IBM Tivoli Storage Productivity Center
Version 5.2

Problem Determination Guide

SC27-4090-00

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Note:
Before using this information and the product it supports, read the information in "Notices" on page 91.

This edition applies to version 5, release 2, modification 1 of IBM Tivoli Storage Productivity Center (product numbers 5725-F92, 5725-F93, and 5725-G33) and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

Preface

IBM® Tivoli® Storage Productivity Center manages storage infrastructure by centralizing, automating, and simplifying the management of complex and heterogeneous storage environments. IBM Tivoli Storage Productivity Center for Replication helps you manage data-copy functions. If you encounter problems with either of these products, use this publication to identify and solve errors.

Who should read this guide

This publication is intended for administrators or users who troubleshoot problems with Tivoli Storage Productivity Center and Tivoli Storage Productivity Center for Replication

Administrators and users should be familiar with the following topics:

- General procedures for installing software on supported servers
- Tivoli Storage Productivity Center concepts
- Tivoli Storage Productivity Center for Replication concepts
- IBM DB2® Database for Linux, AIX, and Windows
- Simple Network Management Protocol (SNMP) concepts
- IBM Tivoli Enterprise Console

Publications

You are provided with a list of publications in the Tivoli Storage Productivity Center and Tivoli Storage Productivity Center for Replication libraries and other related publications. The following section also describes how to access publications online, how to order publications, and how to submit comments about publications.

The publications are available from the IBM Publications Center at http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss.

Accessing publications online

Publications for this product and other related products are available online.

Information about installing, configuring, upgrading, and uninstalling Tivoli Storage Productivity Center and related products is available online. Use Table 1 on page vi to view and download these publications. Translated documents are available for some products.

IBM Tivoli Documentation Central also provides links to the information centers for all Tivoli products. For information about referenced Tivoli products, such as Tivoli Storage Manager and Tivoli Enterprise Console®, go to the home page for Tivoli Documentation Central.

Table 1. Locations of publications for Tivoli Storage Productivity Center and related products

Product	Online location
IBM Tivoli Storage Productivity Center and IBM Tivoli Storage Productivity Center for Replication	Tivoli Storage Productivity Center Information Center. In the navigation pane, click **IBM Tivoli Storage Productivity Center**. To obtain PDF documents, click **IBM Tivoli Storage Productivity Center** > **Printable documentation**. To view previous versions of the IBM Tivoli Storage Productivity Center Information Center, go to the Tivoli Storage Productivity Center page in Tivoli Documentation Central.
IBM Tivoli Storage Productivity Center for Replication for System z®	Tivoli Storage Productivity Center Information Center. In the navigation pane, click **IBM Tivoli Storage Productivity Center for Replication for System z**. To obtain PDF documents, click **IBM Tivoli Storage Productivity Center for Replication for System z** > **Printable documentation**. To view previous versions of the IBM Tivoli Storage Productivity Center for Replication Information Center, go to the Tivoli Storage Productivity Center page in Tivoli Documentation Central.
IBM WebSphere® Application Server	http://publib.boulder.ibm.com/infocenter/wasinfo/v8r0/index.jsp
Jazz™ for Service Management	http://pic.dhe.ibm.com/infocenter/tivihelp/v3r1/topic/com.ibm.psc.doc_1.1.0/psc_ic-homepage.html
IBM System Storage® DS3000, IBM System Storage DS4000®, or IBM System Storage DS5000	http://www.ibm.com/support/entry/portal/
IBM System Storage DS6000™	http://publib.boulder.ibm.com/infocenter/dsichelp/ds6000ic/index.jsp
IBM System Storage DS8000®	http://publib.boulder.ibm.com/infocenter/dsichelp/ds8000ic/index.jsp
IBM System Storage DS® Open Application Programming Interface publications	http://www.ibm.com/support/entry/portal/Troubleshooting/Hardware/System_Storage/Storage_software/Other_software_products/CIM_Agent_for_DS_Open_(API)/ Use these publications for information about how to install, configure, and use the CIM agent.
IBM System Storage SAN Volume Controller	http://pic.dhe.ibm.com/infocenter/svc/ic/index.jsp
IBM Storwize® V3500	http://pic.dhe.ibm.com/infocenter/storwize/v3500_ic/index.jsp
IBM Storwize V3700	http://pic.dhe.ibm.com/infocenter/storwize/v3700_ic/index.jsp
IBM Storwize V7000	http://pic.dhe.ibm.com/infocenter/storwize/ic/index.jsp
IBM Storwize V7000 Unified	http://pic.dhe.ibm.com/infocenter/storwize/unified_ic/index.jsp

Table 1. Locations of publications for Tivoli Storage Productivity Center and related products (continued)

Product	Online location
IBM Scale Out Network Attached Storage (IBM SONAS)	http://pic.dhe.ibm.com/infocenter/sonasic/sonas1ic/index.jsp
IBM XIV® Storage System	http://publib.boulder.ibm.com/infocenter/ibmxiv/r2/index.jsp
IBM DB2 Database for Linux, AIX®, and Windows	http://publib.boulder.ibm.com/infocenter/db2luw/v10r1/index.jsp
IBM System Storage N series	http://www.ibm.com/systems/storage/network/redbooks.html For more information about IBM System Storage N series, see http://www.ibm.com/systems/storage/network/software/.
IBM Systems Director	http://www.ibm.com/systems/software/director/index.html
VMware vSphere	http://www.vmware.com/support/pubs/vsphere-esxi-vcenter-server-pubs.html

IBM Redbooks

The IBM Redbooks® are publications about specialized topics.

You can order publications through your IBM representative or the IBM branch office serving your locality. You can also search for and order books of interest to you by visiting the IBM Redbooks home page at http://www.redbooks.ibm.com.

Translation

Translated publications are available from the information center which is available in certain translated languages. It is displayed in the language that is appropriate for the browser locale setting.

When a locale does not have a translated version, the information center is displayed in English, which is the default language. Translations of the PDFs are available when the information center is translated.

Contact your service representative for more information about the translated publications and whether translations are available in your language.

Downloading publications

IBM publications are available in electronic format to be viewed or downloaded free of charge.

You can download IBM publications from http://www.ibm.com/e-business/linkweb/publications/servlet/pbi.wss.

Providing feedback about publications

Your feedback is important to help IBM provide the highest quality information. You can provide comments or suggestions about the documentation from the IBM Tivoli Storage Productivity Center Information Center.

Go to the information center at http://publib.boulder.ibm.com/infocenter/tivihelp/v59r1/index.jsp and click **Feedback** on the information center Welcome page or at the bottom of the individual topic pages.

Tivoli Storage Productivity Center Service Management Connect community

Connect, learn, and share with Service Management professionals: product support technical experts who provide their perspectives and expertise.

Access Service Management Connect at https://www.ibm.com/developerworks/servicemanagement/. Use Service Management Connect in the following ways:

- Become involved with transparent development, an ongoing, open engagement between other users and IBM developers of Tivoli products. You can access early designs, sprint demonstrations, product roadmaps, and prerelease code.
- Connect one-on-one with the experts to collaborate and network about Tivoli and the Storage Management community.
- Read blogs to benefit from the expertise and experience of others.
- Use wikis and forums to collaborate with the broader user community.

Contacting IBM Software Support

You can contact IBM Software Support by phone, and you can register for support notifications at the technical support website.

- Go to the IBM Tivoli Storage Productivity Center technical support website at http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Productivity_Center.

  To receive future support notifications, sign in under **Notifications**. You are required to enter your IBM ID and password. After you are authenticated, you can configure your subscription for Tivoli Storage Productivity Center technical support website updates.
- Customers in the United States can call 1-800-IBM-SERV (1-800-426-7378).
- For international customers, go to the Tivoli Storage Productivity Center technical support website to find support by country. Expand **Contact support** and click **Directory of worldwide contacts**.

You can also review the *IBM Software Support Handbook*, which is available at http://www14.software.ibm.com/webapp/set2/sas/f/handbook/home.html.

The support website offers extensive information, including a guide to support services; frequently asked questions (FAQs); and documentation for all IBM Software products, including Redbooks and white papers. Translated documents are also available for some products.

When you contact IBM Software Support, be prepared to provide identification information for your company so that support personnel can readily assist you. Company identification information might also be needed to access various online services available on the website. See “Reporting a problem.”

Reporting a problem

Provide the IBM Support Center with information about the problems that you report.

Have the following information ready when you report a problem:

- The IBM Tivoli Storage Productivity Center version, release, modification, and service level number.
- The communication protocol (for example, TCP/IP), version, and release number that you are using.
- The activity that you were doing when the problem occurred, listing the steps that you followed before the problem occurred.
- The exact text of any error messages.

Conventions used in this guide

Information is given about the conventions that are used in this publication.

This publication uses several conventions for special terms and actions, and for operating system-dependent commands and paths.

The following typeface conventions are used in this publication:

Bold

- Flags that display with text
- Graphical user interface (GUI) elements (except for titles of windows and dialogs)
- Names of keys

Italic

- Variables
- Values that you must provide
- New terms
- Words and phrases that are emphasized
- Titles of documents

monospace

- Commands and command options
- Flags that display on a separate line
- Code examples and output
- Message text
- Names of files and directories
- Text strings that you must type, when they display within text
- Names of Oracle Java™ methods and classes
- HTML and XML tags that display `like this`, in monospace type

For syntax notations, remember the following details.

- In AIX, the prompt for the root user is #.
- In AIX and Linux, the commands are case-sensitive, so you must type commands exactly as they are shown.

Chapter 1. Resolving problems

If you experience an error with Tivoli Storage Productivity Center, you can use problem determination to determine why an error occurred, and explain how to resolve the problem.

Overview

The diagnostic tips that you can perform vary from including how to view and package log files, how to use network connectivity tools, and how to identify known problems and resolutions.

The first step in the problem determination process is to describe the problem completely.

Problem descriptions help you and IBM Software Support know where to start to resolve the problem. Answer the following questions:

- What are the symptoms of the problem?
- Where does the problem occur?
- When does the problem occur?
- Under which conditions does the problem occur?
- Can the problem be reproduced?

Describe the symptoms of the problem

When you describe a problem, the most obvious question is "What is the problem?" By using the following questions, you can create a more descriptive picture of the problem:

- What are the error codes and messages?
- How does the system fail? For example, is it a loop, hang, crash, performance degradation, or incorrect result?
- What is the business impact of the problem?

Describe where the problem occurs

Determining where the problem originates is not always easy, but it is one of the most important steps in resolving a problem.

The following questions help you focus on where the problem occurs to isolate the problem:

- Is the problem specific to one operating system, or is it common across multiple operating systems?
- Is the environment and configuration supported?
- Is the application active locally on the database server or on a remote server?
- Is a gateway involved?
- Is the database on a local or remote computer?

Part of identifying where a problem originates is understanding the environment in which it exists.

Completely describe the problem environment, including the operating system and version, all corresponding software and versions, and hardware information. Confirm that the system is running within an environment that is a supported configuration.

Describe when the problem occurs

Develop a detailed timeline of events that led up to failure.

You can get a detailed timeline of events by starting at the time an error was reported. Use the available logs.

To develop a detailed timeline of events, answer these questions:

- Does the problem happen only at a certain time of day?
- How often does the problem happen?
- What sequence of events leads up to the time that the problem occurred?
- Does the problem happen after an environment change such as upgrading or installing software or hardware?

These questions can help you set a frame of reference in which to investigate the problem.

Describe the conditions under which the problem occurs

Knowing which systems and applications are running at the time that a problem occurs is an important part of problem determination and troubleshooting. These questions about the operating system environment can help you identify the root cause of the problem:

- Does the problem always occur when the same task is being run?
- Must a certain sequence of events occur for the problem to occur?
- Do any other applications fail at the same time?

Can the problem be reproduced?

Problems that you can reproduce are often easier to debug and solve. However, problems that you can reproduce might have a disadvantage: If the problem has a significant business impact, you do not want it to recur.

If possible, re-create the problem in a test or development environment, which typically offers you more flexibility and control during your investigation.

Ask the following questions:

- Can the problem be re-created on a test system?
- Is the same type of problem encountered by multiple users or applications?
- Can the problem be re-created by running a single command, a set of commands, or a particular application?

Tivoli Storage Productivity Center problem determination resources

A wide variety of troubleshooting and problem determination information is available to assist you in using Tivoli Storage Productivity Center.

Tivoli Storage Productivity Center documentation

Troubleshooting information can be found in the Information Center. For information about the Tivoli Storage Productivity Center library, see http://publib.boulder.ibm.com/infocenter/tivihelp/v59r1/index.jsp.

Tivoli Storage Productivity Center Technical Support website

If you are experiencing problems and want help finding possible causes and solutions, see the Tivoli Storage Productivity Center and Tivoli Storage Productivity Center for Replication Technical Support website. The Technical Support website has links to the latest Tivoli Storage Productivity Center and Tivoli Storage Productivity Center for Replication publications, technical notes, Authorized Program Analysis Reports (APARs), fix packs, and other resources. You can search through this knowledge base to find possible solutions to your problems, see http://www.ibm.com/support/entry/portal/Overview/Software/Tivoli/Tivoli_Storage_Productivity_Center_Standard_Edition.

For tips about how to collect data for the IBM Software Support, see http://www-01.ibm.com/support/docview.wss?uid=swg21302800.

Chapter 2. Tivoli Storage Productivity Center tools

Use the Service tool, the Repository copy tool and, the Tracing tool to help you diagnose errors with Tivoli Storage Productivity Center.

Repository copy tool

You can use the Repository copy tool, **repocopy**, to export all the tables in the IBM Tivoli Storage Productivity Center repository (Data Manager data) for purposes of debugging problems.

You can send the exported data to IBM Software Support to help debug problems.

Important:

- You must stop the Device server and Data Server before you use **repocopy** to import a repository.
- You cannot import **repocopy** data into the Tivoli Storage Productivity Center database if the migration tool was not run against the database. When you upgrade the Device server, you must run the migration tool before you import **repocopy** data.

Exporting repository data

Use the Repository copy tool to export data from an existing repository into a text file.

To export repository data, follow these steps:

1. Go to the following default directory:

   Windows operating systems:
   `c:\Program Files\IBM\TPC\data\server\tools`

   Linux or UNIX operating systems:
   `/opt/IBM/TPC/data/server/tools`

2. Issue the **repocopy** command:

   Windows operating systems:
   repocopy.bat

   Linux or AIX operating systems:
   repocopy.sh

3. Select **Export data from repository tables** and click **Next**.
4. In the Options for Import/Export window, enter information in the following fields:

   Directory for Export
   Enter the directory where the comma-delimited file is saved.

   Delimiter
   Enter a delimiter for the delimited file format (a comma is the default).

   Quote Enter the symbol that contains string data (double quotation marks is the default).

Tivoli Storage Productivity Center exports the data into the comma-delimited file that you specify, and places it in a file named *tablename*.txt. Click **Next**.

5. Select one of the following options and click **Next**.
   - Export by using DB2 native format.
   - Export by using text files (the preferred method).
6. Select one of the following options and click **Next**.
   - Export base tables (always export the base tables)
   - Export Performance Manager tables, if requested by IBM Software Support
   - Export history tables that are used for Tivoli Storage Productivity Center for Data history reports, only if requested by IBM Software Support

   The information that is detected in the server.config file is displayed in the Connection Properties window within the following fields:
   - Database Types
   - User name
   - Password
   - Driver Class
   - Driver URL
   - Database
   - DB Creator
   - Classpath

   If you want to export data from a different database from the one listed in the server.config file, you can select the database from the **Database Types** list box. Manually enter the database information.
7. Click **Finish**.
8. Click **Run**.

As you progress through the export process, messages are written to a progress log that is displayed. You can track the steps through the progress log.

When the **repocopy** command is used with a remote database, the DB2 shared library is not available for loading the libTSRMinsudb.so file. You can ignore this message. Click **OK** and continue.

Importing repository data

Use the Repository Copy tool to import data from a text file. The exported data must be from an existing repository.

To import data into repository tables, follow these steps:

1. Stop the Device server and Data server.
2. Go to the following default directory:

   Windows operating systems:
   TPC_installation_directory\data\server\tools

   Linux or AIX operating systems:
   TPC_installation_directory/data/server/tools
3. Issue the **repocopy** command:

   Windows operating systems:
   repocopy.bat

Linux or AIX operating systems:
repocopy.sh

4. Select **Import data into repository tables**, and then click **Next**.
5. In the Options for Import/Export window, enter information in the following fields:

   Directory for Import
   Enter the directory where the comma-delimited files are stored.

   Delimiter
   Enter a delimiter that is used for the delimited file format (comma is the default). You must use the same delimiter that was used in the exported file.

   Quote Enter the symbol that is used to contain string data (double quotation marks is the default). You must use the same double quotation marks that were used in the exported file.

   Delete before inserting
   Check this option if you want to delete any existing data in the repository tables before you import new data.

   Tivoli Storage Productivity Center imports the data from the file that you specify. Click **Next**.
6. Enter the database and the access information of the database to which you want to import data. The Connection Properties window contains the following fields:
   - Database Types
   - User name
   - Password
   - Driver Class
   - Driver URL
   - Database
   - DB Creator
   - Classpath

   Click **Finish**.
7. Click **Run**.

As you progress through the import, messages are written to a progress log. You can use the progress log to track the steps as they happen.

When the **repocopy** command is used with a remote database, the DB2 shared library is not available for loading the `libTSRMinsudb.so` file. You can ignore this message. Click **OK** and continue.

Service tool overview

The service tool collects information from all installed Tivoli Storage Productivity Center components. The tool detects the system configuration, collects the applicable information, and creates a compressed file that can be sent to IBM Software Support.

The service tool collects the following information:

- Host name
- IP address and configuration information

- Operating system and version. On the Windows operating system, a `msInfo.txt` report is also generated
- Java home, version, and class path
- Java Virtual Machine (JVM) implementation name and version
- Protocol statistics
- Internet Protocol network connections for Tivoli Storage Productivity Center, including listening ports
- Diagnostic information about the system and its services
- Listing of all library files, for example, server and library and agent and library
- HOSTS file
- Tivoli Storage Productivity Center version and license files

When the service tool is run on the system where the Data Server or the Device server are installed, it also collects the following information:

- For the Data Server, information about all of the remote and local graphical user interfaces (GUIs) that are associated with it
- For Device and Replication servers, information about their profiles in IBM WebSphere Application Server Liberty Profile
- All applied interim fixes
- Installation logs
- The contents of the `log` and `logs` directory, including subdirectories
- The contents of the `conf` and `config` directory
- Directory listing of the `lib` and `bin` directory
- The contents of the `log` and `conf` subdirectories of the `web` directory
- For the web-based GUI, information about its profile in the embedded WebSphere Application Server
- Information from the **ipconfig /all** command on Windows operating systems
- Information from the **ipconfig -a** command on Linux and AIX operating systems
- Information from the **netstat -an** command on all operating systems

When the service tool is run on the system where the database repository is installed, it also collects the DB2 support information.

