configure Network Tunnel Service** page appears.



3 In the **IP address pools** area, create one or more IP address pools. For more information, see Configuring IP Address Pools.

4 To enable and configure Web resource filtering, click **Edit** in the **Web resource filtering** area. For more information, see Configuring Web Resource Filtering.

5 To configure a custom connection in which Connect Tunnel can access the current or a different default appliance or realm, or list other appliances and realms the client can connect to, click the **New** button in the **Custom Connections** area. For more information, see Configuring Custom Connections.

6 To configure fallback servers that network tunnel clients can contact in the event of a connection failure, click the **New** button in the **Fallback servers** area. For more information, see Configuring Fallback Servers.

Configuring IP Address Pools

IP address pools are used to allocate IP addresses to the network tunnel clients. When a user makes a connection using the Connect Tunnel client or the OnDemand Tunnel agent, the SMA appliance assigns the client an IP address from one of its configured address pools. Only pools allowed for the client's community are considered. For more information about how IP addresses are allocated to a community, see IP Address Allocation.

For information about editing and deleting IP address pools, see Adding, Editing, Copying, and Deleting Objects in AMC.

Topics:

- Address Pool Allocation Methods

- Best Practices for Configuring IP Address Pools
- Adding Translated IP Address Pools
- Adding Dynamic IP Address Pools
- Adding a Dynamic, RADIUS-Assigned IP Address Pools
- Adding Static IP Address Pools

Address Pool Allocation Methods

You can configure IP address allocation in the following ways:

- Translated Address Pools (Source NAT)
- Routed Address Pools (DHCP)
- RADIUS-Assigned Address Pools
- Static Address Pools

Translated Address Pools (Source NAT)

With translated address pools, the appliance assigns non-routable IP addresses to clients and uses source network address translation (Source NAT) to translate them to a single address you configure for back-end traffic. The appliance uses the name servers you specify in AMC to define the DNS and WINS settings on the client. Source NAT translates the client's non-routable source address to a single configured address from a fixed, non-routable sequence (`2.0.0.2` through `2.255.254.254`) on the internal network.

The advantages of using translated address pools are:

- Source NAT address pools require only a single back-end address, which is shared by all remote connections.
- Fewer IP addresses are required for the tunnel clients.

The constraints of this type of pool are:

- All network activity must be initiated by the client; therefore, this method of IP address allocation does not support applications that make reverse connections or cross-connections (such as SMS, VoIP, or FTP).
- Windows domain browsing is not supported; if users try to browse a Windows domain through Network Explorer or Network Neighborhood, an error message indicates that they are not authorized to access the resources.
- Client-to-client cross-connections are not supported.

Routed Address Pools (DHCP)

With a routed address pool, IP addresses are dynamically allocated to the tunnel clients from a DHCP server. DHCP address pools have these characteristics:

- They require an external server that has enough spare addressing capacity to support the new remote clients. These pools are easy to set up and maintain, and impose few restrictions on client activity.
- Reverse connections and cross-connections are supported, but client IP addresses must be known. If necessary, you can associate a fixed DHCP address with a particular client by configuring the DHCP client ID on the DHCP server. Client IDs are generated during client configuration; consult the DHCP server logs to find particular IDs.

RADIUS-Assigned Address Pools

Some applications require a one-to-one relationship between an assigned IP address and a user. This is best supported by a RADIUS server, where IP address allocation happens during the authorization process, as part of authentication.

This strict one-to-one correlation may have some unintended consequences:

- For example, if an employee is logged in to the appliance at work and forgets to log out, logging in from home will fail: the IP address is still attached to the original tunnel connection at the office. Optionally, you can configure the community and realm in AMC that is referencing the RADIUS server to use other IP address pools if the RADIUS pool is exhausted.
- If you have two appliances authenticating against the same RADIUS server and both are using RADIUS pools, duplicate address assignments will be made, resulting in multiple network conflicts.

Static Address Pools

With static address pools, you specify one or more static IP address pools from which IP addresses will be allocated to the tunnel clients. You can configure static IP address pools as subnets or address ranges. Static address pools have these characteristics:

- Static address pools require no configuration work outside of the appliance, and they support reverse connections and cross-connections.
- Static pools require identification of one back-end address per simultaneous remote connection. If enough addresses are available to cover all possible remote clients (not just simultaneous connections) and no address conflicts occur, this method tends to be the most stable because the same address is typically assigned to the same client.
- Static pools leave an IP address assigned as long as the tunnel remains up. If the tunnel goes down, there is a two-minute period during which the address is available, but only for reassignment to the same client. After that two minute period expires, the address is available to any client; address reassignment is performed using an LRU (Least Recently Used) scheme.
- Windows domain browsing is supported.

Best Practices for Configuring IP Address Pools

Here are some best practices to keep in mind when configuring IP address pools:

- Don’t duplicate addresses:
    - When configuring static IP address pools, do not specify IP addresses that are already assigned to other network resources.
    - Be aware that any IP addresses you configure for use by the network tunnel clients may conflict with IP addresses already in use on the client networks. Whenever possible, avoid configuring IP addresses that you know to be in use on your users’ networks.
    - When configuring translated (Source NAT) IP address pools, be sure to specify an unused address on the subnet of the internal interface.
    - If you are using RADIUS pools on more than one appliance, and the appliances are authenticating against the same RADIUS server, duplicate address assignments will be made.
- When configuring dynamic DHCP or static IP address pools, ensure that you have enough IP addresses to accommodate your maximum number of concurrent users. For example, if your maximum concurrent user count is 100, you should make at least 100 IP addresses available.

Adding Translated IP Address Pools

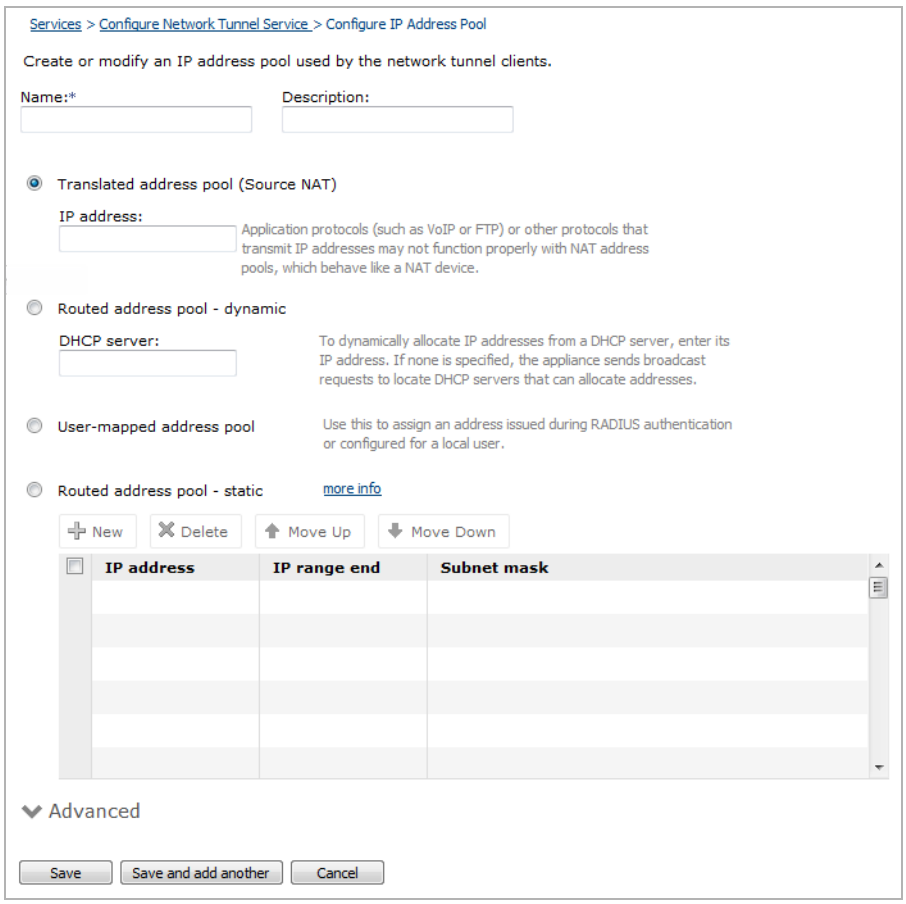
This section describes how to create a translated IP address pool using secure network address translation (Source NAT).

To add a translated IP address pool:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 Under **Access services**, in the **Network tunnel service** area, click **Configure**. The **Configure Network Tunnel Service** page appears.

3 In the **IP address pools** area, click **New**. The **Configure IP Address Pool** page appears.



4 In the **Name** field, type a name for the address pool.

5 In the **Description** field, type a descriptive comment about the address pool.

6 Click **Translated address pool (Source NAT)**.

7 In the **IP address** field, type the Source NAT address that will appear to back-end servers as the source of all client traffic. Ensure that this IP address is not in use elsewhere.

8 Click **Save**.

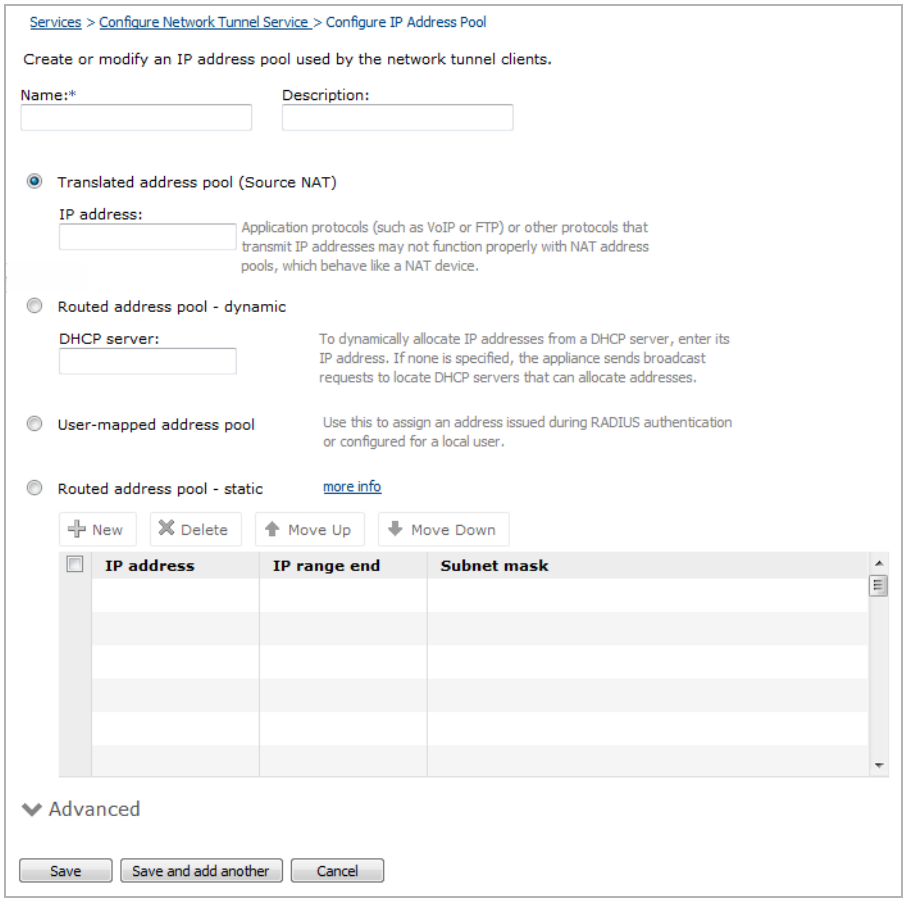
Adding Dynamic IP Address Pools

To add a dynamic IP address pool:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 Under **Access services**, in the **Network tunnel service** area, click **Configure**. The **Configure Network Tunnel Service** page appears.

3 In the **IP address pools** area, click **New**. The **Configure IP Address Pool** page appears.



4 In the **Name** field, type a name for the address pool.

5 In the **Description** field, type a descriptive comment about the address pool.

6 Click **Routed address pool - dynamic**.

7 By default the **DHCP server** field is blank; the appliance sends broadcast requests to locate DHCP servers and uses them to allocate addresses. Leave this box blank unless you need to configure a specific DHCP server.

8 Click **Save**. (DHCP address pools ignore the **Advanced** settings on this AMC page.)

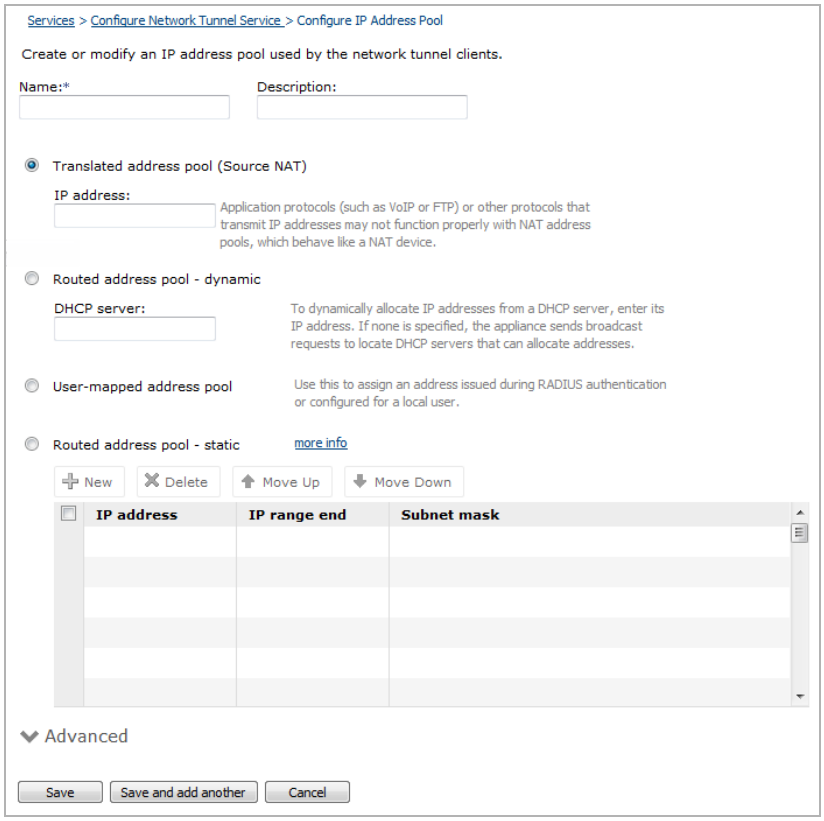
Adding a Dynamic, RADIUS-Assigned IP Address Pools

To add a RADIUS-assigned IP address pool

1 From the main navigation menu under **System Configuration**, click **Services**.

2 Under **Access services**, in the **Network tunnel service** area, click **Configure**. The **Configure Network Tunnel Service** page appears.

3 In the **IP address pools** area, click **New**. The **Configure IP Address Pool** page appears.

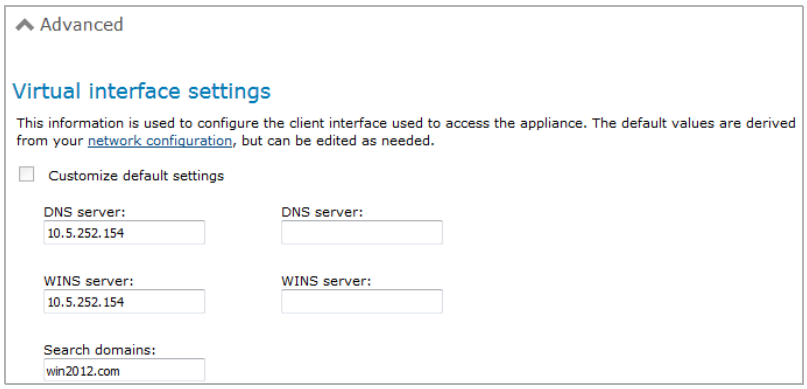


4 In the **Name** field, type a name for the address pool.

5 In the **Description** field, type a descriptive comment about the address pool.

6 Click **RADIUS-assigned - dynamic** to configure a pool in which IP address allocation is made during the authorization process, as part of authentication. You would choose this setting if, for example, you have an application that requires a one-to-one relationship between an assigned IP address and a user.

7 (Optional) To change the virtual interface settings for configuring the client interface, click to expand the **Advanced** area. The **Virtual interface settings** are preconfigured with the **DNS server**, **WINS server**, and **Search domains** as defined on the **Network Settings** page. (For more information, see Configuring Basic Network Settings.) To change these settings, select the **Customize default settings** checkbox and then specify custom values for any settings that you want to change.



8 Click **Save**.

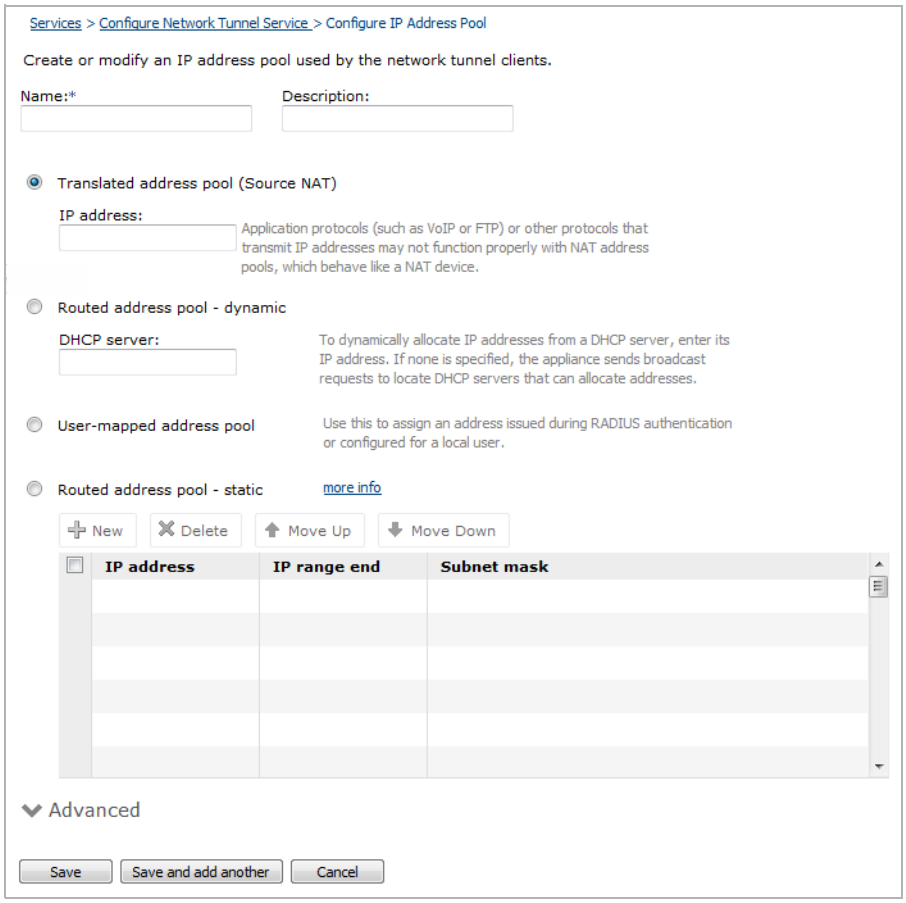
Adding Static IP Address Pools

To add a static IP address pool:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 Under **Access services**, in the **Network tunnel service** area, click **Configure**.

3 In the **IP address pools** area, click **New**. The **Configure IP Address Pool** page appears.



4 In the **Name** field, type a name for the address pool.

5 In the **Description** field, type a descriptive comment about the address pool.

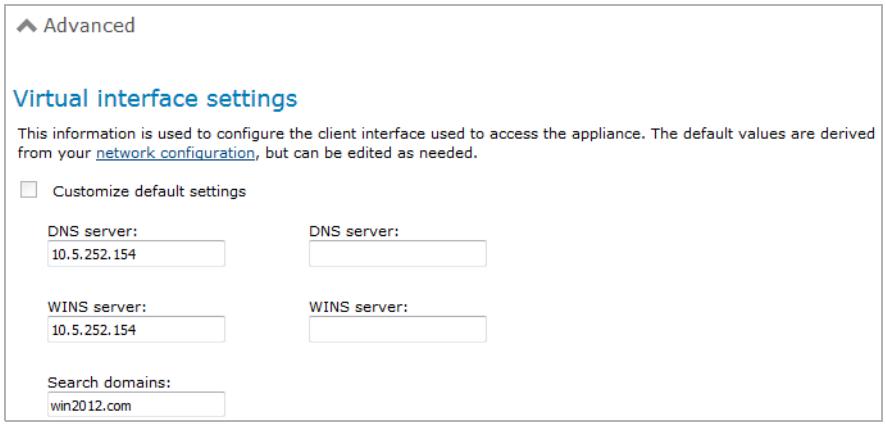
6 Click **Routed address pool - static**, and then click **New**.

7 Specify the IP address or addresses to make available to the tunnel clients. Type IP addresses and subnet masks using dotted decimal form (*n . n . n . n*).

- To define a single host, type an **IP address** and a **Subnet mask** of 255 . 255 . 255 . 255.
- To specify a range of IP addresses, type the beginning address in the **IP address** field and the ending address in the **IP range end** field, and specify a **Subnet mask**.
- To define an entire subnet, type the network address in the **IP address** field and fill in the **Subnet mask** field. The subnet mask is converted to a range and values are filled in as appropriate. If the IP address of the subnet is entered, it is converted to the first usable address in the network, but addresses in the middle of the subnet are used as is. The ending address is filled in with the highest usable address in the subnet.

8 Click **OK**. The pool is added to the list of available IP address pools.

9 (Optional) To change the virtual interface settings for configuring the client interface, click to expand the **Advanced** area. The **Virtual interface settings** are preconfigured with the **DNS server**, **WINS server**, and **Search domains** as defined on the **Network Settings** page. (For more information, see Configuring Basic Network Settings.) To change these settings, select the **Customize default settings** checkbox and then specify custom values for any settings that you want to change.



10 Click **Save**.

Configuring Web Resource Filtering

Web resource filtering enables extra processing for defined IP addresses and ports to detect HTTP traffic. When HTTP requests are found, policy and single sign-on logic are applied to the Web server connections.

Web resource filtering allows you to enforce the same URL-based rules in tunnel sessions that administrators define for ExtraWeb. It also allows you to leverage single sign-on functionality when accessing Web applications.

When Web resource filtering is not enabled, the available policies for Web access and tunnel access are not equivalent. The Web access cases can evaluate URL policy for all translated access and HTTP access for Web proxy and port map clients. For users connected via a tunnel, the IP layer redirection only permits policies based on IP address. In deployments where multiple Web addresses or namespaces are hosted on a single Web server, all Web content is reachable at a single IP address or pool of addresses. Basing policy on just the IP layer does not permit the administrator to enforce policy distinctions between the multiple namespaces. Enabling Web resource filtering allows policies to use URL-based rules in addition to IP-based rules for tunnel sessions.

To configure Web resource filtering:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 In the **Access services** area, click **Configure** under **Network tunnel service**.

3 In the **Web resource filtering** area, click **Edit**. The **Configure Tunnel Web Policy** page appears.

4 Select the **Enable web resource filtering** checkbox to cause the tunnel service to check all client traffic at ports that may contain Web network traffic.

5 Click **Save**.

Configuring Custom Connections

By default, Connect Tunnel is configured to access the realm and appliance from which it was downloaded. Use the Custom Connections options to configure Connect Tunnel to access a different default appliance or realm, or list other appliances and realms the client can connect to.

To configure custom connections:

1 From the main navigation menu under **System Configuration**, click **Services**.

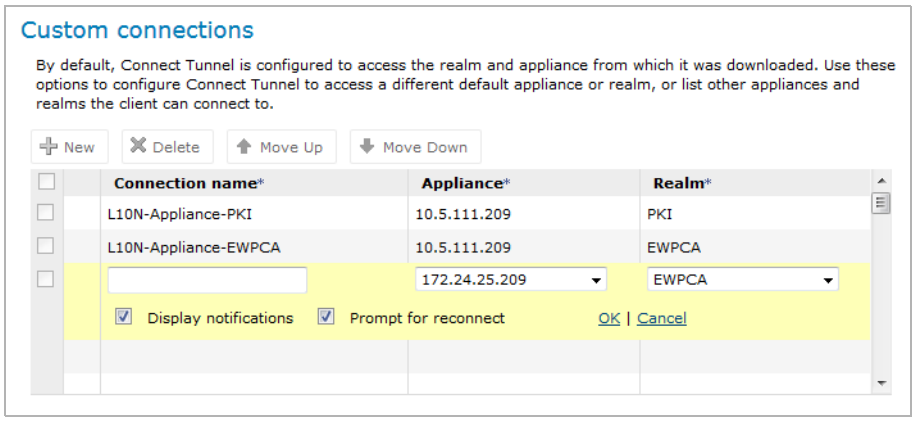
2 In the **Access services** area, click **Configure** under **Network tunnel service**.

3 In the **Custom Connections** area, click **New** to add a custom connection.

4 Select the type of connection:

- Connection to this appliance
- Connection to a different appliance

The **Custom connections** table displays editable fields for the connection name, appliance, and realm.



5 Type a descriptive name for the custom connection into the **Connection name** field.

6 Type the FQDN or IP address of the appliance into the **Appliance** field.

7 Type the realm name into the **Realm** field.

8 Select **Display** notifications checkbox if notifications should be displayed when this custom connection is used.

9 Select **Prompt for reconnect** checkbox if the user should be prompted to reconnect to this custom connection if disconnected.

10 Click **OK**.

11 When more than one custom connection is listed, to change the order of the connections, select the checkbox next to one custom connection and then click either **Move Up** or **Move Down**. The list is updated with the new order.

12 To delete a custom connection, select the checkbox next to it and then click **Delete**.

Configuring Fallback Servers

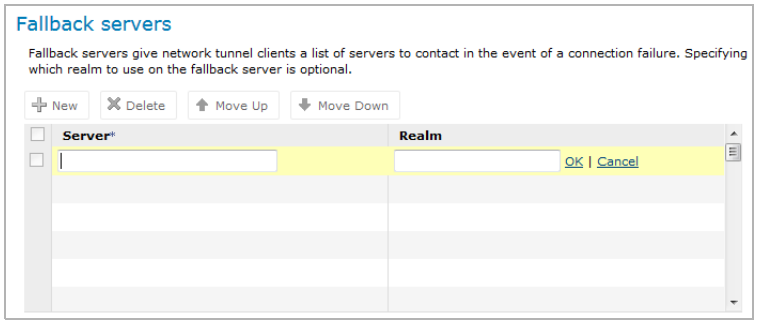
Fallback servers give network tunnel clients a list of servers to contact in the event of a connection failure.

To configure fallback servers:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 In the **Access services** area, click **Configure** under **Network tunnel service**.

3 In the **Fallback servers** area, click **New to add a fallback server**. The **Fallback servers** table displays editable fields for the server and realm.



4 Type the IP address of the fallback server into the **Server** field.

5 To specify a realm to use on the fallback server, type the realm name into the **Realm** field. Specifying the realm is optional. If none is specified, the primary realm will be used.

6 Click **OK**.

7 When more than one fallback server is listed, to change the order of the servers, select the checkbox next to one server and then click either **Move Up** or **Move Down**. The list is updated with the new order.

8 To delete a fallback server, select the checkbox next to it and then click **Delete**.

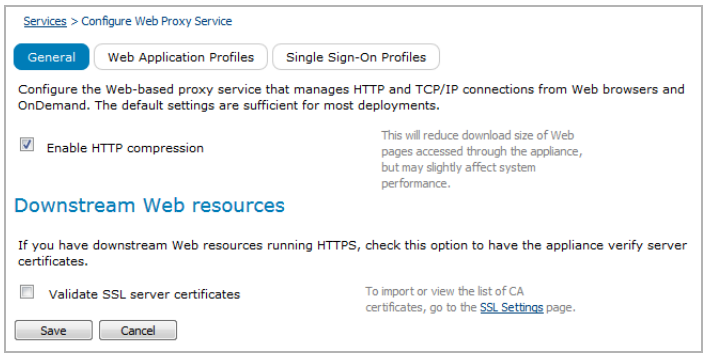
Configuring the Web Proxy Service

This section describes how to configure the service that manages access to Web resources. The Web proxy service provides Web proxy access, translated Web access, custom port mapped Web access, and custom FQDN mapped Web access.

To configure the Web proxy service:

1 From the main navigation menu under **System Configuration**, click **Services**.

2 In the **Access services** area, click **Configure** under **Web proxy service**.



3 On the **General** tab, select **Enable HTTP compression** if you want to compress HTML, XML, and CSS files before they are sent from the appliance to the client. This reduces the download size of Web pages accessed through the appliance, but may also affect system performance.

   Enabling compression may affect system performance.

4 Configure **Downstream Web resources**:

   - If you want the Web proxy service to check the validity of certificates presented by back-end Web servers, select **Validate SSL server certificates**. If enabled, the appliance will make sure the CN in the certificate matches the host name and that the certificate is valid. Secure Mobile Access recommends enabling this feature if you are using downstream HTTPS.
   - To view details about the appliance's root certificate listing CAs that issued certificates to back-end Web servers, or to import a certificate, click **the SSL Settings** link. For more information about managing CA certificates, see CA Certificates.

NOTE: For information about configuring Web application profiles, see Adding Web Application Profiles.

Android Application Access Control - Allow Any Version

SMA allows any version of the mobile client to run with Android Application Access Control (AAC).

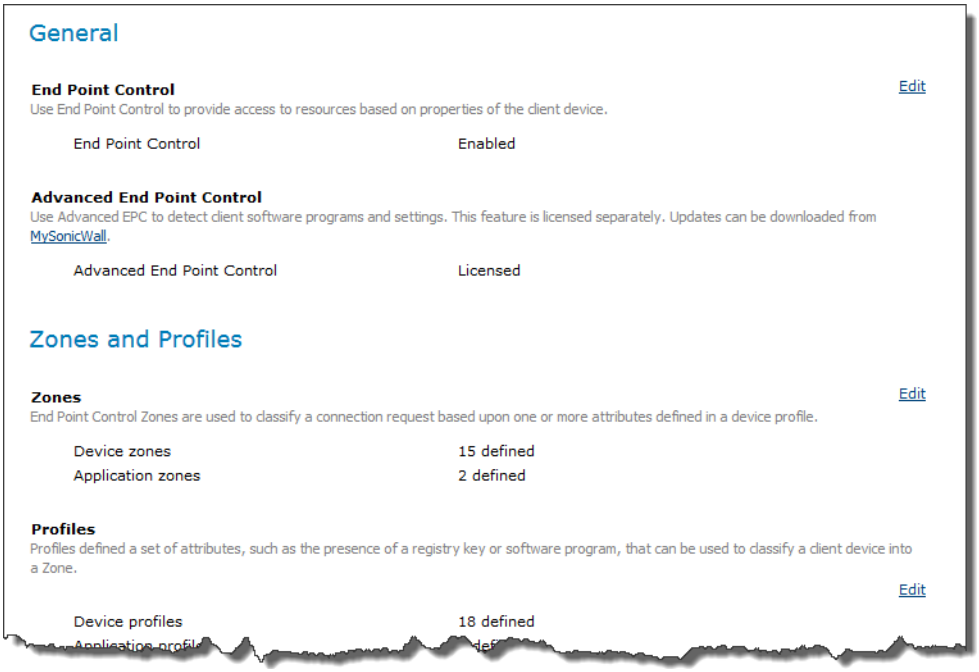
With Apple iOS, any version of a client application may access the network, because iOS is inherently more trustworthy due to the strict audit and review processes that Apple puts application store developers through.

However, with Android, there is more risk associated with allowing any version of a client application to access the network. Nevertheless, Android customers still want to be able to allow any version of a client to access the network, due to the frequency of updating applications on devices.

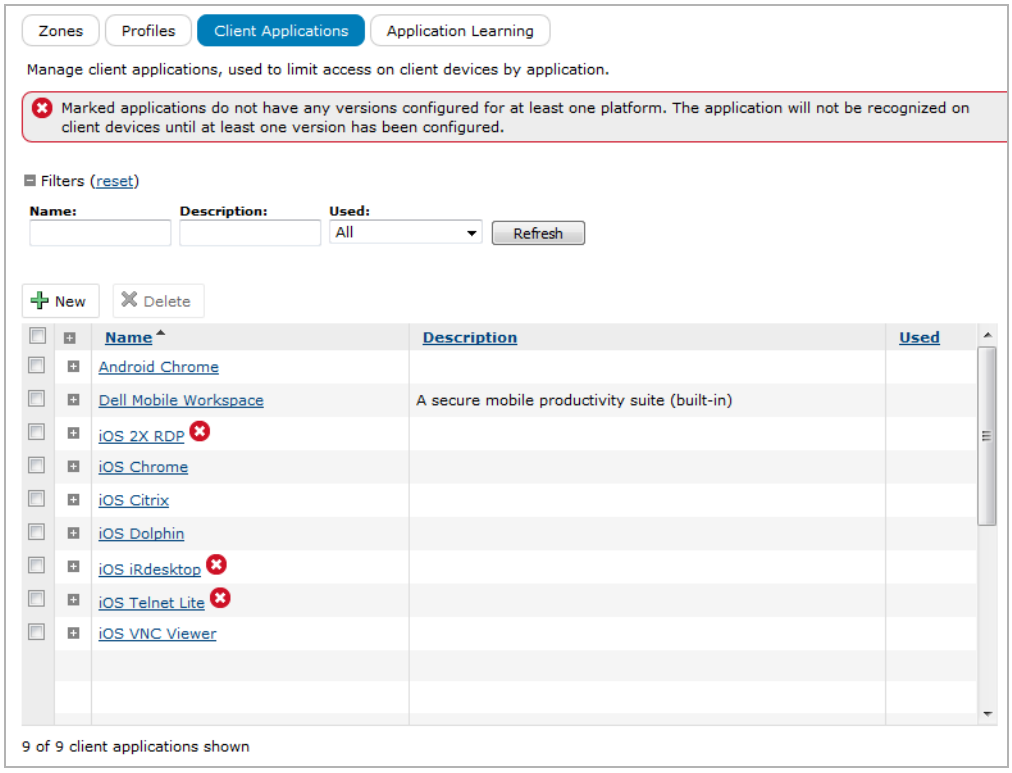
Allowing any version of a client application to access the network is enabled under **Client Applications**.

