

Netcool/OMNIbus Probe for Lucent ITM-
NM/OMS
6.0

Reference Guide
April 28, 2016



Note

Before using this information and the product it supports, read the information in [Appendix A, “Notices and Trademarks,”](#) on page 15.

Edition notice

This edition (SC23-7876-03) applies to version 6.0 of IBM Tivoli Netcool/OMNIbus Probe for Alcatel-Lucent ITM-NM/OMS and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC23-7876-02.

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

The IBM Tivoli Netcool/OMNIBUS Probe for Alcatel-Lucent ITM-NM/OMS documentation is provided in softcopy format only. To obtain the most recent version, visit the IBM® Tivoli® Knowledge Center.

Table 1. Document modification history

Document version	Publication date	Comments
SC23-7876-01	December 31, 2008	Summary table updated. IPv6 support information added. FIPS information added. Installation section added.
SC23-7876-02	April 30, 2009	Summary section updated.
SC23-7876-03	April 28, 2016	Summary section updated. References to peer-to-peer functionality removed from guide.

Chapter 1. Probe for Alcatel-Lucent ITM-NM/OMS

Lucent G2 is a protocol common to Lucent management solutions. It is used by the Lucent XMC interface to collect data from the IBM Tivoli Netcool/OMNIbus Probe for Alcatel-Lucent ITM-NM/OMS. The Probe for Alcatel-Lucent ITM-NM/OMS collects data from the Lucent XMC interface.

The Lucent XMC interface can also collect data from the Lucent Integrated Transport Management - Network Manager (ITM-NM). For details of the probe that can acquire this data, see the Probe for Lucent ITM-NM guide.

This guide contains the following sections:

- [“Summary” on page 1](#)
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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 Probe for Alcatel-Lucent ITM-NM/OMS.

Probe target	Alcatel-Lucent ITM-NM / 1350 OMS R9.6 and R11.1 using G2 Protocol
Probe executable name	nco_p_lucent_g2itm_nm
Patch number	6.0
Probe supported on	For details of supported operating systems, see the following Release Notice on the IBM Software Support Website: https://www-304.ibm.com/support/docview.wss?uid=swg21414865
Properties file	\$OMNIHOME/probes/arch/ nco_p_lucent_g2itm_nm.props
Rules file	\$OMNIHOME/probes/arch/ nco_p_lucent_g2itm_nm.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.

<i>Table 2. Summary (continued)</i>	
Connection method	TCP/IP
Remote connectivity	The Probe for Alcatel-Lucent ITM-NM/OMS can connect to a device on a remote host. Details of the remote host are specified using the Host and Port properties in the properties file.
Multicultural support	Not Available
Peer-to-peer failover functionality	Not 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 the probe

All probes follow a very similar installation procedure.

Installing the probe

To install the Probe for Alcatel-Lucent ITM-NM/OMS, run the following command:

```
$OMNIHOME/install/nco_patch -install patch
```

Where *patch* is the file name of the patch that you have downloaded.

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 Probe for Alcatel-Lucent ITM-NM/OMS connects to the XMC interface on the Lucent ITM-NM using the TCP/IP protocol. The data is parsed into Netcool/OMNIBus events and forwarded to the ObjectServer. The interface must be set up correctly by a qualified Lucent engineer for the probe to work with Lucent ITM-NM. The Lucent ITM-NM platform has the interface embedded, but it requires licensing and configuration.

Lucent Optical Management System (OMS)

Lucent OMS replaces the network management system of which Lucent ITM-NM forms a part. The Probe for Lucent ITM-NM/OMS supports both Lucent ITM-NM and Lucent OMS. The lookup table in the rules file supplied with the probe supports Lucent OMS 3.2.

Note : The probe only accesses the lookup table in the rules file if there is no alarm description available in the \$txt element. This means that if new alarms are added by Lucent, the lookup table in the rules file will not need updating.

Event data

When initialization is complete the ITM-NM/OMS starts to generate a log file of all alarms. When the Probe for Alcatel-Lucent ITM-NM/OMS successfully logs into the XMC interface on the ITM-NM/OMS host machine, a synchronization process starts and the content of the log file is sent to the XMC interface. This interface generates an alarm event for each alarm message received. The alarm events use the G2 format and are acquired by the Probe for Alcatel-Lucent ITM-NM/OMS. When synchronization is complete all the new messages are sent to the XMC interface and are then acquired by the Probe for Alcatel-Lucent ITM-NM/OMS.

