IBM[®] Tivoli[®] Netcool/OMNIbus Probe for Tellabs 8000 Intelligent Network Manager 9.0

Reference Guide November 7, 2014



Note

Before using this information and the product it supports, read the information in <u>Appendix A</u>, "Notices and Trademarks," on page 21.

Edition notice

This edition (SC23-7937-10) applies to version 9.0 of IBM Tivoli Netcool/OMNIbus Probe for Tellabs 8000 Intelligent Network Manager and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC23-7937-09.

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About this guide

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The following sections contain important information about using this guide.

Document control page

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

The IBM Tivoli Netcool/OMNIbus Probe for Tellabs 8000 Intelligent Network Manager documentation is provided in softcopy format only. To obtain the most recent version, visit the IBM[®] Tivoli[®] Knowledge Center:

https://www.ibm.com/support/knowledgecenter/SSSHTQ/omnibus/probes/common/Probes.html

Table 1. Document modification history		
Document version	Publication date	Comments
SC23-7937-01	July 25, 2008	First IBM publication.
SC23-7937-02	February 19, 2010	Patch number updated in <u>"Summary" on page 1</u> .
		Added the Response Timeout and Heartbeating sections to <u>"Data</u> acquisition" on page 6
		Added HeartbeatInterval , HeartbeatRetryCount , and HeartbeatTimeout properties to <u>"Properties and command line options" on page 9</u> .
		Added 7 messages to <u>"ProbeWatch messages" on page 19</u> .
SC23-7937-03	June 04, 2010	Summary table updated.
		Response Timeout section in <u>"Data acquisition" on page 6</u> updated.
SC23-7937-04	February 25, 2011	<u>"Summary" on page 1</u> updated.
		Support for Tellabs 8000 SR2.0 and SR2.0.1 added.
		Installing the probe sections replaced by <u>"Installing probes" on</u> page 2.
		"Reconnection settings" on page 7 added to replace the <i>Backoff strategy</i> section.
		Descriptions for the RetryConnectionCount and RetryConnectionTimeOut properties added to <u>"Properties and command line options" on page 9</u> .
		"Error messages" on page 16 updated.
SC23-7937-05	June 10, 2011	Information about operating system conventions added in "Conventions used in this guide" on page vi.
		Supported device versions updated in <u>Chapter 1</u> , "Probe for Tellabs 8000 INM," on page 1 and <u>"Summary" on page 1</u> .

Table 1. Document modification history (continued)		
Document version	Publication date	Comments
SC23-7937-06	November 4, 2011	"Summary" on page 1 updated. Description of the TargetVersion property updated in "Properties and command line options" on page 9.
SC23-7937-07	March 2, 2012	Table 3 on page 1 updated."Summary" on page 1 updated."Lookup table" on page 3 added.Description of the TargetVersion property updated in"Properties and command line options" on page 9."Running the probe" on page 20 added.
SC23-7937-08	July 6, 2012	Table 3 on page 1 updated. "Summary" on page 1 updated.
SC23-7937-09	November 8, 2013	<u>"Summary" on page 1</u> updated. The lookup tables provided with the Probe for Tellabs 8000 INM have been updated to support Tellabs 8000, release SR5.0
SC23-7937-10	November 7, 2014	Supported extended to Tellabs 8000, release SR6.0. <u>"Summary" on page 1</u> updated. <u>"Generating a probe lookup table from the Tellabs fault text</u> <u>definition XML file " on page 3</u> added. <u>"Lookup table generator utility error messages" on page 5</u> <u>added.</u>

Conventions used in this guide

All probe guides use standard conventions for operating system-dependent environment variables and directory paths.

Operating system-dependent variables and paths

All probe guides use standard conventions for specifying environment variables and describing directory paths, depending on what operating systems the probe is supported on.

For probes supported on UNIX and Linux operating systems, probe guides use the standard UNIX conventions such as *\$variable* for environment variables and forward slashes (/) in directory paths. For example:

\$OMNIHOME/probes

For probes supported only on Windows operating systems, probe guides use the standard Windows conventions such as *%variable%* for environment variables and backward slashes (\) in directory paths. For example:

%OMNIHOME%\probes

For probes supported on UNIX, Linux, and Windows operating systems, probe guides use the standard UNIX conventions for specifying environment variables and describing directory paths. When using the

Windows command line with these probes, replace the UNIX conventions used in the guide with Windows conventions. If you are using the bash shell on a Windows system, you can use the UNIX conventions.

