Note
Before using this information and the product it supports, read the information in Appendix A, “Notices and Trademarks,” on page 19.

Edition notice
This edition (SC27-8705-00) applies to version 1.0 of IBM Tivoli Netcool/OMNibus Probe for Juniper Contrail and to all subsequent releases and modifications until otherwise indicated in new editions.

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Contents

About this guide.......................................................................................................................... v
Document control page.................................................................................................................. v
Conventions used in this guide....................................................................................................... v

Chapter 1. Probe for Juniper Contrail..................................................................................... 1
Summary........................................................................................................................................ 1
Installing probes............................................................................................................................ 2
SSL-based connectivity.................................................................................................................... 3
Running the probe.......................................................................................................................... 4
Data acquisition............................................................................................................................. 4
  Communicating using REST APIs............................................................................................ 4
  Performing a full resynchronization with a target system at startup.......................................... 5
  Specifying a query filter to send to the target system................................................................. 5
  Configuring the transport module.............................................................................................. 5
  Obtaining historical events from target system......................................................................... 6
  Data stream capture................................................................................................................... 7
  Support for Unicode and non-Unicode characters.................................................................. 7
  Peer-to-peer failover functionality............................................................................................ 8
Properties and command line options.......................................................................................... 8
Properties and command line options provided by the Java Probe Integration Library (probe-sdk-
  java) version 4.0....................................................................................................................... 12
Elements....................................................................................................................................... 14
Error messages............................................................................................................................. 16
ProbeWatch messages................................................................................................................... 16

Appendix A. Notices and Trademarks..................................................................................... 19
Notices........................................................................................................................................... 19
Trademarks................................................................................................................................. 20
About this guide

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 Probe for Juniper Contrail documentation is provided in softcopy format only. To obtain the most recent version, visit the IBM® Tivoli® Knowledge Center:


<table>
<thead>
<tr>
<th>Table 1. Document modification history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document version</td>
</tr>
<tr>
<td>SC27-8705-00</td>
</tr>
</tbody>
</table>

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>
<thead>
<tr>
<th>Operating system</th>
<th>Directory name represented by arch</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIX® systems</td>
<td>aix5</td>
</tr>
<tr>
<td>Red Hat Linux and SUSE systems</td>
<td>linux2x86</td>
</tr>
<tr>
<td>Linux for System z</td>
<td>linux2s390</td>
</tr>
<tr>
<td>Solaris systems</td>
<td>solaris2</td>
</tr>
<tr>
<td>Windows systems</td>
<td>win32</td>
</tr>
</tbody>
</table>

**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.
IBM Tivoli Netcool/OMNibus Probe for Juniper Contrail can acquire JavaScript Object Notification (JSON) events from REST APIs. It converts these events into Netcool/OMNibus events and sends them to the ObjectServer.

This guide contains the following sections:

• “Summary” on page 1
• “Installing probes” on page 2
• “Running the probe” on page 4
• “SSL-based connectivity” on page 3
• “Data acquisition” on page 4
• “Properties and command line options” on page 8
• “Properties and command line options provided by the Java Probe Integration Library (probe-sdk-java) version 4.0” on page 12
• “Elements” on page 14
• “Error messages” on page 16
• “ProbeWatch messages” on page 16

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 Juniper Contrail.

<table>
<thead>
<tr>
<th>Table 3. Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe target</td>
</tr>
<tr>
<td>Probe executable name</td>
</tr>
<tr>
<td>Probe installation package</td>
</tr>
<tr>
<td>Package version</td>
</tr>
<tr>
<td>Probe supported on</td>
</tr>
<tr>
<td>Properties file</td>
</tr>
<tr>
<td>Rules file</td>
</tr>
<tr>
<td>WebSocket Transport Module properties file</td>
</tr>
</tbody>
</table>
### Table 3. Summary (continued)

