

Netcool/OMNIbus TSM for Nortel DMS
9.0.7

Reference Guide
October 29, 2010



Note

Before using this information and the product it supports, read the information in [Appendix A, “Notices and Trademarks,”](#) on page 27.

Edition notice

This edition applies to version 9.0.7 of IBM Tivoli Netcool/OMNIbus TSM for Nortel DMS and to all subsequent releases and modifications until otherwise indicated in new editions.

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Use this information to track changes between versions of this guide.

The IBM Tivoli Netcool/OMNIBus TSM for Nortel DMS documentation is provided in softcopy format only. To obtain the most recent version, visit the IBM® Tivoli® Information Center:

http://publib.boulder.ibm.com/infocenter/tivihelp/v8r1/index.jsp?topic=/com.ibm.tivoli.nam.doc/welcome_ptsm.htm

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00	December 31, 2008	Summary table updated. IPv6 support information added. FIPS information added. Installation section added.
01	October 29, 2010	<u>“Summary” on page 1</u> updated. <u>“Installing probes” on page 2</u> updated. <u>“Properties and Rules files default location” on page 3</u> added. Description for the following property added to <u>“Properties and command line options” on page 11</u> : <ul style="list-style-type: none">• InactivityAlarmTime

Chapter 1. TSM for Nortel DMS

The Nortel DMS Supernode exchange is a digital switching system for public telephone networks that serves both fixed and mobile services. The DMS system is designed for a range of applications from smaller switches to large transit exchanges. It can be used to implement many different platforms.

The TSM for Nortel DMS monitors any DMS Supernode switch, including the 100, 250, 300, and 500 models, Super Data Node Managers (SDMs), and CS2k switches.

This guide contains the following sections:

- [“Summary” on page 1](#)
- [“Installing probes” on page 2](#)
- [“Data acquisition” on page 4](#)
- [“Properties and command line options” on page 11](#)
- [“Elements” on page 18](#)
- [“Error messages” on page 19](#)
- [“TSMWatch messages” on page 22](#)

Summary

Each probe works in a different way to acquire event data from its source, and therefore has specific features, default values, and changeable properties. Use this summary information to learn about this probe.

The following table provides a summary of the TSM for Nortel DMS.

Probe target	TSM for Nortel DMS
Probe executable name	nco_t_dms
Patch number	9.0
Probe supported on	Solaris, HP-UX, AIX, and Linux. For details of the operating system versions on which this probe is supported, see the following page on the IBM Tivoli Netcool Knowledge Center: http://www-01.ibm.com/support/knowledgecenter/SSSHTQ_7.4.0/com.ibm.netcool_OMNIBus.doc_7.4.0/omnibus/wip/install/concept/omn_pln_supportedoperatingsystems.html?lang=en Note : This probe is supported on HP-UX version 11.11, but not version 11.0.
Properties file	<code>\$OMNIHOME/tsm/arch/dms.props</code> Note : When starting the TSM, if you encounter an error that the file cannot be found in <code>\$OMNIHOME/probes/arch</code> use the workaround described in the following topic: “Properties and Rules files default location” on page 3

Table 2. Summary (continued)	
Rules file	\$OMNIHOME/ <i>tsm/arch/dms.rules</i> Note : When starting the TSM, if you encounter an error that the file cannot be found in \$OMNIHOME/ <i>probes/arch</i> use the workaround described in the following topic: “Properties and Rules files default location” on page 3
Requirements	A currently supported version of IBM Tivoli Netcool/OMNIBus
Connection method	TCP/IP
Remote connectivity	The TSM for Nortel DMS can connect to a device on one or more remote hosts. Use the Host and Port properties to define a single remote host. To connect to multiple hosts, create a file containing details of the remote hosts and identify the file using the HostsFile property.
Multicultural support	Available
Peer-to-peer failover functionality	Available
IP environment	IPv4 and IPv6 Note : The probe is supported on IPv6 when running on IBM Tivoli Netcool/OMNIBus 7.4.0.
Federal Information Protocol Standards (FIPS)	IBM Tivoli Netcool/OMNIBus uses the FIPS 140-2 approved cryptographic provider: IBM Crypto for C (ICC) certificate 384 for cryptography. This certificate is listed on the NIST website at http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2004.htm . For details about configuring Netcool/OMNIBus for FIPS 140-2 mode, see the <i>IBM Tivoli Netcool/OMNIBus Installation and Deployment Guide</i> .

Installing probes

All probes are installed in a similar way. The process involves downloading the appropriate installation package for your operating system, installing the appropriate files for the version of Netcool/OMNIBus that you are running, and configuring the probe to suit your environment.

The installation process consists of the following steps:

1. Downloading the installation package for the probe from the Passport Advantage Online website.

Each probe has a single installation package for each operating system supported. For details about how to locate and download the installation package for your operating system, visit the following page on the IBM Tivoli Knowledge Center:

http://www-01.ibm.com/support/knowledgecenter/SSSHTQ/omnibus/probes/all_probes/wip/reference/install_download_intro.html

2. Installing the probe using the installation package.

The installation package contains the appropriate files for all supported versions of Netcool/OMNIBus. For details about how to install the probe to run with your version of Netcool/OMNIBus, visit the following page on the IBM Tivoli Knowledge Center:

http://www-01.ibm.com/support/knowledgecenter/SSSHTQ/omnibus/probes/all_probes/wip/reference/install_install_intro.html

3. Configuring the probe.

This guide contains details of the essential configuration required to run this probe. It combines topics that are common to all probes and topics that are peculiar to this probe. For details about additional configuration that is common to all probes, see the *IBM Tivoli Netcool/OMNIBus Probe and Gateway Guide*.

Properties and Rules files default location

When starting the TSM, if you encounter an error that the file cannot be found in `$OMNIHOME/probes/arch`, start the TSM using the following command.

```
$OMNIHOME/tsm/nco_t_dms  
-propsfile $OMNIHOME/tsm/arch/dms.props  
-rulesfile $OMNIHOME/tsm/arch/dms.rules
```

Internationalization support

The probe supports multibyte character sets (for example, Japanese) and character sets that contain individual multibyte characters (for example German, French, and Spanish). To view the character sets correctly, you must configure the locale settings on the host machine correctly.

