Course Guide

IBM Network Performance Insight 1.3.1 Installation and Configuration

Course code: TN530 ERC 1.0

IBM Training

March 2020 edition

Contents

About this course

IBM Training

IBM Network Performance Insight 1.3.1 Installation and Configuration

IBM Network Performance Insight is a network performance monitoring system. It offers real-time and historical trends in network performance and interactive views of network data that help reduce network downtime and optimize network performance. Network Performance Insight provides IBM Netcool Operations Insight with comprehensive IP network device performance monitoring and traffic analysis. In this 3-day course, you learn how to install IBM Network Performance Insight and integrate it with IBM Netcool Operations Insight. This course is lab-intensive, with an emphasis on hands-on exercises.

The lab environment for this course uses the web-based IRLP/Soleil platform.

For information about other related courses, visit the IBM Training website:

http://www.ibm.com/training

	Details
Delivery method	Classroom or instructor-led online (ILO) or self-paced (SPVC)
Course level	ERC 1.0
	This course is a new course.
Product and version	IBM Network Performance Insight 1.3.1
Recommended duration	3 days
Skill level	Intermediate

IBM Training

Course objectives

- Describe the features of Network Performance Insight
- Prepare the hosts for installation
- Install Ambari and Hortonworks Data Platform
- Set up and install Network Performance Insight
- Integrate discovery and metric collection with IBM Tivoli Network Manager
- Integrate the event service with Netcool/OMNIbus
- Integrate the UI service with Dashboard Application Services Hub
- Install technology packs
- Install and configure the Device Dashboard
- Configure Dashboard Application Services Hub (DASH) roles
- Install an interim fix
- Set the resource scope
- Verify the installation

Course objectives

Audience

This course is designed for implementers, administrators, and technical sellers.

Prerequisites

Before taking this course, make sure that you have the following skills:

- Linux administration skills
- A working knowledge of IBM Netcool Operations Insight
- A general knowledge of IP network monitoring methods, such as SNMP, IP Flow, and IP SLA

IBM Training

Agenda

- Unit 1 Overview and installation
- Unit 2 Integration
- Unit 3 Post-installation configuration
- Unit 4 Solution verification

Agenda

The course contains the following units:

1. Overview and installation

   This unit begins with a description of the features and functions of Network Performance Insight. You then learn how to install Network Performance Insight, including all prerequisite setup tasks.

   In the exercises for this unit, you prepare the hosts, install Ambari, install Hortonworks Data Platform, and install Network Performance Insight

2. Integration

   In this unit, you learn how to integrate Network Performance Insight with other Netcool Operations Insight software.

   In the exercises for this unit, you integrate Network Performance Insight with IBM Tivoli Network Manager, Netcool/OMNIbus, and Dashboard Application Services Hub (DASH).

3. Post-installation configuration

   This unit walks you through several post-installation tasks.

In the exercises for this unit, you complete the following tasks:

- Install technology packs
- Install and configure the Device Dashboard
- Configure user and roles
- Install an interim fix

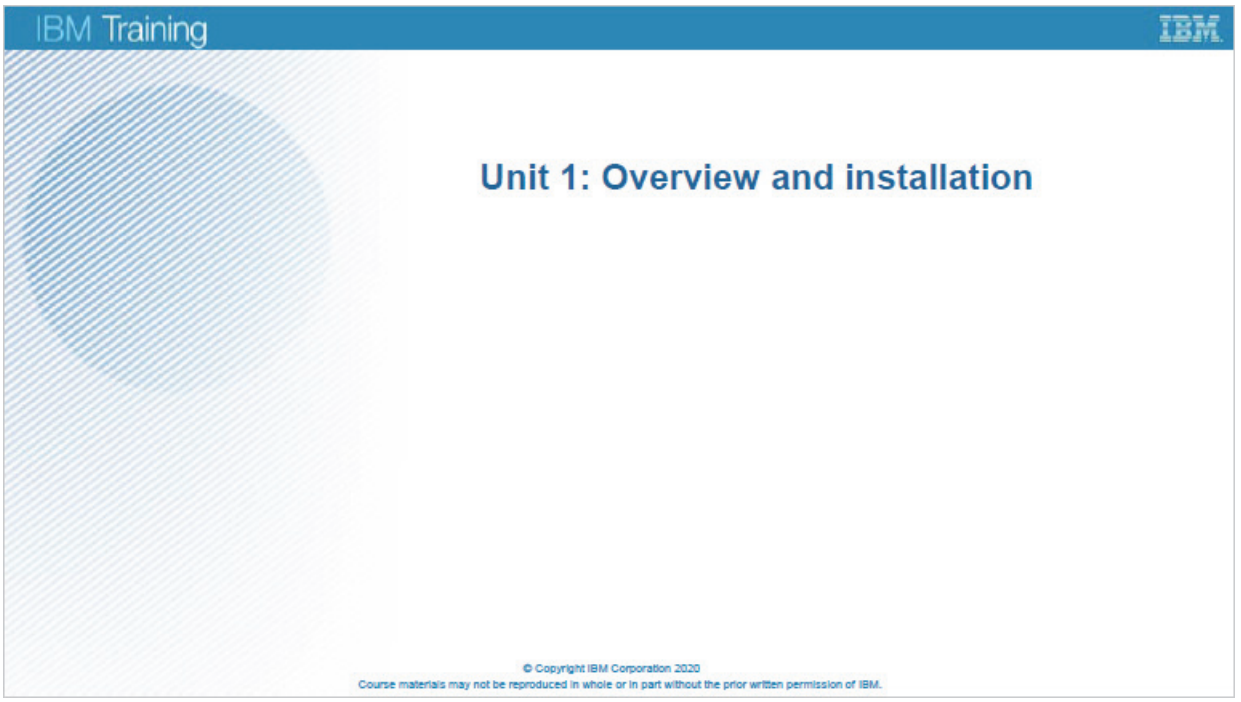
  Set the resource scope

4. Solution verification

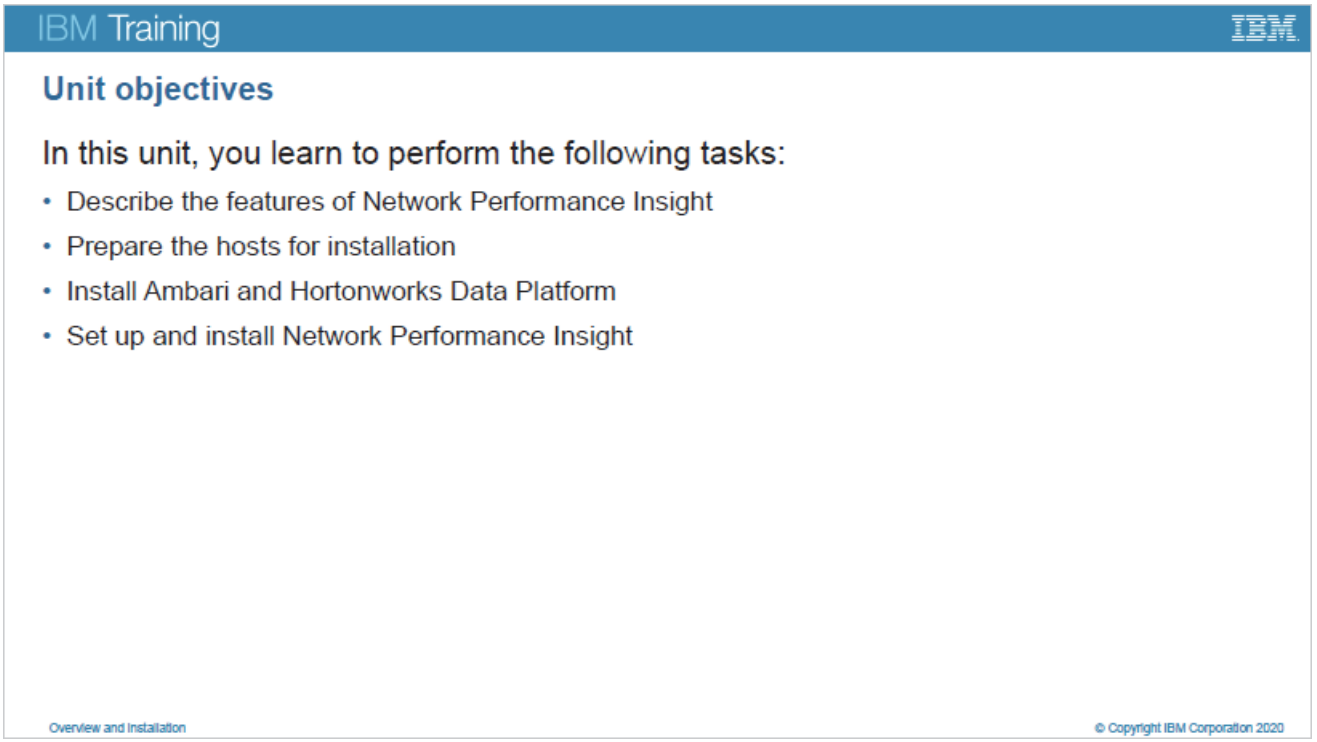
   This unit describes several IBM Network Performance Insight dashboards and reports. You can use these reports to confirm that IBM Network Performance Insight is successfully processing data.

   In the exercises for this unit, you verify that IBM Network Performance Insight is successfully collecting, aggregating, and reporting performance data. You also learn how to navigate the IBM Network Performance Insight user interface and set thresholds on flow data.

Unit 1 Overview and installation



This unit begins with a description of the features and functions of Network Performance Insight. You then learn how to install Network Performance Insight, including all prerequisite setup tasks.



Unit objectives

Lesson 1 Overview

In this lesson, you learn about Network Performance Insight features, reports, and architecture.

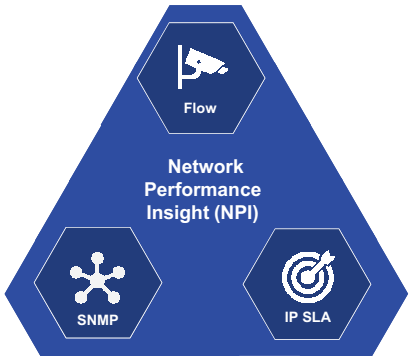
IBM Training IBM

What is Network Performance Insight?

Application-aware network performance management solution

Complements fault management by providing historical trends of network device performance behavior

Optional component of Netcool Operations Insight



Analyzes network traffic flow and decomposes the traffic by applications

Monitors latency performance of IP Links for Quality of Service (QoS) reporting

Detects performance anomalies through threshold violation and deviations

Utilizes high capacity data storage using Hadoop with built-in data replication

What is Network Performance Insight?

IBM Network Performance Insight is performance management software that provides fast network reporting suitable for trend analysis, troubleshooting, capacity planning, and service level agreement (SLA) objectives.

Network Performance Insight delivers a single tool with carrier-class performance management, monitoring, and reporting. You can use its scalable, flexible architecture to effectively consolidate network performance management and help reduce costs.

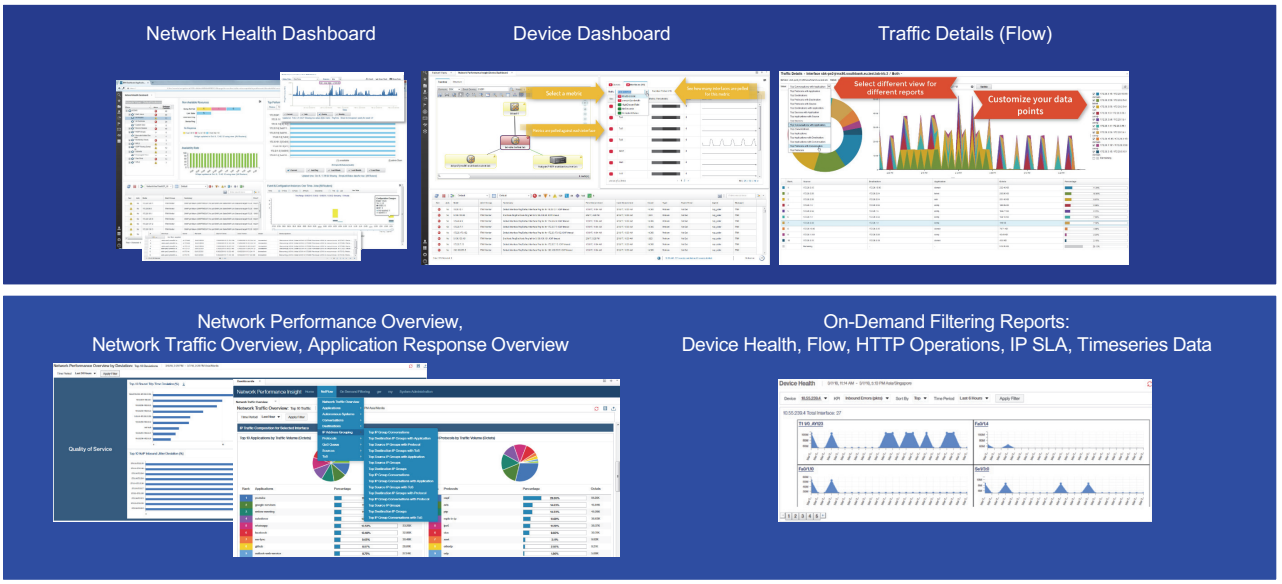
Network Performance Insight provides you with the flexible, global view that you need to bring data into a consolidated, customer and service-centric display. It helps service providers access the customer and service information necessary to prioritize troubleshooting. It also provides the historical and contextual reports needed to decrease troubleshooting time.