<table>
<thead>
<tr>
<th>Requirements</th>
<th>For details of any additional software that this probe requires, refer to the description.txt file that is supplied in its download package.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection method</td>
<td>REST API</td>
</tr>
<tr>
<td>Multicultural support</td>
<td>Available</td>
</tr>
<tr>
<td>Peer-to-peer failover functionality</td>
<td>Not available</td>
</tr>
<tr>
<td>IP environment</td>
<td>IPv4 and IPv6</td>
</tr>
</tbody>
</table>

### 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:
   

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:


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.
SSL-based connectivity

The Probe for Juniper Contrail supports Secure Sockets Layer (SSL) connections between the probe and Juniper Contrail. SSL connections provide additional security when the probe retrieves alarms from the target systems.

To enable SSL connections, obtain the required SSL certificates and the Trusted Authority certificate from the Juniper Contrail server administrator. Add the certificates to a local Java™ keystore so that they can be referenced by the KeyStore property.

Prerequisites

The following tools are available to create the keystore:

- The OpenSSL toolkit.
  This is available from http://www.openssl.org/.
- The IBM KeyMan utility.
  This is available from http://www.alphaworks.ibm.com/tech/keyman/download.
- The Keytool toolkit.
  This is available in the JRE package.

Converting the key and certificate into PKCS12 format

If you have a key and a certificate from the server in separate files, you must combine them into a single PKCS12 format file to load into a new keystore. To convert the server certificate into PKCS12 format, use the following OpenSSL toolkit command:

```
openssl pkcs12 -export -inkey key_file -in cert_file -out cert_pkcs12
```

Where

- `key_file` is the key file retrieved from the server.
- `cert_file` is the certificate retrieved from the server.
- `cert_pkcs12` is the combined file in PKCS12 format for loading into the keystore.

Creating the SSL keystore

You can create a Java keystore using either the KeyMan utility or the Keytool utility.

To create a Java keystore using the KeyMan utility, follow these steps:

1. Start the KeyMan utility.
2. Click Create New and select the Keystore token option.
3. Click File > Import and choose the certificate that you retrieved from the server.
   This imports the certificate into the keystore.
4. Click File > Save and enter a password and name for the keystore; for example, `trusted_keystore.jks`.

To create a Java keystore using the Keytool utility, follow these steps:

1. Generate a keystore and self-signed certificate using the following command:

   ```
   keytool -genkey -keyalg RSA -alias alias_name -keystore keystore_file -storepass keystore_password -validity 360 -keysize 2048
   ```

2. Import the SSL certificate into the newly created Java keystore file using the following command:
3. Verify that the certificates are in a Java keystore using the following command:

```
keytool -list -v -keystore keystore_file
```

Enabling SSL connections

To enable SSL-based connections between the probe and the Element Management System (EMS) server, make the following changes to the `juniper_contrail.props` file:

1. Set the `EnableSSL` property to true.

   When the `EnableSSL` property is set to true, the following properties are enabled:
   - `KeyStore`
   - `KeyStorePassword`

2. Use the `KeyStore` property to specify the location of the keystore file.

3. Use the `KeyStorePassword` property to specify a password for the keystore.

   **Note:** You can encrypt the keystore file password using the `nco_aes_crypt` utility (for FIPS 104-2 mode security).

4. Set the `Port` property to the port that the probe uses for SSL connections.

Running the probe

Probes can be run in a variety of ways. The way you choose depends on a number of factors, including your operating system, your environment, and any high availability considerations that you may have.

For details about how to run the probe, visit the following page on the IBM Tivoli Knowledge Center:

```
```

Data acquisition

The probe acquires `MessageTable` messages objects from Juniper Contrail in JavaScript Object Notification (JSON) format using the Transport Module. It converts the JSON raw data into Netcool/OMNibus events and sends them to the ObjectServer.