To allow any version of a client application on Android:

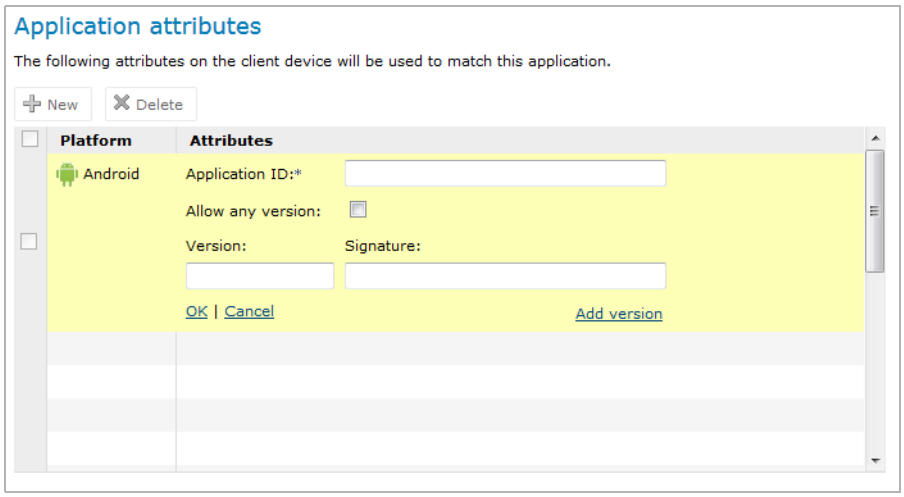
1 From the main navigation menu under **User Access**, click **End Point Control**.



2 Under **Application Control**, click **Edit** for **Client Applications**. The **Client Application** page appears.



3 Click **New** for **Application attributes**, and then select **Android** from the menu.



4 Enter the Application ID in the **Application ID** field.

5 Select the **Allow any version** checkbox.

6 Click **Save**.

Terminal Server Access

The SMA appliance supports native Web-based access to individual Windows Terminal Services or Citrix servers, and to Citrix server farms. The Native Access Module requires a separate license; contact your channel partner or Secure Mobile Access sales representative for information on purchasing one.

Topics:

Providing Access to Terminal Server Resources

The Web-based graphical terminal agents provide access to a terminal server using native application protocols. For example, when accessing a Citrix server, the client sends traffic from the client to the server using the proprietary (non-HTTP) Citrix protocol. Accordingly, to provide access to a terminal server resource, you must configure WorkPlace to provision one of the Secure Mobile Access access methods (the Web Proxy Agent or one of the tunnel clients). If you configure WorkPlace to provide only Translated Web access, terminal resources will be unavailable because the client computer will not have the network transport required to access a proprietary application protocol. For information about configuring access methods, see Selecting Access Methods for a Community.

You can enable single sign-on for applications hosted on Windows Terminal Services or a Citrix server; this passes the user's WorkPlace login credentials to all published applications on the server. If you disable single sign-on, an additional login page is displayed and the user must supply the required credentials before accessing any applications that are hosted on the terminal server.

Enabling access to terminal server resources consists of these basic steps:

1 Define the terminal server resources and access policy

First define individual Windows Terminal Services or Citrix servers, or Citrix server farms, and then add these resources to access control rules:

- You must define each host or Citrix server farm object as a resource in AMC. If your network includes a set of Citrix servers that have similar names, you can save time by using wildcard characters to define one resource object that includes multiple servers.

  If you are configuring a Citrix server farm, you must also define each individual Citrix server that is hosting applications as a resource. For information about defining Citrix server farms, see Adding Citrix Server Farm Resources.

- Reference the resources in access control rules as you would any other resource. For information about providing terminal server access to individual Windows Terminal Services or Citrix servers, and see Defining an Access Control Rule and Resource for Terminal Server Access.

2 Install or update the appropriate graphical terminal agent

When a user initiates a connection to a Citrix or Windows Terminal Services resource through WorkPlace, the appliance determines whether the version of the applicable agent that is available on the appliance is already installed on the user's computer, and automatically installs or updates the agent as needed.

You must ensure that the correct graphical terminal agents are configured in AMC; for information about managing the agents, see Managing Graphical Terminal Agents.

3 Create a WorkPlace shortcut that references the terminal server resource

The Windows Terminal Services or Citrix host is accessed from a Web-based agent that is deployed when users click a shortcut in WorkPlace. For information about configuring graphical terminal WorkPlace shortcuts, see Graphical Terminal Shortcuts.

Server Farm Resources

The SMA appliance allows you to specify individual Citrix servers, one or more load-balanced Citrix server farms, or VMware servers.

Topics:

- Adding Citrix Server Farm Resources
- Adding VMware View Resources

Adding Citrix Server Farm Resources

This section describes how to define a Citrix server farm as a resource. For information about providing terminal server access to Citrix servers, see Defining an Access Control Rule and Resource for Terminal Server Access.

To enable users to access Citrix resources, first configure the appliance with two Citrix agents: an ActiveX control that runs on Windows, and a cross-platform Java applet. Once the agent files are uploaded to the appliance, the appropriate Citrix client is automatically provisioned to users the first time they access a Citrix resource from WorkPlace. For details, see Managing Graphical Terminal Agents. The appliance supports all desktop operating systems and applications that are supported by the Citrix clients. Small form factor devices are not supported.

For individual Citrix servers, you can specify a custom ICA file; these files contain additional configuration settings for the Citrix host.

Citrix server farms must meet the following system requirements:

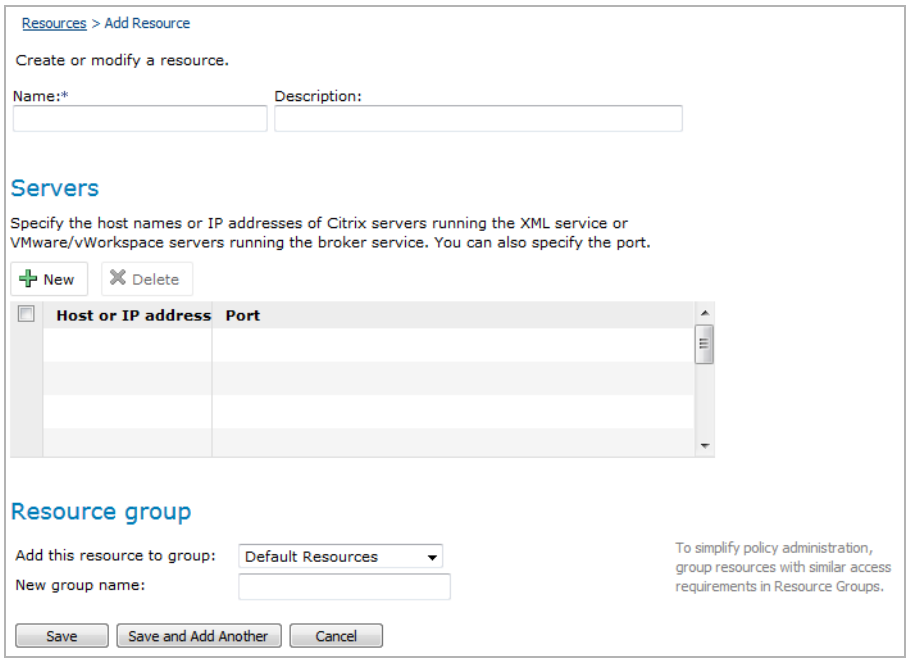
- Citrix XenApp
- Citrix XML service must be running

When a user clicks a WorkPlace shortcut that points to a Citrix server farm, a separate WorkPlace window appears and displays the resources that are hosted on the server. The WorkPlace Web interface provides the services that users need to browse and work with applications that are hosted on Citrix servers in the farm. There is no need to deploy an additional Web interface. The user can browse these resources and click links to automatically launch applications. The Citrix applications appear in the Citrix client window.

To add a Citrix server farm resource:

1 On the main navigation menu in AMC under **Security Administration**, click **Resources**.

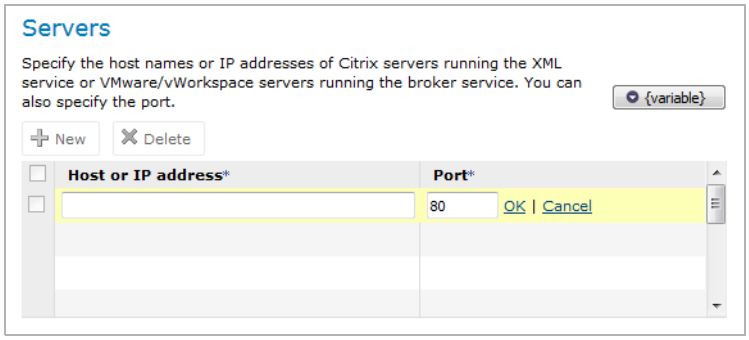
2 On the **Resources** page, click **New** and then select **Server farm** from the list. The **Add Resource - Servers** page appears.



3 In the **Name** field, type a name for the server farm.

4 In the **Description** field, type a descriptive comment about the server farm. This step is optional, but a description can be helpful later when viewing your list of resources.

5 Under **Servers**, click **New**. and then specify the servers that are included in the server farm. Each server farm must include at least one Citrix XenApp server.



a In the **Host or IP address** field, type the host name or IP address for the Citrix XenApp server.

b In the **Port** field, type the number of the port through which the appliance connects to the XML browser service on the Citrix XenApp server. The default port number is **80**.

c Click **OK**. The server is added to the list of servers in the farm.

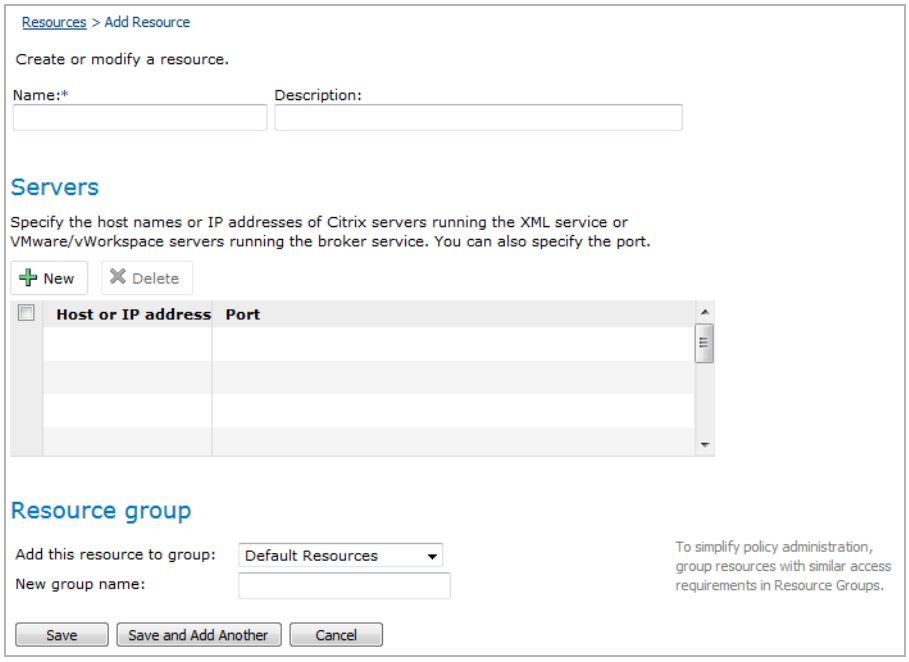
6 Click **Save**.

Adding VMware View Resources

To add a VMware view resource:

1 On the main navigation menu in AMC under **Security Administration**, click **Resources**.

2 On the **Resources** page, click **New** and then select **Server farm** from the list. The **Add Resource - Servers** page appears.



3 In the **Name** field, type a name for the VMware view.

4 Optional. In the **Description** field, type a descriptive comment about the VMware view.

5 Under **Citrix or VMware servers**, click **New** and then specify the VMware servers that are included in the VMware view. Each view must include at least one server.

   a In the **Host or IP address** field, type the host name or IP address for the VMware server.

   b In the **Port** field, type the number of the port through which the appliance connects to the service on the VMware server. The default port number is *80*.

   c Click **OK**.

6 Click **Save**.

To add a VMware View Client:

1 On the main navigation menu in AMC under **User Access**, click **Agent Configuration**.

2 In the Other agents area > Graphical terminal agents, click **Configure**.

3 In the **VMware View clients** area, click **Browse**... to navigate to the agent file. Select the agent file for each

4 Click **Save**.

Browser Only Mode for Citrix Access

Customers have been using our Citrix Native Access Module to access Citrix applications. Configuring Citrix resources means the end users have to make use of ActiveX or Java agents which are cumbersome to maintain. Citrix has developed HTML5 browser-based receivers which can be used from Firefox and Chrome browsers to connect to XenApp and XenDesktop. SMA provides an easy way to configure Citrix HTML5 receivers from the SMA appliance to enable end users to access these backend applications easily.

By leveraging the Citrix HTML5 based receiver, administrators can configure the Citrix StoreFront URL in the appliance as a URL Resource. Users can then launch the URL through host mapped or port mapped methods (reverse proxy), provide their credentials, and get redirected to the HTML5 view of StoreFront.

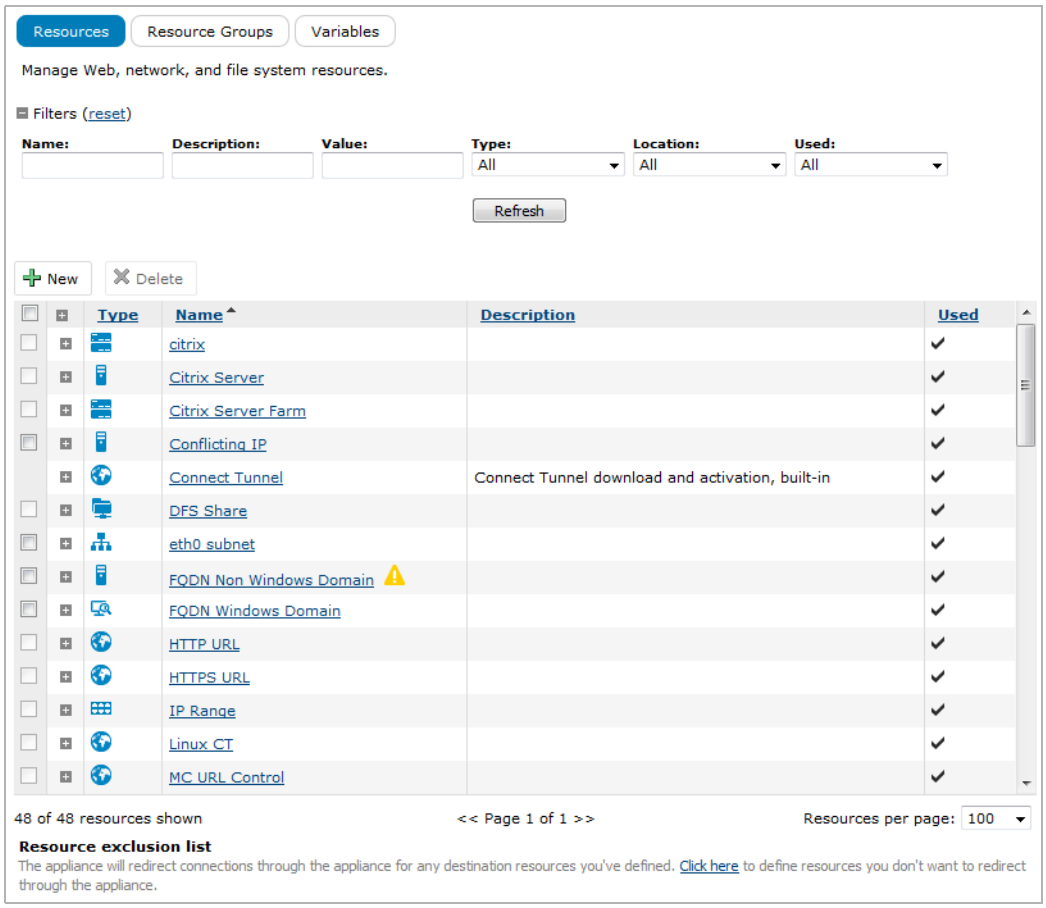
The HTML5 Receiver works only with Firefox and Chrome browsers.

Topics:

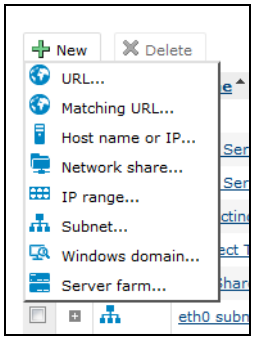
Configuring the Citrix HTML5 Receiver URL

To configure the URL for the Citrix HTML5 Receiver:

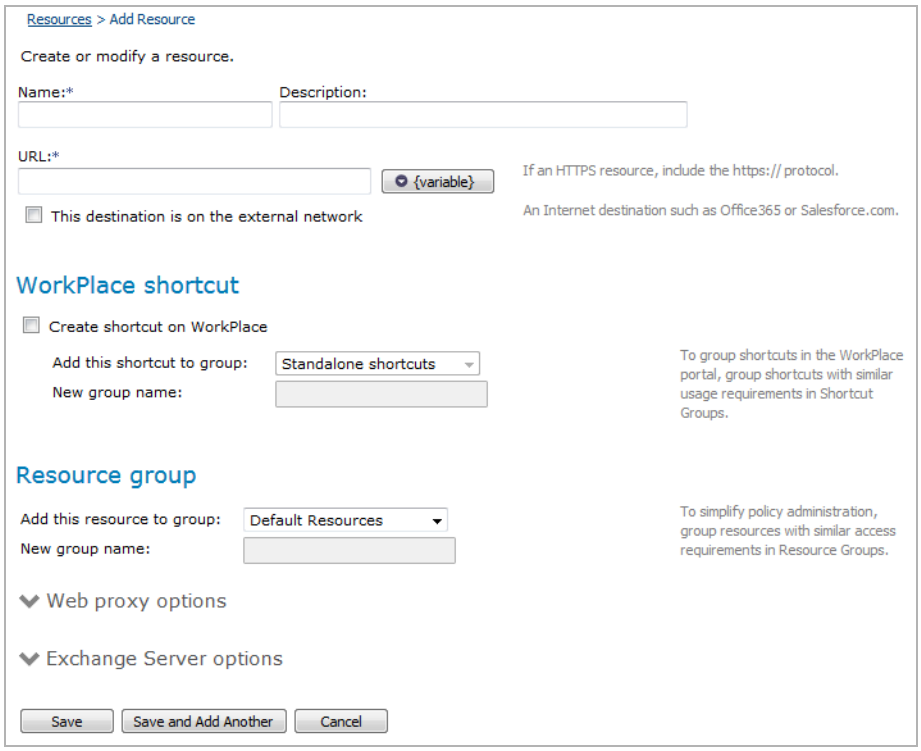
1 On the main navigation menu in AMC under **Security Administration**, click **Resources**.



2 Click the **New** button. The drop-down menu appears.



3 Select **URL**. The **Add Resource URL** dialog appears.



4 In the **Name** field, enter the name for this URL resource, such as Citrix HTML5 Receiver.

5 In the **URL** field, enter the URL of the Citrix HTML5 Receiver.

6 If this resource is on the external network, select the checkbox for **This destination is on the external network**.

7 Select the **Create Shortcut on WorkPlace** checkbox.

8 In the **Custom access** panel, from the drop-down menu, select **Access this resource on a custom port**.

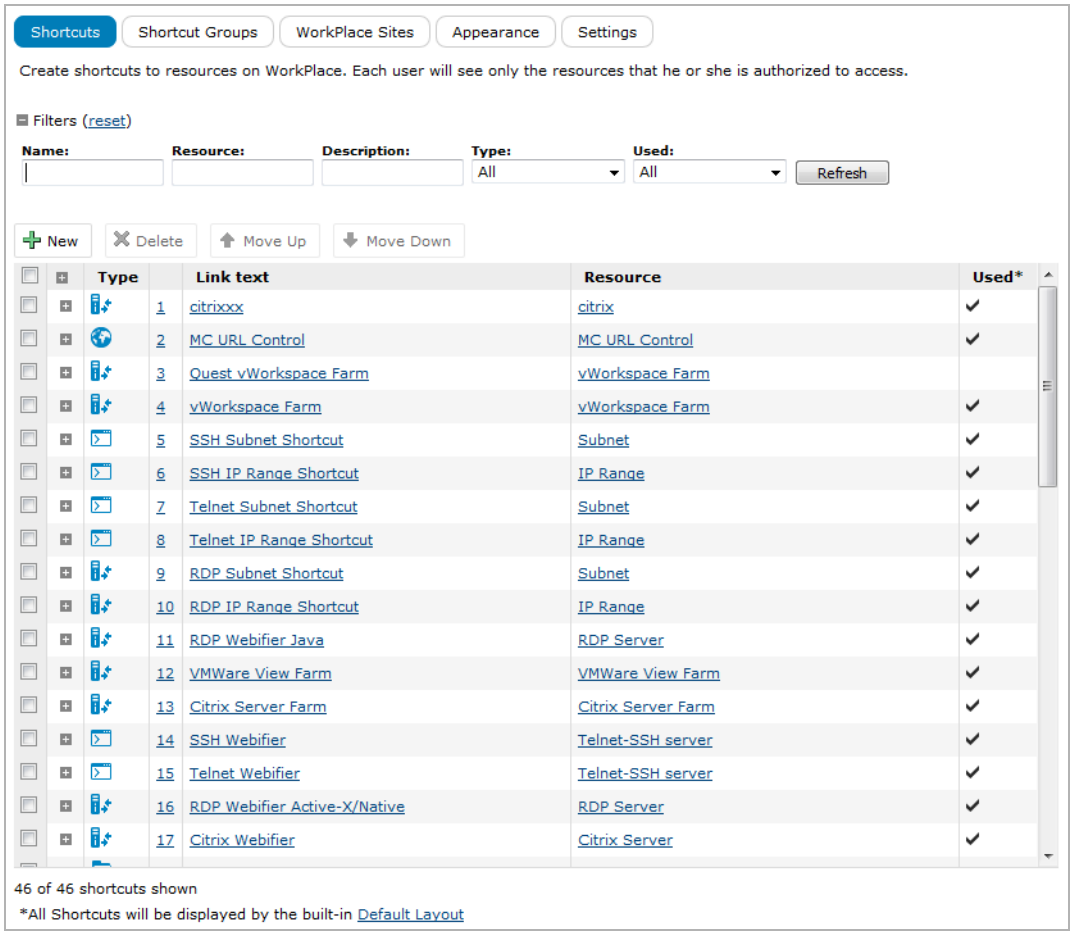
9 In the **Port** field, enter the port number you want.

10 Click **Save**.

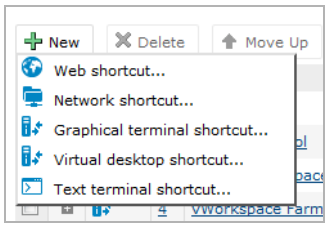
Configuring a Shortcut for Citrix HTML5 Receiver in Workplace

To configure a shortcut for the Citrix HTML5 Receiver in Workplace:

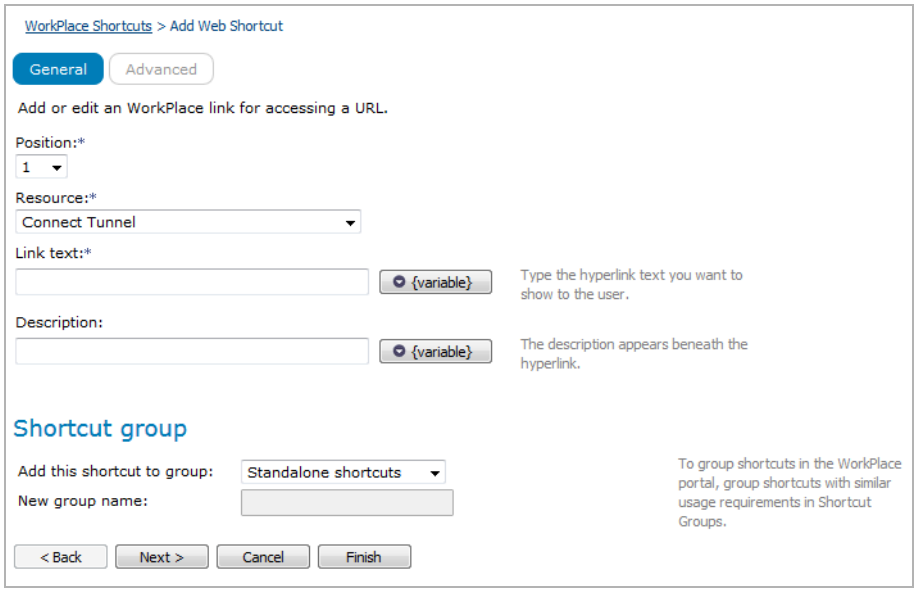
1 On the main navigation menu in AMC under **User Access**, click **Workplace**, and click the **Shortcuts** tab.



2 Click the **New** button. The drop-down menu appears.

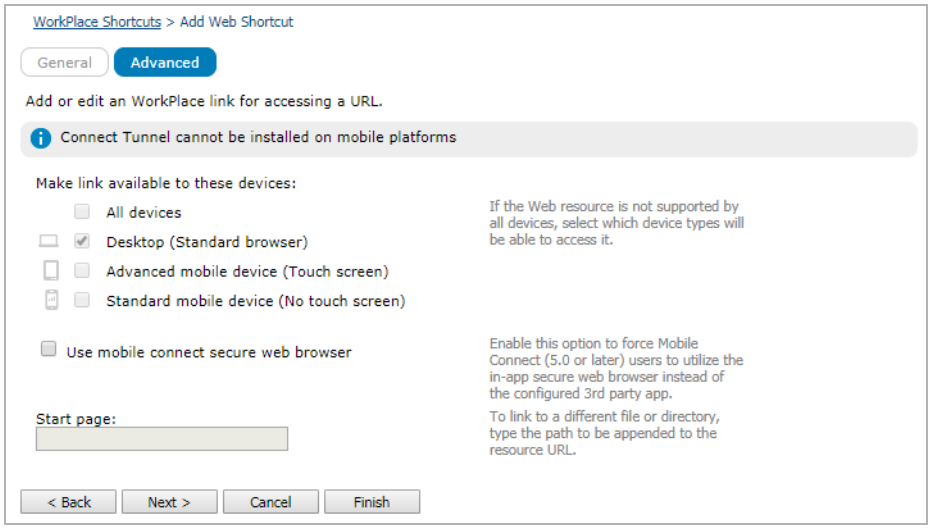


3 Select **Web shortcut**. The **Edit Web Shortcut** dialog appears.



4 Enter the name and description of the Citrix HTML5 Receiver in the appropriate fields.

5 Click **Next** to display the **Advanced** page.



6 Select the **All devices** checkbox.

7 In the **Start page** field, enter URL of the Citrix HTML5 Receiver:

```
/citrix/store2web
```

8 Click **Save**.

Defining an Access Control Rule and Resource for Terminal Server Access

This section describes how to provide terminal sever access to your users by defining an access control rule and creating a terminal server resource. For more information see, Access Control Rules and Adding Resources.

To define a terminal server resource:

1. From the main navigation menu in AMC un der **Security Administration**, click **Access Control**.
2. Click **New**. The **Add/Edit Access Rule** page appears.
3. In the **Number** field, type a number to specify the rule's position in the access rule list.
4. Use the **Action** buttons to specify **Permit**.
5. Complete the information under **Basic settings**:
    a. Leave **User** selected (so that the rule applies to users trying to access a resource).
    b. The **From** field specifies the users to whom the rule applies. For this example, leave the value as *Any user*.
    c. In the **To** field, click **Edit** to specify the target resource for this rule. A **Resources** dialog appears.
    d. Click **New** and then select **Host name** or **IP** from the list. If you have more than one terminal server on the same IP subnet, you can select **IP range** or **Subnet**. The **Add/Edit Resource** page appears.
    e. Type a name for the resource. For example, `terminal server`.
    f. In the **Host name or IP address** field, type the host name or IP address for the terminal server.
    g. Click **Save**. The **Add/Edit Resource** page closes.
6. Click **Finish**.

Managing Graphical Terminal Agents

This section describes how to configure the graphical terminal agents that give users access to terminal server resources through the SMA appliance. For information about providing access to terminal servers through WorkPlace, see Graphical Terminal Shortcuts.

Topics:

- Managing the Windows Terminal Services Agent
- Managing the VMware View Clients

Managing the Windows Terminal Services Agent

As shown in the **Windows Terminal Services agent** section of the **Configure Graphical Terminal Agents** page, the SMA appliance automatically uses either the native RDP client that is installed on the Windows client machine, or a cross-platform Java-based Windows Terminal Services agent that is pre-installed on the appliance. The cross-platform agent has been customized for use on the appliance and cannot be updated. The native Windows RDP client is updated on the client machine by Microsoft automatic updating.

Managing the Citrix Agent

To enable users to access Citrix resources, you must configure the appliance with two Citrix agents: an ActiveX control that runs on Windows, and a cross-platform Java applet.

To configure the appliance for each Citrix agent, upload the agent file to the appliance. The SMA appliance provisions the Citrix agents to users the first time they access a Citrix resource from WorkPlace.

To install the Citrix agents:

1 From the main navigation menu in AMC under **User Access**, click **Agent Configuration**.

2 In the **Other agents** area, under **Graphical terminal agents**, click **Configure**. The **Configure Graphical Terminal Agents** page appears.

3 To specify the ActiveX agent, configure the **Windows (ActiveX control)** settings under **Citrix agents**:

   a In the **Agent file** field, type the path for the agent file, or click **Browse** to locate it.

   b Click **Save** to transfer the file to the SMA appliance.

4 To specify the Mac OS X agent, configure the **Mac OS X** settings under **Citrix agents**:

   a In the **Agent file** field, type the path for the agent file, or click **Browse** to locate it.

   b Click **Save** to transfer the file to the SMA appliance.

5 To specify the Java agent, configure the **Cross-platform (Java applet)** area under **Citrix agents**:

   a In the **Agent file** field, type the path for the agent file, or click **Browse** to locate it.

   b Click **Save** to transfer the file to the SMA appliance.

Managing the VMware View Clients

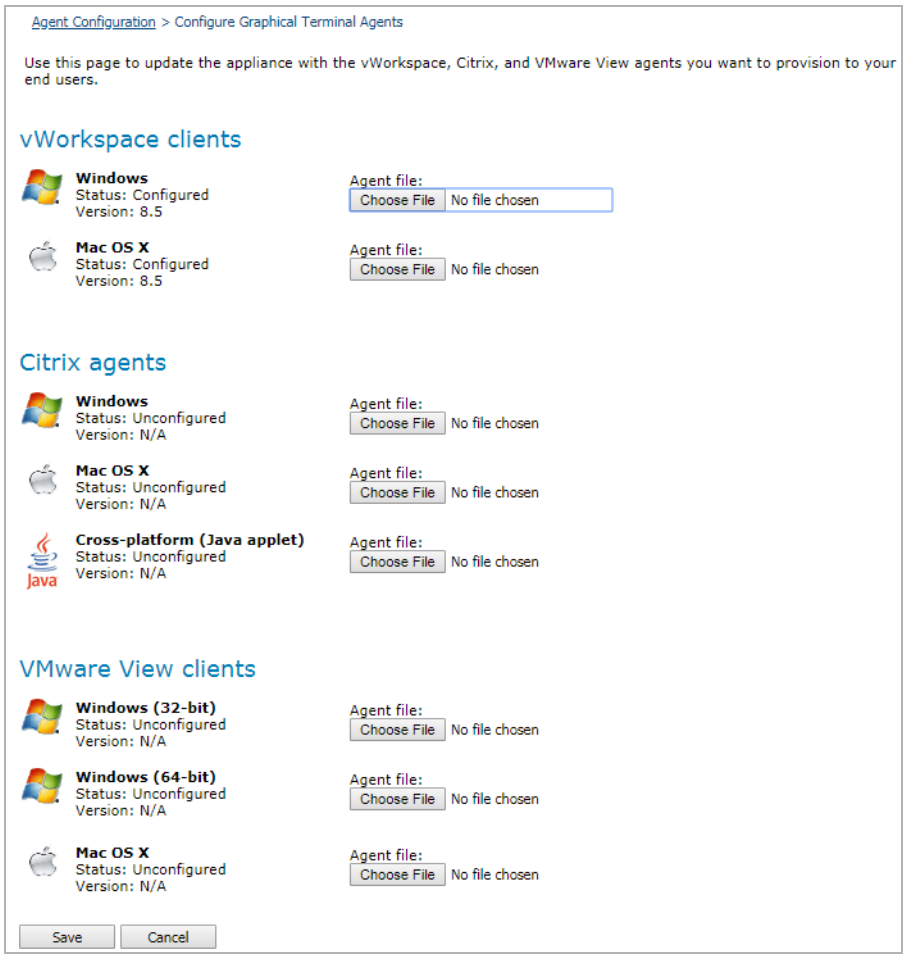
To enable 32-bit and 64-bit Windows users to access VMware resources, you must configure the appliance with two VMware View clients: a 32-bit Windows client and a 64-bit Windows client.

To configure the appliance for each VMware View client, upload the agent file to the appliance. The SMA appliance provisions the VMware View agents to users the first time they access a VMware View resource from WorkPlace.

To install the VMware agents:

1 From the main navigation menu in AMC under **User Access**, click **Agent Configuration**.

2 In the **Other agents** area, under **Graphical terminal agents**, click **Configure**. The **Configure Graphical Terminal Agents** page appears.



3 To specify the agent for a 32-bit Windows VMware View client, configure the **Windows (32-bit)** settings under **VMWare View clients**:

   a In the **Agent file** field, type the path for the agent file, or click **Browse** to locate it.

   b Click **Save** to transfer the file to the SMA appliance.

4 To specify the agent for a 64-bit Windows VMware View client, configure the **Windows (64-bit)** area under **VMWare View clients**:

   a In the **Agent file** field, type the path for the agent file, or click **Browse** to locate it.

   b Click **Save** to transfer the file to the SMA appliance.

5 To specify the agent for a Mac OS X VMware View client, configure the **Mac OS X** area under **VMWare View clients**:

   a In the **Agent file** field, type the path for the agent file, or click **Browse** to locate it.

   b Click **Save** to transfer the file to the SMA appliance.

Graphical Terminal Shortcuts

Graphical terminal shortcuts provide your users with Web-based access to resources that are available through Windows Terminal Services or Citrix hosts. Before you can create a shortcut to a terminal resource, you must first define the resource (for more information, see Adding Resources and Adding Citrix Server Farm Resources). You must also ensure that the correct graphical terminal agents are configured in AMC; for more information see Managing Graphical Terminal Agents.

This section describes how to configure graphical terminal shortcuts to individual Citrix or Windows Terminal Services hosts, and Citrix server farms.