As a result, customer care resources can be more intelligently deployed and service level agreement violations can be avoided and minimized.

Network Performance Insight uses data from network flow records, SNMP polls, and IP SLA probes.

IBM Training

Network Performance Insight dashboards and reports



Overview and installation

Network Performance Insight dashboards and reports

Network Performance Insight web-based reports are appropriate for audiences including network operations staff, business decision makers, and customers of service providers. The highly flexible and scalable architecture enables full integration into a service provider or enterprise-scale operations support systems (OSS) infrastructure.

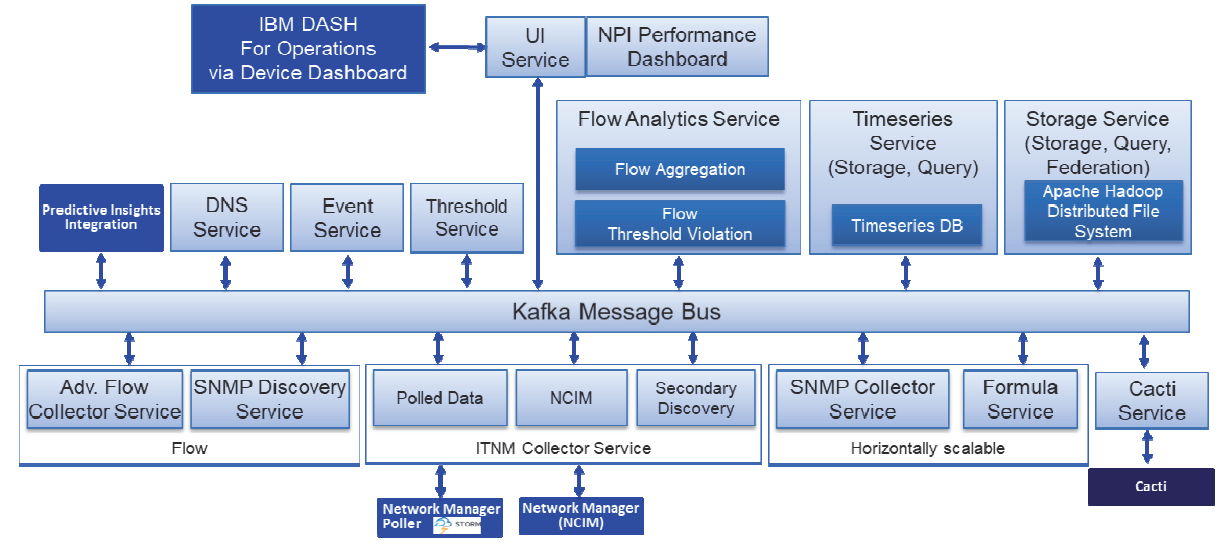
Network Performance Insight reports are embedded in these Netcool Operations Insight dashboards:

- Performance data is displayed on the Network Health Dashboard, which you can access from the DASH menu
- Performance data for a single device is displayed on the Device Dashboard, which you can access from a IBM Tivoli Network Manager View.
- Traffic details can be viewed from the Netcool/OMNIbus event list when a threshold has been violated.

Network Performance Insight also includes native dashboards, such as performance overviews, device health overviews, network health summaries, application response summaries, and so on.

IBM Training

Architecture



Architecture

Network Performance Insight is composed of several microservices, which communicate with each other using an Apache Kafka message bus. These microservices can be categorized into three different types of services: flow metric services, entity metric services, and foundation services.

Flow metric services handle data from network flow records. The following list describes flow services and their function:

- **Flow collector:** The flow collector receives flow records from devices in the network that export flow data. The service normalizes flow data which can vary by vendor and version into a common format. The flow collector stores flow data in Hadoop Distributed File System (HDFS).
- **Flow analytics:** This service aggregates raw flow data into 1 minute, 30 minutes, and 1-day intervals. The flow analytics service also computes top-N aggregations and detects threshold violations in incoming flow data.

Generally speaking, entity metric services handle data that is obtained by SNMP polling. The following list describes entity metric services and their function:

- **SNMP collector**: This service polls network devices for SNMP OID values.
- **Formula service**: The formula service takes OID values from the SNMP collector service and uses them to calculate metrics. This service also creates poll definition requests for the SNMP Collector.
- **Threshold service**: The threshold service detects threshold violations in SNMP metrics.
- **Tivoli Network Manager collector**: This service acquires discovery information from IBM Tivoli Network Manager using a JDBC connection to the NCIM database. This service also pulls

metrics that IBM Tivoli Network Manager is polling and makes that data available to other Network Performance Insight services.

- **Cacti collector**: Cacti is open source network monitoring software. Network Performance Insight can use Cacti discovery data, as well as metrics that Cacti has collected. The Cacti collector service obtains inventory and metrics from an instance of Cacti.
- **Timeseries exporter**: This service exports metrics to IBM Operations Analytics Predictive Insights using a compatible Kafka topic.

Foundation services are basic infrastructure services that are used by other Network Performance Insight services. The following list describes foundation services and their function:

- **Dashboard service**: This service holds all of the content to support the Network Performance Insight dashboards.
- **DNS service**: This service resolves DNS names for reporting.
- **Event service**: The event service sends alerts to the Netcool/OMNIbus ObjectServer when a threshold has been violated.
- **Inventory service**: The inventory service collects metadata about devices that are monitored via SNMP, for example the property names and values of a device.
- **Manager service**: This service monitors the status and health of all Network Performance Insight microservices.
- **Storage service**: This service provides high-volume data storage as well as high-bandwidth query and data analysis.
- **UI service**: The UI Service controls all the visualizations that are associated with Network Performance Insight.

In addition to the services pictured in the diagram, Network Performance Insight uses the following Hortonworks Data Platform (HDP) components:

- Apache Hadoop
- Apache Kafka
- Apache Ambari
- Apache Spark
- Apache ZooKeeper

Lesson 2 Installation

In this lesson, you review the steps necessary to install Network Performance Insight.

IBM Training

Setting up passwordless SSH

- Apache Ambari requires passwordless SSH authentication to all hosts in the Ambari cluster, including its own host and the host where IBM Netcool Operations Insight is running.
- Use the `setup_cluster_ssh.sh` tool to setup passwordless SSH to your hosts as the root user.
- IBM Netcool Operations Insight is commonly owned and run by a non-root user, so you must set up passwordless SSH manually.

Setting up passwordless SSH

During the installation process, Ambari run commands and transfers files to other hosts in your Network Performance Insight cluster, including hosts that are running Netcool Operations Insight components. Before you start the installation, you must set up passwordless SSH from the Ambari host to all other hosts, including the Ambari host itself.

To facilitate this task, the `setup_cluster_ssh.sh` tool is included in the Network Performance Insight media. Run this tool as the root user. Use fully qualified domain names when you are prompted for the name of each remote host.

This tool configures passwordless SSH for the root user. Often, Netcool Operations Insight components run as a non-root user. To configure passwordless SSH from the Ambari host as the root user to a Netcool Operations Insight host as a non-root user, you must copy the public keys manually. In the following example, passwordless SSH is configured for a user named **netcool** on a host named **host1.csite.edu**.

```
cd /root/.ssh

ssh-copy-id -i id_rsa.pub netcool@host1.csite.edu

/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "id_rsa.pub"
/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out
any that are already installed
/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted
now it is to install the new keys

netcool@host1.csite.edu's password:
```

IBM Training

Editing kernel parameters

You must change the system settings for the hosts where Network Performance Insight will be installed. Add the following settings to `/etc/sysctl.conf`:

```
net.core.rmem_default = 33554432
net.core.rmem_max = 33554432
net.core.netdev_max_backlog = 10000
```

Run the following command to refresh the host with the new configuration:

```
sysctl -p
```

Overview and installation

Editing kernel parameters

Edit these three kernel settings to tune network performance:

- **net.core.rmem_default**: The TCP/UDP default receive buffer size, in bytes
- **net.core.rmem_max**: The TCP/UDP maximum receive buffer size, in bytes
- **net.core.netdev_max_backlog**: The maximum amount of input packets that are buffered when an interface receives data faster than the system can process it

IBM Training

Processes and open files

- Increase the number of processes and open files permitted for all users.
- Create a .conf file in the `/etc/security/limits.d/` directory and add the following lines:

```
* - nofile 65536
* - nproc 65536
```


Processes and open files

Increase the number of processes and open files on the hosts where you install Network Performance Insight. Do this by creating a file with the extension `.conf` in the `/etc/security/limits.d/` directory.

You must log out and log back in to apply the changes.

IBM Training

Required operating system packages

The following operating system packages must be installed:

- libtirpc-devel
- redhat-lsb
- python-devel
- gcc
- zlib
- ncurses
- bzip2
- libstdc++
- ntp

Required operating system packages

You must install the following operating system packages on the hosts where you install Network Performance Insight:

- libtirpc-devel
- redhat-lsb
- python-devel
- gcc
- zlib, 32-bit
- ncurses, 32-bit
- bzip2, 32-bit
- libstdc++, 32-bit

IBM Training IBM

Disabling the Python security certificate verification

Open the `/etc/python/cert-verification.cfg` file in a text editor. Change the **verify** setting to **disable**.

```
# Possible values are:
# 'enable' to ensure HTTPS certificate verification is enabled by default
# 'disable' to ensure HTTPS certificate verification is disabled by default
# 'platform_default' to delegate the decision to the redistributor providing
this particular Python version

# For more info refer to https://www.python.org/dev/peps/pep-0493/
[https]
verify=disable
```


Disabling the python security certificate verification

Some Python modules used during installation include HTTP client functionality. To facilitate installation, disable security certificate verification on all Network Performance Insight hosts.

To disable certificate verification, edit the `/etc/python/cert-verification.cfg` file and change the value of `verify` to `disable`.

IBM Training

Installing Ambari and Hortonworks Data Platform (HDP)

After you decompress the Network Performance Insight installation media, the installation script is in the following directory:

`<DISTRIBUTION_DIRECTORY>/NPI-1.3.1.0/bin/`

Run the installation script with the location of the Network Performance Insight and Hortonworks Data Platform installation media, for example:

```
./install.sh /software/NPI/CC29WML
```


Installing Ambari and Hortonworks Data Platform (HDP)

You install Ambari, Hortonworks Data Platform (HDP), and the Network Performance Insight repositories with an installation script. Remove the existing yum cache on all Network Performance Insight hosts before you start the installation. Run the following command as the root user to remove the cache:

```
rm –rf /var/cache/yum
```

You can download the Ambari and Hortonworks Data Platform installation media here:

https://www.ibm.com/support/knowledgecenter/SSCVHB_1.3.1/install/tnpi_download_iop.html

Move the Hortonworks Data Platform installation packages to the same directory where the `NPI-1.3.1.0` subdirectory is located. The `NPI-1.3.1.0` subdirectory is created when you decompress the Network Performance Insight installation media.

Run the installation script, `install.sh`, followed by the path where you downloaded and decompressed the Network Performance Insight installation files.

In this example, the Network Performance Insight media was copied to `/software/NPI/`. When the installer archive (named `NOIPM_1.3.1_LNX_ML.tgz`) was decompressed, the `CC29WML` subdirectory was created.

```
ls /software/NPI/

CC29WML   NOIPM_1.3.1_LNX_ML.tgz
```

In the `CC29WML` subdirectory, you see the `NPI-1.3.1.0` subdirectory. Move the Hortonworks Data Platform installation packages to the same level as the `NPI-1.3.1.0` subdirectory.

```
ls /software/NPI/CC29WML/

ambari-2.6.2.2-centos7.tar.gz   HDP-GPL-2.6.4.0-centos7-rpm.tar.gz  NPI-1.3.1.0
HDP-2.6.4.0-centos7-rpm.tar.gz  HDP-UTILS-1.1.0.22-centos7.tar.gz
NPI-1.3.1.0.tgz
```

In this example, the command to start the installation script is:

```
./install.sh /software/NPI/CC29WML
```

After the installation script starts, you are prompted for the number of hosts in your Network Performance Insight cluster, followed by each of their host names.

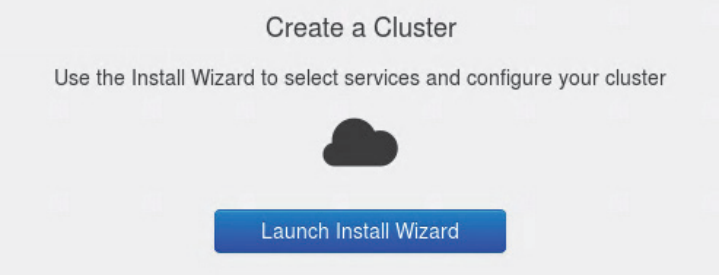
IBM Training

Setting up the Network Performance Insight cluster

Access the Ambari Manager page at the following URL.

http://<*host_name*>:8080

After you log in, start the installation wizard.



