IBM Network Performance Insight 1.2.3
Document Revision R2E1

Administering Network Performance Insight

IBM
Before using this information and the product it supports, read the information in “Notices” on page 31.

This edition applies to version 1.2.3.0 of IBM Network Performance Insight and to all subsequent releases and modifications until otherwise indicated in new editions.

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Administering Network Performance Insight

Use this information to administer IBM® Network Performance Insight®, Version 1.2.3 and its integration services.

Intended audience

The audience who are network administrator or operations specialist responsible for configuring 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 1.2.3 system
- Basic principles of network protocols and network management
- Flow concepts
- RHEL Administration
- Jazz for Service Management

Organization

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

- Chapter 2, “Administering Network Performance Insight services through Ambari,” on page 9
- “Starting and stopping services” on page 15
- Chapter 3, “Database administration,” on page 21

Network Performance Insight architecture

IBM Network Performance Insight is a network performance monitoring system. It offers both real-time and historical trends in network performance and interactive view on the network 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:
Network Performance Insight services

Network Performance Insight services 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. Currently, Network Performance Insight 1.2.3 consists of the following microservices:

**Foundation services**
- DNS
- Event
- Manager
- Storage
- UI

**Entity Metric services**
- Cacti Collector
- Formula Service
- Entity Analytics
- SNMP Collector
- SNMP Discovery
- Tivoli® Network Manager Collector
- Threshold

**Flow Metric services**
- Flow Analytics
- Flow Collector
For more information about these services, see their respective sections in IBM Network Performance Insight: Product Overview.

**Network Performance Insight additional components**

Some of the additional components that are introduced in Network Performance Insight V1.2.3 for enhanced functions are described here:

**Network Performance Insight Dashboards**

These interactive dashboards are the built-in JSON-based dashboards suite that can display aggregated network data from Network Performance Insight database with the help of REST API calls. It supports a combination of data from multiple data sources.

This feature provides a wide variety of dashboards for Network Operators, Network Engineers, and Network Capacity Planners. These dashboards help in pinpointing the troubled resources and general resource performance. A number of web-based configuration options are available to control the data that is displayed on the dashboards.

For more information, see Network Performance Insight Dashboards section in IBM Network Performance Insight: Product Overview.

**Note:** Networks for Operations Insight is a solution extension of Netcool Operations Insight that includes the following components and products:

- Tivoli Network Manager
- Tivoli Netcool Configuration Manager
- Network Performance Insight
- Network Health Dashboard
- Device Dashboard
- Topology Search

**IBM Open Platform with Apache Spark and Apache Hadoop components**

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 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 increase
- 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

HDFS
Note: Because Zookeeper requires a majority, it is best to use an odd number of machines. For example, with four machines ZooKeeper can 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**

Products that are integrated with Network Performance Insight 1.2.3:

**Jazz™ for Service Management**

Dashboard 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 Application Services Hub.

**IBM Tivoli Network Manager IP Edition**

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**

Netcool Operations Insight is powered by the fault management capabilities of IBM Tivoli Netcool/OMNIbus. In Network Performance Insight V1.2.3, Tivoli Netcool/OMNIbus is an important part of the solution for monitoring the network threshold violations.

**Related information:**

- IBM Network Performance Insight on IBM Knowledge Center
- IBM BigInsights 4.2 documentation
- HDFS Architecture
- Apache Hadoop YARN
- Apache Kafka
- Apache Zookeeper
- IBM Networks for Operations Insight
**developerWorks community**

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

Access the [IBM Network Performance Insight community](https://tnpmsupport.persistentsys.com/updated_trainings) Use developerWorks community 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.

**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](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 [https://www.ibm.com/software/support/isa](https://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. Network Performance Insight user and group management

Use this information to provide user access to Network Performance Insight Dashboards based on the default user roles and user groups.

Network Performance Insight users have the following access to its web interfaces:

<table>
<thead>
<tr>
<th>Web interfaces</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Configuration</td>
<td>The Network Performance Insight Dashboards is pre-configured with working sets of default configurations. A broad range of functions in Network Performance Insight can be administratively configured. The System Configuration Console is to configure your Network Performance Insight system that is integrated with Dashboard Application Services Hub.</td>
</tr>
<tr>
<td>Performance Dashboards</td>
<td>Network Performance Insight provides built-in and interactive network traffic performance dashboards. You can administer the users specific to Network Performance Insight Dashboards here.</td>
</tr>
</tbody>
</table>
| Traffic Details Dashboard| You can launch the Traffic Details dashboard:  
   - From Device Dashboard  
   - From Event Viewer or AEL  
   - From Network Health Dashboard  
   The Traffic Details dashboard provides a simplified view of traffic performance data. The Flow data that is collected by Network Performance Insight is shown from Traffic Details dashboard. |

**Administering users**

User administration involves setting user access through the following tasks:

1. Creating and assigning groups to the user in WebSphere® administrative console.
2. Assigning roles to the created user to allow users to work with Network Performance Insight web interfaces from Dashboard Application Services Hub console settings.
3. Adding user to gain access to Network Performance Insight Dashboards from Network Performance Insight Dashboards System Administration.

These tasks are application for both Installation and Upgrade Network Performance Insight scenarios.
Default users

After the installation of Network Performance Insight, some users, groups, and roles are created by default.

Users and their groups

The following table describes users that are present after installation, along with their groups.

Table 1. Users present after installation Network Performance Insight and Jazz for Service Management

<table>
<thead>
<tr>
<th>User name</th>
<th>Group</th>
<th>Default password</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>npiadmin</td>
<td>• ConsoleAdmin</td>
<td>netcool</td>
<td>This user is authorized for all operations.</td>
</tr>
<tr>
<td></td>
<td>• ConsoleUser</td>
<td></td>
<td>By default, this user has permissions to administer all of the web interfaces.</td>
</tr>
<tr>
<td></td>
<td>• ReadAdmin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• WriteAdmin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• dashboarduser</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• manager-gui</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• manager-jmx</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• manager-script</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• manager-status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• npiadministrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• npiuser</td>
<td></td>
<td></td>
</tr>
<tr>
<td>npiuser</td>
<td>• ConsoleUser</td>
<td>netcool</td>
<td>By default, this user has permissions to access Network Performance Insight dashboards.</td>
</tr>
<tr>
<td></td>
<td>• dashboarduser</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• npiuser</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Default roles for the Device Dashboard

Table 2. User roles present after the Device Dashboard installation

<table>
<thead>
<tr>
<th>Roles</th>
<th>Privileges</th>
</tr>
</thead>
<tbody>
<tr>
<td>noi_pni</td>
<td>View the Device Dashboard.</td>
</tr>
<tr>
<td>noi_pni_admin</td>
<td>Edit access to the Device Dashboard.</td>
</tr>
</tbody>
</table>

Note:

- The Device Dashboard installation process automatically creates the noi_pni and noi_pni_admin roles.

Important: Make sure to assign all the other user roles that are related to Tivoli Network Manager to the new users.