Data acquisition is described in the following topics:

- “Communicating using REST APIs” on page 4
- “Performing a full resynchronization with a target system at startup” on page 5
- “Specifying a query filter to send to the target system” on page 5
- “Configuring the transport module” on page 5
- “Obtaining historical events from target system” on page 6
- “Data stream capture” on page 7
- “Support for Unicode and non-Unicode characters” on page 7
- “Peer-to-peer failover functionality” on page 8

Communicating using REST APIs

The Probe for Juniper Contrail uses the REST API to send HTTP requests or secure HTTPS requests. The probe uses the REST API to perform the following functions:

- Initiate the probe session and authenticate with Juniper Contrail
• Request a full or a filtered resynchronization
• Refresh the probe session before timeout
• Refresh the probe subscription to notifications before timeout

Performing a full resynchronization with a target system at startup

Resynchronization with a target system is configured by the following properties in the juniperContrailTransport.properties file:

• resyncRequestURI
• resyncRequestMethod
• resyncRequestContent

For details about these properties, see “Configuring the transport module” on page 5.

Specifying a query filter to send to the target system

When the probe sends requests to the target system for resynchronization, you can specify a query filter to limit the scope of the events that are returned.

You can filter the results of an API query by editing the resyncRequestContent property in the juniperContrailTransport.properties file:

```json
{"sort": 1, "start_time": ++StartTime++, "sort_fields": ["MessageTS"], "filter": [{"name": "Level", "value": "6", "op": 5, "suffix": null, "value2": null}], "end_time": ++EndTime++, "select_fields": ["Source", "NodeType", "MessageTS", "SequenceNum", "Category", "InstanceId", "ModuleId", "MessageType", "Type", "Level", "XmlMessage"], "table": "MessageTable" }
```

The sort and op query parameter can be changed to filter results.

For a list of available query options, refer to the Juniper website:

Configuring the transport module

The transport properties file defines how the probe receives events from the transport module.

Juniper Contrail transport properties file

The probe is packaged with the juniperContrailTransport.properties file which is a pre-configured transport properties file for the probe to retrieve faultInst objects from Juniper Contrail. This configuration file does not require customization, unless you have special requirements; for example, to define the scope of filters or refresh intervals.

To specify a different transport properties file, use the TransportFile property in the juniper_contrail.props file.

The configuration of the juniperContrailTransport.properties file supplied with the probe is based on the Juniper Contrail REST API specifications.

The following table describes the properties used to configure the juniperContrailTransport.properties file.
Table 4. Juniper Contrail transport properties

<table>
<thead>
<tr>
<th>Property name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>httpVersion</td>
<td>Use this property to specify the version of the HTTP protocol that the target system supports. For Juniper Contrail, this property is set to 1.1.</td>
</tr>
<tr>
<td>responseTimeout</td>
<td>Use this property to specify how long (in seconds) the probe waits for a response from the target system before timing out. For Juniper Contrail, this property is set to 120.</td>
</tr>
<tr>
<td>resyncRequestURI</td>
<td>Use this property to specify the URI that the probe uses to request a resynchronization with the target system at startup. For Juniper Contrail, set this property to /analytics/query.</td>
</tr>
<tr>
<td>resyncRequestMethod</td>
<td>Use this property to specify the message type that the probe sends to request a resynchronization with the target system. For Juniper Contrail, this property is set to POST.</td>
</tr>
<tr>
<td>resyncRequestContent</td>
<td>Use this property to specify any additional information that the probe sends with the resynchronization request. For Juniper Contrail, this property is set to {&quot;sort&quot;: 1, &quot;start_time&quot;: ++StartTime++, &quot;sort_fields&quot;: [&quot;MessageTS&quot;], &quot;filter&quot;: [{&quot;name&quot;: &quot;Level&quot;, &quot;value&quot;: &quot;6&quot;, &quot;op&quot;: 5, &quot;suffix&quot;: null, &quot;value2&quot;: null}], &quot;end_time&quot;: ++EndTime++, &quot;select_fields&quot;: [&quot;Source&quot;, &quot;NodeType&quot;, &quot;MessageTS&quot;, &quot;SequenceNum&quot;, &quot;Category&quot;, &quot;InstanceId&quot;, &quot;ModuleId&quot;, &quot;MessageType&quot;, &quot;Type&quot;, &quot;Level&quot;, &quot;XmlMessage&quot;], &quot;table&quot;: &quot;MessageTable&quot; }</td>
</tr>
</tbody>
</table>

Note: The ++StartTime++ and ++EndTime++ are placeholders for the start and end of a time window used in the query statement, and later replaced with runtime values accordingly.