Setting up the Network Performance Insight cluster

You use a wizard to setup and install your Network Performance Insight cluster. To access the wizard, open a browser and go to the following URL, where host_name is the Ambari host.

http://<*host_name*>:8080

After you log in to the Ambari Manager page, you see the button to launch the installation wizard.

Note: The wizard prompts you for the private SSH key of the root user. If you choose to upload this key, you must run the browser as the root user.

IBM Training

Key fields in the installation wizard

These are the settings and values that are required by the installation wizard:

- List of host names
- SSH private key of the root user
- Grafana admin password
- Cassandra seed nodes
- JDBC URL for storage connection
- Ambari manager password

Key fields in the installation wizard

At minimum, you need the following information as you complete the required fields in the installation wizard:

- **List of host names**: Use the fully qualified domain name of each host.
- **SSH private key of the root user**: You can upload this key or copy and paste it into the wizard.
- **Grafana admin password**: Used for Ambari monitoring metrics.
- **Cassandra seed nodes**: Used during Cassandra startup to discover other Cassandra nodes in the cluster. Typically this is a host that runs Network Performance Insight flow or entity services.
- **JDBC URL for storage connection**: The host name and port number that is in the JDBC path to the storage location. This setting is required only if the storage service is not installed on all Network Performance Insight hosts. Typically, the host name is the storage service host and the port number is 13081.
- **Ambari manager password**: The password to access the Ambari Manager page.

IBM Training

Unit summary

You should now be able to perform the following tasks:

- Describe the features of Network Performance Insight
- Prepare the hosts for installation
- Install Ambari and Hortonworks Data Platform
- Set up and install Network Performance Insight

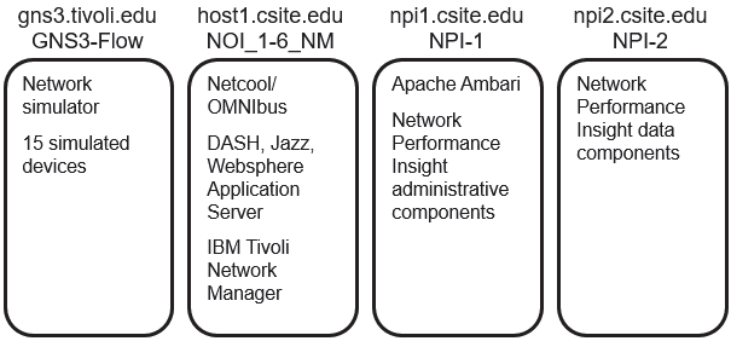
Unit summary

IBM Training

Exercise: Installation

In the exercises for this unit, you prepare the hosts, install Ambari, install Hortonworks Data Platform, and install Network Performance Insight.

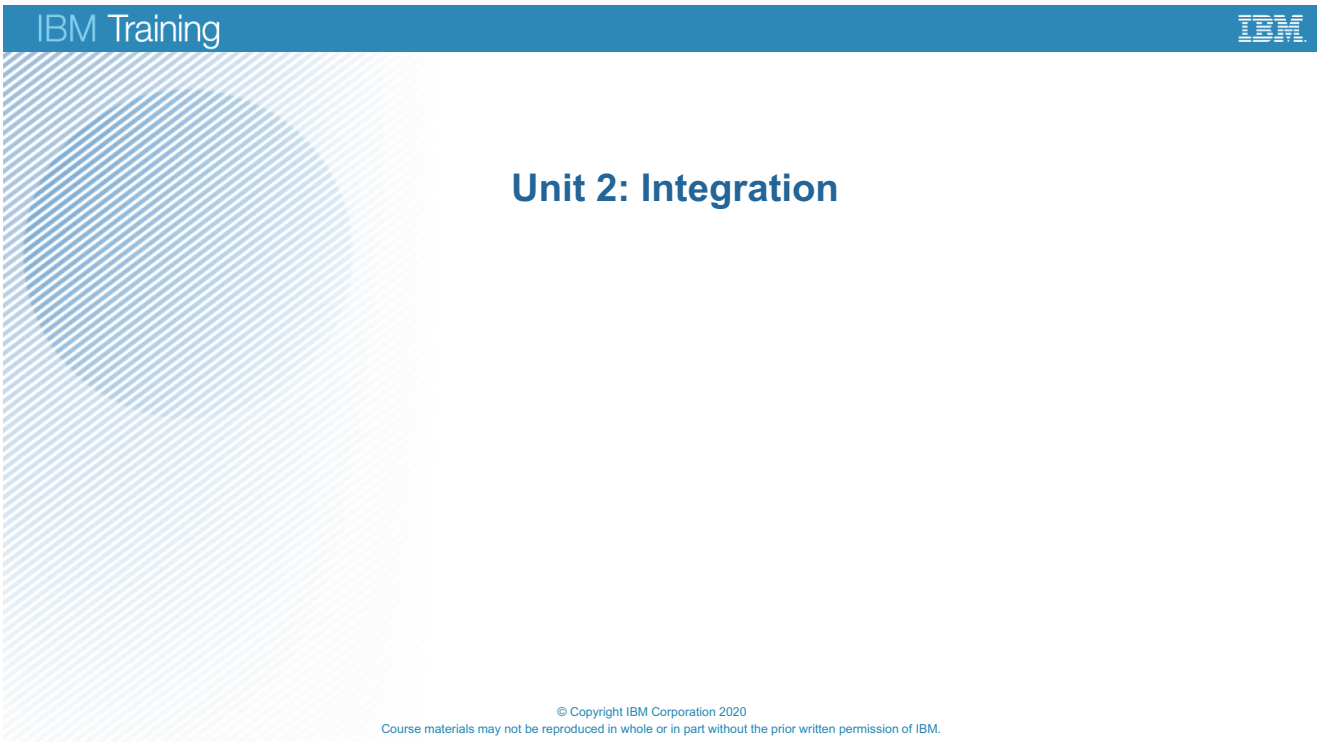
This course includes four virtual images. The following diagram shows the function of each virtual machine. You install Network Performance Insight on **npi1.csite.edu** and **npi2.csite.edu**.



Overview and installation

Exercise: Installation

Unit 2 Integration



In this unit, you learn how to integrate Network Performance Insight with other Netcool Operations Insight software.

IBM Training

Unit objectives

In this unit, you learn to perform the following tasks:

- Integrate discovery and metric collection with IBM Tivoli Network Manager
- Integrate the event service with Netcool/OMNIbus
- Integrate the UI service with Dashboard Application Services Hub

Unit objectives

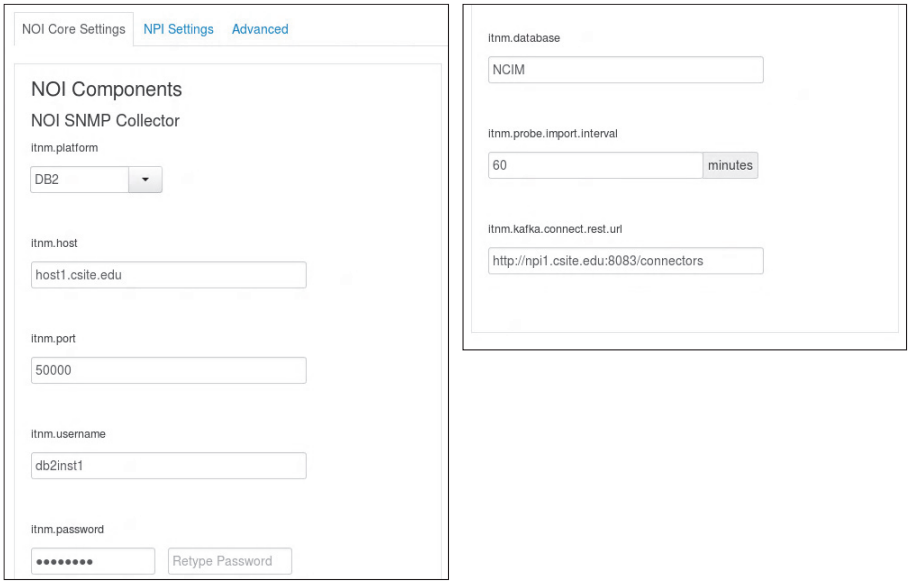
Lesson 1 Integration with IBM Tivoli Network Manager

Network Performance Insight can acquire discovery information from IBM Tivoli Network Manager. Network Performance Insight can also obtain metrics that IBM Tivoli Network Manager is polling. This lesson teaches you how to integrate Network Performance Insight and IBM Tivoli Network Manager.

IBM Training

IBM Tivoli Network Manager settings in Ambari

Use the **NOI Core Settings** tab to enter the details of your IBM Tivoli Network Manager environment.



Integration

IBM Tivoli Network Manager settings in Ambari

You use the Ambari Manager page to configure Network Performance Insight. To access the manager page, open a browser and go to the following URL, where *host_name* is the Ambari host.

http://<*host_name*>:8080

To access the NOI Core Settings tab, click **NPI** in the menu on the left of the page, then click the **Configs** tab.

Enter the following details about your IBM Tivoli Network Manager environment:

- Choose DB2 or Oracle as the platform
- Enter the host name where IBM Tivoli Network Manager is running
- Enter the database port number
- Enter the database user name
- Enter the database password
- Enter the database name, which is typically NCIM
- Enter a URL like the following example in the itnm.kafka.connect.rest.url field, where *host_name* is the host where Kafka connect is running.

  http://<*host_name*>:8083/connectors

You must restart the Network Performance Insight services after you save your changes.

IBM Training

IBM Tivoli Network Manager encryption key

Copy the IBM Tivoli Network Manager encryption key (`conf.key`) to the following directory. You must create the `resources/itnm/security/keys` sub-directory.

```
/opt/IBM/npi/npi-itnm-collector/resources/itnm/security/keys
```

Perform this task on all Network Performance Insight hosts where the Tivoli Network Manager collector service is installed.

IBM Tivoli Network Manager encryption key

Copy the encryption key file from IBM Tivoli Network Manager to Network Performance Insight. This key is used to obtain SNMP community strings from IBM Tivoli Network Manager.

On the hosts where the Tivoli Network Manager collector service is installed, create the following directory:

```
/opt/IBM/npi/npi-itnm-collector/resources/itnm/security/keys
```

Copy the conf.key file from the IBM Tivoli Network Manager host into the new directory. You can find the file in the $NCHOME/etc/security/keys directory, for example:

```
/opt/IBM/tivoli/netcool/etc/security/keys/conf.key
```

IBM Training

IBM Tivoli Network Manager kafka.properties file

Copy the `kafka.properties` file to the correct location and edit it to add the host and port where Kafka connect is running. Edit the following properties:

```
kafka.consumer.bootstrap.servers=<host_name>:6667
kafka.producer.bootstrap.servers=<host_name>:6667
```

Perform this task on the IBM Tivoli Network Manager host.

IBM Tivoli Network Manager kafka.properties file

By default, the kafka.properties file is in the following directory on the IBM Tivoli Network Manager host:

```
/opt/IBM/tivoli/netcool/precision/storm/conf/default/
```

Copy the kafka.properties file to the correct location:

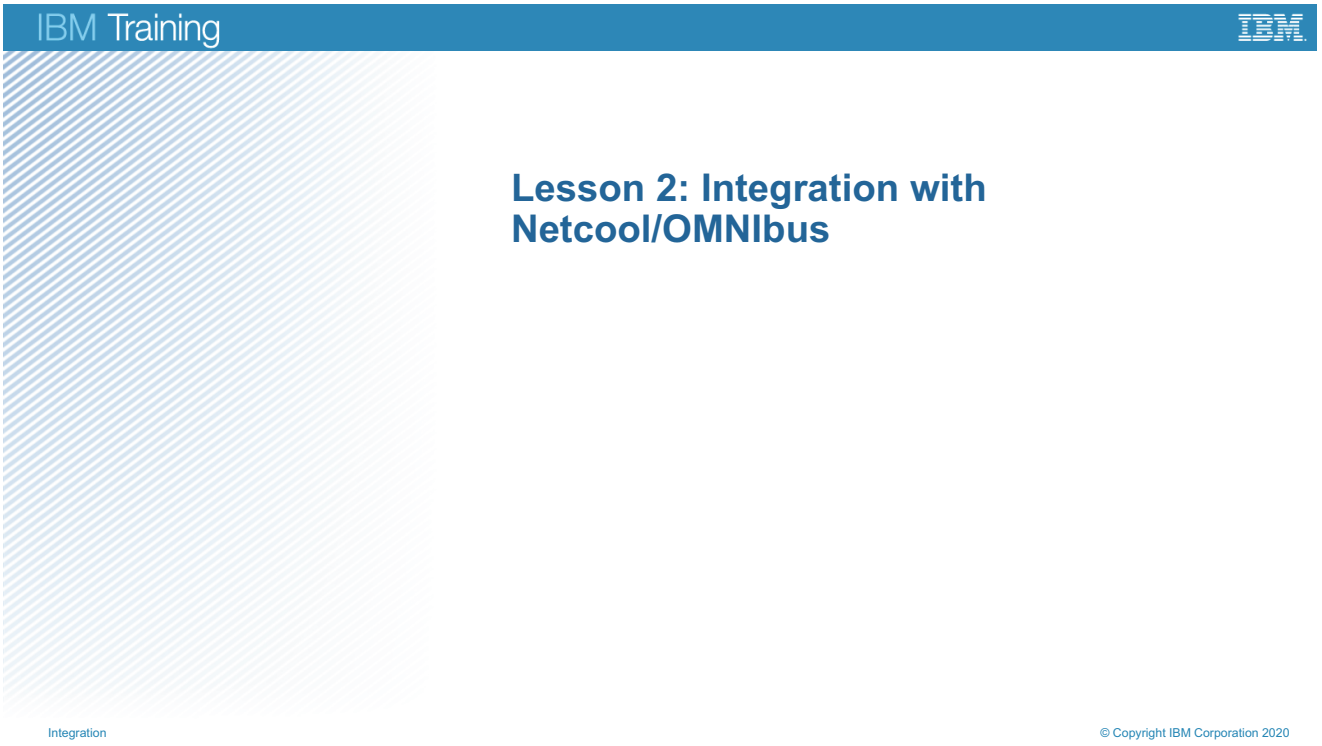
```
/opt/IBM/tivoli/netcool/precision/storm/conf
```

Find the following two lines near the top of the file. Edit these lines and add the host name of the Network Performance Insight host where Kafka connect is running.

```
kafka.consumer.bootstrap.servers=<host_name>:6667
kafka.producer.bootstrap.servers=<host_name>:6667
```

You must restart IBM Tivoli Network Manager after you edit the file.

