Network Performance Insight
References
Note

Before using this information and the product it supports, read the information in "Notices" on page 43.
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References

Provides you with additional reference information to help you work with IBM®
Network Performance Insight effectively.

Intended audience

The audience who are network administrators or operations specialist responsible
for installing the Network Performance Insight product suite on an enterprise
network.

To install Network Performance Insight successfully, you must have a thorough
understanding of the following subjects:

- Network Performance Insight 1.2.0 system
- Basic principles of network protocols and network management
- NetFlow concepts
- Administration of the Linux
- Jazz™ for Service Management
- IBM Tivoli® Network Manager IP Edition
- IBM Tivoli Netcool/OMNIbus

Organization

Read this summary to help you find the information that you need.

This information is organized as follows:

- Chapter 1, “REST API definitions,” on page 1
- Chapter 2, “Command line interface,” on page 23
- Chapter 3, “Configuring Flow devices,” on page 27

Network Performance Insight architecture

IBM Network Performance Insight is a network performance monitoring system.

Network Performance Insight provides comprehensive, flexible, and scalable traffic
data management with visualization and reporting to support complex,
multi-vendor, multi-technology networks. It offers a range of dashboard views
with robust security features that are designed to meet the needs of executive
management and converging network and IT operations teams.

Network Performance Insight offers near real-time and interactive view on the
traffic data that helps in reduced network downtime and optimized network
performance.

Network Performance Insight provides IBM Netcool® Operations Insight with
comprehensive IP network device performance monitoring and session traffic
analysis.

The following diagram shows how data is flowing through the various
components in Network Performance Insight:
IBM Open Platform with Apache Spark and Apache Hadoop

IBM Open Platform with Apache Spark and Apache Hadoop (IOP) can be used to help process and analyze the volume, variety, and velocity of data that continually enters your organization every day. Network Performance Insight is installed as a service extension to the installed IBM Open Platform with Apache Spark and Apache Hadoop stack.

The features of IOP that are used in installing Network Performance Insight:

- IBM Open Platform with Apache Spark and Apache Hadoop
- Default support for rolling upgrades for Hadoop services
- Support for long-running applications within YARN for enhanced reliability
- Spark in-memory distributed compute engine for dramatic performance increases
- Apache Ambari operational framework. Apache Ambari is an open framework for provisioning, managing, and monitoring Apache Hadoop clusters. Ambari provides an intuitive and easy-to-use Hadoop management web UI backed by its collection of tools and APIs that simplify the operation of Hadoop clusters.
- Essentially includes the following open source technologies for working with Network Performance Insight:
  - HDFS
  - Kafka
  - Ambari
  - Spark
  - ZooKeeper
**Note:** Because Zookeeper requires a majority, it is best to use an odd number of machines. For example, with four machines ZooKeeper can only handle the failure of a single machine; if two machines fail, the remaining two machines do not constitute a majority. However, with five machines ZooKeeper can handle the failure of two machines.

**Integrated products**

The products that are needed to work with Network Performance Insight, V1.2.0 are as follows:

**Jazz for Service Management 1.1.3.0**
Dashboards and Application Services Hub provides visualization and dashboard services in Jazz for Service Management. It has a single console for administering IBM products and related applications. Visualization for Network Performance Insight is federated into Dashboard and Application Services Hub.

Products that are integrated with Network Performance Insight 1.2.0:

**IBM Tivoli Network Manager IP Edition 4.2.0.1**
Tivoli Network Manager provides network discovery, device polling, including storage of polled SNMP data for reporting and analysis, and topology visualization. In addition, Network Manager can display network events, perform root-cause analysis of network events, and enrich network events with topology and other network data.

**Tivoli Netcool/OMNIbus component of IBM Netcool Operations Insight 1.4.0.3**
Netcool Operations Insight is powered by the fault management capabilities of IBM Tivoli Netcool/OMNIbus. In Network Performance Insight v1.2.0, Tivoli Netcool/OMNIbus 8.1.0.8 is an important part of the solution for monitoring the network threshold violations.

**Network Performance Insight services**

Network Performance Insight components are running on microservice architecture that has the software application as a suite of independently deployable, small, modular services in which each service runs a unique process and communicates through a well-defined, lightweight mechanism.

For more information about these services, see *IBM Network Performance Insight: Product Overview*.

**Related information:**

- [IBM Network Performance Insight on IBM Knowledge Center](#)
- [IBM BigInsights 4.2 documentation](#)
- [HDFS Architecture](#)
- [Apache Hadoop YARN](#)
- [Apache Kafka](#)
- [Apache Zookeeper](#)
Service Management Connect

Connect, learn, and share with Service Management professionals: product support technical experts who provide their perspectives and expertise.

Access Network and Service Assurance community at https://www.ibm.com/developerworks/servicemanagement/nsa/index.html Use Service Management Connect in the following ways:

• Become involved with transparent development, an ongoing, open engagement between other users and IBM developers of Tivoli products. You can access early designs, sprint demonstrations, product roadmaps, and prerelease code.
• Connect one-on-one with the experts to collaborate and network about Tivoli and the Network and Service Assurance community.
• Read blogs to benefit from the expertise and experience of others.
• Use wikis and forums to collaborate with the broader user community.

Related information:

IBM Network Performance Insight community on developerWorks

Network Performance Insight technical training

For Tivoli technical training information, see the following Network Performance Insight Training website at https://tnpmsupport.persistentsys.com/updated_trainings

Support information

If you have a problem with your IBM Software, you want to resolve it quickly. IBM provides the following ways for you to obtain the support you need:

Online

IBM Support Assistant
The IBM Support Assistant is a free local software serviceability workbench that helps you resolve questions and problems with IBM Software products. The Support Assistant provides quick access to support-related information and serviceability tools for problem determination. To install the Support Assistant software, go to http://www.ibm.com/software/support/isa

Troubleshooting Guide
For more information about resolving problems, see the problem determination information for this product.

Conventions used in this publication

Several conventions are used in this publication for special terms, actions, commands, and paths that are dependent on your operating system.

Typeface conventions

This publication uses the following typeface conventions:

Bold
• Lowercase commands and mixed case commands that are otherwise difficult to distinguish from surrounding text
• Interface controls (check boxes, push buttons, radio buttons, spin buttons, fields, folders, icons, list boxes, items inside list boxes, multicolumn lists, containers, menu choices, menu names, tabs, property sheets), labels (such as Tip:, and Operating system considerations)
• Keywords and parameters in text

Italic
• Citations (examples: titles of publications, diskettes, and CDs)
• Words defined in text (example: a nonswitched line is called a point-to-point line)
• Emphasis of words and letters (words as words example: "Use the word that to introduce a restrictive clause."); letters as letters example: "The LUN address must start with the letter L."
• New terms in text (except in a definition list): a view is a frame in a workspace that contains data.
• Variables and values you must provide: ... where myname represents....

Monospace
• Examples and code examples
• File names, programming keywords, and other elements that are difficult to distinguish from surrounding text
• Message text and prompts addressed to the user
• Text that the user must type
• Values for arguments or command options

Bold monospace
• Command names, and names of macros and utilities that you can type as commands
• Environment variable names in text
• Keywords
• Parameter names in text: API structure parameters, command parameters and arguments, and configuration parameters
• Process names
• Registry variable names in text
• Script names
Chapter 1. REST API definitions

The APIs in Network Performance Insight that give access to the database data for constructing the dashboards.

Using Network Performance Insight REST API commands requires the same permissions as using the web interface. These REST APIs are available so that you can retrieve the data outside of the web interface.

Each REST resource contains information such as URLs, functions, parameters, descriptions, sample input, and output data.

Common REST API status codes

<table>
<thead>
<tr>
<th>HTTP status code</th>
<th>Generic description</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>Success</td>
</tr>
<tr>
<td>400</td>
<td>Failure</td>
</tr>
</tbody>
</table>

Flow APIs

REST APIs that are related Flow data that is collected by Flow Collector Service and analyzed by Flow Analytics Service.

interface

Provides a list of all the flow interfaces that the system received from an exporter. This API is specific for Flow data alone.

URL

With help of this API, information is queried and retrieved from FLOW_METRIC.INTERFACE table.

http://[host]:[port]/service/dataset/flow/interface

http://<myserver.ibm.com>:8081/service/dataset/flow/interface/?fields=*  

Method

The supported request type.