If you are using a language that contains multibyte characters, you must set the LANG environment variables to the name of your character set, and export the LC_ALL environment variable. For example, if you are using Japanese, set these environment variables to `ja_JP.UTF-8`; if you are using German, set these environment variables to `de_DE.UTF-8`. This will enable the probe to recognise the multibyte characters used by your character set when they occur in any network events.

The probe supports the following language locales:

Languages	AIX	HP-UX	Solaris	Linux
English (US)	en_US	en_US	en_US	en_US
Simplified Chinese	zh_CN	zh_CN	zh_CN	zh_CN
Traditional Chinese	zh_TW	zh_TW.eucTW	Zh_TW.big5	zh_TW.big5
Czech	cs_CZ	cs_CZ	cs	cs_CZ
French (standard)	fr_FR	fr_FR	fr	fr_FR
German (standard)	de_DE	de_DE	de	de_DE
Hungarian	hu_HU	hu_HU	hu	hu_HU
Italian (standard)	it_IT	it_IT	it	it_IT
Japanese	ja_JP	ja_JP	ja	ja_JP
Korean	ko_KR	ko_KR	ko	ko_KR
Polish	pl_PL	pl_PL	pl	pl_PL
Portuguese (Brazilian)	pt_BR	pt_BR	pt	pt_BR

Table 3. Supported language locales (continued)

Languages	AIX	HP-UX	Solaris	Linux
Russian	ru_RU	ru_RU	ru	ru_RU
Spanish	es_ES	es_ES	es	es_ES

Example multi-byte character set on Solaris

The following steps describe how to configure Solaris to use the Japanese character set:

1. Install the necessary components for Japanese on to the host machine using the Solaris CD.
2. Set the LANG and LC_ALL environment variables to `ja_JP PCK`. This uses SJIS encoding.

Note : You may have to set the LANG in the host machine's default settings file and reboot it to make the changes take effect.

3. Make sure that the file `$OMNIHOME/platform/arch/locales/locales.dat` has the following entry:

```
locale = ja_JP PCK, japanese, sjis
```

Where `ja_JP PCK` is the vendor locale, `japanese` is the Sybase language, and `sjis` is the Sybase character set.

Data acquisition

Each probe uses a different method to acquire data. Which method the probe uses depends on the target system from which it receives data.

The TSM for Nortel DMS acquires event data by connecting to a DMS system and intercepting the event stream. The events on the event stream are read, parsed into Netcool/OMNIbus alerts, and forwarded to the ObjectServer.

The TSM for Nortel DMS can connect to multiple DMS switches through a direct TCP/IP connection to a specified port or through a terminal server attached to a serial port on the switch. The TSM can be terminated only with a stop command (Control-C).

The TSM automatically recognizes the format of the messages it receives from the switch. It supports messages in the SCC2 format as well as messages in the NT STD and NT ECORE format.

Data acquisition is described in the following topics:

- [“Logging in and out” on page 5](#)
- [“Connecting to Single or Multiple Devices” on page 6](#)
- [“Hosts File Format” on page 6](#)
- [“Configuring the DMS Device” on page 8](#)
- [“Heartbeating” on page 8](#)
- [“Backoff Strategy” on page 8](#)
- [“Data Stream Capture” on page 9](#)
- [“Bounce Connection” on page 9](#)
- [“SOS Messages” on page 9](#)
- [“Invalid Alarms” on page 10](#)
- [“Peer-to-peer failover functionality” on page 10](#)

Logging in and out

The TSM for Nortel DMS can log in and out using chat-in and chat-out strings or by using automatic login and logout procedures.

Whichever method is used, the TSM performs the following steps when logging in:

1. Log in
2. Enter logutil facility
3. Obtain device ID

To configure the device and to delete the connection after logging out, the TSM needs to record the device ID. To obtain the device ID, the TSM sends a **stop** command to the device. The response from the device includes its ID, which begins with the letters TELNSRV; the TSM can extract the device ID from this response.

4. Configure DMS device.
5. Start parsing.

Logging on and off is described in the following topics:

- [“Chat In and Chat Out Scripts” on page 5](#)
- [“Automatic Log in and Log out” on page 6](#)

Chat In and Chat Out Scripts

The properties file and command line options use short scripts to control the logging in and out of the target system.

These scripts are used when the **NoConnect** property is set to 1 and the login details are specified using the **ChatinString** property. .

Chat in and chat out scripts form a single line in the expect-send format (for chat in scripts) or send-expect format (for chat out scripts). The format is:

```
ChatinString : <expect> <send> <expect> <send> ...
ChatoutString : <send> <expect> <send> <expect>
```

Note : The elements in the chat strings are separated by white space. In order to send or expect a sequence that includes white space, surround the sequence with single quotes.

A typical chat in script might be:

```
".*login.*:*anu\r\n.*assword.*:*anu\r\n"
```

The number of connections to a device is usually limited to 32. When a connection is closed, it must be deleted using the **deldevice** command. This command requires the device ID. If you are using a chat out string, the TSM automatically adds this to the chat out string. Effectively, the TSM prefixes any chat out string with the following:

```
stop\r .*> 'deldevice deviceid\r' .*>
```

The expect text can use any regular expression, while the send text can send any characters (including control characters) using the standard UNIX/C escape sequences described in [“Escape Codes” on page 17](#).

Automatic Log in and Log out

When the chat-in and chat-out properties are not defined, the TSM for Nortel DMS uses automatic login and log out procedures.

Logging in

The automatic log-in procedure comprises the following steps:

1. Expect the Enter User Name prompt from the switch.
2. Send the username defined by the **UserName** property.
3. Expect the Enter Password prompt from the switch.
4. Send the defined **Password** property.
5. Expect the Logged response from the switch

If the TSM fails to log in to the switch, it disconnects from the device and restarts the login procedure from step 1. Once connected to the switch, the TSM changes the password to the password specified in **AltPassword**. The TSM then changes it back to the original password. This is done in order to prevent the password from expiring. The TSM deletes any inactive TELNSVR device if there are too many devices in use when the **start** command is given.