Lesson 2 Integration with Netcool/OMNIbus



Network Performance Insight sends alerts to the Netcool/OMNIbus ObjectServer when a threshold has been violated. In this lesson, you configure the Netcool/OMNIbus Standard Input probe that is installed with Network Performance Insight.

IBM Training

Add an alias for the ObjectServer

Add the alias `omnihost` in the hosts file where the Network Performance Insight event service is running.

In this example, the ObjectServer is running on host1.csite.edu.

```
cat /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6

192.168.100.195 npi1.csite.edu npi1
192.168.100.196 npi2.csite.edu npi2
192.168.100.100 host1.csite.edu host1 omnihost
10.10.255.1  BRU.csite.ibm.com        # Loopback
```

Integration

Add an alias for the ObjectServer

To facilitate communication from the Network Performance Insight event service to the Netcool/OMNIbus ObjectServer, add the alias `omnihost` in the `/etc/hosts` file where the event service is running.

IBM Training

Configure the Standard Input probe

Edit the Standard Input probe properties file to include the name of your ObjectServer. In this example, the ObjectServer name is NOI_AGG_P:

```
##############################################################################
#
# Add your settings here
#
##############################################################################

Manager                 : 'NPI'
Server                  : 'NOI_AGG_P'
```

Integration

Configure the Standard Input probe

When you install Network Performance Insight, the Netcool/OMNIbus Standard Input probe is installed as part of the event service. Configure the probe to send events to your Netcool/OMNIbus ObjectServer by editing its properties file, which is named `npi-flow-stdin.props`.

The `npi-flow-stdin.props` file is in the following directory:

`/opt/IBM/npi/npi-event/stdin-probe/omnibus/probes/linux2x86`

Add a line like the following example to the bottom of the file, where *OBJSERVER* is the name of your Netcool/OMNIbus ObjectServer:

```
Server                  : 'OBJSERVER'
```

IBM Training

Edit the OMNIbus interfaces file

Edit the OMNIbus interfaces file to include the name of your ObjectServer. In this example, the ObjectServer name is NOI_AGG_P:

```
# NCOMS => omnihost 4100
#NCOMS
NOI_AGG_P
      master tcp sun-ether omnihost 4100
      query tcp sun-ether omnihost 4100
```

Integration

Edit the OMNIbus interfaces file

OMNIbus component communication information is saved in an interfaces file. Edit the interfaces file on the host where the Network Performance Insight event service is running. The interfaces file, which is named `interfaces.linux2x86`, is in the following directory:

```
/opt/IBM/npi/npi-event/stdin-probe/etc
```

Replace the string `NCOMS` with the name of your Netcool/OMNIbus ObjectServer.

To apply these changes, you must restart the Network Performance Insight Event service.

Lesson 3 Integration with Dashboard Application Services Hub

In this lesson, you learn how to integrate the Network Performance Insight user interface with Dashboard Application Services Hub (DASH).

IBM Training

Generate the SSL certificate and keystore files

Complete the following tasks to create a self-signed SSL certificate:

1. Configure the details of the Network Performance Insight SSL certificate by editing the custom.cfg file
2. Generate the SSL certificate and keystore files with the securityKeyTool.sh utility
3. Verify that the certificate and keystore were created successfully

Integration

Generate the SSL certificate and keystore files

Generating the SSL certificate and keystore files is a three-step procedure:

1. Configure the details of the Network Performance Insight SSL certificate by editing the custom.cfg file
2. Generate the SSL certificate and keystore files with the securityKeyTool.sh utility
3. Verify that the certificate and keystore were created successfully

Editing the custom.cfg file

Configure the details of the Network Performance Insight SSL certificate by editing the custom.cfg file. The custom.cfg file is in the following directory on the host where Ambari is installed.

```
/opt/IBM/basecamp/basecamp-installer-tools/dash-integration
```

Change the values of the following three properties. Do not change any other property.

`DASH_CONNECTION`: Enter the user who owns and runs DASH followed by the fully qualified domain name of the host where DASH is running, for example: `netcool@host1.csite.edu`

`DOMAIN_NAME`: Enter `*`, followed by the domain name of your Network Performance Insight hosts, for example: `*.csite.edu`

`NPI_UI_HOST`: Enter the fully qualified domain name of the host where the Network Performance Insight UI service is running

Generating the SSL certificate and keystore files

Run the following command on the Ambari host to generate the SSL certificate and keystore files. Run the entire command on one line. In this example, the key password and keystore password is **changeit**.

```
/opt/IBM/basecamp/basecamp-installer-tools/dash-integration/securityKeyTool.sh
-default=/opt/IBM/basecamp/basecamp-installer-tools/dash-integration/default.cfg
-custom=/opt/IBM/basecamp/basecamp-installer-tools/dash-integration/custom.cfg
-keyStorePassword=changeit -keyPassword=changeit
```

Verifying the files

Check the following log files for any errors or warnings. These log files are on the host where Ambari is installed.

```
/tmp/ambari_npi_key_startup.log
/tmp/securityKeyTool.<timestamp>.log
/tmp/genSecurityKey.log
```

IBM Training

Enable the integration with Jazz for Service Management and DASH

Use the npiDashIntegration.sh tool to enable the integration with DASH. The npiDashIntegration.sh script performs the following functions:

- The following files are transferred to the DASH host:
  - enableDash.sh
  - signkey
  - eWasAddUsersAndGroups.py
  - priv_key.key
  - ca.crt
  - Install.User.cfg
- The enableDash.sh script is run
- The dashboarduser group is created
- npiadmin and npiuser users are added to DASH

Integration

Enable the integration with Jazz for Service Management and DASH

Before you enable the DASH integration, verify that the Netcool/OMNIbus ObjectServer is running.

Run the following command to enable the integration on the Ambari host. Run the entire command on one line. In this example, the DASH administrator password is object00. When the script creates the npiadmin and npiuser users, their password is set to object00.

```
/opt/IBM/basecamp/basecamp-installer-tools/dash-integration/npiDashIntegration.sh
-default=/opt/IBM/basecamp/basecamp-installer-tools/dash-integration/default.cfg
-custom=/opt/IBM/basecamp/basecamp-installer-tools/dash-integration/custom.cfg
-dashPassword=object00 -npiUserPassword=object00
```

Check the following log file on the Ambari host for any errors or warnings.

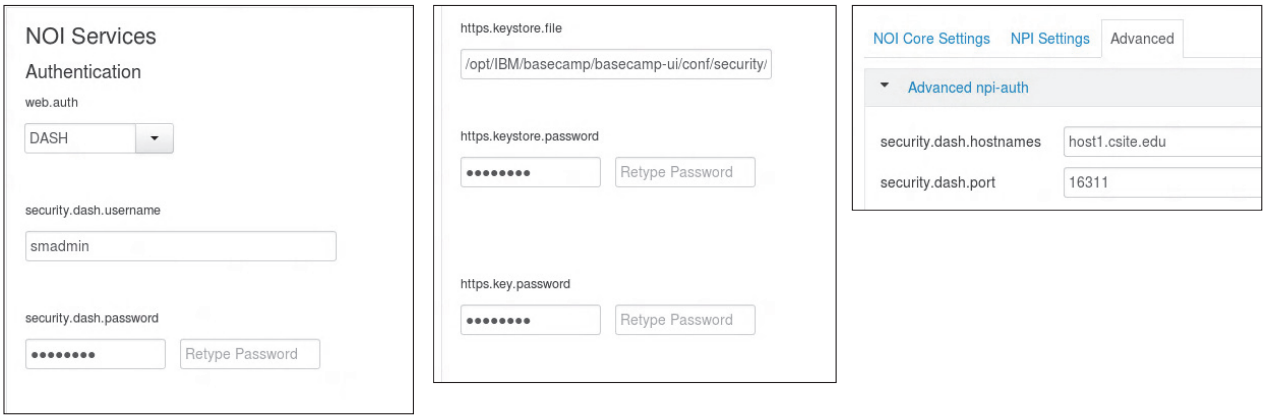
```
/tmp/npiDashIntegration.log
```

Check the following log file on the DASH host for any errors or warnings.

```
/tmp/enableDash.log
```

IBM Training

DASH settings in Ambari



Integration

DASH settings in Ambari

Use the Ambari Manager page to configure the details of your DASH environment.

To access the NOI Core Settings, click **NPI** in the menu on the left of the page, then click the **Configs** tab.

Enter the following details about your IBM Tivoli Network Manager environment:

- Choose **DASH** as the value for web.auth.
- Enter **smadmin** as the value for security.dash.username.
- Enter the password for the smadmin user.
- Enter `/opt/IBM/basecamp/basecamp-ui/conf/security/security.keystore` as the value of https.keystore.file.
- Enter **changeit** as the keystore password. Enter **changeit** again to confirm. You configured this password when you generated the certificate and keystore files.
- Enter **changeit** as the key password. Enter **changeit** again to confirm.

Click the **Advanced** tab. Expand **Advanced npi-auth** and enter the fully qualified host name and port number where DASH is running.

You must restart the Network Performance Insight services after you save your changes.

Verifying your changes

Run the following command to verify that the security.keystore file exists and is in the correct directory. Run the command on the host where the Network Performance Insight UI is running.

```
ls -al /opt/IBM/basecamp/basecamp-ui/conf/security

-rwxr-xr-x 1 root    root    3437 Jan 17 16:39 security.keystore
```

On the host where the Network Performance Insight UI is running, compare the following two certificate fingerprints to verify that they match:

- WebSphereCACert, in the cacerts file
- npi_ca, in the key store file

Run the following command to show the details of the WebSphereCACert certificate. Run the entire command on one line. Note the certificate fingerprint in the output of the command. The fingerprint in your environment will be different than the following example.