The ITM-NM/OMS sends two types of messages to the XMC interface:

- Alarm messages
- Heartbeat messages

The following section describes the format of the alarm events that the XMC interface sends when these messages are received.

Note : After sending the alarm event the XMC interface does not provide an acknowledgement to the ITM-NM/OMS.

Lucent ITM-NM/OMS alarm messages

ITM-NM/OMS alarm messages are sent to the XMC interface under the following conditions:

- During the synchronization following a successful login by the Probe for Lucent ITM-NM/OMS
- When a new active alarm occurs
- When a clear operation on a previous alarm occurs

The XMC interface then generates alarm events. There are several different alarm events generated; this section contains examples for two of these. Other event headers are recognized according to the setting of the **AlarmHeaders** property. For more detailed descriptions of the following alarm events and their values, refer to your Lucent G2 documentation.

The XMC interface then generates alarm events. The format of the event is:

```
ae
t < numeric>
s < C | A>
tm < string>
sv < P | D | I>
n < string>
af < SA | NSA>
cla < string>
clz < string>
pa < string>
clf < string>
< 012>< 012>
```

The following table describes the format of the Lucent ITM-NM alarm event fields.

Table 3. Lucent ITM-NM alarm event fields

Field Name	Values	Description
t	<i>numeric</i>	This field specifies the sequence number tag. The tag is increased each time a regular alarm message is sent, including alarm clears.
s	<i>C A</i>	This field specifies the state of the alarm. Possible values are: C (clear) A (active)
tm	<i>string</i>	This field specifies the time stamp. The format is MM-DD-YYYY HH:MM:SS.
sv	<i>P D I</i>	This field specifies the alarm severity. Possible values are: P (Prompt) D (Deferred), and I (Information) These values are related to major, minor, and warning.
n	<i>string</i>	This field specifies the name or description of the alarm. This is provided by the EMS to identify the probable cause.
af	<i>SA</i>	This field specifies the NSA Service Affecting flag. Possible values are: SA (Service Affecting) and NSA (Non-Service Affecting)
cla	<i>string</i>	This field identifies the network element (A element) that reported the alarm.
clz	<i>string</i>	This field identifies the network element (Z element) at the other end of the path/circuit that is affected by the alarm generated by the A element. This field may be blank when no path/circuit is associated with the A element and the port address (pa) can be found.

<i>Table 3. Lucent ITM-NM alarm event fields (continued)</i>		
Field Name	Values	Description
pa	<i>string</i>	This field specifies the physical port address.
clf	<i>string</i>	This field contains the circuit identifier. This field may be blank when no path/circuit associated with the A element and the port address (pa) can be found.

Heartbeat alarms

Heartbeat messages are used to signal the health of the interface. Heartbeat messages are sent at regular time intervals, independent of the occurrence of alarms. The frequency of the heartbeat message can be configured at installation time. The default is one minute.

In addition to regular heartbeat messages, the start initialization message is preceded by a heartbeat message. The Lucent ITM-NM heartbeat message has the following format:

```
ae
tm <string>
n <THE LINK IS UP>
<012><012>
```

The following table describes the heartbeat event fields and corresponding values.

<i>Table 4. Lucent ITM-NM heartbeat event fields</i>		
Field Name	Values	Description
tm	<i>string</i>	This field specifies the time stamp. The format is MM-DD-YYYY HH:MM:SS.
n	THE LINK IS UP	This field contains a description of the alarm.

Exclusions

The following alarms are not forwarded as alarm events from the XMC interface:

- Equipment alarms that cannot be related to (physical) ports (for example, power failure).
- Threshold Crossing Alerts whose reporting can be configured per port.
- Environmental alarms
- Loss of communication between NM and managed entities.

Probe operation

The probe receives alarms events from ITM-NM/OMS workstations using the XMC interface.