Default roles for Network Performance Insight Dashboards

The following roles provide access control to the different pages on Network Performance Insight Dashboards and are assigned to the new users from Network Performance Insight Dashboards System Administration menu.
Table 3. User roles present after the installation

<table>
<thead>
<tr>
<th>Roles</th>
<th>Privileges</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>User can access the Network Performance Insight Dashboards:</td>
</tr>
<tr>
<td></td>
<td>• Network Performance Overview dashboard</td>
</tr>
<tr>
<td></td>
<td>• All NetFlow dashboards</td>
</tr>
<tr>
<td></td>
<td>• On Demand Filtering dashboards</td>
</tr>
<tr>
<td></td>
<td>• User Preferences from the System Administration page</td>
</tr>
<tr>
<td>AppAdmin</td>
<td>User has the full administration access to Network Performance Insight Dashboards:</td>
</tr>
<tr>
<td></td>
<td>• System Administration pages</td>
</tr>
<tr>
<td></td>
<td>• Network Performance Overview dashboard</td>
</tr>
<tr>
<td></td>
<td>• All NetFlow dashboards</td>
</tr>
<tr>
<td></td>
<td>• On Demand Filtering dashboards</td>
</tr>
</tbody>
</table>

Related information:
- Network Manager user roles
- Default users in Network Manager
- Configuring the Device Dashboard

Logging in to the Dashboard Application Services Hub portal

Information about how to access the Network Performance Insight Dashboards from Dashboard Application Services Hub.

Procedure
1. Open a web browser and enter the following URL for the Jazz™ for Service Management UI and reporting server:
   https://host.domain:port/DASH_context_root
   For example: https://<myserver.ibm.com>:16311/ibm/console
   Where:
   • host.domain is the fully qualified host name or IP address of the Jazz for Service Management UI and reporting server.
     When single sign-on (SSO) is enabled, ensure that you use the fully qualified host name in the URL of the Jazz for Service Management reporting and UI server. SSO requires that the browser pass LTPA cookies to the Jazz for Service Management application server, and these cookies contain the fully qualified host name.
   • port is the secure HTTP port number that was specified during installation. The default value is 16311.
   • /DASH_context_root is the context root for the console that was specified during installation. The default value is /ibm/console.
2. Enter the user ID and password in the login page. Log in with smadmin credentials and click Go.
   The Dashboard Application Services Hub Welcome page opens.
Creating users for Web applications

Use these steps to create new users and assign the groups to the user, which provides with the appropriate access for accessing Jazz™ for Service Management server.

About this task

You can create one or more users. The users are added to the registry and a login account for each new user is automatically created. When creating the new user, you can also add the user as a member of one or more groups.

You must add the user and groups sequentially. Use the following order.
1. Create the users.
2. Assign the users to the relevant groups.

Procedure

1. Log in to Dashboard Application Services Hub portal as smadmin user.

2. Expand Console Settings ( ) > WebSphere Administrative Console.
3. Click Launch WebSphere Administrative Console.
4. From the navigation pane, click Users and Groups > Manage Users.
5. Click Create to create a new user.
6. In the User ID field, type a unique name to identify the user.
   This user ID will be added to the user registry and also will be used as the login account name.
7. In the First name field, type the given or first name of the user.
8. In the Last name field, type the family or last name of the user.
9. Optional: In the E-mail field, type an e-mail address for the user.
10. In the Password and Confirm password field, type a unique password.
11. Click Group Membership to add the user as a member of one or more existing groups.
12. In the Search by field, select the attribute from the list that you want to use to search for one or more users. For example, select Group name.
13. In the Search for field, either type the string that you want to search for to limit the set of groups, or use the wildcard character (*) to search for all groups. Whether the search is case sensitive or case insensitive depends on the user registry that you are using.
14. In the Maximum results field, specify the maximum number of search results that you want to display.
15. Click Search.
   After the search completes, the results are displayed in two lists:
   - Available - the list is for groups that matched the search criteria
   - Mapped To - the list is for groups that the user is already a member.
16. In the Available column, select the following groups and click < Add:
   - ConsoleAdmin
   - ConsoleUser
   - ReadAdmin
   - WriteAdmin
17. Optional: To undo or remove the user as a member, highlight the groups from the Mapped To list and then click Remove >.
18. Click Close to return to Create a User page.
19. Click Create.
   If successful, a message will display that indicates that the user has been created. Also, the user ID and other user information will be added to the user registry, and a new login account will be created for the user.
20. To create another user, click Create Like.
21. Repeat the process until all the new users have been created.

Granting roles to the new user

New console users must be granted access to resources based on the role to which they have been assigned.

Procedure

1. Log in to Dashboard Application Services Hub portal as smadmin user.

2. In the navigation pane, select Console Settings > User Roles.

3. To assign a role to a user, click Search. A list of available users is displayed.

4. Select the new user from the User ID column.
   A list of available roles for the selected user is displayed on a new page.

5. Select the following roles to work with Network Performance Insight Dashboards from the available roles check box:
   - noi_npi
   - noi_npi_admin

   Important: Make sure to assign all the other user roles that are related to Tivoli Network Manager to the new users.

   Note: noi_npi and noi_npi_admin roles are created when the Device Dashboard is installed.
   For more information, see
   - Installing the Device Dashboard section in Installing and Configuring IBM Network Performance Insight guide.
   - Network Manager user roles section in IBM Tivoli Network Manager IP Edition 4.2.0 guide.

6. Click Save.

What to do next

Log off from Dashboard Application Services Hub and log in again to ensure all the privileges that include admin privileges are available to the new user.
Adding users to access Network Performance Insight Dashboards

Assigning permissions to access Network Performance Insight Dashboards.

**Before you begin**

You must first create the users on WebSphere Application Server.

**About this task**

Network Performance Insight Dashboards installs with predefined roles that you can use to grant access to the Network Performance Insight dashboards, reports, and administration tasks.

To create user and assign roles to provide the user with the appropriate access to Network Performance Insight Dashboards:

**Procedure**

1. Log in to Dashboard Application Services Hub portal with npiadmin and netcool credentials.

2. Click Console Integrations icon ( ) in the navigation bar and select Dashboards under Performance.
   The page loads with menu bar to navigate to different Network Performance Insight Dashboards.


4. Click Add and enter the following details:
   - UserID is the identification of the user.
   - Email is the email address of the user.
   - First Name is the given name of the user.
   - Last Name is surname of the user.

5. Select the required roles from the Available Roles list and add them to the Selected Roles list.

6. Click Save.

7. To edit an existing user information, select user from the list and click Edit and make the required changes.

8. To delete an existing user, select user from the list and click Delete.

   **Note:** Deleting a user removes only the permissions that are assigned to that user. It does not remove the user from WebSphere Application Server or Dashboard Application Services Hub user list.

9. To refresh the user list, click Refresh.

**Related information:**

"Default roles for Network Performance Insight Dashboards" on page 2
Optional: Setting User Preferences

You can set the PDF, CSV, and other dashboard properties for the Network Performance Insight Dashboards.

About this task

Administer Network Performance Insight Dashboards by using user preferences options.

Procedure

1. Log in to Dashboard Application Services Hub portal with npadmin and netcool credentials or any user with the appropriate privileges.