Logging out

When the **ChatoutString** property is not defined and the TSM is stopped, it attempts to log out using the following procedure:

1. Send stop\r.
2. Expect .*>.
3. Send deldevice <deviceid> \r.
4. Expect .*>.
5. Send logout\r.

Connecting to Single or Multiple Devices

The TSM for Nortel DMS is a multi-headed TSM that can connect to either a single device or multiple devices.

When the TSM connects to a single device, it uses either a chat in script specified by the **ChatinString** property or a series of properties required for automatic login. For automatic login, the TSM uses the values specified by the **UserName**, **Password**, and **AltPassword** properties. When the TSM connects to multiple devices, it references a hosts file. The hosts file contains the same details as those required for the single connection, but in a different format. For details about this format, see [“Hosts File Format” on page 6](#).

If you are using multiple hosts or ports, the TSM rotates among the connections, processing one event from each. If the TSM experiences a read timeout when doing its first read of any connection in each iteration, it moves directly to the next connection.

Hosts File Format

The TSM for Nortel DMS uses a hosts file to connect to multiple hosts.

This file is specified by the **HostsFile** property. When the TSM starts, it reads through the hosts file attempting to connect and log into each host.

The hosts file defines the TSM connections in the following format:

```
<host> <port> [ci co], [un p1 p2], lc, ac, dc,[hs hr hi ht];
```

Note : If you encounter problems when uninstalling the TSM after the hosts file has been modified, remove the hosts file or replace it with the original file before you try to uninstall again.

Table 4 on page 7 describes the hosts file format and the properties in the properties file that correspond to each item.

Item	Corresponding property	Description
host	Host	The host to which the TSM connects.
port	Port	The port to which the TSM connects.
ci	ChatinString	The chat in string for the host/port.
co	ChatoutString	The chat out string for the host/port.
un	UserName	Username with which the TSM logs on.
p1	Password	Password associated with the username.
p2	AltPassword	Alternate password associated with the username.
lc	LogClasses	Log classes the TSM monitors. to
ac	AddrepClasses	Log reports the TSM includes.
dc	DelrepClasses	Log reports the TSM excludes.
hs	HeartbeatString	Heartbeat string the TSM sends to the switch.
hr	HeartbeatResponse	Response the TSM expects to the heartbeat request.
hi	HeartbeatInterval	Interval between heartbeats.
ht	HeartbeatTimeout	Time within which the TSM expects to receive a response.

Be aware of the following when creating a hosts file:

- Semicolons (;) indicate the end of each entry in the host file.
- Colons (:) are used to separate the device details from the corresponding connection information.
- Commas (,) separate individual sections within logins.
- Whitespace separates individual elements within the sections.
- Whitespace characters are <sp>, <tab>, <cr>, and <nl>.
- Comment lines are preceded by #.
- Blank lines are ignored.
- If the hosts file is defined, all properties in the properties file that define the connection to an individual host are ignored. These are the properties listed in the **Corresponding property** column of [Table 4 on page 7](#).
- If the hosts file is not defined, the TSM uses the **Host** and **Port** properties to connect to the device. If the **Host**, **Port**, and **HostsFile** properties are not defined, the TSM exits.

Configuring the DMS Device

The TSM for Nortel DMS can send commands to DMS devices to control the reports it receives.

The commands are independent of each other and are sent in the following order: :

addclass

This command specifies the log classes that the device reports on.

The command has the syntax:

```
addclass_deviceid <classes>
```

The value of <classes> is defined in the **LogClasses** property.

delrep

This command specifies the reports that the device excludes

The command has the syntax:

```
delrep_deviceid <reports>
```

The value of <reports> is defined in the **DelrepClasses** property.

addrep

This command specifies the reports that the device includes.

The command has the syntax:

```
addrep_deviceid <reports>
```

The value of <reports> is defined in the **AddrepClasses** property.

Each command is sent only if its corresponding property is set. For example, if a value is set for the **LogClasses** property, the **addclass** command is sent. The TSM sends the commands after extracting the device ID from the response it receives from the device. If a chat in string is used, the TSM continues to process the string after issuing these report commands.

Heartbeating

When the TSM receives no data from the DMS device, heartbeating allows the TSM to determine whether there is a problem with either the device or the connection.

If the TSM fails to receive any data for the length of time specified by the **HeartbeatInterval** property, the TSM sends the string specified by the **HeartbeatString** property to the device. If the TSM receives any data, it assumes that both the device and the connection are running correctly. If the TSM fails to receive a response within the number of seconds specified by the **HeartbeatTimeout** property, the TSM disconnects. When the TSM reconnects to the device, it immediately sends a heartbeat string.

If the **HeartbeatInterval** property is set to 0, heartbeating is not used. If the **HeartbeatTimeout** property is set to 0, the TSM times out immediately after sending the heartbeat string and goes into reconnection mode.

Backoff Strategy

Backoff strategy is used when the TSM fails to establish a connection or loses an existing connection to the device.

The TSM tries to reestablish a connection after one second, two seconds, then four seconds, and so on, up to a maximum of 4096 seconds. Once the connection is made to the specified port, the TSM tries to log in to the device. If the TSM fails to log in, it shuts down and tries to connect again.

The backoff strategy remains in place until a successful login occurs. The user can also specify a reconnection interval using the **ReconnectionInterval** property or **-reconnectioninterval** command line option. When this property is enabled, the TSM reconnects at the specified time interval

instead of using the backoff strategy. If the connection is terminated by the remote host, the connection is also closed by the TSM on the host machine. The operating system is not allowed to close it.

Data Stream Capture

The TSM for Nortel DMS can capture all raw data sent from a device.

The raw data is stored in a log file and can be used for debugging purposes, to develop new features for the TSM, or to pass to other management systems that require the same data.

For each connection, the full data stream is stored in a file with the following naming convention:

```
streamcapturefile_host_port
```

To enable stream capture, set the **StreamCaptureFile** property or `-streamcapturefile` command line option.

Rotating Stream Capture Files

The TSM for Nortel DMS can rotate stream capture files; that is, write to a stream capture file that is saved and archived periodically when a predefined file size is reached.