When the service tool is run on the system where Tivoli Common Reporting component is installed, it also collects the following information:

- Logs for the deployment engine
- A listing of the Composite Offering Installer (COI) components that are installed
- InstallAnywhere logs for Tivoli Common Reporting
- Logs, configuration, and profile files for Jazz for Service Management
- Logs and configuration files for Tivoli Common Reporting that are located in the `reporting` directory in the Jazz for Service Management installation directory
- Information from the **ipconfig /all** command on Windows operating systems
- Information from the **ifconfig -a** command on Linux and AIX operating systems
- Information from the **netstat -an** command on all operating systems

The service tool does not collect service logs or other service information for Tivoli Storage Productivity Center for Replication. To collect the log and trace files for the Replication server, go to the Tivoli Storage Productivity Center information center

and select **IBM Tivoli Storage Productivity Center** > **Troubleshooting** > **Tivoli Storage Productivity Center for Replication** > **Logs**.

When the service tool runs on the Storage Resource agent computer, it collects the following information:

- All applied interim fixes
- Everything in the `config`, `log`, `nls`, `output`, and `service` directories, including subdirectories
- Everything in the `opt/IBM/CAP` directory on Linux and AIX operating systems
- Directory listing of the `ProgramData\Application Data\IBM\CAP` directory on Windows operating systems
- Directory listing of the `agent` directory
- Directory listing of the `bin` directory
- Listing of version numbers for the Storage Resource agent component
- Information from the **ipconfig /all** command on Windows operating systems
- Information from the **ifconfig -a** command on Linux and AIX operating systems
- Information from the **netstat -an** command on all operating systems

By default, the service data is collected in one of the following directories:

Windows operating systems:

TPC_installation_directory`\service\data`

Linux and AIX operating systems:

TPC_installation_directory`/service/data`

For more information about changing the default directory, see "How to customize the service tool" on page 11.

You can run the service tool on Tivoli Storage Productivity Center regardless of whether you configured it on a single server or on multiple servers. The service tool automatically recognizes the installed components and collects service data about them. For more information about running the service tool for servers, see "Creating a compressed file for servers."

Creating a compressed file for servers

Run the service tool for the Data Server and the Device server to create a compressed file that can be sent to IBM Software Support.

You must have administrator authority on Windows operating systems or root authority on AIX and Linux operating systems.

To run the tool for the servers, follow these steps:

1. Log on to the system where Tivoli Storage Productivity Center is installed.
2. If you used the default directory, go to the following directory:

   Windows operating systems:
   `C:\Program Files\IBM\TPC\service\`

   Linux or AIX operating systems:
   `/`*user_or_opt*`/IBM/TPC/service/`

3. Run the following program:

   Windows operating systems:
   `service.bat`

   Linux or AIX operating systems:
   `service.sh`

A compressed file, `TPCServiceFiles.zip`, is created in the following directory:

Windows operating systems:
TPC_installation_directory\service\data

Linux or AIX operating systems:
TPC_installation_directory/service/data

Tip: You can customize the data that is collected by the service tool. For more information, see "How to customize the service tool" on page 11.

Related tasks:

"Creating a compressed file for Storage Resource agent"
Run the service tool on Storage Resource agents that were deployed by using the web-based GUI to create a compressed file that can be sent to IBM Software Support.

Creating a compressed file for Storage Resource agent

Run the service tool on Storage Resource agents that were deployed by using the web-based GUI to create a compressed file that can be sent to IBM Software Support.

You must have administrator authority on Windows operating systems or root authority on AIX and Linux operating systems.

To run the service tool on the Storage Resource agents, complete the following steps:

1. Log on to the web-based GUI.
2. In the navigation pane, select **Server Resources** > **Servers**.
3. Right-click the server where the Storage Resource agent is deployed, and select **Logs** > **Collect Agent Logs**.

The following compressed files are created:

Windows operating systems:
C:\Program Files\IBM\TPC\data\log\SRATraces*SRA_computer_name*\TPCServiceInfo.zip

AIX and Linux operating systems:
/opt/IBM/TPC/data/log/SRATraces/*SRA_computer_name*/TPCServiceInfo.zip

where *SRA_computer_name* represents the name of the computer on which the Storage Resource agent is located.

If the compressed file cannot be created, a message indicates that the job was unsuccessful.

For more information about the error, see the server log file or the services script information file. The files are in one of the following default directories:

Server log file
This file is on the system where Tivoli Storage Productivity Center is installed:

Windows operating systems:
`c:\Program Files\IBM\TPC\data\log`

AIX or Linux operating systems:
`/opt/IBM/TPC/data/log`

Services script information file
This file is on the computer on which the Storage Resource agent is installed:

Windows operating systems:
`c:\Program Files\IBM\TPC\`*`SRA_computer_name`*`\services\TPCServiceInfo.log`

AIX or Linux operating systems:
`/opt/IBM/TPC/`*`SRA_computer_name`*`/services/TPCServiceInfo.log`

For more information about customizing the data that is collected by the service tool, see "How to customize the service tool."

Related tasks:

"Creating a compressed file for servers" on page 9
Run the service tool for the Data Server and the Device server to create a compressed file that can be sent to IBM Software Support.

How to customize the service tool

You can customize the service tool to collect data about specific Tivoli Storage Productivity Center components, which you can send to IBM Software Support. You can also use command-line parameters to specify a location to place the data that is collected, specify that the data is compressed, or to specify both.

Specifying help and output command-line parameters

To obtain information about the service tool usage, use the **-help** command-line parameter.

To specify the data that is collected by the service tool, use the following command-line parameters when you run service tool:

-output *directory_path*
Places the files that contain the data that was collected in a directory that you specify. If you specify a directory that does not exist on your system, that directory is created. If you do not use the **-output** *directory_path* parameter, the files are placed in the default directory:

Windows operating systems
`TPC_installation_directory``\service\data`

Linux or AIX operating systems
`TPC_installation_directory``/service/data`

Restriction: If you specify a directory, the directory path cannot contain spaces. This restriction refers to the **-output** option.

-nozip
When you use this parameter, the compressed collected data archives are no

longer created. The service tool creates separate directories for each component for which data was collected. You can then create compressed archives for the collected files. In this way, you can control the size and content of each compressed file. To specify a directory other than the default directory, use the **-output** *directory_path* parameter.

Tip: You can specify more than one parameter, for example, `C:\Program Files\IBM\TPC\service>service -install -nozip`.

Collecting data for specific Tivoli Storage Productivity Center components

You can use the service tool to collect data about specific Tivoli Storage Productivity Center components.

Use the following parameters to specify the components:

-all
All components.

-install
Installation component files.

-data
Data Server component files.

-device
Device server component files.

-repl
Replication server component files.

-sra
Storage Resource agent component files.

-db
DB2 files.

-cli
Command-line interface files.

-gui
Collects data about web-based GUI files.

-tcr
Jazz for Service Management and Tivoli Common Reporting data.

Tip: You can specify to collect data for more than one component, for example, `C:\Program Files\IBM\TPC\service>service -tcr -install -gui`.

If you collect information about a particular component, and you do not specify the **-nozip** parameter, you can identify the contents of a compressed service file from its name. For example, if you specify the **-tcr -install -gui** parameters but did not specify the **-nozip** parameter, a file named `TPCServiceFiles_tcr_install_gui.zip` is created.

Note: An existing compressed file is overwritten when another file of the same name is created. For example, if you run `C:\Program Files\IBM\TPC\service>service -db -gui`, a file named `TPCServiceFiles_db_gui.zip` is created. If you rerun the tool with the same component options, a new file named

TPCServiceFiles_device_db.zip is created. This new file overwrites the previously created file unless you specify the **-nozip** parameter, or use the **-output** parameter to specify a different path.

If you specify the **-nozip** parameter, a directory is created for the components that you specified in the parameter. If you did not specify a specific component, data is collected for all installed components, and the data is placed in files in the following directory:

Windows operating systems:
TPC_installation_directory\service\data

Linux or AIX operating systems:
TPC_installation_directory/service/data

Files for particular components are then placed in a directory that corresponds to that component. Common files, such as license.txt, are placed in the following directory:

Windows operating systems:
TPC_installation_directory\service\data

Linux or AIX operating systems:
TPC_installation_directory/service/data

Restriction: You cannot specify a specific component as a command-line parameter when you specify the **-all** parameter. Also, when you specify a component that is not installed on the computer, the service tool displays an error message.

Tracing servers and agents

The tracing tool uses the IBM Logging Toolkit for C (CCLOG) for tracing server and agent data.

Tracing the Data Server

You can trace the following components:

- Server
- Agent
- Scheduler
- Device
- GUI

If you want to trace the Data server, you must turn on the server component.

To start the tracing function for the Data server services, follow these steps:

1. Open the Tivoli Storage Productivity Center stand-alone GUI.
2. Click **Administrative Services** > **Services** > **Data Server**.
3. Right-click on the Server component.
4. Click **Configure Tracing**.
5. In the tracing window, select the **Enable Trace** box and enter a value for the following options:

   Level The level can be one of the following values:

DEBUG_MIN
The minimum debugging level. This option is the default. This option includes trace information for key locations in the code that includes the first failure data capture. This setting does not capture any output data.

DEBUG_MID
The medium debugging level. This setting does not capture any output data.

DEBUG_MAX
The maximum debugging level. This option includes entry and exit information for every method in addition to all DEBUG_MIN statements.

Maximum Number of Files
The maximum number of files that are used before the Data server starts reusing the tracing files. The default is five files.

Maximum File Size (KB)
The maximum file size for the tracing files. The default is 20 MB.

Tip: For the agent, scheduler, device, or GUI components, only the check box for **Enable Trace** and **Level** are displayed.

6. Click **OK**.

Changes that are made in the Agent or Server Tracing Configuration panel are not saved in the nativelog.config file.

The changes are effective only while the process is running. For example, if the default trace level for an agent is modified by using the Agent Tracing Configuration panel, those settings are only effective while the agent is running.

If that agent is restarted, the defaults that are specified in the nativelog.config file are read and used.

Traces are written to the *TPC_installation_directory*\data\log\ServerTrace.log file.

Tracing a Storage Resource agent

To trace a Storage Resource agent, follow these steps:

1. Open the Tivoli Storage Productivity Center stand-alone GUI on the server.
2. Click **Administrative Services** > **Data Sources** > **Storage Resource Agents**.
3. In the topic pane, select a Storage Resource agent and click **Configure Tracing**.
4. In the tracing dialog window, select the **Enable Trace** box and enter a value for the following options:

   Level The level can be one of the following values:

   DEBUG_MIN
   The minimum debugging level. This option is the default and is always turned on. This option includes trace information for key locations in the code that includes first failure data capture. This setting does not capture any output data.

DEBUG_MID
The medium debugging level. This setting does not capture any output data.

DEBUG_MAX
The maximum debugging level. This option includes entry and exit information for every method in addition to all DEBUG_MIN statements. This option can impact on performance.

Maximum Number of Files
The maximum number of files that are used before the Data server starts reusing the tracing files. The default is five files.

Maximum File Size (KB)
The maximum file size for the tracing files. The default is 20 MB.

5. Click **OK**.

Tracing the Device server

You can set several different trace loggers for tracing a specific element of the product. For example, the san.SanEventCorrelatorFactory trace logger sets the tracing levels for functions that deal with SNMP traps.

When you collect information for the investigation of problems, IBM Software Support provides information about the logger to configure. The following example shows how to change the tracing level for the logger.

You can set logging to the following levels:

INFO This option contains large amounts of data that is logged in the trace files and is used to investigate specific issues with the product.

WARN This option contains warning and error level messages that are logged in the trace files. This option is the default level of tracing.

ERROR This option contains only error messages that are logged in the trace files.

ALL This option contains all warning and error messages.

Tracing is already turned on by default. You can specify a different level of tracing. The following example shows how to turn on tracing for the Event Correlator component.

Turn tracing on for the Event Correlator component of the Device server:

1. To run the **srmcp** trace command, follow these steps:

   Windows operating systems:

   a. Go to the default directory:

      TPC_installation_directory\device\bin\w32-ix86

   b. Run the following command to set the correct environment variables:

      setenv

   c. Run the following command:

      ```
      srmcp -u user_id -p password log set
      san.SanEventCorrelatorFactoryTraceLogger -filterkey INFO
      ```

      The filter key can be: INFO, WARN, ERROR, or ALL.

Linux and AIX operating systems:

To run the **srmcp** trace command, follow these steps:

a. Go to the default directory:

Linux operating systems:

TPC_installation_directory/device/bin/linux

AIX operating systems:

TPC_installation_directory/device/bin/aix

b. Run the following command to set the correct environment variables:

./setenv.sh

c. Run the following command:

```
./srmcp.sh -u user_id -p password
log set san.SanEventCorrelatorFactoryTraceLogger -filterkey INFO
```

The filter key can be: INFO, WARN, ERROR, or ALL.

The information is logged in the traceTPCDeviceServer.log file.

Debugging SNMP traps

The **srmcp** trace command can provide detailed information about the SNMP traps received, when set to the INFO level, so that the filters can be defined. You can also see the traps that were detected by the filters after they were added. The traps are placed in the trace log file with a message that indicates which filter detected the trap.

To turn on tracing for the Device server, follow these steps:

1. Run the **srmcp** tracing command.

Windows operating systems:

To run the **srmcp** trace command, follow these steps:

a. Run the following command to set the correct environment variables:

setenv

b. Go to the default directory:

TPC_installation_directory\device\bin\w32-ix86

c. Run the following command:

```
srmcp -u user_id -p password
log set san.SanEventCorrelatorFactoryTraceLogger -filterkey INFO
```

The filter key can be: INFO, WARN, ERROR, or ALL.

Linux or AIX operating systems:

To run the **srmcp** trace command on Linux and AIX operating systems, follow these steps:

a. Go to the default directory:

Linux operating systems:

TPC_installation_directory/device/bin/linux

AIX operating systems:

TPC_installation_directory/device/bin/aix

b. Run the following command to set the correct environment variables:

./setenv.sh

c. Run the following command:

```
./srmcp.sh -u user_id -p password
log set san.SanEventCorrelatorFactoryTraceLogger -filterkey INFO
```

The filter key can be: INFO, WARN, ERROR, or ALL.

The information is placed in the traceTPCDeviceServer.log file.

Trace log file locations

The Java tracing information is stored in the locations that are shown in Table 2 and Table 3.

Table 2. Java trace log files

Class	Java trace log file
Storage Resource agent	*TPC_installation_directory*/agent/log *TPC_installation_directory*/agent/log/ *name_of_server_SRA_communicates_with*
Server	*TPC_installation_directory*/data/log/ServerTrace.log

The Native tracing information is stored in the locations that are shown in Table 3.

Table 3. Native trace log files

Class	Native trace log file
Server	*TPC_installation_directory*/data/log/traceTPCDNativeServer_*yyyymmddhhmmssLOGx*.log
UnixStopServer	*TPC_installation_directory*/data/log/traceTPCDNativeStopServer_*yyyymmddhhmmssLOGx*.log
ImportExport	*TPC_installation_directory*/data/log/traceTPCDNativeImportExport_*yyyymmddhhmmssLOGx*.log

Messages are logged before the creation of a user-defined installation directory. Because the log directory is not initially available, installation messages are written to standard error log files. The standard error log is redirected to a temporary file. The temporary message log file is copied to the appropriate log directory, and the standard error log file is redirected to reflect the new message log file location

When an executable file is run, it creates the tracing files that are shown in Table 4.

Table 4. Trace files for executable routines

Executable file	Platform	Trace log file location, file name, and description
udbexec.exe	Windows operating systems	*hostname*\traceTSRMNativeUdbexec_PID.log *TPC_installation_directory*\data\ca\ traceTSRMNativeUdbexec_*PID_yyyymmddhhmmss*.log
ExecSvc.exe	Windows operating systems	*temp*\traceTSRMNativeExecSvc.log This executable routine runs only on the remote computer during a Windows push installation.
udbexec.exe[1] or udbexec [2]	All operating systems	*TPC_installation_directory*/data/ca/ traceTSRMNativeudbexec_*pid_yyyymmddhhmmss*.log

Table 4. Trace files for executable routines (continued)

Executable file	Platform	Trace log file location, file name, and description
DbMonitor.exe[1] or DbMonitor[2]	All operating systems	This executable routine is run on Windows operating systems for all database monitoring activities. This executable routine generates trace files that are named based on the name of the active job. For example, the default database scan generates a trace file similar to the following file: TPCUser.Default Db Scan.0001_dbmonitor.00009163.trace
[1] Use in Windows operating systems. [2] Use in Linux or AIX operating systems.		

Configuration files for tracing

There are two configuration files added for Java tracing: ServerTraceLog.config and AgentTraceLog.config. The nativelog.config file is used for native code tracing.

Table 5. Trace configuration files

File	Directory
Native code trace configuration file	*TPC_installation_directory*/data/config/nativelog.config
Java tracing configuration file	*TPC_installation_directory*/data/config/ ServerTraceLog.config

When changes are made to tracing configuration through the stand-alone GUI, the appropriate configuration file is updated. For example, if you change the **Maximum Number of Files** parameter for server tracing, the new value is displayed in both ServerTraceLog.config and nativelog.config. Both ServerTraceLog.config and AgentTraceLog.config have extra parameters that are not listed. Only the parameters that are listed in nativelog.config can be modified.

nativelog.config file

During the installation or a maintenance upgrade of Tivoli Storage Productivity Center, a file that is named nativelog.config is created in the *TPC_installation_directory*/data/config directory.

This file is used to specify the default levels of tracing for the Tivoli Storage Productivity Center processes (for example, the server and the agent). Depending on which platform Tivoli Storage Productivity Center is installed, some of the items that are listed in this file might vary.

In particular, Windows installations do not have the #StopAgent section that Linux and AIX platforms have. The reason for the difference is because the agent service is started differently on these platforms. Settings in these files are separated into sections that represent Tivoli Storage Productivity Center processes. The trace settings per process are listed underneath the process they represent.

For more information about these settings and their default values, see “Tracing the Data Server ” on page 13.