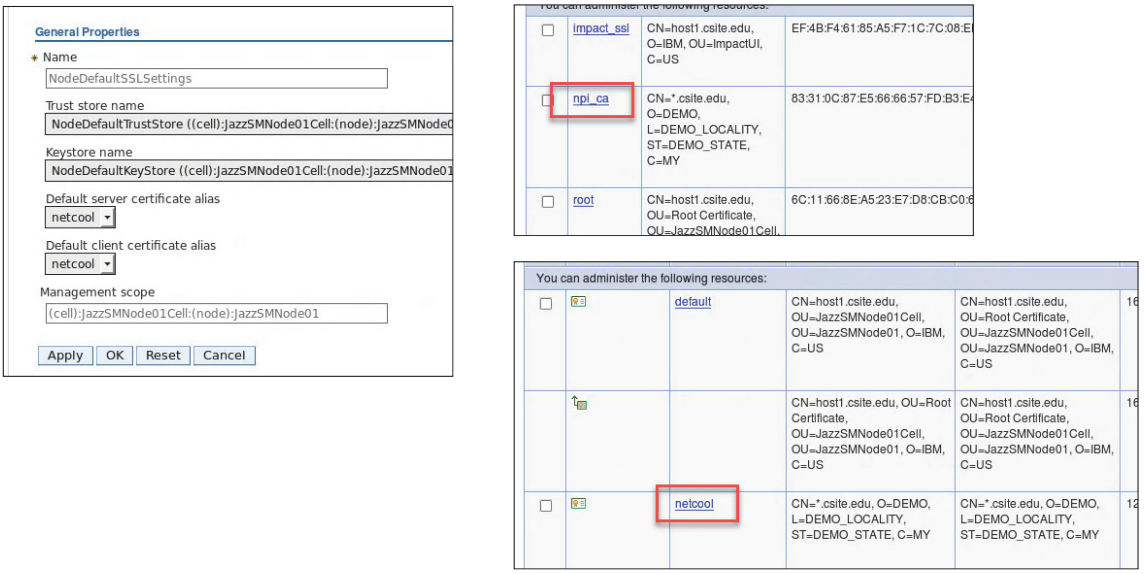
```
keytool -keystore
/opt/IBM/basecamp/basecamp-jre/java-1.8.0-openjdk.x86_64/jre/lib/security/cacer
ts -storepass changeit -list -alias WebSphereCACert

WebSphereCACert, Jan 17, 2020, trustedCertEntry,
Certificate fingerprint (SHA1):
83:31:0C:87:E5:66:66:57:FD:B3:E4:5D:D7:0A:E5:8B:94:F1:87:BA
```

Run the following command to show the details of the npi_ca certificate. Run the entire command on one line. Notice the npi_ca certificate fingerprint in the output of the command. The fingerprint in your environment will be different than the following example. Verify that this matches the WebSphereCACert fingerprint you found with the preceding command.

```
keytool -keystore /opt/IBM/basecamp/basecamp-ui/conf/security/security.keystore
-storepass changeit -list

Keystore type: jks
Keystore provider: SUN

Your keystore contains 2 entries

npi_ca, Jan 16, 2020, trustedCertEntry,
Certificate fingerprint (SHA1):
83:31:0C:87:E5:66:66:57:FD:B3:E4:5D:D7:0A:E5:8B:94:F1:87:BA
npi, Jan 16, 2020, PrivateKeyEntry,
Certificate fingerprint (SHA1):
25:3C:83:B6:DA:F3:D4:9E:5D:4E:F7:8B:C2:72:DE:A0:18:84:7C:B7
```

IBM Training

Configure SSL certificates in WebSphere Application Server



Integration

Configure SSL certificates in WebSphere Application Server

Use the WebSphere Administrative Console to change the alias of the default client and server certificate. The following steps show you how to change the aliases.

1. Open the WebSphere Administrative Console and expand **Security**. Click **SSL certificate and key management**.
2. **Click SSL configurations** at the right of the page.
3. Click **NodeDefaultSSLSettings**.
4. Select **netcool** as the Default server certificate alias.
5. Select **netcool** as the Default client certificate alias.
6. Click **OK**.
7. Click **Save** at the top of the page.

In WebSphere Administrative Console, verify that the certificates that you previously created with the securityKeyTool.sh are available. The following steps show you how to confirm that the certificates are present.

1. Expand **Security**. Click **SSL certificate and key management**.
2. Click **Key stores and certificates** on the right side of the page.
3. Click **NodeDefaultKeyStore**.
4. Click **Personal certificates** on the right side of the page.

5. Verify that the **netcool** certificate is present.
6. Click the **Key stores and certificates** link at the top of the page.
7. Click **NodeDefaultTrustStore**.
8. Click **Signer certificates**.
9. Verify that the **npi_ca** certificate is present.

You must restart Jazz, DASH, and WebSphere Application Server after you change the certificate aliases.

IBM Training

Unit summary

You should now be able to perform the following tasks:

- Integrate discovery and metric collection with IBM Tivoli Network Manager
- Integrate the event service with Netcool/OMNIbus
- Integrate the UI service with Dashboard Application Services Hub

Unit summary

IBM Training

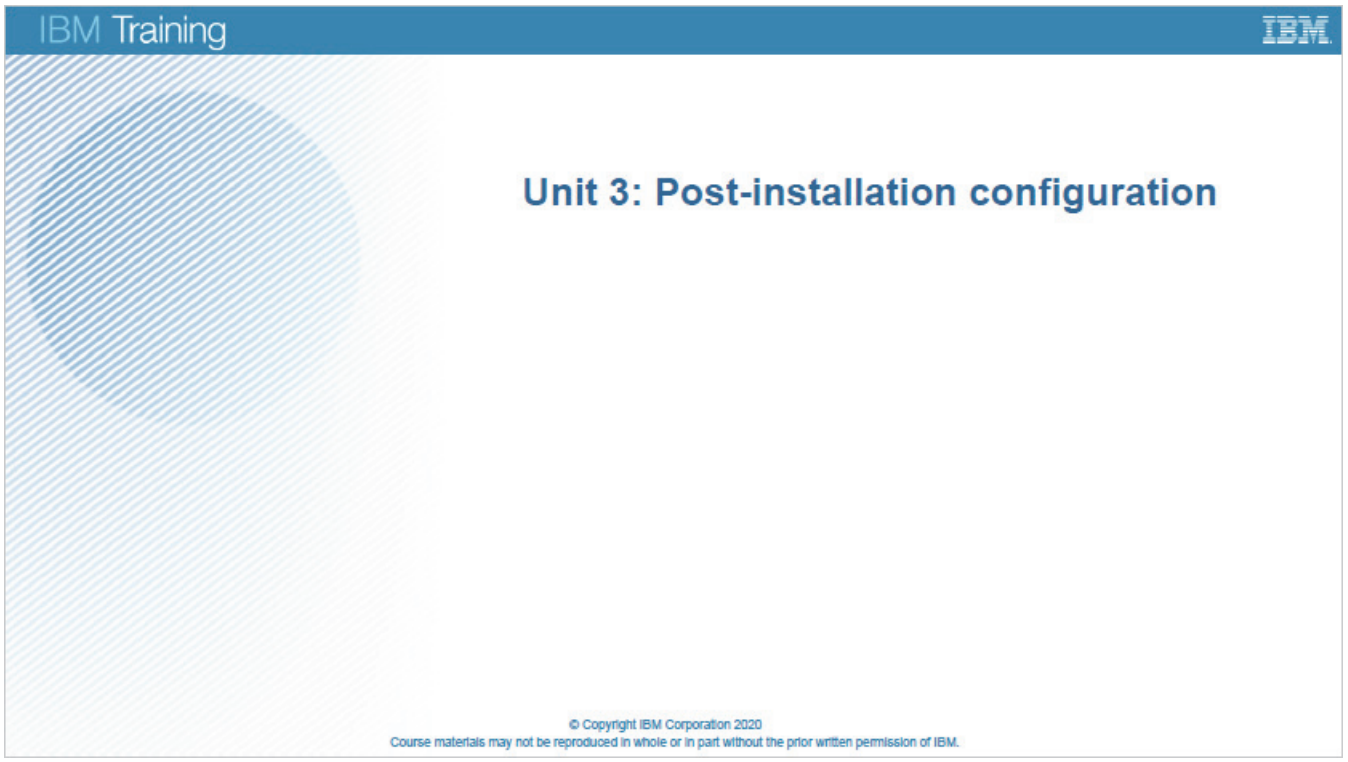
Exercise: Integration with Netcool Operations Insight

In the exercises for this unit, you integrate Network Performance Insight with IBM Tivoli Network Manager, Netcool/OMNIbus, and Dashboard Application Services Hub (DASH).

Integration

Exercise: Integration with Netcool Operations Insight

Unit 3 Post-installation configuration



This unit walks you through several post-installation tasks.

IBM Training

Unit objectives

In this unit, you learn to perform the following tasks:

- Install technology packs
- Install and configure the Device Dashboard
- Configure Dashboard Application Services Hub (DASH) roles
- Install an interim fix
- Set the resource scope

Unit objectives

IBM Training

Installing technology packs

Technology packs are content plugins. They contain instructions that allow Network Performance Insight to discover and collect data from diverse network devices and technologies.

Technology packs contain:

- Discovery formulas, to interrogate network devices and discover their capabilities
- Collection formulas, to poll devices for performance measurements
- Metrics, to calculate values based on the result of network polls
- Standard and vendor-specific MIB files, to facilitate SNMP collection

Post-installation configuration

Installing technology packs

Use the pack-install.sh tool to install technology packs. The pack-install.sh tool is in the following directory:

```
/opt/IBM/basecamp/basecamp-installer-tools/pack-installer
```

Technology packs are packaged as JAR files. The technology pack installation files are in the following directory:

```
/opt/IBM/basecamp/basecamp-installer-tools/ootb-packs
```

Run the following commands to install a technology pack. The installer prompts you for an administrative user name and password. In the following example, the Network Health technology pack is installed.

```
cd /opt/IBM/basecamp/basecamp-installer-tools/pack-installer/
./pack-install.sh install ../ootb-packs/network-health-1.2.0.jar
NPI Username: npiadmin
NPI Password:
NPI Port[9443]:
```

Repeat this process to install additional technology packs.

Run the following command to verify that the technology packs were successfully installed:

```
./status.sh

npi1.csite.edu                    network-health-generic        1.2.0
                                  network-health                1.2.0
                                  network-health-cisco          1.1.0
                                  network-probe-cisco           1.0.0
```

You can also verify installation with the following command:

```
./pack-install.sh status
-------------------------------------------------------------------------
HOST                              PACK NAME                     VERSION
-------------------------------------------------------------------------
npi1.csite.edu                    network-health-huawei         1.1.0
                                  network-health-generic        1.2.0
                                  network-qos-cisco             1.1.0
                                  network-health                1.2.1
...
```

IBM Training

Installing the Device Dashboard

The Device Dashboard shows performance metric values, anomalies, and trends on any device, link, or interface. You can also view network flow performance data from the Device Dashboard.

You access the Device Dashboard from an IBM Tivoli Network Manager network view.

Install the Device Dashboard with IBM Installation Manager.

Installing the Device Dashboard

Install the Device Dashboard on the host where Dashboard Application Services Hub (DASH) is running.

Copy the Device Dashboard installation media to the DASH host, then decompress it.

Start IBM Installation manager, and follow the next steps to install the Device Dashboard.

Add the Device Dashboard installation media as a repository

1. Click **File > Preferences**.
2. Click **Add Repository**.
3. Browse to the **1.1.0-NOI-DeviceDashboard-FP0002.zip** file, then click **OK**. You can find this file in the directory where you decompressed the Device Dashboard installation media.
4. Verify that only the Device Dashboard repository is selected.
5. Click **OK** to close the preferences window.

Install the Device Dashboard

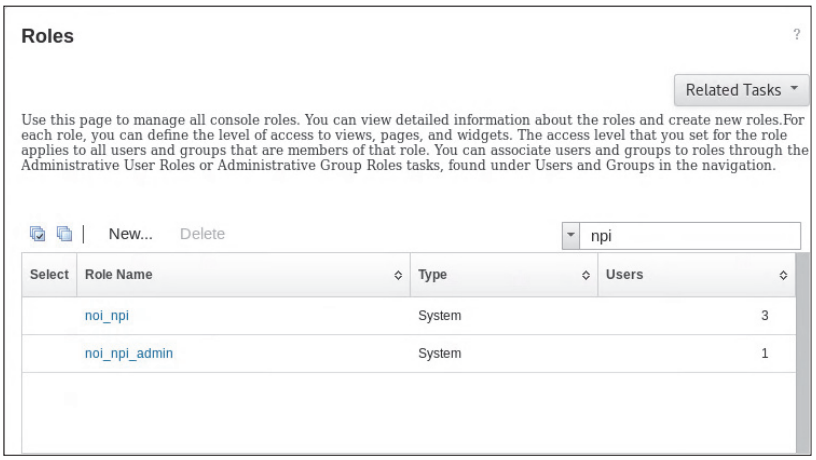
1. Click **Install** to start the installation wizard.
2. Select the version 1.1.0.2 package and click **Next**.
3. Accept the license agreement and click **Next**.

4. Confirm that IBM Netcool GUI Components is selected as the package group and click **Next**.
5. Verify that both features (Widgets and Device Dashboard) are selected and click **Next**.
6. Enter the password for smadmin and click **Next**.
7. Enter the Ambari administrative user name and password, then click **Next**.
8. Click **Install** at the summary page. The installation takes about 20 minutes.
9. Click **Finish** to close the installation wizard.
10. Click **File > Exit** to close Installation Manager.

IBM Training

Add DASH roles to the Network Performance Insight users

When you install Network Performance Insight, the **noi_npi** and **noi_npi_admin** roles are created in DASH. Add these roles to users who access Network Performance Insight dashboards and reports.



Add DASH roles to the Network Performance Insight users

When you install Network Performance Insight, two users are created: npiadmin and npisuer. Use the following steps to add the Network Performance Insight DASH roles to these users.

1. Log into DASH as an administrative user.
2. Click **Console Settings > Roles**.
3. Enter **npi** in the filter field.
4. Click the **noi_npi** role.
5. Expand **Users and Groups**.
6. Click the icon to add users.
7. Enter **npi*** as the user id, then click **Search**.
8. Select the **npiadmin** and **npiuser** users, then click **Add**.
9. Verify that the users are listed and click **Save**.
10. Click the **noi_npi_admin** role.
11. Expand **Users and Groups**.
12. Click the icon to add users.
13. Enter **npi*** as the user id, then click **Search**.

14. Select the **npiadmin** user, then click **Add**.
15. Verify that the user is present and click **Save**.

IBM Training

Configure IBM Tivoli Network Manager to access flow data

Configure IBM Tivoli Network Manager with the host, port number, and version of the Network Performance Insight UI service.