2. Click Console Integrations icon ( ) in the navigation bar and select Dashboards under Performance.

   The page loads with menu bar to navigate to different Network Performance Insight Dashboards.

3. Select System Administration > Preferences > User Preferences.

To set the PDF Preferences:

4. Enter the following details under the PDF Preferences pane:
   - Include Legends, select if to include legends.
   - Password Protected, select if to protect the PDF with a password.
   - Password, enter a password.
   - Configure, select from the list to configure user, page, and report properties.

5. Select a configure property from the Configure list.
   a. For UserId, enter the following details:
      - Include User Id, select if to include a User ID.
      - User Id Alignment, select an alignment for User ID.
      - User Id Position, select the position for User ID.
   b. For PageNo, enter the following details:
      - Include Page No., select if to include page number.
      - Page No. Format, select the page number format.
      - Page No. Alignment, select the alignment for page number.
      - Page No. Position, select the position for page number.
   c. For ReportTime, enter the following details:
      - Include Report Time, select if to include report time.
      - Report Time Format, select the report time format.
      - Report Time Alignment, select the alignment for report time.
      - Report Time Position, select the position for report time.
   d. Click Save to save your settings.

To set the Auto Refresh Time:

6. To set the auto refresh timing, type a time in the Auto Refresh Time in minutes.

To set the File separator:
7. To set the CSV file separator, type the separator parameter in the CSV Separator field.

To set the Theme:
8. To set the theme for Network Performance Insight Dashboards, select from the Theme list.
   By default, IDL theme is used.
   IBM Design Language (IDL) is an IBM standard to create crafted products and enlightening user experiences. It uses data visualization to provide meaningful context and precision.

Menu Preferences:
9. To set the menu position of Network Performance Insight Dashboards menus, select from the Position list.
10. Click Save to save your settings.
Chapter 2. Administering Network Performance Insight services through Ambari

The installation of Ambari server host and agents is now complete. Use this basic information to help you administer your Ambari environment.

Apache Ambari can provision, manage, and monitor Hadoop clusters. After Ambari server is installed, the default user admin/admin is created. This Ambari-level Administrator user has full control over all aspects of Ambari, and all the clusters that are managed by the Ambari instance, and the ability to manage users, groups, and clusters.

Related information:
- [Ambari Administration Overview](#)

Adding nodes and components to existing hosts in a cluster

Apache Hadoop clusters grow and change with use. You can add more services after you build your initial cluster with a base set of Hadoop services.

Related information:
- [Using Apache Ambari to add new nodes to your existing cluster](#)

Adding new hosts to the cluster

You can add more hosts to an existing cluster and assign these hosts to run as DataNodes and NodeManagers to expand both HDFS storage capacity and YARN processing power.

Before you begin

Set up SSH passwordless login on the new host.

For more information, see Setting SSH passwordless login in [Installing and Configuring IBM Network Performance Insight](#)

Procedure

1. Open a browser and access the Ambari server dashboard.
   Use the following default URL: `http://<myserver.ibm.com>:8080`
   The default user name is `admin`, and the default password is `admin`.
2. In the Ambari web interface, browse to the Hosts page and click the Actions button.
3. Select Add New Hosts.
   The ADD HOST WIZARD provides a sequence of prompts similar to the ones in the Ambari installation wizard. Follow the prompts, and provide information similar to that provided to define the first set of hosts in your cluster.
   For more information, see [Setting up Network Performance Insight cluster](#) in [Installing and Configuring IBM Network Performance Insight](#)
4. Select the slave components to include on the host.
   For example, DataNode and NodeManager.
Ambari deploys the software packages on the hosts, push the configuration to the hosts, and start the components so they join their respective Services.

5. Perform the postinstallation tasks on the new host.

For more information, see Postinstallation tasks in Installing and Configuring IBM Network Performance Insight.

**Related information:**

[Adding Hosts to a Cluster]

**Adding ZooKeeper service to new hosts in a cluster**

Expand your cluster further by adding the ZooKeeper service to the hosts in your cluster.

**About this task**

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.

**Procedure**

1. Open a browser and access the Ambari server dashboard.
   - Use the following default URL: `http://<myserver.ibm.com>:8080`
   - The default user name is `admin`, and the default password is `admin`.
2. Click **Services > ZooKeeper > Service Actions**.
3. Select **Add ZooKeeper Server** and add it to the specific Ambari agent host.
4. Restart the service.

**Adding components to new hosts in a cluster**

After a new node is added to the cluster, expand your cluster by adding all the master host components to the slave hosts in your cluster.

**About this task**

Add the following components:
- Manager Service
- Kafka Broker

**Procedure**

1. Open a browser and access the Ambari server dashboard.
   - Use the following default URL: `http://<myserver.ibm.com>:8080`
   - The default user name is `admin`, and the default password is `admin`.
2. Click **Hosts** and browse to the specific host page and click the **Add** button.
3. Start all the added services.

**What to do next**

If you add a Kafka Broker to your new host, make sure to reassign the topic partition Leaders. Follow these steps:
1. Run the following commands to list all the available topics on your new host as follows:

```bash
cd /usr/iop/current/kafka-broker/bin
./kafka-topics.sh --zookeeper <myserver.ibm.com>:<port> --list
```

Typically, the port number is 2182. You might see an output as follows:

```
__consumer_offsets
__schemas
events
itmm.ncim.entity-name
itmm.ncim.entity-property
itmm.ncim.network-interfaces
itmm.ncim.physical-chassis
itmm.nmonitor.snmp-credentials
nm.datarequest
nm.monitoredinstance
nm.monitoredobject
nm.polldata
mpi-connect-configs
mpi-connect-offsets
mpi.agg.win-mgr
mpi.aggsstatus
mpi.cfg.domain_names-mgr
mpi.cfg.retention_profile-mgr
mpi.cfg.thresholds-mgr
mpi.flow-collector-mgr
mpi.flow_metric.interface-mgr
mpi.ncpolldata.monitored_instance
mpi.ncpolldata.monitored_object
mpi.notificationbaseline.dynamic_definition
mpi.notification.entity_metric.raw
mpi.notification.flow_metric.agg-001day
mpi.notification.flow_metric.agg-001min
mpi.notification.flow_metric.agg-030min
mpi.notification.flow_metric.raw
mpi.notification.inventory.entities
mpi.notification.inventory.entity_metric
mpi.notification.inventory.entity_property
mpi.notification.ncim.network_interfaces
mpi.notification.ncim.physical_chassis
mpi.notification.ncpolldata.monitoredinstance
mpi.notification.ncpolldata.monitoredobject
mpi.notification.threshold.state
mpi.snmp.poll.credentials
mpi.snmp.poll.data
mpi.snmp.poll definitions
mpi.threshold-service.static-definitions
mpi.threshold.static_definition-mgr
mpi.timeseries-aggstatus
mpi.timeseries.raw
snapshot.mpi.agg.win-mgr
snapshot.mpi.cfg.domain_names-mgr
snapshot.mpi.cfg.retention_profile-mgr
snapshot.mpi.cfg.thresholds-mgr
snapshot.mpi.flow-collector-mgr
snapshot.mpi.flow_metric.interface-mgr
snapshot.mpi.threshold.static_definition-mgr
udp.flow.packet
```

**Note:** Select an existing Zookeeper.

2. Use the output to create your `topics-to-move.json` file.

3. Follow the steps as in [Reassigning Kafka topic partitions](#)
Deleting masters and slaves hosts in a cluster

Decommissioning is a process that supports removing a component from the cluster. You must decommission a master or slave before you remove the component or host from service. Decommissioning helps prevent potential loss of data or service disruption.