The definitions for the entries in the nativelog.config file are as follows:

 # Agent
A Tivoli Storage Productivity Center process. In this case, the agent process is specified.

agt.level=DEBUG_MIN
The default trace level for the agent process.

agt.maxFiles=3
The maximum number of trace files to be created or used.

agt.maxFileSize=20480000
The maximum size of each trace file (in bytes).

The level of trace that is specified in this file is also applied to specific child processes run from their parent process. For example, the processes udbexec.exe and MiniProbe.exe can use the settings from the Agent section as their default trace level because these processes are run by the Agent process.

You can edit the contents of this file if you want to change the default level of tracing for a particular process. However, these changes do not take effect until that process is stopped and restarted again. For example, if you want to change the tracing level of the server from DEBUG_MIN to DEBUG_MID, you can modify the nativelog.config file. Restart the server to effect the change.

By modifying this file, you can ensure that each time the server is stopped and restarted, the specified trace level is applied.

Alternatively, trace settings can be changed during run time by using the stand-alone GUI. For more information, see "Tracing the Data Server " on page 13.

Here is an example of the nativelog.config file for Windows operating systems:

```
# level: DEBUG_MIN || DEBUG_MID || DEBUG_MAX
# maxFiles: >= 2 && <= 100
# maxFileSize: >= 128000 && <= 102400000

# Agent
agt.level=DEBUG_MIN
agt.maxFiles=3
agt.maxFileSize=20480000

# Server
srv.level=DEBUG_MIN
srv.maxFiles=3
srv.maxFileSize=20480000

# ImportExport
impexp.level=DEBUG_MIN
impexp.maxFiles=3
impexp.maxFileSize=20480000
```

Here is an example of the nativelog.config file for Linux and AIX operating systems:

```
# level: DEBUG_MIN || DEBUG_MID || DEBUG_MAX
# maxFiles: >= 2 && <= 100
# maxFileSize: >= 128000 && <= 102400000

# Agent
agt.level=DEBUG_MIN
agt.maxFiles=3
agt.maxFileSize=20480000
```

```
# ImportExport
impexp.level=DEBUG_MIN
impexp.maxFiles=3
impexp.maxFileSize=20480000

# StopAgent
stpagt.level=DEBUG_MIN
stpagt.maxFiles=3
stpagt.maxFileSize=20480000
```

AgentTraceLog.config file

The definitions for the entries in the `AgentTraceLog.config` file are as follows:

ITSRM.logger.trace.Agent.logging=true
The state of tracing for the agent. In this case, tracing is enabled.

ITSRM.logger.trace.Agent.level=DEBUG_MAX
The trace level for the agent. `DEBUG_MAX` is the only level that produces trace information.

ITSRM.handler.file.maxFiles=8
The maximum number of trace files to be created or used.

ITSRM.handler.file.maxFileSize=1024
The maximum size of each trace file (in bytes).

ServerTraceLog.config file

The definitions for the entries in the `ServerTraceLog.config` file are as follows:

ITSRM.logger.trace.Server.logging=true
The state of tracing for the Server process. In this case tracing is enabled.

ITSRM.logger.trace.Server.level=DEBUG_MAX
The trace level for the Server process. `DEBUG_MAX` is the only level that produces trace information.

ITSRM.handler.file.maxFiles=5
The maximum number of trace files to be created or used.

ITSRM.handler.file.maxFileSize=20480
The maximum size of each trace file (in bytes).

ITSRM.logger.trace.TivoliSRM-GUI.logging=false
The state of tracing for the stand-alone GUI process. In this case tracing is disabled.

ITSRM.logger.trace.TivoliSRM-GUI.level=DEBUG_MAX
The trace level for the stand-alone GUI process.

ITSRM.logger.trace.TivoliSRM-CIMOM.logging=false
The state of tracing for the CIMOM process. In this case tracing is disabled.

ITSRM.logger.trace.TivoliSRM-CIMOM.level=DEBUG_MAX
The trace level for the CIMOM process.

ITSRM.logger.trace.TivoliSRM-Agent.logging=false
The state of tracing for the Agent process. In this case tracing is disabled.

ITSRM.logger.trace.TivoliSRM-Agent.level=DEBUG_MAX
The trace level for the Agent process.

ITSRM.logger.trace.Scheduler.logging=false
The state of tracing for the Scheduler process. In this case tracing is disabled.

ITSRM.logger.trace.Scheduler.level=DEBUG_MAX
The trace level for the Scheduler process.

Chapter 3. Tivoli Storage Productivity Center problem determination

You can use this information to help you resolve Tivoli Storage Productivity Center problems.

Configuration files

Use the information in Tivoli Storage Productivity Center configuration files to help resolve problems.

The default *TPC_installation_directory* for Tivoli Storage Productivity Center installations is as follows:

Windows operating systems:
`c:\Program Files\IBM\TPC`

Linux or AIX operating systems:
`/opt/IBM/TPC`

The default file locations for the configuration files for 5.2 and the components of are as follows:

Tivoli Storage Productivity Center:

Windows operating systems:
TPC_installation_directory`\config`

Linux or AIX operating systems:
TPC_installation_directory`config`

Data server:

Windows operating systems:
TPC_installation_directory`\data\config`

Linux or AIX operating systems:
TPC_installation_directory`/data/config`

Device server:

Windows operating systems:
TPC_installation_directory`\device\conf`

Linux or AIX operating systems:
TPC_installation_directory`/device/conf`

Storage Resource agent:

Windows operating systems:
TPC_installation_directory`\agent\config\agent.config`

Linux or AIX operating systems: operating systems:
TPC_installation_directory`/agent/config/agent.config`

server.config file

The following information lists the parameters that are set in the `server.config` file. These parameters include controller, logging, repository, and service.

Controller parameters

name The Data Manager server name is the name of the host computer.

port The port on which the server listens for requests. The default is 9549.

maxConnections
The maximum number of concurrent sockets that the server opens. The default is 500.

routerThreads
The number of threads that redirect incoming requests to the appropriate service provider. The default is 1.

serviceThreads
The number of threads to allocate for the internal service provider of the server. The default is 2.

agentErrorLimit
The number of consecutive attempts to reach an agent before the agent is displayed as DOWN. The default is 3. When an agent is in this state, no attempts to connect are made until either the agent contacts the server or the agent status is manually changed to UP.

adminGroup
The name of the group a user must be a member of to perform administrative functions from the GUI, the default is`adm`.

commEncrypted
The switch that secures communication between the Server or Agent and the Server/GUI by encrypting the DataStream.

- `0` = Off. Do not encrypt the DataStream.
- `1` = On. Encrypt the DataSteam.

FileSystemScan NFSTimeout
Determines the numbers of seconds that a Storage Resource agent waits for a status system call on a Network File System (NFS) before it times out.

hostAlias
This parameter is displayed if the HOST_ALIAS is not specific and represents the name of the server. The value for this parameter is used when multiple computers have the same name or the name cannot be determined.

Logging parameters

logsKept
The number of server logs to keep. The default is 5.

messagesPerLog
The maximum number of messages in a log. When this number is reached the log is closed and a new log is created. The default is 100,000.

Repository parameters

driver The name of the JDBC driver to use, normally:

- DB2: `COM.ibm.db2.jdbc.app.DB2Driver`

url The URL used to connect to the database, normally:

- DB2: `jdbc:db2:`*`database_name`*

user The user name that Tivoli Storage Productivity Center uses to connect to the repository.

connectionPool
The number of database connections in a pool of reusable open connections. The default is 10.

Service parameters

name Repeating section that indicates the service providers that are required to start.

The REQUIRED parameters are as follows:

- `TStorm.server.svp.GuiSvp`
- `TStorm.server.svp.AgentSvp`
- `scheduler.Scheduler`

scheduler.config file

The following information lists the parameters that are set in the `scheduler.config` file. These parameters include concurrency parameters and jobs parameters.

Concurrency parameters

maxSubmitThreads
The number of threads to create that handle the submission of jobs. The default is 3.

maxCompleteThreads
The maximum number of threads to create to handle job completions. Initially creates a pool of half the number that can grow to the maximum of 3.

Jobs parameters

minutesAdvanced
The number of minutes in advance of scheduled time to begin the scheduling process. The default is 1. Use this option to allow for the processor time that is involved in scheduling a job so that the job starts close to the scheduled time.

delayLimitMinutes
Number of minutes after scheduled start time that the Scheduler continues to attempt to start a job for a selected resource, so that resource state is not in a down state or, connection status is not in a failed state. The default is 120.

Location of the scheduler.config file

The `scheduler.config` file is in the following directories:

Windows operating systems:
TPC_installation_directory`\data\config`

Linux or AIX operating systems:
TPC_installation_directory`/data/config`

TPCD.config file

The list of parameters that are set in the `TPCD.config` file include server parameters and GUI parameters.

The following list describes the server parameters:

threadPoolSize
Number of initial threads to create for handling requests. The default is 3.

abbreviatedProbe
Only SCSI commands are sent to disk drives for inquiry and disk capacity information. The default is 1.

maxThreads
Set the maximum number of threads for handling requests. The default is 8.

pingReceiveTimeout
Number of seconds to wait before it indicates that a ping failed. The default is 10.

skipAutoFS
Set to 1 if you want to skip the **automount** process during discovery on the Oracle Solaris Storage Resource agent. By default, discovery always processes **automount** on all Oracle Solaris Storage Resource agents managed by the Data server.

batchPartitionWaitRetryCount
Specify the number of times that the Storage Resource agent tries to get a report partition before the Storage Resource agent fails with an error.

Large batch reports are generated in partitions. The partitions are placed on the Tivoli Storage Productivity Center server, and the Storage Resource agent gets them from the server when the batch report is created.

The following list describes the GUI parameters:

threadPoolSize
Number of initial threads to create for handling user interface requests. The default is 3.

maxThreads
Set the maximum number of threads for handling user interface requests. The default is 10.

reportRowLimit
Maximum number of rows that are sent at a time to the user interface. If this number is exceeded, a **More** button is displayed over the table, along with a warning message. The default is 5000.

keepCachedReport
Number of minutes to retain incomplete reports in the `tmp` directory for the server. The default is 120.

pmBatchChartReportRowLimit
Specify the maximum number of rows to use for batch reports whose output type is PDF Chart or HTML Chart.

agent.config file

The `agent.config` file contains configuration parameters for the Storage Resource agent. These parameters are set when the Storage Resource agent is installed. The parameters can also be changed manually by editing the file.

The following list contains the parameters for the `agent.config` file.

Servername
Fully qualified host name of the system on which the Data server is installed.

Portnumber
Port on which the Storage Resource agent listens for requests. By default, the port is set to 9549.

IPAddress
IP address of the Storage Resource agent.

Log files

When you have a problem, you can check several product log files.

Installation log files

The following information shows where you can find the installation log files for Tivoli Storage Productivity Center.

Installation log files for Tivoli Storage Productivity Center

You can use the installation log files, that contain all the installation messages and traces that are generated during the installation process, to debug installation problems.

The lax*-out.txt and lax*-err.txt files

The `lax*-out.txt` and `lax*-err.txt` files are Installation Anywhere log files that contain all of the traces that are generated by the Tivoli Storage Productivity Center installer.

These log files are useful for debugging any issues that occurred before you clicked **Install** on the installer. You can find them in the following locations:

Windows operating systems (assuming you are installing as Administrator):
`C:\Users\Administrator\AppData\Local\Temp\2`

Linux or AIX operating systems:
`/tmp`

The msgTPCInstall.log and traceTPCInstall.log files

The `msgTPCInstall.log` and `traceTPCInstall.log` files are Message and Trace Installation logs that contain all of the installation messages and traces, after you clicked **Install** on the installer. You can find them in the following locations:

Windows operating systems:
TPC_installation_directory`\TPC\logs`

Linux or AIX operating systems:
TPC_installation_directory`/logs`

The agent*.log file

The agent*.log file is the storage resource agent installation log file. You can find it in the following locations:

Windows operating systems:
TPC_installation_directory`\logs\install\sra`

Linux or AIX operating systems:
TPC_installation_directory/logs/install/sra

The *component*Install.log and *component*InstallIS.log files

The *component*Install.log and *component*InstallIS.log files are the main Tivoli Storage Productivity Center log files for installation. *component* can be any of the following components:

- ca
- cli
- data
- dbSchema
- device
- gui
- agent (Storage Resource agent)

You can find the *component*Install.log and *component*InstallIS.log files in the following location:

Windows operating systems:
TPC_installation_directory\log\ *component*\install

Linux or AIX operating systems:
TPC_installation_directory/log/*component*/install

Default locations of log files

Check log files to view detailed information about Tivoli Storage Productivity Center processing and to troubleshoot problems.

The following list shows the default log file locations for Tivoli Storage Productivity Center and other components.

Device server:

The Liberty Profile logs are in the following directories:

Windows operating systems
TPC_installation_directory\wlp\usr\servers\deviceServer\logs

Linux or AIX operating systems:
TPC_installation_directory/wlp/usr/servers/deviceServer/logs

The operational logs are in the following directories:

Windows operating systems:
TPC_installation_directrory\device\log

Linux or AIX operating systems:
TPC_installation_directory/device/log

Data server:

Windows operating systems:
TPC_installation_directory\data\log

Linux or AIX operating systems:
TPC_installation_directory/data/log

Web server log files:

Windows operating systems:

TPC_installation_directory\ewas\profiles\WebServerProfile\logs\webServer

Linux or AIX operating systems:

TPC_installation_directory/ewas/profiles/WebServerProfile/logs/webServer

Web-based GUI:

Windows operating systems:

TPC_INSTALL_DIR\web\log

Linux or AIX operating systems:

TPC_INSTALL_DIR/web/log

Storage Resource agents:

TPC_installation_directory/agent/log/*name_of_server_SRA_communicates_with*

Tips:

- For Windows operating systems, the default *TPC_installation_directory* is C:\Program Files\IBM\TPC.
- For Linux or AIX operating systems, the default *TPC_installation_directory* is /opt/IBM/TPC.

Audit logs

Tivoli Storage Productivity Center has two audit logs. The audit logs provide an audit of all administrator activities. The log includes the identification of users that initiate actions in Tivoli Storage Productivity Center.

The audit logs are as follows:

- Data Server audit log, which is initiated by the GUI
- Device server audit log, which is initiated by the API or CLI

Audit logging is performed as follows:

- GUI commands are logged in the Data server audit log
- API and CLI commands are logged in the Device server audit log

Communication between the following services are not logged:

- Data server to Device server
- Data server to agents
- Device server to agents

Audit logs are in the following directories:

Data server audit log:

TPC_installation_directory\IBM\TPC\data\log\AuditTrace.log

Device server audit log:

TPC_installation_directory\IBM\TPC\device\log\auditTPCDeviceServer.log

The Device server audit log includes the following information:

- Timestamp
- User ID

- IP address of client
- Service and operation performed
- Key input and output parameters

Diagnosing Tivoli Storage Productivity Center problems

You can use the log files, audit files, configuration files, and what steps to take, to diagnose a Tivoli Storage Productivity Center problem.

When a problem occurs with Tivoli Storage Productivity Center, collect pertinent information to help diagnose the problem. The following topics help you gather the information that you need.

For specific troubleshooting topics, see the Tivoli Storage Productivity Center Information Center.

General information requirements for problem diagnosis

When a problem occurs with Tivoli Storage Productivity Center, gather the following information:

- An exact description of the problem.
- The function in use at the time that the problem occurs.
- The sequence of steps that resulted in the problem.
- The expected results from the failing step.
- Any error messages that you see.
- The date and time when the problem occurred.
- The log files that are collected with the service utility.
- The ESS microcode level, if known. The microcode level can be obtained by looking at the properties of the discovered device.
- The ESS, DS4000, DS5000, or DS6000, CIM Agent version, if known.
- The last time that inventory collection was run, which indicates that the repository is in synchronization with the real configuration.
- Whether the error is repeatable or it occurs intermittently.
- The answers to the following connectivity questions help you determine whether there is a communication issue between Tivoli Storage Productivity Center and the CIM Agent server:
  - Is there any firewall that is enabled interfering with the communication between the Tivoli Storage Productivity Center components and the CIM agents?
  - Is it possible to ping the CIM agents?
  - Is it possible to telnet to the CIM agents?
  - Is it possible to contact the CIM agents with a CIM browser?
  - Are the CIM agents in the local subnet or is a Directory Agent (DA) in another subnet used for discovery?
  - Is the DA on the remote subnet registered with Tivoli Storage Productivity Center?
  - Was the CIM agents Service Location Protocol (SLP) registration successful? Use the **slptool findsrvs** command.

When you schedule a job (for example, discovery, probe, scan), the actual start time of the job starts 1 minute earlier, which is the default, than the scheduled

time. So, if you schedule a job to run at 1:30 PM, the job actually starts at 1:29 PM. The 1:29 PM time stamp is displayed in the GUI for that job and in the job log files. The action takes into account the system processor time that is involved in scheduling a job so that the job actually starts close to the scheduled time.

Login and Authentication Troubleshooting

The following information explains how to troubleshoot login or authentication problems.

Perform one or more of the following steps to resolve login or authentication issues :

1. Check error messages for any of the following issues:
   a. The user ID is invalid.
   b. The password is invalid.
   c. The user ID does not have the correct access to a user group.
   d. A server is not available.
   e. A service is not available.
2. Ensure all services, including DB2, are running.
3. Log in with a different user ID, to rule out a problem accessing .
4. For Operating System user ID, login to another server to rule out problems with the user ID.
5. For LDAP or Windows Active Directory user IDs, check that the Active Directory or LDAP server is accessible.
6. If you use secure LDAP (s-LDAP), check with the LDAP administrator that the certificate is still valid. Also check if the certificate did not change or is reissued.
7. Check to see if the user ID has one of the following issues:
   a. Is the password expired?
   b. Is the user ID revoked or locked out?
   c. Did a password change comply with the password length and character restriction guidelines?
   d. Did a password change follow the procedures and complete without errors?
8. Use the following steps to check for server or service authentication issues:
   a. Examine the server or service log files and search for errors at the time of the failure. Recreate the failure and record the log information if necessary.
   b. Check log files for messages that show database connection errors
   c. Check log files for messages that show database tuning or maintenance issues. For example, transaction log files are full, table spaces are full, database deadlocks or database timeouts.

Discovery

The following information shows you how to troubleshoot discovery problems.

General information for problem diagnosis

For discovery problems, there are several service level logs to check:

- msgTPCDeviceServer.log
- traceTPCDeviceServer.log
- dmSvcTrace.log

These logs are in this directory: *TPC_installation_directory*\IBM\TPC\device\log.

