

Netcool/OMNIbus TSM for Alcatel-Lucent
DSC DEX
5.0

Reference Guide
December 31, 2010



Note

Before using this information and the product it supports, read the information in [Appendix A, “Notices and Trademarks,”](#) on page 13.

Edition notice

This edition applies to version 5.0.5896 of IBM Tivoli Netcool/OMNIBus TSM for Alcatel-Lucent DSC DEX (SC14-7210-01) 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 Alcatel-Lucent DSC DEX 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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01	December 31, 2008	Summary table updated. IPv6 support information added. FIPS information added. Installation section added.
02	December 31, 2010	Installation section replaced by “Installing probes” on page 2.

Chapter 1. TSM for Alcatel-Lucent DSC DEX

The Alcatel-Lucent DSC DEX modular tandem switches provide intermediate switching functionality, flexible dialing plans, service access codes, customized screening, translation, and routing for complex telephone networks. The TSM for Alcatel-Lucent DSC DEX intercepts the DSC DEX event stream, generates alerts from the stream and forwards them to the ObjectServer.

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 6](#)
- [“Elements” on page 9](#)
- [“Error messages” on page 11](#)

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 Alcatel-Lucent DSC DEX.

Probe target	Alcatel-Lucent DSC DEX switches
Probe executable name	nco_t_dcsdex
Patch number	5.0
Properties file	\$OMNIHOME/probes/arch/dscdex.props
Rules file	\$OMNIHOME/probes/arch/dscdex.rules
Requirements	A currently supported version of IBM Tivoli Netcool/OMNIBus probe-compatibility-3.x (for IBM Tivoli Netcool/OMNIBus version 3.6) common-libnetcool-3_1 (for IBM Tivoli Netcool/OMNIBus version 3.6) common-libOp1-7_6 (for IBM Tivoli Netcool/OMNIBus version 3.6)
Connection method	TCP/IP
Remote connectivity	The TSM for Alcatel-Lucent DSC DEX can connect to a device on a remote host. Details of the remote host are specified using the Host and Port properties.
Multicultural Support	Not Available

Table 2. Summary (continued)	
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 V7.3.0, 7.3.1 and 7.4.0 on all UNIX and Linux operating systems.
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*.

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
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 \$OMNIBHOME/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 Alcatel-Lucent DSC DEX acquires data from the DSC DEX range of voice switches by connecting to a DSC DEX system and intercepting the event stream. The messages on the event stream are read, parsed, converted to Netcool/OMNIBus alerts, and forwarded to the ObjectServer.

The TSM for Alcatel-Lucent DSC DEX can connect to a DSC DEX system through telnet, tip, or rsh. The TSM can only be terminated with a stop command (control-c).

Data acquisition is described in the following topics:

- [“Chat In and Chat Out Scripts” on page 4](#)
- [“Heartbeating” on page 4](#)
- [“Backoff Strategy” on page 5](#)
- [“Data Stream Capture” on page 5](#)
- [“Timeout” on page 5](#)
- [“Self Test” on page 5](#)
- [“Peer-to-peer failover functionality” on page 5](#)