Note : The names of environment variables are not always the same in Windows and UNIX environments. For example, %TEMP% in Windows environments is equivalent to \$TMPDIR in UNIX and Linux environments. Where such variables are described in the guide, both the UNIX and Windows conventions will be used.

Operating system-specific directory names

Where Tivoli Netcool/OMNIbus files are identified as located within an *arch* directory under NCHOME or OMNIHOME, *arch* is a variable that represents your operating system directory. For example:

\$OMNIHOME/probes/arch

The following table lists the directory names used for each operating system.

Note : This probe may not support all of the operating systems specified in the table.

Table 2. Directory names for the arch variable		
Operating system	Directory name represented by <i>arch</i>	
AIX [®] systems	aix5	
Red Hat Linux [®] and SUSE systems	linux2x86	
Linux for System z	linux2s390	
Solaris systems	solaris2	
Windows systems	win32	

OMNIHOME location

Probes and older versions of Tivoli Netcool/OMNIbus use the OMNIHOME environment variable in many configuration files. Set the value of OMNIHOME as follows:

- On UNIX and Linux, set \$OMNIHOME to \$NCHOME/omnibus.
- On Windows, set %OMNIHOME% to %NCHOME%\omnibus.

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Chapter 1. Probe for Tellabs 8000 INM

The Tellabs 8000 Intelligent Network Manager (INM) is used by public network operators and service providers to build or enhance their networks. Typical applications managed through Tellabs 8000 INM include cellular transport solutions and business service solutions.

The system comprises a range of network elements, terminating units, and the Tellabs 8000 INM network management system. The Tellabs 8000 INM is used to centralize control of a wide range of components including modems, network terminating units, and backbone nodes. Operators can use the Tellabs 8000 INM to fix problems around their system from a single management center.

The IBM Tivoli Netcool/OMNIbus Probe for Tellabs 8000 Intelligent Network Manager supports the following Tellabs INM versions:

Table 3. Supported Tellabs INM versions		
Tellabs 8000	Tellabs 8100	
SR6.0		

The following topics describe the probe and how it works:

- "Summary" on page 1
- "Installing probes" on page 2
- "Lookup table" on page 3
- "Data acquisition" on page 6
- "Properties and command line options" on page 9
- "Elements" on page 13
- "Error messages" on page 16
- "ProbeWatch messages" on page 19
- "Running the probe" on page 20

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 summarizes the probe.

Table 4. Summary	
Probe target	Tellabs 8000 versions R15, R16, R16A, R17, R17A, SR2.0, SR2.0.1, SR2.1, SR2.2, SR3.0, SR4.0, SR5.0, and SR6.0. Tellabs 8100 versions R12, R13A, and R14.
Probe executable file name	nco_p_tellabs_8000

Table 4. Summary (continued)		
Probe installation package	omnibus-arch-probe-nco-p-tellabs-8000-version	
Package version	9.0	
Probe supported on	For details of supported operating systems, see the following Release Notice on the IBM Software Support website: <u>http://www-01.ibm.com/support/docview.wss?</u> <u>uid=swg21649677</u>	
Properties file	\$OMNIHOME/probes/ <i>arch</i> /tellabs_8000.props	
Rules file	\$OMNIHOME/probes/ <i>arch</i> /tellabs_8000.rules	
Requirements	For details of any additional software that this probe requires, refer to the description.txt file that is supplied in its download package.	
Connection method	TCP/IP Socket	
Remote connectivity	The probe can connect to a remote device. Details of the remote device are specified using the Host and Port properties in the properties file.	
Multicultural support	Not Available	
Peer-to-peer failover functionality	Available	
IP environment	IPv4 and IPv6 Note : The probe only supports the IPv6 environment on IBM Tivoli Netcool/OMNIbus v7 running on Solaris.	

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*.

Lookup table

The probe is supplied with a set of lookup tables that contain details of the various types of alarms that the Probe for Tellabs 8000 generates.

During installation, the following lookup tables are installed into \$OMNIHOME/probes/includes/:

- tellabs8000_alarmtype.lookup
- tellabs8000_gpt.lookup
- tellabs8000_ntunames.lookup
- tellabs8000_sptnms.lookup
- tellabs8000_sptntu.lookup
- tellabs8000_sptunit.lookup
- tellabs8000_unames.lookup

The following lines in the rules file reference these lookup files:

```
include "$OMNIHOME/probes/includes/tellabs8000_alarmtype.lookup"
include "$OMNIHOME/probes/includes/tellabs8000_gpt.lookup"
include "$OMNIHOME/probes/includes/tellabs8000_ntunames.lookup"
include "$OMNIHOME/probes/includes/tellabs8000_sptnms.lookup"
include "$OMNIHOME/probes/includes/tellabs8000_sptnu.lookup"
include "$OMNIHOME/probes/includes/tellabs8000_sptnut.lookup"
include "$OMNIHOME/probes/includes/tellabs8000_sptnut.lookup"
```

Before running the probe, you must replace each path with the full path to the lookup file.