Edit the following files:

`/opt/IBM/netcool/gui/precision_gui/profile/etc/tnm/tnm.properties`

`/opt/IBM/netcool/gui/precision_gui/profile/etc/tnm/npi.properties`

Configure IBM Tivoli Network Manager to access flow data

Add details about Network Performance Insight to two IBM Tivoli Network Manager configuration files. The following steps describe how to edit these files.

Configure access to flow data

Configure access to traffic flow data by editing the following file:

```
/opt/IBM/netcool/gui/precision_gui/profile/etc/tnm/tnm.properties
```

Add the following line to the bottom of the tnm.properties file:

```
tnm.npi.host.name=https://npi2.csite.edu:9443
```

Configure the Network Performance Insight version

Configure IBM Tivoli Network Manager with the Network Performance Insight version by editing the following file:

```
/opt/IBM/netcool/gui/precision_gui/profile/etc/tnm/npi.properties
```

Add the following line to the bottom of the npi.properties file:

```
npi.server.version=1.3.1
```

Restart WebSphere Application Server, Jazz for Service Management, and DASH to apply the changes.

IBM Training

Installing an interim fix

The interim fix includes tools to back up your existing users and install the fix:

```
dashboard_user_backup.sh
fix_update.sh
```

Follow these steps to install the fix:

1. Stop the Network Performance Insight services
2. Decompress the interim fix files
3. Back up the existing Network Performance Insight users
4. Install the interim fix with the fix_update.sh tool
5. Restart the Network Performance Insight Storage service and UI service

Installing an interim fix

Use the following steps to install an interim fix.

Stop the Network Performance Insight services

1. Go to the Ambari Manager page. Log in as the **admin** user.
2. Click the **Services** tab.
3. Select the **NPI** service at the left of the page.
4. Click **Service Actions > Stop**.
5. Click **Confirm Stop**.
6. Click **OK** when the Stop NPI operation is finished.

Decompress the interim fix files

1. Change to the target directory. In this example the interim fix is in the /software/IF2 directory.
   ```
   cd /software/IF2
   ```
2. Run the following command to decompress the interim fix pack.
   ```
   tar -zxvf 1.3.1.0-TIV-NPI-IF0002.tgz
   ```

Back up the existing Network Performance Insight users

1. Change to the target directory.
   ```
   cd 1.3.1.0-TIV-NPI-IF0002/bin
   ```
2. Run the following command to back up your existing users.
   ```
   ./dashboard_user_backup.sh
   ```

Install the interim fix with the fix_update.sh tool

Run the following command to install the interim fix. The installation takes about 10 minutes.

```
./fix_update.sh

...
DB configs consistency check: no errors and warnings were found.
INFO: NPI 1.3.1.0 IF0002 Interim Fix update is completed.
```

Restart the Network Performance Insight Storage Service and UI Service

1. Return to the Ambari Manager page.
2. Click the **Services** tab.
3. Select the **NPI** service at the left of the page.
4. Click **Service Actions > Restart Storages**.
5. Click **Trigger Rolling Restart**.
6. Click **OK** when the operation is finished.
7. Click **Service Actions > Restart UIs**.
8. Click **Trigger Rolling Restart**.
9. Click **OK** when the operation is finished.

IBM Training

Updating the technology packs

The interim fix includes a tool to update technology packs:

```
packs-update.sh
```

The tool prompts you for the user name and password of a Network Performance Insight user.

Updating the technology packs

Use the following steps to update the technology packs.

1. Run the following script to start the update utility. This script is in the `1.3.1.0-TIV-NPI-IF0002/bin` directory.

   ```
   ./packs-update.sh
   ```

2. Enter **npiadmin** as the user name.

   ```
   NPI Username: npiadmin
   ```

3. Enter the password for npiadmin. The update operation takes about 5 minutes.

   ```
   NPI Password:

   ...
   Running sync of pack resource types with config UI
   Script completed

   ------------------------------------------------------------------------
   HOST                                PACK NAME                      VERSION
   ------------------------------------------------------------------------
   npi1.csite.edu                      network-health-huawei          1.1.0
                                       network-health-generic         1.2.0
   ...
   ```

4. Start all Network Performance Insight services that are not running.
   a. Return to the Firefox browser where the Ambari Manager page is open.
   b. Click the **Services** tab.
   c. Select the **NPI** service at the left of the page.
   d. Click **Service Actions > Start**.
   e. Click **Confirm Start**.
   f. Click **OK** when the operation is finished.

IBM Training

Restoring the Network Performance Insight users

Follow these steps to restore the Network Performance Insight users:

1. Stop the Network Performance Insight Dashboard service
2. Restore the users with the `dashboard_user_restore.sh` tool
3. Start the Network Performance Insight Dashboard service

Restoring the Network Performance Insight users

After you install the interim fix and update the technology packs, use the following steps to restore the users you previously backed-up.

Stop the Network Performance Insight Dashboard service

1. Go to the Ambari Manager page.
2. Click the **Hosts** tab and click **npi2.csite.edu**.
3. Scroll down and find the Dashboard service. Click the **Started** button then click **Stop**.
4. Click **OK** to confirm.
5. Click **OK** when the operation is finished.

Restore the users with the dashboard_user_restore.sh tool

Run the following command to restore the users. This script is in the `1.3.1.0-TIV-NPI-IF0002/bin` directory.

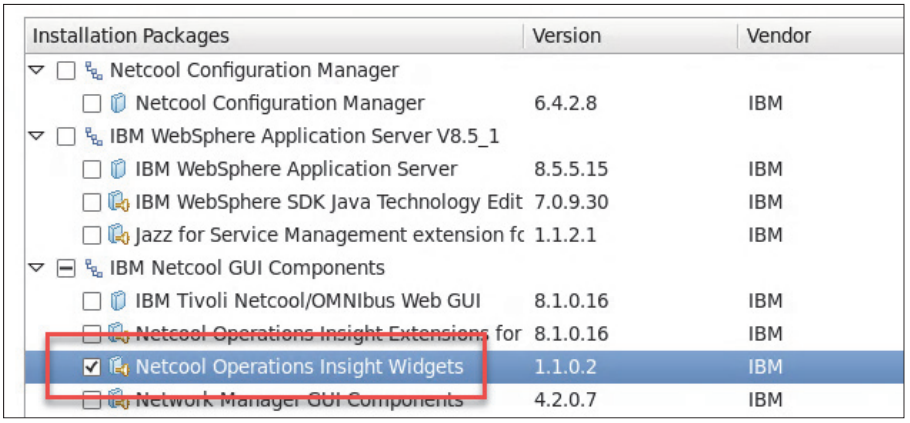
```
./dashboard_user_restore.sh

...
INFO: User restore done on npi2.csite.edu
```

Start the Network Performance Insight Dashboard service

1. Return to the Ambari Manager page.
2. Find the Dashboard service. Click the **Stopped** button and click **Start**.
3. Click **OK** to confirm.
4. Click **OK** when the operation is finished.

IBM Training

Uninstalling and reinstalling the Device Dashboard



Uninstalling and reinstalling the Device Dashboard

After you install the interim fix, you must reinstall the Device Dashboard. Uninstall and reinstall the Device Dashboard on the host where Dashboard Application Services Hub (DASH) is running. You use IBM installation manager for this task.

Uninstall the Device Dashboard

Start IBM Installation manager, and follow the next steps to uninstall the Device Dashboard.

1. Click **Uninstall**.
2. Select **Netcool Operations Insight Widgets 1.1.0.2** as the package to uninstall. Click **Next**.
3. Enter the password for smadmin and click **Next**.
4. Click **Uninstall** on the summary page. The operation to uninstall the Device Dashboard takes about 5 minutes.
5. Click **Finish** to close the wizard. Leave Installation Manager open.

Reinstalling the Device Dashboard

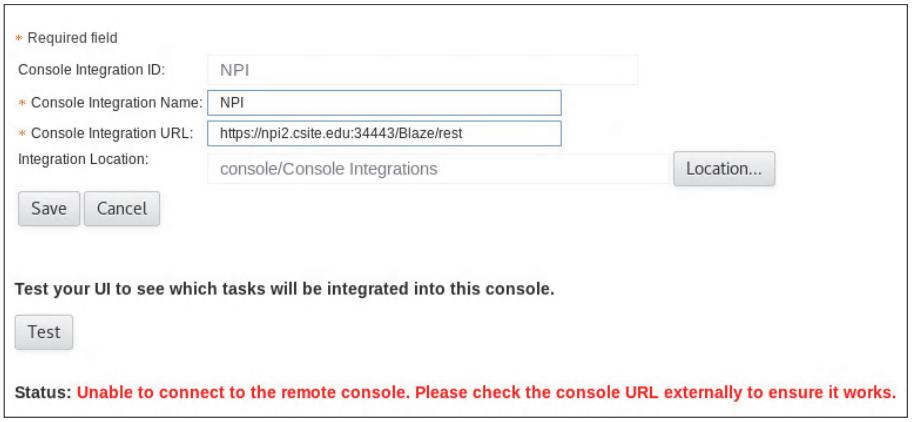
Return to IBM Installation manager, and follow the next steps to install the Device Dashboard again.

1. Click **Install** to start the installation wizard.
2. Select the version 1.1.0.2 package and click **Next**.
3. Accept the license agreement and click **Next**.

4. Confirm that IBM Netcool GUI Components is selected as the package group and click **Next**.
5. Verify that both features are selected and click **Next**.
6. Enter the password for smadmin and click **Next**.
7. Enter the Ambari administrative user name and password, then click **Next**.
8. Click **Install** at the summary page. The installation takes about 20 minutes.
9. Click **Finish** to close the installation wizard.
10. Click **File > Exit** to close Installation Manager.

IBM Training

Configuring the Console Integration



Configuring the Console Integration

Use the following steps to configure the DASH Console Integration for Network Performance Insight.

1. Open a Firefox browser. Go to the following URL, where *DASH_HOST* is the host name where DASH is running. Log in as the user name **npiadmin** user.

   https://<*DASH_HOST*>:16311/ibm/console/logon.jsp

2. Click **Console Settings > Console Integrations**.
3. Click **NPI**.
4. Click **Test**. You can ignore the status message.
5. Click **Save**.
6. Verify that the connection is successful for the NPI Console Integration. Verify that you see a snowflake icon in the menu on the left.

IBM Training

Setting the resource scope

To enable SNMP collection, set the resource scope to start polling SNMP data from a device or a range of devices.

The snmp-scoping.sh tool can assign polling targets to an SNMP collector, for example:

```
./snmp-scoping.sh set npi2.csite.edu "range(resource.agentIp, '10.10.255.1', '10.10.255.254')"
```

Use the snmp-scoping.sh tool to configure a Network Performance Insight SNMP collector to start polling, for example:

```
./snmp-scoping.sh set npi2.csite.edu true
```


Setting the resource scope

The following steps show you an example of how to set the resource scope for SNMP metric collection. In this example, the scope is set for a range of devices.

1. Change to the target directory.

   ```
   cd /opt/IBM/basecamp/basecamp-installer-tools/snmp/
   ```

2. Run the following command to enable SNMP collection for a host named npi2.csite.edu, where a Network Performance Insight SNMP collector is running.

   ```
   ./snmp-scoping.sh set npi2.csite.edu true
   ```

3. Run the following command to set the resource scope to include a range of devices. In this example, the host named npi2.csite.edu is set to poll devices from 10.10.255.1 to 10.10.255.254.

   ```
   ./snmp-scoping.sh set npi2.csite.edu "range(resource.agentIp, '10.10.255.1',
   '10.10.255.254')"
   ```

4. Run the following command to list resource scopes.

   ```
   ./snmp-scoping.sh list

   npi-npi2.csite.edu : { "formula.entity-scope" : "range(resource.agentIp,
   '10.10.255.1', '10.10.255.254')" }
   ```

5. Run a command like the following example to test your scope.

```
./snmp-scoping.sh test npi2.csite.edu "range(resource.agentIp, '10.10.255.1',
'10.10.255.254')"

[{"entityName":"10.10.255.5"},{"entityName":"10.10.255.7"},{"entityName":"10.10
.255.10"},{"entityName":"10.10.255.12"},{"entityName":"10.10.255.11"},{"entityN
ame":"10.10.255.2"},{"entityName":"10.10.255.15"},{"entityName":"10.10.255.14"}
...
```

After you set the resource scope, use the following steps restart all affected Network Performance Insight services.

1. Go to the Ambari Manager page.
2. Click the **Services** tab and select **NPI**.
3. Click **Restart > Restart All Affected**.
4. Click **Confirm Restart All**.
5. Click **OK** when the operation is finished.
6. Start the Dashboard service manually. Click the **Hosts** tab close to the top of the page.
7. Click **npi2.csite.edu**.
8. Scroll down and find the Dashboard service. If it is not running, click the **Stopped** button, then click **Start**.
9. Click **OK** to confirm.
10. In a short time, the start operation will be 100% complete. Click **OK** to confirm.

IBM Training

Unit summary

You should now be able to perform the following tasks:

- Install technology packs
- Install and configure the Device Dashboard
- Configure Dashboard Application Services Hub (DASH) roles
- Install an interim fix
- Set the resource scope

Unit summary

IBM Training

Exercise: Post-installation configuration

In the exercises for this unit, you complete several post-installation tasks.