Obtaining historical events from target system

Historical events are retrieved in batches by REST API requests (queries), sent in a serial manner, with each query covering an evenly partitioned time-line.

The following properties in the juniper_contrail.props are used:

- InitialResync
- InitialResyncWindow
- ResyncBatchTimespan
- UseLastResyncTimestamp

For details about these properties, see “Properties and command line options” on page 8 and “Properties and command line options provided by the Java Probe Integration Library (probe-sdk-java) version 4.0” on page 12.
When **InitialResync** is set to true, the probe performs resynchronization for historical data from a time window of the length specified by the **InitialResyncWindow** property. The RESTAPI module then sends multiple queries of a fragmented time frame, specified by the **ResyncBatchTimespan** property that covers the entire timeline of interest, with new queries starting one microsecond after the end time of the preceding query. By default, the initial resynchronization is offset to 3 days before probe startup, with a maximum time frame per query of 5 minutes over the timeline covered in initial resynchronization.

The start time of the initial resynchronization is determined by the following properties: **InitialResyncWindow** and **UseLastResyncTimestamp**. If **UseLastResyncTimestamp** is set to true, and there is a timestamp recorded in the $OMNIHOME/var/juniper_contrail.timestamp file, then the start time is one microsecond after that timestamp. If **UseLastResyncTimestamp** is set to false or there is no previously recorded timestamp, then the start time is the offset from probe startup time based on the length of **InitialResyncWindow**.

**Failure recovery on unsuccessful queries**

Some queries may timeout or fail because of system environment issues, such as connection stability. To prevent data loss, the probe retries these failed queries. If the probe detects the target system cannot be reached using ping, it perceives the connection as down and stops sending queries during this period to prevent wasted query retry attempts. The probe discards a query after four unsuccessful attempts.

**Data stream capture**

The probe can capture the stream of binary data from the EMS and store it in a file. The data can be used for debugging purposes, to develop new features for the probe, or to pass onto other management systems that require the same data.

To capture the data stream in log files, use the following procedure:

1. Set the value of the **StreamCapture** property to true.
2. Set the value of the **StreamCaptureFile** property to the full path of a directory to hold the data file.

**Notes:**

- Specify the full path to the file. For example:
  `/opt/IBM/tivoli/netcool/omnibus/var/juniper_contrail.stream`
- You cannot include variables such as $OMNIHOME in the directory path.
- The directory must exist. The probe does not create the directory if it does not exist.
3. If the probe is running, restart it.

The probe now writes stream data to the specified file.

**Note:** Capturing the data stream to a log file generates a lot of data, consuming a lot of disk space and other system resources. So use this feature with caution. As soon as you no longer require the capture of data, set the value of the **StreamCapture** property to false and restart the probe.

**Support for Unicode and non-Unicode characters**

The probe can process multibyte characters and so can display both Unicode and non-Unicode characters.

Use the following procedure to set up the probe to process multibyte characters:

1. Ensure that the device or EMS is configured to send data in the required format, for example, UTF-8.
2. Set the required locale on the system running the probe:
Table 5. Setting the locale for multibyte characters