HTTP GET

URL parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fields</td>
<td>No</td>
<td>Fields that must be returned.</td>
</tr>
<tr>
<td>count</td>
<td>No</td>
<td>Number of flow interface records that must be returned.</td>
</tr>
<tr>
<td>sort</td>
<td>No</td>
<td>How the records must be sorted. Prefix + or - to indicate sort direction. For example, sort=name,-description.</td>
</tr>
<tr>
<td>Name</td>
<td>Required</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>condition</td>
<td>No</td>
<td>Expression that must be used to filter specific records.</td>
</tr>
</tbody>
</table>

**Sample URLs**

http://<myserver.ibm.com>:8081/service/dataset/flow/interface/?fields=*  
http://<myserver.ibm.com>:8081/service/dataset/flow/interface/?fields=*&count=10&condition=direction=1&sort=+start_ms  
http://<myserver.ibm.com>:8081/service/dataset/flow/interface/?fields=*&count=10&condition=direction=1  

**Response**

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>entity_id</td>
<td>number</td>
<td>Internal system ID for the returned flow interface.</td>
<td>8589941330</td>
</tr>
<tr>
<td>start_ms</td>
<td>number</td>
<td>Time at which the flow interface is first known by the system.</td>
<td>1470123228820</td>
</tr>
<tr>
<td>exporter_ip</td>
<td>string</td>
<td>IP address of the exporter on which the flow interface resides.</td>
<td>10.55.239.201</td>
</tr>
<tr>
<td>if_index</td>
<td>number</td>
<td>Index of the flow interface on the exporter.</td>
<td>23274</td>
</tr>
<tr>
<td>direction</td>
<td>number</td>
<td>Direction of the flow interface (0= ingress, 1= egress).</td>
<td>1</td>
</tr>
<tr>
<td>enabled</td>
<td>boolean</td>
<td>Flag that indicates for data collection enablement in the system for the flow interface.</td>
<td>false</td>
</tr>
<tr>
<td>speed</td>
<td>number</td>
<td>Speed of the flow interface in bits per second.</td>
<td>100</td>
</tr>
<tr>
<td>if_name</td>
<td>string</td>
<td>Name of the flow interface as known by the exporter.</td>
<td>eth0,:1-1</td>
</tr>
</tbody>
</table>

**JSON code:**
```json
[
  {
    "entity_id":8589953896,
    "start_ms":1470249413374,
    "exporter_ip":"10.55.239.201",
    "if_index":62903,
    "direction":1,
    "enabled":false,
    "speed":100
  }
]```
threshold

Provides a list of all the thresholds on Flow data in the system. This API is specific for Flow data only.

URL

With help of this API, information is queried and retrieved from CFG.THRESHOLD table.

http://[host]:[port]/service/dataset/flow/threshold

http://<myserver.ibm.com>:8081/service/dataset/flow/threshold/?fields=*  

Method

The supported request type.

HTTP GET

URL parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>fields</td>
<td>No</td>
<td>Fields that must be returned.</td>
</tr>
<tr>
<td>count</td>
<td>No</td>
<td>Number of Flow interface records that must be returned.</td>
</tr>
<tr>
<td>sort</td>
<td>No</td>
<td>How the records must be sorted. Prefix + or - to indicate sort direction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, +metric,-upper_limit indicates to sort by metric ascending,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and then sort by upper_limit descending.</td>
</tr>
<tr>
<td>condition</td>
<td>No</td>
<td>Expression that must be used to filter specific records.</td>
</tr>
</tbody>
</table>

Sample URLs

http://<myserver.ibm.com>:8081/service/dataset/flow/threshold/?fields=*  


http://<myserver.ibm.com>:8081/service/dataset/flow/threshold/?fields=*&count=10&condition=direction=1&sort=start_ms  

http://<myserver.ibm.com>:8081/service/dataset/flow/threshold/?fields=*&count=10&condition=direction=1
Response

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>entity_id</td>
<td>number</td>
<td>The internal system ID for the returned Flow interface</td>
<td>8589934713</td>
</tr>
<tr>
<td>metric_id</td>
<td>number</td>
<td>The internal system ID for the metric</td>
<td>1</td>
</tr>
<tr>
<td>start_ms</td>
<td>number</td>
<td>The system time when threshold is configured</td>
<td>1466008543902</td>
</tr>
<tr>
<td>period_sec</td>
<td>number</td>
<td>The accumulated time in seconds when the threshold is monitored</td>
<td>60</td>
</tr>
<tr>
<td>enabled</td>
<td>boolean</td>
<td>Flag to indicate whether threshold monitoring is enabled in the system for the Flow interface.</td>
<td>true, false</td>
</tr>
<tr>
<td>kind</td>
<td>number</td>
<td>The type of threshold monitored. 0 is Static Threshold and 1 is Learned Threshold</td>
<td>0, 1</td>
</tr>
<tr>
<td>limit_type</td>
<td>number</td>
<td>The limit type for threshold monitored. • 0 is Over • 1 is Under • 2 is Band</td>
<td>0, 1, 2</td>
</tr>
<tr>
<td>upper_limit</td>
<td>number</td>
<td>The upper bound limit for the threshold monitored</td>
<td>1000</td>
</tr>
<tr>
<td>lower_limit</td>
<td>number</td>
<td>The lower bound limit for the threshold monitored</td>
<td>100</td>
</tr>
<tr>
<td>num_events</td>
<td>number</td>
<td>The number of events that are generated on the Flow interface.</td>
<td>2</td>
</tr>
<tr>
<td>learning_days</td>
<td>number</td>
<td>The number of days for the system to learn the pattern.</td>
<td>2</td>
</tr>
<tr>
<td>interface_id</td>
<td>number</td>
<td>The internal system ID for the returned Flow interface</td>
<td>8589934713</td>
</tr>
<tr>
<td>direction</td>
<td>number</td>
<td>The direction of the Flow interface (0=ingress, 1=egress)</td>
<td>0, 1</td>
</tr>
<tr>
<td>Name</td>
<td>Data type</td>
<td>Description</td>
<td>Example</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>speed</td>
<td>number</td>
<td>The speed of the Flow interface in bits per second</td>
<td>100</td>
</tr>
<tr>
<td>exporter_ip</td>
<td>string</td>
<td>The IP address of the exporter on which the Flow interface resides</td>
<td>:1, 192.168.10.1</td>
</tr>
<tr>
<td>if_index</td>
<td>number</td>
<td>The index of the Flow interface on the exporter</td>
<td>1</td>
</tr>
<tr>
<td>if_name</td>
<td>string</td>
<td>The name of the Flow interface as known by the exporter</td>
<td>eth0::1-1</td>
</tr>
</tbody>
</table>


```json
[
  {
    "entity_id":8589934601,
    "metric_id":1,
    "start_ms":1472466812124,
    "period_sec":60,
    "enabled":false,
    "kind":0,
    "limit_type":0,
    "upper_limit":80923502,
    "lower_limit":60692626,
    "num_events":2,
    "learning_days":0,
    "interface_id":8589934601,
    "direction":0,
    "speed":0,
    "exporter_ip":"::1",
    "if_index":1,
    "if_name":"::1-1"
  },
  {
    "entity_id":8589934600,
    "metric_id":1,
    "start_ms":1472466812125,
    "period_sec":60,
    "enabled":false,
    "kind":0,
    "limit_type":0,
    "upper_limit":62739672,
    "lower_limit":47054754,
    "num_events":2,
    "learning_days":0,
    "interface_id":8589934600,
    "direction":1,
    "speed":0,
    "exporter_ip":"::1",
    "if_index":1,
    "if_name":"::1-1"
  }
]
```
Provides the top 10 values for an aggregation on a flow interface over a period. This API is specific for Flow data only.

**URL**

With help of this API, information is queried and retrieved from FLOW_METRIC.RAW, and other FLOW_METRIC. 1MIN/30MIN/1DAY AGGREGATION tables.

http://[host]:[port]/service/dataset/aggregation/summary


**Method**

The supported request type.

HTTP GET

**URL parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entity</td>
<td>Yes</td>
<td>The ncim entity ID that represents the interface.</td>
</tr>
<tr>
<td>aggregation</td>
<td>Yes</td>
<td>The aggregation ID that represents how the data must be aggregated.</td>
</tr>
<tr>
<td>direction</td>
<td>Yes</td>
<td>The direction of the flow data that must be returned.</td>
</tr>
<tr>
<td>start</td>
<td>Yes</td>
<td>The start time of the period for which flow data must be returned.</td>
</tr>
<tr>
<td>end</td>
<td>Yes</td>
<td>The end time of the period for which flow data must be returned.</td>
</tr>
<tr>
<td>granularity</td>
<td>No</td>
<td>The granularity for which the data must be aggregated.</td>
</tr>
<tr>
<td>remaining</td>
<td>No</td>
<td>A flag to indicate whether a row with the total of the remaining records must be provided.</td>
</tr>
</tbody>
</table>

**Sample URL**


**Response**

The results are returned as JSON data that contains an array of the following fields:
<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>rank</td>
<td>number</td>
<td>Rank (1-10) of the record that is relative to all other records. Rank 11 indicates remaining records in total.</td>
<td>5</td>
</tr>
<tr>
<td>octets</td>
<td>number</td>
<td>The aggregated octets value for a time period</td>
<td>12312</td>
</tr>
<tr>
<td>percentage</td>
<td>number</td>
<td>The relative percentage of total octets for a time period.</td>
<td>35</td>
</tr>
</tbody>
</table>

**Note:** The actual fields returned depend on the type of aggregation in the URL. The rank, octets, and percentage are constant for all aggregations.

The supported aggregations are as follows:
- srcip - source
- srcip_app - source, application
- dstip - destination
- dstip_app - destination, application
- conv - source, destination
- conv_app - source, destination, application
- app - application
- app_srcip - application, source
- app_dstip - application, destination
- app_conv - application, source, destination
- prot - protocol
- prot_srcip - protocol, source
- prot_dstip - protocol, destination
- prot_conv - protocol, source, destination
- prot_app - protocol, application

