

IBM® Tivoli® Netcool/OMNIbus Probe for  
Juniper Contrail  
1.0

*Reference Guide*  
*December 10, 2015*



**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.

© **Copyright International Business Machines Corporation 2015.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

---

# 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:

<https://www.ibm.com/support/knowledgecenter/SSHTQ/omnibus/probes/common/Probes.html>

| Document version | Publication date  | Comments               |
|------------------|-------------------|------------------------|
| SC27-8705-00     | December 10, 2015 | First IBM publication. |

### 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.

| <b>Operating system</b>         | <b>Directory name represented by arch</b> |
|---------------------------------|---|
| 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.

# Chapter 1. Probe for Juniper Contrail

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.

|  |  |
|--|--|
| Probe target                               | Juniper Contrail version 2.0   |
| Probe executable name                      | nco_p_juniper_contrail   |
| Probe installation package                 | omnibus-arch-probe-nco-p-juniper_contrail-version  |
| Package version                            | 1.0  |
| Probe supported on                         | For details of supported operating systems, see the following Release Notice on the IBM Software Support website:<br><a href="http://www-01.ibm.com/support/docview.wss?uid=swg21970415">http://www-01.ibm.com/support/docview.wss?uid=swg21970415</a> |
| Properties file                            | \$OMNIHOME/probes/arch/juniper_contrail.props  |
| Rules file                                 | \$OMNIHOME/probes/arch/juniper_contrail.rules  |
| WebSocket Transport Module properties file | \$OMNIHOME/java/conf/juniperContrailTransport.properties   |

| <i>Table 3. Summary (continued)</i>             |   |
|---|---|
| Requirements                                    | For details of any additional software that this probe requires, refer to the <code>description.txt</code> file that is supplied in its download package.   |
| Connection method                               | REST API  |
| Multicultural support                           | Available   |
| Peer-to-peer failover functionality             | Not available   |
| IP environment                                  | IPv4 and IPv6   |
| Federal Information Processing 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 <a href="http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2004.htm">http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/1401val2004.htm</a> . For details about configuring Netcool/OMNIBus for FIPS 140-2 mode, see the <i>IBM Tivoli Netcool/OMNIBus Installation and Deployment Guide</i> . |

## Installing probes

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

The installation process consists of the following steps:

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

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

[http://www-01.ibm.com/support/knowledgecenter/SSSHTQ/omnibus/probes/all\\_probes/wip/reference/install\\_download\\_intro.html](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](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*.



## 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:

```
keytool -import -trustcacerts -alias alias_name -file cert_file -keystore keystore_file
```

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 chose depends on a number of factors, including your operating system, your environment, and the 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:

[http://www-01.ibm.com/support/knowledgecenter/SSHTQ/omnibus/probes/all\\_probes/wip/concept/running\\_probe.html](http://www-01.ibm.com/support/knowledgecenter/SSHTQ/omnibus/probes/all_probes/wip/concept/running_probe.html)