Topics:

- Adding Graphical Terminal Shortcuts to Individual Hosts
- Adding Graphical Terminal Shortcuts to Server Farms

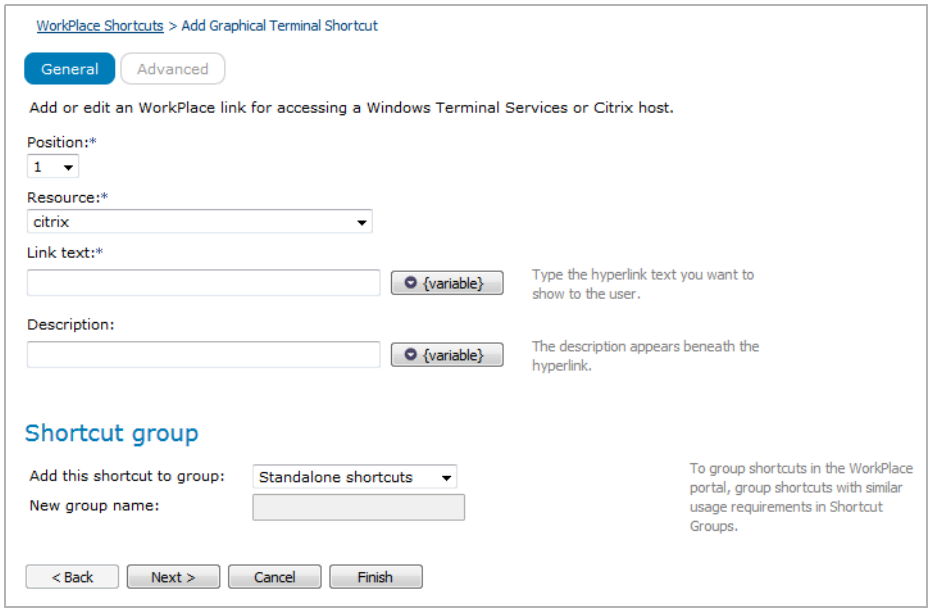
Adding Graphical Terminal Shortcuts to Individual Hosts

This section describes how to configure a graphical terminal shortcut to an individual Windows Terminal Services or Citrix host. For information about configuring graphical terminal shortcuts to Citrix server farms, see Adding Graphical Terminal Shortcuts to Server Farms.

To add a graphical terminal shortcut to an individual host:

1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 On the **Shortcuts** page, click **New** and then select **Graphical terminal shortcut** from the list. The **General** subpage of the **Add Graphical Terminal Shortcut** page appears.



3 In the **Position** field, specify the shortcut's position in the list.

4 In the **Resource** drop-down menu, select the host or IP address resource to which this shortcut will be linked. This menu contains the available defined resources. (**URL** and **Network share** resources do not appear because they cannot have graphical terminal shortcuts associated with them.)

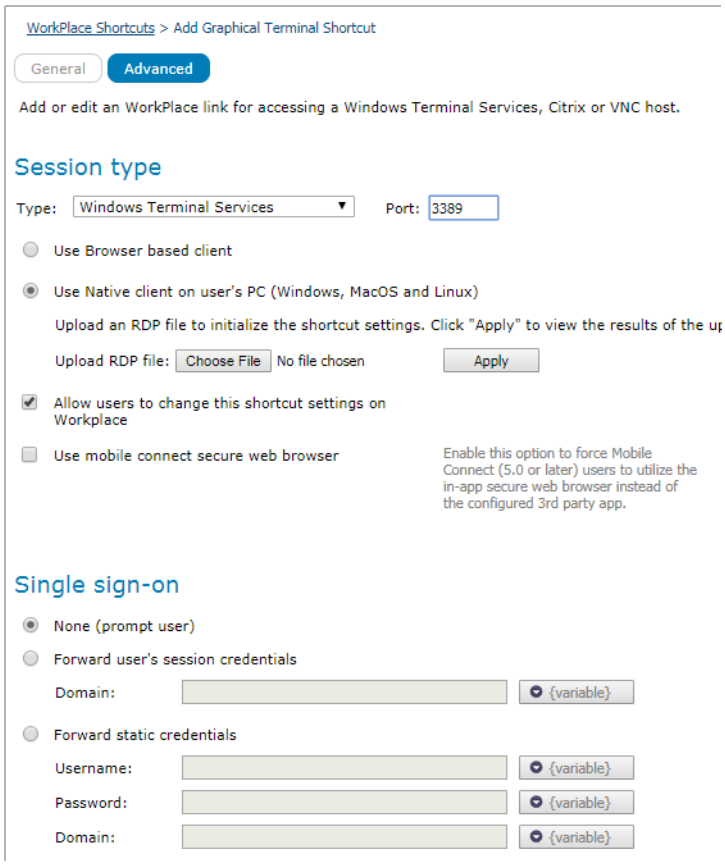
5 Enter the hyperlink that users will click to access the resource and (optionally) a description of the link that will appear next to it. These entries can include variables:

a In the **Link text** field, type the text for the hyperlink users will see. For example, if the resource you selected was the Windows domain for users' home directories, enter `Home directory`. Using a variable you can have the link be followed by the actual path: click **{variable}**, and then select **{URL_REF_VALUE}** from the list. Click **Insert** to add the variable to the link text, and then close the list by clicking **{variable}** again.

b In the **Description** field, type a descriptive comment about the shortcut. Although optional, a description helps users understand what the resource is. You can, for example, use a variable to be specific about the user's identity. Here's a sample entry for **Description**, followed by the explanatory text the user (in this case *LGeorge*) sees in WorkPlace:

```
{Session.userName}'s user directory –> LGeorge's user directory
```

6 Click **Finish** to save the shortcut with the current settings, or click **Next** to display additional configuration settings. The **Advanced** tab of the **Add Graphical Terminal Shortcut** page appears.



7 Under **Session type**, specify the type of session to initiate:

- Click **Windows Terminal Services** to initiate a connection to a Windows Terminal Services host. In the **Port** field, type the port number for the Windows Terminal Services connection. Select the **Automatically reconnect if session is interrupted** checkbox for seamless reconnection attempts.
- Click **Citrix** to initiate a connection to an individual Citrix host. In the **Port** field, type the port number for the connection. Optionally, you can specify a **Custom ICA file** by typing its path or clicking **Browse** to locate it. Custom ICA files contain additional configuration settings for the Citrix host.

8 Under **Single sign-on**, specify how you want user credentials forwarded to the host. Forwarding user credentials prevents the user from needing to log in multiple times (once to get to the appliance, and again to access the host).

- Click **None** to disable single sign-on and instead prompt the user for credentials.
- Click **Forward user's session credentials** to pass the username and password for authentication in WorkPlace along to the host.
- Click **Forward static credentials** to forward the same username and password for all users. Type the static **Username**, **Password**, and **Domain** to be forwarded for all users.

9 Specify **Startup options** if you want to automatically start an application when users click the graphical terminal shortcut.

- In the **Start application** field, type the path to the application.
- If the application requires a working directory, type its path in the **Working directory** box.

10 Specify **Display properties**:

- In the **Screen resolution** drop-down menu, select the appropriate resolution for the application. The default resolution is **1024 x 768 pixels**. To set a custom resolution, select **Custom...**, and then type the desired pixel values (width x height) into the fields that appear to the right. The minimum supported resolution is 640x480 and the maximum is 4096x2048 pixels.
- For **Terminal Services** shortcuts, select the **Allow users to select a different resolution** checkbox to give users control over their screen resolution. Users will be able to select their own resolution from a list box on the shortcut itself in Workplace. This checkbox is disabled for Citrix shortcuts.
- In the **Color depth** list, select the color depth. The default setting is **Lowest (8-bit)**.

  NOTE: Higher color depth settings can affect performance.

11 Specify **Resource redirection** settings as needed:

- Select the **Allow access to local drives** checkbox to enable users to access local drives during the session.
- Select the **Allow access to local printers** checkbox to enable users to access local printers during the session.
- Select the **Bring remote audio to local computer** checkbox to enable users to access remote audio during the session. Note that audio redirection is network intensive and can affect performance. The default is off.
- Select the **Share clipboard between local and remote computers** checkbox to enable clipboard copy/paste in both directions for the user. The default is to allow this feature.

12 Click **Finish**.

NOTE:

- Enabling single sign-on for shortcuts to Citrix hosts causes users' authentication credentials to be forwarded to the client, which can potentially compromise security.
- The Java open-source version of the Windows Terminal Services agent does not support any **Resource redirection** options.
- Enabling clipboard sharing is not appropriate for shortcut that provides read-only access to applications and sets of data.

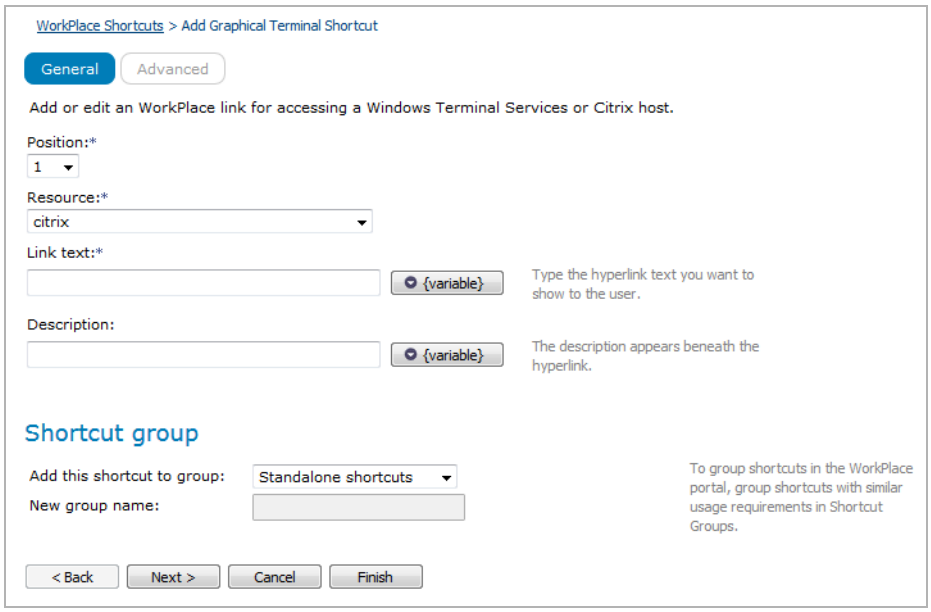
Adding Graphical Terminal Shortcuts to Server Farms

This section describes how to configure a graphical terminal shortcut to a Citrix server farm. For information about configuring graphical terminal shortcuts to individual Citrix or Windows Terminal Services hosts, see Adding Graphical Terminal Shortcuts to Individual Hosts.

To add a graphical terminal shortcut to a server farm:

1 From the main navigation menu under **User Access**, click **WorkPlace**.

2 Click **New**, and then select **Graphical terminal shortcut** from the list. The **Add Graphical Terminal Shortcut** page appears.



3 In the **Position** field, specify the shortcut's position in the list.

4 In the **Resource** drop-down menu, select the resource to which this shortcut will be linked. This list contains the available defined resources. (**URL** and **Network share resources** do not appear because they cannot have graphical terminal shortcuts associated with them.)

5 In the **Link text** field, type the hyperlink text that users will click to access the graphical terminal resource.

6 Enter the hyperlink that users will click to access the resource and (optionally) a description of the link that will appear next to it. These entries can include variables:

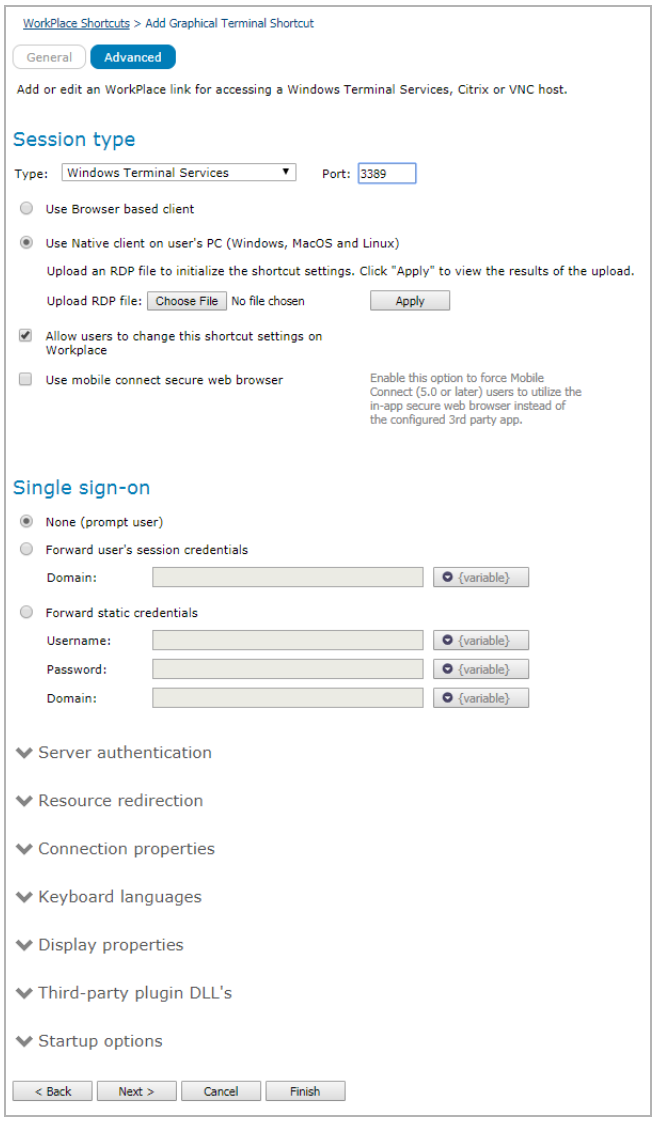
   a In the **Link text** field, type the text for the hyperlink users will see.

   b In the **Description** field, type a descriptive comment about the shortcut. Although optional, a description helps users understand what the resource is. You can, for example, use a variable to be specific about the user's identity. Here's a sample entry for **Description**, followed by the explanatory text the user (in this case *LGeorge*) sees in WorkPlace:

```
{Session.userName}'s user directory –> LGeorge's user directory
```

In WorkPlace you can set up groups to organize resources for your users, or have shortcuts appear singly. In the **Shortcut group** area, add your new shortcut to a new or existing group, or have it appear on its own in WorkPlace by adding it to the *Standalone shortcuts* group. (The order in which shortcuts appear can be changed on the **Configure WorkPlace Layout** page; see Creating or Editing a WorkPlace Layout for more information.)

7 Click **Finish** to save the shortcut with the current settings, or click **Next** to display additional configuration settings. The **Advanced** tab of the **Add Graphical Terminal Shortcut** page appears.



8 If necessary, you can specify a different **Port** for sending ICA traffic between the Citrix client and WorkPlace. The default port is **1494**.

9 Under **Single sign-on**, specify how you want user credentials forwarded to the host. Forwarding user credentials prevents the user from needing to log in multiple times (once to get to the appliance, and again to access the host).

- Click **None** to disable single sign-on and instead prompt the user for credentials.
- Click **Forward user's session credentials** to pass the username and password used for authentication in WorkPlace along to the host.
- Click **Forward static credentials** to forward the same username and password for all users. Type the static **Username**, **Password**, and **Domain** to be forwarded for all users.

10 Select the **Enable SSO to Citrix applications** checkbox to forward the user's WorkPlace login credentials to all published applications that are hosted on the Citrix server farm. Enabling single sign-on to Citrix applications provides more convenience for the user; however, it can potentially compromise security, as users' passwords are temporarily stored in cleartext on the client computer.

11 Specify **Display properties**:

- In the **Screen resolution** list, select the appropriate resolution for the application. The default setting is **1024 x 768 pixels**.
- In the **Color depth** list, select the color depth. The default setting is **16-bit**.

  NOTE: Higher color depth settings can affect download speed.

12 Click **Save**.

NOTE: Enabling single sign-on for shortcuts to Citrix hosts causes users' authentication credentials to be forwarded to the client, which can potentially compromise security.

Part 8

Mobile Connect

- Using SMA with Mobile Connect

11

Using SMA with Mobile Connect

About using SMA with Mobile Connect

Mobile Connect has general design constraints and implementation issues with Application Access Control (also known as Per-App VPN) on iOS, OS X and Android. The following information provides considerations and caveats that you may need to know when configuring Mobile Connect to connect to an SMA appliance.

For more information about Mobile Connect, see the *Mobile Connect User Guide* for your device, available at SonicWall Support.

General Limitations

Topics:

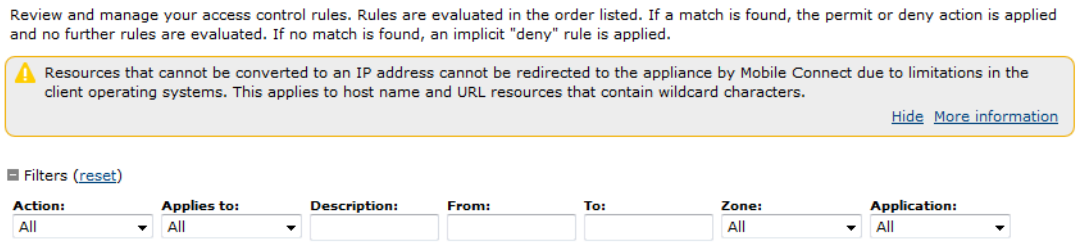
Hostname Redirection

Mobile Connect on all supported platforms can perform DNS monitoring (like Connect Tunnel for Windows/Mac OSX/Linux), but it is unable to add a route. The current version logs a `Corresponding IP resource is missing` message. In addition, Mobile Connect does not have dynamic routing support:

- Mobile Connect does not include dynamic routing like other clients (Windows/Mac/Linux), so all IP subnet or ranges corresponding to a host or domain that the user would access should be added as

resources in AMC and included in Access Control rules appropriate for the user/groups that need access to the destination host or domain.

- Because Mobile Connect cannot handle dynamic routing, Secure Mobile Access 11.x.0 and higher include warnings that resources containing wild cards will not work.



DNS Routing with Split Tunnel

In split tunnel, only DNS requests that match the VPN DNS suffix search domains will use the VPN DNS servers. Requests to domains that do not match the VPN DNS suffixes go to the local (3G/WiFi connection) DNS servers. This is true for connections to all server appliances: E-Series SMA, SMB SMA, and UTM. This is a limitation of Apple's iOS.

Example DNS suffix: `example.com`

- Query for `www.example.com` uses VPN DNS Server
- Query for `intranet.corp.example.com` uses VPN DNS Server
- Query for `www.google.com` uses Local DNS server
- Query for `i2.examplecorp.com` uses Local DNS server

This behavior can be overridden in Split Tunnel mode by adding a CEM entry in AMC.

DNS Routing with Redirect-All

In tunnel-all mode (also called Redirect-All), all DNS requests are prioritized to use the VPN DNS servers.

Mobile Connect General Limitations

Mobile Connect does not currently provide messaging to the end-user when an application is attempting to access something on the corporate network that either the user or application is not allowed to access. Currently, it is silently dropped. SonicWall is aware of this limitation and is working to enhance Mobile Connect in a future release to provide more information and messaging to the user in these types of conditions.

Files

Mobile Connect 3.0 introduces secure mobile access to files through new File bookmarks. File bookmarks allow secure access to files by first checking and enforcing the server configured file policy, and then securely downloading and displaying the file within the Mobile Connect app. Server configured policies include control over whether a file may be printed, copied to the clipboard, opened in a third party app, or securely cached on the iOS device. File bookmarks can also be created to folders or file share root directories to allow directory navigation.

Application Access Control

Application Access Control works on Android and iOS/Mac OSX platforms for SonicWall Secure Mobile Access as follows:

- VPN-Controlled Apps
- iOS/Mac OS X Specific Limitations
- Android Specific Limitations
- Windows RT MC limitations

VPN-Controlled Apps

When a Mobile Connect user removes authorization of an app, the application no longer remains a VPN-controlled app. Any further access through the app behaves like the app was never in the App. Checking or unchecking an app takes effect immediately. There is no need to disconnect and reconnect Mobile Connect.

When using Application Access Control can a user continue to access network resources or personal web sites with an application approved for use if the user removes authorization of the application?

For example, while a user is accessing a corporate resource with Chrome (an application approved for use) the following steps occur in this instance:

1. When Chrome is checked, Chrome can send traffic over the corporate network.
2. When Chrome is unchecked, the client guarantees that none of the user's traffic is sent via the tunnel to the corporate network.
3. Whether Chrome is checked or unchecked, if the user navigates to a location not on the corporate network that traffic flows out the user's normal network interface. Traffic to/from a location not on the corporate network never uses the tunnel. That is, SMA always uses **Split Tunnel** and never **redirects all** when using Application Access Control.
4. Traffic to destinations inside the corporate network that the user has been granted access to will be either delivered to the tunnel if the app is checked or dropped if the app is unchecked. Traffic to destinations inside the corporate network will never flow out the normal interface of the user's device.

   The checkbox only controls if the traffic is dropped on the floor or sent down the tunnel, it does not have the ability to determine where the traffic will flow. That kind of dynamic routing is not something we can support with the current client interfaces.

It is not strictly true that applications under control are not affected by the VPN. If the Mobile Connect client is running and connected to the server, all traffic bound for IP addresses on the corporate network from ANY application (even those not listed) is captured. Traffic not from a listed application is dropped. This is important if there are IP address collisions, those same issues can occur with Application Access Control and will affect all applications on the user's device whether they are under control or not under control.

iOS/Mac OS X Specific Limitations

In some cases, additional limitations are imposed on Mobile Connect by Apple. SonicWall is continuing to work with Apple on several of these limitations to further empower the BYOD story for administrators and users. Some examples of limitations are:

- Mobile Connect on iOS and Mac OSX uses a proxy-based mechanism to redirect application data to the corporate network. This has specific server-side scale limitations that SonicWall is aware of. SonicWall is continuing to work with Apple on finding the right solution for BYOD administrators and users on iOS and Mac OSX devices.

- Version information is not provided during Application Learning on iOS and Mac OSX. To get version information, view app details in the App Store.

Android Specific Limitations

Google does not have built-in per-app VPN support for Android like Apple does on iOS and Mac OSX. Therefore, Mobile Connect uses a proprietary mechanism to perform the per-app VPN capabilities and runtime verification on Android devices. SonicWall is continuing to work with Google to provide a more holistic approach to per-app VPN inside of Android to further empower the BYOD story for administrators and users.

Windows RT MC limitations

- Windows RT MC does not support App Access Control
- Limited EPC support

Supported EPC Profiles

End Point Control policy checking is performed before establishing the VPN connection established. Mobile Connect supports the attributes shown ni the Supported EPC profiles table.

Supported EPC profiles

Android	iOS	Mac OSX
Antivirus App	Application	Antivirus Program
Personal Firewall App	Client Certificate	Antispyware Program
Application	Directory Name	Personal Firewall Program
Client Certificate	Equipment ID	Application
Directory Name	File Name	Client Certificate
Equipment ID	iOS Version	Directory Name
File Name		Equipment ID
Android Version		File Name
		Mac OS version

IPV6 Limitations

If a device has IPv4 and IPv6 and the DNS host name resolves to an IPv6 record for the appliance, Mobile Connect uses IPv6 to communicate with the appliance. Otherwise, it falls back to IPv4.

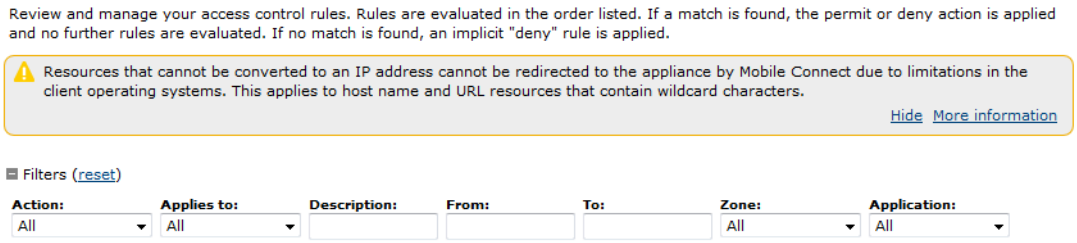
URL Control Caveats

The contents of the following fields adversely affect Mobile Connect functions:

- Server field setup with `http` or `https` causes a Mobile Connect failure.

- Realm name limitations require that URLs are correctly formatted, without wild cards in the host name or URL.

Warnings are shown on various page where wild cards might interfere with Mobile Connect operations:



URL Control allows other mobile applications to pass action requests using special URLs to Mobile Connect. These action requests can create VPN connection entries and connect or disconnect VPN connections. For example, another application can launch Mobile Connect, access internal resources as needed, and then disconnect by using the `mobileconnect://` or `sonicwallmobileconnect://` URL scheme. Some common examples of URL Control are:

- Add profile: `mobileconnect://addprofile[/ ]?name=ConnectionName&server=ServerAddress[&Parameter1=Value&Parameter2 =Value...]`
- Connect: `mobileconnect://connect[/ ]?[name=ConnectionName|server=ServerAddress][&Parameter1=Value&Parameter2 =Value...]`
- Disconnect: `mobileconnect://disconnect[/]`

More detailed information is provided in the SonicWall *Mobile Connect User Guide* for your mobile device.

Configuring Trusted Network Detection

The Apple Trusted Network Detection (TND) enhancement to the iOS Connect On Demand feature is available in iOS 6. TND results in the following:

- Can be used only with Connect on Demand.
- Extends the Connect on Demand functionality by determining whether the user is on a trusted network.
- Configured with the iPhone Configuration Utility.
- Used for Wi-Fi connections only. When operating over other types of network connections, Connect on Demand does not use TND to determine whether a VPN should be connected.

Connect On Demand starts a VPN connection whenever a user tries to access a destination with a hostname specified in the domains list. For example, if `*.example.com` is in the **Always Connected** list, when a user accesses `internal.example.com`, the client starts a VPN connection regardless of the network to which the device is currently connected. TND compares the VPN and local DNS servers and DNS suffixes to determine whether to use Mobile Connect and dial the VPN, as shown inthe Trusted Network Detection according to suffixes table.

Trusted Network Detection according to suffixes

DNS Suffixes	DNS Servers	Login
None	None	Refused - no VPN
None	Same	Refused - no VPN
Same	Same	Refused - no VPN
Same	Same and others	Allowed
Same	Different	Allowed
Different	Same	Allowed
Some	Some	Allowed

Consult documentation from Apple Inc. for more information about Trusted Network Detection and Connect on Demand.

To determine if TND is available for your connection, tap the info indicator in the **Status** row on the **Connection** tab. This displays the buttons used to enable/disable TND if available.

To configure TND:

1 Tap the **Info** icon in the **Status** row on the **Connection** tab.

2 Ensure **Connect On Demand** is turned on.

3 Turn on **Trusted Networks**.

NOTE: In Mobile Connect for iOS 3.0, File bookmarks are supported only on the SonicWall SMA appliances with SMA 7.5 or later firmware. Support for File bookmarks in SMA and Next Generation Firewall appliances is expected in a future release.

Part 9

Appendix

- Appliance Command-Line Tools
- Troubleshooting
- Best Practices for Securing the Appliance
- Configuring SAML Identity Providers
- Log File Output Formats
- Internationalization Support
- SonicWall Support
- Warranty and Licensing

A

Appliance Command-Line Tools

About the Tools

Most of the configuration management tasks that you need to perform—backing up and restoring your appliance configuration, applying upgrades, and so on—can be done using the Web-based Appliance Management Console (AMC), on the **Maintenance** page. This section describes tools on the appliance that perform these same tasks and some others, for administrators who prefer to work on the command line. See the Appliance command-line tools table.

Appliance command-line tools

Tool	Purpose
Setup Tool (`setup_tool`)	Configure the appliance by running Setup Tool from a serial connection using a laptop computer or terminal. • See Configuring a New Appliance Using Setup Tool. **NOTE:** `setup_tool` and `cluster_tool` are integrated into `config_reset`.
Backup Tool (`config_backup`)	Save the current configuration file. • See Saving Configuration Data.
Host Validation Tool (`checkhosts`)	Show a list of the hosts referred to in your appliance resources, and find out if they are accessible and can be resolved in DNS. • See Validating Hosts

See Managing Configuration Data and Upgrading, Rolling Back, or Resetting the System for a description of configuration data files and how to manage them in AMC.

Configuring a New Appliance Using Setup Tool

The recommended way to set up a new appliance is to use the LCD controls on the front of the appliance to enter information that will enable a Web browser to connect to your appliance so that you can connect to the Appliance Management Console and run Setup Wizard, as described in Powering Up and Configuring Basic Network Settings.

If you prefer using a command-line utility, you can configure the appliance by running Setup Tool from a serial connection using a laptop computer or terminal.

Topics:

- Tips for Working with Setup Tool
- Using Setup Tool

Tips for Working with Setup Tool

Here are some tips for working with Setup Tool:

- Yes or no questions include a `[y]` or `[n]` at the end of the prompt; type the appropriate letter and then press **Enter** to display the next question.
- To delete a character, press **Backspace**. (On a Windows-based PC, you can also press **Delete** to remove a character.)
- When typing an IP address or netmask, use the standard IP address format of four octets (`w.x.y.z`). Setup Tool provides basic error checking (for example, validating that the gateway you type is on the same subnet as the appliance).
- Type `q` to quit Setup Tool and discard your changes.

Using Setup Tool

When you run Setup Tool from the command line, it prompts you to accept the Secure Mobile Access End User License Agreement (EULA), create a root password, and provide an IP address, subnet mask, and internal default gateway.

To run Setup Tool:

1. Make a serial connection to the appliance (see Powering Up and Configuring Basic Network Settings), and then turn on the appliance using the power button.
2. If the appliance has not yet been configured, or if you have just reset it using either Factory Reset Tool or Config Reset, Setup Tool will run automatically.
3. When you're prompted to log in, type `root` for the username; press **Enter** to move to the next page.
4. You're prompted to type an IP address, subnet mask, and (optionally) a gateway for the internal interface. You use this interface to connect to the appliance from a Web browser and continue setup using AMC.

   `IP address:`

   - Type an IP address for the internal interface connected to your internal (or private) network and then press **Enter**.

   `Subnet mask:`

   - Type a netmask for the internal network interface and then press **Enter**.

   `Gateway:`

   - If the computer from which you'll access AMC is on a different network than the appliance, you must specify a gateway. Type the IP address of the gateway used to route traffic to the appliance and then press **Enter**.

     If you're accessing AMC from the same network on which the appliance is located, simply press **Enter**.
5. You're prompted to review the information you provided. Press **Enter** to accept the current value, or type a new value and then press **Enter**.

6 Finally, you're prompted to save and apply your changes.

- Press **Enter** to save your changes.

At this point, Setup Tool saves your changes and restarts the necessary services. It also generates SSL keys using the information you provided (SSH requires security keys that it exchanges with remote SSH clients and servers). After SSH is configured using Setup Tool, it will display a message saying that it is generating these keys.

During this time, you will receive minimal feedback; be patient and do not assume that Setup Tool is not responding. When Setup Tool is finished, a message appears indicating that the initial setup is complete. This message also includes the URL for accessing AMC.

Saving and Restoring Configuration Data

Included on the appliance are a number of command-line administrative tools for saving and restoring configuration data:

- Config Backup Tool—Saves the current configuration file
- Config Restore Tool—Restores a saved configuration file

The AMC method for saving and restoring configuration data is more convenient, but it imports and exports a subset of the data that can be saved and restored using the command-line tools. the AMC method vs. command-line tools table compares the two methods.

AMC method vs. command-line tools

Configuration item	AMC	Command-line tools
Access policy	x	x
Certificates	x	x
WorkPlace customizations	x	x
Node-specific network settings	x	x

Topics:

- Saving Configuration Data
- Validating Hosts

Saving Configuration Data

Backup files are saved to a compressed `tar` file (by default, `/var/backups/cfgback.tgz`). It is a good practice to back up your system regularly, especially when making many system customizations.

To back up your configuration using Backup Tool:

1 Connect to the appliance using SSH or a serial connection, and log in as `root`.

2 Type `config_backup`, specifying any of the following optional parameters:

```
config_backup [-t <tarfile>] [-q] [-d <debuglevel>] [-h]
```

Parameters for configuration backup

Parameter	Description
-t <*tarfile*>	Backs up your configuration to the specified file. This parameter is required only if you want to back up to a different backup file than the default file: `/var/backups/cfgback.aea` Setting this parameter is not recommended, because the restore program normally looks for the default file when restoring.
`-q`	Turns off the confirmation prompts (making the backup “quiet”). Normally, you are prompted when you might overwrite an existing backup file.
`-d` <*debuglevel*>	Specifies how much information to display about the backup operation. Set <*debuglevel*> to an integer between `0` (no information) and `10` (complete information). The default is **1** (normal information).
`-h`	Shows help listing available parameters.

When you run Config Backup Tool, it saves your system configuration files to a backup file with the name and location specified above. If a backup file already exists at that location, you are prompted to confirm that you want to overwrite it (unless you use the `-q` *parameter*).

NOTE: Your configuration is automatically backed up if you install a new system update using Update Tool. This will not overwrite manual backups created by an administrator.

For additional protection, use a program like SCP to copy the `.tgz` file from the appliance to a separate location, such as a drive on your network or removable media.

You can automate backups by adding Backup Tool to a script. In this case, use the `-q` parameter to suppress confirmation prompts.

Validating Hosts

Many of the access control rules that you create in AMC point to host resources; as each rule is evaluated, the appliance tries to resolve these hosts in DNS. When resources are added, deleted, and modified on an appliance, some may become outdated, or completely unreachable. If there are any hosts that can’t be resolved you may also find that performance slows down.

There is a script you can run from the command line on the appliance (using SSH) called `checkhosts`, located in `/usr/local/extranet/bin`. By reporting on hosts that may no longer be functional or reachable, this tool can help you update your resources and access control lists so that policy evaluation is more efficient.

For help with the command syntax, type the following:

```
<appliance prompt>:/usr/local/extranet/bin/checkhosts -h
```

B

Troubleshooting

About Troubleshooting

This Appendix provides general troubleshooting instructions and discusses the troubleshooting tools available in the Appliance Management Console (AMC). Failure in core networking services (such as DHCP, DNS, or WINS) will cause unpredictable failures.

The **User Sessions** page in AMC can be used to monitor, troubleshoot or terminate sessions on your appliance or HA pair of appliances. You can sort through the summary of session details and, if needed, display details on how a device was classified, and why. About 24 hours worth of data is kept; even items that have been deleted or modified are displayed. See Viewing User Access and Policy Details.