Related information:

Decommissioning NodeManager and DataNode components

Use this information to decommission NodeManager and or DataNode components on Ambari.

About this task

HDFS replication rule states that the number of live DataNodes must be equal or less than the replication factor. The dfs.replication is an HDFS global setting to set the replication factor that is available in hdfs-site.xml file. You can set this value on Ambari as follows:

1. Open a browser and access the Ambari server dashboard.
   Use the following default URL: http://<myserver.ibm.com>:8080
   The default user name is admin, and the default password is admin.
2. Click Services > HDFS > Advanced.
3. Expand the General pane and enter a value for the Block replication.

   Note: This value must be equal or less than the number of live DataNodes in your cluster.

Procedure

1. In the Ambari web interface, click Hosts to find the host FQDN on which the component is available.
2. Select the specific host to decommission the components.
3. Click Actions > Selected Hosts > <component_type>.
   You can decommission NodeManagers and DataNodes.

   Note: Make sure that decommissioning of NodeManagers and DataNodes is completed successfully with status that is changed to “Decommissioned”. The decommissioning of DataNodes can take a long time based on the size of your DataNode.
4. Click Decommission.
5. Delete the decommissioned component as follows:
   a. Select the host name that is decommissioned in Components.
   b. Optional: Stop the component.
      A decommissioned slave component might restart in the decommissioned state.
   c. Select Delete from the component list.
6. Restart all services from Ambari.
To remove a Kafka Broker component, first reassign the Kafka topic partition Leaders from the Kafka Broker by using the kafka-reassign-partitions.sh script, and then shutdown and delete the Kafka Broker component in Ambari.

### Decommissioning the Kafka Broker component

To remove a Kafka Broker component, first reassign the Kafka topic partition Leaders from the Kafka Broker by using the kafka-reassign-partitions.sh script, and then shutdown and delete the Kafka Broker component in Ambari.

### Before you begin

Ensure that Kafka and ZooKeeper services are up and running.

### Procedure

1. Connect to ZooKeeper Service by using the following commands:
   ```bash
   cd /usr/iop/current/kafka-broker/bin
   ./zookeeper-shell.sh <zookeeper_server>:<port>
   ```
   Where
   - `<zookeeper_server>` is the host name where ZooKeeper is running.
   - `<port>` is the port number where the ZooKeeper Service is running. By default, 2182.

2. In the ZooKeeper shell, list the brokers and their IDs by using the following command:
   ```bash
   ls /brokers/ids
   ```

3. In the ZooKeeper shell, get the specific Kafka Broker information with the help of the broker IDs by using the following commands:
   ```bash
   get /brokers/ids/<brokerId>
   ```
   The output looks as follows:
   ```json
   "jmx_port": -1, "timestamp": "1473387779988", "endpoints": "PLAINTEXT://<myserver.ibm.com>:6667", "host": "<myserver.ibm.com>", "version": 2, "port": 6667}
   cZxid = 0xdef
  ctime = Thu Sep 08 22:22:59 EDT 2016
   mZxid = 0xdef
   pZxid = 0xdef
   cversion = 0
   dataVersion = 0
   aclVersion = 0
   ephemeralsOwner = 0x1570cc18b10d0000
   dataLength = 127
   numChildren = 0
   ```

4. Exit the zookeeper shell, with the following command:
   ```bash
   quit
   ```

5. Identify the list of topics and partitions that require leadership and replicas reassignment by using the following commands:
   ```bash
   ./kafka-topics.sh --zookeeper <zookeeper_server>:2182 --describe
   ```
   The output looks as follows:
Note: Topic partitions that require reassignment are identified with Leader and Replicas values that are equal to the broker ID of the node that is to be decommissioned.

6. Isolate the topics for a specific broker ID that you want to delete by running the following commands:

For example, to decommission, broker ID 1004:

```
./kafka-topics.sh --zookeeper `hostname`:2182 --describe | egrep "Leader: 1004|Replicas: 1004"
```

You can see the following output:

```
Topic: topic1 Partition: 0 Leader: 1004 Replicas: 1004 Isr: 1004
Topic: topic2 Partition: 0 Leader: 1004 Replicas: 1004 Isr: 1004
Topic: topic3 Partition: 0 Leader: 1004 Replicas: 1004 Isr: 1004
Topic: topic4 Partition: 3 Leader: 1004 Replicas: 1004 Isr: 1004
Topic: topic5 Partition: 1 Leader: 1004 Replicas: 1004 Isr: 1004
```

7. Reassign partitions to a different Kafka Broker.

8. Stop the Kafka Broker Service and delete the component in Ambari.

9. Restart all the Network Performance Insight services and HDFS and YARN that might be consuming from the decommissioned Kafka node in the cluster.

Related tasks:

“Decommissioning NodeManager and DataNode components” on page 12

Use this information to decommission NodeManager and or DataNode components on Ambari.

Related information:

[How to Delete a Component](#)

Deleting hosts from a cluster

Deleting a host removes the host from the cluster.

Before you begin

Before you delete a host, complete the following tasks:

- Decommission any DataNodes, NodeManager, and Kafka Broker that are running on the host.
- Stop all components that are running on the host.
- Stop Ambari Metrics on each DataNode.
- Stop the Ambari Agent on the host.
- Move from the host any master components, such as NameNode or ResourceManager, running on the host.
- Turn Off Maintenance Mode, if necessary, for the host.
Procedure

1. Open a browser and access the Ambari server dashboard.
   Use the following default URL: http://<myserver.ibm.com>:8080
   The default user name is admin, and the default password is admin.
2. In the Ambari web interface, browse to the Hosts page and select the specific host that you want to remove.
3. Click Host Actions > Delete Host.
4. Restart all services from Ambari.

Related information:

Dealing with the services from the Ambari administration interface

Starting and stopping services

Use this information to start and stop Network Performance Insight and its related components.

About this task

Note: If you must restart your server, stop all the services on that server. After the restart, start all the Network Performance Insight services manually.

Controlling the services from Ambari administration interface

Stop all IBM Open Platform with Apache Spark and Apache Hadoop services, by either using the Ambari administration interface or command line to start Ambari REST APIs.

Procedure

Stopping the services

- Click Actions > Stop All from the Ambari web interface.
  Then, wait for all of the services to stop.
- Optional: Follow this sequence to stop the services on Ambari web interface:
  The order in which to stop the services:
  1. Network Performance Insight
  2. MapReduce2
  3. YARN
  4. HDFS
  5. KAFKA
  6. Ambari Metrics
  7. ZooKeeper

Starting the services

- Click Actions > Start All from the Ambari web interface.
- Optional: Follow this sequence to start the services on Ambari web interface:
  The order in which to start the services:
  1. ZooKeeper
  2. Ambari Metrics
  3. KAFKA
  4. HDFS
5. YARN
6. MapReduce2
7. Network Performance Insight

**Controlling the Ambari server and Ambari agent services**

Commands to control the Ambari server and Ambari agent services.