XMC interface

The XMC interface is a software interface on ITM-NM/OMS workstations that allows communication with Netcool/OMNIbus. The XMC interface and the Probe for Alcatel-Lucent ITM-NM/OMS communicate through a TCP/IP connection.

The XMC interface provides for a unidirectional transfer of alarm data from the ITM-NM/OMS to the Probe for Alcatel-Lucent ITM-NM/OMS. When the probe logs in to the interface a session starts. All current active alarms in the ITM-NM/OMS are transferred to the probe by means of a synchronization procedure. Subsequent alarms are forwarded as they occur. Alarm and alarm-clears are supported.

A heartbeat message is sent by the ITM-NM/OMS to allow monitoring of the communication link. A session is terminated by (voluntarily or involuntarily) disconnection of the TCP/IP communication link.

Alarms are sent once, and are not re-transmitted. Re-transmission of alarms may occur because of synchronization after recovery from failure. Threshold Crossing Alert data (TCAs) are not forwarded through the XMC interface. The XMC interface provides no mechanisms to acknowledge alarms.

XMC operational states

The Probe for Alcatel-Lucent ITM-NM/OMS operates in the following states:

- Login
- Initialization
- Normal

The following sections describe the process sequence of the probe through each of the states. When the probe starts, it reads the rules and properties files, and then enters the Login state.

Login state

For security reasons, access to Lucent ITM-NM is protected by a login process. Lucent ITM-NM sends a denial message and drops the connection if the login process fails.

The Probe for Lucent ITM-NM/OMS initiates the communication to Lucent ITM-NM by setting up the TCP/IP connection and sending out a login request message.

The format of the ITM-NM/OMS login message is:

```
logreq
orig_id <string>
dest_id <string>
login <string>
pswd <string>
tm <string>
<014><014>
```

The following table describes the login request fields and corresponding values.

<i>Table 5. Lucent ITM-NM login request and response fields</i>		
Field Name	Values	Description
orig_id	<i>string</i>	This field contains the originator identifier for the request.
dest_id	<i>string</i>	This field contains the destination identifier the request.
login	<i>string</i>	This field contains the user login ID.
pswd	<i>string</i>	This field contains the password.
tm	<i>string</i>	This field contains a time stamp. The format is MM-DD-YYYY HH:MM:SS.

Field Name	Values	Description
stat	C D S	This field contains a status identifier. Possible values are: C (login completed) D (login denied), and S (login suspended)
c	<i>string</i>	This field contains the message string for the denied login.

The Lucent ITM-NM responds with a login response message. The format of the response is:

The format of the response is:

```
logrsp
orig_id <string>
dest_id <string>
tm <string>
stat <C | D | S>
c <string>
<012><012>
```

On successful completion of the Login state, the probe proceeds to the Initialization state.

Lucent ITM-NM initialization state

After a successful login the ITM-NM/OMS sends all active network events across the XMC interface. The ITM-NM/OMS sends the network events that are active at the time the start resynchronization message is sent to the probe.

The start resynchronization message has the following format:

```
resync_event
ne_tid <string>
resync_type <D | F>
phase <string>
msgno <long integer>
<012><012><012>
```

The following table describes the start resynchronization message fields and corresponding values.

Field Name	Values	Description
ne_tid	<i>string</i>	Network element identifier.
resync_type	<i>D F</i>	Type of resynchronization.
phase	<i>string</i>	Event phase.
msgno	<i>long integer</i>	Message number.
i2000_tid	<i>string</i>	Lucent ITM-NM/OMS identifier.
time	<i>long integer</i>	Time.

Table 6. Lucent ITM-NM/OMS Start and End Resynchronization Fields (continued)

Field Name	Values	Description
stat	C D S	Status. Possible values are: C: Login completed. D: Login denied. S: Login suspended.
errcode	string	Error code.

If new alarms occur when the resynchronization procedure is in progress, those alarms are notified after the resynchronization process is completed.

On successful completion of the Resynchronization state, the probe proceeds to the Normal state.

Normal state (alarm monitoring)

The Normal state is the standard operating state of the probe. All new events generated by the ITM-NM/OMS are monitored by the probe and forwarded as alerts to the ObjectServer.