General Networking Issues

These troubleshooting tips for networking issues are grouped by type of solution. Before using the ping utility, make sure that **Enable ICMP pings** is enabled on the **Configure Basic Network Settings** page. Some tips are given in these tables:

- the Troubleshooting tips for networking issues table
- the Troubleshooting tips for networking issues: hardware table
- the Troubleshooting tips for networking issues: third-party solutions table

Troubleshooting tips for networking issues

Utility	Troubleshooting tip
Ping the external interface	Ping the external interface to verify the network connection. If you can ping a host's IPv4 or IPv6 address, but not its fully qualified domain name, there is a problem with name resolution. You can issue the `ping` command from the command line or from within AMC (see Ping Command).
Capture network traffic on the external interface	To verify that traffic is reaching the appliance and being returned, use the network traffic utility in AMC, which is based on `tcpdump`. You can send this network traffic data to Technical Support, or review it using a network protocol analyzer like Wireshark. See Capturing Network Traffic for more information.
Ping the network gateway(s)	Ping the external gateway and/or internal gateway. You can issue the `ping` command from the command line or from within AMC. For more information, see Ping Command.
Use ping to test DNS	If you experience DNS problems, first determine whether client DNS resolution is working: 1 Make sure that the client machine has Internet access. 2 At a DOS command prompt, type `ping google.com`. You should see a response like this: `Pinging google.com [nnn.nnn.nnn.nnn]` If basic DNS functionality is available, the IP address in square brackets is resolved by DNS lookup, demonstrating that basic DNS is functioning at the client. If DNS is not available, the ping program will pause for a few seconds and then indicate that it could not find the host `google.com`.
Try to use DNS to resolve the appliance host name	If you continue to experience DNS problems, determine whether DNS can resolve the appliance host name. Repeat the ping procedure described above but replace `google.com` with the host name of your appliance. If `ping` finds: • No address for your host name, troubleshoot the DNS server that should be serving that host name. Try working around client connection issues by replacing the host name with the IP address of the appliance's external interface. • An address for your host name, but no replies appear (`Request timed out`), ICMP echoes may be blocked at any hop between the client and the appliance.
Clear the ARP	If you've recently assigned a new IP address to the appliance, be sure to clear the local Address Resolution Protocol (ARP) cache from network devices such as firewalls or routers. This ensures that these network devices are not using an old IP-to-MAC address mapping.

Troubleshooting tips for networking issues: hardware

Hardware	Troubleshooting tip
Cables	Check all network cables to be sure you don't have a bad cable.
Bypass the firewall	If you're using network address translation (NAT), you might be blocked by a firewall. Temporarily bypass the firewall by connecting a laptop to the appliance on the physical interface using a cable, and then verify network connectivity. If this type of connection is impractical, try placing your laptop on the same network segment as the external interface of the appliance (to get as close to the appliance as possible).
Configure the switch port	If you experience network latency, such as slow SCP file copying or slow performance by the Web proxy or network tunnel service, the problem may be due to configuration differences between the appliance interface settings and the switch ports to which the appliance is connected. It's possible for a switch to improperly detect duplex-mode settings (for example, the appliance is configured at full duplex but the switch detects half duplex). Cisco has documented such problems with its switches. To resolve this problem, disable auto negotiation. Instead, configure the switch port to statically assign settings that match the appliance. You must check both switch ports and both appliance interface settings (internal and external, if applicable). If even one interface/switch port is mismatched, performance suffers. If you are experiencing network latency but your appliance/switch ports are configured correctly, the problem lies somewhere else in the network. It could also be an application-level issue (such as slow name resolution on the DNS server being accessed by the Web proxy or network tunnel service).

Troubleshooting tips for networking issues: third-party solutions

Third-party solution	Troubleshooting tip
Verify that traffic is not being filtered out	Review the contents of the log file */var/log/kern.iptables* while a connection attempt is failing. If packets are reaching the appliance but are being dropped or denied by **iptables** (a firewall running on the appliance), review the **iptables** ruleset by running the following command: `iptables -L -n -v` Traffic that is filtered by **iptables** is logged but not forwarded to an external syslog server.

Verify a Downloaded Upgrade File

You can use AMC to install version upgrades, as described in Upgrading, Rolling Back, or Resetting the System. To make sure that the update was successfully transferred to your local computer, compare its checksum against the one in the `.md5` file you extracted from the `.zip` file.

To verify the MD5 checksum on your PC, use a Windows- or Java-based utility. Microsoft, for example, offers an unsupported command line utility on their site named File Checksum Integrity Verifier (FCIV):

To verify the downloaded file on a PC:

1 At the DOS command prompt, type the following, which returns a checksum for the downloaded file:

```
fciv <upgrade_filename>.bin
```

2 Open the associated `.md5` file (which you downloaded from the MySonicWall Web site) using Notepad or another text editor:

```
notepad <upgrade_filename>.bin.md5
```

3 Compare the two check sums. If they match, you can safely continue with your update. If they differ, try the download again and compare the resulting check sums. If they still don't match, contact SonicWall Technical Support.

To verify the downloaded file on the appliance:

1 Type the following command, which returns a checksum for the downloaded file:

```
md5sum <upgrade_filename>.bin
```

2 Open the associated `.md5` file:

```
cat <upgrade_filename>.md5
```

3 Compare the two checksums.

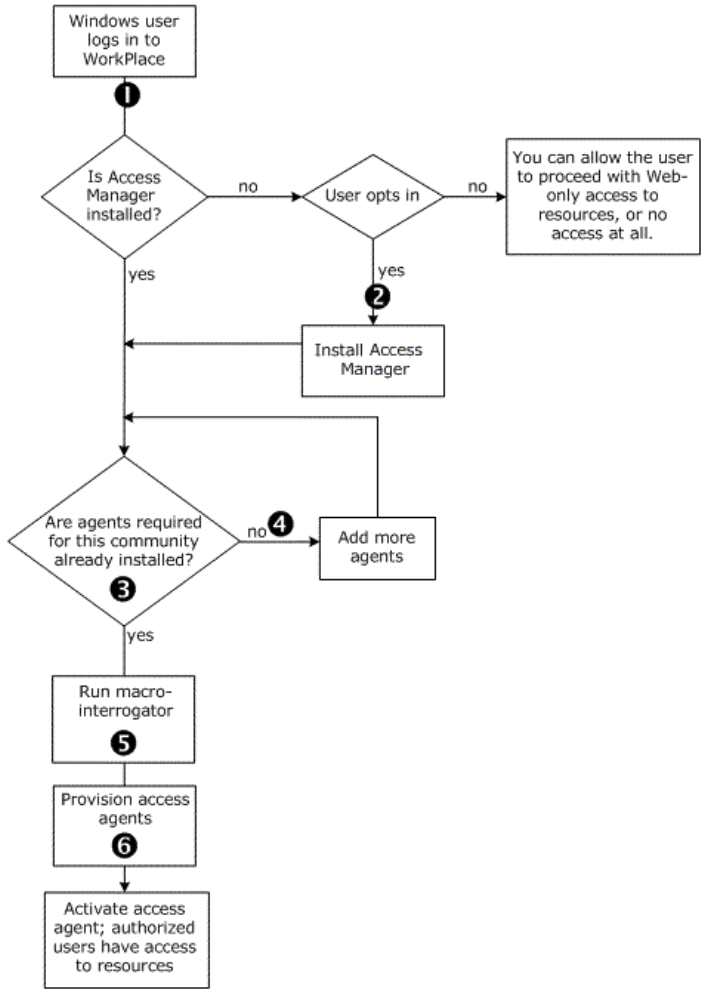
Troubleshooting Agent Provisioning (Windows)

Secure Endpoint Manager (SEM) is a component that provisions Windows users with EPC and access agents when they log in to WorkPlace. If something goes wrong during provisioning, the error is recorded in a client installation log (identified by username) that you can view in AMC.

To get to the App data folder, click **Start -> Run**, type in `%appdata%`, and press **Enter**.

Provisioning process presents a broad overview of the provisioning process. At Step 2 through Step 6, information is appended to a file named `epiBoostrapper.log` (stored in `\Documents and Settings\<username>\Application Data\Secure Mobile Access\LogFiles\`).

Provisioning process



To troubleshoot agent provisioning:

1 Micro-interrogation (JavaScript is used to get basic platform and browser information):

- Is this a Microsoft OS? Is ActiveX enabled? If not, is Java enabled?
- If neither is available, the user sees an error message.

2 Fetch `epiBootstrapper.exe`, a self-extracting executable in MSI (Microsoft Windows Installer) format; the executable also includes the macro-interrogator used in Step 5.

3 Fetch the list of Advanced EPC agents and install it. At a minimum, `OPSWAT.msi` is installed.

4 Fetch additional Advanced EPC agents as required by the community.

5 Macro-interrogation: Search for both Advanced EPC and other device profile attributes, such as a particular file name, or a Windows registry key.

6 Provision agents (for example, data protection, or OnDemand Tunnel).

For related topics, see:

- Client Installation Logs (Windows)
- Client and Agent Provisioning (Windows)

AMC Issues

One of the most common errors in AMC is to make a configuration change and then forget to apply it. A **Pending changes** link appears in the top-right corner in AMC whenever changes have been made but not applied. Click the link, and then click **Apply Changes** to automatically restart the services.

Troubleshooting AMC issues

Issue	Solution
Can't access AMC	If you can't access AMC, connect a cable to the internal network interface on the appliance and verify that you can access AMC without any network. If this type of connection is impractical, put the laptop on the same network segment as the internal interface (to get as close to the appliance as possible). If you still can't access AMC, make sure your URL includes the `https://` protocol identifier. Also verify that you've included the port number 8443 in the URL.
Can't log in to AMC on the internal network	If your browser cannot log in to AMC on the internal network, ensure that traffic from the client to the IP address of the appliance's internal interface actually arrives at the internal interface. Using the network traffic utility in AMC, which is based on `tcpdump`, you can capture traffic on the internal interface (`eth0`). Any client attempts to reach AMC should show traffic TCP SYN packets from the client's IP address directed to port 8443. See Capturing Network Traffic for more information.
Can't log in	If AMC login fails with the error `Invalid Login Credentials`, verify the spelling of your username and password. Passwords are case-sensitive; ensure that **Caps Lock** and **Num Lock** are not enabled.
CPU utilization is spiking	If you are using nested group lookup on your LDAP or AD authentication server, make sure that you are also caching the lookup results: searching the entire directory tree takes time and increases the CPU usage on both the appliance and your authentication server.

Authentication Issues

An authentication server is referenced in a realm.

Troubleshooting authentication issues

Issue	Solution
Access to the external authentication server(s)	Verify that you can access the external authentication server by using the network traffic utility in AMC, which is based on `tcpdump`. You can send this network traffic data to Technical Support, or review it using a network protocol analyzer like Wireshark. See Capturing Network Traffic for more information.
Authentication server credentials	Verify that AMC contains the proper credentials for access to your external server. For LDAP, check the **Login DN** and **Password** settings, and click **Test Connection**. For RADIUS, check the **Shared secret** setting.

Troubleshooting authentication issues

Issue	Solution
Authentication server logs	Review the authentication server logs. Make sure you're not entering invalid credentials or having connectivity problems.
User authentication using an LDAP or AD server takes too long or times out	If you are using nested group lookup on your LDAP or AD server, make sure that you are also caching the lookup results, because searching the entire directory tree takes time. To reduce the load on your directory and get better performance, cache the attribute group or static group search results by selecting the **Cache group checking** checkbox.

Using Personal Firewalls with Agents

Some firewall products display a security alert during the provisioning of Secure Mobile Access agents or EPC components. This is because the firewalls are regulating outbound connections by process (in addition to port and protocol). In most cases, the user can simply “unblock” or “permit” the outbound connection.

Connect Tunnel users should configure their personal firewalls to allow the Secure Mobile Access VPN service (`ngvpnmgr.exe`) and Secure Endpoint Manager (`AventailComponents.exe`) to access the Internet and to add the SMA appliance by host name or IP address as a trusted host or zone. In addition, Windows Vista users should make an exception for `epiVista.exe`.

There are a few firewalls, such as one supplied by Trend Micro, that do not permit a user with restricted rights to override the firewall settings. For corporate systems on which users have limited access rights, you may need to update the firewall settings before deploying the Secure Mobile Access VPN so that users won’t have to respond to security dialog prompts.

Consult the documentation for your corporate personal firewall to determine the firewall policy. If a firewall update proves necessary, a rule that allows all processes to communicate with the appliance over port 443 is recommended.

Secure Mobile Access Services Issues

To see a brief summary of which services are running, click **Services** on the main navigation menu.

Topics:

- Web Proxy Service Issues
- Web Proxy Agent Issues
- Tunnel Issues

Web Proxy Service Issues

- Temporarily increase the server log level in AMC to **Verbose**. (Don’t forget to click **Pending changes** in the top-right corner of any AMC page, and then click **Apply Changes** to automatically restart the service.)
- To see the Web proxy service log, click **Logging** in the main navigation menu, and then select **Web proxy audit log** from the **Log file** list. Verify that your connection request appears in the log.
- Verify that your DNS server can resolve the Web proxy service **Server name** setting in AMC to the IP address of the Web proxy service interface. You can use the lookup tool within AMC (see Using DNS Lookup), or you can issue the `nslookup` or `dig` commands from a command prompt.

- If your network uses NAT to translate IP addresses, make sure that the Web proxy service **Server name** setting contains the IP address of the outside (or public) IP address that is being substituted using NAT.

Web Proxy Agent Issues

The Web proxy agent provides access to URL resources on Windows systems with Internet Explorer 7.0 or later. WorkPlace indicates that Web proxy mode is active on a client by displaying **Secure Mobile Access Web proxy** in the **Connection Status** area.

To troubleshoot whether the Web proxy agent is running properly on a client machine, follow these steps:

1. On the client machine, press **Ctrl**+**Alt Delete**, and then click **Task Manager**.
2. Look in Windows Task Manager's **Processes** list for the process `ewpca.exe`. If that file is present, the standard Web mode access agent is running, although it may not be receiving network traffic.
3. To confirm that the Web proxy agent is receiving traffic, start Internet Explorer and then select **Tools** > **Internet Options**. On the **Connections** tab, click **LAN Settings** or **Settings** for the dial-up/VPN connection you are using to connect to the appliance.
4. In the appropriate **Settings** dialog for your connection type, verify that the **Use automatic configuration script** checkbox is selected and that the **Address** field contains the following address:

   `http://127.0.0.1:<portnumber>/redirect.pac`

   Internet Explorer uses the redirect.pac file to determine which connections to send to the Web proxy agent.
5. To view the resource addresses that are redirected by the `redirect.pac` file, open the file in a text editor. The file is located on the client machine in this folder:

   `\Documents and Settings\<username>\Application Data\SMA1000\ewpca`

The `//Redirection Rules//` section of the `redirect.pac` file lists the addresses defined as destinations that are sent through the standard Web proxy agent. These addresses come from the list of network and URL resources defined in AMC.

Tunnel Issues

This section describes how to troubleshoot problems with the network tunnel service and the tunnel clients.

Topics:

- Installation
- Connectivity

See also:

- Windows Client Troubleshooting
- Macintosh and Linux Tunnel Client Troubleshooting

Installation

Troubleshooting installation issues

Issue	Troubleshooting tips
Connect Tunnel client does not install	The provisioned client is delivered to client computers as an installation package. If the installation procedure fails, the following may explain the issue or offer a solution: • System is not supported: Ensure that the client computer's system software is supported by the Connect Tunnel client. • Client software doesn't match system requirements: If users can access WorkPlace, install the client that is available in WorkPlace. • User does not have local administrator rights: Users must have administrator rights to install the Connect Tunnel client. • The Connect Tunnel client installation log file (`ngsetup.log`) may contain information that can help troubleshoot installation issues. On Windows Vista, the file is located in the `ProgramData` folder, which is hidden by default: `[drive:]\ProgramData\SMA1000\ngsetup.log`
OnDemand Tunnel agent does not install	The OnDemand Tunnel client is automatically installed and activated when a user browses to WorkPlace after authenticating in an appropriately configured realm. Typically, the OnDemand Tunnel agent operates without user intervention, providing secure, tunneled access to configured resources as long as WorkPlace is running. If the OnDemand Tunnel agent fails to install or activate, the following may explain the issue or offer a solution: • Installing OnDemand Tunnel requires administrator rights. • OnDemand Tunnel not enabled for this Workplace realm: On the main navigation menu in AMC, click **Realms**. The **Realms** page displays a list of all realms defined for the appliance. To review the settings affecting the network tunnel service for a particular realm, click the realm name. On the **Communities** tab of the **Configure Realm** page, click **Edit** in the **Access Methods** area. Ensure that the **Network tunnel client** checkbox is selected. • System is not supported: Ensure that the client computer's system software is supported by the OnDemand Tunnel agent. • Browser is not supported: Ensure that the user is running a Web browser that is supported by the OnDemand Tunnel agent. See Client Components for system requirements.

Connectivity

Troubleshooting connectivity issues

Issue	Troubleshooting tips
Client does not connect	The OnDemand Tunnel agent starts automatically after users successfully authenticate to WorkPlace, if the community supports the OnDemand Tunnel agent. The provisioned Connect Tunnel client requires you to activate it each time you want to begin a tunnel session. Tunnel sessions can remain active for many hours. Interrupting network connectivity for periods of more than a few seconds causes the tunnel session to end. Interruptions occur, for example, when a network cable is disconnected, a laptop is set to sleep, or the network link is so busy that it has high latencies and packet drop rates. The following describes common failures that can prevent a Connect Tunnel client or OnDemand Tunnel agent connection from succeeding: • Appliance is unreachable: In the Connect Tunnel login dialog box, click **Properties**. In the **Properties** dialog box, under **Login group**, click **Change**. If the appliance is reachable over the network, the **Select or enter your login** box will be populated with a list of available realms. If the appliance is not reachable, after a few moments you will see an error message that reads “The remote network connection has timed out.” • Incorrect appliance address specified: In the Connect login dialog box, click **Properties**. In the **Properties** dialog box, ensure that the **Host name or IP address of your VPN** is correct. If a host name is entered instead of an IP address, ensure that the client can resolve the host name, and that the host name corresponds to the IP address of the appliance’s external interface. • Appliance is not running: Ensure that the appliance is running. • Invalid realm for user name: Ensure that a valid realm is configured for the user. • Authentication failure: Ensure that the user has specified the correct authentication credentials. • Client service failure: Retrieve the client log (`ngsetup.log`), and send the log file to SonicWall for analysis along with a description of the situation. • Personal firewall is not permitting tunnel traffic: Ensure that the user’s firewall is configured to allow connections to the appliance’s FQDN or IP address.
Client connects, but cannot access a resource	When a tunnel is established, an icon representing that tunnel appears in the taskbar notification area. At this point the client computer has access to all configured resources the appliance can reach and for which the user is authorized. If the client cannot reach a resource, the following may explain the issue or offer a solution: • Resource not defined: Ensure that the correct resource is defined in AMC. • User not authorized to access resource: In AMC, review access control rules, and realm and community assignments, to ensure that the user is allowed to access the resource. • Appliance routing cannot reach resource: Ensure that there isn’t a general networking problem between the appliance and back-end resources. • Server software failure: Note the time of the failure, determine whether the network tunnel service is functioning properly, and gather further troubleshooting information if necessary.

Troubleshooting connectivity issues

Issue	Troubleshooting tips
Client connects, but disconnects unexpectedly	Once connected, a Connect Tunnel or OnDemand Tunnel connection should remain active for many hours. However, the tunnel can end prematurely for several reasons. If a tunnel connection disconnects unexpectedly, the following may explain the issue or offer a solution: • Tunnel that was left idle timed out: To conserve appliance resources, idle tunnels can disconnect after an extended period of time. • Administrator stopped or restarted the network tunnel service: Normal configuration operations using AMC should not affect established tunnels; they continue to operate under the configuration that was in effect when they were established. However, configuration changes that affect basic appliance networking will cause existing tunnels to drop or hang, possibly requiring a disconnect at the client to recover. • With the network tunnel service logs set to Info level or higher, the message, `Reset Internal Interface and Addressing Information`, appears in the log any time the network tunnel service is stopped; in addition, the message, `Internal Interface eth0 Address n.n.n.n Netmask n.n.n.n BCastAddr n.n.n.n Subnet n.n.n.n` (with appropriate IP addressing values), appears any time the service is started from a stopped condition. In the `ngutil` log, the text, `The server is shutting down`, identifies this situation. • Internetwork carrying tunnel became unresponsive or unreliable: When traffic fills the available bandwidth on any hop between the client and the appliance, packets wait on queues in the end-point TCP stack or in intermediate routers. When queues fill, packets are dropped. • The network tunnel service carries traffic over a TCP SSL connection. TCP is designed to accept network unreliability by delivering traffic only when it is in sequence, it can be verified, and it is available. TCP implementations can drop connections when ACK responses are not returned soon enough; this is true of the Windows TCP implementation. After the connection drops, the tunnel client's normal behavior is to attempt to resume the connection transparently for 20 seconds. If congestion caused the drop, resumption is likely to fail, and the user sees the tunnel terminate. • Cluster failover occurred, and client's resumption failed: In a cluster configuration, when an active node fails over to the standby node, client connections are preserved by the client tunnel resumption mechanism. Clients will continue tunnel resumption attempts for 20 seconds, and then give up; if the failover is not complete within this time the tunnel connection is dropped. On orderly termination the client does not attempt resumption, so all tunnel connections are dropped. • In addition, a new client connection initiated after failover, but during the period in which tunnel clients are attempting resumption, might be assigned an address that an existing client is trying to resume using. Several characteristics of address assignment make this case unlikely, but if it occurs the resuming client's tunnel is dropped.
Client connects, but disconnects unexpectedly (continued)	• Client service failure: Failure of the client service software can cause the tunnel to drop, and an error dialog box to appear. Retrieve the client log, send the log file to SonicWall for analysis along with a description of the situation, and then restart the service. • Server software failure: Failure of the appliance tunnel software generally causes a spontaneous reboot of the appliance, or possibly an indefinite hang. • In the reboot case, a crash dump appears in a numbered directory in `/var/log/dump`; retrieve and analyze this information. • If the appliance hangs without rebooting, the crash dump may have succeeded before the hang; reboot the appliance and check `/var/log/dump` for a new crash dump, and then retrieve and analyze this information. You may need to reproduce the circumstances that led to the crash.

Troubleshooting connectivity issues

Issue	Troubleshooting tips
General server problems	Tunnel problems typically show up at the client first. Many possible problems can be identified only by an administrator in AMC or, sometimes, at an SSH console or the system serial console. For more information, see General Networking Issues.
Network tunnel service is not running	At the serial console or in an SSH session, type: `uscat /var/avt/vpn/status` If the network tunnel service is configured and running, client virtual address range information will appear. Otherwise, nothing will appear except another shell prompt. The following items can help you determine why the network tunnel service is not running. • License invalid or expired: If your appliance license is invalid, AMC displays a license warning at the top- right corner of every AMC page after login. You may need to contact SonicWall to resolve licensing issues. • Stopped in AMC or from console prompt: In the **Network Tunnel Service** area of the AMC **Services** page, you can stop the network tunnel service indefinitely, and you can view information that indicates whether the service has been stopped. • Service unconfigured, or incorrectly configured: The network tunnel service must be configured with virtual addresses and related information for assignment to clients. If tunnel service configuration is incomplete, the service will not run. • Server software failure: A failure of a userspace network tunnel service component will generally cause the failed component to restart. There may be helpful information in the log or in a corefile in `/var/log/core`. Serious failure of a kernel component will likely result in a crash dump. • Cluster issues: Clustered appliances must be able to communicate over their cluster interfaces. If they cannot communicate reliably, both nodes in the pair may attempt to provide service, resulting in failures, or both nodes may be on standby, so that neither is providing service.

OnDemand Issues

This section describes how to troubleshoot issues with OnDemand (port-mapped).

Topics:

General OnDemand Issues

If OnDemand fails to work properly, perform the following diagnostics.

Testing OnDemand

Test OnDemand by connecting to the appropriate URLs to start the applet, and then running the supported applications.

When testing, make sure that:

- OnDemand can communicate with required network access services.
- Web proxy service authentication and access control are working.
- OnDemand automatically redirects connections properly.
- OnDemand creates connections for each configured application.
- OnDemand starts any thin-client applications that are configured to start automatically.

Viewing OnDemand Log Files

For users running Windows, OnDemand creates a log file when it starts that contains troubleshooting messages. The log files are saved here:

```
%SystemRoot%\Documents and Settings\AllUsers\Application Data\SMA1000\Logfiles\
%SystemRoot%\Documents and Settings\<username>\Application Data\SMA1000\Logfiles\
```

Detecting the JRE Version

If OnDemand is not working properly, ensure that the user is running a version of the Java Runtime Environment (JRE) that is supported by OnDemand; see Client Components for system requirements. In addition, make sure the user has enabled Java in the browser; see Enabling Java in the Browser.

To detect the JRE version running on a client computer:

- Internet Explorer for Windows: Open the browser's Java Console to view information about your JRE; see Viewing the Java Console.
- Browsers for Mac OS X: In the **Applications** folder, open the **Utilities** folder, and then open the **Java** folder. Run the Java Plugin Settings program, and then click **About** in the menu to see information about the version you are running.

NOTE: Some versions of Windows may not include a JRE; in this case, you see an error message (`jview.exe must exist in \path or you need to set JAVA_HOME`). If you see this message, but you know that you have a JRE on your Windows computer, set the path to the JRE directory as JAVA_HOME in the **Environment Variables** dialog; see Windows Help for information. Otherwise, you must either install a JRE on your Windows computer or use a different computer.

Enabling Java in the Browser

Java must be enabled in the user's browser for the OnDemand applet to run. In Internet Explorer, Java is enabled by default. If OnDemand doesn't run, and you suspect the defaults have been changed, enable them as described in the browser's documentation.

Viewing the Java Console

If the OnDemand applet doesn't start, the Java Console might offer an explanation. Have your user follow the steps appropriate for his or her machine:

Viewing the Java console: Windows—Sun JRE users

1. Users who are running the Sun Java Runtime Environment can access the Java Console by right-clicking the Sun Java icon in the taskbar notification area.
2. Click **Open Console**.

Viewing the Java console: Internet Explorer for Windows

1. Click **Tools** > **Internet Options,** and then click the **Advanced** tab.
2. Under **Microsoft VM**, select the **Java Console enabled** and **Java logging enabled** checkboxes, and then click **OK**.
3. Close the browser and then reopen it.
4. Click **Java Console** on the **View** menu.

Viewing the Java console: Mac OS X

1. In the `Applications` folder, open the `Utilities` folder.
2. In the `Java` folder, run the **Java Plugin Settings** program.
3. In the **Java Plug-in Control Panel**, click **Use Java console** on the **General** page.

Specific OnDemand Issues

This section describes some troubleshooting tips for specific situations you may encounter when using OnDemand.

Troubleshooting specific OnDemand issues

Issue	Troubleshooting tip
OnDemand does not start	On the computer you are trying to start OnDemand, verify that Java or JavaScript is enabled in the Web browser. If Java is enabled in the browser, also verify that the browser is using a version of the Java Runtime Environment (JRE) that is supported by OnDemand; see Client Components for system requirements. If both of these options are enabled, and OnDemand still doesn't start, open the Java Console on the user's computer to see Java messages. If the problem requires a call to SonicWall Technical Support, you'll be asked about these messages; see Viewing the Java Console.
An application does not run correctly over OnDemand	Have the user check the OnDemand **Details** page and verify whether the application name is active or inactive. Problems can occur when more than one application is configured to use the same local IP address and port. To see more details about the problem, ask the user to copy the log messages from the OnDemand **Details** page and email them to you.
OnDemand is installed but not activated	If both ActiveX and UAC (User Account Control) are disabled on a client computer running Vista SP1, OnDemand can be installed but fails to activate unless Java is configured to keep a cache of temporary files on the local computer. To select the cache setting, go to the Control Panel and open the Java Control panel. In the **Temporary Internet Files** area, click **Settings**, and then select **Keep temporary files on my computer**.
The server-certificate **Accept** button is unavailable	Under some circumstances, OnDemand may present the user with a server certificate that he or she cannot accept. If the **Accept** button on the certificate page is unavailable, OnDemand detects a problem with the server certificate. The most common causes of this problem are: • Date/time mismatches between client computer and server. Verify that the client computer and the Web proxy service have the correct date and time. • The certificate has expired or is not yet valid. • The certificate information does not match the server information. • The certificate chain is invalid.

Client Troubleshooting

This section provides client troubleshooting information for Windows, Mac, and Linux clients.

Topics:

- Windows Client Troubleshooting
- Macintosh and Linux Tunnel Client Troubleshooting

Windows Client Troubleshooting

The Secure Mobile Access installer software can be loaded on a user's computer by Java or by ActiveX. If you want to remove this installer, as well as all the other Secure Mobile Access software components, follow these steps:

- Resetting Browser and Java Settings
- Uninstalling Secure Mobile Access Components
- Logging Back In to WorkPlace

Resetting Browser and Java Settings

Follow these steps to reset browser and Java settings. Where applicable, the instructions for Internet Explorer, Google Chrome, and Firefox Mozilla are given:

- Clear Cookies and Cache
- Reset Security Zones to Defaults
- Reset Advanced Settings to Defaults
- Reset Privacy Settings to Defaults
- Clear your Java Cache
- Enable your Java Cache

Clear Cookies and Cache

To clear browser cookies and cache in Internet Explorer:

1. Click **Tools > Internet Options**.
2. Click **Delete Files** and **Delete Cookies**.

To clear browser cookies and cache in Mozilla Firefox:

1. Click **Tools > Clear Private Data**.
2. Select at least these three checkboxes:
   - **Cookies**
   - **Cache**
   - **Authenticated Sessions**
3. Click **Clear Private Data Now**.

To clear browser cookies and cache in Google Chrome:

1. Click **Tools > Clear browsing data**.
2. Select at least these checkboxes:
   - **Delete cookies and other site and plug-in data**
   - **Empty the cache**
3. Click **Clear browsing data**.

Reset Security Zones to Defaults

To reset the security level for all Web content zones in Internet Explorer:

1. Click **Tools > Internet Options > Security** tab.
2. Highlight a Web content zone (for example, **Internet**), and then click the **Default Level** button. Do this for each zone.

Reset Advanced Settings to Defaults

To reset advanced Internet Explorer settings:

1. Click **Tools > Internet Options > Advanced** tab.
2. Click the **Restore Defaults** button.

Reset Privacy Settings to Defaults

To reset Internet Explorer privacy settings:

1. Click **Tools > Internet Options > Privacy** tab.
2. Click the **Default** button.

Clear your Java Cache

To clear the Java Cache on your Windows system:

1. In the Control Panel, double-click **Java**.
2. Click the **Delete Files** button.
3. Make sure that all three types of temporary files are selected for deletion, and then click **OK**.

Enable your Java Cache

By default, Java is configured to keep a cache of temporary files on the local computer. If you are using Java for remote access through an SMA appliance, make sure that this cache is enabled:

1. In the Windows Control Panel, open **Java**.
2. In the Java control panel, click **Settings** in the **Temporary Internet Files** area.
3. Select **Keep temporary files on my computer**.

Uninstalling Secure Mobile Access Components

To uninstall all Secure Mobile Access files:

1. Reboot your computer. This ensures that no files are loaded in memory and makes the uninstall easier.
2. Remove all Secure Mobile Access components:
    a. In Windows Explorer, browse to `%WINDIR%\Downloaded Program Files\`.
    b. Right-click the `Secure Mobile Access Installer` file, and select **Remove**.

c Uninstall the Secure Mobile Access VPN Software. You are prompted to reboot your computer, but you don't need to do so until the final step in this procedure.

d In the **Control Panel**, open **Add/Remove Programs**.

e Remove each Secure Mobile Access component.

3 The Secure Mobile Access software may have been installed using either ActiveX or Java (if you're not sure, follow both sets of instructions):

ActiveX

If you have already done Step b, you can skip to the steps for Java.

a In Windows Explorer, browse to `%WINDIR%\Downloaded Program Files\`.

b Right-click on the `Secure Mobile Access Installer` file, select **Remove**, and then click **OK**.

c Uninstall the Secure Mobile Access VPN Software. You are prompted to reboot your computer, but you don't need to do so until the final step in this procedure.

Java

a In Windows Explorer, browse to `%HOMEPATH%\Application Data\Aventail\EP\`.

b Double-click `uninstall_ep.exe`.

c Uninstall the Secure Mobile Access VPN Software. You are prompted to reboot your computer, but you don't need to do so until the final step in this procedure.

4 In Windows Explorer, browse to `%HOMEPATH%\Application Data\`, right-click on the `Aventail` folder, and then select **Delete**.

5 Reboot the computer.

Logging Back In to WorkPlace

Log back in to WorkPlace, install Secure Endpoint Manager, and let the Secure Mobile Access components load.

If something goes wrong during client or agent installation, the error is recorded in a client installation log. This log is automatically uploaded to the appliance and listed in AMC if Secure Endpoint Manager is installed. Users who do not have Access Manager are prompted to upload the log file to the appliance when an installation error occurs.

To obtain additional log files:

1 Browse to `%HOMEPATH%\Application Data\`.

2 You should see a folder named `Aventail`: zip the folder contents up, and email it to SonicWall Technical Support.

3 Browse to `%ALLUSERSPROFILE%\Application Data\`.

4 You should see a folder named `Aventail`: zip the folder contents up, and email it to SonicWall Technical Support.

5 Open a DOS box (click **Start > Run**, type `cmd`, and then press Enter).

6 In the command prompt window, type `ngutil -all > ngutil.txt`.

7 Email the `ngutil.txt` file to SonicWall Technical Support.

8 Click **Start > Run**, type `msinfo32`, and then press Enter.

9 Highlight **System Summary**, and then select **File > Export**. Email the exported file to SonicWall Technical Support.

Macintosh and Linux Tunnel Client Troubleshooting

When troubleshooting Macintosh and Linux tunnel client problems, request the system and version information described in this section from your users. Before gathering this information, users should uninstall and re-install the software.

Topics:

Macintosh System and Application Information

Have users specify the information listed in the Macintosh system and application information table.

Macintosh system and application information

System information	How to find it
Operating system	Select **About this Mac** from the Apple menu.
`Hostfino` command	Open the Terminal application (in the `Applications > Utilities` folder) and type `hostfino`. This displays processor and kernel information, along with the amount of available memory.
OpenSSL	Open the Terminal application (in the `Applications > Utilities` folder) and type the following to display information about OpenSSL: `openssl version`
Safari browser	Select **About Safari** from the Safari menu.
Java Virtual Machine (JVM)	1 In the `Applications` folder, open the `Utilities` folder. 2 In the `Java` folder, run the **Java Plugin Settings** program. 3 In the **Java Plug-in Control Panel**, click **Use Java console** on the **General** page.
System Profiler	1 Select **About this Mac** from the Apple menu. 2 Click **More Info** to open the **System Profiler.** The profiler displays detailed information about the computer's hardware and installed software. The complete report (if you choose to print it) can easily be over 100 pages long.