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Procedure to set the locale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux and Unix</td>
<td>Set the locale by changing the values of the LANG and LC_ALL environment variables. For example, to set the locale to simplified Chinese in UTF-8, use the following commands:</td>
</tr>
<tr>
<td></td>
<td>export LANG=zh_CN.UTF-8</td>
</tr>
<tr>
<td></td>
<td>export LC_ALL=zh_CN.UTF-8</td>
</tr>
<tr>
<td>Windows</td>
<td>a. Open the Control Panel and double click on Regional and Language.</td>
</tr>
<tr>
<td></td>
<td>b. On the Formats tab, select the language from the list in Format.</td>
</tr>
<tr>
<td></td>
<td>c. On the Administrative tab, click Change system locale.</td>
</tr>
<tr>
<td></td>
<td>d. Select the language from the list in Current System Locale.</td>
</tr>
<tr>
<td></td>
<td>e. Click OK.</td>
</tr>
<tr>
<td></td>
<td>f. Click OK.</td>
</tr>
</tbody>
</table>

3. Configure the ObjectServer to enable the insertion of data that uses the required character set. The IBM Tivoli Netcool/OMNIbus Administration Guide shows how to create, configure, and run an ObjectServer in UTF-8 mode or using another character set.

4. Run the probe. If it is already running, restart it.

When running the probe on a Windows system using a UTF-8 character set, always specify the -utf8enabled command line option with a setting of TRUE. For all other character sets, omit the -utf8enabled command line option.

Peer-to-peer failover functionality

Peer-to-peer failover is not currently supported for this probe.

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 probe specific properties and command line options configured by the juniper_contrail.props file.