You can get a core dump file in this directory: *TPC_installation_directory*\ewas\profiles\DeviceServerProfile\.

For Windows operating systems, follow these steps:

1. Go to this directory: *TPC_installation_directory*\device\apps\was\bin
2. Enter the following command:

```
wsadmin set jvm [$AdminControl completeObjectName
type=JVM,process=deviceServer1,*] $AdminControl invoke $jvm dumpThreads
```

For Linux or AIX operating systems, enter this command:

```
ps -ef | grep "IBM/TPC" | grep "ewas" | grep "deviceServer" |
awk '{print $2}' | xargs kill -3
```

The **setenv** command must be run before you run the **srmcp** command.

For Windows operating systems, follow these steps:

1. Go to this directory: *TPC_installation_directory*\device\bin\w32-ix86
2. Enter the following command: **setenv**.

For Linux or AIX operating systems, follow these steps:

1. Go to this default directory:

   Linux systems:
   TPC_installation_directory/device/bin/linux

   AIX systems:
   TPC_installation_directory/device/bin/aix
2. Run this command:

   ```
   ./setenv.sh
   ```

To discover the job activity, issue the following command:

```
srmcp -u user_ID -p password DiscoverService list jobs
```

To determine the DB2 activity, issue the following DB2 commands:

```
db2 list applications show detail > dbListApplicationDetails.out
db2 update monitor switches using statement on lock on table
db2 connect to tpcdb
db2 get snapshot for all on tpcdb > dbsnap.out
```

Common user errors

A discovery or probe operation does not complete. This condition can be caused by the following situations:

- There is a lock contention when Tivoli Storage Productivity Center accesses the database tables.
- DB2 does not return information from a query.
- The CIM agent starts returning information and then stops.

To work around this problem, stop and start the Data server and Device server. Also, use the service tool to collect log information. For information about the service tool, see “Service tool overview” on page 7.

Unable to discover filers in a Windows environment

If you are unable to discover filers in a Windows environment, check the following items:

- Verify that an agent is installed on a system in the Windows domain and that the agent can contact the filer. Verify that the Storage Resource agent is up and running and can communicate with the Data server.
- Check the license panel. If the filer is present, the filer was probably discovered but its file systems cannot be retrieved because of invalid login information.
- Check the discovery log file:
  - For initial discovery, check the `probe_000001.log` file.
  - For discovery jobs, check the associated discovery log file.
- If the log file contains the following information, check the authentication information that is entered in the Filer Login panel:

  ```
  DIS0001I FULL command selected.
  STA0246I Discovery started
  STA0339I Discovery started for domain xxx
  NAA0041E Local login failed -- SRM\db2admin
  NAA0041E Local login failed -- SRM\db2admin
  STA0249I Sending results to server
  STA0250I Server saved results
  ```

  This information indicates:
  - Authentication that is entered for a single filer is validated.
  - The default login and password, which is used for multiple filers, are not validated.
- Verify that the SNMP community specified in the discovery job is the SNMP community that is used by the filer.
- Check the `TPCUser.Discovery.*.trace` log file. If the trace log file does not exist, set the agent trace to the maximum value and rerun the discovery job.

  The trace file for the discovery job contains helpful information about hosts that are found on the domain, which host is contacted that uses SNMP, the SNMP community name, and Windows API calls errors.

Unable to discover filers in a Linux or AIX environment

Check the following items:

- Ensure that the agent can communicate with the filer and can mount a file system from the filer.
- Verify that the SNMP community name specified in the discovery job is the SNMP community that is used by the filer.
- Ensure that the mounts on the agent system are current and not stale.
- Check the `TPCUser.Discovery.*.trace` log file. If the trace log file does not exist, set the agent trace to the maximum value and rerun the discovery job.

  The trace file for the discovery job contains helpful information about what SNMP community name is used to communicate with the filer.

Other scenarios that can cause discovery problems

Other scenarios that might occur are as follows:

- If the **View Log File** option is disabled in the Job Management panel after you submit a discovery job, click **Refresh All** until the log file name is updated in the GUI.

- If you see message STA0155E in the Windows discovery log file:

```
DIS0001I FULL command selected.
STA0246I Discovery started
STA0339I Discovery started for domain xxx
STA0155E Discovery was unable to find the Windows computers in the domain
         or workgroup.
STA0249I Sending results to server
STA0250I Server saved results
STA0252I Discovery completed successfully.
```

  If you receive these messages, turn on tracing to generate a discovery trace file. Check the trace log for error code 6118. If you see code 6118, try starting the Computer Browser service on the Windows system, if the service is not turned on.
- If you use the **Other NAS** option to add a filer, then you delete the filer and do not use the **Other NAS** option to add it again, Tivoli Storage Productivity Center continues to recognize the filer as **Other NAS.**
- If you see error message STA0096E when you manually enter a filer for a Linux or AIX agent, check the mounts on the Linux or AIX system. There is a stale NFS handle. Unmount the reported file to proceed.
- For hosts that are on different Windows subnets but have the same workgroup name, Tivoli Storage Productivity Center considers the workgroup is on the same subnet and excludes one subnet when a discovery job is run. To work around this issue, disable the Storage Resource agent on one subnet and then run the discovery job again.

Monitoring service

The following information shows you how to troubleshoot monitoring service problems.

Tivoli Storage Productivity Center shows an event for the discovery and control components for the following actions:

- When you add a resource.
- When you make device status changes.
- When the device is not detected.

Tivoli Storage Productivity Center provides an alert generation on behalf of the performance monitoring service when the threshold changes and there is a collection failure. The database table snapshot for a certain device type is based on the request that is made to the performance monitoring service.

For general diagnosis of the problem, check these items:

- Make sure that the alert trigger condition is set up correctly.
- Make sure that the changes did happen.
- Check the alerts that are shown on the Alerts page in the web-based GUI.

For specific diagnosis of the problem, check these items:

- Locate the Device server trace log and search for possible exceptions that are generated from the monitor service.
- If no errors and exceptions are found for the monitor service, it means that the monitor service is running without problems. Next, check to see whether some other component is causing the problem such as the Change Detection component.

Common usability problems

These items are some common user errors with the monitoring service:

Why do I not get the correct alert?
Check to see that you configured the correct trigger condition for the correct device or device type.

Why is overall performance slow?
Many database activities to form SNMP and Tivoli Enterprise Console events might affect overall performance if too many alerts get created. You can configure only the needed alerts to control the number of alerts.

Why am I losing an event or alert?
An event or alert might be lost because the required data is unavailable in the database or there are network communication problems. After the alert creation fails, the alert for this changed device is not re-created.

Why do I see unexpected alert definitions and unexpected alerts with the keyword Pre-defined in the name?
These alerts are shown when another application is subscribed to receive events from Tivoli Storage Productivity Center through the Tivoli Storage Productivity Center API.

You can change the setting to hide Pre-defined alert definitions when you use the **tpctool** command:

```
tpctool setdscfg -user user_ID -pwd password -url localhost:9550
-property APIAlert.Visibility false
```

Logs and traces

When a problem occurs, you can set the trace level parameter **san.eventFactoryTrace.level = INFO** when you use the CLI command to get detailed trace information. Make sure that the created FabricAlert object is sent to the Data Server successfully.

The detailed trace information is saved in the following directory:
TPC_install_directory\data\log\traceTPCDeviceServer.log

Use the service tool and repocopy tool to collect trace information for Tivoli Storage Productivity Center and the database.

When an expected alert is not presented, check the following items:

- The trace log to make sure that the device changes are reported to the monitor service. For example, search the log for the corresponding API call.
- The correct alert population routine is used, and any other exception that is encountered during the process.
- Make sure that the alert object is sent to the Device server.

Database monitoring

The following information shows you how to troubleshoot database monitoring problems.

Agent issues or failures

If you have an agent issue or failure that is related to database monitoring, the likely cause is related to a command, or query that is sent to the database. The agent logs indicate that the job failed.

If you have an agent issue or failure during database monitoring, follow these steps:

1. Turn the tracing option on and set the tracing option to DEBUG_MAX for the Storage Resource agent.
2. Run the specific job that caused the issue (for example, a probe or scan job).
3. Check the trace log for the specific job run. The trace log includes information about the specific commands that are run against the database and also captures any error messages from the database.

Server issues or failures

If you have a server issue or failure that is related to database monitoring, the likely cause is related to the server not being able to capture or process output from a probe or scan job.

If you have a server issue or failure during database monitoring, follow these steps:

1. Enable the tracing option and set the tracing option to DEBUG_MAX for the Data server and agent.
2. Run the specific job that caused the issue (for example, a probe or scan job).
3. Check the `ServerTrace.log` file on the Data server. Look for error messages that are listed with the following information:

   For scan jobs:

   ```
   com.tivoli.itsrm.Db.server.svp.DbScanResultsZHndlr
   ```

   For probe jobs:

   ```
   com.tivoli.itsrm.Db.server.svp.DbProbeResultsHndlr
   ```

Performance monitoring

The following information shows you how to troubleshoot performance monitoring problems.

Tuning switch performance for collecting data

When you are using the switch performance monitor and you run into timeout problems, you can change the attributes that affect the performance monitor. The performance monitor uses algorithms to collect performance information. The association algorithm is optimized for environments with larger numbers of switches that are managed by a CIM agent and the enumeration algorithm is optimized for environments with fewer switches managed by a CIM agent. Tivoli Storage Productivity Center attempts to determine which algorithm to use based on the fabric configuration.

You can change the following attributes in the `pm.conf` file:

MinSwitchPortRatio

This attribute defines the minimum port ratio, for example, the ratio of monitored ports to total ports for a switch CIMOM. This value is used to

determine which algorithm to use for querying the performance statistics data for the ports through the CIM agent. The default cutoff value for the enumeration algorithm is 20%. If the cutoff value is less than 20% of the ports for a CIMOM that are targeted for performance data collection, the association algorithm is used instead, if the **MaxSwitchPortLimit** is not exceeded. This parameter does not apply to Cisco CIMOMs.

MaxSwitchPortLimit
This attribute defines the maximum port limit, for example, the maximum number of ports to be monitored that use the association algorithm for switch CIMOMs. This value is used to determine which algorithm to use for querying the performance statistics data for the ports through the CIM agent. If not set, the default cutoff value for the association algorithm is 256 ports, so that performance data is not collected for more than 256 ports simultaneously that use the association algorithm. Instead, the enumeration algorithm will be used for any CIMOMs after the limit is reached.

To change these attributes in the `pm.conf` file, go to the following directory: *TPC_installion_directory*`/device/conf/pm.conf` and remove the number sign (#) from these attributes and modify your setting:

```
#com.ibm.tpc.perf.MinSwitchPortRatio = 0.4
#com.ibm.tpc.perf.MaxSwitchPortLimit = 256
```

Save the file. The Device server must be restarted for these changes to take effect.

File system scans

If you have a file system scan issue, check this information for probable causes of the problem.

The following are some probable causes of file system scan issues:

The specified file system is not found on the Storage Resource agent system
Follow these steps to check for the file system:

1. Check the server where the Storage Resource agent is deployed to ensure that the file system is still available.
2. Run a probe again on the server where the agent is deployed.

The file system is full
Here are some reasons why you might encounter this problem:

- The scan of the file system did not start because a scan definition file cannot be copied to the server where the Storage Resource agent is deployed.
- During a scan or probe, the log and trace files cannot be written to the server because the file system is full.

If the file system is full, remove files, directories, or components that are not needed to increase the available space.

File system scan job abruptly ended
The file system scan job that ends abruptly because Tivoli Storage Productivity Center indicates that the file system is already being scanned even though no file system scan is running.

The reasons for this condition are as follows:

- The file system scan failed. Check the agent log and trace files for error messages.

- The file system name was not properly removed from file `sra_scan_res` after the file system was scanned.

If you encounter this problem, delete the `sra_scan_res` file in the *SRA_directory*`/agent/log` directory and rerun the file system scan job.

The file system scan job cannot log on to the NAS filer

The file system scan job cannot log on to the NAS filer to scan the NAS filer.

If you encounter this problem, follow these steps:

1. Check Tivoli Storage Productivity Center to see that the correct user ID and password were entered for this NAS filer.
2. Try to manually mount and access the filer volume on the Storage Resource agent system.

The NAS filer volume or file system was not found

If you encounter this problem, check the following items:

- If the Storage Resource agent system still has the volume mounted
- If the network connection to the NAS filer is still available
- If the NAS filer volume is still available

Correct the problem and rerun the computer probe job.

The file system scan job takes a long time

The file system scan job takes a long time for a small file system.

If you encounter this problem, follow these steps:

1. Check to see that the tracing option is set for this Storage Resource agent. If the tracing option is set to DEBUG_MAX, numerous tracing information might be written.
2. If the tracing option is set with DEBUG_MAX, change the setting to DEBUG_MIN and rerun the job.

The file system scan fails to scan the clustered file system

If you encounter this problem, check the following items:

- Probe all nodes in the cluster.
- Ensure that the cluster resource group is configured with an IP address. In a Microsoft Cluster Service (MSCS), you must configure a Network Name resource with an IP address resource, not just an IP address resource.
- Ensure that the IP address for the cluster resource group can be contacted by the Tivoli Storage Productivity Center server. Ensure that Tivoli Storage Productivity Center has access through any firewall.
- Ensure that Tivoli Storage Productivity Center can find the IP address for the cluster resource group when the clustered nodes are probed. Tivoli Storage Productivity Center collects one IP address per Network Name resource. Check the computer entry for the cluster resource group in Data Manager. In the navigation tree, click **Data Manager** > **Reporting** > **Asset** > **By Cluster** > **cluster_name** > **Cluster Resource Groups**. If the IP address listed is not the one that can be contacted by the Tivoli Storage Productivity Center, check the T_RES_IP_ADDRESSES table that uses the following query:

  ```
  db2 select network_name, IP_address from tpc.t_res_ip_addresses
  ```

Topology viewer

The following information show you how to troubleshoot the topology viewer.

You can use the topology viewer to see the following information:

- The entire data model that is sent by the Data server to the GUI.
- Any exceptions that occurred.
- A special debug ID column in the tabular view. Each entry contains the following information:
  - The prefix for the entity, server, or node.
  - The ID of that entity. You can use this ID to easily look up that entity in the database tables.

The data model is rendered on the screen. If something looks wrong in the GUI, check the data model first:

- If the data model contains the correct information, it is a GUI defect.
- If the data model contains the wrong information, you must check the database. Either the underlying data is incorrect, or the Data server portion of the topology viewer is not handling the data correctly.

To turn on debugging mode, a flag must be passed to Java when you start the GUI:

```
-DTopologyViewerDebug=5
```

This action causes the topology viewer to provide debugging information to `stdout`, and show an extra debug ID column in the tabular view. If Tivoli Storage Productivity Center is started by `javaw.exe`, you do not see any output data because `javaw.exe` hides the console window. `javaw.exe` is the default selection in the Windows shortcut.

An easier way to route the debugging information to a file is to use the following option:

```
-DTopologyViewerDebugOutputFile="C:\topo.log"
```

You can then send the file to IBM Software Support.

Here is an example of how to edit the target portion of the Windows shortcut for Tivoli Storage Productivity Center.

```
"C:\Program Files\IBM\TPC\jre\bin\javaw.exe"
-Xmx512m -classpath
"C:\Program Files\IBM\TPC\gui\TSRMgui.jar"
com.tivoli.itsrm.gui.GUiMain
tpcserver1.tpc.example.com:9549
```

To generate the log file `C:\topo.txt`, change the "target" field in the shortcut properties to this statement:

```
"C:\Program Files\IBM\TPC\jre\bin\javaw.exe"
-DTopologyViewerDebug=5
-DTopologyViewerDebugOutputFile="C:\topo.txt"
-Xmx512m -classpath
"C:\Program Files\IBM\TPC\gui\TSRMgui.jar"
com.tivoli.itsrm.gui.GUiMain
tpcserver1.tpc.example.com:9549
```

For Linux or AIX operating systems, you must edit the `TPCD.sh` script in the following directory: `/opt/IBM/TPC/gui/`. Add the following lines:

```
-DTopologyViewerDebug=5
-DTopologyViewerDebugOutputFile="/tmp/topo.txt"
```

The TPCD.sh script also contains some characters at the end that pipe the output data elsewhere. At the end of the script, remove the sequence of characters that look like this value:

```
>/dev/null 2>&1
```

Common usability problems

Note the following actions when you link the topology viewer with Tivoli Storage Productivity Center reports and alert logs:

- You are not offered a link to asset reports if you selected more than one entity (for example, computer, and storage subsystem).
- Links to alerts show all alerts, not just alerts that happen to be selected in the topology viewer.
- If you select storage subsystems or fabrics when you link to manage storage subsystems, only one selected storage subsystem or fabric is highlighted in the panel.

Single sign-on

You can use the *Single sign-on* authentication process to enter one user ID and password to access multiple applications. *Single sign-on* integrates with the launch and launch-in-context features to enable the smooth movement from one application to a functionally related location in a second application.

Log files

For *single sign-on* issues, make sure that tracing is turned on for *single sign-on*. You can see these parameters in the DataStore.properties file, which is in the *TPC_installation_directory*/device/conf directory:

- san.SingleSignonServiceTraceLogger.level=ALL
- san.SingleSignonServiceTraceLogger.logging=true
- san.SingleSignonServiceTraceLogger.listenerNames=file.trace
- san.SingleSignonServiceTraceLogger.LoggerType=TraceLogger

You can find the traces in the following file: *TPC_installation_directory*/device/log/traceTPCDeviceServer.log.

In addition, you can collect the WebSphere Application Server log files for the Device Server and first-failure data capture (FFDC) files. Look in the *TPC_install_directory*/ewas/profiles/DeviceServerProfile/logs/ directory and review the following file: wsadmin.traceout.

Rollup reports

The following information is provided about what to look for when you diagnose problems with rollup reports.

Through rollup reports, you can view storage information that is collected by the master Tivoli Storage Productivity Center server from its associated subordinate servers. Rollup reports provide you with a network-wide perspective of storage usage in an environment where multiple Tivoli Storage Productivity Center servers are deployed and collect storage metrics.

Rollup reports setup Requirements

The following conditions must be met to ensure rollup reports work correctly:

- The master server must not monitor more than 500 unique sources.
- Subordinate servers must not have more than 1200 unique data sources. Data sources include storage systems, CIM agents, Storage Resource agents, and VM agents.
- You must have Tivoli Storage Productivity Center superuser or Tivoli Storage Productivity Center administrator authority to run administrative operations such as adding or deleting a subordinate server to or from the master server list.
- Extra storage information that is collected by a subordinate server, is only available for that subordinate server, and is not rolled up into the reports available through the master server.