## 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:

```
{ "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",
  "Messageype", "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:

[http://www.juniper.net/techpubs/en\\_US/release-independent/contrail/information-products/pathway-pages/opserver/opserver.html](http://www.juniper.net/techpubs/en_US/release-independent/contrail/information-products/pathway-pages/opserver/opserver.html)

## 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.

| <i>Table 4. Juniper Contrail transport properties</i> |  |
|---|--|
| Property name   | Description  |
| <b>httpVersion</b>                                    | Use this property to specify the version of the HTTP protocol that the target system supports.<br><br>For Juniper Contrail, this property is set to 1.1. |

Table 4. Juniper Contrail transport properties (continued)

| Property name               | Description  |
|-----------------------------|--|
| <b>responseTimeout</b>      | Use this property to specify how long (in seconds) the probe waits for a response from the target system before timing out.<br><br>For Juniper Contrail, this property is set to 120.  |
| <b>resyncRequestURI</b>     | Use this property to specify the URI that the probe uses to request a resynchronization with the target system at startup.<br><br>For Juniper Contrail, set this property to /analytics/query.   |
| <b>resyncRequestMethod</b>  | Use this property to specify the message type that the probe sends to request a resynchronization with the target system.<br><br>For Juniper Contrail, this property is set to POST.   |
| <b>resyncRequestContent</b> | Use this property to specify any additional information that the probe sends with the resynchronization request.<br><br>For Juniper Contrail, this property is set to {"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" }<br><br><b>Note :</b> 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 |   |
|--|---|
| Operating system                                     | Procedure to set the locale   |
| Linux and Unix                                       | <p>Set the locale by changing the values of the <b>LANG</b> and <b>LC_ALL</b> environment variables. For example, to set the locale to simplified Chinese in UTF-8, use the following commands:</p> <pre>export LANG=zh_CN.UTF-8 export LC_ALL=zh_CN.UTF-8</pre>  |
| Windows  | <ol style="list-style-type: none"> <li>Open the <b>Control Panel</b> and double click on <b>Regional and Language</b>.</li> <li>On the <b>Formats</b> tab, select the language from the list in <b>Format</b>.</li> <li>On the <b>Administrative</b> tab, click <b>Change system locale</b>.</li> <li>Select the language from the list in <b>Current System Locale</b>.</li> <li>Click <b>OK</b>.</li> <li>Click <b>OK</b>.</li> </ol> |

- 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.
- 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 6. Properties and command line options |  |   |
|--|--|---|
| Property name                                | Command line option  | Description   |
| <b>EnableSSL</b> <i>string</i>               | <p><code>-noenables1</code> (This is equivalent to <b>EnableSSL</b> with a value of <code>false</code>.)</p> <p><code>-enables1</code> (This is equivalent to <b>EnableSSL</b> with a value of <code>true</code>.)</p> | <p>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:</p> <p><code>false</code>: SSL connectivity between the probe and the EMS server is disabled.</p> <p><code>true</code>: SSL connectivity between the probe and the EMS server is enabled.</p> <p>The default is <code>false</code>.</p> |

Table 6. Properties and command line options (continued)

| Property name                            | Command line option                | Description   |
|--|------------------------------------|---|
| <b>Host</b> <i>string</i>                | -host <i>string</i>                | Use this property to specify the host name or IP address of the instance to which the probe connects.<br><br>For supported IP environments, see <a href="#">“Summary” on page 1</a> .<br><br>The default is " ".  |
| <b>InitialResyncWindow</b> <i>string</i> | -initialresyncwindow <i>string</i> | 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.<br><br>The supported format for this property is:<br><br>xd yh zm<br><br>Where d is days, h is hours, and m is minutes with <i>x</i> , <i>y</i> , and <i>z</i> 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.<br><br>The maximum value is 14d and minimum value is 1m.<br><br>The default is 3d. |
| <b>KeyStore</b> <i>string</i>            | -keystore <i>string</i>            | Use this property to specify the location of the keystore file that contains the client certificate for the SSL and trusted authority certificate.<br><br>The default is " ".   |
| <b>KeyStorePassword</b> <i>string</i>    | -keystorepassword <i>string</i>    | Use this property to specify the password required to access the certificate specified by the <b>KeyStore</b> property.<br><br>The default is " "。<br><br><b>Note :</b> You can encrypt this password using the nco_aes_crypt utility within Netcool/OMNIBus.   |
| <b>Port</b> <i>integer</i>               | -port <i>integer</i>               | Use this property to specify the host port of the instance of Juniper Contrail to which the probe connects.<br><br>The default is 8081.   |

Table 6. Properties and command line options (continued)

| Property name                                | Command line option   | Description   |
|--|---|---|
| <b>ResyncBatchTimespan</b><br><i>integer</i> | -resyncbatchtimespan<br><i>integer</i>  | Use this property to specify the maximum timespan (in minutes) per query over the timeline covered in the initial resynchronization.<br><br>You can specify a value between 1 and 15.<br><br>The default is 5.  |