Note : The probe is supplied with a utility for generating new versions of these lookup tables, for details, see "Generating a probe lookup table from the Tellabs fault text definition XML file " on page 3

Generating a probe lookup table from the Tellabs fault text definition XML file

The probe is supplied with a utility that allows you to generate lookup tables from the Tellabs fault text definition XML file.

In the previous version of this probe, the probe was supplied with the following lookup tables:

- tellabs8000_gpt.lookup
- tellabs8000_ntunames.lookup
- tellabs8000_sptnms.lookup
- tellabs8000_sptntu.lookup
- tellabs8000_sptunit.lookup
- tellabs8000_unames.lookup

With this version of the probe, these lookup tables are still provided, but the lookup table generator utility (tellabs8000_lookup_generator.jar) allows you to generate lookup tables from a fault text definition XML file. This means that the lookup tables that the probe uses can be updated before a newer version of the probe is released.

The lookup table generator utility is installed in the following directory:

\$OMNIHOME/probes/java/tools/Tellabs8000LookupGenerator

The fault text definition XML file can be obtained from the Tellabs INM product or from Tellabs directly.

Note : The probe is also supplied with tellabs8000_alarmtype.lookup, but this lookup table is not generated by the lookup table generator utility.

Configuring the lookup table generator utility

The lookup table generator utility is configured using a properties file. It is supplied with the following properties file which has been pre-configured with default values set for each property:

\$OMNIHOME/probes/java/tools/Tellabs8000LookupGenerato/
generator_default.properties

The following table describes the properties and their default values. The only property you need configure is the **inputPaths** property to specify the location of the XML file that you want the probe to parse.

Table 5. Lookup table generator utility properties		
Property name	Description	
inputPaths string	Use this property to specify the location of the fault text definition XML file.	
	The default is resource/nbi/faults.xml.	
combineMethod string	This property specifies how the utility generates the output files.	
	The default is separate which instructs the probe to create a separate lookup table for each fault type.	
outputPath string	This property specifies the locations of the output files that the utility generates.	
	The default is tellabs8000_gpt.lookup tellabs8000_ntunames.lookup tellabs8000_sptnms.lookup tellabs8000_sptntu.lookup tellabs8000_sptunit.lookup tellabs8000_unames.lookup.	
	Note : Each filename is separated by a pipe character (). If the number of filenames specified does not match the number of table names specified by the tableName property, the utility writes all tables into the first filename specified in the list.	
tableName string	This property specifies the names of the lookup tables that the utility generates.	
	The default is tellabs-GPT tellabs-NTUNAMES tellabs-SPTNMS tellabs-SPTNTU tellabs- SPTUNIT tellabs-UNAME.	
	Note : Each table name is separated by a pipe character ().	

Table 5. Lookup table generator utility properties (continued)		
Property name	Description	
tableComment string	This property specifies comments to include with the tables that the utility generates.	
	The default is " " .	
	Note : Use a pipe character () to specify table comments for each table generated. The order of tableComment should follow the order of the table names specified in the tableName property.	
verbose string	This property specifies whether the utility prints detailed log messages. The default is false.	

Note : If you need to include spaces in the value set for any of the properties, you must include the whole value within double quote marks (").

Running the utility

You run the lookup table generator utility from the command line. To run this utility, you must have Java JRE version 6 installed.

To run the utility with the default properties file (generator_default.properties), use the following command:

java -jar tellabs8000_lookup_generator.jar

To run the utility with an alternative properties file, use the following command:

java -jar tellabs8000_lookup_generator.jar -propPath "generator.properties"

Where *generator*.properties is the name of the properties file that you want to use instead of the default file.

To print information about the usage of the utility, use the following command:

java -jar tellabs8000_lookup_generator.jar -help

After running the utility, verify that the lookup tables have been generated correctly.