Diagnosing the problem

The first thing to look at is the log files.

The Data server log file on the master server in the following directory:
TPC_installation_directory/data/log/server_*nnnn*.log

The TPC Data log file on the master server in the following directory:
TPC_installation_directory/data/log/TPCD_*nnnn*.log

Use the following instructions to view the log files:

1. From the navigation pane in the web-based GUI, click **Server Resources** > **Servers**.
2. On the Servers page, right-click the server where the agent is deployed and select **Logs** > **View Agent Log**.

The Data Server trace log file on the master server in the following directory
TPC_installation_directory/data/log/ServerTrace.log

Turn on the trace function through the stand-alone GUI. For information about how to turn on the trace function, see "Tracing servers and agents" on page 13.

The Device Server log on the subordinate server in the following directory:
TPC_installation_directory/device/log/msgTPCDeviceServer.log

The Device Server trace log on the subordinate server in the following directory:
TPC_installation_directory/device/log/traceTPCDeviceServer.log

IBM Software Support requests that you run **repocopy** to gather information about your environment. You must run **repocopy** for both the master server and the subordinate server.

Configuration History

The following information shows you how to diagnose problems with Configuration History.

The Configuration History view is a variation of the topology viewer. The Configuration History view shows the current configuration and provides information about what the configuration looked like in the past. Use the snapshot selection panel in the Configuration History page to view changes that occurred in your storage environment between two or more periods.

The Configuration History views can show an entity two or more times. This condition might happen when an entity is removed manually from the database or by the removed resource retention function, and Tivoli Storage Productivity Center rediscovers that entity again. Tivoli Storage Productivity Center assigns the entity to a different ID when it is rediscovered.

Limitations

The following items are not supported by Configuration History:

- Alert and performance overlays
- Data Path Explorer view
- Pin and refresh settings actions

Diagnosing problems

Check the following conditions when you encounter a problem with Configuration History:

- Message log for the Device Server. The log file is available in the following directory: *TPC_installation_directory*/device/log/msgTPCDeviceServer.log. The message prefix is "HWNCC".
- Device Server trace log.

  To turn on tracing for Configuration History in the Device server, run the **setenv** command before you run the **srmcp** tracing command.

  Windows operating systems:

  Follow these steps:

  1. Go to this default directory: *TPC_installation_directory*\device\bin\w32-ix86
  2. Run the following command: **setenv**.
  3. Run these commands:

     ```
     srmcp -u user_id -p password log set
     san.ChangeRoverTraceLogger -filterkey INFO

     srmcp -u user_id -p password log set
     san.DBTraceLogger -filterkey INFO
     ```

     The filter key can be: INFO, WARN, or ERROR.

  Linux or AIX operating systems:

  Follow these steps:

  1. Go to the default directory:

     Linux operating systems:

     TPC_installation_directory/device/bin/linux

     AIX operating systems:

     TPC_installation_directory/device/bin/aix
  2. Run the following command:

     ```
     ./setenv.sh
     ```
  3. Run the following commands:

     ```
     ./srmcp.sh -u user_id -p password log set
     san.ChangeRoverTraceLogger -filterkey INFO

     ./srmcp.sh -u user_id -p password log set
     san.DBTraceLogger -filterkey INFO
     ```

The filter key can be: INFO, `WARN, or ERROR.

The output data is logged in the `traceTPCDeviceServer.log` file.

- Data Server trace log. For information about turning on tracing for the Data server, see "Tracing servers and agents" on page 13. Select DEBUG_MAX when you turn on tracing. The log file is at this location: *TPC_installation_directory*/data/log/ServerTrace.log and *TPC_installation_directory*/data/log/dbtrace.log.

  To configure tracing for the Data server, from the stand-alone GUI, right-click the **Server** node from **Administrative Services** > **Services** > **Data Server** and select **Configure Tracing**.

Configuration Analysis

The following information shows you how to diagnose problems with the Configuration Analysis tool.

When you set up the Configuration Analysis tool for policy checking, you define the scope to check:

- All fabrics
- One fabric
- One zone set

Common usability problems

These items are some common usability problems with the Configuration Analysis tool:

- Policy violations are not correctly sorted in the Alert Overlay within the topology viewer.
- When a missing fabric is selected as a scope in a configuration analysis job, then no violations are reported for policies that need zoning information (policies 3, 4, 5, 6, 12 and 13). The zone information is removed from the IBM Tivoli Storage Productivity Center database when a fabric goes missing.
- By default the limit of 50 policy violations are stored per analysis job. This limitation is done to prevent overloading the topology viewer with numerous violations. You can change this policy violation limit by using the **tpctool** command. For example, if you wanted to change the policy violations limit to 200, run this command:

```
tpctool setdscfg -user user_ID -pwd password
-url localhost:9550 -property MaxPolicyViolationsStored 200
```

Dependencies

Configuration Analysis requires the following information:

- A mixture of in-band Fabric agents, out-of-band Fabric agents, Storage Resource agents, and CIM agents for the fabric to collect all fabric topology information. For example switches, interconnections, and zoning. This information is required for the evaluation of all Configuration Analysis policies.
- CIM agents for storage subsystems to collect the storage subsystem information for example subsystem details, storage volumes, storage ports, and storage volumes to host mappings. The information is required for the evaluation of configuration analysis policies 2, 3, 5, 7, and 11.

- Storage Resource agents to collect the host information, for example operating system type and version. This information is required for the evaluation of configuration analysis policies 3 and 9.
- In-band Fabric agents or Storage Resource agents to collect the attribute information from the host information for example HBA and host port details. This information is required for the evaluation of configuration analysis policies 2, 3, 4, 8, and 9.

Diagnosing problems

Check the following conditions when you encounter a problem with Configuration Analysis:

- Configuration Checker job logs are located here: *TPC_installation_directory*/data/log/*config_analysis*.log.
- Message log for the Device Server. The log file is here: *TPC_installation_directory*/device/log/msgTPCDeviceServer.log. The message prefix is "HWNCC".
- Device Server trace log.

  To turn on tracing for the Configuration Analysis in the Device server, run the **srmcp** tracing command.

  Windows operating systems:

  Follow these steps:

  1. Run the following command:

     setenv

  2. Go to the default directory:

     TPC_installation_directory\device\bin\w32-ix86

  3. Run the following command:

     ```
     srmcp -u user_id -p password log set
     san.ConfigCheckerTraceLogger -filterkey INFO
     ```

     The filter key can be: INFO, WARN, or ERROR.

  Linux or AIX operating systems:

  Follow these steps:

  1. Go to the default directory:

     Linux operating systems:

     TPC_installation_directory/device/bin/linux

     AIX operating systems:

     TPC_installation_directory/device/bin/aix

  2. Run the following command:

     ```
     ./setenv.sh
     ```

  3. Run the following command:

     ```
     ./srmcp.sh -u user_id -p password log set
     san.ConfigCheckerTraceLogger -filerkey INFO
     ```

     The filter key can be: INFO, WARN, or ERROR.

  The output data is logged in the traceTPCDeviceServer.log file.
- Data Server trace log. For information about turning on tracing for the Data server, see "Tracing servers and agents" on page 13. Select DEBUG_MAX when you turn on tracing. The log file is at this location: *TPC_installation_directory*/data/log/ServerTrace.log

To configure tracing for the Data server, from the stand-alone GUI, right-click the **Server** node from **Administrative Services** > **Services** > **Data Server** and select **Configure Tracing**.

Data Path Explorer

You can diagnose connectivity and performance problems with Data Path Explorer.

The Data Path Explorer is a type of view in the topology viewer. Storage administrators can use this view to debug connectivity and performance problems in the storage environment. Data Path Explorer shows the different data paths for each host disk. You can use the Data Path Explorer to check the health and performance statistics of the storage components along the I/O path.

Things to note

When you have the problem of data paths not showing in the topology viewer, check these items:

- Are the storage volumes visible as disks on the initiator?
- Are the agents configured correctly for the host, fabric, and storage subsystem?
- Have probes been run on these agents?
- Using the L2:Computers view and L2:Subsystem view, check which switches (and fabric) the host and subsystem are connected to.
- Does the L2:Fabric view show the interconnection between the switches that are shown previously?

Common usability problems

The entities and connections that are involved in a data path segment are not highlighted in the Data Path Explorer graphical view when a data path segment is selected in the data path tabular view.

Diagnosing problems

Check these log files:

- Message log. The message log can be accessed through the Tivoli Storage Productivity Center GUI. The log file is located here:

  TPC_installation_directory/data/log/server_*.logTo look at the log file, follow these steps:

  1. Open the Tivoli Storage Productivity Center GUI and click **Administrative Services** > **Services** > **Data Server** > **Server**.
  2. For the server, right-click on **Server**. Click **View Log**. The log is displayed in the right pane.
  3. For the GUI, right-click on **GUI**. Click **View Log**. The log is displayed in the right pane.
- Server trace log. For information about how to turn on tracing, see "Tracing servers and agents" on page 13. When you turn on tracing, specify DEBUG_MAX. The log file is located here:

  TPC_installation_directory/data/log/ServerTrace_*.log
- GUI trace log.

  Here is an example of how to edit the target portion of the Windows shortcut for Tivoli Storage Productivity Center.

```
"C:\Program Files\IBM\TPC\jre\bin\javaw.exe"
-Xmx512m -classpath
"C:\Program Files\IBM\TPC\gui\TSRMgui.jar"
com.tivoli.itsrm.gui.GUiMain
tpcserver1.tpc.example.com:9549
```

To generate the log file `C:\topo.txt`, change the "target" field in the shortcut properties to this statement:

```
"C:\Program Files\IBM\TPC\jre\bin\javaw.exe"
-DTopologyViewerDebug=5
-DTopologyViewerDebugOutputFile="C:\topo.txt"
-Xmx512m -classpath
"C:\Program Files\IBM\TPC\gui\TSRMgui.jar"
com.tivoli.itsrm.gui.GUiMain
tpcserver1.tpc.example.com:9549
```

SMI-S fabric probe

The following information shows you how to diagnose problems with the SMI-S fabric probes.

Tivoli Storage Productivity Center supports the SMI-S Agent (CIM agent) for the fabric. The SMI-S Agent collects basic fabric, switch, and port information that is used for performance monitoring. For Brocade fabrics, full topology information and zoning information is also collected during the fabric probe through SMI-S. For other switch vendors, monitoring of the fabric topology requires the Tivoli Storage Productivity Center Storage Resource agent or out-of-band Fabric agent.

For a list of switches and directors that are supported by Tivoli Storage Productivity Center, see http://www.ibm.com/software/sysmgmt/products/support/IBMTotalStorageProductivityCenterStandardEdition.html. Search for the appropriate version of switch and director.

Common usability problems

SMI-S fabric usability issues include the following items:

Switch Vendor and Model are blank or unknown
Some switch vendors do not provide a distinguishable vendor name or model name through some of the fabric agents.

Switch performance monitoring job fails immediately
Check to see that a fabric probe completed.

Switch performance monitoring job fails
A switch performance monitoring job might fail for switches that are known to the Cisco CIMOM but are not managed by the CIMOM.

For Cisco
To get detailed information for Cisco switches, you can use either the SMI-S agent that is embedded on the switch or a proxy CIM agent that is embedded in their Data Center Network Manager (DCNM) software. Ensure that Tivoli Storage Productivity Center is configured to manage the relevant agent for each switch in the fabric. This action collects information about FC ports.

Cisco logical switches and VSANs are missing
Check to see that the out-of-band Fabric agents for the Cisco switches are configured.

The Switch port, Index, Slot, or Enabled State option is blank for the Brocade switch Check to see that an SMI-S agent is configured for this fabric, and check to see that a fabric probe completed.

CIMOM discovery failed
Check to see that the switch CIMOMs are at the supported levels.

Brocade SMI Agent

For information about the Brocade Network Advisor SMI Agent, see the *Brocade Network Advisor User Manual* that supports your version of BNA.

For information about the Brocade DCFM SMI Agent, see the *Brocade Data Center Fabric Manager User Manual* that supports your version of DCFM.

For information about the Brocade SMI Agent, see *Brocade SMI Agent User's Guide* for the SMI Agent at the Brocade website. See the appropriate version of the SMI Agent you are using. Also, see the documentation for the *Data Center Fabric Manager (DCFM) Integrated SMI Agent* or *Brocade Network Advisor (BNA) Integrated SMI Agent* for any problems that are encountered with this type of SMI Agent.

Things to note

When you have a problem with the SMI-S fabric probe, check these items:

- The following information is collected only through the CIMOM:
  - Brocade blades
  - Brocade Switch FCPort EnabledState and Index
- For Cisco switches, VSAN and logical switches are not collected through the CIMOM. You must use the out-of-band Fabric agent or Storage Resource agent to collect this information.
- When a CIMOM discovery is performed, Tivoli Storage Productivity Center finds fabrics and switches through the switch CIMOMs. Tivoli Storage Productivity Center finds basic information for switches that are not registered with the CIMOM, if they are in a fabric with a switch that is registered with the CIMOM. Tivoli Storage Productivity Center also finds and persists fabrics and the fabric-to-switch relationships.
- When a fabric probe is performed, the following actions occur:
  - CIMOM discovery is rerun.
  - When a backend fabric agent assignment is made, Tivoli Storage Productivity Center checks to see which fabric agents are available. The fabric agents are sorted and the top agent in the list is run. The other agents in the list are run only if the fabric probe fails with the previous fabric agent.

NAS and NetApp

The following information shows you how to troubleshoot NAS and NetApp problems.

NAS probes

The best way to troubleshoot NAS probe issues is to check the log and trace files for the Storage Resource agent that is running the probe job.

To see which agents are assigned to a probe and to scan the filers, select **Administrative Services** > **Configuration** in the Scan/Probe Agent Administration panel.

The log and trace files are found under the following directory:
SRA_directory/log/*TPC_server_name*

These files use the following naming convention:

- *schedule_name.schedule_number*_naprobe.*job_run_number*.log
- *schedule_name.schedule_number*_naprobe.*job_run_number*.trace

NetApp ImportQuota

Check the following items to troubleshoot NetApp issues:

- Ensure that the NetApp discovery and probe jobs collected the basic NetApp filer information.
- If the ImportQuota job state is *No files found*, verify that a Storage Resource agent is configured to probe and scan the filer.
- If numeric IDs are reported with the quotas for Windows Security Identifiers (SIDs) instead of user names, the Storage Resource agent that is used to scan the filer cannot resolve the user IDs that are on other servers. To solve the problem, add a Storage Resource agent for the other servers.
- If you see an alert that is generated but does not show up in Tivoli Storage Productivity Center, verify that you have a current file system scan for the NetApp volume in question.

Important: Resolving all user names that might be involved with quotas is a two-step process that requires two agents of different operating system types. For example, you must configure an agent for Windows, Linux and AIX. As a result, the corresponding agent log files are also found on different systems.

The log and trace files that are found on the primary Storage Resource agent, where the ImportQuota job is run, has the following naming convention:

- *schedule_name.schedule_number*_netapp_quota.*job_run_number*.log
- *schedule_name.schedule_number*_netpp_quota.*job_run_number*.trace

The log and trace files that are found on the auxiliary Storage Resource agent, for resolving more user IDs, usually a Windows Storage Resource agent, has the following naming convention:

- netapp_resolveids_*run_number*.log
- netapp_resolveids_*run_number*.trace

CIM Agent

You can use a CIM agent to monitor a NAS filer in the Web GUI. For information about CIM agents, go to the Tivoli Storage Productivity Center Information Center, and search for *CIM agent.*

VMware ESX

The following information shows you how to diagnose problems with VMware ESX servers.

Tivoli Storage Productivity Center supports the VMware Virtual Infrastructure that consists of the ESX server and VMware VirtualCenter. The ESX server is a true hypervisor product that can host multiple virtual machines that run independently of each other while they share hardware resources.

Tivoli Storage Productivity Center supports the following services:

- The Virtual Center discovery is the only successful criteria.
- Alerts are for probe only. No event, traps, or alarms from the Virtual Infrastructure are supported.
- Tivoli Storage Productivity Center supports reporting only. No active management of the Virtual Infrastructure is supported.
- The information from VMware is equivalent of a read-only Storage Resource agent. It does not include scripts or file system (FS) extension.

To get detailed information for space and capacity reports, you must run the following steps:

- Probe all the ESX servers.
- Install Storage Resource agents on all the virtual machines and probe them. Otherwise, you get a partial picture with incomplete capacity data.

Common usability problems

The following list shows some common user errors with VMware:

- There are new totals in the dashboard and reports.
- Note the indications for the hypervisor status.
- Differentiate Storage Resource agent for a virtual machine information from the ESX Server.

Dependencies

Some of the dependencies are as follows:

- VMware ESX 3.0.1 and Virtual Center 2.0.1 are required.
- A probe of the hypervisor is required for complete reporting.
- Hypervisors and VirtualCenters have HTTPS communication that is turned on and HTTP communication that is turned off by default.
- You require permission to browse through the data stores on the ESX server. For more information about how to check permissions to browse data stores,go to the Tivoli Storage Productivity Center Information Center, and search for *hypervisor permissions*.

Diagnosing the problem

When you troubleshoot a VMware problem, make a note of the following items:

- Look at the job logs for discovery and probe create jobs that might indicate that tracing information is available.
- Look for trace messages in the general trace file: *TPC_installation_directory*/device/log/traceTPCDeviceServer.log
- Set the trace level.

  To turn on tracing for the Device server, follow these steps:

  1. Run the **srmcp** tracing command.

     Windows operating systems:

     To run the **srmcp** trace command, follow these steps:

     a. Run the following command: **setenv**.

     b. Go to the default directory: *TPC_installation_directory*\device\bin\w32-ix86

c. Run the following command:

```
srmcp -u user_id -p password log set
san.VMManagerTraceLogger -filterkey INFO
```

The filter key can be: INFO, WARN, or ERROR.

Linux and AIX operating systems:

To run the **srmcp** trace command, follow these steps:

a. Go to the default directory:

For Linux operating systems

TPC_installation_directory/device/bin/linux

For AIX operating systems

TPC_installation_directory/device/bin/aix

b. Run the following command:

./setenv.sh

c. Run the following command:

```
./srmcp.sh -u user_id -p password log set
san.VMManagerTraceLogger -filerkey INFO
```

The filter key can be: INFO, WARN, or ERROR.