To use this feature, set the maximum size for the stream capture file using the **MaxStreamCapFileSize** property and set the **DateStreamCapture** property to 1. When the **DateStreamCapture** property is set to 1, the TSM creates a stream capture file with the following naming convention:

```
streamcapturefile_host_port_date_time
```

By appending the filename with a timestamp, the TSM avoids overwriting the old stream capture file. The maximum file size specified by the **MaxStreamCapFileSize** property acts as an upper limit for the stream capture file. If the TSM reads a stream whose size exceeds the remaining allowable space in the current stream capture file, it saves the current file and creates a new one, thus storing the whole stream in a single file.

If you do not specify a maximum size for the stream capture file, it grows indefinitely until the connection is closed. If the **MaxStreamCapFileSize** property is set and the **DateStreamCapture** property to 0, the TSM overwrites the stream capture file for that connection each time the maximum file size is reached.

Bounce Connection

The **bounce** command allows users to close and re-establish the TSM's connection to a particular device.

You can connect to the TSM for Nortel DMS system using a TCP/IP socket to issue the **bounce** command. The TSM listens for bounce commands on the port specified by the **CommandPort** property. The **bounce** command kills the connection to the specified network element and then immediately reconnects.

The command syntax is:

```
bounce -host hostname -port portnumber
```

When the command is issued, the TSM looks for the connection specified by the **host** and **port** parameters. If found, the TSM then closes that connection, which then goes into re-connection mode.

Note : To run this command from within Netcool/OMNIbus, you must create the script, prompts, and tool. A description of this procedure is provided in the Netcool/OMNIbus Supporting Products documentation for the TL1 TSM.

SOS Messages

An SOS message is a system message sent out by the DMS switch due to a restart.

The following types of restarts cause the switch to send out an SOS message:

- COLD Restart
- WARM Restart
- SOS Reload

The TSM reacts to SOS messages differently from normal events. If the TSM receives an SOS message while parsing an event, the TSM creates an extra element: `$RestartLine`. This element contains the SOS message and is added to the list of elements created for the event. If the TSM receives an SOS message during login, the TSM sends out a Switch is being rebooted TSMWatch message. The TSM then disconnects and reconnects using the backoff strategy.

Invalid Alarms

The TSM does not discard invalid alarms. If the TSM receives alarms that are invalid or incomplete, it writes their full details to the `$InvalidAlarm` element

Note : You can include the processing of `$InvalidAlarm` element in the rules file.

Peer-to-peer failover functionality

The probe supports failover configurations where two probes run simultaneously. One probe acts as the master probe, sending events to the ObjectServer; the other acts as the slave probe on standby. If the master probe fails, the slave probe activates.

While the slave probe receives heartbeats from the master probe, it does not forward events to the ObjectServer. If the master probe shuts down, the slave probe stops receiving heartbeats from the master and any events it receives thereafter are forwarded to the ObjectServer on behalf of the master probe. When the master probe is running again, the slave probe continues to receive events, but no longer sends them to the ObjectServer.

Example property file settings for peer-to-peer failover

You set the peer-to-peer failover mode in the properties files of the master and slave probes. The settings differ for a master probe and slave probe.

Note : In the examples, make sure to use the full path for the property value. In other words replace `$OMNIHOME` with the full path. For example: `/opt/IBM/tivoli/netcool`.

The following example shows the peer-to-peer settings from the properties file of a master probe:

```
Server      : "NCOMS"
RulesFile   : "master_rules_file"
MessageLog  : "master_log_file"
PeerHost    : "slave_hostname"
PeerPort    : 6789 # [communication port between master and slave probe]
Mode        : "master"
PidFile     : "master_pid_file"
```

The following example shows the peer-to-peer settings from the properties file of the corresponding slave probe:

```
Server      : "NCOMS"
RulesFile   : "slave_rules_file"
MessageLog  : "slave_log_file"
PeerHost    : "master_hostname"
PeerPort    : 6789 # [communication port between master and slave probe]
Mode        : "slave"
PidFile     : "slave_pid_file"
```


Properties and command line options

You use properties to specify how the probe interacts with the device. You can override the default values by using the properties file or the command line options.

The following table describes the properties and command line options specific to this probe. For information about default properties and command line options, see the *IBM Tivoli Netcool/OMNIBus Probe and Gateway Guide*, (SC14-7530).

Property name	Command line option	Description
AddrepClasses <i>string</i>	-addrepclasses <i>string</i>	Use this property to specify the DMS Log Reports that the TSM monitors. For example, <code>trk 101 trk 102 trk 103</code> instructs the TSM to use the DMS command <code>addrep</code> to monitor the three classes listed. The default is "" (no configuration is done using the <code>addrep</code> command).
AltPassword <i>string</i>	-altpassword <i>string</i>	Use this property to specify a valid password that the TSM uses to log in to the switch. When the TSM logs in, the password is changed and then changed back to the original Password. The default is "". Note : The value of <code>AltPassword</code> must be different the value of <code>Password</code> .
ChatinString <i>string</i>	-chatinstring <i>string</i>	Use this property to specify the chat in script for connection to the host system. If the NoConnect property is set to 1, you must specify the following login details for this property: <pre>.*name username\r assword password\r .* IN.</pre> Where <code>*name</code> is the expected username, and <code>assword</code> is the expected password. The TSM sends them to the Nortel DMS device to connect. The default is "".
ChatoutString <i>string</i>	-chatoutstring <i>string</i>	Use this property to specify the chat out script for disconnection from the host system. The default is "".
CommandPort <i>integer</i>	-commandport <i>integer</i>	Use this property to specify the port to which the TSM listens for commands. The default is 0 (command port is not used).