Once all of the synchronization events have been sent, the ITM-NM/OMS starts to send network events and heartbeat messages to indicate the current status of the managed network.

Alerts are sent to the ObjectServer for events that indicate alarms being raised, cleared or acknowledged.

Loss of connection between the probe and Lucent ITM-NM/OMS

If the ITM-NM/OMS or the LAN develops a fault, the socket connection between ITM-NM/OMS and the Probe for Alcatel-Lucent ITM-NM/OMS is lost.

If no events have been received, including the heartbeat events, within the period set by the **G2IdleHeartbeatTimeout** property, the Probe for Alcatel-Lucent ITM-NM/OMS assumes the socket connection has been lost. The probe sends the following ProbeWatch message:

```
We've been idle for xx seconds
```

Where, xx is the defined timeout period.

After the **G2IdleHeartbeatTimeout** property has elapsed the probe checks the period specified by the **G2RestartOnIdleTimeout** property. If this property is set to 0, the probe restarts the timeout period. If it is set to 1, the probe disconnects from the ITM-NM/OMS.

Reconnection between the probe and the Lucent ITM-NM/OMS

After the **G2RestartOnIdleTimeout** property has caused the probe to disconnect from the ITM-NM/OMS machine, the probe checks the **G2ReconnectTimeout** property. If this property has been set to a time period greater than 0, the probe waits for this period and then restarts itself. During the restart the probe tries to establish a new connection to the ITM-NM/OMS machine.

As the probe is restarted the ProbeWatch message `Restarting idle connection` is sent. When the connection has been made, the Probe for Alcatel-Lucent ITM-NM/OMS logs in and receives all of the current network events from the ITM-NM/OMS machine. Each event received by the Probe for Alcatel-Lucent ITM-NM/OMS during the initialization process is sent to the ObjectServer to re-synchronize the event list.

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
AlarmHeaders <i>string</i>	-alarmheaders <i>string</i>	Use this property to indicate the header of an event. The default is 'ae\n'.
DateFormat <i>string</i>	-dateformat <i>string</i> -usedateformat (equivalent to -dateformat %m-%d-%Y) -eudateformat (equivalent to -dateformat %d-%m-%Y) -intdateformat (equivalent to -dateformat %Y-%m-%d)	Use this property to specify the date format as used by <code>strptime()</code> . The default is %m-%d-%Y. Note : For full details of the <code>strptime()</code> function, see the <code>strptime()</code> man page on UNIX.
G2IdleHeartbeatTimeout <i>integer</i>	-g2idleheartbeattimeout <i>integer</i>	Use this property to set the time (in seconds) the probe allows the system to be idle before a ProbeWatch message is sent to the ObjectServer. The default is 0 (probe does not send idle ProbeWatch messages).
G2ReconnectTimeout <i>integer</i>	-g2reconnecttimeout <i>integer</i>	Use this property to set the time (in seconds) the probe waits before trying to reconnect to the system. The default is 0 (probe does not attempt to reconnect to the system).
G2RestartOnIdleTimeout <i>integer</i>	-g2norestartonidle timeout <i>integer</i> (equivalent to G2RestartOnIdleTimeout with a value of 0). -g2restartonidletimeout (equivalent to G2RestartOnIdleTimeout with a value of 1)	Use this property to specify whether the probe disconnects from the device after an idle timeout: 0: The probe disconnects. 1: The probe sends a ProbeWatch message and restarts the idle timer. The default is 0.

Table 7. Properties and command line options (continued)

Property name	Command line option	Description
Host <i>string</i>	-host <i>string</i>	Use this property to specify the host to which the probe connects. The default is localhost.
LineFormat <i>string</i>	-lineformat <i>string</i>	Use this property to format each line of the event. The default is \t%f\t%v\n. Note : %f indicates a field; %v indicates a field value.
LocalID <i>string</i>	-localid <i>string</i>	Use this property to specify the IP address of local machine interface. The default is " ".
Login <i>string</i>	-login <i>string</i>	Use this property to specify the login ID. The default is tim.
MessageTerminator <i>string</i>	-messageterminator <i>string</i>	Use this property to specify the regular expression that indicates the end of the message. The default is \n\n.
OutputTerminator <i>string</i>	-outputterminator <i>string</i>	Use this property to specify the regular expression the probe adds to outgoing G2 messages to indicate the end of the message. The default is \r\r.
Password <i>string</i>	-password <i>string</i>	Use this property to specify the login password. The default is tim123.
Port <i>integer</i>	-port <i>integer</i>	Use this property to specify the port to which the probe connects. The default is 2212.
RemoteID <i>string</i>	-remoteid <i>string</i>	Use this property to specify the Remote identifier. The default is " ".