```json
[
  {
    "rank": 1,
    "source": "221.87.136.94",
    "destination": "176.188.66.226",
    "application": "ftp-data",
    "octets": 999771,
    "percentage": 0.26
  },
  {
    "rank": 2,
    "source": "118.212.117.178",
    "destination": "195.155.116.226",
    "application": "irc",
    "octets": 999708,
    "percentage": 0.26
  },
  {
    "rank": 3,
    "source": "63.240.4.179",
    "destination": "38.38.4.156",
    "application": "ftp-data",
    "octets": 999771,
    "percentage": 0.26
  }
]
```
"application":"ftp",
"octets":999318,
"percentage":0.26
},
  
  "rank":4,
  "source":"169.103.111.49",
  "destination":"63.240.4.179",
  "application":"irc",
  "octets":998990,
  "percentage":0.26
},
  
  "rank":5,
  "source":"98.68.38.15",
  "destination":"63.240.4.179",
  "application":"ipv6:43",
  "octets":998797,
  "percentage":0.26
},
  
  "rank":6,
  "source":"53.128.59.189",
  "destination":"246.69.57.153",
  "application":"tcp:7715",
  "octets":997065,
  "percentage":0.26
},
  
  "rank":7,
  "source":"198.138.156.62",
  "destination":"150.22.179.64",
  "application":"domain",
  "octets":996777,
  "percentage":0.26
},
  
  "rank":8,
  "source":"182.90.202.14",
  "destination":"236.58.124.230",
  "application":"ipv6:80",
  "octets":995233,
  "percentage":0.26
},
  
  "rank":9,
  "source":"63.240.4.179",
  "destination":"209.22.146.28",
  "application":"ipv6:161",
  "octets":995004,
  "percentage":0.26
},
  
  "rank":10,
  "source":"63.240.4.179",
  "destination":"142.36.208.40",
  "application":"http",
  "octets":993862,
  "percentage":0.26
},
  
  "rank":11,
  "source":"",
  "destination":"",
  "application":null}
timeseries

Provides a timeseries of data for an aggregation on a flow interface over a period.

URL

With help of this API, information is queried and retrieved from FLOW_METRIC.RAW, and other FLOW_METRIC. 1MIN/30MIN/1DAY AGGREGATION tables.

http://[host]:[port]/service/dataset/aggregation/timeseries

http://<myserver.ibm.com>:8081service/dataset/aggregation/timeseries?entity=ncim-217&direction=ingress&aggregation=conv_app&start=1466008260000&end=1466011860000&granularity=1-minute&key=221.87.136.94%2F176.188.66.226%2F%2520%2520ftp-data

Method

The supported request type.

HTTP GET

URL parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entity</td>
<td>Yes</td>
<td>The ncim entity ID that represents the interface.</td>
</tr>
<tr>
<td>aggregation</td>
<td>Yes</td>
<td>The aggregation ID that represents how the data must be aggregated.</td>
</tr>
<tr>
<td>direction</td>
<td>Yes</td>
<td>The direction of the flow data that must be returned.</td>
</tr>
<tr>
<td>start</td>
<td>Yes</td>
<td>The start time of the period for which flow data must be returned.</td>
</tr>
<tr>
<td>end</td>
<td>Yes</td>
<td>The end time of the period for which flow data must be returned.</td>
</tr>
<tr>
<td>granularity</td>
<td>No</td>
<td>The granularity for which the data must be aggregated.</td>
</tr>
<tr>
<td>key</td>
<td>Yes</td>
<td>Combination of grouping keys that are separated by /. This key must be in the same aggregation order and support only the top 10 grouping from aggregation summary.</td>
</tr>
</tbody>
</table>

Note: The query only supports the top 10 grouping from the aggregation summary for the provided time period.

Sample URL

http://<myserver.ibm.com>:8081service/dataset/aggregation/timeseries?entity=ncim-217&direction=ingress&aggregation=conv_app&start=1466008260000&end=1466011860000&granularity=1-minute&key=221.87.136.94%2F176.188.66.226%2F%2520%2520ftp-data
Response

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>timestamp</td>
<td>number</td>
<td>The time that is associated with the aggregated value</td>
<td>1466008980000</td>
</tr>
<tr>
<td>value</td>
<td>number</td>
<td>The aggregated octets value for the associated time</td>
<td>999771</td>
</tr>
</tbody>
</table>

```
[
  {
    "timestamp":1466008980000,
    "value":999771
  },
  {
    "timestamp":1466008990000,
    "value":999771
  },
  {
    "timestamp":1466009000000,
    "value":999771
  },
  {
    "timestamp":1466009100000,
    "value":999771
  }
]
```

Metric APIs

REST APIs that are related entity metric data that is collected by Network Manager Collector Service and analyzed by Entity Analytics Service.

**timeseries**

Provides a timeseries of raw metric data.

**URL**

With help of this API, information is queried and retrieved from ENTITY_METRIC_RAW, ENTITY_METRIC.AGG_001DAY/AGG_006HR/AGG_030MIN tables.

http://[host]:[port]/service/dataset/metric/timeseries

http://<myserver.ibm.com>:8081/service/dataset/metric/timeseries?entities=ncim-348&metrics=ifInDiscards&time=last-hour

**Method**

The supported request type.

HTTP GET
URL parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entities</td>
<td>No</td>
<td>Comma-separated list of ncim entity IDs.</td>
</tr>
<tr>
<td>metrics</td>
<td>Yes</td>
<td>Comma-separated list of metrics and their aggregation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, snmpInBandwidth, health, max(health), min(health)</td>
</tr>
<tr>
<td>parents</td>
<td>No</td>
<td>Comma-separated list of main node ID.</td>
</tr>
<tr>
<td>start</td>
<td>No</td>
<td>The start time for which flow data must be returned.</td>
</tr>
<tr>
<td>end</td>
<td>No</td>
<td>The end time for which flow data must be returned.</td>
</tr>
<tr>
<td>time</td>
<td>No</td>
<td>The name of the time short cut. For example:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-month</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-year</td>
</tr>
<tr>
<td>granularity</td>
<td>No</td>
<td>The granularity of the data for aggregation. For example, raw, 30 minute, 5-days</td>
</tr>
<tr>
<td>sort</td>
<td>No</td>
<td>How the records must be sorted. Prefix + or − to indicate sort direction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ indicates ascending order and − indicates descending order.</td>
</tr>
</tbody>
</table>

Sample URLs

&metrics=snmpInBandwidth

&metrics=ifInDiscards&time=last-hour

&metrics=ifInDiscards&start=1470368339000&end=1470368339000

&metrics=ifInDiscards&time=last-day&granularity=30-min

&metrics=ifInDiscards&time=last-day&granularity=30-min&sort+

Response

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entity</td>
<td>number</td>
<td>The entity that is associated with the time and metric value</td>
</tr>
<tr>
<td>Name</td>
<td>Data type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>parent</td>
<td>number</td>
<td>The parent entity ID that is associated with the entity.</td>
</tr>
<tr>
<td>entityName</td>
<td>string</td>
<td>The entity name. The value is defaulted to unknown if enrichment fails.</td>
</tr>
<tr>
<td>parentName</td>
<td>string</td>
<td>The entity’s parent name. The value is defaulted to unknown if enrichment fails.</td>
</tr>
<tr>
<td>metric</td>
<td>string</td>
<td>The metric name for the associated time and metric value</td>
</tr>
<tr>
<td>timestamp</td>
<td>number</td>
<td>The time that is associated with the metric value</td>
</tr>
<tr>
<td>value</td>
<td>number</td>
<td>The metric value for the associated time</td>
</tr>
</tbody>
</table>

**Note:**
- entities or parents or both must be provided.
- Sorting by value is not supported.
- The start and end parameters must be used together. time parameter supersedes start and end if they are all present in the URL.