Table 5. Properties and command line options (continued)

Property name	Command line option	Description
DateStreamCapture <i>boolean</i>	-datestreamcapture <i>boolean</i>	Use this property to specify whether the TSM appends a date and time to the stream capture file name. Possible values are: 0: The TSM does not append the date and time to the stream capture file name. 1: The TSM appends the date and time to the stream capture file name. The default is 0. Note : Setting the DateStreamCapture property to 1 prevents the stream capture file from being overwritten.
DelrepClasses <i>string</i>	-delrepclasses <i>string</i>	Use this property to specify the DMS Log Reports that the TSM excludes from its monitoring. For example, <code>trk 101 trk 102 trk 103</code> instructs the TSM to use the DMS command <code>delrep</code> to exclude the three classes listed from its monitoring. The default is "" (no configuration is done using the <code>delrep</code> command).
FlushTime <i>integer</i>	-flushtime <i>integer</i>	Use this property to specify number of seconds of silence that the TSM allows after each line read before assuming that an error has occurred and sending the incomplete event to the ObjectServer. The default is 5. Note : If this property is set to 0, the TSM does not flush events to the ObjectServer.
HeartbeatInterval <i>integer</i>	-heartbeatinterval <i>integer</i>	Use this property to specify the time (in seconds) that the TSM waits, after receiving data, before sending a Heartbeat String. The default is 0 (the TSM waits indefinitely).
HeartbeatResponse <i>string</i>	-heartbeatresponse <i>string</i>	Use this property to specify the response the TSM expects to receive from the device. This property is a regular expression, with a maximum of 4096 characters. The default is "".

Table 5. Properties and command line options (continued)

Property name	Command line option	Description
HeartbeatString <i>string</i>	-heartbeatstring <i>string</i>	Use this property to specify the command that prompts the switch to give the appropriate heartbeat response. The default is "". Note : The user specified using the Username property must have permissions set to use the command specified using this property.
HeartbeatTimeout <i>integer</i>	-heartbeattimeout <i>integer</i>	Use this property to specify the time interval (in seconds) within which the TSM expects to receive a response from the device. The default is 0.
Host <i>string</i>	-host <i>string</i>	Use this property to specify the name of the host to which the TSM connects. The default is localhost.
HostsFile <i>string</i>	-hostsfile <i>string</i>	Use this property to specify the file that the TSM uses to connect to multiple hosts. The default is "" (hosts file not used).
InactivityAlarmTime <i>integer</i>	-inactivityalarmtime <i>integer</i>	Use this property to specify the time (in seconds) the probe waits to receive any messages before sending an inactivity ProbeWatch message to the ObjectServer. The default is 60.
LogClasses <i>string</i>	-logclasses <i>string</i>	Use this property to specify the DMS Log Classes that the TSM monitors. For example, 0 1 3 5 6 7 13 instructs the TSM to use the DMS command addclass to monitor the seven classes listed. The default is "" (no configuration is done using the addclass command).
MaxEvents <i>integer</i>	-maxevents <i>integer</i>	Use this property to specify the maximum number of events the TSM attempts to read per connection before moving on to the next connection. The default is 1. Note : You can increase this number to increase the event throughput when a large number of events is generated.

Table 5. Properties and command line options (continued)

Property name	Command line option	Description
MaxStreamCap FileSize <i>integer</i>	- maxstreamcapfilesize <i>integer</i>	Use this property to specify the maximum size in bytes of the stream capture file. When this limit is reached, the probe creates a new file. The default is 0 (disabled). Note : If the TSM reads a stream whose size exceeds the remaining allowable space in the file, it creates a new one, thus storing the whole stream in a single file.
NoConnect <i>boolean</i>	-noconnect <i>boolean</i>	Use this property to specify whether the probe bypasses the login process when connecting to the system. Possible values are: 0: The probe does not bypass the login process. 1: The probe bypasses the login process. If this property is set to 1, you must specify the login details using the ChatinString property. The default is 0.
NT_ECORE_regexp <i>string</i>	-nt_ecore_regexp <i>string</i>	Use this property to specify the regular expression that the TSM expects to find in the header of Ecore events. For Netcool/OMNIbus 3.6 and above, the default is <code>^([A-Z0-9_]+ [A-Z0-9_]+) *(*\+)? +(\+)\?([A-Z0-9]+) (.*[0-3][0-9]) ([0-2][0-9]: [0-5][0-9]: [0-5][0-9]) ([0-9]+) ([A-Z]+)? (.*)\$.</code> For Netcool/OMNIbus 3.5 and below, the default is <code>^([A-Z0-9_]+ [A-Z0-9_]+) *(*\+)? + (\+)\?([A-Z0-9]+) (.*[0-3][0-9]) ([0-2][0-9]: [0-5][0-9]: [0-5][0-9]) ([0-9]+) ([A-Z]+)? (.*)\$.</code>

Table 5. Properties and command line options (continued)

Property name	Command line option	Description
NT_STD_regexp <i>string</i>	-nt_std_regexp <i>string</i>	<p>Use this property to specify the regular expression that the TSM expects to find in the header of STD events.</p> <p>For Netcool/OMNIbus 3.6 and above, the default is <code>^[A-Z0-9_+]? *(\ *+)? *(\ +)? ([A-Z0-9]+[0-9]+) * ([JFMASOND] [AEPUCO] [NBRYLGPTVC] [0-3]? [0-9]) *([0-2][0-9]:[0-5][0-9]: [0-5][0-9]) *([0-9]+) *([A-Z]+)? * (.*)\$.</code></p> <p>For Netcool/OMNIbus 3.5 and below, the default is <code>^[A-Z0-9_+]? *(\ *+)? *(\ +)? ([A-Z0-9]+[0-9]+) * ([JFMASOND] [AEPUCO] [NBRYLGPTVC] [0-3]? [0-9]) *([0-2][0-9]:[0-5][0-9]: [0-5][0-9]) *([0-9]+) * ([A-Z]+)? * (.*)\$.</code></p>
Password <i>string</i>	-password <i>string</i>	<p>Use this property to specify the password required with the UserName property to log in to the DMS switch.</p> <p>The default is "".</p>
Port <i>integer</i>	-port <i>integer</i>	<p>Use this property to specify the port to which the TSM connects.</p>
ReadTimeout <i>integer</i>	-readtimeout <i>integer</i>	<p>Use this property to specify the time (in milliseconds) that the TSM allows to elapse during a data read before assuming that there is nothing to be read.</p> <p>The default is 100.</p>
ReconnectionInterval <i>integer</i>	-reconnectioninterval <i>integer</i>	<p>Use this property to specify the time (in seconds) between successive reconnection attempts.</p> <p>The default is 0 (TSM uses standard backoff strategy).</p>
ReportClasses <i>string</i>	-reportclasses <i>string</i>	<p>Use this property to specify the class of events that the probe writes to a report file. All events of this class are written to a report file and are not forwarded to the ObjectServer.</p> <p>The default is "".</p>
ReportDirectory <i>string</i>	-reportdirectory <i>string</i>	<p>Use this property to specify the location of the directory to which the probe writes the report file containing events not sent to the ObjectServer.</p> <p>The default is <code>\$OMNIHOME/log/</code>.</p>