The output data is logged in the `traceTPCDeviceServer.log` file.

Reporting groups

This topic provides information about what to look for when diagnosing problems with reporting groups.

A reporting group is a user-defined set of resources and groups upon which you want to report. Reporting groups are available in Data Manager and Data Manager for Databases only. Use reporting groups to view storage information about:

- Resources that are displayed in different monitoring groups. Because a resource can be displayed in only one monitoring group at a time, you can use reporting groups to include resources from different monitoring groups and view reports on them.
- A subset of resources within a monitoring group. For example, you can create a reporting group for a specific subset of computers with the Payroll monitoring group and generate a report containing information about those computers.

Diagnosing the problem

To diagnose problems for reporting groups, you can get an exception stack trace memory dump in the command window:

- For AIX or Linux operating systems, the memory dump is displayed in the shell window
- For Windows operating systems, the memory dump is displayed in the DOS window

You must run the GUI manually using the following command:

```
"TPC_installation_directory\jre\bin\java.exe" -Xmx256M
-classpath "TPC_installation_directory\gui\TSRMgui.jar"
com.tivoli.itsrm.gui.GuiMain localhost:9549
```

You must also perform the following actions:

- Turn tracing on in the GUI. For information about turning tracing on, see "Tracing servers and agents" on page 13.
- Run **repocopy** of the IBM Tivoli Storage Productivity Center database. For information about how to run **repocopy**, see "Repository copy tool" on page 5.
- Run the service tool for both the servers and common agents. For information about how to run service tool, see "Service tool overview" on page 7.
- Get DB2 logs (`db2diag.log`).
- Get output data from the **db2 list applications** command. To get output data, run these commands:
  - **db2 connect to tpcdb**
  - **db2 list applications**

FlashCopy

Tivoli Storage Productivity Center FlashCopy® support labels volumes as having a FlashCopy property of *source*, *target* , or *none* as appropriate. The FlashCopy property ensures that the *consumable volume space* value shown in the Data Manager system-wide asset reports by storage subsystem does not include capacity that is used by the FlashCopy target volumes.

Tivoli Storage Productivity Center does not provide the following information or actions:

- More information about FlashCopy relationships
- The Tivoli Storage Productivity Center user cannot create or manipulate FlashCopy relationships
- A report (or any information) that links together the source and target volumes of a particular FlashCopy relationship

Diagnosing the problem

Most issues arise from one of two causes:

Missing data
The subsystem does not report the FlashCopy data in a manner that Tivoli Storage Productivity Center expects. Missing data is most likely to occur in the event of the release of new microcode or CIM agents for a subsystem.

The DS8000 and XIV storage systems do not require CIM agents. These storage systems use native interfaces.

Check that the CIMOM knows of the FlashCopy relationships. Use the CIMOM browser.

Improperly created FlashCopy relationships
The user did not create a persistent FlashCopy relationship. If the relationship is temporary, the relationship is probably no longer valid by the time Tivoli Storage Productivity Center probe requests the information. Verify that the management software of the subsystem reports the FlashCopy relationship.

Element Management

The Element Management is integrated with the Tivoli Storage Productivity Center stand-alone GUI. You can manage multiple DS element managers within the Tivoli Storage Productivity Center stand-alone GUI.

Logs and traces

When you encounter a problem in this area, turn tracing on using the maximum debug level. For information about turning tracing on for the Data Server, see "Tracing servers and agents" on page 13.

For information about turning tracing on for the Device server, see "Tracing the Device server " on page 15.

Before you run a **srmcp** command, you must run the **setenv** command.

Windows operating systems:

Follow these steps:

1. Go to the default directory:

   TPC_installation_directory\device\bin\w32-ix86
2. Run the following command:

   setenv

Linux or AIX operating systems:

Follow these steps:

1. Go to the default directory:

   Linux operating systems:

   TPC_installation_directory/device/bin/linux

   AIX operating systems:

   TPC_installation_directory/device/bin/aix
2. Run the following command:

   ./setenv.sh

Run the following command:

```
srmcp -u user_id -p password log set
san.ElementManagerMgmtTrcLogger -filterkey INFO
```

The filter key can be: INFO, WARN, or ERROR.

Restart the Device server and collect the Data server and Device server logs by running the **service.bat** or **service.sh** command.

The most useful log is: *TPC_installation_directory*\device\log\
traceTPCDeviceServer.log

For element manager issues, look for entries that include the related Java classes:

```
com.ibm.tpc.dmc.***
```

JavaServer Pages (JSP)

To turn on the JSP debug trace, edit the following file:

TPC_installation_directory/device/apps/was/profiles/deviceServer/
installedApps/ DefaultNode/DeviceServer.ear/DeviceServer.war/*.jsp.

Change the following line:

```
var djConfig=isDebug: false
```

to

```
var djConfig=isDebug: true
```

No server reboot is required. You can then view the JSP log entries in the GUI panel.

tpctool

tpctool is a stand-alone Java client and connects to the Device server only. *Tpctool* connects through TCP, HTTP, and SOAP to the web service APIs. The commands provide query, control, and reporting capabilities only. The commands do not initiate discovery, probes, or configuration and control of agents.

Tpctool is installed in the following default directories:

Windows operating systems:
TPC_installation_directory\cli

Linux or AIX operating systems:
TPC_installation_directory/cli

The Windows command to run the tool is *tpctool*. The Linux or AIX command to run the tool is **tpctool.sh**.

There are two distinct kinds of authentication:

- User authentication
- Super user or host-based authentication

The user authentication requires a user ID and password authenticated in the Device server authentication domain. Role-based authorization is enforced on a per command basis.

The super user or host authentication is for the tpc_superuser user ID. The password for this user ID bypasses role-based authorization. This action is the required authentication method for AIX-based Device servers.

Some of the control commands run for a long time. An example is the `mkvol` command. It is not possible to determine the intermediate status of the command. If the *tpctool* client stops, for example the user presses Ctrl-C or the node crashes, all connections with the job are lost. It is not possible to reconnect to the host to check on the status of the command.

The Device server logs and trace files, assuming that tracing is on, are shown. For the disk commands, see this log:

```
DiskManagerService: dmSvcTrace.log
```

For the Fabric commands, see these logs for the Fabric Manager Service:

- `TPCZoneControl.log`
- `msgTPCDeviceServer.log`
- `traceTPCDeviceServer.log`

For the reporting commands, see this log:

```
PerformanceService: tracePerfMgr.log
```

For fabric reports, the commands pass through the Fabric service for authorization. For subsystem reports, the commands pass through the Disk service for authorization.

For configuration commands, see this log:

`ConfigService: traceTPCDeviceServer.log`

For all other commands, see this log:

`msgTPCDeviceServer.log`

Here are some notes about passwords:

- You can use the GUI to change the Device server host authentication password.
- If you use the GUI to change the password, the password is updated in the database and the Device server is notified.
- The configuration file for all the Fabric agents must be manually changed.

Common usability problems

Here are some common usability problems with the *tpctool*:

- You do not know where the installation directory is. Is the installation directory in a nonstandard location?
- You did not set the *PATH* or *chdir* to the *TPC_installation_directory*`/cli` directory.
- Using *tpctool* on Linux or AIX operating systems instead of `tpctool.sh`.
- Did not provide the following parameters in the command:
  - **-url** *tpcserver*:*deviceserverport* where tpcserver is the hostname or IP address of the server that runs Tivoli Storage Productivity Center and the deviceserverport default value is 9550, for example: localhost:9550
  - **-user**
  - **-pwd**

A common error message for *tpctool* is as follows:

`AAJ000009E Error communicating to the App server.`

This error message indicates an invalid port, invalid host, or that the Device server is unreachable. To distinguish what the problem is, you can set a debug flag that prints the Java stack if an exception occurs. Most errors are propagated to *tpctool* as exceptions. To set this flag:

Windows operating systems:

```
set TPCCLIDBG=1
```

Linux or AIX operating systems:

```
export TPCCLIDBG=1
```

For an invalid host, the host name is embedded in the message. For example:

```
[SOAPException: faultCode=SOAP-ENV:Client: msg=Error opening socket:
java.net.UnknownHostException:badhost:...]
```

For a valid host but an invalid port or when the Device Server is down, an example of a message is as follows:

```
[SOAPException: faultCode=SOAP-ENV:Client: msg=Error opening socket:
java.net.ConnectException: Connection refused:...]
```

An invalid port is the most common problem.

If the Device server node is unreachable, an example of the message is as follows:

```
[SOAPException: faultCode=SOAP-ENV:Client: msg=Error opening socket:
java.net.SocketException: Operation timed out:
connect:could be due to invalid address:...]
```

srmcp commands

Before you run a **srmcp** command, you must run the **setenv** command.

Windows operating systems:

Follow these steps:

1. Go to this default directory: *TPC_installation_directory*\device\bin\w32-ix86
2. Run the following command: **setenv**.

Linux or AIX operating systems:

Follow these steps:

1. Go to this default directory on UNIX

   Linux systems:

   TPC_installation_directory/device/bin/linux

   AIX systems:

   TPC_installation_directory/device/bin/aix

2. Run this command:

   ```
   ./setenv.sh
   ```

You can use the following **srmcp** commands for SANEventCorrelatorFactory for fabric troubleshooting:

- To list the configured filters:

  ```
  cd TPC_installation_directory\device\bin\w32-ix86
  srmcp -u user_ID -p password SANEventCorrelatorFactory
    list
  ```

- To add a filter with the specified values (any or all can be specified). You can specify just the enterprise, the OIDs, or a combination:

  ```
  cd TPC_installation_directory\device\bin\w32-ix86
  srmcp -u user_ID -p password SANEventCorrelatorFactory
    add filter [enterprise=enterprise][genericTrap=<number>]
    [specificTrap=number][OID=value]
  ```

- To specify an IP address that is filtered for the specified filter:

  ```
  cd TPC_installation_directory\device\bin\w32-ix86
  srmcp -u user_ID -p password SANEventCorrelatorFactory
    add address ID IP_address
  ```

- To remove a specified filter:

  ```
  cd TPC_installation_directory\device\bin\w32-ix86
  srmcp -u user_ID -p password SANEventCorrelatorFactory
    remove filter ID
  ```

- To remove the IP address from the filter list:

  ```
  cd TPC_installation_directory\device\bin\w32-ix86
  srmcp -u user_ID -p password SANEventCorrelatorFactory
    remove address ID IP_address
  ```

Here is the **srmcp** command to change the host authentication password:

```
cd TPC_installation_directory\device\bin\w32-ix86
srmcp -u user_ID -p password ConfigService setAuthenticationPw
  new_host_password
```

Here is the **srmcp** command to change the DB2 password (not the db2admin password) that the server uses:

```
cd TPC_installation_directory\device\bin\w32-ix86
srmcp -u user_ID -p password ConfigService setPw
  new_host_password
```

Fabric-specific problems

You can use this information to troubleshoot fabric-specific problems.

Fabric discovery

The types of fabric discovery problems you can have are as follows:

- An error in the logs. Typically the first error you see is the most important.
- Information in the GUI that is incorrect or unexpected.

For information about error messages, see the *Tivoli Storage Productivity Center Messages Guide* and try to follow the explanations, user responses, and administrator responses.

For fabric discovery problems, follow these steps:

1. Run the service tool. See "Service tool overview" on page 7.
2. Run the **repocopy** command to capture the Tivoli Storage Productivity Center database. Follow these steps:
   a. Go to the following directory:

      Windows operating systems:
      TPC_installation_directory\data\server\tools

      Linux or AIX operating systems:
      TPC_installation_directory/data/server/tools

   b. Run the following command:

      Windows operating systems:
      repocopy.bat

      Linux or AIX operating systems:
      repocopy.sh

   c. Select **Export data from repository tables**.
   d. Select the directory for the export file location.
   e. Use the default values for delimiter and double quotation marks.
   f. Take the default values for the connection properties.
   g. Compress all the files in the output directory and send to the IBM Software Support.
3. Get more trace information.
   a. Go to the following directory:
      cd *TPC_installation_directory*\device\bin\w32-ix86
   b. Run the setenv command.
   c. Run the following command:
      srmcp -u *user_ID* -p *password* log set -filterkey INFO

      To turn logging off:
      srmcp -u *user_ID* -p *password* log set -defaults
4. Correlate the time stamps in the job log.

5. Check the health of the Device server.
6. Check these files:
   - *TPC_installation_directory*\device\log\traceTPCDeviceServer.log
   - *TPC_installation_directory*\device\log\msgTPCDeviceServer.log
7. Correlate the time stamps in the job log.

To check on incorrect information, check these items:

- Did Tivoli Storage Productivity Center receive an event? Look for the following items:
  - Events in the alerts.
  - ALR4100I: Received an SNMP trap notification from source.
- The health of the probe:
  - Look in the log file: *TPC_installation_directory*\device\log\msg.probeFabricAgents.x.x.log
  - Look for exceptions or error messages.
- If the population of the results into DB2 failed:
  - Check the following log file: *TPC_installation_directory*\device\log\msg.probeFabricAgents.x.x.log
  - Look for exceptions or error messages.

The following is a list of some of the known problems:

- Some unsupported devices like multi-protocol routers can cause job failures during fabric discovery.
- AIX HBA information is limited and provides only name, manufacturer, firmware, and model.
- HBA hardware and BIOS versions are not shown in the Tivoli Storage Productivity Center GUI.

Fabrics not discovered by the Storage Resource agent

Check the computer probe log to identify any additional information that is helpful to isolating the problem. Check the following items:

- If the HBA is connected to the fabric. Confirm through operating system commands or the switch element manager or both that the HBA is connected to the fabric.
- If the Storage Resource agent is deployed on the AIX operating system. Check to see that the system has the minimum level of AIX maintenance level and patches.
- The Storage Resource agent is running on an operating system for which the Storage Resource agent fabric functions are not supported.

  For more information about the requirements for the Storage Resource agent, see the Tivoli Storage Productivity Center Information Center. Search for *Software requirements for Storage Resource agents*
- If the Storage Resource agent is disabled for fabric functions.

  To enable an agent, complete the following steps:

  1. From the navigation pane in the web-based GUI, click **Server Resources** > **Servers**.
  2. On the Servers page, right-click the server where the agent is deployed and select **Modify Agents** > **Enable**. You can enable agents on multiple servers at the same time.

3. Click **OK** to confirm that you want to enable the agent.
4. If the agent is running as a daemon service, enter the user ID, password, and other credentials for the server where the agent is deployed. Click **OK** to start the service and enable the agent.

The agent is enabled and the state of the agent is updated to reflect its current condition, such as Up or Upgrade needed. If the agent is deployed as a daemon service, the service is started when you enable the agent.

HBAs not discovered by a Storage Resource agent

The Storage Resource agents do not use RNID and SCSI inquiries for remote HBA and device identification. You need a Storage Resource agent on each system for which HBA information is needed. You need a native interface storage system or CIM agent to identify the storage devices.

Check for any messages in the computer probe log for information about what might be the problem. You can also check the following items:

- If the supported HBA driver and API are installed. In some cases, the HBA driver includes the API. In other cases, the HBA driver and API must be installed separately. Contact your HBA vendor for information about the driver and API.
- If the HBA and API are at a level that is supported by Tivoli Storage Productivity Center. See http://www-01.ibm.com/support/docview.wss?rs=40&uid=swg21386446&loc=en_US&cs=utf-8&lang=en.
- There are some operating system restrictions for Storage Resource agent fabric functions.

  For more information about the requirements for the Storage Resource agent, see the Tivoli Storage Productivity Center Information Center. Search for *Software requirements for Storage Resource agents*.
- Check to see whether the HBA is configured appropriately. For information about how to configure the HBA, contact your HBA vendor.

The HBA to port relationship is a logical concept. Sometimes one physical card might have more than one HBA port. Multiple ports in the same HBA share node WWN. Check the node and port WWN names in the topology viewer.

Fabric probe failures

If you get a fabric probe failure, check the following items:

- Look at the fabric probe job log and Device server message and trace log files. If the error message is in processing before the agent is called, the issue is with the agent assignment.
- Check for communication errors when the agent is called, any error response from the agent, or no response from the agent.
- Check the agent log files for error messages.

Fabric configuration

Check the following items for fabric configuration problems:

- Look at the GUI or CLI error code. See Tivoli Storage Productivity Center Messages for the error codes. The error codes have two parts: command failure code and native failure code.

Command failure code
The command failure code specifies which operation failed, such as an error that occurred while a zone is created.

Native failure code
The native failure code gives the reason for the error, such as *Already exists*.

- Whether the agent that is connected to the fabric is configured appropriately for zoning.

Check the following logs:

- GUI job log.
- `AuditTrace.log` in the Data Server log directory.
- `TPCZoneControl.log` in the Device server log directory.
- `msg.control.123.123.log` in the Device server log directory
- `traceTPCDeviceServer.log` in the Device server log directory

How to adjust log and trace levels

You can adjust the following trace levels in the `DataStore.properties` and `nativelog.properties` files in the Device server `conf` directory.

Tip: Make a backup copy of the `DataStore.properties file` before you modify this file. A corrupt `DataStore.properties` file can cause Tivoli Storage Productivity Center to not start.

```
san.ControlTraceLogger.level=ALL
san.SanZoneControlTraceLogger.level=ALL
san.SanZoneControlAgentTraceLogger.level=ALL
```

Commands and tools for troubleshooting

- On the seed switch of the fabric, check for a transaction lock. For example, for the Brocade CLI, use the **cfgTransShow** and **cfgTransAbort** commands.
- Look for Tivoli Storage Productivity Center GUI or CLI instances that can be holding a transaction lock. It might be difficult to abandon the transaction lock on older switch models without rebooting the switch.

Fabric events

Some of the common reasons for not getting notification of external fabric events or not having fabric probes run automatically in response to events are as follows:

- Switches are not configured to send SNMP traps to the server.
- The fabric for which an event was received or fabrics that are discovered by the Storage Resource agent are not included in any probes that are defined by the user. An automatic probe of fabrics is done only for fabrics that are included in some probe definition.
- The switch is configured for a trap level that results in the filtering of the trap and not sent from the switch to the server. The trap that is sent from the switch to the server is filtered by the server because of default filter rules or filtering rules, or both, configured by the user.

To configure tracing to check that the traps are filtered, set the trace level parameter `dsn.eventFactoryTrace.level = INFO` by using the CLI command to get detailed trace information. Ensure that the created FabricAlert object is sent to the Data Server successfully.