For information about default properties and command line options, see the IBM Tivoli Netcool/OMNIbus Probe and Gateway Guide.
<table>
<thead>
<tr>
<th>Property name</th>
<th>Command line option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnableSSL string</td>
<td>-noenablessl (This is equivalent to EnableSSL with a value of false.) -enablessl (This is equivalent to EnableSSL with a value of true.)</td>
<td>Use this property to specify whether SSL connectivity between the probe and the EMS server is enabled or disabled. This property takes the following values: false: SSL connectivity between the probe and the EMS server is disabled. true: SSL connectivity between the probe and the EMS server is enabled. The default is false.</td>
</tr>
<tr>
<td>Host string</td>
<td>-host string</td>
<td>Use this property to specify the host name or IP address of the instance to which the probe connects. For supported IP environments, see “Summary” on page 1. The default is “”.</td>
</tr>
<tr>
<td>InitialResyncWindow string</td>
<td>-initialresyncwindow string</td>
<td>Use this property to offset the initial resynchronization to a specified point in the timeline before the probe starts up, which will be the start time of the first query. The supported format for this property is: xd yh zm Where d is days, h is hours, and m is minutes with x, y, and z being integers. Other supported formats allowed are single day, hour or minute values, or multiple values in sequential order from minutes to days. For example, the following formats are allowed: 59m, 11h 59m, or 13d 11h 59m. The maximum value is 14d and minimum value is 1m. The default is 3d.</td>
</tr>
<tr>
<td>KeyStore string</td>
<td>-keystore string</td>
<td>Use this property to specify the location of the keystore file that contains the client certificate for the SSL and trusted authority certificate. The default is “”.</td>
</tr>
<tr>
<td>Property name</td>
<td>Command line option</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>KeyStorePassword</strong></td>
<td><code>-keystorepassword string</code></td>
<td>Use this property to specify the password required to access the certificate specified by the <strong>KeyStore</strong> property.</td>
</tr>
</tbody>
</table>
|                         |                           | The default is "".
| **Note:** You can encrypt this password using the nco_aes_crypt utility within Netcool/OMNibus.                                                                                                                                       |
| **Port**                | `-port integer`           | Use this property to specify the host port of the instance of Juniper Contrail to which the probe connects.                                                                                                                          |
|                         |                           | The default is 8081.                                                                                                                                                                                                                 |
| **ResyncBatchTimespan** | `-resyncbatchtimespan integer` | Use this property to specify the maximum timespan (in minutes) per query over the timeline covered in the initial resynchronization.                                                                                                       |
|                         |                           | You can specify a value between 1 and 15.
<p>|                         |                           | The default is 5.                                                                                                                                                                                                                  |
| <strong>StreamCapture</strong>       | <code>-nostreamcapture (This is equivalent to StreamCapture with a value of false.)</code> | Use this property to specify whether the probe stores the event data received in a stream capture file.                                                                                                                              |
|                         | <code>-streamcapture (This is equivalent to StreamCapture with a value of true.)</code> | The default is false.                                                                                                                                                                                                               |
| <strong>StreamCaptureFile</strong>   | <code>-streamcapturefile string</code> | Use this property to specify the location of the stream capture file.                                                                                                                                                                 |
|                         |                           | The default is <code>${OMNIHOME}/var/juniper_contrail.stream</code>.                                                                                                                                                                             |
|                         |                           | On UNIX, if you specify an environment variable (for example, OMNIHOME) you must include it within curly brackets <code>{ }</code>.                                                                                                                  |
|                         |                           | On Windows operating systems, you must manually change this property value to: <code>%OMNIHOME%\var\juniper_contrail.stream</code>.                                                                                                              |
| <strong>TransformerFile</strong>     | <code>-transformerfile string</code> | Use this property to specify the location of the transformer file.                                                                                                                                                                   |
|                         |                           | The default is <code>${OMNIHOME}/java/conf/juniper_contrail _transformers.xml</code>.                                                                                                                                                           |</p>
<table>
<thead>
<tr>
<th>Property name</th>
<th>Command line option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TransportFile</strong></td>
<td>-transportfile string</td>
<td>Use this property to specify the location of the transport properties file. The default is <code>${OMNIHOME}/java/conf/juniperContrail Transport.properties</code> On UNIX, if you specify an environment variable (for example, OMNIHOME) you must include it within curly brackets <code>{ }</code>. On Windows operating systems, you must manually change this property value to: <code>%OMNIHOME%\java\conf\juniperContrailTransport.properties</code></td>
</tr>
<tr>
<td><strong>TransportType</strong></td>
<td>-transporttype string</td>
<td>Use this property to specify the transport method. The default is RESTAPI. <strong>Note:</strong> Currently RESTAPI is the only supported value for this property.</td>
</tr>
<tr>
<td><strong>UseLastResyncTimestamp</strong></td>
<td>-uselastresynctimestamp string</td>
<td>Use this property to specify whether the probe uses the last resynchronization timestamp as the starting point of the initial resynchronization. true: If the interval between the last event timestamp and the probe startup time is less than the maximum value allowed for the <strong>InitialResyncWindow</strong> property (14 days), then the probe will use the last resynchronization timestamp value as the starting point of the initial resynchronization. However, if the last resynchronization timestamp exceeds 14 days from the probe startup time, then the probe will offset the initial resynchronization starting time as specified by the <strong>InitialResyncWindow</strong> property. false: The probe will offset the initial resynchronization starting time as specified by the <strong>InitialResyncWindow</strong> property. The default is false.</td>
</tr>
</tbody>
</table>
Properties and command line options provided by the Java Probe Integration Library (probe-sdk-java) version 4.0

All probes can be configured by a combination of generic properties and properties specific to the probe. The following table describes the properties and command line options that are provided by the Java Probe Integration Library (probe-sdk-java) version 4.0.