| <b>StreamCapture</b> <i>string</i>           | -nostreamcapture (This is equivalent to <b>StreamCapture</b> with a value of false.)<br><br>-streamcapture (This is equivalent to <b>StreamCapture</b> with a value of true.) | Use this property to specify whether the probe stores the event data received in a stream capture file.<br><br>The default is false.  |
| <b>StreamCaptureFile</b> <i>string</i>       | -streamcapturefile <i>string</i>  | Use this property to specify the location of the stream capture file.<br><br>The default is <code>\${OMNIHOME}/var/juniper_contrail.stream</code> .<br><br>On UNIX, if you specify an environment variable (for example, OMNIHOME) you must include it within curly brackets { }.<br><br>On Windows operating systems, you must manually change this property value to: <code>%OMNIHOME%\var\juniper_contrail.stream</code> . |
| <b>TransformerFile</b> <i>string</i>         | -transformerfile <i>string</i>  | Use this property to specify the location of the transformer file.<br><br>The default is <code>\${OMNIHOME}/java/conf/juniper_contrail_transformers.xml</code> .  |



Table 6. Properties and command line options (continued)

| Property name                               | Command line option                   | Description  |
|---|---------------------------------------|--|
| <b>TransportFile</b> <i>string</i>          | -transportfile <i>string</i>          | <p>Use this property to specify the location of the transport properties file.</p> <p>The default is <code>\${OMNIHOME}/java/conf/juniperContrailTransport.properties</code></p> <p>On UNIX, if you specify an environment variable (for example, OMNIHOME) you must include it within curly brackets <code>{ }</code>.</p> <p>On Windows operating systems, you must manually change this property value to: <code>%OMNIHOME%\java\conf\juniperContrailTransport.properties</code></p>  |
| <b>TransportType</b> <i>string</i>          | -transporttype <i>string</i>          | <p>Use this property to specify the transport method.</p> <p>The default is RESTAPI.</p> <p><b>Note :</b> Currently RESTAPI is the only supported value for this property.</p>   |
| <b>UseLastResyncTimestamp</b> <i>string</i> | -uselastresynctimestamp <i>string</i> | <p>Use this property to specify whether the probe uses the last resynchronization timestamp as the starting point of the initial resynchronization.</p> <p><b>true:</b> If the interval between the last event timestamp and the probe startup time is less than the maximum value allowed for the <b>InitialResyncWindow</b> 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 <b>InitialResyncWindow</b> property.</p> <p><b>false:</b> The probe will offset the initial resynchronization starting time as specified by the <b>InitialResyncWindow</b> property.</p> <p>The default is <code>false</code>.</p> |

## 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.

| Property name                           | Command line option               | Description   |
|---|-----------------------------------|---|
| <b>CommandPort</b> <i>integer</i>       | -commandport <i>integer</i>       | Use this property to specify the port to which users can Telnet to communicate with the probe using the Command Line Interface (CLI) supplied.<br><br>The default is 6970.  |
| <b>CommandPortLimit</b> <i>integer</i>  | -commandportlimit <i>integer</i>  | Use this property to specify the maximum number of Telnet connections that can be made to the probe.<br><br>The default is 10.  |
| <b>DataBackupFile</b> <i>string</i>     | -databackupfile <i>string</i>     | Use this property to specify the path to the file that stores data between probe sessions.<br><br>The default is "".<br><b>Note :</b> Specify the path relative to \$OMNIHOME/var.  |
| <b>HeartbeatInterval</b> <i>integer</i> | -heartbeatinterval <i>integer</i> | Use this property to specify the frequency (in seconds) with which the probe checks the status of the host server.<br><br>The default is 60.  |
| <b>Inactivity</b> <i>integer</i>        | -inactivity <i>integer</i>        | Use this property to specify the length of time (in seconds) that the probe allows the port to receive no incoming data before disconnecting.<br><br>The default is 0 (which instructs the probe to not disconnect during periods of inactivity). |

Table 7. Properties and command line options (continued)

| Property name                           | Command line option                | Description  |
|---|------------------------------------|--|
| <b>InitialResync</b> <i>string</i>      | -initialresync <i>string</i>       | <p>Use this property to specify whether the probe requests all active alarms from the host server on startup. This property takes the following values:</p> <p><b>false</b>: The probe does not request resynchronization on startup.</p> <p><b>true</b>: The probe requests resynchronization on startup.</p> <p>For most probes, the default value for this property is <b>false</b>.</p> <p>If you are running the JDBC Probe, the default value for the <b>InitialResync</b> property is <b>true</b>. This is because the JDBC Probe only acquires data using the resynchronization process.</p> |
| <b>MaxEventQueueSize</b> <i>integer</i> | -maxeventqueue size <i>integer</i> | <p>Use this property to specify the maximum number of events that can be queued between the non native process and the ObjectServer.</p> <p>The default is 10000.</p> <p><b>Note</b> : You can increase this number to increase the event throughput when a large number of events is generated.</p>   |
| <b>ResyncInterval</b> <i>integer</i>    | -resyncinterval <i>integer</i>     | <p>Use this property to specify the interval (in seconds) at which the probe makes successive resynchronization requests.</p> <p>For most probes, the default value for this property is 0 (which instructs the probe to not make successive resynchronization requests).</p> <p>If you are running the JDBC Probe, the default value for the <b>ResyncInterval</b> property is 60. This is because the JDBC Probe only acquires data using the resynchronization process.</p>   |