```json
[
  {
    "parent": 6,
    "timestamp": 1471503616000,
    "entityName": "0",
    "parentName": "10.55.239.2",
    "metric": "ifOutErrors",
    "entity": 86,
    "value": 5398
  },
  {
    "parent": -1,
    "timestamp": 1471501946000,
    "entityName": "unknown",
    "parentName": "unknown",
    "metric": "ifOutErrors",
    "entity": 134,
    "value": 40
  },
  {
    "parent": 8,
    "timestamp": 1471501956000,
    "entityName": "T1 1/2",
    "parentName": "10.55.239.4",
    "metric": "ifOutErrors",
    "entity": 114,
    "value": 0
  }
]
```
**summary**

Provides a summary of metric data.

**URL**

With help of this API, information is queried and retrieved from ENTITY_METRIC.RAW, ENTITY_METRIC.AGG_001DAY/AGG_006HR/AGG_030MIN tables.

http://[host]:[port]/service/dataset/metric/summary
http://<myserver.ibm.com>:8081/service/dataset/metric/summary

**Method**

The supported request type.

HTTP GET

**URL parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entities</td>
<td>No</td>
<td>Comma-separated list of ncim entity ID.</td>
</tr>
<tr>
<td>metrics</td>
<td>Yes</td>
<td>Comma-separated name of the metric expression.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, snmpInBandwidth, health, max(health), min(health)</td>
</tr>
<tr>
<td>parents</td>
<td>No</td>
<td>Comma-separated list of main node ID.</td>
</tr>
<tr>
<td>start</td>
<td>No</td>
<td>The start time for which flow data must be returned.</td>
</tr>
<tr>
<td>end</td>
<td>No</td>
<td>The end time for which flow data must be returned.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: start and end parameters must be used together.</td>
</tr>
<tr>
<td>time</td>
<td>No</td>
<td>Specific time values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-month</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note: You need either start/end or time parameters in the URL.</td>
</tr>
<tr>
<td>granularity</td>
<td>No</td>
<td>Granularity for which the data must be aggregated. For example, RAW,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30-minute, 5-days</td>
</tr>
<tr>
<td>sort</td>
<td>No</td>
<td>Metric expression that defines the sort order of the records. Only one</td>
</tr>
<tr>
<td></td>
<td></td>
<td>metric is allowed with the sort expression.</td>
</tr>
<tr>
<td>Name</td>
<td>Required</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>count</td>
<td>No</td>
<td>Number of entities summary that must be returned per page. When this parameter is combined with sort, they provide TopN / BottomN functions. Default value -1 returns all available records.</td>
</tr>
<tr>
<td>page</td>
<td>No</td>
<td>The index of the page for data display. This parameter is supplied with count parameter to indicate page size. By default, it is 1.</td>
</tr>
</tbody>
</table>

**Sample URLs**

http://<myserver.ibm.com>:8081/service/dataset/metric/summary?entities=ncim-88 &metrics=ifInDiscards&time=last-hour

http://<myserver.ibm.com>:8081/service/dataset/metric/summary?entities=ncim-88 &metrics=ifInDiscards&start=1470725344000&end=1470725500000

http://<myserver.ibm.com>:8081/service/dataset/metric/summary?entities=ncim-88 &metrics=ifInDiscards,snmpInBandwidth&time=last-hour

http://<myserver.ibm.com>:8081/service/dataset/metric/summary?parents=3,4 &entities=ncim-81,ncim-83&metrics=min(ifInDiscards),avg(ifInDiscards),count(ifInDiscards) &time=last-day&sort=-avg(ifInDiscards)

http://<myserver.ibm.com>:8081/service/dataset/metric/summary?parents=3,4 &entities=ncim-81,ncim-83&metrics=min(ifInDiscards),avg(ifInDiscards),count(ifInDiscards) &time=last-day&sort=-avg(ifInDiscards)&count=5

**Response**

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>total</td>
<td>number</td>
<td>Total number of records available</td>
<td>1000</td>
</tr>
<tr>
<td>page</td>
<td>number</td>
<td>Current page number</td>
<td>1</td>
</tr>
<tr>
<td>count</td>
<td>number</td>
<td>Number of records in the page</td>
<td>10</td>
</tr>
<tr>
<td>items</td>
<td>list</td>
<td>List of metric values. The entity that is associated with the time and metric value.</td>
<td></td>
</tr>
<tr>
<td>entity</td>
<td>number</td>
<td>The entity associated with the time and metric value.</td>
<td>88</td>
</tr>
<tr>
<td>startTimestamp</td>
<td>number</td>
<td>The start time that is associated with the metric value</td>
<td>1470899798481</td>
</tr>
<tr>
<td>endTimestamp</td>
<td>number</td>
<td>The end time that is associated with the metric value</td>
<td>1470901584841</td>
</tr>
<tr>
<td>rank</td>
<td>number</td>
<td>The rank (1-N) of the record relative to all other entities based on sort. Defaults to 0 if sort parameter is not provided.</td>
<td>0</td>
</tr>
<tr>
<td>Name</td>
<td>Data type</td>
<td>Description</td>
<td>Example</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>metricValues</td>
<td>list</td>
<td>The list metric names and their values.</td>
<td></td>
</tr>
<tr>
<td>metric</td>
<td>string</td>
<td>The metric expression for the associated time and metric value.</td>
<td>avg(snmpInBandwidth)</td>
</tr>
<tr>
<td>value</td>
<td>number</td>
<td>The metric value for the associated time, entity, and metric expression.</td>
<td>150</td>
</tr>
</tbody>
</table>

**Note:**
- entities or parents or both must be provided.
- count must be provided with sort.
- metric used in sort parameter must be one of the expression that is used in metrics parameter.
- When sort is not provided, output is sorted by entities and rank is shown as zero.
- The start and end parameters must be used together. The time parameter supersedes start and end if they are all present in the URL.

**JSON code:**

```json
{
    "total":22,
    "page":3,
    "count":2,
    "items":[
        {
            "entity":59,
            "startTimestamp":1469515500000,
            "endTimestamp":1469615500000,
            "rank":1,
            "metricValues":[
                {
                    "metric":"min(health)",
                    "value":0
                },
                {
                    "metric":"max(health)",
                    "value":54
                },
                {
                    "metric":"avg(health)",
                    "value":50
                },
                {
                    "metric":"avg(snmpInBandwidth)",
                    "value":150
                }
            ]
        },
        {
            "entity":61,
            "startTimestamp":1469515500000,
            "endTimestamp":1469615500000,
            "rank":2,
            "metricValues":[
                {
                    "metric":"min(health)",
                    "value":0
                }
            ]
        }
    ]
}
```
metrics

Provides a list of metrics that are available for specified entities and time frame.

URL

With help of this API, information is queried and retrieved from ENTITY_METRIC.RAW table.

http://[host]:[port]/service/dataset/metrics

http://<myserver.ibm.com>:8081/service/dataset/metrics

Method

The supported request type.

HTTP GET

URL parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entities</td>
<td>Yes</td>
<td>Comma-separated list of ncim entity ID.</td>
</tr>
<tr>
<td>start</td>
<td>No</td>
<td>The start time for which flow data must be returned.</td>
</tr>
<tr>
<td>end</td>
<td>No</td>
<td>The end time for which flow data must be returned.</td>
</tr>
<tr>
<td>parents</td>
<td>No</td>
<td>Comma-separated list of main node ID.</td>
</tr>
<tr>
<td>time</td>
<td>No</td>
<td>Specific time values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-month</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-year</td>
</tr>
</tbody>
</table>

Note: You need either start/end or time parameters in the URL.
Sample URLs
http://<myserver.ibm.com>:8081/service/dataset/metrics?entities=219&time=last-day

Response

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric</td>
<td>string</td>
<td>The metric name</td>
<td>ifInDiscards</td>
</tr>
<tr>
<td>units</td>
<td>string</td>
<td>Unit of measurement for the metric</td>
<td>#, %, undef</td>
</tr>
</tbody>
</table>

Note:
- entities or parents or both must be provided.
- The start and end parameters must be used together. The time parameter supersedes start and end if they are all present in the URL.

JSON code:
```
[
  {
    "metric":"ifInErrors",
    "units":"#"
  },
  {
    "metric":"ifOutDiscards",
    "units":"#"
  },
  {
    "metric":"snmpInBandwidth",
    "units":"%"
  }
]
```

anomalies

Provides anomalies in timeseries entity metric data. This information is used in the Device Dashboard to display the network anomalies.

URL

With help of this API, information is queried and retrieved from THRESHOLD.STATE table.
http://[host]:[port]/service/dataset/metric/anomalies
http://<myserver.ibm.com>:8081/service/dataset/metric/anomalies

Method

The supported request type.
HTTP GET
### URL parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>entities</td>
<td>No</td>
<td>Comma-separated list of ncim entity IDs.</td>
</tr>
<tr>
<td>metrics</td>
<td>Yes</td>
<td>Comma-separated names of the metrics and their aggregation expression.</td>
</tr>
<tr>
<td>parents</td>
<td>No</td>
<td>Comma-separated list of main node ID.</td>
</tr>
<tr>
<td>start</td>
<td>No</td>
<td>The start of the period for which flow data that must be returned.</td>
</tr>
<tr>
<td>end</td>
<td>No</td>
<td>The end of the period for which flow data that must be returned.</td>
</tr>
<tr>
<td>time</td>
<td>No</td>
<td>The name of time short cut used. For example:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-day</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-month</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• last-year</td>
</tr>
</tbody>
</table>

### Sample URLs

&time=last-week&metrics=ifInDiscards

&end=1466011860000&metrics=ifInDiscards

&end=1466011860000&metrics=ifInDiscards,ifOutDiscards

http://<myserver.ibm.com>:8081/service/dataset/metric/anomalies?parents=1,2&entities=59
&start=1466008260000&end=1466011860000&metrics=ifInDiscards,ifOutDiscards

### Response

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>entity</td>
<td>number</td>
<td>The entity that is associated with the time and metric value.</td>
<td>15</td>
</tr>
<tr>
<td>parent</td>
<td>number</td>
<td>The parent entity ID that is associated with the entity. The value is defaulted to -1 if enrichment fails.</td>
<td>2</td>
</tr>
<tr>
<td>entityName</td>
<td>string</td>
<td>The entity name. The value is defaulted to unknown if enrichment fails.</td>
<td>T1 1/0</td>
</tr>
<tr>
<td>parentName</td>
<td>string</td>
<td>The entity’s parent name. The value is defaulted to unknown if enrichment fails.</td>
<td>10.55.239.2</td>
</tr>
<tr>
<td>Name</td>
<td>Data type</td>
<td>Description</td>
<td>Example</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
<td>--------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>metric</td>
<td>string</td>
<td>The metric name for the associated time and metric</td>
<td>health</td>
</tr>
<tr>
<td>type</td>
<td>string</td>
<td>The type of anomaly that is detected.</td>
<td>Static threshold</td>
</tr>
<tr>
<td>severity</td>
<td>string</td>
<td>The severity of the anomaly.</td>
<td>major</td>
</tr>
<tr>
<td>start</td>
<td>number</td>
<td>The time that is associated with the start of the</td>
<td>1466008980000</td>
</tr>
<tr>
<td>end</td>
<td>number</td>
<td>The time that is associated with the end of the</td>
<td>1466009000000</td>
</tr>
<tr>
<td>value</td>
<td>number</td>
<td>The last violation metric value for the associated</td>
<td>999771</td>
</tr>
</tbody>
</table>
| details| string    | JSON blob that contains the details of the anomaly.| 'effectiveTimeStamp': 1472098732320,
|        |           |                                                  | 'limitType': 0,
|        |           |                                                  | 'upperLimit': 10,
|        |           |                                                  | 'lowerLimit': 5,
|        |           |                                                  | 'numEvents': 2}]
|        |           |                                                  | [1474011562171,
|        |           |                                                  | 'limitType': 0,
|        |           |                                                  | 'upperLimit': 5000,
|        |           |                                                  | 'lowerLimit': 3000,
|        |           |                                                  | 'numEvents': 2]},
|        |           |                                                  | [1474255259000,
|        |           |                                                  | 'effectiveTimeStamp': 1474264259000,
|        |           |                                                  | 'limitType': 0,
|        |           |                                                  | 'upperLimit': 5000,
|        |           |                                                  | 'lowerLimit': 3000,
|        |           |                                                  | 'numEvents': 2]},
|        |           |                                                  | [1474270259000,
|        |           |                                                  | 'effectiveTimeStamp': 1474278659000,
|        |           |                                                  | 'limitType': 0,
|        |           |                                                  | 'upperLimit': 5000,
|        |           |                                                  | 'lowerLimit': 3000,
|        |           |                                                  | 'numEvents': 2}]

Note:

- entities and parents or both must be provided.
- The start and end parameters must be used together. The time parameter supersedes start and end if they are all present in the URL.

JSON code:

```json
[
  {
    "parent": 16,
    "entityName": "Fa0/1",
    "parentName": "10.55.239.250",
    "metric": "ifInDiscards",
    "entity": 298,
    "details": {
      'effectiveTimeStamp': 1474011562171,
      'limitType': 0,
      'upperLimit': 5000,
      'lowerLimit': 3000,
      'numEvents': 2
    },
    "end": 1474255259000,
    "severity": "major",
    "type": "StaticThreshold",
    "start": 1474264259000,
    "value": 4069
  },
  {
    "parent": 16,
    "entityName": "Fa0/1",
    "parentName": "10.55.239.250",
    "metric": "ifInDiscards",
    "entity": 298,
    "details": {
      'effectiveTimeStamp': 1474011562171,
      'limitType': 0,
      'upperLimit': 5000,
      'lowerLimit': 3000,
      'numEvents': 2
    },
    "end": 1474278659000,
    "severity": "major",
    "type": "StaticThreshold",
    "start": 1474264259000,
    "value": 4112
  },
  {
    "parent": 16,
```
Threshold API

REST APIs that define entity metric Thresholds and stores Threshold definitions.

**definition**

Provides threshold definitions, and stores the definitions.

It performs the following functions:
- Get everything
- Get a single response
- Stores a definition

**URL**

With help of this API, information is queried and retrieved from THRESHOLD.STATIC_DEFINITION table.

http://[host]:[port]/service/dataset/threshold/definition

http://<myserver.ibm.com>:8081/service/dataset/threshold/definition

**Method**

The supported request type.

HTTP GET
HTTP POST

**URL parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Required</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>query</td>
<td>No</td>
<td>Provides a query predicate, which is a filter that is applied to a where clause.</td>
</tr>
<tr>
<td>fields</td>
<td>No</td>
<td>Specifies the wanted fields in the response</td>
</tr>
<tr>
<td>count</td>
<td>No</td>
<td>Specifies the wanted maximum number of rows in the response</td>
</tr>
<tr>
<td>sort</td>
<td>No</td>
<td>How the records must be sorted. Prefix + or - to indicate sort direction. For example, +metric,-upper_limit indicates to sort by metric ascending, and then sort by upper_limit descending.</td>
</tr>
</tbody>
</table>

**Sample URL**

Get All

http://<myserver.ibm.com>:8081/service/dataset/threshold/definition
Get one (Query by an identifier)


Post or Put

http://<myserver.ibm.com>:8081/service/dataset/threshold/definition

**Response**

The results are returned as JSON data that contains an array of the following fields:

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>metric</td>
<td>string</td>
<td>The metric name</td>
<td>snmpInBandwidth</td>
</tr>
<tr>
<td>effective_time_stamp</td>
<td>long</td>
<td>Most recent time when the static definition is stored or updated.</td>
<td>UNIX epoch time with millisecond precision</td>
</tr>
<tr>
<td>threshold_id</td>
<td>long</td>
<td>Unique identifier for the threshold definition</td>
<td>2</td>
</tr>
<tr>
<td>enabled</td>
<td>boolean</td>
<td>Indicates whether the threshold definition is active or not.</td>
<td>true or false</td>
</tr>
<tr>
<td>limit_type</td>
<td>int</td>
<td>How the static threshold ranges are to be applied.</td>
<td>• 0 is Over</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 1 is Under</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 2 is Band</td>
</tr>
<tr>
<td>upper_limit</td>
<td>long</td>
<td>Upper range limit</td>
<td>100</td>
</tr>
<tr>
<td>lower_limit</td>
<td>long</td>
<td>Lower range limit</td>
<td>100</td>
</tr>
<tr>
<td>num_events</td>
<td>int</td>
<td>Number of consecutive occurrences that are required to violate a threshold.</td>
<td>4</td>
</tr>
</tbody>
</table>

Get response

```json
[
  {
    "metric":"snmpInBandwidth",
    "effective_time_stamp":1469199999999,
    "threshold_id":2,
    "enabled":true,
    "limit_type":2,
    "upper_limit":400000,
    "lower_limit":330000,
    "num_events":6
  }
]
```

Payload for Post

```json
{
  "metric":"snmpInBandwidth",
  "effective_time_stamp":1469199999999,
  "threshold_id":2,
  "enabled":true,
  "limit_type":2,
  "upper_limit":400000,
  "lower_limit":330000,
  "num_events":6
}
```
"upper_limit":400000,
"lower_limit":330000,
"num_events":6
}]}
Chapter 2. Command line interface

Provide command-line interfaces that are available in IBM Network Performance Insight to support installation, configuration, administration, and other tasks.

A list of commands available for Network Performance Insight users and administrators.

npi-cmd command reference

Usage for the npi-cmd command. Run the npi-cmd command to start, stop, and check the status of Network Performance Insight services.

Location

Note: npi-cmd command can be run as netcool or a non-root user with sudo permissions to control Network Performance Insight services.

<NPI_Home>/npi-manager/bin

<NPI_Home> is the location where Network Performance Insight is installed. For example, /opt/IBM/npi.

npi-cmd command syntax

```
npi-cmd -service <service_name> | host | action[stop|start|status]
```

Parameters

**service**

Specify the name of the service. For example:

- npi-manager
- npi-dns
- npi-event
- npi-storage
- npi-ui
- npi-threshold
- npi-itnm-collector
- npi-flow-analytics
- npi-flow-counter
- npi-entity-analytics
• npi-entity-analytics

**host**
Fully qualified host name (FQDN) where the service is located.

**action**
- **stop**
  Stops the specified service.
- **start**
  Start the specified service.
- **status**
  Checks the status of the specified service.

**Note:** You can check the status only when the Manager Service is up and running.

For example:
```
sudo /opt/IBM/npi/npi-manager/bin/npi-cmd -service npi-flow-collector -host <myserver.ibm.com> start
```

---

**backup command reference**

Usage for the **backup** command. Run the **backup** command to back up Network Performance Insight storage database.

**Location**

**Note:** **backup** command can be run as root or netcool user with sudo permissions to control Network Performance Insight services.

`<NPI_Home>/npi-storage/bin`

`<NPI_Home>` is the location where Network Performance Insight is installed. For example, `/opt/IBM/npi`.

**backup command syntax**

```
backup [-path | -backupTool | -help]
```

**Parameters**

**path**
The directory path of where the backup tar files are stored.

**backupTool**
The full path of where the Customized_script is located. For example:

`<NPI_Home>/npi-storage/bin/directory/Customized_script`

By default, this option uses the `<NPI_Home>/npi-storage/bin/backup-tool` script to create tar files to the path specified in **-path**.

**help**
Displays the usage for **backup** command.
Usage for the `restore` command. Run the `restore` command to restore Network Performance Insight storage database.

**Location**

**Note:** The `restore` command can be run as root or netcool user with sudo permissions to control Network Performance Insight services.

```shell
<NPI_Home>/npi-storage/bin
```

`NPI_Home` is the location where Network Performance Insight is installed. For example, `/opt/IBM/npi`.

**restore command syntax**