Exercise: Post-installation configuration

Unit 4 Solution verification

This unit describes several IBM Network Performance Insight dashboards and reports. You can use these reports to confirm that IBM Network Performance Insight is successfully processing data.

IBM Training

Unit objectives

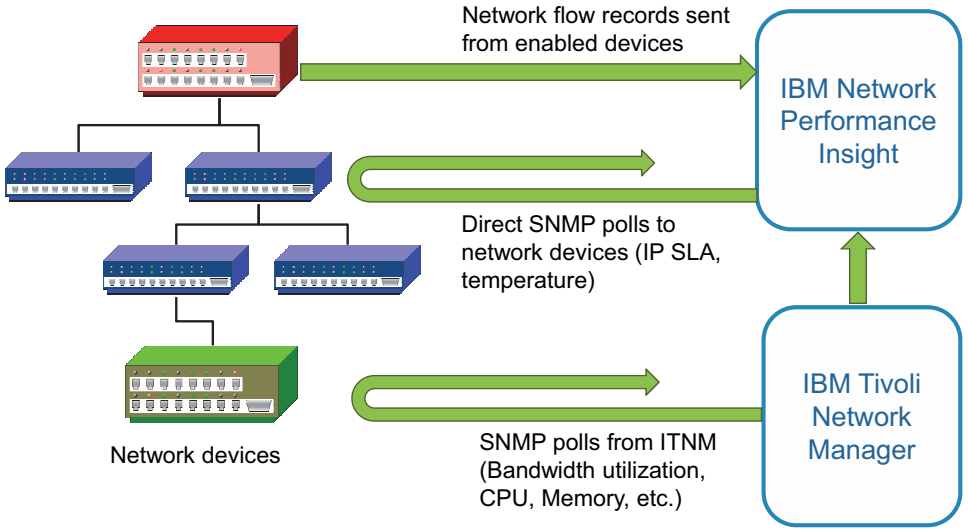
In this unit, you learn to perform the following tasks:

- Use performance dashboards and reports
- Verify that IBM Network Performance Insight is processing data

Unit objectives

IBM Training

Example data sources



Solution verification

Example data sources

In the labs for this course, IBM Network Performance Insight obtains performance data using the following three methods:

- **From network flow records:** A network flow record is data that is generated by a network device, such as a router or switch. The data in a network flow record describes the network traffic that has passed through the router or switch. These records contain data about network traffic; for example, every network flow record contains information about the source and destination of the traffic.

  Flow-enabled network devices export network flow records to an external application for collection and analysis. The role of IBM Network Performance Insight is to accept flow records from network devices, analyze them, store them, and present users with reports about the flow of traffic through the network.

  IBM Network Performance Insight users get reports and dashboards to help them understand the traffic on their network. Here are examples of information that users quickly learn from Network Performance Insight:

  – Traffic source and destination

  – Which applications are using the most bandwidth

  – Monitor new applications or network segments to observe their impact on the network

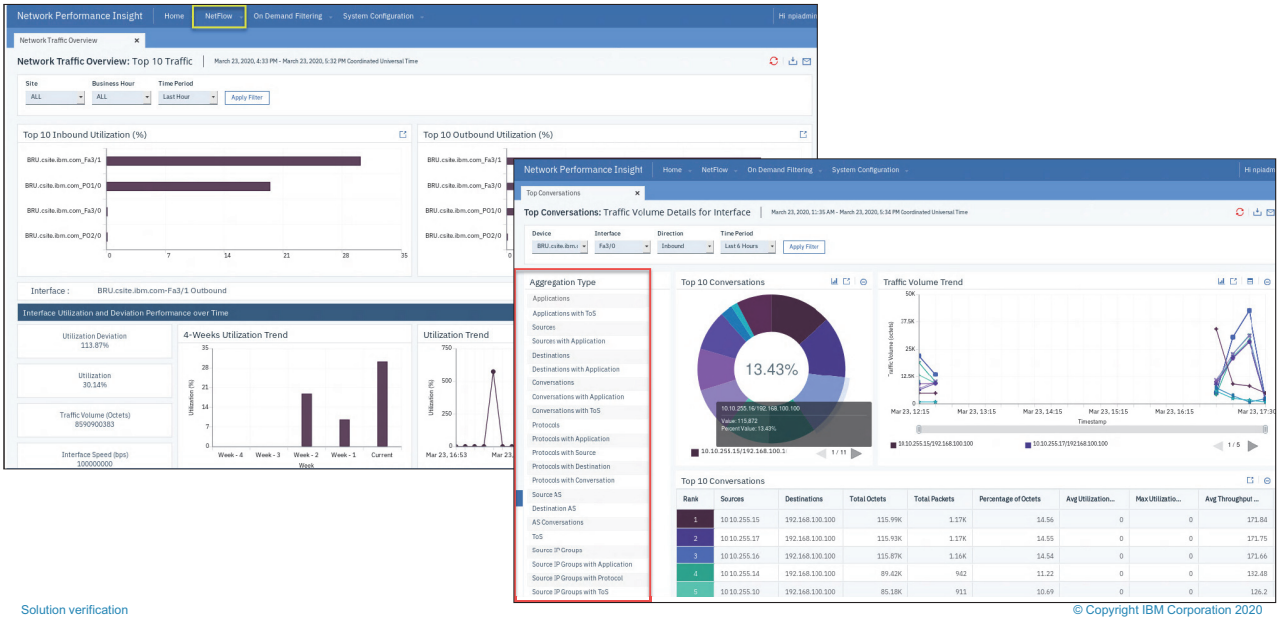
- **From SNMP polls:** Network devices can expose performance measurements about themselves using SNMP agents. IBM Network Performance Insight can directly poll these SNMP-enabled devices to obtain the current value of these measurements. In your lab

environment, IBM Network Performance Insight is directly polling the simulated network devices for IP SLA metrics.

- **From IBM Tivoli Network Manager:** IBM Tivoli Network Manager can also poll devices for SNMP data. IBM Network Performance Insight can obtain the metrics that are generated by IBM Tivoli Network Manager and use them in reports and dashboards. In your environment, IBM Network Performance Insight is reusing IBM Tivoli Network Manager metrics such as bandwidth utilization, CPU utilization, memory utilization, and others.

IBM Training

Network flow dashboards



Solution verification

Network flow dashboards

IBM Network Performance Insight provides several dashboards that present flow data. These dashboards show different aspects of your network traffic, including the following:

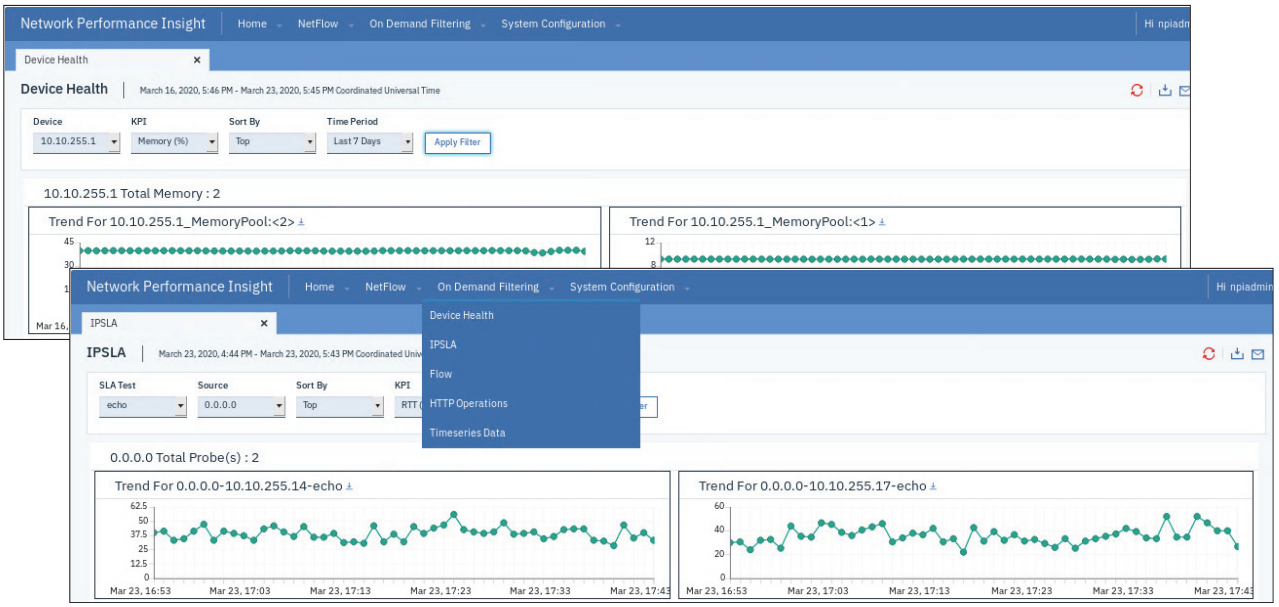
- Traffic source
- Traffic destination
- Conversations between network endpoints
- Applications within your traffic
- Network protocols

These dashboards are interactive. You can change the device, the interface, the traffic direction, and the time period of the dashboard page. You can also click on data points or table rows to drill-down to more detailed data.

Click **NetFlow** at the top of the IBM Network Performance Insight user interface to access the network flow data dashboards.

IBM Training

On demand dashboards



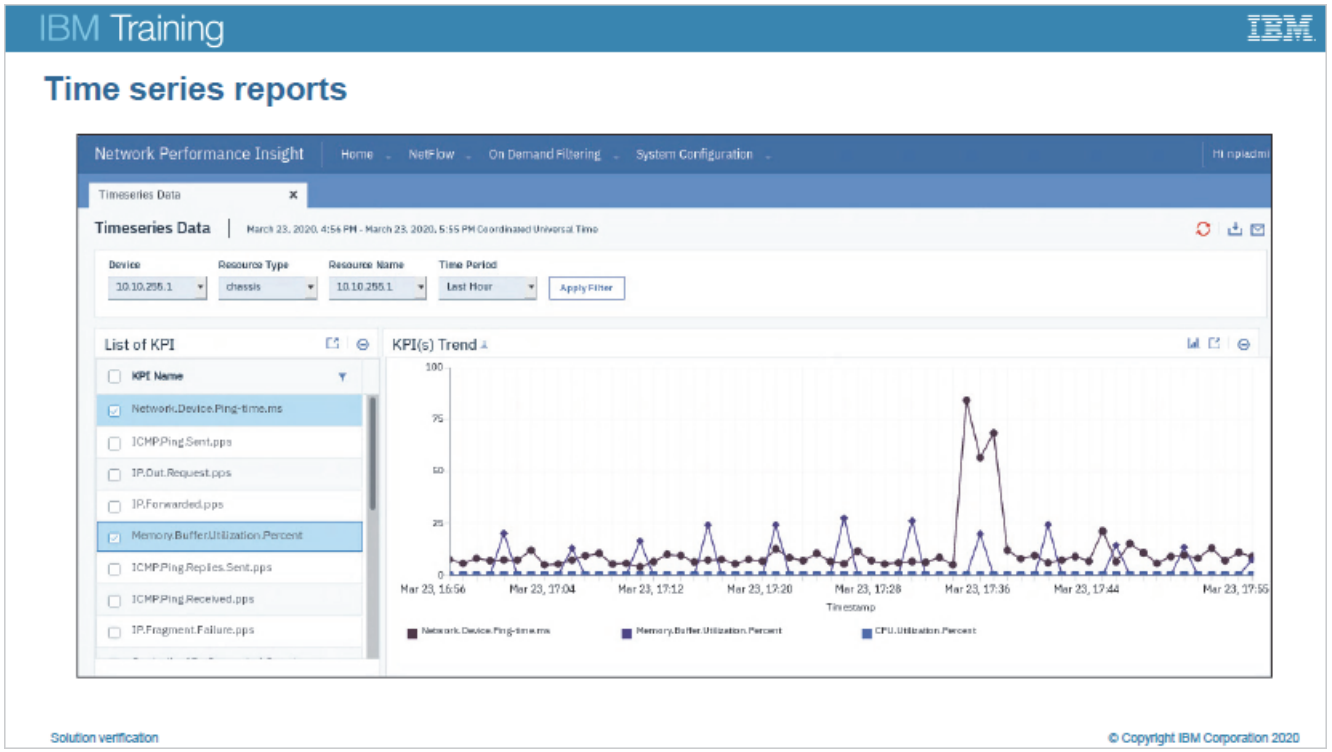
Solution verification

On demand dashboards

Generally, on demand dashboards show SNMP data. The SNMP metrics in these reports are either polled directly, obtained from IBM Tivoli Network Manager, or obtained from Cacti.

The data in these reports varies, depending on what Technology Packs are installed and what metrics are exposed in your network. For example, the network health packs show KPIs such as interface, CPU, and memory utilization.

Use the **On Demand Filtering** link at the top of the IBM Network Performance Insight user interface to access the on demand dashboards.