**Note:** Some of the properties listed may not be applicable to your probe.

<table>
<thead>
<tr>
<th>Property name</th>
<th>Command line option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CommandPort</td>
<td>-commandport integer</td>
<td>Use this property to specify the port to which users can Telnet to communicate with the probe using the Command Line Interface (CLI) supplied. The default is 6970.</td>
</tr>
<tr>
<td>CommandPortLimit</td>
<td>-commandportlimit integer</td>
<td>Use this property to specify the maximum number of Telnet connections that can be made to the probe. The default is 10.</td>
</tr>
<tr>
<td>DataBackupFile</td>
<td>-databackupfile string</td>
<td>Use this property to specify the path to the file that stores data between probe sessions. The default is &quot;&quot;. <strong>Note:</strong> Specify the path relative to $OMNIHOME/var.</td>
</tr>
<tr>
<td>HeartbeatInterval</td>
<td>-heartbeatinterval integer</td>
<td>Use this property to specify the frequency (in seconds) with which the probe checks the status of the host server. The default is 60.</td>
</tr>
<tr>
<td>Inactivity</td>
<td>-inactivity integer</td>
<td>Use this property to specify the length of time (in seconds) that the probe allows the port to receive no incoming data before disconnecting. The default is 0 (which instructs the probe to not disconnect during periods of inactivity).</td>
</tr>
<tr>
<td>Property name</td>
<td>Command line option</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>InitialResync</strong></td>
<td><code>-initialresync string</code></td>
<td>Use this property to specify whether the probe requests all active alarms from the host server on startup. This property takes the following values: false: The probe does not request resynchronization on startup. true: The probe requests resynchronization on startup. For most probes, the default value for this property is false. If you are running the JDBC Probe, the default value for the <code>InitialResync</code> property is true. This is because the JDBC Probe only acquires data using the resynchronization process.</td>
</tr>
<tr>
<td><strong>MaxEventQueueSize</strong></td>
<td><code>-maxeventqueue sizeinteger</code></td>
<td>Use this property to specify the maximum number of events that can be queued between the non native process and the ObjectServer. The default is 10000. <strong>Note:</strong> You can increase this number to increase the event throughput when a large number of events is generated.</td>
</tr>
<tr>
<td><strong>ResyncInterval</strong></td>
<td><code>-resyncinterval integer</code></td>
<td>Use this property to specify the interval (in seconds) at which the probe makes successive resynchronization requests. For most probes, the default value for this property is 0 (which instructs the probe to not make successive resynchronization requests). If you are running the JDBC Probe, the default value for the <code>ResyncInterval</code> property is 60. This is because the JDBC Probe only acquires data using the resynchronization process.</td>
</tr>
<tr>
<td><strong>RetryCount</strong></td>
<td><code>-retrycount integer</code></td>
<td>Use this property to specify how many times the probe attempts to retry a connection before shutting down. The default is 0 (which instructs the probe to not retry the connection).</td>
</tr>
</tbody>
</table>
Table 7. Properties and command line options (continued)

<table>
<thead>
<tr>
<th>Property name</th>
<th>Command line option</th>
<th>Description</th>
</tr>
</thead>
</table>
| RetryInterval integer | -retryinterval integer          | Use this property to specify the length of time (in seconds) that the probe waits between successive connection attempts to the target system.  
The default is 0 (which instructs the probe to use an exponentially increasing period between successive connection attempts, for example, the probe will wait for 1 second, then 2 seconds, then 4 seconds, and so forth). |
| RotateEndpoint string | -rotateendpoint string          | Use this property to specify whether the probe attempts to connect to another endpoint if the connection to the first endpoint fails.  
This property takes the following values:  
false: The probe does not attempt to connect to another endpoint if the connection to the first endpoint fails.  
true: The probe attempts to connect to another endpoint if the connection to the first endpoint fails.  
The default is false. |

**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 generates. Not all the elements described are generated for each event. The elements that the probe generates depend on the event type.