Note : The Tellabs fault text definition XML file encoding is set to UTF-8 and may contain some special characters. These special characters may not appear correctly if viewed with a different locale settings. Use the following command to specify the file encoding property when generating the lookup tables and update your locale settings to UTF-8:

java -Dfile.encoding="UTF-8" -jar tellabs8000_lookup_generator.jar

Lookup table generator utility error messages

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

The following table describes the error messages that the lookup table generator utility writes to the log file.

Table 6. Error messages			
Error	Description	Action	
File access denied!	The utility could not access the target output file.	Check the file permissions. Make sure the utility has read and write access to the target ouput file.	
The filepath specified cannot be a NULL value.	The output file path has not been set	Specify the correct file paths.	
Unable to close BufferedReader for outputfilepath	The program could not close the connection to the file.	Check that the file is not locked by another process.	
ParserConfiguration Exception: exception message	The XML parser has encountered an error.	Make sure the XML file is following the W3C standard.	
SAXException: exception message	The XML parser has encountered an error.	Make sure the XML file is following the W3C standard.	
IOException: exception message	The XML parser has encountered an error.	Make sure that the input file is accessible.	
Input file does not exists.	The utility could not access the input file.	Make sure that the input file is accessible.	
Multiple values not supported for: property_name	The property specified can only accept one value, but multiple values have been set.	Specify only one value for the property.	
Invalid option: property_name	An invalid option or property has been specified in the properties file.	Check the properties set in the properties file.	
Invalid options specified in command line.	An invalid option is specified as an argument via the command line.	Check the option flag. Refer to the properties file for available options.	

Data acquisition

The probe acquires alert data from a fault adapter. The fault adapter is a Tellabs 8000 INM software module that communicates with the Tellabs 8000 Intelligent Network Manager through TCP/IP.

The fault adapter collates the raw data from which the probe creates alerts. There are two categories of data that the probe acquires from the fault adapter:

- Network element faults
- Active faulty circuits

The probe can be configured to acquire an extended definition of these faults.

Data acquisition is described in the following topics:

- <u>"Device connection" on page 7</u>
- <u>"Reconnection settings" on page 7</u>

- "Data stream capture" on page 7
- "Read Timeout" on page 8
- "Response Timeout" on page 8
- "Heartbeating" on page 8
- "Peer-to-peer failover functionality" on page 9

Device connection

When the probe starts, its first action is to open a connection to the TCP/IP port. If the connection is successful, the probe then tries to ping the target adapter module to check that it is active.

When the probe has confirmed that the module is active, it starts to request alert data in the following sequence:

- 1. The probe requests all active network element faults.
- 2. The fault adapter module returns all the active network element faults to the probe.
- 3. The fault adapter enables a reporting feature that forwards new network element faults to the probe at specified time intervals.
- 4. The probe requests all active faulty circuits.
- 5. The fault adapter module returns all the faulty active circuits to the probe.
- 6. The fault adapter enables a reporting feature that forwards new faulty active circuits to the probe at specified time intervals.

Each network element fault or faulty active circuit acquired by the probe is used to generate an alert.

Reconnection settings

You can specify how the probe attempts to reconnect to the device by using the **ReconnectionInterval**, **RetryConnectionCount**, and **RetryConnectionTimeOut** properties.

If the probe loses its connection with the device, it waits for the time specified by the **ReconnectionInterval** property before attempting to reconnect. If the connection attempt is not successful within the time specified by the **RetryConnectionTimeOut** property, the probe halts the attempt, and then waits before making a subsequent attempt. Use the **RetryConnectionCount** property to specify the maximum number of attempts that the probe makes to connect to the device.

Data stream capture

The probe can capture the data stream sent from a device. This data is stored in a log file and can be used for debugging, to develop new features for the probe, or to pass to other management systems that require the same data.

To enable stream capture, set the **DateStreamCapture** property to 1. Then specify the name of the stream capture file by setting the **StreamCaptureFile** property or -streamcapturefile command line option and specify the maximum size allowed for the stream capture file using the **MaxStreamCapFileSize** property or -maxstreamcapfilesize command line option.

When the stream capture file has reached the maximum size specified by the **MaxStreamCapFileSize** property, the probe will capture the latest stream data by overriding the older stream data stored in the stream capture file. If you set the **MaxStreamCapFileSize** property to 0, the probe stores all the stream capture data in a single file.

Note : By default, the **DateStreamCapture** property is set to 0. The probe will not create a new data stream capture file. The data stream capture function generates a lot of data. When you no longer require data for debugging, remove the file name specified by the **StreamCaptureFile** property in the properties file. You should also reset the values set for the **StreamCaptureFile** and **MaxStreamCapFileSize** properties if you changed their values while using data stream capture.