When you start Connect Tunnel, make sure that the log files `/var/log/AvConnect.log` and `/var/log/AventailConnectUI.log` are set to collect debugging information. You can enable debug mode in the Connect client itself, or go to a command prompt, and type the following:

```
/Applications/AventailConnect.app/Contents/MacOS/startct.sh -d
```

Linux System and Application Information

Have your users enable debug logging and clear the current set of logs before attempting to reproduce an issue. Once the issue is reproduced, export the logs to SonicWall Support.

Use the **Enable Debug Logging** checkbox, **Clear Logs** button, and **Export Logs** button on the **General** tab to perform these functions:

Troubleshooting Tools in AMC

You can monitor, troubleshoot or terminate sessions on your appliance, filtering them by user name, realm (authentication server), community, access agent, traffic load, and so on—and then get a quick summary of particular sessions. Several basic network tools are also available, including ping, traceroute, DNS lookup, a routing table viewer, and a way to capture and filter network traces for backend connectivity troubleshooting.

Topics:

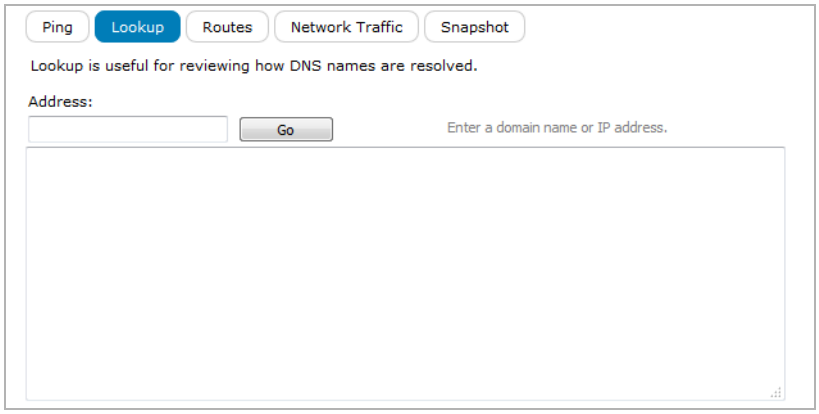
Using DNS Lookup

You can use AMC's Lookup tool to determine how DNS is resolving an IP address or a host name. This tool is useful for troubleshooting various DNS problems (for example, it can determine whether your DNS server is running).

Use a fully qualified domain name or an IP address to specify a host in the Lookup tool. However, you can type a non-qualified host name as long as you have defined one or more default search domains on the **Configure Name Resolution** page (available from the **Network Settings** page in AMC). For details on name resolution, see Configuring Name Resolution.

To determine how DNS is resolving an IP address or host name:

1. From the main navigation menu under **Monitoring**, click **Troubleshooting**.
2. Click the **Lookup** tab.



3 In the **Address** field, type the IP address or host name of the machine against which you want to issue the command.

4 Click **Go**.

Viewing the Current Routing Table

You can view the current routing table from within AMC.

To view the current routing table:

1 From the main navigation menu under **Monitoring**, click **Troubleshooting**.

2 Click the **Routes** tab.

3 Click **Go**. The routing table is displayed.

Capturing Network Traffic

This network traffic utility, which is based on `tcpdump`, allows you to capture a packet-by-packet list of the data going in and out of the appliance. If you are new to troubleshooting, you can use this utility to generate a file of network traffic data that can be sent to Technical Support for troubleshooting network issues. If you are familiar with troubleshooting and reading trace files, you can analyze the traffic using a network protocol analyzer, such as Wireshark.

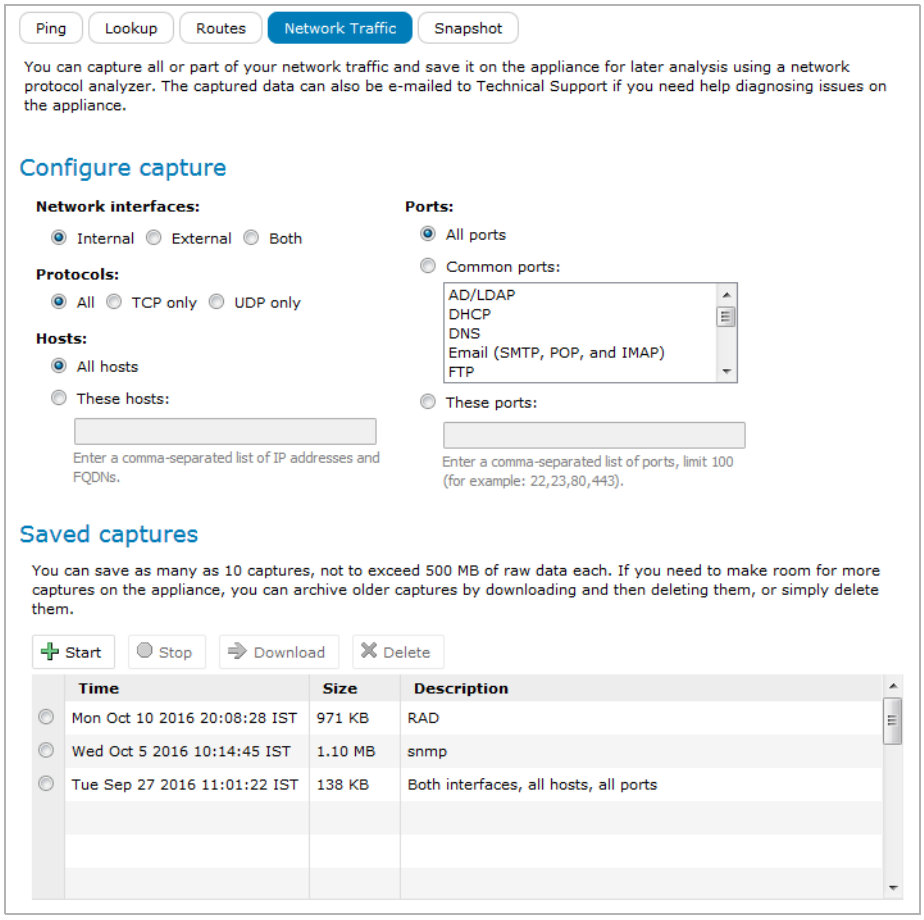
Capturing all network traffic on your appliance can quickly result in files that are too unwieldy to analyze. Where possible, use filters to restrict the traffic to issues you are troubleshooting.

The following sample procedure demonstrates how to filter by host and port (in this example, an Exchange server and Web traffic).

To filter and capture network traffic to a file on the appliance:

1 From the main navigation menu under **Monitoring**, click **Troubleshooting**.

2 Click the **Network Traffic** tab.



3 To restrict the capture to traffic coming from or going to your Exchange server, enter the server's full qualified domain name or IPv4 or IPv6 address in the **These hosts** field. For example, `exchange.mycompany.com`.

4 To make sure that you are capturing only the HTTP traffic, select `Web (HTTP or HTTP/S)` from the **Common ports** list; only traffic to and from the HTTP and HTTPS ports (80, 443, 8080, and 8443) will be captured.

5 Click **Start** to begin capturing traffic. The size limit for a single capture is 500 MB of raw data; when the size of a capture file reaches 100 MB, it "rolls over" into a separate file (large files are difficult to process with packet analysis tools such as Wireshark). If the total size of a single capture reaches 500 MB (five files of 100 MB each), the capture automatically stops. During a capture, the **Size** column indicates how close you are to the limit.

6 Click **Stop** to stop capturing traffic. The capture file is a `.zip` file that is stored on the appliance and listed here. (The figure in the **Size** column indicates how much room the file is using on the appliance; this is the size of the compressed `.zip` file, not the raw data.) The maximum number of files you can store is ten; as more capture files are added, the oldest ones are dropped from the list.

7 To download captured data, click the button corresponding to the file you want to analyze or send to Technical Support, and then click **Download**. Each capture file is a `.zip` file containing the captured network traffic (for example, `eth0.cap`) and a `readme` text file outlining what filters were used, if any, and when the data was captured.

```
Comment: Internal interface, hosts: exchange.mycompany.com, selected ports

Internal interface (eth0): enabled
External interface (eth1): disabled
Protocol: <All>
Hosts: exchange.mycompany.com
```

```
Ports: 80,443, 8080, 8443

Start time: Wed Aug 15 2007 17:56:52 GMT
Stop time:  Wed Aug 15 2007 17:58:31 GMT
```

NOTE: Captured network traffic is not encrypted and may contain passwords and other sensitive information. If you have security concerns about storing a downloaded capture or sending it over an unsecured Internet connection, use Snapshot Tool in AMC instead. You can make a partial snapshot that includes only network captures, and then choose to encrypt the results. See Snapshot Tool for more information.

You can capture network traffic on either of the appliances in a high-availability pair (the master node or the slave node).

Logging Tools for Network Tunnel Clients

To capture a session during which a user is running either of the network tunnel clients, have users follow these steps and email you the results. The Windows procedure differs from the one for Macintosh and Linux users.

To run ngutil on a Windows client computer:

1. Go to a command prompt: Click **Start > Run**, and then type `cmd` in the **Open** field; if you are using Windows Vista, Click **Start**, and then type `cmd` in the **Start Search** field.
2. At the command prompt, clear the event log and set the severity level by typing the following command:

   ```
   ngutil -reset -severity=debug
   ```

3. Start the network tunnel client and perform any actions the system administrator wants captured in the log.
4. At the command prompt, type `ngutil > log.txt` to write the buffered log messages to a file named `log.txt` in the current directory.
5. Send the `log.txt` file to the administrator.
6. Alternatively, you can run `ngutil -poll` to see real-time logging on the client computer. (Press **Ctrl-C** to stop logging.)

NOTE: You can also have users type the `ngutil -tail=1000>client-log.txt` command; this sends the most recent 1000 lines in the client log to a file named `client-log.txt` in plain text.

For more information on the syntax for the `ngutil` command, type `ngutil -help` at the command prompt.

To save session information on a client computer (Macintosh or Linux):

1. Start the network tunnel client and perform any actions the system administrator wants captured in the log.
2. On the client device, locate the files `AvConnect.log` and `AvConnectUI.log` and send them to the administrator.

Using CEM Extensions

SonicWall Technical Support may ask you to use Secure Mobile Access Configuration Extension Mechanism (CEM) advanced URL extensions. These CEM extensions are used to access advanced AMC pages and should only be used when instructed to do so by Technical Support.

Contact SonicWall Support at https://support.sonicwall.com/.

CEM Advanced Features

The Configuration Extension Mechanism (CEM) is a generic mechanism to allow simple configuration to be done for features that appear in maintenance releases or hotfixes. The CEM page allows the configuration of arbitrary key-value pairs for enabling advanced functionality. These key-value pairs are read from the extension config file by each service that has a patch generated for it (custom drop, hotfix, or maintenance release).

Advanced features should be used only under SonicWall Support supervision. Contact SonicWall Support for additional instructions.

Ping Command

Use the `ping` command to verify a network connection. When you issue the `ping` command, it sends an ICMP ECHO_REQUEST packet to a target host and waits to see if the host answers.

To issue a ping command:

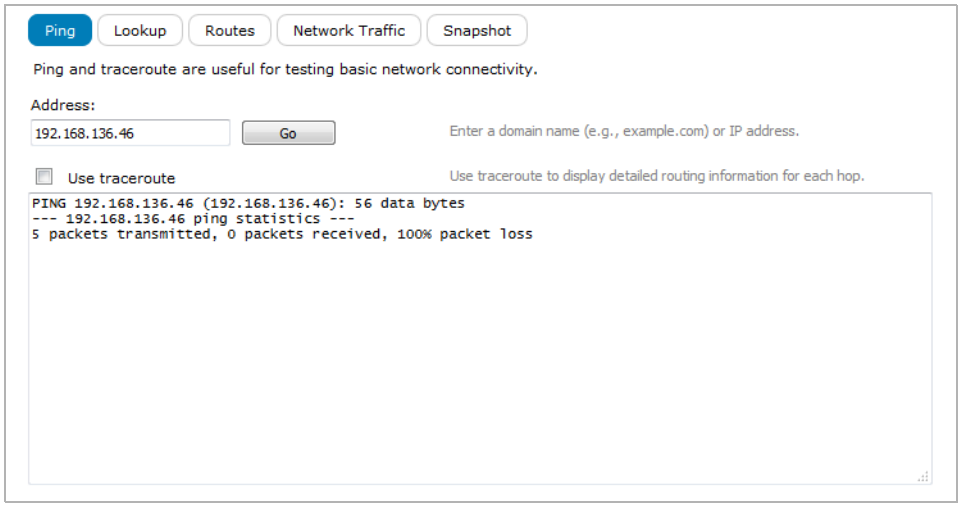
1. From the main navigation menu under **Monitoring**, click **Troubleshooting,** then click the **Ping** tab.
2. In the **Address** field on the **Ping** page, type the IPv4 or IPv6 address or host name of the machine you want to ping.
3. Click **Go**. AMC issues the ping command. After about five seconds, the results appear in the large box at the bottom of the page. If the ping command cannot reach the host, it returns results resembling the following:

Traceroute Command

Use the traceroute command to see the sequence of gateways through which an IP packet travels to reach its destination. This can help you find a network failure point.

To issue a traceroute

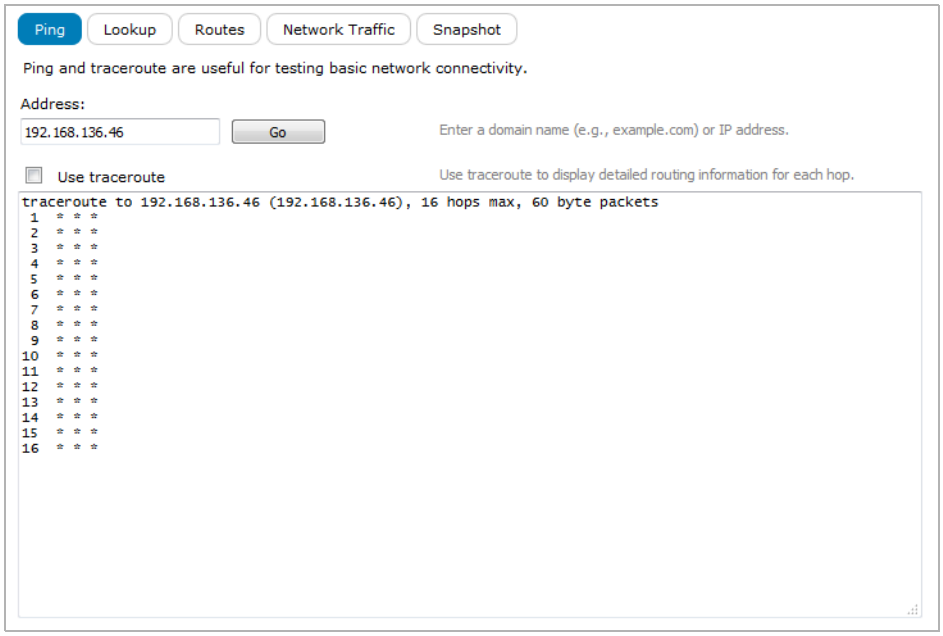
1 From the main navigation menu under **Monitoring**, click **Troubleshooting,** then click the **Ping** tab.



2 In the **Address** field, type the IP address or host name of the machine against which you want to issue the `traceroute` command.

3 Select the **Use traceroute** checkbox.

4 Click **Go**. `Traceroute` returns a list of hosts, starting with the first gateway and ending with the destination.



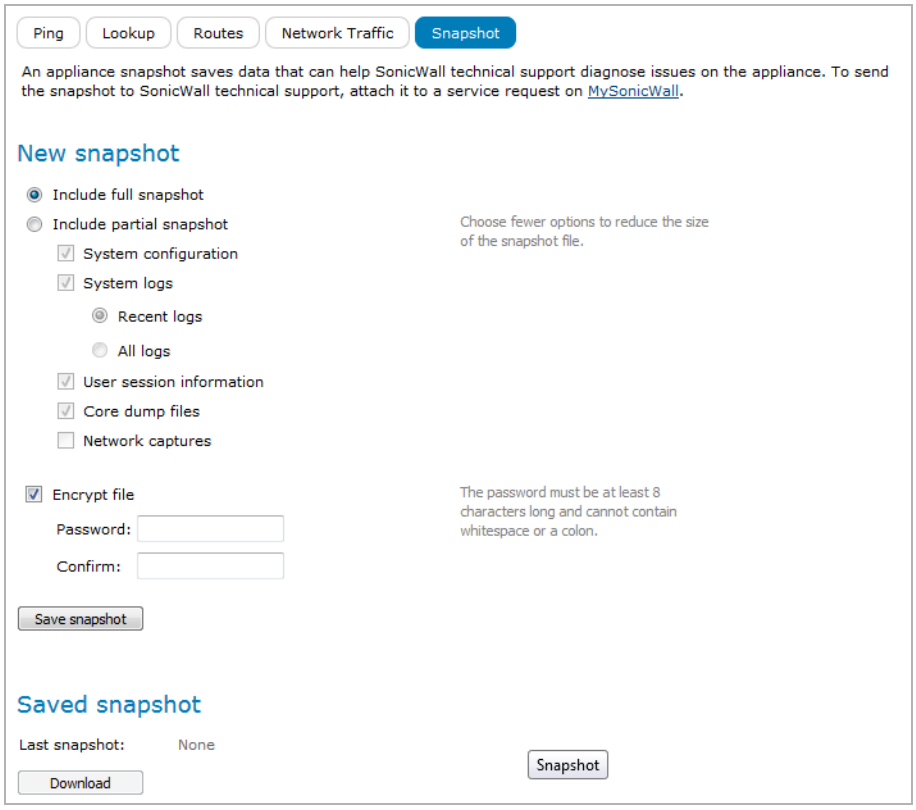
Snapshot Tool

A snapshot of your configuration can help SonicWall Technical Support or other IT professionals diagnose any problems you are having with the appliance. This file, especially if it includes core dump files, can be quite large (the File Download dialog in the final step will tell you how large).

To save a configuration snapshot:

1 From the main navigation menu under **Monitoring**, click **Troubleshooting**.

2 Click the **Snapshot** tab.



3 Select a full or partial snapshot.

4 Specify whether you will include all system logs, or just the four most recent ones.

5 Click **Save snapshot**. The files are saved in a zip archive named `snapshot.tgz`.

6 If you plan to send the file to SonicWall Technical Support, you should select **Encrypt file** to keep sensitive information secure. Technical Support will need the password you assigned to this archive so that they can decrypt the file. Make sure you send it in such a way that it meets your internal security requirements (over the phone or by secure email, for example).

7 Click the **Download** link to save the compressed file locally.

C

Best Practices for Securing the Appliance

Network Configuration

You can configure most of the settings in the following list of best practices on the **Network Settings** and **Services** pages in AMC:

Configure the Appliance to Use Dual Interfaces

The appliance optimizes firewall settings when it is configured with both an external and internal interface. Services are split between the interfaces so that management services, such as the AMC, listen only internally. Public services, such as the Secure Mobile Access access services, listen only externally.

Configure the Appliance to Use Dual Network Gateways

Dual network gateways allow you to leverage your existing network routers, which means less overhead for the appliance administrator, and provide a more manageable network configuration as your network grows and evolves.

Protect both Appliance Interfaces with Firewalls

- Allow traffic from the Internet only on ports 80 and 443.
- Give the appliance access to only the necessary resources on the customer network.
- Allow only trusted IP addresses from the customer network to access AMC.

Enable Strict IP Address Restrictions for the SSH Service

If both network interfaces are enabled, Secure Shell (SSH) listens on both interfaces. Be sure to restrict SSH service access to the IP addresses of trusted management workstations or, at a minimum, the address range of the internal network.

Enable Strict IP Address Restrictions for the SNMP Service

If both network interfaces are enabled, Simple Network Management Protocol (SNMP) listens on both interfaces. Restrict SNMP service access to the IP addresses of trusted management workstations or, at a minimum, the address range of the internal network.

Use a Secure Passphrase for the SNMP Community String

By default, the SNMP configuration in AMC sets the string your network management tool uses to query the SMA appliance in the **Community string** field to **public**. Be sure to change this to a secure passphrase.

Disable or Suppress ICMP Traffic

If both network interfaces are enabled, enabling Internet Control Message Protocol (ICMP) makes it possible for someone to discover the appliance from the Internet. The most secure approach is to disable ICMP. If you do enable ICMP, you should suppress ICMP Echo Request traffic using a firewall or other network device.

Use an NTP Server

Synchronize with an external Network Time Protocol (NTP) server to ensure accurate timestamps in the system logs, and to ensure that time-based security checks—such as password and certificate expiration—occur properly.

Protect the Server Certificate that the Appliance is Configured to Use

Don't leave the appliance server certificate where others can access it, and always make sure the key is encrypted with a strong password. If attackers obtain it, it will tell them which host it is associated with and will enable them to decrypt private data.

Appliance Configuration

You can configure most of the settings in the following list of best practices on the **Maintenance** page in AMC.

Keep the software image on the appliance updated

Use the **Update** page to apply hotfixes and upgrade files promptly because they often contain security fixes.

Make regular configuration backups

Periodically back up your current configuration using one of these methods in AMC:

- The **Export** option on the **Import/Export** page; see Exporting the Current Configuration to a Local Machine.
- If you prefer, you can save the backup to your appliance; see Saving the Current Configuration on the Appliance.

Appliance Sessions

Your AMC session automatically times out after 15 minutes of inactivity (the length of the timeout period is not configurable). To end an AMC session, click **Log out** in the top-right corner of AMC. (If you terminate a session by closing your Web browser instead, the session is listed as logged in until it times out 15 minutes later.)

There is an exception to this rule on the following pages, which both include an **Auto-refresh** setting:

AMC session exception

AMC page	Default auto-refresh setting
System Status	1 min.
Logging > View Logs	1 min.

When **Auto-refresh** is set to any time interval other than *Off* while one of these pages is displayed, the refresh activity prevents the AMC session from automatically timing out after 15 minutes. This means that if you leave

AMC unattended while one of these pages is displayed and in auto-refresh mode, AMC will not time out. A good security practice is to switch to another page in AMC when you are done viewing system status or logs.

Administrator Accounts

To configure administrator accounts, click **General Settings** in the main AMC navigation menu, and then click **Edit** in the **Administrators** area.

Use a Strong Password

Your password should be at least eight characters long and should contain punctuation characters, a combination of uppercase and lowercase letters, and numbers.

Change the AMC Administrator Password

The AMC administrator password is set to the same value as the root password during the initial installation. It is good practice to change the AMC administrator password because it is transmitted in an SSL tunnel between the Web browser and the AMC server. If the password for the primary administrator (whose username is `admin`) is changed, the password for logging in to the appliance directly (as `root`) is also changed.

Change Administrator Passwords often and don't Share Them

It is good practice not to share passwords with anyone unless necessary. If you need to enable access for other administrators, create individual administrative accounts. One person should own the administrator account, and the password should be kept in escrow or some other safe place.

Limit the Number of Administrative Accounts and Assign Administrative Privileges only to Trusted Individuals

Restrict the access of secondary administrators. AMC's role-based administration enables the primary administrator to grant limited administrative control to secondary AMC administrators. For more information, see Defining Administrator Roles.

Access Policy

To create, edit, or reorder access rules, click **Access Control** in the main AMC navigation menu. Use the following guidelines when you create rules:

- Follow the Principle of "Least Privilege"
- Pay Close Attention to Rule Order

- Put your Most Specific Rules at the Top of the List
- Carefully Audit Rules Containing “Any”

Follow the Principle of “Least Privilege”

The most secure approach to policy design is to specifically list the resources to which you want to permit access. Anything not accounted for in the “permit” rules is denied by the appliance. This approach follows one of the fundamental design principles of computer security: that access rights should be explicitly required, rather than given to users by default.

An alternate approach is to create “deny” rules for restricted resources, but permit access to everything else by default. Here, anything not accounted for in the “deny” rules is accessible, until the final “deny” rule is processed. This method may be easier to set up, but is more error-prone and thus not as secure.

Of course, you can also use a combination of permit and deny rules. In this case, users are permitted access to some resources, but denied access to others.

Pay Close Attention to Rule Order

Because the appliance processes your access control rules sequentially, the order in which you organize them has great significance in terms of whether access is permitted or denied. The appliance stops reading the rules as soon as it finds a match. Carefully review your security policy settings to avoid inadvertently placing rules in the wrong order.

Put your Most Specific Rules at the Top of the List

Putting broader rules that grant more permissions at the top of the list may cause the appliance to find a match before it has a chance to process your more restrictive rules. As a general rule, it is best to put your most specific rules at the top of the list.

Carefully Audit Rules Containing “Any”

If you create a rule that does not restrict access to a particular user or destination resource, the word “any” appears in the access control list.

Carefully consider the impact of “any” in your policy rules. For a “permit” rule, too many criteria that apply to “any” could expose a security hole. On the other hand, too many “deny” rules for “any” could unnecessarily restrict network access.

Set Up Zones of Trust

You can define “zones of trust” that provide different levels of access depending on the level of trust at the user’s end point. Connection requests are compared against device profiles you set up in AMC and are then assigned to the appropriate zone. See About End Point Control for more information.

To set up zones of trust:

1. Set up a **Deny** zone. Deny zones are evaluated first. If there is a device profile match (for example, a certain file or registry key is found on the device), the user is denied access and logged out. See Creating a Deny Zone for more information.
2. Set up a **Quarantine** zone. A device for which there is no profile match is placed in the quarantine zone (if one has been defined). You can customize the message users see; for example, you may want to explain why the user is quarantined and what is required to bring the user's system into compliance with your security policies. See Creating a Quarantine Zone for more information.

Enabling SSL Ciphers

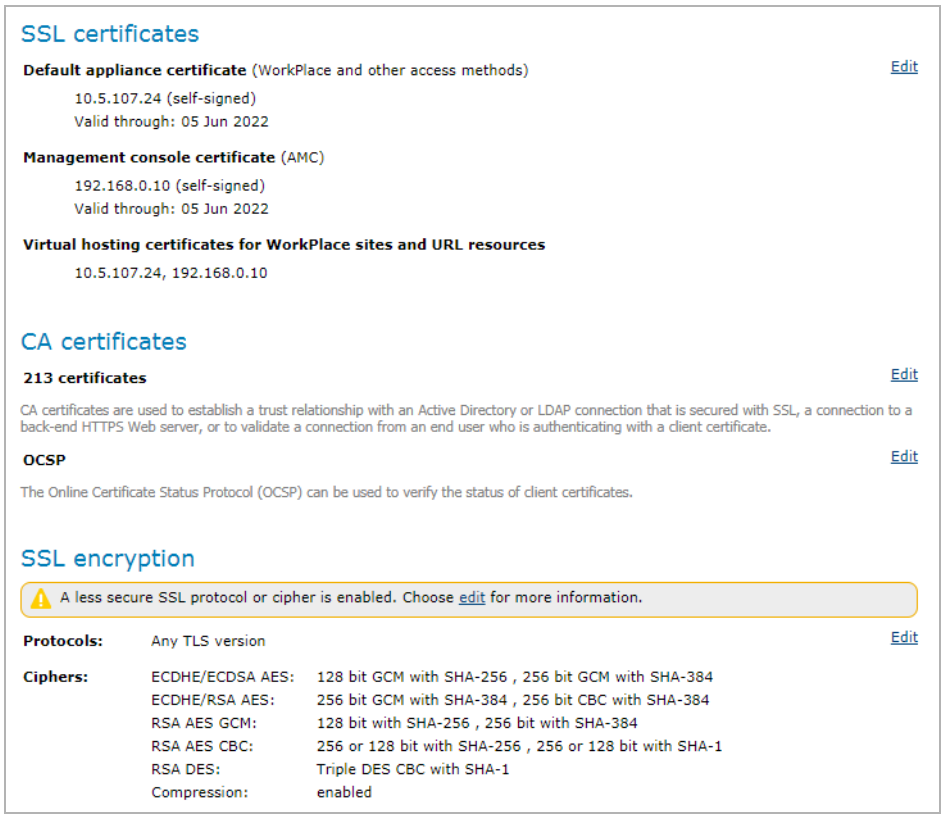
When you configure the protocols and compression settings for encrypting traffic, you can select one or more ciphers. The appliance will use these ciphers to provide the best combination of security and performance supported by the user's Web browser. You can enable or disable the ciphers you want.

The AMC, WorkPlace, Extraweb, and Tunnel will all conform to the SSL protocols that are enabled on the **Configure SSL Encryption** page to enforce protocols and ciphers on connecting clients.

The AMC logs SSL connection failures if the client/browser fails to negotiate an SSL connection due to incompatible ciphers or protocols. These messages are logged at the ERROR level to help the administrator troubleshoot SSL compatibility problems.

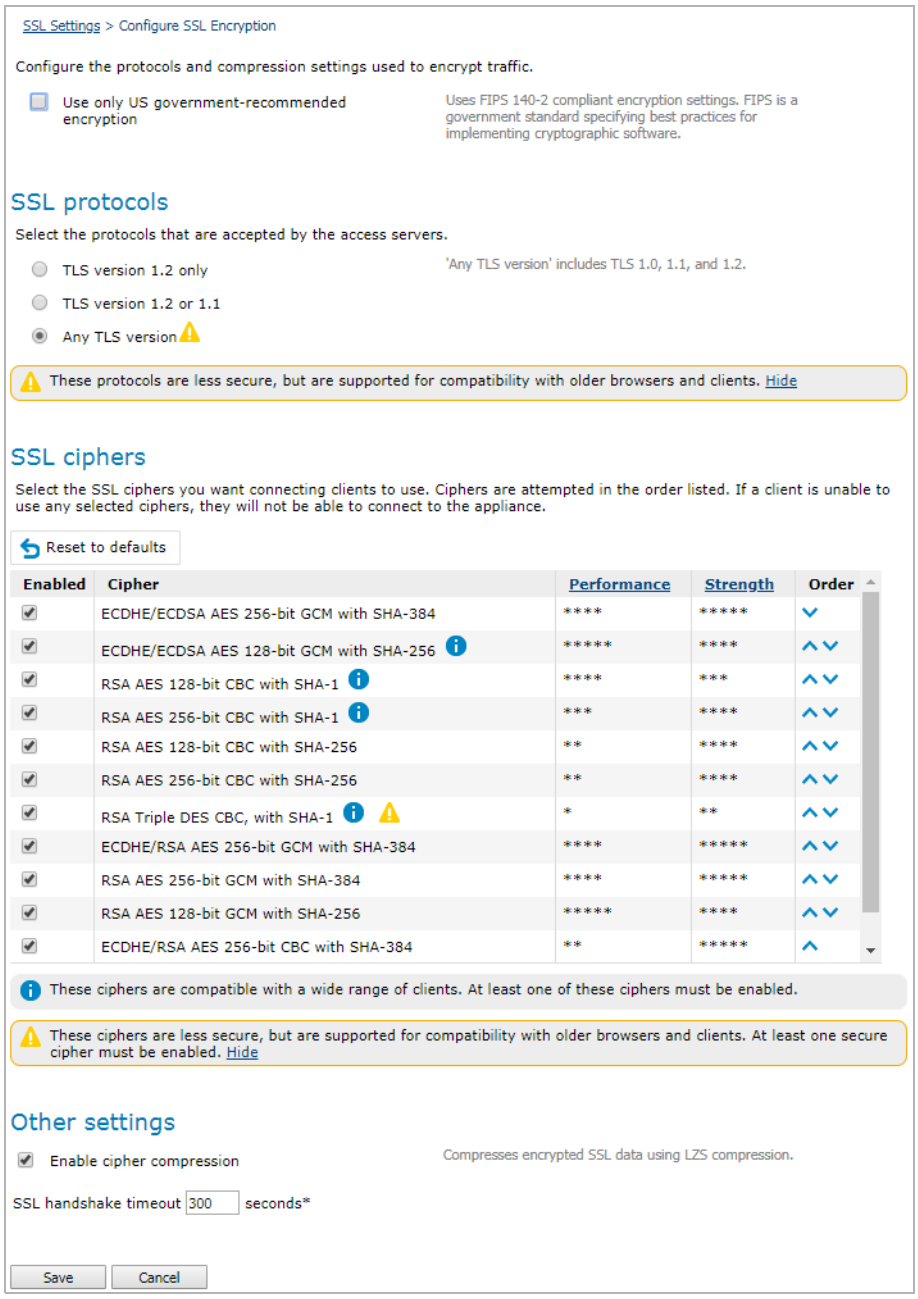
To enable or disable the SSL ciphers you want:

1. Go to the **System Configuration > SSL Settings** page.

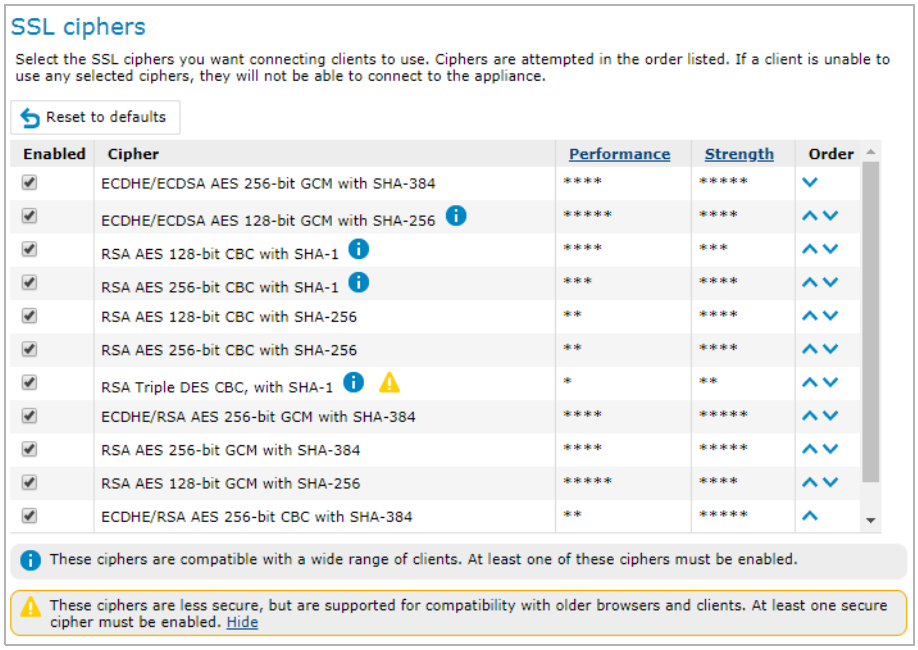


NOTE: The warning appears only when you have a less secure protocol or cipher enabled.