The detailed trace information is saved in the following directory: *TPC_installation_directory*\data\log\traceTPCDeviceServer.log.

If you are not getting a fabric alert when you expected one, check if the information shown in Tivoli Storage Productivity Center reflects the change. Check that the appropriate types of alerts are defined for the fabric.

Check the following logs for error messages:

- *TPC_installation_directory*/data/log/server_*xxxx*.log
- *TPC_installation_directory*/data/log/TPCD_*xxxx*.log

Storage Resource agents that run on AIX

Your fabric probe can fail on AIX with error message: AGT0430I.

AIX has a constraint wherein the size of the response buffer that is passed in for GS-3 commands made to the switch cannot exceed 4 KB. The Storage Resource agent passes 4 KB buffer sizes for AIX.

If the zone configuration for a fabric probe meets or exceeds the 4 KB limitation for AIX, Tivoli Storage Productivity Center flags this condition. The fabric probe fails under this condition with error message AGT0430I.

You can use Storage Resource agents that are deployed on another platform that is connected to the same fabric. Use this Storage Resource agent for collecting zone information and for running zone changes. In this case, the fabric functions for the Storage Resource agent that is failing can be disabled.

If the fabric probe fails with the error message, and you try to make zone changes for the fabric, then you might get a warning message that the zoning changed.

CIM indications

Here is a list of some things to check when you are having issues with CIM indications from the Data Center Fabric Manager (DCFM) or Brocade Network Advisor (BNA):

CIM indication not received

- Verify that SNMP registration is successful by the DCFM and BNA discovery dialogs
- Verify if the configured SNMP port is blocked by a firewall
- Verify if the Management Information Base (MIB) capability for trap forwarding and tracking changes are configured properly

To get the DCFM/IA and BNA logs, follow these steps:

1. Open the DCFM and BNA Server Management Console.
2. Go to the **Technical Support Information** tab.
3. Click **Browse** and select the log destination. Click **capture**.

Fabric Removed Resource Retention

Check for fabric Removed Resource Retention problems in the following logs:

- server_*xxxxx*.log
- TPCD_*xxxxx*.log

These logs are in the following directory: *TPC_installation_directory*/data/log/

CIM agents

The following information provides details on how to troubleshoot CIM client or CIM agent problems.

XML requests and responses are written to the CIM client trace file that is in the following directory: C:\Program Files\IBM\TPC\device\log\cim-xml-trace.txt

The **cimxmlTracing** configuration parameter in table T_RES_CONFIG_DATA must be set to true to collect tracing information.

To set the CIM client trace parameter, follow these steps:

1. Check to see what the **cimxmlTracing** attribute is set to in the DB2 table T_RES_CONFIG_DATA. Run the following command:

   ```
   tpctool getdscfg -user user_ID -pwd password -url localhost:9550
   -property cimxmlTracing
   ```

   The tpctool command shows the following information:

   ```
   Property      Context Value
   ==========================
   cimxmlTracing CIM     false
   ```

   If the value is false, set the attribute to true:

   ```
   tpctool setdscfg -user user_ID -pwd password -url localhost:9550
   -context CIM -property cimxmlTracing true
   ```

   Run the **getdscfg** command again to show the setting of the value. The value is displayed:

   ```
   Property      Context Value
   ==========================
   cimxmlTracing CIM     true
   ```

2. Modify the attribute, then stop and restart the Device server.

Chapter 4. Troubleshooting DB2 and the database

Tivoli Storage Productivity Center stores information in a DB2 database. Information is provided for troubleshooting the DB2 database and for daily operations for DB2.

Troubleshooting the database

For database problems, follow these steps.

1. Run the Service tool.
2. Run **repocopy** to capture the Tivoli Storage Productivity Center database. Follow these steps:
   a. Go to the following directory:

      Windows operating systems:
      TPC_installation_directory\data\server\tools

      Linux or AIX operating systems:
      TPC_installation_directory/data/server/tools

   b. Run the **repocopy** command:

      Windows operating systems:
      repocopy.bat

      Linux or AIX operating systems:
      repocopy.sh

   c. Select **Export data from repository tables**.
   d. Select the directory for the export file location.
   e. Use the default values for delimiter and quotation marks.
   f. Take the default values for the connection properties.
   g. Compress all the files in the output directory and send them to IBM Software Support.

Tip: The Service tool runs the **db2support** command. The **db2support** command collects all DB2 and system diagnostic information that you can use to help diagnose database problems.

Accessing the DB2 command line processor

To access the DB2 command line processor, follow these steps:

Windows operating systems:
Click **Start** > **Programs** > **IBM DB2** > **Command Line** > **Tools** > **Command Line Processor**.

Linux or AIX operating systems:

1. In a Command Prompt window, issue the following command: **su - db2inst1** where **db2inst1** is the db2user.
2. Issue the following command to access the DB2 command line processor: **db2**. This command opens the DB2 command line processor window.
3. To exit the DB2 command line processor window, issue the following command: **quit**

Determining when a DB2 table is accessible

To determine whether the DB2 table is accessible, follow these steps:

1. Ensure that all table space states are 0. For AIX or Linux, use the **db2 list tablespaces | grep State | sort | uniq** command.
2. Use the **db2 select * from table_name** command to determine whether you can read one record of the table. Get only the first row.

Using DB2 commands

The following list of DB2 commands are useful for troubleshooting purposes:

Determining the DB2 release and version
From the DB2 command line processor, enter `quit` to exit the DB2 prompt, and then enter `db2level`.

Looking up the DB2 message code
From the DB2 command line processor (CLI) DB2 prompt, enter `? ErrorCode`. For example:

```
db2=> ? sql0289
```

Connecting to a database
From the DB2 command line processor, enter the following command:

```
db2=> connect to database user user_ID using password
```

You must supply the database name, user ID, and password.

Changing the password for a user ID
From the DB2 command line processor, enter the following command:

```
db2=> connect to database user user_ID change password
```

Verifying the existence of a database
From the DB2 command line processor, enter the following command: **db2=> list db directory**. You can also enter: **db2=> list db directory show details**.

Looking at the database manager configuration file
From the DB2 command line processor, enter the following command: **db2=> get db cfg**

Looking at the database configuration file
From the DB2 command line processor, enter the following command: **db2=> get db cfg for** *database*

Looking at the DB2 registry
From the DB2 command line processor, enter the following command: **db2=> quit**Then enter this command (you must be out of command-line mode to issue this command): **db2set -all**

Listing active DB2 applications
Enter this command to list active DB2 applications: **db2 list applications show detail**

Displaying the status change time
Enter this command to see the status change time: **db2 update monitor switches using uow on**

Chapter 5. Troubleshooting performance and memory problems

You can tune Data Manager for Tivoli Storage Productivity Center to improve performance and solve memory problems.

From a server perspective, you do not have to tune Tivoli Storage Productivity Center if you meet these criteria:

- You are using fewer than 500 agents.
- You are using all the product defaults for schedules and history retention.

Common user errors

Here are some common user errors:

Why do certain devices not show up in the selection list, such as switches or subsystems, when you define a performance monitor?
The device shows up in the selection list if it supports performance data collection. This situation can occur if the CIM Agent is not at the appropriate version, or an incorrect namespace was used for discovery. Also, check to see that the CIM Agent discovery completed successfully.

Why am I not successful in getting performance data?
For a successful performance data collection to occur, the device must be discovered and probed successfully. For switches, an out-of-band fabric scan must also run.

Why does the performance monitor job fail immediately after it starts?
A failure usually occurs when there is a network connectivity problem with the CIM Agent.

Why do the CIM Agent operations time out?
You get the error message:

```
HWNPM4103E CIM/OM operation time out (30 seconds) expired.
```

Check whether the CIM Agent is up and running. You can check the agent by clicking **Administrative Services** > **Agents** > **CIMOM**. Select **Test CIMOM Connection**.

Why does the CIM Agent run slowly?
Try stopping and restarting the Tivoli Storage Productivity Center services. If this action does not help, increase the value of the `com.ibm.tpc.perf.ConteConnectTimeOut` property in the following file: *`TPC_installation_directory`*`\device\conf\pm.conf`

Why does the performance correlation step take a long time to complete?
The performance correlation step can take a long time to complete if there are numerous volumes. This condition causes a delay in collecting the first performance sample. To work around this problem, place the CIM Agent and Tivoli Storage Productivity Center servers on faster systems. You can also use multiple CIM Agents to monitor a set of storage subsystems.

Why can I not define a performance monitor for a switch?

If you cannot define a performance monitor for a switch because the switch is not listed in the storage subsystems list that can be monitored, take the following actions:

- Check to see that the SMI-S version supported by the switch vendor is 1.1 or higher.
- Check to see that the CIM Agent supports the Fabric subprofile.
- Check to see that the CIM Agent discovery completed successfully.
- Check to see that an out-of-band fabric discovery was run after the CIM Agent discovery completed successfully. This action is required for the switch performance monitor even if you are not using out-of-band Fabric agents.

Disk performance reports

To troubleshoot disk performance reports, ask the following questions:

- Does the GUI hang?
- Are error messages viewed in the GUI?
- Is information in the GUI correctly populated?
- Is the Data Server running? Go to **Administrative Services** > **Services** > **Data Server** > ***node***.
- Is the Device Server running? Go to **Administrative Services** > **Services** > **Device Server** > ***node***.
- Check the Data Server and Device Server logs. Are there Java exceptions in the logs? Are the messages in the logs for information, warning, or error?

Troubleshooting the stand-alone GUI

To view the status of a performance monitor, in the navigation tree, expand **Disk Manager > Monitoring > Subsystem Performance Monitors**, select the performance monitor, and click **View Job History** in the content pane. The Job Management panel is displayed. Use the **Jobs for Selected Schedule** section on this panel to view the status of a performance monitor and access its log files.

You can also run the GUI from a command line window:

```
TPC_installation_directory\jre\bin\java.exe -Xmx512m
-classpath TPC_installation_directory\com.tivoli.itsrm.gui.GuiMain
host:9549
```

You might see exceptions when you run this command.

Troubleshooting the performance data query API

Follow these steps for a general diagnosis procedure:

- Look in the `tracePerfMgr.log` for calls to `PerfReportingService` during the time the report was being generated. The parameters to the call can be seen in the log entry.
- Look for related calls to lower-level services. These calls show more detailed information. For example, you can see the SQL queries that were made to the database.
- If the exception was reported by the GUI or other client, then it most likely originated from a lower-level exception that is listed in `tracePerfMgr.log`.

Server and agent memory settings

If you are seeing a Java out–of–memory exception in either the server log or agent log, investigate the cause before you increase the memory allocation for either the server or the agent.

If you must substantially increase agent memory for one agent or several, then you must increase the memory on the server at least 25% greater than the largest agent memory setting. This action is required so that the server can handle the entire agent result set in memory.

The causes of an agent out–of–memory situation are almost always linked to a scan job. The possible reasons that a scan job causes this condition can be related to the following actions:

- Many directories are being scanned.
- Profiles that are associated with scans are configured to bring back large file lists.
- You are using jobs to scan many local file systems or remote file systems.
- Many thousands of users own files on the scanned file systems.
- Several jobs are running simultaneously.
- Any combination of the actions listed.

Keep in mind that storage resources like users, operating system groups, file systems, and directories are all items of information that the agent must create in memory. The more storage resources there are the more items that the agent must create and maintain until the scan job is complete. Use forethought and understanding to configure the various jobs to avoid agent out–of–memory issues. However, there are situations where you must increase the memory for the agent.

The causes for a server out–of–memory error are as follows:

- The history aggregation job in combination with the server that receives job results from agents.
- The agent result set for a scan is larger than the server available memory.

Tuning switch performance for collecting data

When you are using the switch performance monitor and you get timeout problems, you can change the attributes that affect the performance monitor. The performance monitor uses algorithms to collect performance information. The association algorithm is optimized for environments with larger numbers of switches that are managed by a CIM Agent and the enumeration algorithm is optimized for environments with fewer switches managed by a CIM Agent. Tivoli Storage Productivity Center tries to determine which algorithm to use based on the fabric configuration.

You can change the following attributes in the `pm.conf` file:

MinSwitchPortRatio
: This attribute defines the minimum port ratio (for example, the ratio of monitored ports to total ports for a switch CIMOM). This value is used to determine which algorithm to use for querying the performance statistics data for the ports through the CIM Agent. If this value is not set, the default cutoff value for the enumeration algorithm is 20%. If that value is less than 20% for the ports for a CIMOM targeted for performance data

collection, the association algorithm is used instead. The association algorithm is used if the *MaxSwitchPortLimit* is not exceeded. This action does not apply to Cisco CIMOMs.

MaxSwitchPortLimit
This attribute defines the maximum port limit (for example, the maximum number of ports to be monitored that uses the association algorithm for switch CIMOMs). This value is used to determine which algorithm to use for querying the performance statistics data for the ports through the CIM Agent. If this value is not set, the default cutoff value for the association algorithm is 256 ports, so that performance data is not collected for more than 256 ports that simultaneously use the association algorithm. Instead, the enumeration algorithm is used for any CIMOMs after the limit is reached.

To change these attributes in the `pm.conf` file, go to the following directory: *TPC_installation_directory*`/device/conf/pm.conf`. Remove the number sign (#) from the following attributes to activate the settings:

```
#com.ibm.tpc.perf.MinSwitchPortRatio = 0.2
#com.ibm.tpc.perf.MaxSwitchPortLimit = 256
```

Save the file. The Device server must be restarted for these changes to take effect.

Some commonly used parameters

You can use the following commonly used parameters to troubleshoot memory and performance issues.

AbbreviatedProbe parameter

When Tivoli Storage Productivity Center probes the system hardware, it attempts to gather the same set of information for all disk devices. This action generates nonfatal errors in the probe log for certain disk devices that do not support some of the data gathering commands for the probe (like getting a list of disk defects). This action can also cause errors to be generated in the logs for the system and trigger alerts on other Systems Management consoles, which might be undesirable. To alleviate this problem, the **abbreviatedProbe** parameter might be set on the server. It is a global setting and effects all agents.

To set this parameter, follow this procedure:

1. Stop the Data server.
2. Edit the `TPCD.config` file on the server, in *TPC_Data_Server_home*`/config`. In the server section, add the **abbreviatedProbe** parameter:

```
[server]
threadPoolSize=3
maxThreads=8
pingReceiveTimeout=10
abbreviatedProbe=1    //add this line and save the file

[gui]
threadPoolSize=3
maxThreads=10
reportRowLimit=5000
keepCachedReport=120
```

   Save the file.
3. Restart the Data server.

4. Run a probe on the agents.

The following SCSI commands are the only ones that can be sent to any disk drives anywhere:
- INQUIRY
- READ CAPACITY

This means that the following information is unavailable for any SCSI or FC drives:
- Medium-defect counts
- Error counts
- I/O counts
- Failure predicted
- Cylinder count
- Head count

saveNonRoot parameter

This server parameter affects the discovery of NAS file systems for the device. The default behavior of this discovery is to discard export paths that are not at the root of the file system. This action is done so that a situation cannot occur where the product double counts information about a file system because it is treating two export jobs to the same file system as separate file systems. In which case the discovery behavior can be overridden by setting the **saveNonRoot** parameter. This action then discovers all exports, shares, of a NAS device as a file system. Insert a parameter **SaveNonRoot=1** in the Server section of the `TPCD.config` file and restart the server.

Server parameters

server.config file

name="myserver"
The instance name for the server. On installing the Tivoli Storage Productivity Center server for the first time, the instance name is automatically set to the host name for the server. If you move Tivoli Storage Productivity Center to a new host and copy the repository to a new DBMS that uses a backup/restore or database memory dump, this parameter must reflect the original instance name (which always is the first host name for the server). Otherwise, you cannot see any of the old data on the new server. After the new server is started, the server detects that its host name is changed and broadcasts this change to the agent systems. The agents then change this entry in their agent configuration files.

maxConnections=500
The maximum connections that the server can handle simultaneously. After this number of connections is reached, the rejected agent waits for 4 hours and tries to make the connection again. This number can be increased. On Solaris, this action requires increasing the number of file descriptors per 32–bit process. By default, on current versions of Solaris, this number is 1024. The file descriptor is created per connection to Tivoli Storage Productivity Center. Other operating systems might require tuning as well.

Tip: GUI connections override this setting.

routerThreads=1

All incoming connections are handled by the routing thread for the server before they are rejected or handed to another service provider (agent, GUI, or scheduler). Connections to this process are not logged or limited byTivoli Storage Productivity Center. This action results in allowing many more connections to the server than the **maxConnection** parameter would allow in large environments. This action occurs because the routing thread allows all connections to be queued before it hands off the connection to another service provider or tells the connecting agent that the maximum connection limit is reached. Setting this parameter to its maximum setting of three threads helps by not allowing many unclassified connections to queue up.

scheduler.config file

maxSubmitThreads=3

Controls the number of threads that the scheduler service provider can create to submit new jobs to agents. The scheduler has a hardcoded 10-minute window in which to submit the job to all agents required. If it goes over the 10-minute window, you see *wait time exceeded* errors. This action can be seen usually in large environments with agents that are on the other side of a slow WAN link from the server. Each submit thread waits for a maximum of 3 minutes for an agent to respond to a request to send it a job. If each of the threads is tied up with slow agents or agents that, do not respond, it is possible for the scheduler to run out of time to submit the job to all of the required agents. The first solution would be to break up the job so that it does not submit the request to many agents. The second solution would be to set this parameter to a higher setting, with a maximum setting of **8**.

nas.config file

The nas.config file is used by the NAS discovery process to discover possible NAS devices. It uses the NAS SNMP Enterprise designation as assigned in IANA:

http://www.iana.org/assignments/enterprise-numbers

Do not set any of the other parameters unless you are told to do so by the IBM Software Support. Setting some of these parameters might cause database deadlocks to occur.

You can edit the configuration files for the Data Manager to customize the operation of the server and agent components within your environment. These files are in the *TPC_installation_directory*/data/config directory, where *TPC_installation_directory* represents the directory where you installed the product. When you change the configuration file for the server, you must stop and restart the server before those changes take effect.

Collecting logs and troubleshooting information about Tivoli Storage Productivity Center

Use the Service tool to collect troubleshooting data about all Tivoli Storage Productivity Center components, which you can then send to the IBM Software Support. For information about the Service tool, see "Service tool overview" on page 7.

Chapter 6. Network connectivity

The following information describes network connectivity commands that you can use to identify and resolve network-related problems.

You can use the following commands to help identify network connectivity problems:
- **netstat**
- **nslookup**
- **ping**
- **telnet**
- **tracert**

These commands are described in this topic.

netstat command

Syntax

Parameters

-a
Displays all connections and listening ports.