Table 5. Properties and command line options (continued)

Property name	Command line option	Description
ResponseTimeout <i>integer</i>	-responsetimeout <i>integer</i>	Use this property to specify the time (in seconds) that the TSM waits for a response from the device when logging in or out. The default is 20.
ResynchCommand <i>string</i>	-resynchcommand <i>string</i>	Use this property to specify the command that the TSM sends to the device to initiate a resynchronization. The default is "". Note : This property is not currently implemented.
ResynchInterval <i>integer</i>	-resynchinterval <i>integer</i>	Use this property to specify the time (in seconds) that the TSM waits between resynchronization attempts. The default is 0 (the TSM waits indefinitely). Note : This property is not currently implemented.
SCC2_regexp <i>string</i>	-scc2_regexp <i>string</i>	Use this property to specify the regular expression that the TSM expects to find in the header of SCC2 events. For Netcool/OMNIbus 3.6 and above, the default is <code>^(*[+C]*)? *([0-5][0-9]) ([A-Z0-9]+ [0-9]+) *(\\+)? ([0-9]+) ([A-Z]+) (.*)\$</code> . For Netcool/OMNIbus 3.5 and below, the default is <code>^(*[+C]*)? *([0-5][0-9]) ([A-Z0-9]+ [0-9]+) *(\\+)? ([0-9]+) ([A-Z]+) (.*)\$</code> .
StreamCaptureFile <i>string</i>	-streamcapturefile <i>string</i>	Use this property to specify the first part of the filename that the TSM uses to store the input stream log. The full file path also needs to be specified. The full filename that the TSM uses is as follows: <pre>streamcapturefile_host_port</pre> The default is "". Note : Omitting this property disables the stream capture feature.
Terminator <i>string</i>	-terminator <i>string</i>	Use this property to specify the regular expression that indicates the end of the message. The default is <code>^ \$</code> . (the TSM waits indefinitely).

Table 5. Properties and command line options (continued)

Property name	Command line option	Description
UserDefined <i>string</i>	-userdefined <i>string</i>	Use this property to specify a comma-separated list of user-defined properties. These properties are available from within the rules file. The default is "".
UserName <i>string</i>	-username <i>string</i>	Use this property to specify the username with which the TSM logs in to the DMS switch. The default is "".

Escape Codes

Some properties support C-style escape codes.

You can use C-style escape codes in the following properties:

- **ChatinString**
- **ChatoutString**

This allows you to easily define whether or not to send escape code sequences after commands. For example, the following ChatinString sends a carriage return character (\r) after the username and password:

```
ChatinString : ".*: user\r .*: passwd\r .*:"
```

The following character sequences are recognized.

Table 6. Escape codes

Escape code	Character
\b	Backspace
\f	Form-feed
\n	New-line
\r	Carriage return
\t	Tab
\\	Backslash
\'	Single quote
\"	Double quote

Note :

- The escape sequences for backslash, single quote, and double quote should be double-escaped. For example, to send a backslash character (\) use \\.
- In Netcool/OMNIBus 3.6 and above, double escape sequences are required for the regular expression properties (**NT_ECORE_regexp**, **NT_STD_regexp**, and **SCC2_regexp**). In Netcool/OMNIBus 3.5 and below, only a single escape sequence is required.

Elements

The probe breaks event data down into tokens and parses them into elements. Elements are used to assign values to ObjectServer fields; the field values contain the event details in a form that the ObjectServer understands.

The following table describes the elements that the TSM for Nortel DMS generates. Not all the elements described are generated for each event; the elements that the probe generates depends upon the event type.

Element name	Element description
\$AdditionalLineNN	This element identifies the number, as indicated by NN, and content of the additional lines contained in a message of variable length. If the event is not being processed as a report, any lines following the first line of the event are passed as elements called AdditionalLine, followed by a number. For example: AdditionalLine01, AdditionalLine02, and so forth.
\$Alarm	This element indicates the alarm type of the log report: critical alarm major alarm minor alarm
\$Class	This element contains the event class that identifies the log subsystem.
\$Date	This element contains the date of event in MMMDD format. For example, JAN01.
\$Date	This element contains the e raw line of data received.
\$Date	This element contains the raw line of data received.
\$EventID	This element contains the identifier of the event in a report or a normal event.
\$EventType	This element contains the type of event.
\$HeaderLine	This element contains the initial line of the event.
\$HeaderText	This element contains a text message associated with the event.
\$Host	This element contains the name of the host from which the event was received.
\$InvalidEvent	If the probe receives an incomplete or invalid alarm, this element contains full details of the alarm.
\$Minutes	This element contains the number of minutes after the hour that the report was generated.
\$Node	This element contains the name that identifies the DMS switch generating the event log.

Table 7. Elements (continued)

Element name	Element description
\$nodeName	This element contains the node name that identifies the DMS switch generating the event log.
\$Office event	This element contains the node name that identifies the DMS switch generating the event log.
\$OfficeID	Used to hold the two-character office code found after the \$Node element in header lines of ECORE_FORMAT = TRUE format.
\$Port	This element contains the name of the port from which the event was received.
\$ReportFlag	This element indicates whether the event is a report or a normal.
\$ReportID	This element indicates from which subsystem the event originated.
\$RestartLine	If the TSM receives an SOS message while parsing an event, this element contains the SOS message.
\$SeqNo	This element contains the sequence number of event.
\$Severity	This element indicates the alarm type of the log report. Possible values are: <ul style="list-style-type: none"> critical alarm major alarm minor alarm
\$SubClass	This element contains the sub class of the event.
\$TextType	This element contains the type of event.
\$Threshold	This element indicates whether a threshold was set for the log report.
\$Time	This element contains the time of event in HH:MM:SS format.
\$Warning	This element is used by DMS if it could not send all events to the TSM due to port bandwidth limitations.