Table 7. Properties and command line options (continued)

Property name	Command line option	Description
StreamCapture <i>integer</i>	<code>-streamcapture <i>integer</i></code>	Use this property to specify whether the probe captures all raw data sent from the device: 0: Stream capture is disabled. 1: Stream capture is enabled. The default is 0. Note : If you set this property to 1, you must specify the file to store the data using the StreamCaptureFilename property.
StreamCaptureFilename <i>string</i>	<code>-streamcapturefilename <i>string</i></code>	Use this property to specify the file the probe uses to store the input stream log. The default is \$OMNIHOME/var/lucent_g2itm_nm.Stream. This property is required if you set the StreamCapture property to 1.

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 Probe for Alcatel-Lucent ITM-NM/OMS generates. Not all the elements described are generated for each event; the elements that the probe generates depends upon the event type.

Table 8. Elements

Element name	Element description
\$af	This element contains service affecting flags. Possible values are: SA: Service Affecting NSA: Non Service Affecting
\$a1	This element contains extra parameters related to the alarm. This data originates from the addInfo field in Lucent OMS. Note : This element is only generated when the probe acquires data from Lucent OMS.

Table 8. Elements (continued)

Element name	Element description
\$cat	This element contains the category of the alarm. Possible values are: <ul style="list-style-type: none"> • ENV • EQU • TRM • QOS • PRC
\$cla	This element contains the A element. This is the network element that reported the alarm.
\$clf	This element contains the circuit identifier.
\$clz	This contains the Z element. This is the network element at the opposite end of the path/circuit that is affected by the alarm generated by the A element.
\$n	This element contains the name or description of alarm.
\$s	This element contains the state of alarm. Possible values are: C: Clear A: Active
\$sv	This element contains the alarm severity. Possible values are: P: Prompt D: Deferred I: Information
\$t	This element contains the sequence number tag.
\$tm	This element contains a time stamp.
\$txt	This element contains an additional text string forwarded with the alarm. Note : This element is only generated when the probe acquires data from Lucent OMS.

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 9. Error messages

Error	Description	Action
Cannot create retry timer. Continuing without retries.	The probe is unable to create a retry timer. This message is generally preceded by more specific error messages.	Check any preceding messages.
Could not login: <i>Reason</i> Failed to initialize TIM connection	The probe was unable to log in to the XMC interface. This message is generally preceded by more specific error messages.	Check any preceding messages. Also, check that the username and password refer to a valid user account.
Failed to read message, incorrect header.	The message header from the device does not match that specified in the properties.	Ensure that the AlarmHeaders and the MessageTerminator properties are set correctly.
Failed to allocate time stamp string: <i>string</i> Failed to create logreq message Failed to create logrsp message Failed to send login request Cannot create g2 message structure	The probe is unable to perform the specified operation because of memory problems.	Make more memory available.
Failed to set Element \$ElementName: <i>Reason</i> Cannot create alive timeout Cannot create idle timeout Failed to setup signals Failed to initialize heartbeat Failed to initialize Failed to define argument: <i>argumentname</i> Failed to initialize arguments	These are internal errors.	Contact IBM Software Support.
Failed to read message, incorrect header.	The message header from the device does not match that specified in the properties.	Ensure that the AlarmHeaders and the MessageTerminator properties are set correctly.

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

Table 10. ProbeWatch messages

ProbeWatch message	Description	Triggers/causes
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.
Unable to get events	A problem occurred while trying to receive events.	Either there was a problem initializing the connection due to insufficient memory or (if this message was sent after some events had been parsed) there was a license or a connection failure.

Appendix A. Notices and Trademarks

This appendix contains the following sections:

- Notices
- Trademarks

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