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 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\i\n.*assword.*:*anu\i\n"
```

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 9](#).

Heartbeating

Heartbeating allows the TSM to determine whether the device is still alive, when the connection is lost between the DSC DEX system and the device.

If the **Heartbeat** property is set and the target system fails, the TSM tries to ping the DSC DEX system module until it is active again. The TSM then reestablishes a connection and start to acquire alert data again. If the TSM fails to receive any data for the length of time in seconds specified by the **HeartbeatInterval** property, it pings the fault adapter. If the TSM fails to receive the ping within **HeartbeatTimeout** seconds, the TSM disconnects and switches to 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 Alcatel-Lucent DSC DEX 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.

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

Timeout

The TSM for Alcatel-Lucent DSC DEX has a timeout facility.

The timeout allows the TSM for Alcatel-Lucent DSC DEX to disconnect from the socket if it fails to receive an alarm within a predefined amount of time. You can specify how long the TSM waits before disconnecting using the **ReadTimeout** property or `-readtimeout` command line option.

Self Test

The TSM for Alcatel-Lucent DSC DEX can perform a self test using dummy data stored in a test file. Self-testing a TSM allows you to determine whether the rules file is working correctly.

To instruct the TSM to perform a self test, you must specify the file that contains the dummy data using the **SelfTest** property. The test file that you specify can be a raw stream capture file generated using the **StreamCaptureFile** property.

- Some item
- another item

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).

<i>Table 4. Properties and command line options</i>		
Property name	Command line option	Description
ChatinString <i>string</i>	-chatinstring <i>string</i>	Use this property to specify the chat in script for connection to the host system. 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 "".
HeaderLength <i>integer</i>	-headerlength <i>integer</i>	Use this property to specify the length of the header that begins the data stream. The TSM discards this number of characters from the ensuing data stream. The default is 0.

Table 4. Properties and command line options (continued)

Property name	Command line option	Description
HeartbeatInterval <i>integer</i>	<code>-heartbeatinterval</code> <i>integer</i>	Use this property to specify the length of time in seconds that the TSM waits between sending successive heartbeats. The default is 0.
HeartbeatResponse <i>string</i>	<code>-heartbeatresponse</code> <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 "".
HeartbeatString <i>string</i>	<code>-heartbeatstring</code> <i>string</i>	Use this property to specify the command that prompts the switch to give a known response. The default is "".
HeartbeatTimeout <i>integer</i>	<code>-heartbeattimeout</code> <i>integer</i>	Use this property to specify the length of time in seconds in which the TSM expects to receive a response from the device. The default is 0.(No time out)
Host <i>string</i>	<code>-host</code> <i>string</i>	Use this property to specify the name of the host to which the TSM connects. The default is "localhost".
InactivityAlarm <i>integer</i>	<code>-inactivityretry</code> <i>integer</i>	Use this property to specify the number of consecutive inactivity alarms the TSM allows before attempting to reconnect to the host. The default is 0 (feature is disabled).
InactivityRetry <i>integer</i>	<code>-heartbeatinterval</code> <i>integer</i>	Use this property to specify the length of time in seconds that the TSM waits between sending successive heartbeats. The default is 0.
PidFile <i>string</i>	<code>-pidfile</code> <i>string</i>	Use this property to specify the name of the file that stores the process ID for the device. The default is "".
Port <i>integer</i>	<code>-port</code> <i>integer</i>	Use this property to specify the port to which the TSM connects. The default is 23.

Table 4. Properties and command line options (continued)

Property name	Command line option	Description
ReadTimeout <i>integer</i>	<code>-readtimeout <i>integer</i></code>	Use this property to specify the length of time in milliseconds that the TSM allows the socket to be silent. If this time is exceeded, it assumes that the connection is dead and disconnects. The default is 100.
ReconnectionInterval <i>integer</i>	<code>-reconnectioninterval <i>integer</i></code>	Use this property to specify the length of time in seconds between successive reconnection attempts. The default is 0.
ResponseTimeout <i>integer</i>	<code>-responsetimeout <i>integer</i></code>	Use this property to specify the length of 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>	<code>-resynchcommand <i>string</i></code>	Use this property to specify the command that the TSM sends to initiate resynchronization. The default is "".
ResynchInterval <i>integer</i>	<code>-resynchinterval <i>integer</i></code>	Use this property to specify the length of time in seconds between successive resynchronization attempts. The default is 0.
SelfTest <i>string</i>	<code>-selftest <i>string</i></code>	Use this property to specify the file the TSM uses to test itself. This can be used to test a rules file against an input stream captured from the switch by specifying the output file from the StreamCaptureFile property. The default is "". Note : Omitting this property disables the self test feature.
StreamCaptureFile <i>string</i>	<code>-streamcapturefile <i>string</i></code>	Use this property to specify the file the TSM uses to store the input stream log. The default is "". Note : Omitting this property disables the stream capture feature.
Switch <i>string</i>	<code>-switch <i>string</i></code>	Use this property to specify the switch type to which the TSM connects. The default is auto.

Table 4. Properties and command line options (continued)

Property name	Command line option	Description
UserDefined <i>string</i>	-userdefined <i>string</i>	Use this property to add a comma-separated list of user-defined properties. 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**
- **HeartbeatString**

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 5. 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 \\.

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.

Static and dynamic elements are described in the following topics:

- [“Static elements” on page 10](#)
- [“Dynamic elements” on page 10](#)

Static elements

The probe generates the same set of static elements for each event it receives.

The following table describes the elements that the TSM for Alcatel-Lucent DSC DEX generates. Not all the elements described are generated for each event; the static elements that the probe generates depends upon the event type.

Element name	Element description
\$RecvTime	This element contains the date and time at which the message was received.
\$UTC	This element contains the date and time at which the message was received in UNIX time format.
\$Summary	This element provides a report summary of the event.
\$ReptTime	This element contains the date and time at which the event was reported.
\$Seq	This element contains the sequence number of the event.
\$Count	This element indicates the number of times the event has been reported.
\$Task	This element contains the task identification number of the event.
\$AlarmType	This element contains the type, number, and state of the alarm.

Dynamic elements

The dynamic elements that the probe generates are entirely dependent on the devices monitored.

The following table describes the elements that the TSM for Alcatel-Lucent DSC DEX generates. Not all the elements described are generated for each event; the dynamic elements that the probe generates depends upon the event type.

Element name	Element description
\$DEVICE	This element identifies the device reporting the event.
\$LOCATION	This element contains the location of the device.
\$Reporting_PROC	This element identifies the process reporting the event.
\$Reporting_UNIT	This element identifies the unit reporting the event.
\$Data_nn	These elements contain additional data.

<i>Table 7. Dynamic elements (continued)</i>	
Element name	Element description
Details_nn	These elements contain additional details.

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).

<i>Table 8. Error messages</i>		
Error	Description	Action
Connection in unknown state	There is a problem with the connection between the TSM and the switch.	Check that the switch is working correctly. If it is, restart the TSM.
Error allocating memory	There is not enough memory available.	Make more memory available.
Failed to send <sendchat>	When the TSM tried to log in or out of the host, the send part of the chat failed. .	Check that the host you are connecting to is running correctly.
Failed to send command <command>	When the TSM tried to log in or out of the host, one command in the chat failed.	Check that the host you are connecting to is running correctly.
Login/Logout timed out after number seconds	When the TSM tried to log in or out of the host, the connection timed out.	Check that the host you are connecting to is running correctly.
Read error from switch	The TSM read a message from the target switch, but it could not interpret the message.	Check that switch is working correctly.
SendAlert failed	The TSM was unable to send an alert to the ObjectServer.	Check that the ObjectServer is available.
Unable to compile regexp for string	A regular expression is incorrectly formed in the rules file.	Check that the rules file for the regular expression and correct the entry.
Unable to log in to host port	The TSM was unable to log on to the switch.	Check that the properties are set correctly.
Unknown connection error Unknown expect connection error	There is a problem with the network.	Check that you can access the target port from the host running the TSM.

Appendix A. Notices and Trademarks

This appendix contains the following sections:

- Notices
- Trademarks

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