**Procedure**

- To start the Ambari server:
  ```bash
  service ambari-server start
  ```

- To stop the Ambari server:
  ```bash
  service ambari-server stop
  ```

- To restart the Ambari server:
  ```bash
  service ambari-server restart
  ```

- To check the Ambari server processes:
  ```bash
  ps -ef | grep Ambari
  ```

- To stop the Ambari agent by using the following command:
  Run this step on the specific Ambari agent server.
  ```bash
  service ambari-agent stop
  ```

- To start the Ambari agent by using the following command:
  Run this step on the specific Ambari agent server.
  ```bash
  service ambari-agent start
  ```

**Restarting Tivoli Network Manager Storm Spout**

The Storm Spout that is available with Tivoli Network Manager provides polling data and related metadata through Kafka.

**Procedure**

1. Go to the following directory:
   ```bash
   cd $NCHOME/precision/bin
   ```
   By default, $NCHOME is /opt/IBM/netcool/core.

2. Source the environment.
   ```bash
   source $NCHOME/env.sh
   ```

3. Restart the Storm by using the following commands
   ```bash
   itm_m_stop storm
   itm_m_start storm
   ```

**Related information:**

- [Starting and stopping Apache Storm](#)
Controlling Remote Flow Collector Service

Start and stop the Remote Flow Collector Service and its associated services by command line.

Starting the Remote Flow Collector associated services

Use these steps to start the Remote Flow Collector and its associated services.

Procedure

1. Start Zookeeper Service by using the following command:
   
   ```
   sudo /usr/iop/current/zookeeper-server/bin/zkServer.sh start
   ```

2. Start Kafka Service by using the following command:
   
   ```
   sudo /usr/iop/current/kafka-broker/bin/kafka start
   ```

3. Start the Remote Flow Collector Service by using the following command:
   
   ```
   sudo systemctl start npi-remote-flow-collector
   ```

Stopping the Remote Flow Collector associated services

Use these steps to stop the Remote Flow Collector and its associated services.

Procedure

1. Stop the Remote Flow Collector Service by using the following command:
   
   ```
   sudo systemctl stop npi-remote-flow-collector
   ```

2. Stop Kafka Service by using the following command:
   
   ```
   sudo /usr/iop/current/kafka-broker/bin/kafka stop
   ```

3. Stop Zookeeper Service by using the following command:
   
   ```
   sudo /usr/iop/current/zookeeper-server/bin/zkServer.sh stop
   ```

Checking the status of the Remote Flow Collector associated services

Use these steps to check the status of the Remote Flow Collector and its associated services.

Procedure

1. Check the status of Remote Flow Collector Service by using the following command:
   
   ```
   sudo systemctl status npi-remote-flow-collector
   ```

2. Check the status of Kafka Service by using the following command:
   
   ```
   sudo /usr/iop/current/kafka-broker/bin/kafka status
   ```

3. Stop Zookeeper Service by using the following command:
   
   ```
   sudo /usr/iop/current/zookeeper-server/bin/zkServer.sh status
   ```

Ambari Metrics System

Ambari Metrics System (AMS) is a built-in system for collecting, aggregating, and serving metrics for various services in Ambari managed clusters.

It contains two components:

**Metrics Collector**

It is the stand-alone server that collects metrics, aggregates metrics, serves metrics from the Hadoop service sinks and the **Metrics Monitor**.
**Metrics Monitor**

It is installed on each host in the cluster to collect system-level metrics and forward to the **Metrics Collector**.

**Metrics Hadoop Sinks**

Plug into the various Hadoop components sinks to send Hadoop metrics to the Metrics Collector.

**Ambari metrics for monitoring Network Performance Insight services**

The Ambari web interface home page is a dashboard of the operating status of your cluster. The dashboard contains metrics widgets that provide status information for each service in your cluster, and the status of your cluster. You can use some of these Ambari metrics to monitor Network Performance Insight services.

By default, you can see metrics for HDFS, YARN, MapReduce, and ZooKeeper in addition to cluster-wide metrics in the Ambari dashboard. You can add and remove individual widgets, and rearrange the dashboard by dragging and dropping each widget to a new location in the dashboard.

Status information appears as pie and bar charts. You can see the following metrics for Network Performance Insight services:

<table>
<thead>
<tr>
<th>Widget</th>
<th>Description</th>
<th>Metrics</th>
<th>Network Performance Insight service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster membership</td>
<td>Number of microservices that are in the cluster. This metric is a division of MemberCount by StartedInstance.</td>
<td>MemberCount, StartedInstance</td>
<td>Manager</td>
</tr>
<tr>
<td>Total deployed instances</td>
<td>Number of Network Performance Insight microservices that are deployed in the cluster.</td>
<td>TotalInstance</td>
<td>Manager</td>
</tr>
<tr>
<td>Flow Agg-IF records read</td>
<td>Total records that are read for Flow Aggregation Interface grouper.</td>
<td>FlowAggIFRecordsRead.sum</td>
<td>Flow Analytics</td>
</tr>
<tr>
<td>Flow Analytics IP Address Count</td>
<td>Number of IP addresses that are resolved by Flow Analytics Inventory.</td>
<td>FlowInventoryIPAdressCount.sum</td>
<td>Flow Analytics</td>
</tr>
<tr>
<td>Flow Collector disabled interface</td>
<td>Number of Interfaces that are disabled.</td>
<td>FlowCollectorDisabledInterfaceCount.max</td>
<td>Flow Collector</td>
</tr>
<tr>
<td>Flow Collector available interface</td>
<td>Number of Interfaces that are available to be added.</td>
<td>FlowCollectorAvailableInterfaceCount.min</td>
<td>Flow Collector</td>
</tr>
<tr>
<td>Flow Collector discarded raw records count</td>
<td>Total Number of RAW records that are discarded for all Flow collectors.</td>
<td>FlowCollectorFilteredRecords.sum</td>
<td>Flow Collector</td>
</tr>
<tr>
<td>Widget</td>
<td>Description</td>
<td>Metrics</td>
<td>Network Performance Insight service</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
<td>---------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Flow Collector total records written</td>
<td>Total number of RAW records that are written to Storage.</td>
<td>FlowCollectorWrittenRecords.sum</td>
<td>Flow Collector</td>
</tr>
<tr>
<td>Flow Collector total records receive</td>
<td>Sum of RAW records that are received from all Flow Collectors.</td>
<td>FlowCollectorRecordReceived.sum</td>
<td>Flow Collector</td>
</tr>
<tr>
<td>ITNM Collector NCIM Interface records received</td>
<td>Number of NCIM Network Interface records that are received from Kafka connect through Tivoli Network Manager database.</td>
<td>ITNMCollectorNCIMRecordReceived</td>
<td>Tivoli Network Manager Collector</td>
</tr>
<tr>
<td>ITNM monitored instance</td>
<td>Number of monitored instances that are received from Kafka topic and processed by Tivoli Network Manager Collector.</td>
<td>ITNMCollectorMonitoredInstances.</td>
<td>Tivoli Network Manager Collector</td>
</tr>
<tr>
<td>ITNM monitored objects</td>
<td>Number of monitored objects that are received from Kafka topic and processed by Tivoli Network Manager Collector.</td>
<td>ITNMCollectorMonitoredObjects</td>
<td>Tivoli Network Manager Collector</td>
</tr>
<tr>
<td>ITNM entity metrics records</td>
<td>Tivoli Network Manager Entity Metrics RAW records that are processed by Tivoli Network Manager Collector.</td>
<td>ITNMCollectorPollData</td>
<td>Tivoli Network Manager Collector</td>
</tr>
<tr>
<td>ITNM PollData Kafka Topic Lag</td>
<td>Tivoli Network Manager poll data Kafka topic lag offset by Collector.</td>
<td>CollectorKafkaPolldataLag</td>
<td>Tivoli Network Manager Collector</td>
</tr>
<tr>
<td>ITNM NCIM Interfaces</td>
<td>Tivoli Network Manager NCIM Interfaces that are processed by Tivoli Network Manager Collector.</td>
<td>ITNMCollectorNCIMInterfaces</td>
<td>Tivoli Network Manager Collector</td>
</tr>
<tr>
<td>Events Processed/Stored</td>
<td>Threshold events that are processed and stored by Event service.</td>
<td>EventsProcessed, EventsStored</td>
<td>Event</td>
</tr>
<tr>
<td>DNS Name Resolution</td>
<td>Forward resolution (domain name to IP address) requests and responses.</td>
<td>DNSResolveNameRequest, DNSResolveNameResponse</td>
<td>DNS</td>
</tr>
<tr>
<td>DNS Address Resolution</td>
<td>Reverse resolution (IP address to domain name) requests and responses.</td>
<td>DNSResolveAddressRequest, DNSResolveAddressResponse</td>
<td>DNS</td>
</tr>
<tr>
<td>Widget</td>
<td>Description</td>
<td>Metrics</td>
<td>Network Performance Insight service</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
</tbody>
</table>
| DNS Service Available Message Buffer | DNS Service free buffer queue to DNS server. Difference between DNSBufferMessageCapacity and DNSMessageBufferSize. | • DNSMessageBufferCapacity Buffer capacity for caching before sending to DNS.  
• DNSMessageBufferSize Buffer used. This metric shows the capacity-size. | DNS                                    |

**Related information:**

[Ambari metrics](#)
Chapter 3. Database administration

Provides information about essential administration tasks such as backing up and restoring your performance data that is stored in a specialized, indigenously developed database in IBM Network Performance Insight.

A backup is a safeguard against unexpected data loss and application errors. If you lose the original data, then you can reconstruct it by using a backup.

**Important:** As a part of database best practices, it is recommended that you run backup operation regularly. Backup and recovery procedures protect your database against data loss and reconstruct the data, if there is a data loss.

You can use Network Performance Insight backup and restore scripts.

**Network Performance Insight backup and restore**

Two modes of backup are available in Network Performance Insight 1.2.3.

The following are some typical scenarios of the backup activity.
- Ad hoc backup before an application or services upgrade
- Periodic backup to recover from a disaster or failure scenarios
- Single node cluster backup in local directory

It is a good practice to schedule a backup operation regularly. You can set up a cron job to run the backup command.

The following are the Network Performance Insight backup contents.
- Network Performance Insight storage data
- Domain objects

The following are the two types of backup modes:
- Backup - Store the Network Performance Insight backup contents in HDFS.
- Backup and Archive - Store the Network Performance Insight backup contents in HDFS and creates a .tar file to a specified local directory.

**Network Performance Insight storage data**

Network Performance Insight storage data is located in HDFS and can be viewed by browsing HDFS NameNode UI at the following HDFS directory:/npi/work/storage

**Domain objects**

Domain object snapshots, which are maintained in Kafka are critical for managing Network Performance Insight Domain processes. Hence important to have a backup setup regularly.

The following list the Network Performance Insight Kafka topics that are backup during the procedure:
- snapshot.npi.cfg.domain_names-mgr
• snapshot.npi.cfg.retention_profile-mgr
• snapshot.npi.cfg.thresholds-mgr
• snapshot.npi.flow_metric.interface-mgr
• snapshot.npi.threshold.static_definition-mgr
• snapshot.npi.cfg.aggregation_disable-mgr
• snapshot.npi.cfg.autonomous_sys-mgr
• snapshot.npi.cfg.ip_address_group-mgr
• snapshot.npi.cfg.nbar2-mgr
• snapshot.npi.cfg.nbar-mgr
• snapshot.npi.cfg.tos-mgr
• snapshot.npi.flow_metric.art_target-mgr
• snapshot.npi.flow_metric.device-mgr
• snapshot.npi.flow_metric.qos_class-mgr
• snapshot.npi.flow_metric.qos_policy-mgr
• snapshot.npi.flow_metric.qos_queue-mgr

Backup

Create a backup of your Network Performance Insight backup contents to prevent data loss if there is a service outage.

Before you begin

1. Ensure that the following services are up and running:
   • ZOOKEEPER
   • KAFKA
   • HDFS
   • Network Performance Insight
     You can start Network Performance Insight services through Ambari Server UI.

About this task

Explains how to backup Network Performance Insight backup contents.

For more information about backup command reference in Fix Pack 1, see IBM Network Performance Insight: References.

Note: Resiliency might be better achieved with a combination of a periodic backup and a multi-node setup, for example, backup on a multi-node cluster environment.

Procedure

1. Log in as root or netcool user.
2. Change to the /<basecamp_Home>/basecamp-storage directory:
   For example,
   ```
   # cd /opt/IBM/basecamp/basecamp-storage
   <basecamp_Home> is the location where the basecamp packages are installed.
   ```
3. Run the following command to display the usage for backup command.
   ```
   # ./bin/backup -help
   ```
4. Run the following command to start the Network Performance Insight backup procedure.
The backup script runs the following tasks in the background:

- Creates and stores Network Performance Insight backup contents in the following **HDFS file system directories**:
  - Network Performance Insight storage data at /npi/work/storage/.snapshot/<BACKUP_VERSION>/*
    - For example: /npi/work/storage/.snapshot/npi-1.2.3.0-<timestamp>/*
  - Domain objects at /npi/work/dmbackup/<BACKUP_VERSION>/*.json
    - For example: /npi/work/dmbackup/npi-1.2.3.0-<timestamp>/snapshot.npi.cfg.domain_names-mgr.json

**Note:** `<BACKUP_VERSION>` is the backup directory with the following naming format: npi-1.2.3.0-yyyyMMddHHmmss

**Note:** Only the latest backup version is retained in the HDFS file system. All the older backup versions are deleted.

5. Verify the `/<basecamp_Home>/basecamp-storage/logs/basecamp-storage.log` file for any issues during the backup procedure.
   All messages during backup procedure are logged in `basecamp-storage.log` file.