2 Under SSL encryption, click **Edit**. The **Configure SSL Encryption** dialog appears. For new installations, the default SSL Encryption ciphers will appear as shown under **SSL ciphers**.



3 Under **SSL ciphers**, select the ciphers that you want.



All the enabled SSL ciphers will be enforced.

Suite B Support

Suite B is a set of security algorithms or ciphers approved by the National Security Agency (NSA) for assuring the security and integrity of information passed over public networks.

Suite B comprises these cipher combinations:

- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384

Suite B for SMA appliances supports these two cipher suites and the Elliptic Curve Digital Signature Algorithm (ECDSA) certificates that they require.

When you create a new certificate signing request or a new self-signed certificate, you have the option to choose an RSA certificate or an ECDSA certificate. The configuration options are different for the different types of certificates. See Configuring the Suite B ciphers for details.

If a mismatch occurs between an enabled cipher and an installed certificate, the AMC will display a warning and prevent the configuration from being enabled.

SMA Tunnel clients and Mobile Connect clients support the Suite B ciphers.

SSH connections will negotiate the cipher to use, including the two Suite B ciphers, by following the existing SSH negotiation rules.

The Suite B ciphers will be enabled and operational on all currently supported appliance models, including virtual appliances.

Configuring the Suite B ciphers

This section describes how to enable the Suite B ciphers and select the appropriate certificates.

Topics:

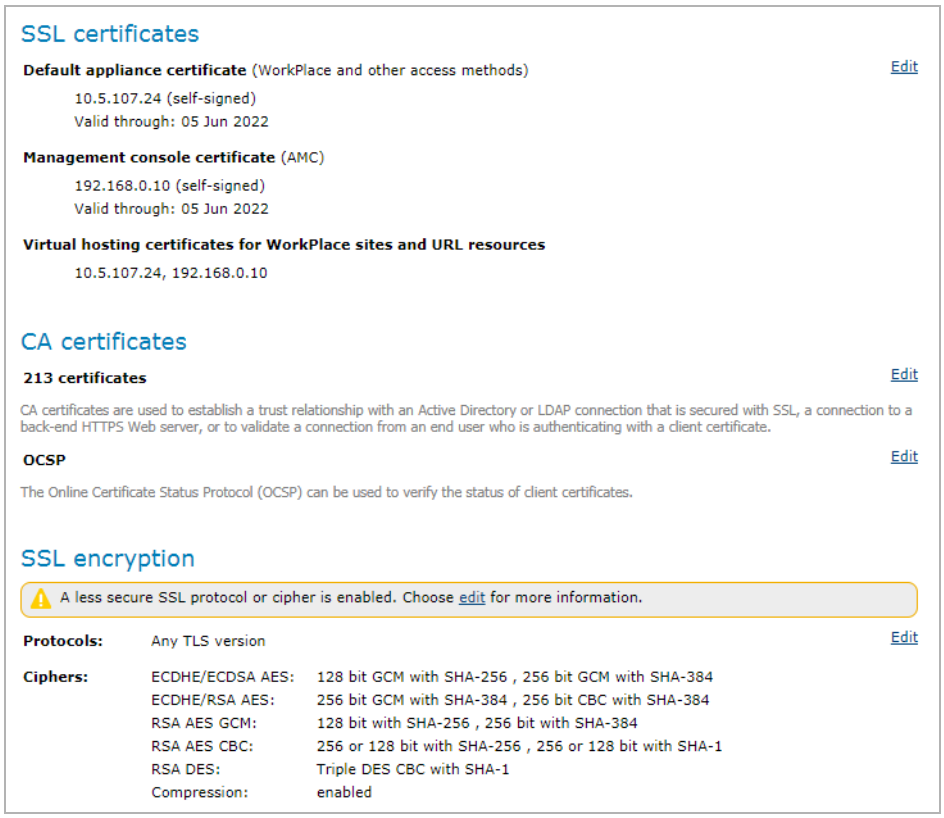
- Enabling the Suite B Ciphers
- Selecting a Certificate

Enabling the Suite B Ciphers

To enable the Suite B ciphers:

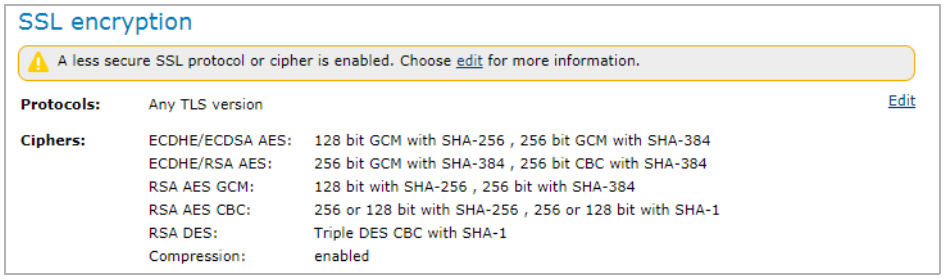
1 On the SMA appliance, go to the **System Configuration > SSL Settings** page.

2 Under **SSL Encryption** click the **Edit** icon. The **Configure SSL Encryption** page appears.



3 Click the **Reset to defaults** button. The available ciphers are listed, and the Suite B ciphers appear at the top of the list.

4 Select the checkboxes for the ciphers you want to enable. The **SSL encryption** panel on the **SSL Settings** page is updated to show the status of the newly added ciphers.

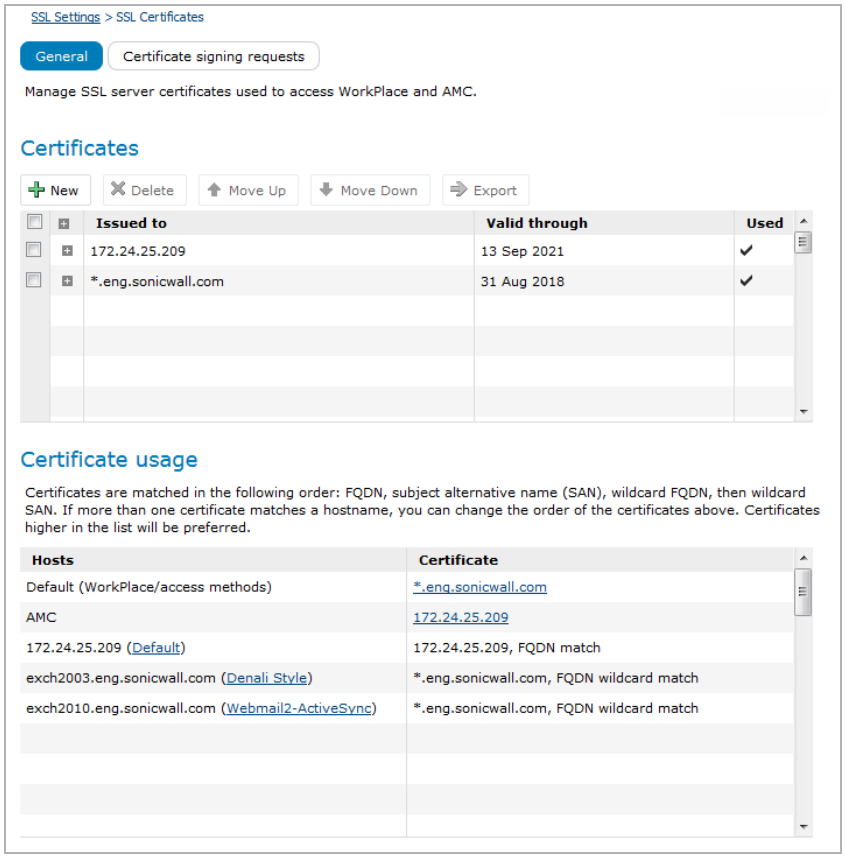


Selecting a Certificate

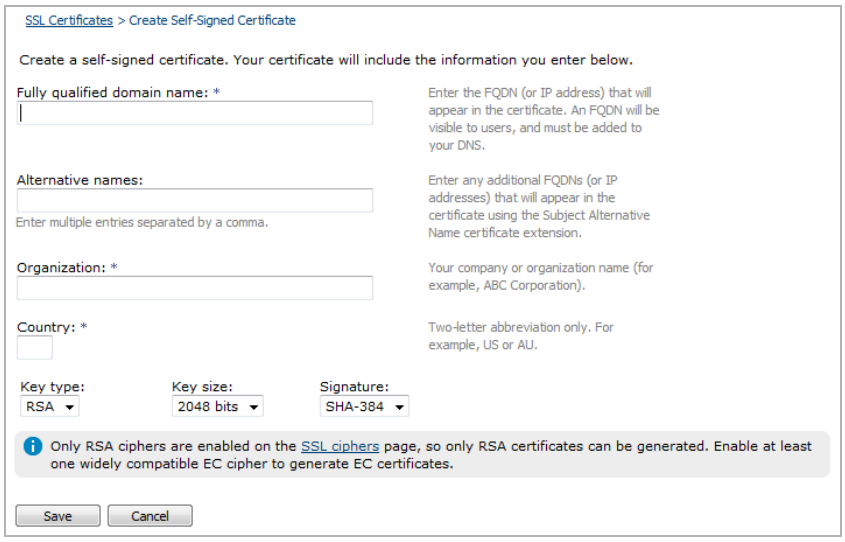
To select the certificate you want:

1 On the SMA appliance, go to the **System Configuration > SSL Settings** page.

2 Under **SSL Certificates,** click the **Edit** icon. The **SSL Certificates** page appears.



3 Click the **New** button and select **Create self-signed certificate...** The **Create self-signed Certificate** dialog appears.



4 If you want an RSA certificate, in the **Key type** drop-down menu, select **RSA**. The default key type is **RSA**, unless no RSA ciphers are enabled.

5 In the **Key size** drop-down menu, select the size you want: **2048** bits or **3072** bits.

6 In the **Signature** drop-down menu, select the signature you want: **SHA-384** or **SHA-256**.

7 If you want **ECDSA** certificate, in the **Key type** drop-down menu, select **EC**.

When you select **EC** as the **Key type**, the only other option is **Prime size**.

8 Select the **Prime size** that you want: **256** bits or **384** bits.

9 To see the details for a certificate, go back to the **SSL Certificates** page and click on the plus sign for the device you want to view. The details view for:

- RSA certificates shows the **Key size** and the **Signature** for the certificate.
- ECDSA certificates shows the **Prime size** and the **Signature** for the certificate.

Client Access

Use these features to control a user's access to WorkPlace and resources.

Change Timeout Settings

To force users to reauthenticate within a specific length of time, set the **Credential lifetime**. Click **General Settings** in the main AMC navigation menu, and then click **Edit** in the **Appliance options** area. This setting applies to all SSL sessions. To make it also apply to the tunnel client and OnDemand proxy sessions, select **Limit session length to credential lifetime** on the **Network Tunnel Client Settings** page.

Deploy End Point Control Components

Secure Mobile Access's End Point Control components help protect sensitive data and ensure that your network is not compromised when accessed by PCs in untrusted environments. Cache Cleaner provides an inactivity timer that terminates user connections after a specified length of time elapses without cursor or pointer movement. EPC supplements user authentication: it does not replace it.

Use Chained Authentication

For increased security, you can require Connect Tunnel users and users with Web-based access to use two different authentication methods to log in to a single realm. For example, set up RADIUS or a digital certificate as the first authentication method, and LDAP or Active Directory as the second one. See Configuring Chained Authentication for information on how to do this.

Use Strong Two-Factor Authentication Mechanisms, such as SecurID

Two-factor authentication uses two independent means—which are usually something the user has and something the user knows—to establish a user's identity and privileges. For example, you can authenticate users by requiring a SecurID token-code (something the user has) and a password or PIN (something the user knows).

D

Configuring SAML Identity Providers

About Configuring SAML Identity Providers

This appendix describes how to configure Security Assertion Markup Language (SAML) Identity Providers on an SMA Authentication Server.

NOTE: The Identity Provider User Interface (UI) pages are subject to change without notice, and may be different than the UI pages used as examples in this document.

Some of configuration procedures in this document require that you download and install a security certificate from the internet before you can complete the procedure. The correct certificate must be available for selection from the **Trust the following certificate** drop-down menu on the **Configure Authentication Server** dialog of the **System Configuration > Authentication Servers** page on the SMA appliance.

The Downloading a Certificate procedure must be done before you can complete the configuration procedures in this document. Which certificate you need is given in the configuration procedure for the specific Identity Provider (IdP). See Configuring SAML Authentication Servers.

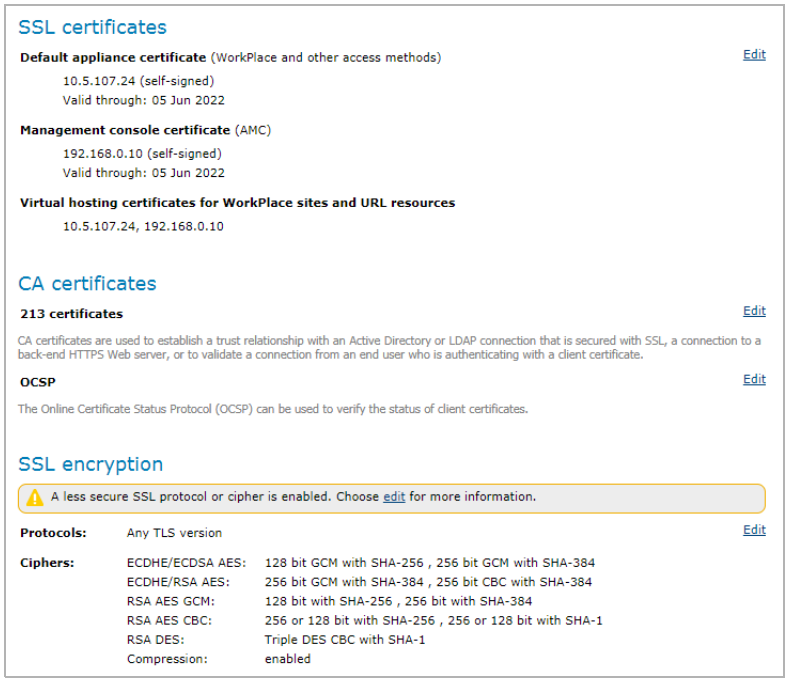
Downloading a Certificate

This procedure must be done before you can select a certificate from the **Trust the following certificate** drop-down menu in the configuration procedures.

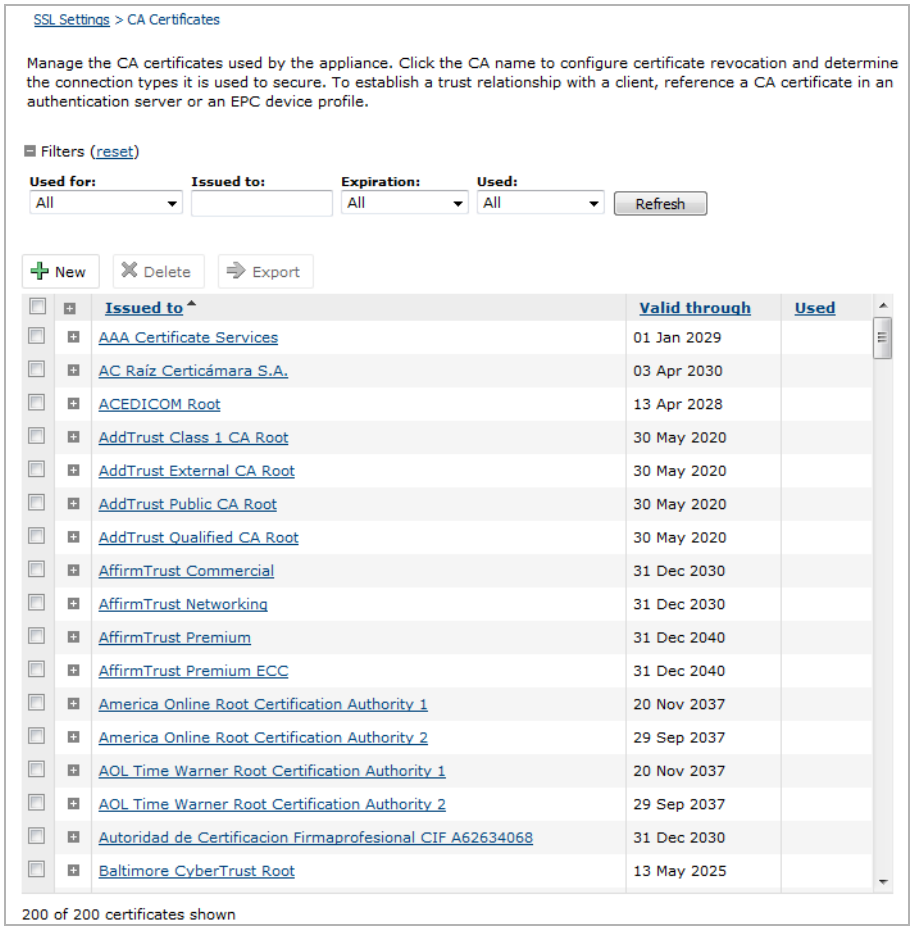
To download and install a certificate:

1 Download the certificate you want from the **Configure Single Sign-on at <*APP_NAME*>** page that appears during the application registration.

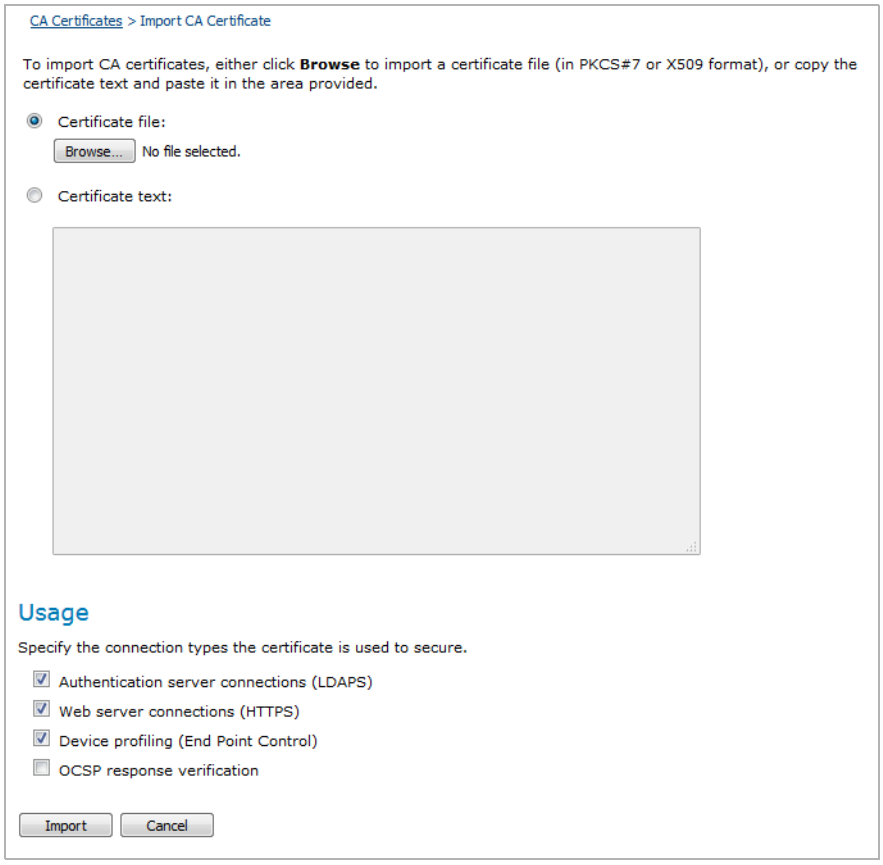
2 Go to the **System Configuration > SSL Settings** page.



3 Under **CA Certificates**, click **Edit** for ***<number>* certificates**. The **CA Certificates** page displays.



4 Click **New**. The **Import CA Certificate** page displays.



5 Select one of the following options:

   a **Certificate file** and browse to select the certificate you want.

   b **Certificate text** and enter the certificate text that you want.

6 Click **Import**.

   The certificate should now appear in the **Trust the following certificate** drop-down menu.

Configuring SAML Authentication Servers

This section describes how to configure the various SAML Authentication Servers (IDP).

Some of these configuration procedures require that you already have certain certificates downloaded and installed on your SMA appliance, so that they are available from the **Trust the following certificate** drop-down menu. See Downloading a Certificate for details on how to do this.

Topics:

- Azure Active Directory
- One Identity Cloud Access Manager
- OneLogin
- Ping Identity PingOne
- Salesforce

Azure Active Directory

This section describes how to configure the Azure Active Directory (AD) as an SMA Authentication Server.

Topics

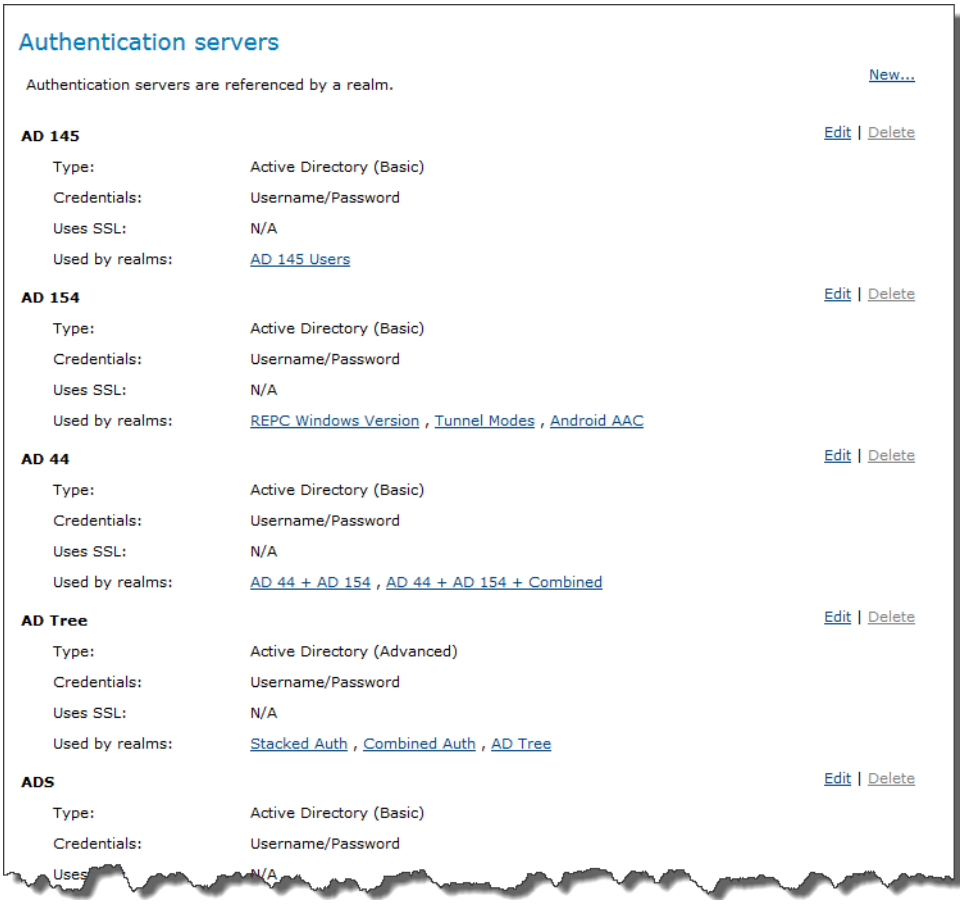
- Configuring Azure Active Directory as an SMA Authentication Server
- Adding the SMA Application to Azure Active Directory
- Configuring Single Sign-On for the SMA Application
- Assigning Users and Groups to the SMA Application

Configuring Azure Active Directory as an SMA Authentication Server

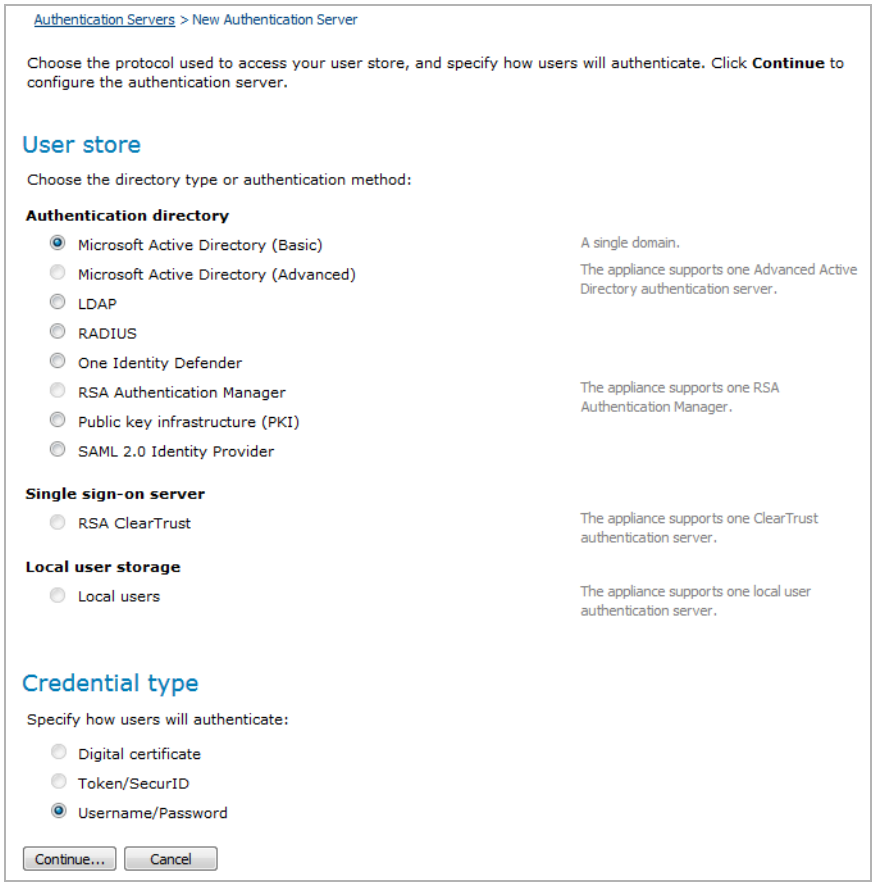
In this procedure, you will configure Azure AD as an SAML Identity provider, and create and configure an Authentication server on an SMA appliance.

To configure Azure AD as an SMA Authentication Server:

1 On the SMA appliance, go to the **System Configuration > Authentication Servers** page.

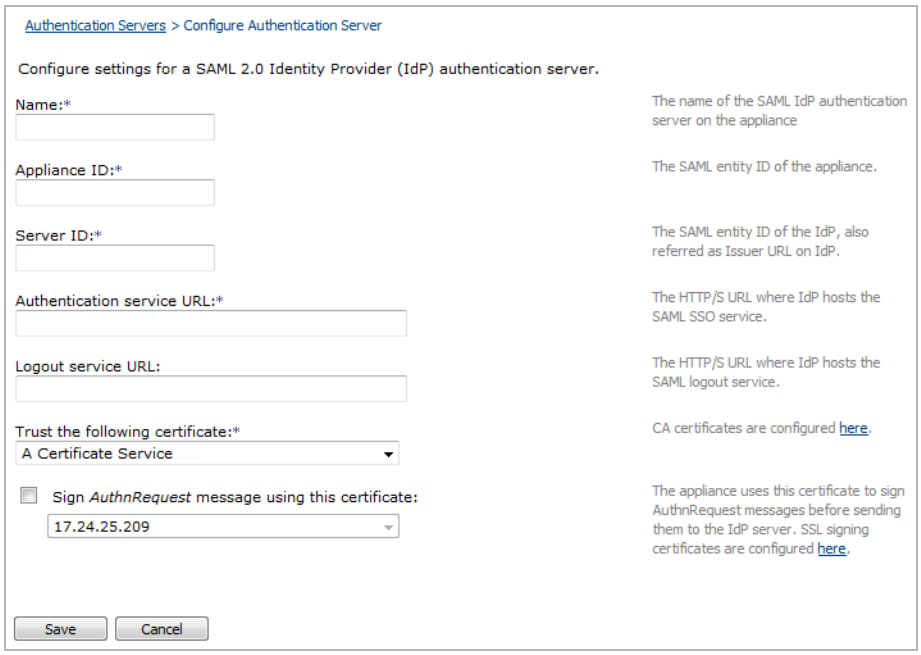


2 Under **Authentication servers**, click **New...**. The **New Authentication Server** page appears.



3 Select **SAML 2.0 Identity Provider**.

4 Click **Continue...**. The **Configure Authentication Server** dialog appears.



The steps that follow explain how to configure the fields in the **Configure Authentication Server** page.

5 In the **Name** field, enter **Azure AD**.

6 In the **Appliance ID** field, enter the URL for the appliance from the **App ID URL** field or the **Issuer URL** field on the **Configure App Settings** page. For example: `https://appliance.company.com`.

7 In the **Server ID** field, enter the URL for the server from the **Issuer URL** field on the **Configure Single Sign-on at *<APP_NAME>*** page. For example: `https://sts.windows.net/db675175-89e4-40f3-xxxx-/`.

8 In the **Authentication service URL** field, enter the URL from the **Single sign-on service URL** field on the **Configure Single Sign-on at *<APP_NAME>*** page. For example: `https://login.windows.net/db675175-89e4-40f3-xxxx-/saml2`.

9 In the **Logout service URL** field, enter the URL from the **Single sign-on service URL** field on the **Configure Single Sign-on at *<APP_NAME>*** page. For example: `https://login.windows.net/db675175-89e4-40f3-xxxx-/saml2`.

10 From the **Trust the following certificate** drop-down menu, select the certificate you want. This should be the **Download certificate** from the **Configure Single Sign-on at <***APP_NAME***>** page.

> **NOTE:** You must first download and install the certificate you want before it can appear in the **Trust the following certificate** drop-down menu. See Downloading a Certificate for instructions on how to do this.

11 (Optional) Select the **Sign *AuthnRequest* message using this certificate** if you want it, then select the appropriate appliance certificate.

12 Click **Save**.

Adding the SMA Application to Azure Active Directory

After you configure Azure Active Directory (AD) as an SMA Authentication Server, you need to add the SMA application to the Azure AD service.

To add the SMA application to Azure AD:

1 Log in to Azure AD, and then select the **Active Directory > [*Directory*] > Applications** page.

2 Select **Add an application from the gallery**. In the **Application Gallery**, you can add a custom application using the **Custom** category on the left.

3 In the **Name** field, enter a name for the SMA application.

Configuring Single Sign-On for the SMA Application

After you enter the name for the SMA application, you can configure the single sign-on options.

To configure Single Sign-On for the SMA application:

1 In Azure AD, go to the **SonicWall_SMA** application page.

2 Select **Configure single sign-on.**

3 To configure SAML-based authentication, select the **Microsoft Azure AD Single Sign-On** option.

4 Click the **Next** arrow. The **Configure App Settings** dialog appears.

5 Enter the URLs you want in the three URL fields:

- **SIGN ON URL** - The appliance URL, for example: `https://appliance.company.com`.
- **IDENTIFIER** - The URL from the **Appliance ID** field from the **Configure Authentication Server** dialog. See Configuring Azure Active Directory as an SMA Authentication Server
- **REPLY URL** - The appliance ACS URL, for example: `https://appliance.company.com/saml2ssoconsumer`.

You can click on the question mark icon for each field to view a tooltip that describes which URL is required for that field and how it is used.

6 Click the **Next** arrow. The **Configure single sign-on at SonicWall_SMA** page provides the information you need to enable the SMA application to accept a SAML token from Azure AD.

The values required will vary depending on the application. Check the SAML documentation for the application for details.

The **SINGLE SIGN-ON SERVICE URL** and **SINGLE SIGN-OUT SERVICE URL** both resolve to the same endpoint, which is the SAML request-handling endpoint for your instance of Azure AD.

The **ISSUER URL** is the URL from the **Issuer** field of the SAML token.

7 After the SMA application is configured, click the **Next** arrow. The **Single Sign-On Confirmation** page appears.

8 Click the check mark to close the dialog.

Assigning Users and Groups to the SMA Application

After the SMA application has been configured to use Azure AD as an SAML-based Identity Provider, then it is almost ready to test. As a security control, Azure AD will not issue a token allowing users to sign into the SMA application until they have been granted access using Azure AD, either directly or through a group.

To assign a user or group to the SMA application:

1 In Azure AD, click the **Assign Users** button.

2 Select the user or group you wish to assign, and then select the **Assign** button.

One Identity Cloud Access Manager

This section describes how to configure One Identity Cloud Access Manager (CAM) 7.0 as an SMA Authentication Server.