-e
Displays Ethernet statistics. This parameter can be combined with the **-s** parameter.

-n
Displays addresses and port numbers in numeric form.

-o
Displays the owning process ID associated with each connection.

-p *protocol*
Shows connections for the specified protocol. You can specify one of these protocols:
- `IP` - only if specified with the **-s** parameter
- `IPv6` - only if specified with the **-s** parameter
- `ICMP` - only if specified with the **-s** parameter
- `ICMPv6` - only if specified with the **-s** parameter
- `TCP`
- `TCPv6`
- `UDP`
- `UDPv6`

-r Displays the routing table.

-s Displays statistics for the protocols. By default, the statistics are shown for IP, IPv6, ICMP, ICMPv6, TCP, TCPv6, UDP, and UDPv6 protocols. The **-p** option might be used to specify a subset of the default.

-interval *seconds*
Displays the selected statistics at intervals, pausing the specified number of seconds between each display.

Press Ctrl+C to stop displaying statistics. If this parameter is omitted, the **netstat** command displays the current configuration information once.

Description

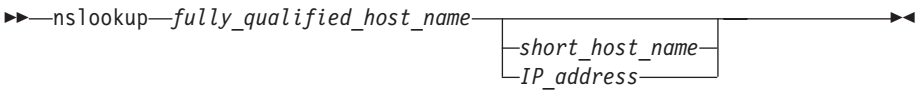
This command displays the following information:

- Active TCP connections on the local system
- State of all TCP/IP servers on the local system and the sockets that are used by them
- Devices and links that are used by TCP/IP
- IP routing tables, gateway tables, in use by the local system

nslookup command

The **nslookup** command locates information about network nodes, examines the contents of a name server database, and establishes the accessibility of name servers.

Syntax



Parameters

fully_qualified_host_name, *short_host_name*, *IP_address*
Specify a fully qualified host name, short name, or IP address.

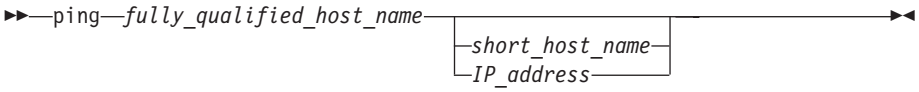
Description

The **nslookup** command is a DNS utility for querying name servers. The command can help identify network connectivity problems due to mis-identification of the host name, fully qualified host name or short name, or the IP address, or both.

ping command

The **ping** command tests, manages, and measures network performance. It can be used to isolate network failures.

Syntax



Parameters

fully_qualified_host_name, *short_host_name*, *IP_address*
Specifies the target host.

Description

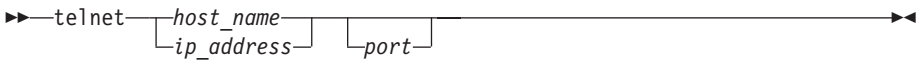
This command sends ICMP Echo Request, ECHO_REQUEST, packets to the host once every second. Each packet that is echoed back through an ICMP Echo Response packet is written to the standard output data, including round-trip time.

Tip: Most UNIX systems provide a similar utility called **traceroute**.

telnet command

The **telnet** command contacts a specific port.

Syntax



Parameters

host_name | *ip_address*
Specifies the target host.

port
Specifies the port.

Description

Use the **telnet** command to contact a specific port to run its scheduling activities and to establish communication with the server and agent. If **telnet** is started without parameters, it enters command mode as indicated by its prompt (telnet>). In this mode, **telnet** accepts and runs the commands. If **telnet** is started with parameters, it runs an open command with those parameters.

In there is an error, or if the connection is closed by the remote host, **telnet** returns a value of 1. Otherwise, **telnet** returns a value of zero.

The following error messages might be shown by the **telnet** command:

Error! Could not retrieve authentication type.
The type of authentication mechanism is obtained from a system file, which is updated by the **inetsvcs_sec** command. If the system file on either the local host or the remote host does not contain known authentication types, this error message is displayed.

telnet/tcp: Unknown service
telnet was unable to find the TELNET service entry in the services (4) database.

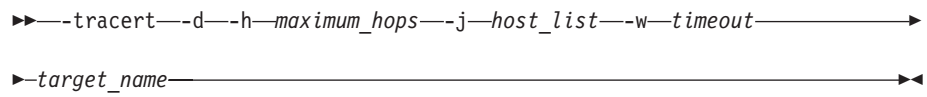
hostname: Unknown host
telnet was unable to map the host name to an IP address. Contact the system administrator to check whether there is an entry for the remote host in the hosts database.

?Invalid command
A command that is not valid was typed in the **telnet** command mode.

tracert command Windows operating systems

The **tracert** command shows the network route to a specific host and identifies faulty gateways.

Syntax



Parameters

-d Does not resolve the addresses to host names.

-h *maximum_hops*
Specifies the maximum number of hops to search for a target.

-j *host_list*
Specifies the source route along a host list.

-w *timeout*
Specifies the timeout, in milliseconds, for each reply.

target_name
Specifies the address or target that you want to trace.

Description

Ensure that you are connected to a network. Set the prompt: `C:\windows\>`

A packet might be redirected to large internet centers and then rerouted to the smaller pipelines, before eventually finding its way to the IP address specified. This command provides about each location to which the packet is sent before it is received.

Chapter 7. Troubleshooting Tivoli Common Reporting

Use the troubleshooting information to help you understand, isolate, and resolve problems with Tivoli Common Reporting.

Restarting a browser session to fix a Predefined reports access problem

You can use only one browser session at a time to access Tivoli Storage Productivity Center predefined reports.

When you try to access Predefined reports in a browser, you might get error DPR-ERR-2107 because of an active web browser cookie that indicates that you are already logged in to Tivoli Common Reporting. Stop and start all web browser sessions to clear the cookie. Use the following steps to access the predefined reports:

1. Shut down all the web browser sessions.
2. Open a new browser session.
3. Start Tivoli Storage Productivity Center web client.
4. Click **Reporting > View Predefined reports**.

Verifying that a report was imported successfully

Eliminate the possibility of an import problem with a Tivoli Common Reporting report by verifying that the import completed successfully.

1. Go to **Reporting > View Predefined Reports**.
2. Select the **Launch** menu on the Tivoli Storage Productivity Center menu bar.
3. Select **Administration**.
4. Select the **Configuration** tab.
5. Select **Content Administration**.
6. Select **TPC_deployment_pckg** and click **More...**.
7. Select **View Run History**.

The details of the import, including the status are listed on the screen.

Saving a report to file system

In Tivoli Common Reporting you cannot save a file to a file system when you schedule a report to run. You must manually configure Tivoli Common Reporting to save reports to the file system.

You must configure the root directory of the locations that you specify in Tivoli Common Reporting.

1. In Tivoli Storage Productivity Center, select **Reporting** > **View Predefined Reports**.
2. From the **Launch** menu in Tivoli Common Reporting, click **Administration**.
3. Click the **Configuration** tab.
4. Click **Dispatchers and Services**.

5. Click the **Define File System Locations** icon  .
6. On the Define file system locations page, click **New**.
7. Specify a name and the directory for the location on the file system, and then click **Finish**. For example, enter `sales`. The directory is created the first time that the output of a report for the directory is created. Repeat this step to configure more file system locations.
8. To stop Tivoli Common Reporting, follow the instructions for your operating system:
   - Windows

     ```
     c:\program files\IBM\JazzSM\profiles\bin\stopServer.bat server_name
      -username JazzSM_username -password JazzSM_password
     ```

   - AIX or Linux

     ```
     /opt/IBM/JazzSM/profile/bin/stopServer.sh server_name
      -username JazzSM_username -password JazzSM_password
     ```

9. To restart Tivoli Common Reporting, follow the instructions for your operating system:
   - Windows

     ```
     c:\program files\IBM\JazzSM\profiles\bin\startServer.bat server_name
     ```

   - AIX or Linux

     ```
     /opt/IBM/JazzSM/profile/bin/startServer.sh server_name
     ```

Configuring the mail server

You must configure the mail server in Tivoli Storage Productivity Center to activate the email option in Tivoli Common Reporting.

1. Open the IBM Cognos Configuration GUI.
2. On the Explorer pane, click **Data Access**.
3. Click **Notification**, and then enter values in the following fields:

   SMTP Mail Server
   Enter the host name and port number of the mail server.

   Account and password
   Leave the field blank if authentication is not required to log on to the mail server. If authentication is required to log on to the mail server, click the **Edit** icon. Enter a valid user ID and password, and then click **OK**.

   Default sender
   Enter the email address of the sender.
4. To ensure that the connection to the mail server is correctly configured, right-click **Notification**, and then click **Test**.
5. Click **Save**.
6. On the Explorer pane, right-click **Local Configuration**, and then click **Restart**.

Setting up a report to run by default

Change the default action of Tivoli Common Reporting from`view` the report to `run by default` when you select a report.

The default configuration for saved Tivoli Common Reporting reports is to view the results of the last run of the report. You must manually change the Default action on each report to `Run the Report` because there is no global change option

available in Tivoli Common Reporting. The following steps show you how to change the default option to run the report:

1. Click **Reporting > View Predefined Reports**.
2. Select the properties icon for the report.
3. Click the **Report** tab.
4. Change the **Default action** to **Run the Report**.

Reimporting reports

You can reimport predefined reports if the reports do not get fully imported or you modified the reports without making a copy and you need to restore the original reports.

1. Click **Reporting > View Predefined Reports**.
2. In Tivoli Common Reporting, select **Launch**.
3. Click **Administration**, and then click the **Configuration** tab.
4. Select **Content Administration**.
5. Select **TPC_deployment_pckg** and click the run icon.
6. Choose the **time** to run the report, the **Report specification**, **Store IDs** and click **Run**.
7. Review your selections and click **OK**.

Appendix A. Accessibility features for Tivoli Storage Productivity Center

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features in IBM Tivoli Storage Productivity Center:

- Keyboard-only operation in the stand-alone GUI and the web-based GUI. Restriction: In the stand-alone GUI, you must use the mouse to navigate the Topology Viewer and report graphs.
- Interfaces that are commonly used by screen readers.
- An information center that includes the following accessibility features:
  - The information center is provided in XHTML 1.0 format, which is viewable in most web browsers. With XHTML, you can view documentation according to the display preferences that are set in your browser. XHTML supports screen readers and other assistive technologies.
  - All documentation for Tivoli Storage Productivity Center is available in Adobe Portable Document Format (PDF) by using the Adobe Acrobat Reader. You can access the PDFs from the Printable PDFs topic in the information center at http://publib.boulder.ibm.com/infocenter/tivihelp/v59r1/index.jsp.
  - All images in the information center are provided with alternative text, so that visually impaired users can understand the contents of the images.

Keyboard navigation in the stand-alone GUI

The stand-alone GUI uses standard Microsoft Windows navigation keys. However, you must use the mouse to navigate the Topology Viewer and report graphs. Standard operating system keystrokes are used for standard operating system operations.

Keyboard navigation in the web-based GUI

Most of the features of the web-based GUI are accessible by using the keyboard. For those features that are not accessible, equivalent function is available by using the command-line interface (CLI), except as noted in the product release notes.

You can use keys or key combinations to perform operations and initiate many menu actions that can also be done through mouse actions. The following sections describe the keys or key combinations for different parts of the web-based GUI:

For navigating the web-based GUI and the context-sensitive help system:

- To navigate to the next link, button, or topic within a panel, press Tab.
- To move to the previous link, button, or topic within a panel, press Shift+Tab.
- To select an object, when the object is in focus, press Enter.

For actions menus:

- To navigate to the grid header, press Tab.

- To reach the drop-down field, press the Left Arrow or Right Arrow key.
- To open the drop-down menu, press Enter.
- To select the menu items, press the Up Arrow or Down Arrow key.
- To start the action, press Enter.

For filters:

To specify a filter option and text:

1. Press Tab to navigate to the magnifying glass icon.
2. Press the Up Arrow or Down Arrow key to navigate the filtering list.
3. Press Enter to select a filtering option.
4. When a filtering option is selected, the cursor moves to the filter text box. Type the filter text and press Enter. To reset a filter, press Enter.

For text fields:

- To navigate to text fields, press Tab.
- To navigate to the fields that are available for editing, press Tab.
- To navigate to the next field or to the **Submit** button, press Tab.

For tables or lists:

- To navigate between column headers, focus on a column header and use the Left Arrow and Right Arrow keys to move to other column headers.
- To navigate between data cells, focus on a data cell and use the Left, Right, Up, Down, Pageup, and Pagedown Arrow keys.
- To sort a column, focus on a column header and press Enter. The focus remains on the column header after the sort occurs.
- To change the size of a column, focus on the column header, hold Shift+Control, and press the Left or Right Arrow keys.
- To follow a link in a data cell, focus on a data cell and press Shift+F9.
- To open a menu for a table row, focus on the row and press Shift+F10.
- To select consecutive rows, select the first row and hold Shift, press the Up or Down Arrow keys to go to the last row in the range, and press the Space bar to add the new rows to the selection.
- To select non-consecutive rows, select a row and hold Control, press the Up or Down Arrow keys, and press the Space bar to add the new row to the selection.

Restriction: For Chinese languages, the keyboard combination Control+Space bar is not enabled for selecting multiple rows at the same time.

IBM and accessibility

For more information about IBM's commitment to accessibility, see the IBM Human Ability and Accessibility Center website at http://www.ibm.com/able/.

Appendix B. Accessibility features for Tivoli Storage Productivity Center for Replication

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

The following list includes the major accessibility features in Tivoli Storage Productivity Center for Replication:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are discernible by touch but do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices

For more information about the commitment that IBM has for accessibility, see the IBM Human Ability and Accessibility Center website at www.ibm.com/able.

Accessibility and keyboard shortcuts in the information center

Accessibility features help users with physical disabilities, such as restricted mobility or limited vision, to use software products successfully. Using the major accessibility features in this product, users can perform these tasks:

- Use assistive technologies, such as screen-reader software and digital speech synthesizer, to hear what is displayed on the screen. Consult the product documentation of the assistive technology for details on using those technologies with this product.
- Operate specific or equivalent features by using only the keyboard.
- Magnify what is displayed on the screen.

In addition, the documentation was modified to include the following features to aid accessibility:

- All documentation is available in HTML formats to give the maximum opportunity for users to apply screen-reader software technology.
- All images in the documentation are provided with alternative text so that users with vision impairments can understand the contents of the images.

Use the following key combinations to navigate the interface by keyboard:

- To go directly to the Topic pane, press Alt+K, and then press Tab.
- In the Topic pane, to go to the next link, press Tab.
- To go directly to the Search Results view, press Alt+R, and then press the Enter or Up-Arrow key to enter the view.
- To go directly to the Navigation (Table of Contents) view, press Alt+C, and then press the Enter or Up-Arrow key to enter the view.
- To expand and collapse a node in the navigation tree, press the Right and Left-Arrow keys.
- To move to the next topic node, press the Down-Arrow or Tab key.
- To move to the previous topic node, press the Up-Arrow key or Shift+Tab.
- To go to the next link, button, or topic node from inside on of the views, press Tab.

- To scroll all the way up or down in a pane, press Home or End.
- To go back, press Alt+Left Arrow; to go forward, press Alt+Right Arrow.
- To go to the next pane, press F6.
- To move to the previous pane, press Shift+F6.
- To print the active pane, press Ctrl+P.

Related accessibility information for sight-impaired users

The following list contains hints and tips that can help you more fully use the graphical user interface:

Drop-down lists are positioned directly over or before the radio button that activates it.

If you use a screen reader, you should be aware that there are radio buttons to activate drop-down lists for several GUI pages. The way to activate the drop-down list is by selecting the associated radio button. The drop-down list is positioned directly over or before the radio button that activates it. When you use a screen reader that processes the fields and controls of a page sequentially, you might select the radio button, but not know that the associated drop-down list has been activated. The screen reader processes inactive drop-down lists first, and then processes the next radio button. The drop-down list is activated if you select the radio button.

On the following pages, keep in mind that radio buttons activate a drop-down list:
- Administration
- ESS/DS Paths
- Sessions
- Session Details
- Storage Systems

Tables are best understood by reviewing the surrounding text and the table row and column number of the table.

On some graphical user pages, tables use the header or row ID attributes when reading a single cell. The screen reader reads the table row and column number, along with cell data. Therefore, you can infer the column header and row ID.

Experiment with and fine-tune the way your screen reader pronounces some of the product abbreviations.

Your screen reader might pronounce abbreviations as if they were words. For example, the common abbreviation for Enterprise Storage Server® is ESS. Your screen reader might read ESS as the word "ess". With some screen readers you can hear alternate pronunciations. If you frequently use the software you might prefer to fine-tune such associations in your settings. When an association is created, the screen reader can recognize the abbreviation as a word. If you can add dictionary words with your screen reader, replace the capitalized character sequence with the sequence E space S space S.

Typically, this abbreviation is used in the combination form of ESS/DS. This term refers to the Enterprise Storage Server 800, the DS6000, or the DS8000.

Some decorative artifacts might persist if the cascading style sheet is disabled.

Enable cascading style sheets when possible; otherwise, some decorative elements might persist in the web browser GUI. These artifacts do not affect performance. If they become too distracting, consider using the command-line interface instead.

For efficiency, confirmation dialogs place initial focus on the Yes button.

When a confirmation dialog box is displayed, focus is given to the **Yes** button. Therefore, the screen reader reads "Yes" but does not read the confirmation text. The software processes the information in this way when you do the following types of tasks:

- Perform an action on a session
- Remove a connection to a storage system
- Click the **About link**
- Create a high-availability connection

To read the confirmation text before clicking the **Yes**, **No**, or **OK** button, view the previous heading before the button.

Dojo components are not read by all screen readers.

The Job Access for Windows and Speech (JAWS) screen reader does not read some Dojo components on Windows Internet Explorer. Use the command-line interface instead of the GUI with JAWS on Windows Internet Explorer.

Firefox is the preferred browser for use with a screen reader.
Use Firefox as the screen reader because other browsers might not fully expose assistive technology content to the screen reader.

Glossary

A glossary is available with terms and definitions for the IBM Tivoli Storage Productivity Center family of products.

You can view the glossary in the IBM Tivoli Storage Productivity Center Information Center at http://publib.boulder.ibm.com/infocenter/tivihelp/v59r1/index.jsp.

To view glossaries for other IBM products, see http://www.ibm.com/software/globalization/terminology/.

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