| <b>RetryCount</b> <i>integer</i>        | -retrycount <i>integer</i>         | <p>Use this property to specify how many times the probe attempts to retry a connection before shutting down.</p> <p>The default is 0 (which instructs the probe to not retry the connection).</p>   |

Table 7. Properties and command line options (continued)

| Property name                       | Command line option                        | Description   |
|-------------------------------------|--|---|
| <b>RetryInterval</b> <i>integer</i> | <code>-retryinterval <i>integer</i></code> | <p>Use this property to specify the length of time (in seconds) that the probe waits between successive connection attempts to the target system.</p> <p>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).</p>  |
| <b>RotateEndpoint</b> <i>string</i> | <code>-rotateendpoint <i>string</i></code> | <p>Use this property to specify whether the probe attempts to connect to another endpoint if the connection to the first endpoint fails.</p> <p>This property takes the following values:</p> <p>false: The probe does not attempt to connect to another endpoint if the connection to the first endpoint fails.</p> <p>true: The probe attempts to connect to another endpoint if the connection to the first endpoint fails.</p> <p>The default is false.</p> |

## 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

| Element name | Element description   |
|--------------|---|
| \$Category   | This element indicates the category type.   |
| \$Endpoint   | This element indicates the endpoint.  |
| \$InstanceId | This element displays the Instance ID, a unique identifier for an instance of the probe |

Table 8. Elements (continued)

| Element name      | Element description   |
|-------------------|---|
| \$Level           | <p>This element indicates the message level of the fault. The level can take one of the following values:</p> <ul style="list-style-type: none"> <li>0: SYS_EMERG</li> <li>1: SYS_ALERT</li> <li>2: SYS_CRIT</li> <li>3: SYS_ERR</li> <li>4: SYS_WARN</li> <li>5: SYS_NOTICE</li> <li>6: SYS_INFO</li> </ul>  |
| \$LogMessage      | <p>This element displays the event log message transformed from \$Xmlmessage. The transformation is performed by the file specified by the <b>TransformerFile</b> property.</p>   |
| \$NodeType        | <p>This element indicates the node type.</p>  |
| \$MessageTS       | <p>This element displays the event message timestamp.</p>   |
| \$Messagetype     | <p>This element indicates the event message type.</p>   |
| \$ModuleId        | <p>This element displays the module ID.</p>   |
| \$Source          | <p>This element indicates the event source.</p>   |
| \$SequenceNum     | <p>This element displays the sequence number.</p>   |
| \$Type            | <p>This element displays the fault type raised by the system. The fault can be one of the following types:</p> <ul style="list-style-type: none"> <li>0: INVALID</li> <li>1: SYSTEM</li> <li>2: REQUEST</li> <li>3: ESPONSE</li> <li>4: TRACE</li> <li>5: BUFFER</li> <li>6: UVE</li> <li>7: OBJECT</li> <li>8: FLOW</li> <li>9: TRACE_OBJECT</li> <li>10: SYSLOG</li> <li>11: ALARM</li> </ul> |
| \$TransformerName | <p>This element displays the Transformer Name.</p>  |

| Table 8. Elements (continued) |  |
|-------------------------------|--|
| Element name                  | Element description  |
| \$Xmlmessage                  | This element displays event log messages from the device under Contrail's system monitoring. |

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

## 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 10. ProbeWatch messages

| <b>ProbeWatch message</b>              | <b>Description</b>  | <b>Triggers/causes</b>  |
|--|---|---|
| Failed to open stream capture file     | The probe failed to initialize logging into the stream capture file during probe startup.                                 | The probe user does not have the required permission to access the file specified by the <b>StreamCaptureFile</b> property.                 |
| Failed to write to stream capture file | The probe failed to write raw data to the stream capture file.  | There is insufficient space available for the file specified by the <b>StreamCaptureFile</b> property.                                      |
| Failed to close stream capture file    | The probe failed to close the stream capture file properly during shutdown. The stream capture file may become corrupted. | Another process was accessing and writing to the file specified by the <b>StreamCaptureFile</b> property while the probe was still running. |





---

## Appendix A. Notices and Trademarks

This appendix contains the following sections:

- Notices
- Trademarks

### Notices

---

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10504-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation  
Licensing 2-31 Roppongi 3-chome, Minato-ku  
Tokyo 106-0032, Japan

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation  
Software Interoperability Coordinator, Department 49XA

3605 Highway 52 N  
Rochester, MN 55901  
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this information and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

#### COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

© (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. \_enter the year or years\_. All rights reserved.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

## Trademarks

---

IBM, the IBM logo, ibm.com, AIX, Tivoli, zSeries, and Netcool are trademarks of International Business Machines Corporation in the United States, other countries, or both.

Adobe, Acrobat, Portable Document Format (PDF), PostScript, and all Adobe-based trademarks are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, other countries, or both.

Intel, Intel Inside (logos), MMX, and Pentium are trademarks of Intel Corporation in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.







SC27-8705-00