```
restore [-localBackup | -help]
```

**Parameters**

- `-localBackup`  
  The directory path of where the backup tar files to be restored from.

- `-help`  
  Displays the usage for `restore` command.
Chapter 3. Configuring Flow devices

Provides the command reference with examples for configuring the flow devices to enable them to work with IBM Network Performance Insight, Version 1.2.0.

Before Network Performance Insight can gather data, routers and other network devices must be configured to send NetFlow data. These configurations are needed to ensure that routers send NetFlow data periodically to the Collector subsystem.

For more detailed information about setting up flow devices for Network Performance Insight, see the specific vendor documentation.

CAUTION:
Only IT administrators with experience in configuring routers and switches must use this information.

Supported devices and flow formats

IBM Network Performance Insight, Version 1.2.0 supports most of the devices and their flow formats that are available in the market.

Some of devices and their flow formats that Network Performance Insight v1.2.0 supports:

<table>
<thead>
<tr>
<th>Device</th>
<th>Flow format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco</td>
<td>NetFlow (v1, v5, v9, and IPFIX versions)</td>
</tr>
<tr>
<td>Juniper</td>
<td>J-Flow (v5 and v9)</td>
</tr>
<tr>
<td>Alcatel</td>
<td>Cflow (v5 and v9)</td>
</tr>
<tr>
<td>Huawei</td>
<td>NetStream (v5 and v9)</td>
</tr>
</tbody>
</table>

Configuring NetFlow on Cisco routers

Netflow is a data collection and reporting protocol for monitoring network traffic that is supported by multiple vendors.

As a part of this configuration, network administrators must configure the devices to transmit NetFlow information actively to the network monitoring application and configure the interfaces to gather information about the traffic conversations. The configurations that you perform must be in line with the capacity of the network application. In this case, Network Performance Insight.

NetFlow also monitors layers 2-4 of Open Systems Interconnection (OSI) model and other flow technologies and provides information on network usage and port conversations activity.

Related information:

Cisco IOS Configuration Fundamentals Command Reference, Release 12.2
Cisco IOS command modes

You use the CLI to access Cisco IOS software.

Enter a question mark (?) at the CLI prompt to obtain a list of commands that are available for each command mode.

When you log in to the CLI, you are in user EXEC mode. User EXEC mode contains only a limited subset of commands. To have access to all commands, you must enter privileged EXEC mode, normally by using a password. From privileged EXEC mode, you can give any EXEC command; user or privileged mode. Or, you can enter global configuration mode.

These configuration modes are needed for you to change the running configuration. If you later save the running configuration to the start configuration, these changed commands are stored when the software is rebooted. To enter specific configuration modes, you must start at global configuration mode. From global configuration mode, you can enter interface configuration mode and various other modes, such as protocol-specific modes.

Command modes

Describes how to use various common command modes of the Cisco IOS software.

Command modes

Shows examples of the prompts displayed.

<table>
<thead>
<tr>
<th>Command mode</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Exec</td>
<td>When you log in to the CLI, you are in User Exec mode. Contains only a limited subset of commands.</td>
</tr>
<tr>
<td></td>
<td>Router&gt;</td>
</tr>
</tbody>
</table>
| Privileged Exec       | You can have access to all commands in this mode. Typically, require a password. Use the enable command. Your prompt changes to Router#.
|                       | Router> enable Password <password> Router#     |
| Global configuration  | Enter the configure terminal privileged EXEC command to enter global configuration mode. Your prompt changes to Router(config)#. |
|                       | Router# configure terminal Router(config)#     |
|                       | **Note:** Enter configuration commands, one per line. End with CTRL+Z or Exit command. |
| Interface configuration| From global configuration mode, specify an interface by using an interface command. Your prompt changes to Router(config_if)#. |
|                       | Router(config)# interface serial ? <0-6> Serial interface number Router(config)# interface serial 4 ? / Router(config)# interface serial 4/ ? <0-3> Serial interface number Router(config)# interface serial 4/0 Router(config-if)# |
|                       | **Note:** Enter “?” to display what you must enter next on the command line. |
Enabling NetFlow on your devices

To enable NetFlow, configure IP routing and use these commands in global configuration mode.

About this task

Enabling flow monitoring for an interface.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
</table>
| Router(config)# interface type slot/port-adapter/port | Enters interface configuration mode and configures the interface.
| For example, interface GigabitEthernet1/0/3 |
| Router(config-if)# ip route-cache flow | Enables NetFlow for IP routing. |
| Router(config-if)# ip route-cache ingress | Enables NetFlow on the sub interfaces with direction. |
| Router(config-if)# ip route-cache egress | |
| Router(config-if)# ip flow egress | |
| Router(config-if)# ip flow ingress | |

Configuring the Flow Exporters

NetFlow information can also be exported to network management applications.

About this task

To configure a router to export NetFlow information that is maintained in the NetFlow cache to Network Performance Insight, use these commands in global configuration mode. NetFlow information is exported to Network Performance Insight when the Flow expires in NetFlow cache.

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
</table>
| Router(config)# ip flow-export ip-address udp-port | Configures a router to export NetFlow cache entries to a Collector.
<p>| Where | |
| &lt;IP_address&gt; | IP address of the system to which you want to send the NetFlow information. |
| udp-port | UDP protocol-specific port number. |</p>
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router(config)# ip flow-export version 9</td>
<td>Specifies that the export packet uses the Version 9 format. Optionally, specify the origin or peer autonomous systems.</td>
</tr>
<tr>
<td>peer-as</td>
<td>Specifies that export statistics include the originating autonomous system for the source and destination.</td>
</tr>
<tr>
<td>origin-as</td>
<td>Specifies that export statistics include the peer autonomous system for the source and destination.</td>
</tr>
<tr>
<td>bgp-nexthop</td>
<td>Specifies that export statistics include BGP next hop-related information.</td>
</tr>
<tr>
<td>show ip flow export</td>
<td>Displays statistics for the NetFlow data export, including statistics for the main cache and for all other enabled caches.</td>
</tr>
<tr>
<td>Router(config)# ip flow-export source</td>
<td>Sets the source IP address of the NetFlow exports that are sent by the device to the specified IP address.</td>
</tr>
<tr>
<td>&lt;interface&gt;/</td>
<td>&lt;interface_number&gt;</td>
</tr>
<tr>
<td>Router(config)# ip flow-cache timeout active</td>
<td>Active timeout is the frequency of active flow records that are exported from the flow cache to Network Performance Insight. Default value is 30 min. To get real-time traffic reports, set this value to 1.</td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Router(config)# ip flow-cache timeout inactive</td>
<td>Inactive timeout is the frequency of inactive flow records that are exported from the flow cache to Network Performance Insight. A flow record is inactive when the conversation between two interfaces is stopped. Default value is 15 sec.</td>
</tr>
</tbody>
</table>

Related information:

[Configuring NetFlow and NetFlow Data Export](#)
Customizing the number of entries in flow cache

You can increase or decrease the number of entries that are maintained in the cache to meet your NetFlow traffic rates. The number of entries can be 1024 - 524288. The default is 65536.

About this task

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router(config)# ip flow-cache entries &lt;number&gt;</td>
<td>Changes the number of entries that are maintained in the NetFlow cache. CAUTION: Improper use of this feature might cause network problems. To return to the default NetFlow cache entries, use the no ip flow-cache entries in global configuration mode.</td>
</tr>
</tbody>
</table>

Monitoring NetFlow information

Use these commands to verify whether the NetFlow data export is functioning and displaying the data.

About this task

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Router# show ip flow export</td>
<td>Displays information about NetFlow flow exporters and statistics.</td>
</tr>
<tr>
<td>Router# show flow exporter &lt;exporter_name&gt;</td>
<td>Displays the statistics of the specified Flow Exporter.</td>
</tr>
<tr>
<td>Router# show ip flow interface</td>
<td>Displays NetFlow accounting configuration on interfaces.</td>
</tr>
<tr>
<td>Router# show ip interface</td>
<td>Displays the usability status of interfaces that are configured for IP.</td>
</tr>
<tr>
<td>Router# show ip cache flow</td>
<td>Displays the NetFlow statistics such as: • IP packet size distribution • IP flow cache information • Flow information: protocol, total flow, flows per second</td>
</tr>
<tr>
<td>Router# clear ip flow stats</td>
<td>Clears the NetFlow statistics.</td>
</tr>
</tbody>
</table>
An example Cisco device configuration

Need more information
configure terminal
interface serial 3/0/0
ip route-cache flow
exit
ip flow-export 127.1.0.0 0 version 5 peer-as
exit
clear ip flow stats
Router# show ip cache flow

The output is as shown:

IP packet size distribution (230151 total packets):
1-32  64  96  128  160  192  224  256  288  320  352  384  416  448  480
.999  .000  .000  .000  .000  .000  .000  .000  .000  .000  .000  .000  .000  .000
512  544  576  1024  1536  2048  2560  3072  3584  4096  4608
.000  .000  .000  .000  .000  .000  .000  .000  .000  .000  .000

Configuring flow on Juniper devices

Provides commands and examples to configure J-Flow on an SRX Series device.

Command modes

<table>
<thead>
<tr>
<th>Command mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational mode</td>
<td>When you log in to the router and type the CLI command, you are automatically in operational mode: user@host&gt; This mode displays the status of the device. In operational mode, you enter commands to monitor and troubleshoot the Junos OS, devices, and network connectivity.</td>
</tr>
<tr>
<td>Configuration mode</td>
<td>A configuration for a device that is running on Junos OS is stored as a hierarchy of statements. In configuration mode, you enter these statements to define all properties of the Junos OS, including interfaces, general routing information, routing protocols, user access, and several system and hardware properties. user@host&gt;configure user@host# To exit the mode, give the following commands: user@host# commit and-quit commit complete user@host To exit without commit: user@host# exit Exiting configuration mode user@host&gt;</td>
</tr>
</tbody>
</table>

Active Flow monitoring

Flow monitoring versions 5, 8, and 9 support active flow monitoring. For active flow monitoring, the monitoring station participates in the network as an active router. A router performs the following actions during active Flow monitoring:

- Sampling
  - The router selects and analyzes only a portion of the traffic.
- Sampling with templates

Network Performance Insight References
The router selects, analyzes, and arranges a portion of the traffic into templates.

- **Sampling per sampling instance**
  The router selects, analyzes, and arranges a portion of the traffic according to the configuration and binding of a sampling instance.

- **Port mirroring**
  The router copies entire packets and sends the copies to another interface.

- **Multiple port mirroring**
  The router sends multiple copies of monitored packets to multiple export interfaces with the next-hop-group statement at the (edit forwarding-options) hierarchy level.

- **Discard accounting**
  The router accounts for selected traffic before it discards. Such traffic is not forwarded out of the router. Instead, the traffic is quarantined and deleted.

- **Flow-tap processing**
  The router processes requests for active flow monitoring dynamically by using the Dynamic Tasking Control Protocol (DTCP).

Some of the commands for these actions are described here.

**Related information:**

- Flow Monitoring Feature Guide for Routing Devices
- Active Flow Monitoring Overview

## Configuring J-Flow versions 5 and 8

Commands to configure J-Flow versions 5 and 8.

### About this task

<table>
<thead>
<tr>
<th>Commands</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# set interfaces ge-0/0/0 unit 0 family inet sampling input</td>
<td>Enables sampling on one or more interfaces and specify the direction.</td>
</tr>
<tr>
<td>user@host# set interfaces ge-0/0/0 unit 0 family inet sampling output</td>
<td></td>
</tr>
</tbody>
</table>

---

*Chapter 3. Configuring Flow devices 33*
<table>
<thead>
<tr>
<th>Commands</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# set forwarding-options sampling input rate 100</td>
<td>Specifies the sampling rate. CAUTION: Caution: Activation of flow collection can have a significant impact on the performance of the SRX Series device. The smaller the sample rate, the bigger the impact. It is recommended to not use a sampling input rate of 1. Where: forwarding-options Starts the inline J-Flow configuration, so that the sampling and the J-Flow service thread are implemented in the forwarding engine. sampling Configures the J-Flow packet sampling options. input Enables sampling. rate Specifies the ratio of packets to be sampled.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling family inet output flow-server 10.10.10.1 port 2056</td>
<td>Specifies the UDP port number of the host that is collecting cflowd packets.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling family inet output flow-server 10.10.10.1 version 5</td>
<td>Specify the version format 5.</td>
</tr>
</tbody>
</table>

Related information:

- SRX Getting Started - Configure J-Flow

Configuring J-Flow version 9
Commands to configure J-Flow versions 9.

About this task

<table>
<thead>
<tr>
<th>Commands</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# set services flow-monitoring version9 template v4 flow-active-timeout 30</td>
<td>Configures the J-Flow v9 template. Note: Currently, the IPv4 template is supported.</td>
</tr>
<tr>
<td>user@host# set services flow-monitoring version9 template v4 flow-inactive-timeout 30</td>
<td></td>
</tr>
<tr>
<td>user@host# set services flow-monitoring version9 template v4 &lt;ipv4-template&gt;</td>
<td></td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling input rate 100</td>
<td>Specifies the sampling rate and run length.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling input run-length 0</td>
<td></td>
</tr>
</tbody>
</table>
### Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# set forwarding-options sampling family inet output flow-server &lt;IP_address&gt; port 2222</td>