Topics

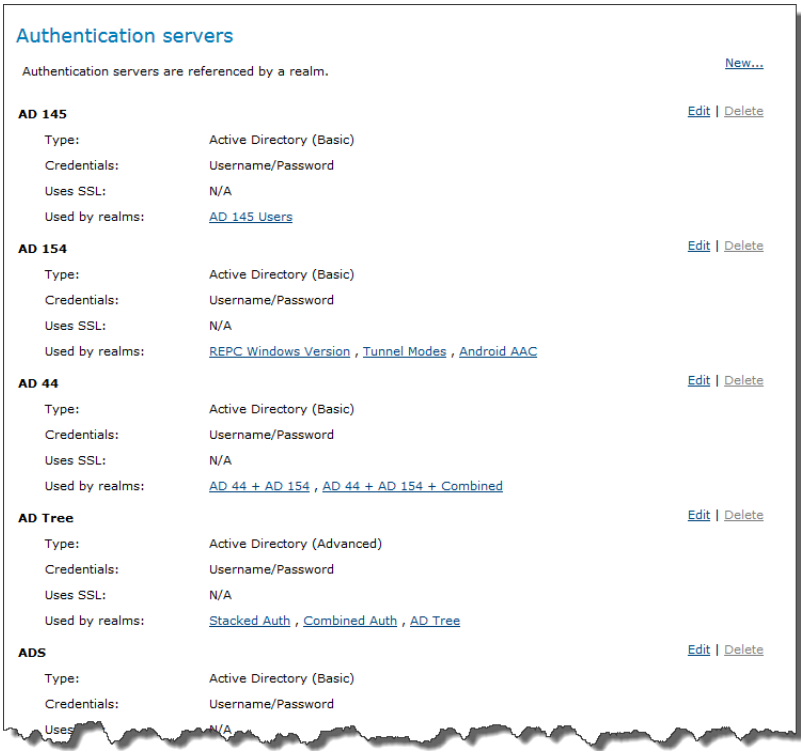
- Configuring One Identity CAM as an SMA Authentication Server
- Adding the SMA Application to One Identity Cloud Access Manager

Configuring One Identity CAM as an SMA Authentication Server

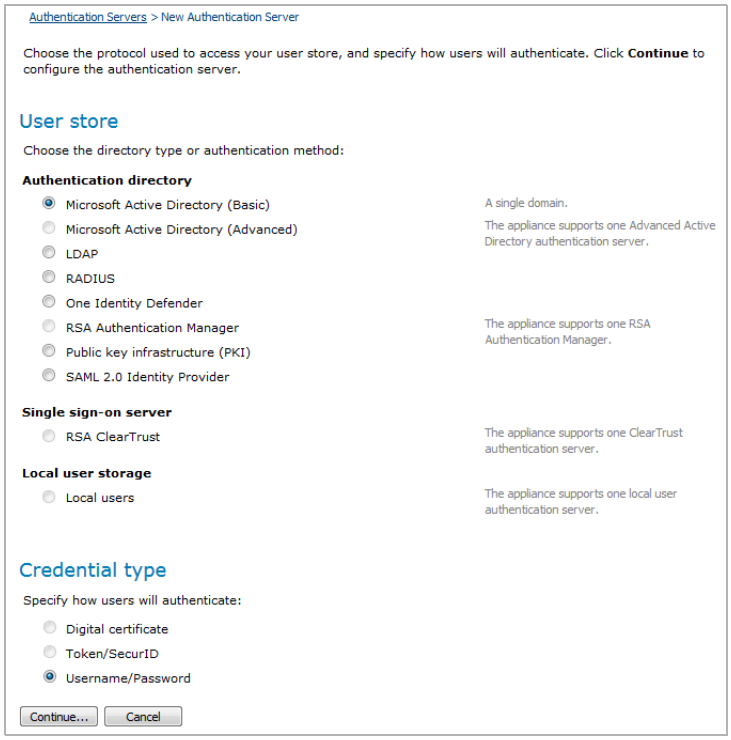
Configuring the One Identity Cloud Access Manager (CAM) as an SMA appliance is done by setting up a One Identity CAM Authentication Server on an SMA appliance.

To configure the One Identity CAM as an SMA Authentication Server:

1 On the SMA appliance, go to the **System Configuration > Authentication Servers** page.

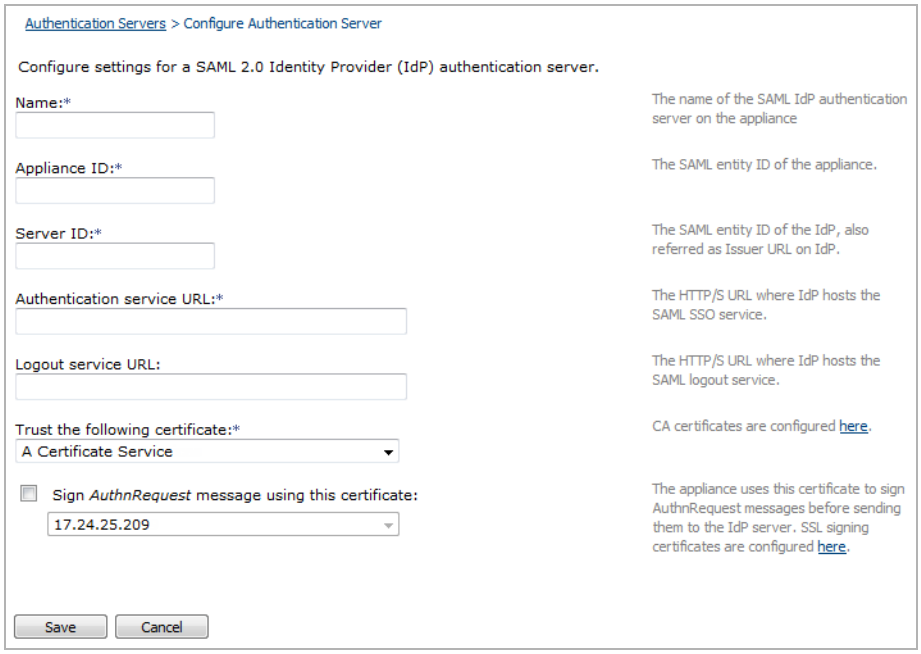


2 Under **Authentication servers**, click **New**. The **New Authentication Server** dialog appears.



3 Select **SAML 2.0 Identity Provider**.

4 Click **Continue...**. The **Configure Authentication Server** page appears.



Some of the values for the fields in the **Configure Authentication Server** page can be obtained from the **Application Created** page of the **One Identity Cloud Access Manager**.

The steps that follow explain how to configure the fields in the **Configure Authentication Server** page.

5 In the **Name** field, enter **CAM**.

6 In the **Appliance ID** field, enter the **Audience/SP Identity** from the **Application Created** page. For example, `https://appliance.company.com`.

7 In the **Server ID** field, enter the **Issuer Entity ID** or **IDP** from the **Application Created** page. For example, `urn:cam.test.com.test.com/CloudAccessManager/RPSTS`.

8 In the **Authentication service URL** field, enter the **IDP Login URL** from the **Application Created** page. For example, `https://sp16.test.com/CloudAccessManager/RPSTS/Saml2/Default.aspx`.

9 In the **Logout service URL** field, enter the **SSO URL**. For example, `https://cam.test.com.com/CloudAccessManager/RPSTS/Saml2/Default.aspx`.

10 From the **Trust the following certificate** drop-down menu, select the certificate you want. This should be the certificate from the **Certificate (Download Certificate)** of the **Application Created** page.

> **NOTE:** You must first download and install the certificate you want before it can appear in this drop-down menu. See Downloading a Certificate for instructions on how to do this.

11 (Optional) Select the **Sign *AuthnRequest* message using this certificate** if you want it, and then select the appropriate certificate.

12 Click **Save**.

Adding the SMA Application to One Identity Cloud Access Manager

After you configure One Identity Cloud Access Manager (CAM) as an SMA Authentication Server, you need to add the SMA application to the One Identity CAM.

To add the SMA application to One Identity CAM:

1. In One Identity CAM, go to the Home page.
2. Under **Applications**, click **Add New**. The **Create a New Application** page appears.
3. Under **Create a New Application**, select **Configure Manually**. The **Back-end SSO Method** page appears.
4. Under **Back-end SSO Method**, select **Using SAML**.
5. Click **Next**. The **Federation Settings** page appears.
6. Under **Federation Settings**, enter the following URLs:
   a. In the **Recipient** field, enter `https://appliance.company.com/saml2ssoconsumer`.
   b. In the **Audience/SP Identity** field, enter `https://appliance.company.com`.
7. Click **Next**. The **Subject Mapping** page appears.
8. Under **Subject Mapping**, leave the default option selected, **Users from "AD" can't log into this application**.
9. Click **Next**. The **Claims Mapping** page appears.
10. Leave the **Claim Mapping** section empty.
11. Click **Next**. The **External Access** page appears.
12. Under **External Access**, select **This application is external to my network**.
13. Click **Next**. The **Permissions** page appears.
14. On the **Permissions** page, select the **Roles** you want, using the **Allow Role Access** button.
15. Click **Next**. The **Application Name** dialog appears.
16. In the **Application Name** field, enter the name of your SMA application.
17. Click **Next**. The **Application Portal** page appears.
18. On the **Application Portal** page, under **SSO Mode**, select **SP Initiated.**
19. In the **URL** field, enter `https://appliance.company.com`.
20. Select any other options you want.
21. Click **Finish**. The **Application Created** page appears.

    The **Application Created** page shows all the Single Sign-On details necessary to configure the SMA application.

OneLogin

This section describes how to configure OneLogin as an SMA Authentication Server and how to add the SMA application to the OneLogin service.

Topics:

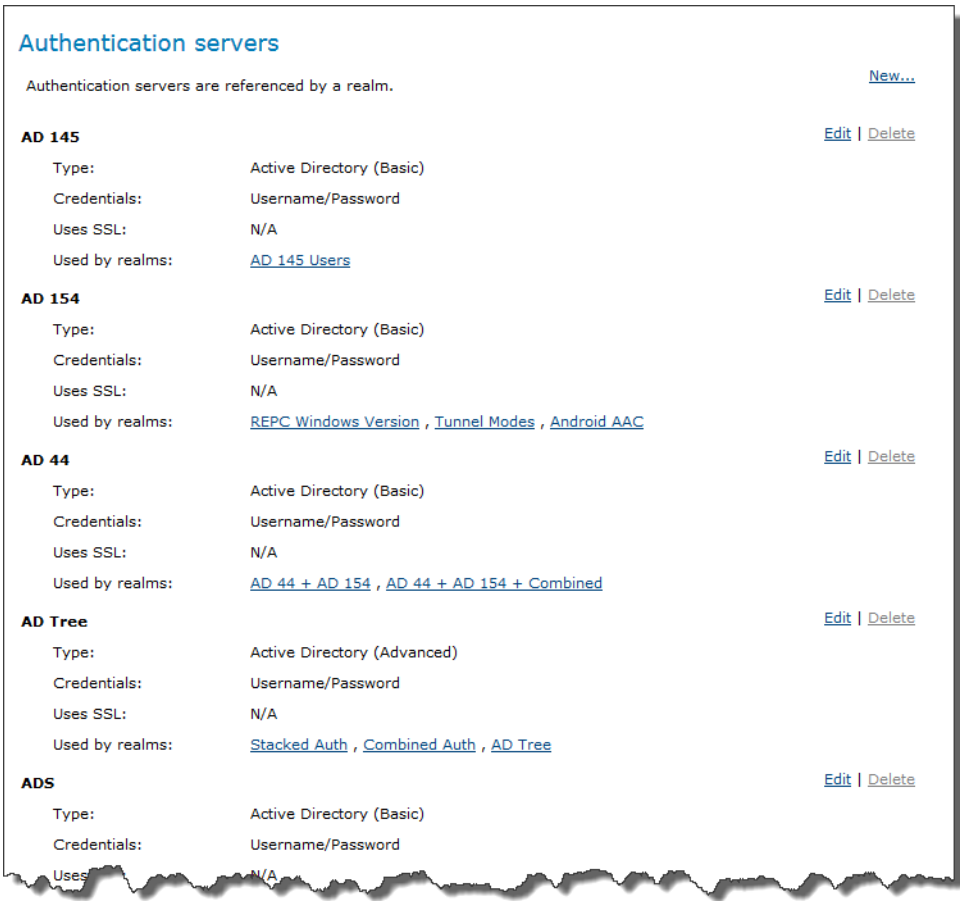
- Configuring OneLogin as an SMA Authentication Server
- Adding the SMA Application to OneLogin

Configuring OneLogin as an SMA Authentication Server

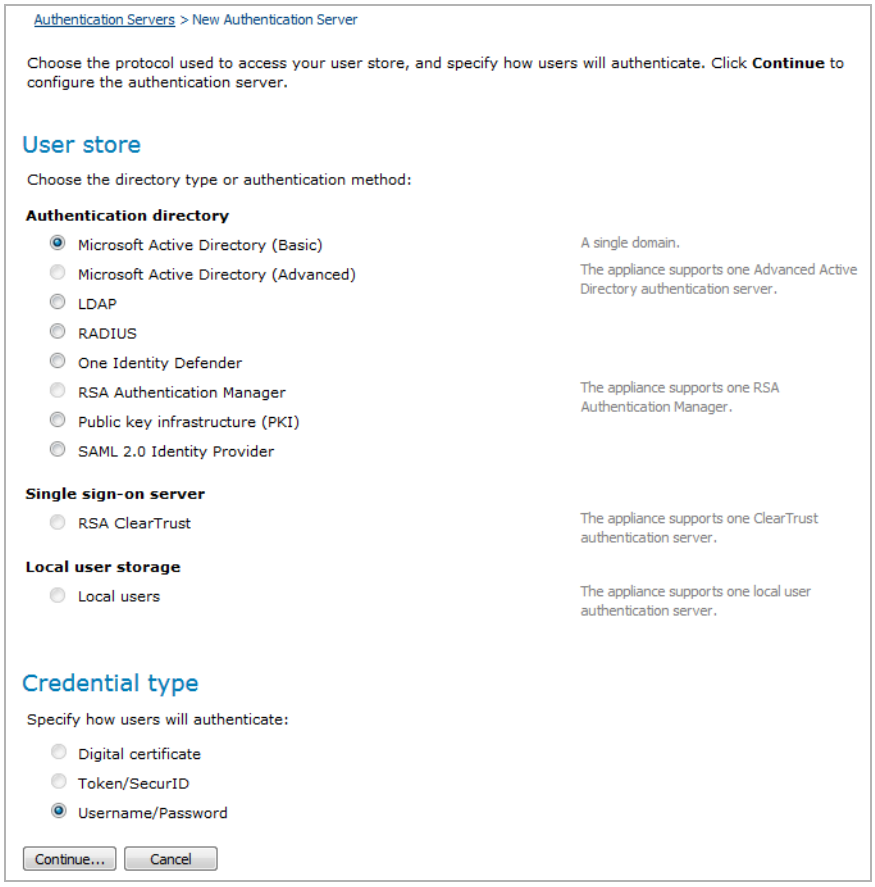
Configuring OneLogin as an SAML Identity Provider is done by configuring a OneLogin Authentication server on an SMA appliance.

To configure OneLogin as an SMA Authentication Server:

1 On the SMA appliance, go to the **System Configuration > Authentication Servers** page.

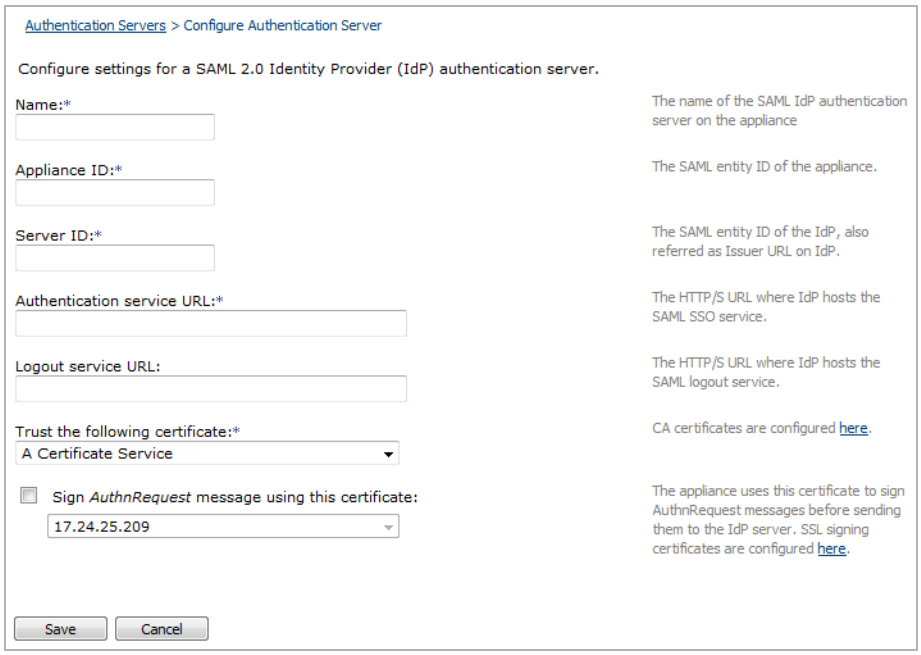


2 Under **Authentication servers**, click **New**. The **New Authentication Server** dialog appears.



3 Select **SAML 2.0 Identity Provider**.

4 Click **Continue...**. The **Configure Authentication Server** dialog appears.



The steps that follow explain how to configure the fields in the **Configure Authentication Server** dialog.

5 In the **Name** field, enter **OneLogin_IDP**.

6 In the **Appliance ID** field, enter the **Audience/SP Identity** from the **Configuration** tab of the **SonicWall VPN** page. For example, `https://appliance.company.com`.

7 In the **Server ID** field, enter the **Issuer URL** from the **Configuration** tab of the **SonicWall VPN** page. For example, `https://app.onelogin.com/saml/metadata/xxxx`.

8 In the **Authentication service URL** field, enter the **IDP Login URL** from the **SSO** tab of the **SonicWall VPN** page. For example, `https://company.onelogin.com/trust/saml2/http-post/sso/xxxx`.

9 In the **Logout service URL** field, enter the **SLO Endpoint (HTTP)** from the **SSO** tab of the **SonicWall VPN** page. For example, `https://company.onelogin.com/trust/saml2/http-redirect/slo/xxxx`.

10 From the **Trust the following certificate** drop-down menu, select the **X.509 Certificate**.

> **NOTE:** You must first download and install this certificate before it can appear in this drop-down menu. See Downloading a Certificate for instructions on how to do this.

11 (Optional) Select the **Sign *AuthnRequest* message using this certificate** if you want it, then select the appropriate certificate.

12 Click **Save**.

Adding the SMA Application to OneLogin

After you configure OneLogin as an SMA Authentication Server, you need to add the SMA application to the One Login service.

To add the SMA application to the OneLogin service:

1 In OneLogin, go to the **Home** page. The **Find Applications** page appears.

2 Under **Find Applications**, enter **sonicwall** in the search field and hit enter. The **Add Sonicwall VPN** page appears.

3 In the **Portal** panel, in the **Display Name** field, enter **SonicWall VPN**.

4 In the **Connectors** panel, for the **Connector Version**, select **SAML 2.0**.

5 Click **Save**. The **Sonicwall VPN** page appears.

6 Click the **Configuration** tab.

7 In the **Appliance** field, enter the FQDN for your appliance. For example, `https://appliance.company.com`.

8 Click the **SSO** tab.

9 In the **Enable SAML 2.0** panel, under the **X.509 Certificate** field, click **View Details**. The **Standard Strength Certificate** dialog appears.

10 Click the **Download** button to upload the CA Certificate to the SMA appliance.

Ping Identity PingOne

This section describes how to configure Ping Identity PingOne as an SMA Authentication Server and how to add the SMA application to the Ping Identity PingOne service.

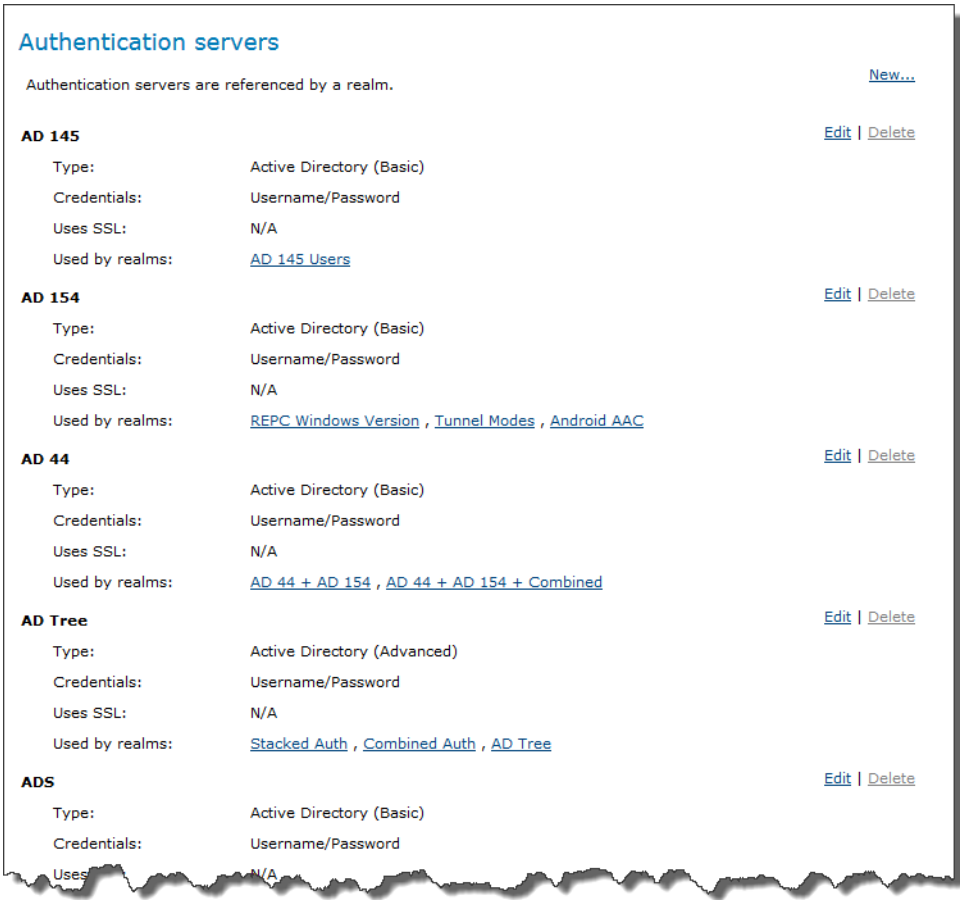
Topics:

Configuring Ping Identity PingOne as an SMA Authentication Server

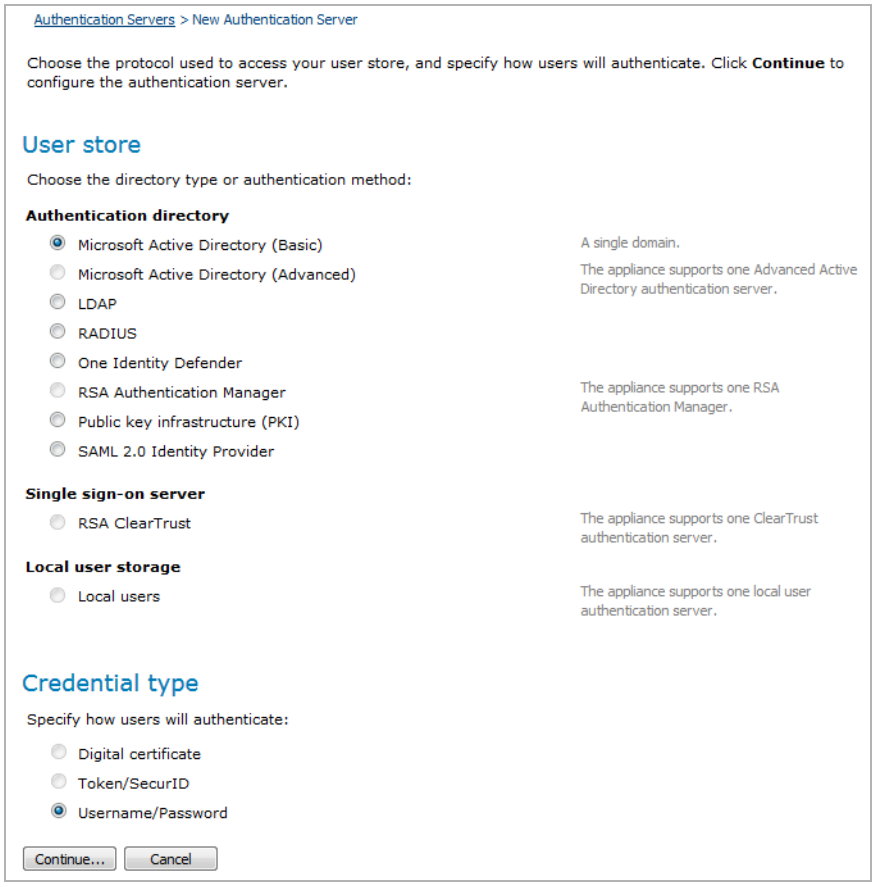
Configuring Ping Identity PingOne as an SAML Identity Provider is done by configuring a Ping Identity PingOne Authentication server on an SMA appliance.

To configure Ping Identity PingOne as an SMA Authentication Server:

1 On the SMA appliance, go to the **System Configuration > Authentication Servers** page.

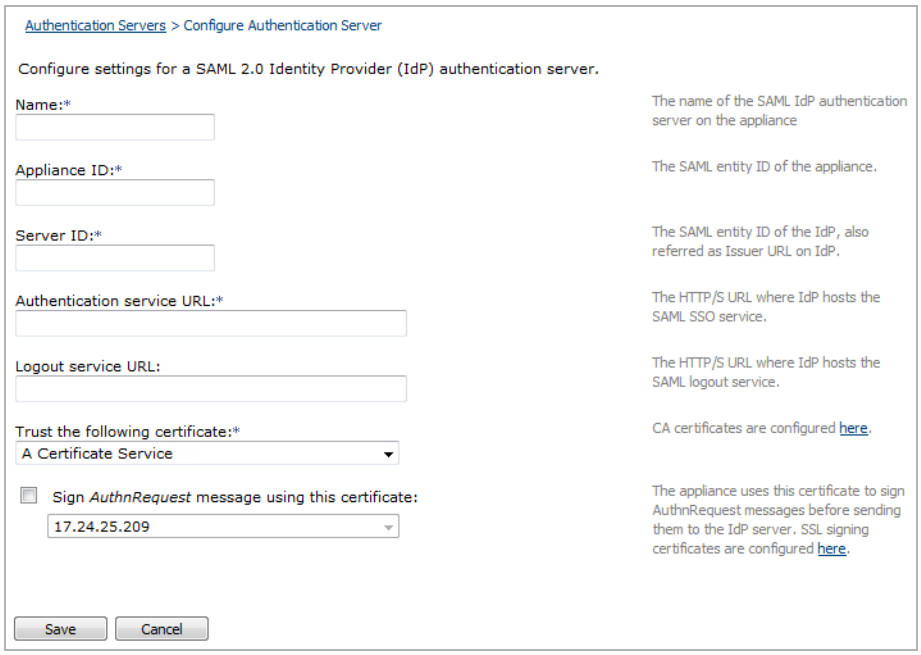


2 Under **Authentication servers**, click **New**. The **New Authentication Server** page appears.



3 Select **SAML 2.0 Identity Provider**.

4 Click **Continue...**. The **Configure Authentication Server** dialog appears.



Most of the values for the fields on this page can be obtained from the fields on the PingOne application page.

The steps that follow explain how to configure the fields in the **Configure Authentication Server** dialog.

5 In the **Name** field, enter **PingOne_IDP**.

6 In the **Appliance ID** field, enter the **entityId** from the **PingOne** application page. For example: `https://appliance.company.com`.

7 In the **Server ID** field, enter the value of the **entityID** of the **EntityDescriptor** tag from the downloaded XML file, for example, `https://pingone.com/idp/company`.

8 In the **Authentication service URL** field, enter the **Initiate Single Sign-On (SSO) URL** from the **PingOne** application page. For example, `https://sso.connect.pingidentity.com/sso/sp/initsso?saasid=734b784f-xxxxxx`.

9 In the **Logout service URL** field, enter the value of the **Logout Service URL** from the **Location** attribute of **SingleLogoutService** tag from the downloaded XML file. For example, `https://sso.connect.pingidentity.com/sso/SLO.saml2`.

10 From the **Trust the following certificate** drop-down menu, select the certificate you want. This should be the **Certificate** downloaded from the **PingOne** application page.

NOTE: You must first download and install the certificate you want before it can appear in this drop-down menu. See Downloading a Certificate for instructions on how to do this.

11 (Optional) Select the **Sign *AuthnRequest* message using this certificate** if you want it, then select the certificate.

12 Click **Save**.

Adding the SMA Application to Ping Identity PingOne

After you configure Ping Identity PingOne as an SMA Authentication Server, you need to add the SMA application to the Ping Identity PingOne service.

To add the SMA application to the Ping Identity PingOne service:

1 In PingOne, go to the **My Applications** page.

2 Under **Add Application**, select **New SAML Application**. The **Applications Details** panel opens.

3 Enter the **Application Name**.

4 Enter the **Application Description**.

5 Select the **Category** you want.

6 For **Graphics**, select the **Application Logo** and **Application Icon** you want.

7 Click **Continue to Next Step**. The **Application Configuration** panel opens.

8 For the **Protocol Version,** select **SAML v2.0**.

9 In the **Assertion Consumer Service (ACS)** field, enter the URL: `https://appliance.company.com/saml2ssoconsumer`.

10 Enter the **Entity ID**.

11 Enter the **Application URL**. This should be the same as appliance URL. For example, `https://appliance.company.com`.

12 For the **Single Logout Binding Type**, select **Post**.

13 Click **Next**. The **SSO Attribute Mapping** panel opens.

14 In the **Status** column, click in the row for the application to make it active.

15 Click **Save & Publish**

16 Click **Add new attribute**. The following panel opens.

17 To upload the CA Certificate to AMC, click Certificate **Download**.

18 Click SAML Metadata **Download**.

19 Click **Finish**.

Salesforce

This section describes how to configure Salesforce as an SMA Authentication Server and how to add the SMA application to the Salesforce service.

Topics:

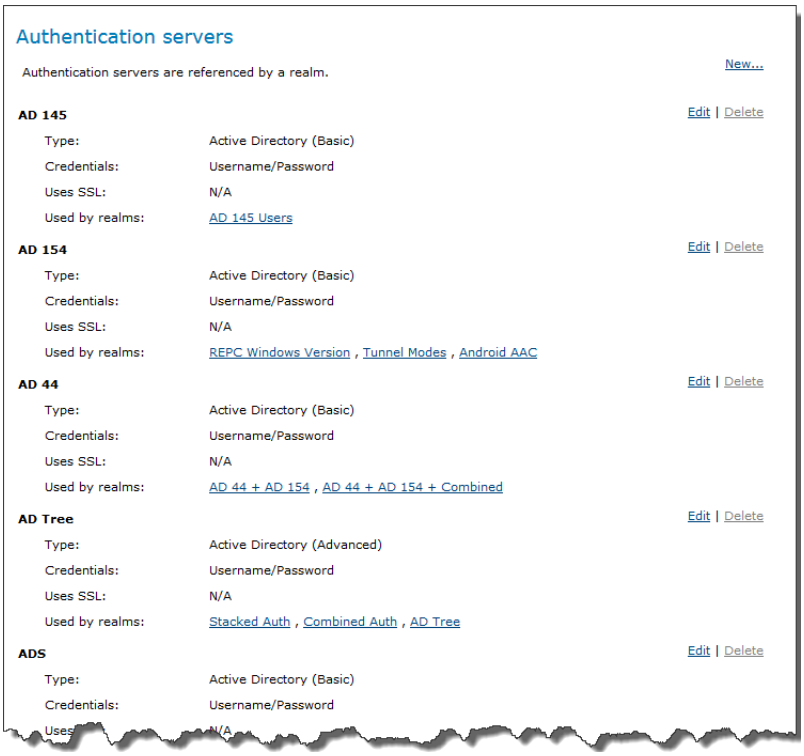
- Configuring Salesforce as an SMA Authentication Server
- Adding the SMA Application to Salesforce

Configuring Salesforce as an SMA Authentication Server

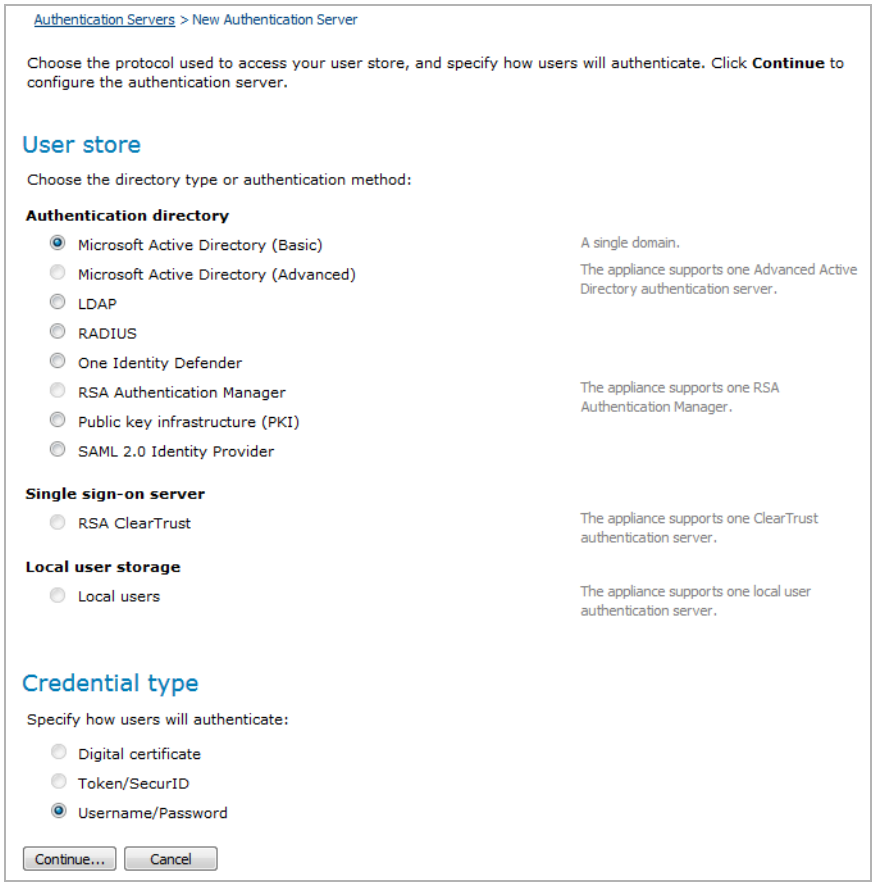
This section describes how to configure Salesforce as an SMA Authentication Server.

To configure Salesforce as an SMA Authentication Server:

1 On the SMA appliance, go to the **System Configuration > Authentication Servers** page.

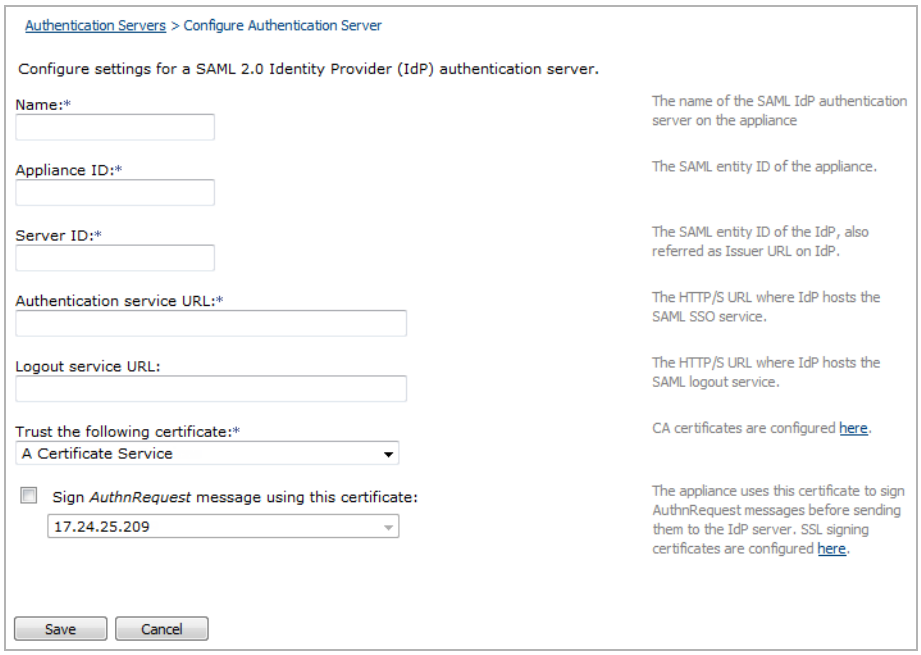


2 Under **Authentication servers**, click **New**. The **New Authentication Server** page appears.



3 Select **SAML 2.0 Identity Provider**.

4 Click **Continue...**. The **Configure Authentication Server** page appears.



The steps that follow explain how to configure the fields in the **Configure Authentication Server** dialog.