Read Timeout

The **ReadTimout** property specifies how long the probe waits to read alarm data before timing out. Each time the probe attempts to read an alarm, this is the allotted time that it waits to receive data. If nothing is received, the probe moves on to the next alarm.

Response Timeout

The **ResponseTimeout** property specifies how long the probe waits for a response from the device before timing out. The probe uses this property when connecting to the device.

Heartbeating

If the connection between the device and the fault adapter fails, heartbeating allows the probe to determine whether the device is still operational.

The heartbeating feature has three properties:

- HeartbeatInterval
- HeartbeatTimeout
- HeartbeatRetryCount

If the probe does not receive any data for the time specified by the **HeartbeatInterval** property, it pings the device. If the device does not respond to the ping within the time specified by the **HeartbeatTimeout** property, the probe pings the device again. The time between each heartbeat ping is specified by the **HeartbeatInterval** property. The **HeartbeatRetryCount** property controls how many times the probe pings the device. If the probe sends a number of consecutive pings equal to the value specified by the **HeartbeatRetryCount** property, and the probe receives no response, it closes the connection to the device and tries to reconnect.

By default, heartbeating is disabled. To enable it, set the **HeartbeatTimeout** property to a positive integer.

Note :

For this feature to work correctly, the following conditions must be met:

1. The value of the **HeartbeatInterval** property must be an exact multiple of the value of the **ReadTimeout** property.

For example, to use a **HeartbeatInterval** of 10 seconds, set the **ReadTimeout** property to one of the following values:

- 10000 (10 seconds)
- 5000 (5 seconds)
- 2000 (2 seconds)
- 1000 (1 second)
- 2. The value of the **HeartbeatTimeout** property must be greater than the value of the **ReadTimeout** property and less than the value of the **HeartbeatInterval** property.

Example usage

Suppose the heartbeating properties are set in the properties file using the following values:

```
ReadTimeout: 5HeartbeatInterval: 10HeartbeatTimeout: 6HeartbeatRetryCount: 3
```

If the probe does not receive any events from the device within 5 seconds (as specified by the **ReadTimeout** property), it will wait a further 5 seconds (making a total of the 10 seconds specified by the **HeartbeatInterval**) before it sends a ping command to the device.

If the device does not respond to the ping command within 6 seconds (as specified by the **HeartbeatTimeout** period), the probe will wait another 10 seconds (as specified by the **HeartbeatInterval** property) before it sends a second ping command to the device.

If the device does not respond to the probe after 3 attempts, (as specified by the **HeartbeatRetryCount** property) the probe will close the connection to the device and try to reconnect. For details about the standard backoff strategy and specifying reconnection details, see <u>"Reconnection</u> settings" on page 7.

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 more information about generic properties and command line options, see the *IBM Tivoli Netcool/OMNIbus Probe and Gateway Guide*).

Table 7. Properties and command line options			
Property name	Command line option	Description	
DateStreamCapture integer	-datestreamcapture integer	Use this property to specify whether the probe uses the stream capture feature. This property takes the following values:	
		0: The probe does not use the stream capture feature.	
		1: The probe uses the stream capture feature.	
		The default is 0.	
Faults string	-faults string	Use this property to specify the type of fault that the probe requests from the fault adapter. This property takes the following values:	
		normal: The probe acquires an abbreviated definition of the faults.	
		extended: The probe acquires an extended definition of the faults.	
		The default is extended.	
HeartbeatInterval integer	-heartbeatinterval integer	Use this property to specify the time (in seconds) that the probe waits to receive data before pinging the device.	
		When heartbeating is in use, set the value of this property to an exact multiple of the value of the ReadTimeout property, and ensure that it is greater than the value of the HeartbeatTimeout property (see "Heartbeating" on page 8).	
		The default is 0.	
HeartbeatRetryCount integer	-heartbeatretrycount integer	Use this property to specify the maximum number of consecutive ping messages the probe sends to the device before closing the connection. The default is 10.	