Error messages

Error messages provide information about problems that occur while running the probe. You can use the information that they contain to resolve such problems.

The following table describes the error messages specific to this probe. For information about generic error messages, see the *IBM Tivoli Netcool/OMNIBus Probe and Gateway Guide*, (SC14-7530).

Table 8. Error messages

Error	Description	Action
<p>ConvertEscapes: Error allocating memory for octal code</p> <p>ConvertEscapes: Error allocating memory for temp buffer</p> <p>Error allocating memory for line buffer</p> <p>Error allocating memory for single node</p> <p>Error allocating memory for socket list</p> <p>Expect: Error allocating memory for buffer</p> <p>Failed to allocate memory for property value: string</p> <p>ReadHostEntry: Error allocating memory for entry</p> <p>ReadHostEntry: Error allocating memory for line</p> <p>ReadHostFile: Error allocating memory for socket node</p> <p>ReadHostFile: Error allocating memory for token</p>	<p>Unable to allocate memory for the buffer that contains the event being read. This caused the TSM to terminate.</p>	<p>Make more memory available.</p>
<p>Could not open port, exiting</p>	<p>There is a problem with the connection details that you specified or with the network connection itself.</p>	<p>Check that you can access the target port from the host running the probe.</p> <p>Check that you have specified the correct host and port.</p>
<p>DMS User Alternative Password property not set, exiting</p> <p>DMS User Name property not set, exiting</p> <p>DMS User Password property not set, exiting</p>	<p>One or more of the properties required for connecting to the DMS device are missing from the properties file.</p>	<p>Check that the properties file contains values for the AltPassword, Password, and UserName properties.</p>

Table 8. Error messages (continued)

Error	Description	Action
<p>Error converting ChatinString escapes</p> <p>Error converting ChatoutString escapes</p> <p>Error converting HeartbeatResponse escapes</p> <p>Error converting HeartbeatString escapes</p>	<p>There is an invalid escape code in the property specified.</p>	<p>Check the values specified for the ChatinString, ChatoutString, HeartbeatResponse, and HeartbeatString properties.</p> <p>For details of valid escape codes, see “Escape Codes” on page 17.</p>
<p>Error reading host file filename</p>	<p>The TSM could not open the hosts file for reading.</p>	<p>Check the permissions for the hosts file and directories, and amend if necessary.</p>
<p>Failed to create new command port connection port</p> <p>Failed to set up command port port</p>	<p>The TSM cannot start due to a problem setting up the port specified.</p>	<p>Check that the port number specified was positive, not a reserved number, and that it is not in use by another application.</p>
<p>Failed to save PID to file</p>	<p>The TSM could not save the process ID number to the file specified.</p>	<p>Check the permissions of the PID file and corresponding directories, and amend if necessary.</p>
<p>HeartbeatInterval property may not be negative (value)</p> <p>HeartbeatTimeout property may not be negative (value)</p> <p>ReconnectionInterval may not be negative - reverting to default</p> <p>ResponseTimeout not positive, Exiting</p>	<p>The property specified has been set to an invalid value.</p>	<p>Update the property in the properties file.</p>
<p>HeartbeatInterval set but heartbeat properties not set, exiting</p>	<p>The HeartbeatInterval property has been set, but the complementary heartbeat properties have been omitted.</p>	<p>Add values for the HeartbeatResponse, HeartbeatString, and HeartbeatTimeout properties in the properties file.</p>
<p>Host property not set, exiting</p> <p>Port property not set, exiting</p>	<p>Either the Host property or the Port property has been omitted, so the TSM cannot connect to the device.</p>	<p>Specify values for the Host and Port properties in the properties file.</p>

Table 8. Error messages (continued)

Error	Description	Action
Hostfile entry line number: Chatin property set, but no chatout! Hostfile entry line number: Failed to retrieve host value Hostfile entry line number: Failed to retrieve port value Hostfile entry line number: Parse error ':' expected HostsFile entry line number: property not set!	There is an error in the format of the hosts file at the line specified.	Correct the line specified. For details of the format of the hosts file, see “Hosts File Format” on page 6.
SendAlert failed	The TSM was unable to send an alert to the ObjectServer.	Check that the ObjectServer is available.
This is not a valid DMS log report - discarding	A report received from the DMS device is not in the correct format.	Check that the device is running correctly.
Unable to compile HeartbeatResponse regexp for: heartbeat response Unable to compile regexp for heartbeat response	The device was unable to compile the heartbeat response required by the TSM.	Check that the HeartbeatResponse property contains a valid regular expression.

TSMWatch messages

During normal operations, the probe generates ProbeWatch messages and sends them to the ObjectServer. These messages tell the ObjectServer how the probe is running.

The following table describes the raw TSMWatch error messages that the probe generates. For information about generic TSMWatch messages, see the *IBM Tivoli Netcool/OMNIbus Probe and Gateway Guide*, (SC14-7530).

Table 9. TSMWatch messages

ProbeWatch message	Description	Triggers/causes
Connection attempted	The TSM is trying to establish a connection to the host.	The TSM is trying to establish a connection to the host.
Connection failed	The TSM has failed to establish a connection to the host.	The TSM has failed to establish a connection to the host.