<td>Configures the external flow collector and its port number. <strong>Note:</strong> The J-Flow v9 template is associated with the external flow collector. Up to eight flow collectors can be simultaneously configured.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling input</td>
<td></td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling output</td>
<td></td>
</tr>
<tr>
<td>family inet output flow-server &lt;IP_address&gt;</td>
<td></td>
</tr>
<tr>
<td>version9 template &lt;template_name&gt;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# set forwarding-options sampling input</td>
<td></td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling output</td>
<td></td>
</tr>
<tr>
<td>family inet output inline-jflow source-address &lt;IP_address&gt;</td>
<td></td>
</tr>
<tr>
<td>user@host# set interfaces ge-0/0/14 unit 0 family inet sampling input</td>
<td>Configure the inline-jflow, so that the sampling and the J-Flow service thread are implemented in the forwarding engine.</td>
</tr>
<tr>
<td>user@host# set interfaces ge-1/0/0 unit 0 family inet sampling output</td>
<td></td>
</tr>
<tr>
<td>user@host# set interfaces ge-0/0/14 unit 0 family inet address &lt;IP_address&gt;/24</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# show interfaces descriptions</td>
<td>Displays all the configured interfaces.</td>
</tr>
</tbody>
</table>

### Related information:

**Juniper Flow Monitoring**

**Configuring the sampling instance**

You can configure active sampling by using a sampling instance and associate that sampling instance to a particular Packet Forwarding Engine. In addition, you can define multiple sampling instances that are associated with multiple destinations (as many as the number of Packet Forwarding Engines in the chassis), with multiple protocol families per each sampling instance destination.

### About this task

<table>
<thead>
<tr>
<th>Command</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>set chassis fpc 0 sampling-instance s0</td>
<td></td>
</tr>
<tr>
<td>set interfaces ge-0/1/0 unit 0 family inet sampling input</td>
<td></td>
</tr>
<tr>
<td>set interfaces ge-0/1/0 unit 0 family inet address</td>
<td></td>
</tr>
<tr>
<td>set interfaces ge-1/0/0 unit 0 family inet address</td>
<td></td>
</tr>
<tr>
<td>set interfaces sp-2/0/0 unit 0 family inet</td>
<td></td>
</tr>
<tr>
<td>set forwarding-options sampling instance s0 input rate 1</td>
<td></td>
</tr>
<tr>
<td>set forwarding-options sampling instance s0 input run-length 0</td>
<td></td>
</tr>
<tr>
<td>set forwarding-options sampling instance s0 family inet output flow-server 2.2.2.2 port 2055</td>
<td>Configure the sampling filter on an interface (or interfaces) in the direction, on which the J-Flow service is required.</td>
</tr>
<tr>
<td>set forwarding-options sampling instance s0 family inet output flow-server 2.2.2.2 version9 template v4;</td>
<td></td>
</tr>
<tr>
<td>set forwarding-options sampling instance s0 family inet output interface sp-2/0/0 source-address 1.1.1.1</td>
<td></td>
</tr>
<tr>
<td>set routing-options static route 50.0.0.0/8 next-hop 20.0.0.2</td>
<td></td>
</tr>
<tr>
<td>set services flow-monitoring version9 template v4 flow-active-timeout 30</td>
<td></td>
</tr>
<tr>
<td>set services flow-monitoring version9 template v4 flow-inactive-timeout 30</td>
<td></td>
</tr>
<tr>
<td>set services flow-monitoring version9 template v4 ipv4-template</td>
<td></td>
</tr>
</tbody>
</table>

### Related information:

**Example: Sampling Instance Configuration**
Configuring J-Flow version 9 for SRX-DataCenter devices

Commands to configure J-Flow versions 9 for SRX-DataCenter devices.

About this task

<table>
<thead>
<tr>
<th>Commands</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>user@host# set services flow-monitoring version9 template &lt;template_name&gt;</td>
<td>Configures the J-Flow v9 template</td>
</tr>
<tr>
<td>user@host# set sampling family inet output flow server &lt;flow_collector_ip_add&gt; port &lt;flow_collector_port&gt; version9 template &lt;template_name&gt;</td>
<td>Configures external flow collector, in this case, Network Performance Insight Collector.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling instance &lt;instance1&gt; input rate 100</td>
<td>Specifies the sampling rate. Note: Currently, IPv4 template is supported.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling instance &lt;instance1&gt; input run-length 0</td>
<td></td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling instance &lt;instance1&gt; family inet output flow-server &lt;Ip_address&gt; port 2222</td>
<td>Configures the external flow collector and its port address. Note: The J-Flow v9 template is associated with the external flow collector. Up to eight flow collectors can be simultaneously configured.</td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling instance &lt;instance1&gt; family inet output flow-server &lt;Ip_address&gt; version9 template &lt;template_name&gt;</td>
<td></td>
</tr>
<tr>
<td>user@host# set forwarding-options sampling instance &lt;instance1&gt; family inet output inline-jflow source-address &lt;Ip_address&gt;</td>
<td>Configures the inline-jflow, so that the sampling and the J-Flow service thread are implemented in the forwarding engine.</td>
</tr>
<tr>
<td>user@host# set interfaces ge-0/0/14 unit 0 family inet sampling input user@host# set interfaces ge-0/0/14 unit 0 family inet address 2.2.2.1/24</td>
<td>Configures the sampling filter on an interface (or interfaces) in the direction, on which the J-Flow service is required.</td>
</tr>
</tbody>
</table>

Related information:

SRX Getting Started - Configure J-Flow

Using the show commands

Describes the possible show command options in configuration mode and Operational mode.

About this task

configure
//To enter a configuration mode
show ?
Execute this command
> access Network access configuration
> access-profile Access profile for this instance
> accounting-options Accounting data configuration
> applications Define applications by protocol characteristics
+ apply-groups Groups from which to inherit configuration data
> chassis Chassis configuration
> class-of-service Class-of-service configuration
> ethernet-switching-options Ethernet-switching configuration options
> event-options Event processing configuration
> firewall Define a firewall configuration
> forwarding-options Configure options to control packet forwarding
> groups Configuration groups
> interfaces Interface configuration
> multi-chassis
> multicast-snooping-options Multicast snooping option configuration
> policy-options Policy option configuration
> protocols Routing protocol configuration
> routing-instances Routing instance configuration
> routing-options Protocol-independent routing option configuration
> schedulers Security scheduler
> security Security configuration
> services Set services parameters
> smtp Simple Mail Transfer Protocol service configuration
> snmp Simple Network Management Protocol configuration
> system System parameters
> vlans VLAN configuration
| Pipe through a command

Exit
//To exit the configuration mode
Show
// To run the show command options in User Execc mode
accounting
arp
as-path
authentication-whitelist
bfd
bgp
chassis
class-of-service
cli
configuration
connections
database-replication
dhcp
dhcpv6
dialer
dot1x
dvmrp
dynamic-tunnels
dynamic-services
dynamic-schedulers
sla
evp
ospf3
ospf
oam
ntp
multicast
mvpn
mpls
lldp
isis
isis
isdn
l2circuit
l2vpn
lacp
ldp
lldp
log
mld
mld-snooping
mpls
multicast
mvpn
network-access
ntp
ospf
ospf3
pfe
pgm
pm
policy
ppp
pppoe
r2cp
rip
ripng
route
rsvp
s
sap
security
services
smtp
snmp
spanning-tree
system
task
ted
tmg
version
vlans
mpls
vrpp
wan-acceleration
Show accounting profiles and records
Show system Address Resolution Protocol table entries
Show table of known autonomous system paths
Show 802.1X White List MAC addresses
Show Bidirectional Forwarding Detection information
Show Border Gateway Protocol information
Show chassis information
Show class-of-service (CoS) information
Show command-line interface settings
Show current configuration
Show circuit cross-connect connections
Show database replication information
Show Dynamic Host Configuration Protocol information
Show Dynamic Host Configuration Protocol v6 information
Show dialer information
Show 802.1X information
Show Distance Vector Multicast Routing Protocol information
Show dynamic tunnel information information
Show end system-to-intermediate system information
Show Ethernet-switching information
Show event-options information
Show firewall information
Show forwarding-options information
Show Generic VLAN Registration Protocol information
Show port-forwarding helper information
Show information related to Host (Direct route) Fast reroute
Show hostname information from domain name server
Show Inter Chassis Control Protocol information
Show Internet Group Management Protocol information
Show IGMP snooping information
Show Ingress-Replication tunnel information
Show interface information
Show IP version 6 information
Show Integrated Services Digital Network information
Show Intermediate System-to-Intermediate System information
Show Layer 2 circuit information
Show Layer 2 VPN information
Show Link Aggregation Control Protocol information
Show Label Distribution Protocol information
Show Link Layer Discovery Protocol information
Show contents of log file
Show multicast listener discovery information
Show MLD snooping information
Show mpls information
Show Multicast Source Discovery Protocol information
Show Multicast information
Show Multicast Virtual Private Network (MVPN) information
Show network-access related information
Show Network Time Protocol information
Show OAM-related information
Show Open Shortest Path First information
Show Open Shortest Path First version 3 information
Show Packet Forwarding Engine information
Show Pragmatic Generalized Multicast information
Show Protocol Independent Multicast information
Show Interface policer counters and information
Show policy information
Show PPP process information
Show PPP over Ethernet information
Show Radio-to-Router Protocol information
Show Routing Information Protocol information
Show Routing Information Protocol for IPv6 information
Show routing table information
Show Resource Reservation Protocol information
Show Session Announcement Protocol information
Show the information on one or more schedulers
Show security information
Show services
Show Simple Mail Transfer Protocol information
Show Simple Network Management Protocol information
Show Spanning Tree Protocol information
Show system information
Show routing protocol per-task information
Show Traffic Engineering Database information
Show telephony gateway module information
Show software process revision levels
Show VLAN information
Show WPLS information
Show Virtual Router Redundancy Protocol information
Show WAN acceleration module information
Verifying the configuration with show commands

To verify that your configuration is correct, use these commands on the monitoring station that is configured for active flow monitoring.

About this task

show services
show services flow-monitoring
show services flow-monitoring version9 template <template_name>
show services accounting (flow | flow-detail)
show services accounting memory
show services accounting packet-size-distribution
show services accounting status
show services accounting usage
show services accounting aggregation template template-name
name (detail | extensive | terse)

Most active flow monitoring operational mode commands contain equivalent output information to the following passive flow monitoring commands:

show services accounting errors = show passive-monitoring error
show services accounting flow = show passive-monitoring flow
show services accounting memory = show passive-monitoring memory
show services accounting status = show passive-monitoring status
show services accounting usage = show passive-monitoring usage

The active flow monitoring commands can be used with most active flow monitoring applications, including sampling, discard accounting, port mirroring, and multiple port mirroring. The following command shows the output of the show commands that are used with the configuration example:

user@router> show services accounting errors

Service Accounting interface: sp-2/0/0, Local interface index: 542
Service name: (default sampling)
Error information
  Packets dropped (no memory): 0, Packets dropped (not IP): 0
  Packets dropped (not IPv4): 0, Packets dropped (header too small): 0
  Memory allocation failures: 0, Memory free failures: 0
  Memory free list failures: 0
  Memory overload: No, PPS overload: No, BPS overload: Yes

user@router> show services accounting flow-detail limit 10

Service Accounting interface: sp-2/0/0, Local interface index: 468
Service name: (default sampling)

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Source</th>
<th>Source Port</th>
<th>Destination</th>
<th>Destination Port</th>
<th>Packet count</th>
<th>Byte count</th>
</tr>
</thead>
<tbody>
<tr>
<td>udp(17)</td>
<td>10.1.1.2</td>
<td>53</td>
<td>10.0.0.1</td>
<td>53</td>
<td>4329</td>
<td>3386035</td>
</tr>
<tr>
<td>ip(0)</td>
<td>10.1.1.2</td>
<td>0</td>
<td>10.0.0.2</td>
<td>0</td>
<td>4785</td>
<td>3719654</td>
</tr>
<tr>
<td>tcp(6)</td>
<td>10.1.1.2</td>
<td>20</td>
<td>10.3.0.1</td>
<td>20</td>
<td>1</td>
<td>1494</td>
</tr>
<tr>
<td>tcp(6)</td>
<td>10.1.1.2</td>
<td>20</td>
<td>10.168.80.1</td>
<td>20</td>
<td>1</td>
<td>677</td>
</tr>
<tr>
<td>tcp(6)</td>
<td>10.1.1.2</td>
<td>20</td>
<td>10.69.192.1</td>
<td>20</td>
<td>1</td>
<td>446</td>
</tr>
<tr>
<td>tcp(6)</td>
<td>10.1.1.2</td>
<td>20</td>
<td>10.239.240.1</td>
<td>20</td>
<td>1</td>
<td>1426</td>
</tr>
<tr>
<td>tcp(6)</td>
<td>10.1.1.2</td>
<td>20</td>
<td>10.126.160.1</td>
<td>20</td>
<td>1</td>
<td>889</td>
</tr>
<tr>
<td>tcp(6)</td>
<td>10.1.1.2</td>
<td>20</td>
<td>10.71.224.1</td>
<td>20</td>
<td>1</td>
<td>1046</td>
</tr>
</tbody>
</table>

user@router> show services accounting memory
Service Accounting interface: sp-2/0/0, Local interface index: 468
Service name: (default sampling)
Memory utilization
Allocation count: 437340, Free count: 430681, Maximum allocated: 6782
Allocations per second: 3366, Frees per second: 6412
Total memory used (in bytes): 133416928, Total memory free (in bytes): 133961744

user@router> show services accounting packet-size-distribution
Service Accounting interface: sp-2/0/0, Local interface index: 468
Service name: (default sampling)
Range start Range end Number of packets Percentage packets
64 96 170516 100

user@router> show services accounting status
Service Accounting interface: sp-2/0/0, Local interface index: 468
Service name: (default sampling)
Interface state: Monitoring
Group index: 0
Export interval: 60 secs, Export format: cflowd v5
Route record count: 13, IFL to SNMP index count: 30, AS count: 1
Time set: Yes, Configuration set: Yes
Route record set: Yes, IFL SNMP map set: Yes

user@router> show services accounting usage
Service Accounting interface: sp-2/0/0, Local interface index: 468
Service name: (default sampling)
CPU utilization
Uptime: 4790345 milliseconds, Interrupt time: 1668537848 microseconds
Load (5 second): 71%, Load (1 minute): 63%

Related information:

Verifying Your Work

Viewing device configuration
An example configuration for the J-Flow v9 template ipv4-test, flow collector 172.19.101.85 (port 2222) with sampling rate 1:100 and run length as 0.

For example, to view the configuration for the following set commands:

```
set services flow-monitoring version9 template ipv4-test ipv4-template
set forwarding-options sampling input rate 1
set forwarding-options sampling input run-length 0
set forwarding-options sampling family inet output flow-server 172.19.101.85 port 2222
set forwarding-options sampling family inet output flow-server 172.19.101.85 version9 template ipv4-test
set forwarding-options sampling family inet output inline-jflow source-address 172.19.101.132
set interfaces ge-0/0/14 unit 0 family inet sampling input
set interfaces ge-0/0/14 unit 0 family inet address 23.23.23.1/24
```

Give this command to view the details:
```
show configuration
```
Configuring NetStream traffic on Huawei devices

Huawei devices support NetStream flow, which is a supported flow type in Network Performance Insight.

Related information:

[NetStream (Integrated) Technology White Paper]

Configuring NetStream export

Huawei NetStream works much like Cisco NetFlow. The NetStream process gathers detailed data about flows and stores them to a cache table. NetStream then processes the flow data from the cache table and sends it to Network Performance Insight for monitoring.

About this task

There are export options for flow sampling, aggregation, and flow record content depending on how and what you are monitoring and how you need to export and report.

<table>
<thead>
<tr>
<th>Commands</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[RouterA] ip NetStream export host &lt;hostname&gt;</td>
<td>&lt;ip_address&gt; 9996</td>
</tr>
<tr>
<td>ip NetStream export source interface &lt;interface_name&gt;</td>
<td>Exports the NetStream data to a specified IP address.</td>
</tr>
<tr>
<td>[RouterA] ip NetStream sampler inbound 100</td>
<td>Configures global sampling.</td>
</tr>
<tr>
<td>[RouterA] ip NetStream sampler outbound 100</td>
<td></td>
</tr>
<tr>
<td>[RouterA-GigabitEthernet1/0/0] interface gigabitethernet 1/0/0</td>
<td>Sets up an interface.</td>
</tr>
<tr>
<td>[RouterA-GigabitEthernet1/0/0] ip address &lt;IP_address1&gt; &lt;IP_address2&gt;</td>
<td></td>
</tr>
<tr>
<td>[RouterA-GigabitEthernet1/0/0] ip NetStream inbound</td>
<td>Enables NetStream statistics on the inbound and outbound interfaces</td>
</tr>
<tr>
<td>[RouterA-GigabitEthernet1/0/0] ip NetStream outbound</td>
<td></td>
</tr>
</tbody>
</table>
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