Table 7. Properties and command line options (continued)			
Property name	Command line option	Description	
HeartbeatTimeout integer	-heartbeattimeout integer	Use this property to specify the time (in seconds) that the probe waits for a response to a ping. If the probe does not receive a response, it sends another ping.	
		To disable the heartbeating feature, set the value of this property to 0.	
		To use the heartbeating feature, make the value of this property a positive integer that is greater than the value of the ReadTimeout property and less than the value of the HeartbeatInterval property (see <u>"Heartbeating" on page 8</u>).	
		The default is 0 (heartbeating is disabled).	
Host string	-host string	Use this property to specify the name of the host to which the probe connects.	
		The default is localhost.	
MaxStreamCapFileSize integer	-maxstreamcapfilesize integer	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.	
		Note : If the probe reads a stream whose size exceeds the remaining allowable space in the file, it creates a new file in which it can store the whole stream.	
Port integer	-port integer	Use this property to specify the port to which the probe connects.	
		The default is 2461.	
ReadTimeout integer	-readtimeout <i>integer</i>	Use this property to specify the time (in milliseconds) that the probe allows the socket to be silent. If this time is exceeded, it assumes that the connection is dead and disconnects. The default is 100.	
ReadTimeout integer	-readtimeout <i>integer</i>	Use this property to specify the (in milliseconds) that the probe the socket to be silent. If this ti exceeded, it assumes that the connection is dead and disconr The default is 100.	

Table 7. Properties and command line options (continued)		
Property name	Command line option	Description
ReconnectionInterval <i>integer</i>	-reconnectioninterval integer	Use this property to specify the interval (in seconds) between successive reconnection attempts.
		The default is 0.
ResponseTimeout integer	-responsetimeout <i>integer</i>	Use this property to specify the time (in seconds) that the probe waits for a response from the device when connecting to it.
RetryConnectionCount integer	-retryconnectioncount integer	Use this property to specify the number of times that the probe attempts to connect to the device. If after this number of attempts the probe has failed to connect to the device, it shuts down.
		The default is 15.
RetryConnectionTimeOut integer	-retryconnectiontimeout integer	Use this property to specify the time (in seconds) that the probe waits to receive a response from the device before abandoning the connection attempt.
		The default is 30.
StreamCaptureFile string	-streamcapturefile string	Use this property to specify the file that the probes uses to store the input stream log. Leaving this property blank disables the stream capture feature. The default is "".
TargetVersion string	-targetversion string	Use this property to specify the version of Tellabs 8000 INM to which the probe connects. This property takes the following values:
		FA12 for R12
		FA13 for R13
		FA14 for R14
		FA15 for R15
		FA16 for R16, R16A
		FA17 for R17, R17A, SR2.0, SR2.0.1, SR2.1, SR2.2, SR3.0, SR4.0
		The default is FA15.

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 fault elements that the probe generates.

Table 8. Fault elements		
Element Name	Element Description	
\$ackdatetm	This element contains the date when an operator acknowledged the fault.	
\$ackopid	This element contains the identifier of the operator who acknowledged the fault.	
\$acksta	This element indicates the acknowledgement state. This attribute can take the following values:0: The event has not been acknowledged.	
	1: The event has been acknowledged.	
\$alarmtype	This element contains alarm type information.	
\$blknr	This element contains the block number.	
\$chgctrstamp	This element contains the sequence number of the fault to notify the FMS user interface.	
\$clearcnt	This element contains the number of off states in a pumping period.	
\$edatetm	This element contains the time and date when the fault event disappeared.	
\$filtertm	This element contains the expiry time of the filter period.	
\$fltcheck	This element contains the status in the database consistency check.	
\$fltcodegpt	This element contains the general problem type.	
\$fltcodepbc	This element contains the value of the SDH probable cause.	
\$fltcodespt	This element contains the specific problem type.	
\$fltid	This element contains the identifier of the fault.	
\$fltstate	This element indicates the status of the fault. This attribute can take the following values: 0: The fault status is off. 1: The fault status is on.	

Table 8. Fault elements (continued)		
Element Name	Element Description	
\$flttype	This element contains a code for the fault type.	
\$forcedon	This element indicates whether the fault was forced by the software.	
\$hwtype	This element contains the hardware type of the faulty table.	
\$ifnr	This element contains the interface number.	
\$logblknr	This element contains the logical block number.	
\$mid	This element contains the NTU identifier of the modem.	
\$mtnevent	This element indicates the maintenance status of the circuit. This attribute can take the following values: 1: PMA 2: DMA 3: MEI	
\$nid	This element contains the identifier of the node.	
\$ntulink	This element contains the number of the link (interface) to which a possible NTU is connected.	
\$ntypemask	This element contains masked node type information.	
\$pdatetm	This element contains the time and date when the fault was polled.	
\$periodcnt	This element contains the number of faults recorded during the occurrence period.	
\$rmsstate	This element contains the recovery status of the circuit. This element can take the following values: 0: The status is undefined. 1: The circuit has not recovered. 2: The circuit has recovered.	
\$sa	This element contains the service alarm status.	
\$sdatetm	This element contains the time and date when the fault event appeared.	
\$srkadr	This element contains the subrack address.	
\$srkhwtype	This element contains the type of subrack hardware.	