**Browsing HDFS file system directories**

You can access HDFS NameNode UI to view the HDFS directories by using **Quick Links** in the Ambari Server user interface.

**Procedure**

1. Open a browser and access the Ambari server dashboard.
   Use the following default URL: `http://<myserver.ibm.com>:8080`
   The default user name is admin, and the default password is admin.

2. To access HDFS NameNode UI from Ambari Server UI, select **Services > HDFS**.

3. Click **Quick Links > NameNode UI**.
   The Overview page of the selected host is displayed.

4. To browse the HDFS file system in the HDFS NameNode UI, select **Utilities > Browse the file system**.
   The Browse Directory page is displayed.

5. Enter the directory path and click **Go!**

**Backup and Archive**

Create a backup of your Network Performance Insight backup contents to your local directory in your system to prevent data loss if there is a service outage.

**Before you begin**

1. Ensure that the following services are up and running:
   - ZOOKEEPER
   - KAFKA
   - HDFS
   - Network Performance Insight
   You can start Network Performance Insight services through Ambari Server UI.
About this task

Explains how to backup Network Performance Insight backup contents to your local directory.

**Note:** Depending on the size of your backup contents, Backup and Archive mode might be more reasonable for a single node set up, for example a stand-alone mode of deployment.

**Important:** Backing up content to LOCAL_BACKUP_DIRECTORY might take a long time to complete and take up large amount of disk space depends on the size of the backup contents.

Procedure

1. Log in as root or netcool user.
2. Change to the /<basecamp_Home>/basecamp-storage directory:
   For example,
   ```
   # cd /opt/IBM/basecamp/basecamp-storage
   
   <basecamp_Home> is the location where the basecamp packages are installed.
   ```
3. Run the following command to display the usage for backup command.
   ```
   # ./bin/backup -help
   ```
4. Run the backup script with **-path** option to create tar file of the backup contents to local directory by using the following command:
   ```
   # ./bin/backup -path <LOCAL_BACKUP_DIRECTORY>
   ```
   **Note:** Make sure that the netcool user has sufficient privilege to read and write the <LOCAL_BACKUP_DIRECTORY>. The directory must have sufficient disk space to contain the backup contents as well.
   For example:
   ```
   # ./bin/backup -path /opt/IBM/basecamp/basecamp-storage/work/backup
   ```
   You can specify any file path (**-path**) to store the backup tar file. In this example, tar file is created at /opt/IBM/basecamp/basecamp-storage/work/backup. By default, the backup script takes the following parameter.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>-tool</strong></td>
<td>/&lt;basecamp_Home&gt;/basecamp-storage/bin/backup-tool</td>
</tr>
</tbody>
</table>

**Note:** The backup script uses the default backup-tool script that is available in the Network Performance Insight package.

The backup script runs the following tasks in the background:

- Creates and stores Network Performance Insight backup contents in the following [HDFS file system directories]:
  - Network Performance Insight storage data at /npi/work/storage/.snapshot/<BACKUP_VERSION>/*
    For example:
    ```
    /npi/work/storage/.snapshot/npi-1.2.3.0-<timestamp>/*
    ```
  - Domain objects at /npi/work/dmbackup/<BACKUP_VERSION>/*.json
    For example:
    ```
    /npi/work/dmbackup/npi-1.2.3.0-<timestamp>/snapshot.npi.cfg.thresholds-mgr.json
    ```
Note: <BACKUP_VERSION> is the backup directory with the following naming format: npi-1.2.3.0-yyyyMMddHHmmss

Creates a copy of Network Performance Insight backup contents in a tar file within the specified backup path directory (<LOCAL_BACKUP_DIRECTORY>).

For example, the backup contents that are created in /opt/IBM/basecamp/basecamp-storage/work/backup:

```
# cd /opt/IBM/basecamp/basecamp-storage/work/backup
# ls -lrt
  total 228236
  -rw-r--r-- 1 netcool hadoop 75581440 Jul 28 17:21 npi-1.2.3.0-<timestamp>.tar
```

5. Optional: Run the backup script with -tool option to override the default backup-tool script, by using the following command:

```
# cd /<basecamp_Home>/basecamp-storage
# ./bin/backup -path <LOCAL_BACKUP_DIRECTORY> -tool <Customised_script>
```

Where, the Customized_script is the full path of the script.

The Customized_script takes the following parameter from the backup script:

a. <LOCAL_BACKUP_DIRECTORY> specified with -path.
b. The backup version name (<BACKUP_VERSION>), for example npi-1.2.3.0-20170823145013.

Note: It depends entirely on the user on how they want to customize their backup-tool script.

6. Verify the /<basecamp_Home>/basecamp-storage/logs/basecamp-storage.log file for any issues during the backup procedure.

All messages during backup procedure are logged in basecamp-storage.log file.

### Restoring backup data

You can restore the Network Performance Insight backup contents to a previous state by using the restore option. A backup image of the backup contents, which is generated with the backup procedure, must exist before you can use this script.

The Network Performance Insight service state is restored to the same state as the backup copy.

**Before you begin**

1. Ensure that the Network Performance Insight service is down.
2. Ensure that the HDFS, Kafka, and ZooKeeper services are running.

You can stop Network Performance Insight services through Ambari Server UI.

**About this task**

Explains how to restore Network Performance Insight service to a previous state.

For more information about restore command reference, see IBM Network Performance Insight: References.

**Procedure**

1. Log in as root or netcool user.
2. Change to the /<basecamp_Home>/basecamp-storage directory:
For example,

```bash
# cd /opt/IBM/basecamp/basecamp-storage
<basecamp_Home> is the location where the basecamp packages are installed.
```

3. Run the following command to display the usage for restore command.

```bash
# ./bin/restore -help
```

4. Run the following command to restore:

```bash
# ./bin/restore
```

After the restore procedure successfully completes, the Network Performance Insight backup contents is copied into the respective HDFS directories.

5. Start the Network Performance Insight process by using the Ambari Server UI. Ensure that process starts without any errors and your Network Performance Insight system works as expected.

6. Verify the `/<basecamp_Home>/basecamp-storage/logs/restore.log` file for any issues during the restore procedure.

All messages during restore procedure are logged in `restore.log` file.

a. If the restore procedure fails, the script tries to revert the restore process. The following message is seen in the log when restore procedure fails and the revert restore is triggered.

```
GYMSB10210E: Begin revert Restore
```

b. Contact technical support in the following cases:

- You are unable to resolve issues that are highlighted in the log where you cannot proceed with a restore rerun.
- If there are issues with starting the Network Performance Insight processes.
- You see the following message, which indicates the revert restore failed:

```
GYMSB1021E: Failed to revert restore. error: <error stack trace>
```

- You see the following message that indicates that the cleanup of Domain Object Kafka topics failed:

```
GYMSB1026E: Failed to clean Domain Object Kafka Topics, cause: Topics: <Failure Details>
```

The `<Failure Details>` message differs according to the issue.