Table 8. Elements

<table>
<thead>
<tr>
<th>Element name</th>
<th>Element description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Category</td>
<td>This element indicates the category type.</td>
</tr>
<tr>
<td>$Endpoint</td>
<td>This element indicates the endpoint.</td>
</tr>
<tr>
<td>$InstanceId</td>
<td>This element displays the Instance ID, a unique identifier for an instance of the probe</td>
</tr>
<tr>
<td>Element name</td>
<td>Element description</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>$Level</td>
<td>This element indicates the message level of the fault. The level can take one of the following values: 0: SYS_EMERG, 1: SYS_ALERT, 2: SYS_CRIT, 3: SYS_ERR, 4: SYS_WARN, 5: SYS_NOTICE, 6: SYS_INFO</td>
</tr>
<tr>
<td>$LogMessage</td>
<td>This element displays the event log message transformed from $Xmlmessage. The transformation is performed by the file specified by the TransformerFile property.</td>
</tr>
<tr>
<td>$NodeType</td>
<td>This element indicates the node type.</td>
</tr>
<tr>
<td>$MessageTS</td>
<td>This element displays the event message timestamp.</td>
</tr>
<tr>
<td>$Messagetype</td>
<td>This element indicates the event message type.</td>
</tr>
<tr>
<td>$ModuleId</td>
<td>This element displays the module ID.</td>
</tr>
<tr>
<td>$Source</td>
<td>This element indicates the event source.</td>
</tr>
<tr>
<td>$SequenceNum</td>
<td>This element displays the sequence number.</td>
</tr>
<tr>
<td>$Type</td>
<td>This element displays the fault type raised by the system. The fault can be one of the following types: 0: INVALID, 1: SYSTEM, 2: REQUEST, 3: ESPONSE, 4: TRACE, 5: BUFFER, 6: UVE, 7: OBJECT, 8: FLOW, 9: TRACE_OBJECT, 10: SYSLOG, 11: ALARM</td>
</tr>
<tr>
<td>$TransformerName</td>
<td>This element displays the Transformer Name.</td>
</tr>
</tbody>
</table>
### Table 8. Elements (continued)

<table>
<thead>
<tr>
<th>Element name</th>
<th>Element description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Xmlmessage</td>
<td>This element displays event log messages from the device under Contrail's system monitoring.</td>
</tr>
</tbody>
</table>

### 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*.

<table>
<thead>
<tr>
<th>Error</th>
<th>Description</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed to close stream capture file</td>
<td>The probe failed to close the stream capture file properly during shutdown. The stream capture file may have become corrupted.</td>
<td>Ensure that no other process is accessing and writing to the stream capture file while the probe is running.</td>
</tr>
<tr>
<td>Failed to open stream capture file</td>
<td>The probe failed to initialize logging into the stream capture file during probe startup.</td>
<td>Ensure that the directory specified by the <strong>StreamCaptureFile</strong> property has the required user permissions and adequate space for logging.</td>
</tr>
<tr>
<td>Failed to write to stream capture file</td>
<td>The probe failed to write raw data into the stream capture file.</td>
<td>Ensure there is sufficient space available for the file specified by the <strong>StreamCaptureFile</strong> property.</td>
</tr>
<tr>
<td>Exception while parsing JSON message</td>
<td>The probe parser encountered an error while parsing the JSON message payload into probe elements.</td>
<td>Enable stream capture by setting the <strong>StreamCapture</strong> property to true and verify that the raw JSON message has the correct syntax. Contact the vendor if the problem persists.</td>
</tr>
<tr>
<td>IO exception while parsing JSON message</td>
<td>The probe encountered an <strong>IOException</strong> when initializing a JSON parser.</td>
<td>Contact IBM Software Support for troubleshooting.</td>
</tr>
</tbody>
</table>

### 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*.
<table>
<thead>
<tr>
<th>ProbeWatch message</th>
<th>Description</th>
<th>Triggers/causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed to open stream capture file</td>
<td>The probe failed to initialize logging into the stream capture file during probe startup.</td>
<td>The probe user does not have the required permission to access the file specified by the StreamCaptureFile property.</td>
</tr>
<tr>
<td>Failed to write to stream capture file</td>
<td>The probe failed to write raw data to the stream capture file.</td>
<td>There is insufficient space available for the file specified by the StreamCaptureFile property.</td>
</tr>
<tr>
<td>Failed to close stream capture file</td>
<td>The probe failed to close the stream capture file properly during shutdown. The stream capture file may become corrupted.</td>
<td>Another process was accessing and writing to the file specified by the StreamCaptureFile property while the probe was still running.</td>
</tr>
</tbody>
</table>
Appendix A. Notices and Trademarks

This appendix contains the following sections:

- Notices
- Trademarks

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