5 In the **Name** field, enter **Saleforce_IDP**.

6 In the **Appliance ID** field, enter the **Entity Id** under **Web App Settings** from the **Salesforce** application page. For example, `https://application.company.com`.

7 In the **Server ID** field, enter the **Issuer** from the **Salesforce** application page, under **Web App Settings**. For example, `https://company.my.salesforce.com` as per application configuration in Salesforce.

8 In the **Authentication service URL** field, enter the **IdP-Initiated Login URL** from the **Salesforce** application page. For example, `https://company.my.salesforce.com/idp/endpoint/HttpRedirect`.

9 From the **Trust the following certificate** drop-down menu, select the certificate you want. This should be the certificate downloaded from the **Identity Provider** page.

NOTE: You must first download and install this certificate before it can appear in this drop-down menu. See Downloading a Certificate for instructions on how to do this.

10 (Optional) Select the **Sign *AuthnRequest* message using this certificate** if you want it, then enter the IP address for the certificate.

11 Click **Save**.

Adding the SMA Application to Salesforce

After you configure Salesforce as an SMA Authentication Server, you need to add the SMA application to the Salesforce service.

To add the SMA application to the Salesforce service:

1 Login to Salesforce.

2 Go to the **App Setup > Create > Apps > Connected Apps Detail** page.

3 Click **Add**. The **Settings** dialog appears.

4 In the **Web App Settings** panel:

a For **Start URL**, enter `https://appliance.company.com`.

b Select **Enable SAML**.

c For **Entity ID**, enter the Workplace URL: `https://appliance.company.com`.

d For **ACS URL**, enter `https://appliance.company.com`.

e For **Subject Type**, select **Username**.

f For **Name ID Format**, enter `urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified`

g For **Issuer**, enter `https://company.my.salesforce.com`.

5 Click **Save**.

6 On the **App Setup > Create > Apps > Connected Apps Detail** page, click **Manage Profiles**.

7 Select the types of users you want to allow to access the Salesforce application.

8 Click **Save**. You can view the configured Sale force settings on the **SonicWall SMA** page.

E

Log File Output Formats

About Log Files

The SMA appliance records system and user events in a series of log files. You can view the log files in AMC or by sending the messages to an external syslog server—this process is described in System Logging and Monitoring. This section explains how to manually review log files from the command-line interface on the appliance itself and interpret the data.

File Locations

the Log file names for SMA services table lists the names of the log files on the appliance, which are initially stored locally (`/var/log/aventail/`).

Log file names for SMA services

Secure Mobile Access service	File format	File name
System messages Contains message logs for the Web proxy service, the network tunnel service, and the policy server. Unregistered device messages are also in this log. See System Message Log.	syslog	`access_servers.log`
Network tunnel service Includes information about connection activity, a list of users accessing the network, and the amount of data transferred for the network tunnel service. See Network Tunnel Audit Log.	SOCKS5LF	`extranet_access.log`
Web proxy service See Web Proxy Audit Log.	W3C CLF	`extraweb_access.log`

Log file names for SMA services

Secure Mobile Access service	File format	File name
Appliance Management Console (AMC) See Management Console Audit Log.	syslog	`policy_audit.log` `management.log`
Client installation See Client Installation Logs (Windows).	syslog	*<username>*`@`*<realm>*`.log`
WorkPlace See WorkPlace Logs.	syslog	`workplace.log` `wp_init.log`
Upgrade log This log is a record of any upgrades you have made to the appliance.	text	`upgrade.log`
Migration log Stored in */var/log/*, these are the logging messages recorded during migration from version *<n.n.n>*.	syslog	`migrate_`*<n.n.n>*`.log`

To minimize storage requirements for log files, the appliance rotates the files. The log rotation procedures vary, depending on the frequency you specify:

Log rotation procedures

Frequency	Procedure
Every 15 minutes	• Rotate any log files that are larger than 750MB. • Force a rotation of the syslog log file. • Turn on Compression for rotated files. • Compression Ratio is set to 0.10 of actual file size. • Each file is compressed after rotation.
Every day	• Force a rotation of all log files. • Delete any log files that are older than seven days.

Log files of more than one day old are stored in uncompressed format. The log file names contain a suffix that is numbered sequentially from 1 through 7, so that if the log rotation occurs daily, a log file with the suffix 7 is one week old. For example:

- `extraweb_access.log` is the current log file for Web proxy service.
- `extraweb_access.log1` through `extraweb_access.log.7` are the logs from the previous rotations.

System Message Log

The system message log (`/var/log/aventail/access_servers.log`) is generated in syslog format (see RFC 3164) and contains message logs for the Web proxy service, the network tunnel service, and the policy server (an internal service that controls policy for the other services). It also provides detailed messages about all access control decisions: each time a user request matches a policy rule, a log file entry is recorded explaining the action taken.

This sample message log entry is followed by descriptions of its elements:

```
[08/Nov/2016:07:16:24.312477 +0000] E-Class SRASSLVPN 002764 up 00000001 Info
System  CFG Pool Init STATIC/NAT id=1 name='HQ-pool2' gid='AV1160554493976A' ndns=2
nwins=2 nsuffix=0
```

System message log fields

Field	Description
`[08/Nov/2016:07:16:24.312477 +0000]`	
Precise timestamp	This timestamp indicates when the message was generated by the service (Web proxy, network tunnel, network proxy, or policy). This is a more accurate timestamp than the one generated by syslog because the logging system buffers messages before sending them to syslog.
`E-Class SRASSLVPN`	
Appliance name	This name can be changed on the Network Settings page in AMC (on the **Configure Basic Network Settings** page).
`002764`	
Process ID (PID)	Every application that is running is assigned a process ID. This PID identifies the application that generated the log entry.
`up`	
Application ID	Identifies the server process that generated the message. The possible IDs are: • `ap` (API server) • `cp` (SMA distributed cache client: policy server, client credential storage) • `dc` (SMA distributed cache server: policy server, client credential storage) • `ev` (network tunnel service—kernel component) • `ew` (Web proxy service) • `fm` (failover monitor) • `kp` (network tunnel kernel mode policy server interface) • `ks` (network tunnel kernel mode interface to SSL daemon) • `kt` (kernel tunnel component) • `ls` (log server) • `ps` (policy service) (Also see Auditing Access Policy Decisions) • `pt` (ping/traceroute tools) • `uk` (unknown) • `up` (network tunnel policy server daemon) • `us` (network tunnel user space SSL daemon)
`00000001`	
Context ID	The context ID is a unique value used to tie related logs from all four services (Web proxy, network tunnel, network proxy, policy, and WorkPlace) together. You can use the context ID to search for all messages related to a single user session. If a message is not tied to a particular user session, it is assigned a number lower than `00000010`. The first digit of this ID indicates which service originally generated the session: • `0` (policy service) • `1` (Web proxy service) • `3` (WorkPlace service)

System message log fields

Field	Description
`Info`	
Severity	The message severity levels are: • **Error**—A problem caused the server to shut down or fail to communicate with another component. A name resolution problem at startup is logged at this level. • **Warning**—Something unexpected occurred that does not adversely affect the operation of the server. For example, a single failed attempt to access a RADIUS server is logged at the Info level, but if all attempts fail, an entry is added to the log file at the Warning level. • **Info**—A normal event that you might want to track; for example, a specific user has logged in, or has matched a given access control rule. • **Verbose**—Like an Info message, this level identifies normal operations, but includes the steps in a process. For example, when processing access control rules a message for each non-match is at the Verbose level, while a matched rule is identified as Info.
`System`	
Message type	Indicates what part of the server logged the message.
`CFG Pool Init STATIC/NAT id=1 name='HQ-pool2' gid='AV1160554493976A' ndns=2 nwins=2 nsuffix=0`	
Message text	The text following all the identifying information is the message itself. See Auditing Access Policy Decisions for an explanation of the message text for access policy decisions.

Topics:

- Auditing Access Policy Decisions
- Viewing Client Certificate Errors in the Log
- End Point Control Interrogation
- Unregistered Device Log Messages

Auditing Access Policy Decisions

One of the main uses for the system message log is to audit access policy **decisions**. Each time a user request matches a policy rule, the appliance writes an entry to the message text field (the last field in the message log) explaining the action taken.

A sample message for an access policy decision looks like this:

```
[09/Nov/2016:02:45:32.282637 +0000] E-Class SRASSLVPN 002421 ps 100004b3 Info
EWACL   User '(192.168.136.70 (Dominique Daba)@(Students)' connecting from
'192.168.136.70:37975' matched rule 'accessRule(AV1091719670706:preauth access
rule)', access to '127.0.0.1:455' is permitted.
```

For each connection request that matches a rule, a log message is generated at the Info level. Requests that don’t match a rule are logged at the Verbose level, and when no rule match is found the request is logged at the Warning level.

For policy decisions, the logging message text field (everything after `Info` in the previous example) includes the information shown in the Logging message text fields table.

Logging message text fields

Field	Description
EWACL	
Log type	The access policy being evaluated. The log types are: • CSACL—client/server access policy • EWACL—Web access policy • WPACL—WorkPlace access policy • NEACL—file system access policy (file shares accessed from the Network Explorer page in WorkPlace)
`User '(192.168.136.70 (Dominique Daba)@(Students)'`	
User name	The user making the request. If the appliance is configured to use multiple realms, the username will appear in the format `(user)@(realm)`.
`connecting from '192.168.136.70:37975'`	
Source of request	The address of the user making the request.
`matched rule 'accessRule(AV1091719670706:preauth access rule)'`	
Match status	Rule match status (either `Matched` or `No Match`) and the ID for the rule.
`access to '127.0.0.1:455' is permitted`	
Rule outcome	Details If the rule matched, this field will be empty. If the rule did not match, one of the following messages will appear: • Source Network is *<network>* • Date/time specification *<time>* • User *<username>* not in User/Group List • Destination network is *<dest>* • Virtual Host is *<vhost>* • Destination services dest is *<dest>* • Command is *<command>* • UDPEncrypt is *<true or false>* • Key Length *<length from the policy rule>* requires a stronger cipher

If no rule matched, an Info-level message is generated indicating that no matching rule was found.

Examples

Example 1—Success at Info Level

```
[09/Nov/2016:02:45:32.712860 +0000] E-Class SRASSLVPN 002421 ps 10000531 Info
Session Authentication for user '(192.168.136.70 (Guest))@(Students)' SUCCESS for
realm 'Visitors'
```

Example 2—Failure at Info Level

```
[09/Nov/2016:04:27:40.965127 +0000] E-Class SRASSLVPN 002873 ps 00000003 Info
WPACL   User '(kevin figment)@(Students)' connecting from '192.168.136.70:0' found
no matching access rule, access to 'www.seattletimes.com:80' is denied.
```

Viewing Client Certificate Errors in the Log

If the appliance is unable to verify a certificate chain, a message such as this one appears in the system message log file:

```
[09/Nov/2016:21:28:14.610949 +0000] E-Class SRASSLVPN 001539 ps 10000042 Info System
Auth: CRL-CERT: Cert verification status = 0, err = 20 'unable to get local issuer
certificate'
```

This message includes an error code (in this case, 20) reporting why the certificate check failed. These error codes are described in the Client certificate error codes table.

Client certificate error codes

Code	Error message	Description
2	Unable to get issuer certificate	The issuer certificate of an untrusted certificate could not be found.
7	Certificate signature failure	The signature of the certificate is invalid.
9	Certificate is not yet valid	The certificate is not yet valid.
10	Certificate has expired	The certificate has expired.
18	Self-signed certificate	The passed certificate is self-signed and cannot be found in the list of trusted certificates.
19	Self-signed certificate in certificate chain	The certificate chain can be built using the untrusted certificates, but the root cannot be found locally.
20	Unable to get local issuer certificate	This normally means the list of trusted certificates is not complete. This error can also occur when an intermediate certificate is used for authentication (a root certificate is required).
21	Unable to verify the first certificate	No signatures could be verified because the chain contains only one certificate and is not self-signed.
22	Certificate chain too long	The certificate chain length is greater than the supplied maximum depth.
23	Certificate revoked	The certificate has been revoked.
24	Invalid CA certificate	A CA certificate is invalid. Either it is not a CA or its extensions are not consistent with the supplied purpose.

End Point Control Interrogation

The system message log captures information during client EPC interrogation when the log level is set to verbose. The appliance checks for the presence of certain device profile attributes on the client, and the log file records the query and the results.

In the following example, EPC is checking for a certain antivirus application (Symantec Client Security, version 9.x or later). When the application is not found, this particular device is relegated to the Default zone:

```
[04/Oct/2016:22:29:23.867093 +0000] E-Class SRASSLVPN 027186 uk 00000001 Verbose
System  ::API::QAABA145dFYNZimCKNWHB7p2q2Y=::(timwillis)@(Students)::CLIENT::
Interrogation: Evaluation of OPSWATAV AV1128462569762A [NortonAV.dll,Symantec
Corp.,Symantec Client Security,>=,9.x,,,,,FALSE] results: FALSE
```

```
04/Oct/2016:22:29:23.875781 +0000] E-Class SRASSLVPN 027186 uk 00000001 Verbose
System  ::API::QAABA145dFYNZimCKNWHB7p2q2Y=::(timwillis)@(Students):: Classified
into zone: Default zone
```

Unregistered Device Log Messages

Unregistered device log messages provide device IDs from login attempts by users on devices that are not registered. The AMC provides a way to export the unregistered device log messages in XML format. On the Logging page, select **Unregistered device log** from the **Log file** drop-down list and then click **Export**. You can reduce the size of the exported file by first applying filter or search criteria.

You can also access and export the list of unregistered devices to an XML format on another system. The list can be accessed directly in a Web browser using the following URL:

```
https://(internal IP address)/UnregisteredDevices.xml
```

This URL requires BASIC HTTP authentication, and the credentials must be an AMC user with at least View access to the Monitoring category.

A `curl` or `wget` command can be used to obtain the list programmatically from the external machine:

Command	Syntax
curl	`curl -k3u (user):(password) https://(internal IP):8443/UnregisteredDevices.xml`
wget	`wget --no-check-certificate --http-user=(user) --http-password=(password) https://(internal IP address):8443/UnregisteredDevices.xml`

Both of these commands turn off SSL certificate checking, which is useful when using a self-signed certificate.

A full definition of the URL used to fetch the XML version of the unregistered device report is provided in:

URL	*https://<internal address>:8443/UnregisteredDevices.xml?parameter=value&parameter=value*	
Authentication		BASIC HTTP authentication, credentials must be AMC user with at least view access to the Monitoring category.
Parameters (all optional)		
	username	string, case insensitive, default ***** (all users) Search for login attempts from users that contain this value as part of their username. Example: `username=li` will return entries for `Linda` and `Melinda`
	realm	string, case insensitive, default ***** (all realms) Search for login attempts to Realms that contain this value as part of the Realm name. Example: `realm=Corp` will return entries for `Corporate` and `Non-Corporate`
	platform	string, enumerated values below Search for login attempt from devices running only the specified platform: `all` — all platforms (default) `windows` —only Windows devices `mac` — only Mac devices `linux` — only Linux devices `activeSyncMobile` — only Exchange ActiveSync devices `mobilePhone` — only Mobile Phone devices `pda` — only PDA devices `unknown` — only devices on which the platform could not be determined

exported	string, enumerated values below Search for entries that have or have not already been exported either in AMC or via an HTTP get command. `all` — all entries, whether or not they have been exported (default) `exported` — only entries that have already been exported `unexported` — only entries that have not already been exported
limit	number, default **1000** Limit the search to this many entries.
deviceCount	number, 0-3, default all entries Search for users with only the specified number of devices already registered in the external AD/LDAP store. 0 — user has no devices registered 1 — user has one device registered 2 — user has two devices registered 3 — user has three or more devices registered
lastLoginTime	string, enumerated values below, default `all` Search for user login attempts that happened only in the time period specified, relative to the current time. `all` — all login attempts `hour` — attempts in the last hour `day` — attempts in the last day (24 hour period) `week` — attempts in the last week (7 days)

Network Tunnel Audit Log

The network tunnel audit log provides detailed information about connection activity, including the status of completed tunnel connections and the status of completed flows within tunnels.

NOTE: The two record types can be distinguished by the word `flow` or `tunnel` appearing in the sixth field of the message.

Messages are stored on disk in the file `/var/log/aventail/extranet_access.log` and contain these parameters:

```
[source-ip:port] [authentication] "[username@realm]" "[date/time]" [version]
[command] [destination-ip:port] [status code] [bytes-received] [bytes-sent]
[connection duration] [imei]
```

This example illustrates a network tunnel service audit log file entry:

```
12.230.158.210:1110 ssl:LDAP "fred figment" "13/Sep/2016:19:18:28 -0700" v1.1 flow:tcp
192.168.136.254:22 0 21722 60631 263 490236207159217
```

The log entries contain the fields (separated by spaces) shown in the Network tunnel audit log fields table.

Network tunnel audit log fields

Field	Description
source-ip:port	For tunnel records this field contains the source address of the outer tunnel connection. For flows this field contains the inner flow source address, which is the virtual IP address assigned from a tunnel pool when the tunnel is established. Example: 12.230.158.210:1110
authentication	A hyphen (-) indicates re-authentication via TEAM credential. **NOTE:** An explicit value is not possible, because the tunnel does not know the authentication method used to negotiate the TEAM credential.
"username@realm"	User accessing the resource, and the realm he or she is logged in to. The format of this field varies, depending on the authentication method used. Example: "mfigment@employees"
"date/time"	Date (in date/month/year format) and time (hours, minutes, seconds, and milliseconds in 24-hour-clock format and hours of time zone +/- GMT) the connection began. **NOTE:** Records containing date/time may not be written immediately to the log. Example: "13/Sep/2016:19:18:28 -0700"
version	The Connect or OnDemand Tunnel protocol version, with 1.1 for currently supported releases.
command	The type of command executed. These commands can appear in log file entries for the network tunnel service: tunnel flow:tcp flow:udp flow:icmp
destination-ip:port	IP address and port number of the resource being accessed. For flows, this is the destination of the TCP, UDP or ICMP flow. For tunnels, this is the external address of the appliance (port number is always 0). Example: 192.168.136.254:22
status code	0 is success. See Auditing Connection Status Messages for more detail about the status codes.
bytes-received	Number of bytes read from source.
bytes-sent	Number of bytes written to destination.
connection duration	Connection duration (in seconds) based on the time the tunnel was closed, a TCP flow entered its TIME_WAIT state, or a UDP or ICMP flow timed out.

Network tunnel audit log fields

Field	Description
imei	Every mobile phone is assigned a unique, 15-digit IMEI code (device identifier) that indicates information like the manufacturer, model type, and country of approval. The IMEI can be displayed on most phones by dialling *#06#. It's also shown on the compliance plate underneath the battery. Example: 352711-01-521146-5 If the IMEI code is not provided by the device, a platform identifier is shown. Platform identifiers (first character) are: W – Windows M – Mac L – Linux P – PDA A – AcitveSync Mobile X – Unknown (blank) – Mobile Phone

Auditing Connection Status Messages

The network proxy/tunnel audit log includes a connection status code that is often useful in debugging client/server connection problems. The status code is the field immediately following the destination-ip:port field in the log file (see Network Tunnel Audit Log for a description of an entire log file entry). the Connection status codes table describes each code.

Connection status codes

Connection status code	Description
0	Successful connection attempt with no errors encountered
1	Client presented an invalid TEAM credential
2	Couldn't send TEAM request to client, error in tunnel auth exchange, or error in PS auth exchange
3	Tunnel protocol at client is below minimum supported by appliance
4	TP error, or unsupported feature requested
5	Session sat idle longer than allowed by configuration or defaults
6	Tunnel pools have no addresses available
9	No tunnel internal address (bad cfg); realm_list (shouldn't happen) problem; client rejected resource list
10	Client version mismatch
11	All available tunnel pool addresses conflict with the client's networking environment in fatal ways
12	Special error to client indicating it should attempt a resume immediately
65535	Permission denied
65524	Out of memory
65520	System busy, session dropped
65514	Internal inconsistency, unexpected condition encountered
65504	Tunnel service aborted
65432	Connection reset by peer
65429	Not connected (internal error)

Connection status codes

Connection status code	Description
65428	Tunnel service shutdown
65426	Timeout (not necessarily an error, esp. for UDP flows)
65279	No authentication method
65278	Authentication failed (for example, the user entered an invalid username/password)
65277	Authentication I/O fail
65276	Authentication quiet fail
65275	Lost client connection
65274	Cannot load module
65273	Not authorized (for example, access denied due to policy)
65272	Encrypt failure
65271	Unknown failure

Examples

If a user enters an invalid username/password, error number 65535 appears in the log:

```
192.168.2.69:3127 ssl "testing" "26/Feb/2017:21:31:51.947 +0000" none -:- 65535 385
0 14 352711-01-521146-5
```

If a timeout occurred, the message contains error number 65426:

```
192.168.2.69:3127 ssl "testing" "26/Feb/2017:21:31:51.947 +0000" none -:- 65426 385
0 1 352711-01-521146-5
```

All tunnel traffic originating from the client and destined for the Internet (running in redirect-all mode) is routed through an IP address you specify on the **Configure Network Tunnel Service** page in AMC (**Enable route to Internet**). If this route to the Internet is not available, you'll see a connection status code of 65504:

```
151.219.76.85:4827 - "(l248411)@(Radius)" "26/Jun/2016:17:54:14.916 +0000" 1.1
Flow:TCP 165.170.0.1:1503 65504 0 0 60 352711-01-521146-5
```

Web Proxy Audit Log

The Web proxy audit log provides detailed information about connection activity, including a list of users accessing your network and the amount of data transferred.

The `/var/log/aventail/extraweb_access.log` file messages are stored in the World Wide Web Consortium (W3C) Common Log Format (CLF). See http://httpd.apache.org/docs/logs.html for more information on CLF logs. The log message has these parameters:

```
[source-ip] [identity] [shortname@realm] [longname] [date/time] "[request]" [HTTP
return code] [bytes-sent] [imei]
```

The following is a sample network proxy/tunnel service audit log file entry:

```
192.168.200.162 - (extranetuser)@(Translation)
(uid=extranetuser,ou=Users,dc=indigo,dc=com) [31/Mar/2017:09:08:09 -0700] "GET
http:/ /127.0.0.1:455/postauth/interrogator/AventailComponents.exe HTTP/1.1" 200
536016 "-"
```

The log entries contain the fields (separated by spaces) shown in the Web Proxy audit log fields table.

Web Proxy audit log fields

Field	Description
source-IP	IP address of the computer accessing the Web proxy service (this field may contain a translated address if NAT is in use). Example: `192.168.200.162`
identity	This field is not used by the Web proxy service; it always contain a dash (`-`).
shortname@realm	If the user has logged in, this field displays the user's name and login realm in the form `(username@realm)`. If a user has not yet authenticated or is accessing content that does not require authentication (such as the WorkPlace login page), this field contains a dash (`-`). In cases where no authentication is used (that is, the **Authentication server** for the realm in AMC is set to **None**), this field will contain **anonymous-user.** Example: `(extranetuser)@(Translation)`
longname	If the user has logged in, this field displays the user's long name. LDAP and Active Directory usernames are displayed using a DN. Other usernames are display using a CN. If a user has not yet authenticated or is accessing content that does not require authentication (such as the WorkPlace login page), this field contains a dash (`-`). Example: `(uid=extranetuser,ou=Users,dc=indigo,dc=com)`
date/time	The date and time at which the request was received by the appliance. Example: `[16/Apr/2017:21:36:37 +0000]`
request	First line of the HTTP request, containing the HTTP command (such as GET or POST), the requested resource, and the HTTP version number. Example: `"GET /alias1/foo.gif HTTP/1.1"`
HTTP-return-code	The server responds with one of the following return codes: • `2xx` codes indicate a successful request. • `3xx` codes indicate some form of redirection or cached response. • `4xx` codes indicate an error (such as a resource that is not found or an unauthorized request). • `5xx` codes indicate a server error. For more information on these codes, see http://www.ietf.org/rfc/rfc2616.txt.
bytes-sent	Number of bytes sent in the body of the response (this does not include the size of the HTTP headers).
imei	Every mobile phone is assigned a unique, 15-digit IMEI code that indicates information like the manufacturer, model type, and country of approval. The IMEI can be displayed on most phones by dialling `*#06#`. It's also shown on the compliance plate underneath the battery. If there is no IMEI associated with the user, a dash (`-`) is entered in the log file. Example: `352711-01-521146-5`

Examples

- If an authentication attempt fails—for example, because the user enters an invalid username or password—a single message appears in the log with a return code of `200` (OK), indicating the client request was understood). Notice that the source IP address in the message is the only way for you to identify who made the request:

```
192.168.2.69 - - [26/Feb/2017:21:43:30 +0000] "POST /__extraweb__authen
HTTP/1.1" 200 3610 352711-01-521146-5
```

For a successful authentication, a similar message appears, but with a return code of 302 (Found). It is immediately followed by another message that contains the user's authentication credentials and a return code of 200:

```
192.168.2.69 - - [26/Feb/2017:21:44:25 +0000] "POST /__extraweb__authen
HTTP/1.1" 302 206 352711-01-521146-5

192.168.2.69 - (jsmith)@(AD) [26/Feb/2017:21:44:25 +0000] "GET
/workplace/access/home HTTP/1.1" 200 15424
```

- If a user successfully authenticates, but is denied access to a Web resource by an access rule, a message containing a return code of 403 (Forbidden) is logged:

```
192.168.2.69 - (jsmith)@(AD) [26/Feb/2017:21:52:25 +0000] "GET /dukes
HTTP/1.1" 403 3358 352711-01-521146-5
```

- If a user successfully authenticates and is permitted to access a URL, a message appears that is identical to the one for a failed authentication (a return code of *200*), except that this one includes the user's credentials:

```
192.168.2.69 - (jdoe)@(AD) [26/Feb/2017:21:51:03 +0000] "GET /dukes
HTTP/1.1" 200 262 352711-01-521146-5
```

Management Console Audit Log

An individual with administrative privileges can view a history of configuration changes that were made to the appliance by reviewing the AMC audit log. This log provides an audit history of configuration changes made in AMC by administrators. Follow the steps in Management Audit Log to view the log (`/var/log/aventail/policy_audit.log`) in AMC.

An additional AMC-related log file in syslog format (`/var/log/aventail/management.log`) is also available.

WorkPlace Logs

The WorkPlace log (`/var/log/aventail/workplace.log`) is useful for troubleshooting access to file shares using Network Explorer, and also answering questions about what Web and network shortcuts are shown on the WorkPlace portal page. Accessing file resources is also logged to the Web proxy service log (`extraweb_access.log`).

WorkPlace Shortcut Examples

When a user logs in to Workplace and successfully sees shortcuts, the log file entries looks like this:

1. The username credentials are logged with a session ID (when troubleshooting, just look for the username):

```
Feb 26 22:03:03 127.0.0.1/127.0.0.1 local7.debug DEBUG [22:03:03,612] GOT:
CredentialsManager[teamSessionId=+kMs+1fJYyVOxJ8f/YO0gg==,teamcredentials=
{username=jdoe} ,credentials={}]
```

2. Later you see a message indicating a successful load of the shortcut (in this case a Web shortcut):

```
Feb 26 22:03:03 127.0.0.1/127.0.0.1 local7.debug DEBUG [22:03:03,615]
pcsession: <authorize:exit> uri=http://wemmet.internal.net status=SUCCESS
```

3. The successful load of a network shortcut looks like this:

```
Feb 26 22:03:03 127.0.0.1/127.0.0.1 local7.debug DEBUG [22:03:03,617]
pcsession: <authorize:exit> uri=smb://marshare01/marketing status=SUCCESS
```

If a user does not see shortcuts (because of an access rule you have set up, for example), the denial of access looks like this:

1 Look for the username at login:

```
Feb 26 22:12:15 127.0.0.1/127.0.0.1 local7.debug DEBUG [22:12:15,027] GOT:
CredentialsManager[teamSessionId=hZ98BEZxdyARJCtjkGl3lA==,teamcredentials=
{username=dsmith} ,credentials={}]
```

2 Look for the shortcut information that is failing to load on the user's WorkPlace portal page. This is an example of a Web shortcut failure:

```
Feb 26 22:12:15 127.0.0.1/127.0.0.1 local7.debug DEBUG [22:12:15,043]
pcsession: <authorize:exit> uri=http://wemmet.internal.net status=FAILURE
```

NOTE:

- Access (permit/deny) to a resource share is also logged in `extaweb_access.log`:

  ```
  192.168.2.69 - (jdoe)@(AD) [26/Feb/2017:22:19:21 +0000] "GET
  /workplace/access/exec/file/view?path=smb://marshare01/marketing/
  reports.doc/ HTTP/1.1" 200 4608
  ```

- An additional WorkPlace-related log file in syslog format (`/var/log/aventail/wp_init.log`) is also available.

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Internationalization Support

Support for Native Character Sets

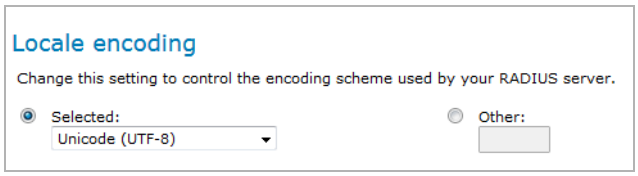
The appliance provides support for extended character sets or double-byte character sets so that usernames, passwords, resources, WorkPlace shortcuts, and access control rules can be entered and displayed in AMC using native character sets that contain extended or double-byte characters. This also allows support for extended characters or double-byte characters in user authentication prompts, such as username and password fields.

RADIUS Policy Server Character Sets

The appliance supports character encoding for RADIUS policy servers that use non-English character sets. The most recent version of the RADIUS specification (RFC2865) calls for all text fields to contain UTF-8 encoded characters. However, older versions of the RADIUS protocol define text fields as 7-bit US-ASCII. To support RADIUS servers that use an older version of the protocol, AMC enables you to select from a list of the most commonly used character sets, and also lets you enter other character sets.

To change the language setting for a RADIUS server:

1. From the main navigation menu, click **Authentication Servers**.
2. Click **Edit** next to the RADIUS server you want to configure. (If you are configuring a RADIUS server in AMC for the first time, see Configuring RSA Server Authentication.)
3. On the **Configure Authentication Server** page, expand the **Advanced** area.
4. Under **Locale encoding**, do one of the following:



   - Choose a character set from the **Selected** list box (see Selected RADIUS Character Sets for the available character sets).
   - Click **Other**, and then type the name of a character set in the text box. See Other Supported RADIUS Character Sets for a list of those that can be entered.
5. Click **Save**.

Topics:

- Selected RADIUS Character Sets
- Other Supported RADIUS Character Sets

Selected RADIUS Character Sets

The character sets shown in are available from the **Selected** list (under **Advanced** settings) on the **Configure Authentication Server** page.

Selected RADIUS character sets

Character set	Code page
Arabic	1256
Baltic	1257
Central European	1250
Chinese Simplified (GBK)	936
Chinese Traditional (Big5)	950
Cyrillic	1251
Greek	1253
Hebrew	1255
Japanese (Shift-JIS)	932
Korean	949
Turkish	1254
Unicode (UTF-8)	65001
Vietnamese	1258
Western	1252

Other Supported RADIUS Character Sets

To set the encoding scheme used by your RADIUS server, type one of the character sets shown in the Other supported RADIUS character sets table in the **Locale encoding** area on the **Configure Authentication Server** page.

Other supported RADIUS character sets

Language type	Supported character set		
European languages	ASCII	ISO-8859-10	MacRoman
	ISO-8859-1	ISO-8859-13	MacCentralEurope
	ISO-8859-2	ISO-8859-14	MacIceland
	ISO-8859-3	ISO-8859-15	MacCroatian
	ISO-8859-4	ISO-8859-16	MacRomania
	ISO-8859-5	KOI8-R	MacCyrillic
	ISO-8859-7	KOI8-U	MacUkraine
	ISO-8859-9	KOI8-RU	MacGreek
		CP850	MacTurkish
		CP866	Macintosh
Semitic languages	ISO-8859-6	MacHebrew	
	ISO-8859-8	MacArabic	
	CP862		
Japanese	EUC-JP		
	ISO-2022-JP		
	ISO-2022-JP-2		
	ISO-2022-JP-1		
Chinese	EUC-CN	BIG5-HKSCS	
	HZ	ISO-2022-CN	
	GB18030	ISO-2022-CN-EXT	
	EUC-TW		
	CP950		
Korean	CP949		
	ISO-2022-KR		
	JOHAB		
Armenian	ARMSCII-8		
Georgian	Georgian-Academy		
	Georgian-PS		
Tajik	KOI8-T		
Thai	TIS-620		
	CP874		
	MacThai		
Laotian	MuleLao-1		
	CP1133		
Vietnamese	VISCII		
	TCVN		

Other supported RADIUS character sets

Language type	Supported character set	
Unicode	UCS-2	UTF-16
	UCS-2BE	UTF-16BE
	UCS-2LE	UTF-16LE
	UCS-4	UTF-32
	UCS-4BE	UTF-32BE
	UCS-4LE	UTF-32LE
		UTF-7

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SonicWall Support

Technical support is available to customers who have purchased SonicWall products with a valid maintenance contract and to customers who have trial versions.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. To access the Support Portal, go to https://www.sonicwall.com/support.

The Support Portal enables you to:

- View knowledge base articles and technical documentation
- View video tutorials
- Access MySonicWall
- Learn about SonicWall professional services
- Review SonicWall Support services and warranty information
- Register for training and certification
- Request technical support or customer service

To contact SonicWall Support, visit https://www.sonicwall.com/support/contact-support.

About This Document

Legend

WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.

CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

IMPORTANT, NOTE, TIP, MOBILE, or VIDEO: An information icon indicates supporting information.

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