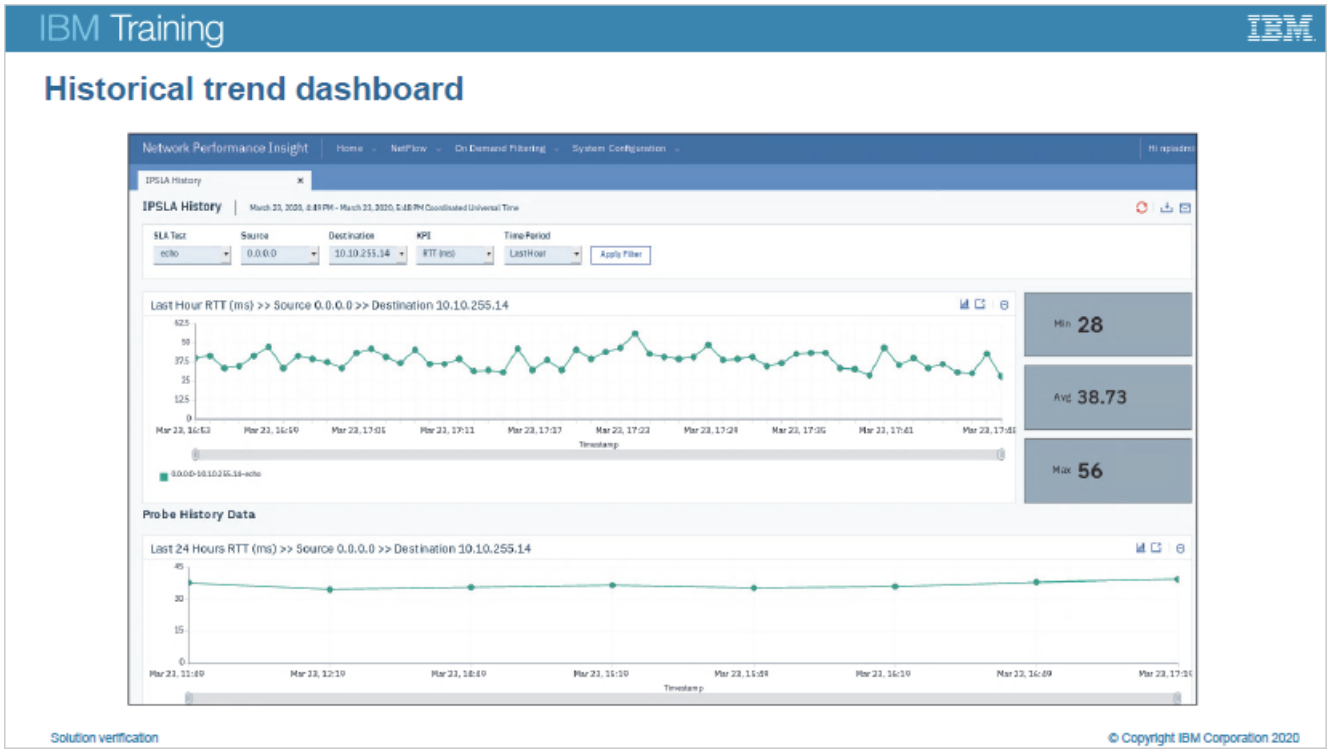
Time series reports

Time series reports allow you to visualize multiple KPIs in the same chart.

Click **On Demand Filtering > Timeseries Data** to access the time series report page.

Use the following steps to create a time series report:

1. Select a device, a resource type, a resource name, and a time period.
2. Select the KPIs you want to include at the left of the page.
3. Right-click the list of KPIs and click **KPI(s) Trend**.



Historical trend dashboard

Historical trend dashboards show metric data over multiple time ranges on one page:

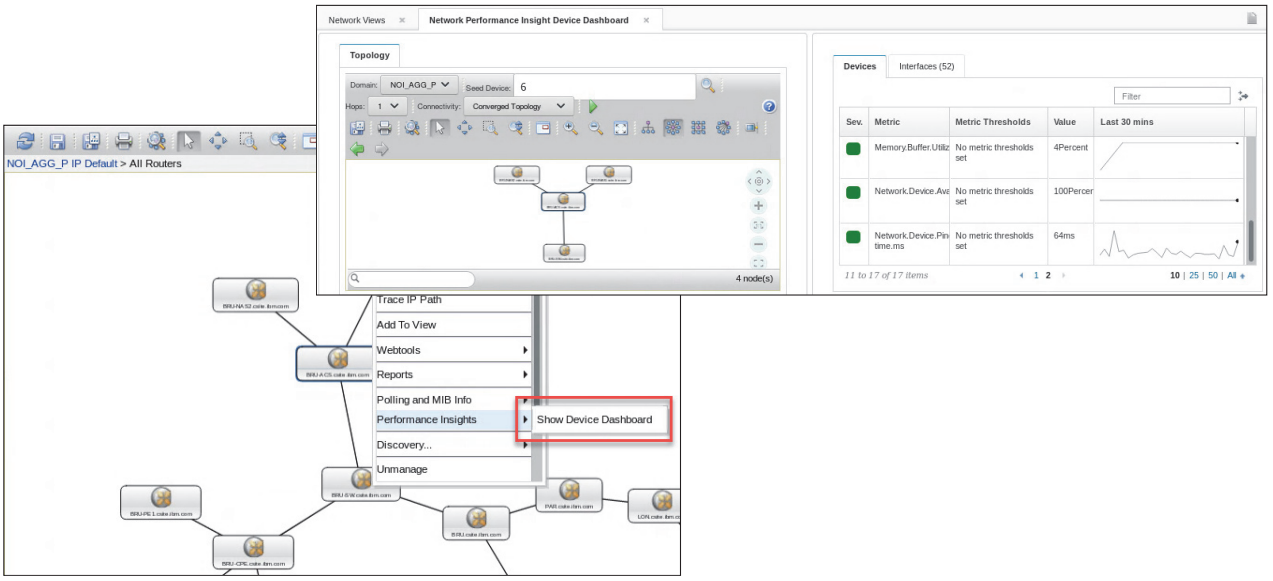
- Last hour
- Last day
- Last week
- Last 30 days
- Last 365 days

Historical trend dashboards also show the maximum, minimum, and average values for each time range.

To access a historical trend dashboard, click a data point in a time series report or an on demand dashboard.

IBM Training

Device Dashboard



Solution verification

Device Dashboard

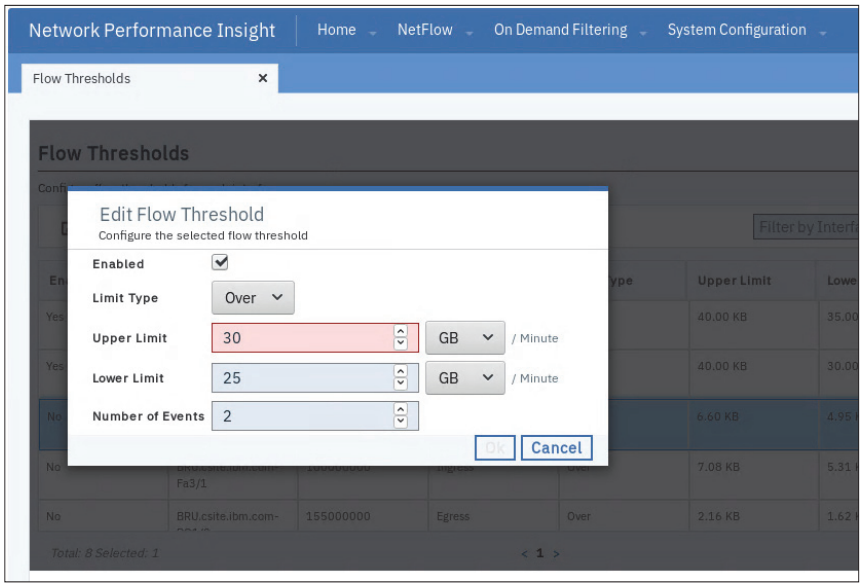
The Device Dashboard is part of Network Performance Insight's tight integration with other Netcool Operations Insight software.

Right-click a device in an IBM Tivoli Network Manager view, then click **Performance Insights > Show Device Dashboard** to access the Device Dashboard.

Performance data for the selected device is displayed at the top-right of the Device Dashboard. You can see a list of metrics along with a quick view of the past 30 minutes on the Devices tab. The Interfaces tab shows metrics for the network interfaces of the selected device, such as bandwidth utilization, discards, and errors.

IBM Training

Configuring network flow thresholds



Solution verification

Configuring network flow thresholds

You can configure IBM Network Performance Insight to send notification to Netcool/OMNIbus if traffic on a flow interface exceeds a predefined level. To set a traffic volume threshold on a flow interface, click **System Configuration > Threshold > Flow Thresholds**.

When you edit a threshold, there are several configuration options.

The **Limit Type** field can be Over, Under, or Band:

- **Over** means that the threshold is violated when interface volume exceeds the upper or lower limits.
- **Under** means that the threshold is violated when interface volume is less than the upper or lower limits.
- **Band** means that the threshold is violated when interface volume exceeds the upper limit or is less than the lower limit.

Number of events is the number of consecutive threshold violations that trigger an event, which is sent to Netcool/OMNIbus.

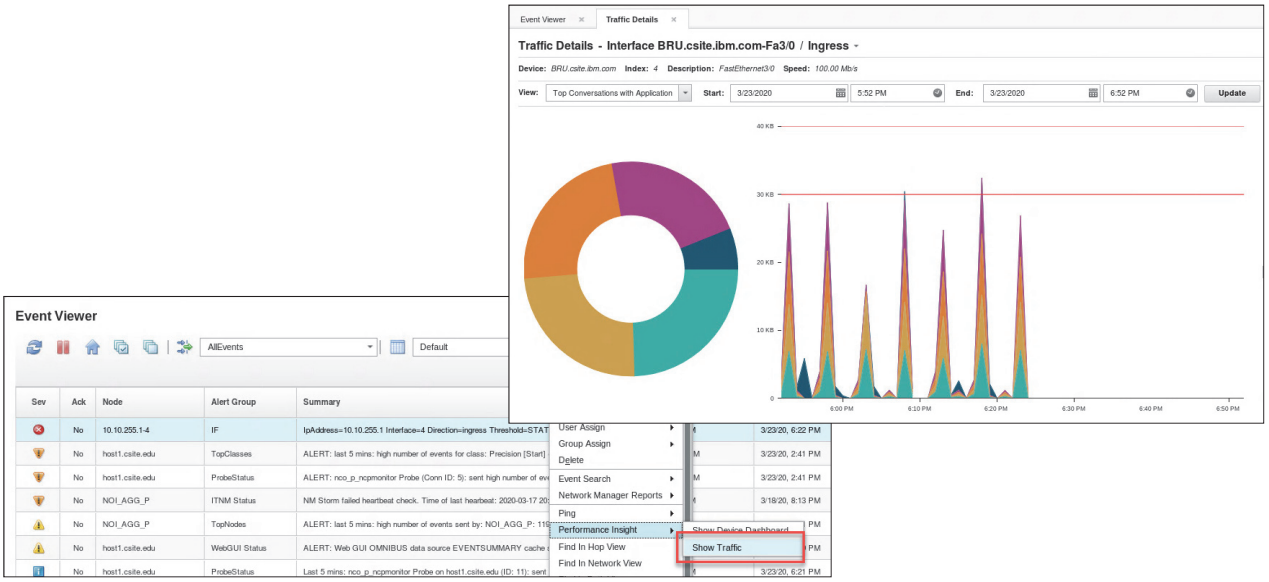
Threshold limits and Netcool/OMNIbus events

The severity of a threshold event that is sent to Netcool/OMNIbus is determined by the type of threshold. The following table lists the event severity for each type of threshold.

Threshold type	Action	Event severity
Over	Traffic volume exceeds the upper limit	Critical
	Traffic volume exceeds the lower limit	Major
Under	Traffic volume is less than the upper limit	Major
	Traffic volume is less than the lower limit	Critical
Band	Traffic volume exceeds the upper limit	Critical
	Traffic volume is less than the lower limit	Critical

IBM Training

Traffic details dashboard



Traffic details dashboard

Threshold violations are displayed in the Traffic Details dashboard. Access the dashboard from the Netcool/OMNIbus event viewer. Right-click a threshold violation event, then click **Performance Insight > Show Traffic** to open the Traffic Details dashboard.

The traffic details dashboard shows you details about network traffic at the network and interface level. Each traffic details report can show ingress traffic, egress traffic, or both. You can access the following traffic details reports, and others, by changing the report view:

- Top Sources
- Top Sources with Application
- Top Applications
- Top Applications with Source
- Top Applications with Destination
- Top Applications with Conversation
- Top Protocols
- Top Protocols with Source
- Top Protocols with Application
- Top Protocols with Conversation

- Top Protocols with Destination
- Top Conversations
- Top Conversations with Application
- Top Destinations
- Top Destinations with Application

IBM Training

Unit summary

You should now be able to perform the following tasks:

- Use performance dashboards and reports
- Verify that IBM Network Performance Insight is processing data

Unit summary

IBM Training

Exercise: Solution verification

In the exercises for this unit, you use reports and dashboards to confirm that IBM Network Performance Insight is installed correctly.

Solution verification

Exercise: Solution verification

IBM Training