For example:

```
GYMSB1026E: Failed to clean Domain Object Kafka Topics, cause: Topics: ${topic} exists after delete
```

## Restoring Backup and Archive data

Explains how to restore the Network Performance Insight service to a previous state by using the backup contents tar file, which is created with the Backup and Archive procedure.

### Before you begin

1. Ensure that the Network Performance Insight service is down.
2. Ensure that the HDFS, Kafka, and ZooKeeper services are running.

You can stop Network Performance Insight services through Ambari Server UI.

### About this task

Explains how to restore Network Performance Insight service to a previous state by using the backup contents tar file.
Restriction:

You cannot perform a Restoring Backup procedure immediately after performing a Restoring Backup and Archive procedure.

It can only be done after a Backup procedure is run after the restore Backup and Archive procedure.

To summarize, you need to follow the following sequence:

1. Run the “Restoring Backup and Archive data” on page 26.
2. Run the “Backup” on page 22.
3. Run the “Restoring backup data” on page 25.

Procedure

1. Log in as root or netcool user.
2. Change to the /<basecamp_Home>/basecamp-storage directory:
   
   For example,
   
   `# cd /opt/IBM/basecamp/basecamp-storage`
   `<basecamp_Home>` is the location where the basecamp packages are installed.
3. Run the following command to display the usage for restore command.
   
   `# ./bin/restore -help`
4. To restore from a local backup file, run the following command:
   
   `# ./bin/restore -localBackup <LOCAL_BACKUP_TAR_FILE>

   Note: You need to specify the full path of the backup tar file (<LOCAL_BACKUP_TAR_FILE>).

   For example:
   
   `# ./bin/restore -localBackup /opt/IBM/basecamp/basecamp-storage/work/backup/npi-1.2.3.0-<timestamp>.tar`

   After the restore procedure successfully completes, the Network Performance Insight storage backup tar file is extracted and copied into the respective HDFS directories.
5. Start the Network Performance Insight process by using the Ambari Server UI. Ensure that process starts without any errors and your Network Performance Insight system works as expected.
6. Verify the `/<basecamp_Home>/basecamp-storage/logs/restore.log` file for any issues during the restore procedure.
   
   All messages during restore procedure are logged in `restore.log` file.

   a. If the restore procedure fails, the script tries to revert the restore procedure. The following message is seen in the log when restore procedure fails and the revert restore is triggered:
      
      GYMSB1020E: Begin revert Restore
   
   b. You should seek technical support help for the following cases:
      
      1) You are unable to resolve issues that are highlighted in the log where you cannot proceed with a restore rerun.
      
      2) If there are issues with starting the Network Performance Insight processes.
      
      3) You see the following message, which indicates the revert restore failed:
         
         GYMSB1021E: Failed to revert restore. error: <error stack trace>
      
      4) You see the following message, which indicates that the cleanup of Domain Object Kafka topics failed:
The <Failure Details> message differs according to the issue. For example:

H2 database and dashboard data backup and restore

The H2 database stores the Network Performance Insight Dashboards data. Some of the information that is stored in H2 database; the list of dashboards, users, roles, page-role mapping information, dashboard state, and database queries that are used for dashboard pages, and so on. The backup operation includes both H2 database and other Network Performance Insight Dashboards related data.

Before you begin

Identify the Network Performance Insight host in your cluster that is integrated with Jazz for Service Management and perform the following steps:

1. Log in to the Dashboard Application Services Hub server as npiadmin user.

2. In the navigation pane, select Console Settings > ( ) > Console Integrations.

3. Click the NPI link and note down the Console Integration URL. For example, https://<myserver.ibm.com>:9443/Blaze/rest

Note: You need the <myserver.ibm.com> hostname to understand from where to back up the data.

About this task

You must backup the H2 database and dashboards data from the Network Performance Insight host that is integrated with Dashboard Application Services Hub, and then restore the data back to another host in a multi-node environment. These steps are applicable if you have a single node environment.

All the required data is available in the /opt/IBM/basecamp/basecamp-ui folders.

For more information, see the following topics:

- Logging in to the Dashboard Application Services Hub portal section in Using IBM Network Performance Insight
- Installation directory structure in Installing and Configuring IBM Network Performance Insight

Backup procedure

Use these steps to back up the H2 database and other related data.

Procedure

1. Stop the basecamp-ui Service from Ambari as follows:
   a. Log in to Ambari server dashboard.
      Use the following default URL:
      http://<myserver.ibm.com>:8080
      The default user name is admin, and the default password is admin.
b. Click **Hosts** and select your host that is integrated with Dashboard Application Services Hub.

c. Select **UI / NPI** from **Components** and click **Stop** from the list.

2. Log in to the Host that is integrated with Dashboard Application Services Hub as *root* user.

3. Create a target directory to hold all the backup data.

   For example, `/opt/IBM/dashboard-backup` that is referred to as `<TARGET_DIR>`.

4. Change the directory to `/opt/IBM/basecamp/basecamp-ui/bin/` and run the backup script as follows:

   ```
   ./oed_backup.sh -target_dir=<TARGET_DIR>
   ```

   If backup is successful, you can see the following file in the `<TARGET_DIR>`:

   - `OED_DB.tgz`
   - `OED_DASHBOARDS.tgz`

5. Start the basecamp-ui service as follows:

   a. Log in to Ambari server dashboard.

      Use the following default URL:

      `http://<myserver.ibm.com>:8080`

      The default user name is *admin*, and the default password is *admin*.

   b. Click **Hosts** and select your host that is integrated with Dashboard Application Services Hub.

   c. Select **UI / NPI** from **Components** and click **Start** from the list.

**Restore procedure**

Use these steps to restore the H2 database and other related data.

**Procedure**

1. Stop the basecamp-ui Service from Ambari as follows:

   a. Log in to Ambari server dashboard.

      Use the following default URL:

      `http://<myserver.ibm.com>:8080`

      The default user name is *admin*, and the default password is *admin*.

   b. Click **Hosts** and select your host that is integrated with Dashboard Application Services Hub.

   c. Select **UI / NPI** from **Components** and click **Stop** from the list.

2. Log in to the host where you want to restore the backup data as root user.

3. Create a source directory and copy all backup data.

   For example, `/opt/IBM/dashboard-backup` that is referred to as `<SOURCE_DIR>`.

4. Change the directory to `/opt/IBM/basecamp/basecamp-ui/bin/` and run the restore script as follows:

   ```
   ./oed_restore.sh -source_dir=<SOURCE_DIR>
   ```

   If restore is successful, you can see the following changes in the `<SOURCE_DIR>`:

   - `OED_DB.tgz` file is extracted to `/basecamp/work/basecamp-ui/oed/`

   - The `OED_DASHBOARDS.tgz` file is extracted to `/opt/IBM/basecamp/basecamp-ui/resources/dashboards`.

5. Start the basecamp-ui service as follows:

   a. Log in to Ambari server dashboard.

      Use the following default URL:

      `http://<myserver.ibm.com>:8080`
The default user name is admin, and the default password is admin.

b. Click Hosts and select your host that is integrated with Dashboard Application Services Hub.

c. Select UI / NPI from Components and click Start from the list.
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