Table 9. TSMWatch messages (continued)

ProbeWatch message	Description	Triggers/causes
Connection Going Down	The TSM is disconnecting from the host.	Either the TSM has received a bounce command from the command port, or the TSM is having problems reading from the socket.
Connection lost	The TSM has lost the connection to the host.	The device has dropped the connection to the TSM.
Connection succeeded	The TSM has successfully established a connection to the host.	The TSM has successfully established a connection to the host.
Deleted inactive device device_name	The TSM has deleted an inactive device.	The TSM received a response that ends with a prompt (>) after sending out the deldevice command to delete inactive devices.
Disconnection Attempted	The TSM is trying to disconnect from the host.	The TSM is shutting down or has lost the connection.
Disconnection Failed	The TSM has failed to disconnect cleanly from the host.	There has been a corruption of the memory location storing the connection details.
Disconnection Successful	The TSM has disconnected from the host.	The TSM is shutting down or has lost the connection.
Event Flushed	Events have been flushed to the ObjectServer from the TSM's buffer.	After a valid HeaderLine or Warning line has been received but before the terminator line has been received, a time interval exceeding that defined in FlushTime property has passed without anything having been read.
Failed to change password	Under automatic login, the TSM is unable to change the password to the alternative password.	The TSM's attempt to change the password used for logging in has been rejected by the host.
Failed to delete inactive devices - logging out	The TSM is unable to delete inactive devices.	There are too many log devices in use but none of the devices is inactive and therefore cannot be deleted.
Failed to issue the addclass command - logging out	The TSM is unable to execute the addclass command.	The TSM received an Invalid parameters response to the addclass command.

Table 9. TSMWatch messages (continued)

ProbeWatch message	Description	Triggers/causes
Failed to issue the <code>addrep</code> command - logging out	The TSM is unable to execute the addrep command.	The TSM received a Log <log report> not found response to the addrep command.
Failed to issue the <code>deldevice</code> command - logging out	The TSM is unable to execute the <code>deldevice</code> command.	Either the TSM received a response other than <code>.*unknown.*</code> or <code>.*></code> after sending this command, or it timed out while waiting for a response.
Failed to issue the <code>deldevice</code> command	The TSM is unable to execute the deldevice command when attempting to remove inactive devices.	Either the TSM received a response other than <code>.*unknown.*</code> or <code>.*></code> after sending this command, or it timed out while waiting for a response.
Failed to issue the <code>delrep</code> command - logging out	The TSM is unable to execute the <code>delrep</code> command.	The TSM received a Log <log report> not found response to the delrep command.
Failed to issue the <code>listdevs</code> command - logging out	The TSM is unable to execute the <code>listdevs</code> command.	Either the TSM received a response other than <code>*known.*</code> or <code>.*Rerouted.*</code> after sending this command, or it timed out while waiting for a response.
Failed to issue the <code>logutil</code> command - logging out	The TSM is unable to execute the <code>logutil</code> command.	Either the TSM received a response other than <code>Unknown.*</code> or <code>.*LOGUTIL.*</code> after sending this command, or it timed out while waiting for a response.
Failed to issue the <code>start</code> command - logging out	The TSM is unable to execute the <code>start</code> command.	Either the TSM received a response other than <code>Unknown.*</code> or <code>.*o</code> many log devices in <code>u.*</code> or <code>.*break.*</code> after sending this command, or it timed out while waiting for a response.
Failed to issue the <code>stop</code> command - logging out	The TSM is unable to execute the <code>stop</code> command.	Either the TSM received a response other than <code>Unknown.*</code> or <code>.*his device.*</code> or <code>.*TELSVR.*</code> after sending this command, or it timed out while waiting for a response.
Failed to retrieve device ID after <code>stop</code> command attempt - logging out	The TSM is unable to extract the device ID from the response received after sending out the <code>stop</code> command.	Either the device ID in the response does not start with <code>TELSVR</code> or the response does not contain the device ID.

Table 9. TSMWatch messages (continued)

ProbeWatch message	Description	Triggers/causes
Going Down	The TSM is shutting down.	The TSM is shutting down after performing the shutdown routine.
Heartbeat response received	A heartbeat response has been received within the period specified by the HeartbeatTimeout property.	A response matching the HeartbeatResponse property in the properties or hosts file has been received.
Heartbeat response timed out	A response to the heartbeat string has not been received for the period specified by the HeartbeatTimeout property.	The TSM has not received the expected response or an event and is disconnecting from and reconnecting to the host.
Heartbeat sent	A heartbeat string has been sent from the TSM to the host.	The TSM has not received an event from the device for the period specified by HeartbeatInterval .
Invalid User ID or password.	Under automatic login, the TSM is unable to log in to the host.	There was a problem logging in; for example, the login properties (UserName , Password and AltPassword) are not specified correctly.
Login attempted	The TSM is trying to log in to the host.	The TSM is trying to log in to the host.
Login failed	The TSM has failed to log in to the host.	The TSM has encountered a problem while logging in. Check that the ChatinString property is specified correctly.
Login succeeded	The TSM has logged in to the host.	The TSM has logged in to the host.
Logout attempted	The TSM is trying to log out from the host.	The TSM has received a command to shut down or has received the bounce command from the command port.
Logout failed	The TSM has failed to log out from the host.	The TSM has encountered a problem while logging out. Check that the ChatoutString property is specified correctly.
Logout succeeded	The TSM has logged out from the host.	The TSM has logged out from the host.
Running	The TSM is running normally.	The TSM has just been started.
Switch is being rebooted	The DMS switch is being rebooted.	The TSM received an SOS response during login.

Table 9. TSMWatch messages (continued)

ProbeWatch message	Description	Triggers/causes
Temporary password may be in use	Under automatic login, the TSM is attempting to log in to the host using AltPassword. T	he TSM was unable to log in using the password specified in Password.
Too many log devices in use: deleting inactive devices	The TSM is trying to delete inactive TELNSVR devices.	The TSM received a Too many log devices in use response to the start command that was sent.
Unable to get events	A problem occurred while receiving events.	There was a problem initializing the connection due to insufficient memory.
Unable to save process ID to file pid_file	The TSM is unable to save its process ID into the file.	General problem saving the PID file; for example, the TSM does not have the permission to save the file.
User does not have permission to use the command command	The TSM is unable to execute the command specified (this will be either logutil , listdev , start , addclass , deldevice , or stop).	The TSM received an Unknown response to the command that was sent.
User logged in on another device	The username and password combination used by the TSM is already in use in the DMS switch.	The username and password combination used by the TSM is already in use in the DMS switch.

Appendix A. Notices and Trademarks

This appendix contains the following sections:

- Notices
- Trademarks

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