Table 8. Fault elements (continued)		
Element Name	Element Description	
\$svrty	This element contains the severity code as an integer between 1 and 5.	
\$tid	This element contains the identifier of the trunk.	
\$ttypemask	This element contains the masked trunk information.	
\$unnr	This element contains the unit number.	
\$unslot	This element contains the slot position of the unit.	
\$vtypemask	This element contains information on the masked view type.	
Active Network Event Extended Fault Data		
\$FaultSrc	This element contains the source of the fault (only available with version R14 of Tellabs 8100).	
\$NodeName	This element contains the network event name.	
\$TrunkName	This element contains a description of the network event.	

The following table describes the circuit elements that the probe generates.

Table 9. Circuit elements		
Element Name	Element Description	
\$acksta	This element indicates the acknowledgement state. This attribute can take the following values:	
	0: The event has not been acknowledged.	
	1: The event has been acknowledged.	
\$catid	This element contains the identifier of the service category.	
\$cid	This element contains the identifier of the circuit.	
\$custid	This element contains the customer identifier.	
\$eventtime	This element contains the event time from AMS event table.	

Table 9. Circuit elements (continued)		
Element Name	Element Description	
\$eventtype	This element indicates the circuit event as described in the amsevent table. This attribute can take the following values:	
	21: The circuit has broken.	
	22: The circuit has recovered.	
	23: The circuit has been repaired.	
	24: The circuit has been restored.	
	41: The circuit has broken. This is a network terminating unit (NTU) line fault.	
	42: The circuit has broken. This is an NTU line fault.	
\$fltstate	This element indicates the fault status of the circuit. This attribute can take the following values:	
	0: The fault status is off.	
	1: The fault status is on.	
\$mtnevent	This element contains the maintenance status of the circuit.	
\$operid	This element contains the identifier of the operator.	
\$rmstate	This element contains the recovery status of the circuit.	
\$sa	This element contains the service alarm status of the circuit as one of the following values:	
	0: The service alarm is off.	
	1: The service alarm is on.	
Active Extended Faulty Circuits Data		
\$CircuitName	This element contains the circuit name.	
\$CustomerName	This element contains the customer name.	

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* (SC14-7608).

Table 10. Error messages			
Error	Description	Action	
Cannot connect to <i>host</i>	There is a problem connecting to the host.	Check that the host is running. If it is, try using the IP address instead of the host name.	
Connection in unknown state	There is a problem with the connection between the probe and the fault adapter.	Check that the fault adapter is working correctly. If it is, restart the probe.	
Connection closed	The probe lost its connection to the target system.	Check that the Tellabs 8000 host is running correctly.	
Connection closed during expect call	The probe failed to receive data from the target system while logging in.	Make sure your authentication information is correct and connection to the host is not lost.	
Failed to connect - aborting	The ObjectServer is not available.	Check that the ObjectServer is running, that the interfaces file on the system where the probe is installed has an entry for the ObjectServer, and that there is no networking problem between the two systems.	
Failed to inform Process Agent of status - aborting	The probe was unable to inform the process agent that it is running.	Restart the probe.	
Failed to process arguments	These are internal errors.	Contact IBM Software Support.	
Failed to initialize probe API			
Session create failed - aborting			
Failed to retrieve value for property: property_name	The value for the named property has not been set correctly.	Check the properties file for the named property, and adjust its value accordingly.	
Failed to read rules - aborting	A property or command-line option is pointing to a non-existent rules file.	Check that the command-line option or the properties file refers to the correct rules file.	
Failed to send command command	When the probe tried to log in or log out of the host, a chat command failed. The given <i>command</i> is the one the probe failed to send.	Check that the host you are connecting to is running correctly.	

Table 10. Error messages (continued)			
Error	Description	Action	
Fault buffer memory alloc error	The probe failed to allocate internal storage.	Make more memory available.	
Failed to allocate memory			
Hearbeat Timeout number_of_seconds is larger than Heartbeat Interval number_of_seconds	The heartbeat timeout has been set to a value that is greater than the heartbeat interval.	Adjust the values set for the HeartbeatTimeout and HeartbeatInterval properties so that the length specified for the heartbeat timeout is not larger than the heartbeat interval.	
Login/Logout timed out after <i>number</i> seconds Protocol timed out	The probe timed out while trying to log in to the host.	Check that the Tellabs 8000 host is running correctly.	
after <i>number</i> seconds			
Read error from switch	The probe read a message from the target switch but it could not interpret the message.	Check that the fault adapter is working correctly.	
SendAlert failed	The probe was unable to send an alert to the ObjectServer.	Check that the ObjectServer is available.	
Tellabs fault adapter may be down	There is a problem connecting to the fault adapter.	Check that the fault adapter is running properly. You may need to restart the Tellabs 8000 INM system.	
SessionProcess failed %d	The probe was unable to process the alert against the rules file.	Contact IBM Software Support.	
Unable to get events	If this message was sent at startup, it indicates that there was a problem initializing the connection due to insufficient memory.	Check that the ObjectServer is running and check the connection between the Tellabs 8000 host and the host running the ObjectServer.	
	If this message was sent after some events had been parsed, it indicates that there was a connection failure.	Then try again to run the probe.	
Unable to open stream capture file <i>file_name</i>	The probe was unable to open the stream capture file indicated by the error message.	Check that the file permissions have been set correctly.	
Unable to log in to host_name : port_number	The probe could not log in to the host on the port indicated in the error message.	Check the values set for the Host and Port properties.	

Table 10. Error messages (continued)		
Error	Description	Action
Unable to compile regexp for <i>string</i>	A regular expression is incorrectly formed in the rules file.	Check the rules file for the regular expression indicated and correct the entry.
Unable to log in to switch number	The probe was unable to log in to the switch.	Check that the properties are set correctly.
Unknown byte swap requested for size <i>size</i>	This is an internal error.	Contact IBM Software Support.
Unknown connection error Unknown expect connection error	The probe is working correctly but a library used by the probe has been changed.	Contact IBM Software Support.

ProbeWatch 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 probe Watch error messages that the probe generates. For information about generic error messages, see the *IBM Tivoli Netcool/OMNIbus Probe and Gateway Guide* (SC14-7608).

Table 11. ProbeWatch messages		
ProbeWatch message	Description	Triggers or causes
Cannot connect to <i>host</i>	The probe cannot connect to <i>host</i> .	The connection might be blocked by a firewall or the hostname is incorrect.
Connection inactive	The connection between the probe and the fault adapter is inactive.	The read timeout period has expired and heartbeating is not in use to help restore the connection.
Established connection host	The probe successfully connected to the given <i>host</i> .	The probe has connected to the Tellabs 8000 INM system.
Finished reading incoming alarms	The resynchronization process completed successfully.	The probe has connected to the Tellabs 8000 INM system and successfully resynchronized with all active alarms.
Going Down	The probe is shutting down.	The probe is shutting down after performing the shutdown routine.
Running	The probe is running normally.	The probe has just been started up.

Table 11. ProbeWatch messages (continued)		
ProbeWatch message	Description	Triggers or causes
Status field value of <i>status</i> not valid for msgtype <i>msgtype</i>	The status of a received message was not equal to 1 (Success).	The fault adapter may be unavailable.
Timed out while trying to connect to <i>host</i>	The probe's response timeout period expired while connecting to the given <i>host</i> .	The host has not responded to the probe within the time specified by the ResponseTimeout property.
Tellabs fault adapter may be down	The status of a received message was not equal to 1 (Success).	The fault adapter may be unavailable.
Unable to get events	A problem occurred while trying to receive events.	If this message was sent at startup, it indicates that there was a problem initializing the connection due to insufficient memory.
		If this message was sent after some events had been parsed, it indicates that there was a connection failure.
Unable to remove process ID file pid_file_location.	The probe was unable to remove the file <i>pid_file_location</i> .	The probe does not have permission to remove the file, the file does not exist, the file location does not exist, or the file is not in the specified location.
Unable to write process ID file, pid_file_location	The probe was not able to open the file <i>pid_file_location</i> for writing.	The probe does not have permission to write to the file, the file does not exist, the file location does not exist, or the file is not in the specified location.

Running the probe

Before running the probe for the first time, you must specify a minimum set of properties.

You must specify the host name and port number of the server on which Tellabs 8000 INM is running using the **Host** and **Port** properties.

To start the probe, use the following command:

\$OMNIHOME/probes/nco_p_tellabs_8000

Appendix A. Notices and Trademarks

This appendix contains the following sections:

- Notices
- Trademarks

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