Installing Network Performance Insight
Note

Before using this information and the product it supports, read the information in “Notices” on page 47.
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</table>
Installing

Use this information to install IBM® Network Performance Insight.

Network Performance Insight installation is a simple process that improves your time to value. It can be deployed with minimal system requirements for the large data that it can manage.

**Important:** Before you install Network Performance Insight, read the *Release Summary* that might have late-breaking information specific to your installation.

Network Performance Insight, v1.2.0 integrates with the following components of IBM Netcool Operations Insight 1.4.0.3:

- IBM Tivoli® Network Manager IP Edition for SNMP data collection and discovery
- IBM Tivoli Netcool/OMNIbus component of IBM Netcool® Operations Insight for fault management of network traffic.

Network Performance Insight together with Tivoli Network Manager provides performance capability to address modern network management challenges around application-oriented, on-demand, software-defined-networks in the enterprise data centers and intranet.

**Intended audience**

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

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

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

**Organization**

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

- Chapter 1, “System requirements,” on page 1
- Chapter 2, “Planning for Network Performance Insight installation,” on page 5
- Chapter 3, “Installing prerequisite software,” on page 13
- Chapter 4, “Preparing your environment,” on page 21
- Chapter 5, “Installing Network Performance Insight,” on page 25
- Chapter 6, “Deploying Network Performance Insight clusters,” on page 33
- Chapter 7, “Postinstallation tasks,” on page 37
Network Performance Insight architecture

IBM Network Performance Insight is a network performance monitoring system.

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

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

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

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

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

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

• IBM Open Platform with Apache Spark and Apache Hadoop
• Default support for rolling upgrades for Hadoop services
• Support for long-running applications within YARN for enhanced reliability
• Spark in-memory distributed compute engine for dramatic performance increases
• Apache Ambari operational framework. Apache Ambari is an open framework for provisioning, managing, and monitoring Apache Hadoop clusters. Ambari provides an intuitive and easy-to-use Hadoop management web UI backed by its collection of tools and APIs that simplify the operation of Hadoop clusters.
• Essentially includes the following open source technologies for working with Network Performance Insight:
  – HDFS
  – Kafka
  – Ambari
  – Spark
  – ZooKeeper

Note: Because Zookeeper requires a majority, it is best to use an odd number of machines. For example, with four machines ZooKeeper can only handle the failure of a single machine; if two machines fail, the remaining two machines do not constitute a majority. However, with five machines ZooKeeper can handle the failure of two machines.

Integrated products

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

Jazz for Service Management 1.1.3.0
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.

Products that are integrated with Network Performance Insight 1.2.0:

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

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

**Network Performance Insight services**

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

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

**Related information:**
- IBM Network Performance Insight on IBM Knowledge Center
- IBM BigInsights 4.2 documentation
- HDFS Architecture
- Apache Hadoop YARN
- Apache Kafka
- Apache Zookeeper

---

**Service Management Connect**

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


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

**Related information:**
- IBM Network Performance Insight community on developerWorks

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**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)

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**Support information**

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

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

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

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

Typeface conventions
This publication uses the following typeface conventions:

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

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

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

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

Complete set of requirements for IBM Network Performance Insight 1.2.0.

Lists the configurations and the supported platforms and components of Network Performance Insight.

For requirements of other integrated products, see the related product documentation for them.

Hardware requirements

Hardware specifications vary according to the size of your network and server topology that you want to use.

Network Performance Insight has the following minimum requirements that are based on the specific default functions on Linux environment in a stand-alone mode of deployment:
<table>
<thead>
<tr>
<th>Features</th>
<th>Value</th>
<th>Hardware specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flows per second</td>
<td>40000 flows per second per Network Performance Insight agent node in your cluster 20,000,000 records per hour for Tivoli Network Manager</td>
<td>Network Performance Insight Ambari server specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 8 Core CPU (Intel Xeon E5-2640@2.2 GHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 32 GB RAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard disk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 100 GB</td>
</tr>
<tr>
<td>Supported number of Interfaces</td>
<td>1000 per Flow Collector Service that is running on each Ambari node in your cluster.</td>
<td>Network Performance Insight Agent node specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CPU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 16 Core CPU (Intel Xeon E5-2640@2.2 GHz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 64 GB RAM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard disk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 7 TB</td>
</tr>
<tr>
<td>Note: You must use RAID level 5 in Network Performance Insight environment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data retention time</td>
<td>• Flow metrics RAW data = 5 Days  • Flow metrics 1 min aggregated data = 1 Month  • Flow metrics 30 min aggregated data = 12 Months  • Flow metrics daily aggregated data = 12 Months  • DNS data = 3 Months  • Events data = 6 Weeks  • Logs = 10 Days  • Entity metrics RAW data = 90 Days  • Entity metrics 30 minutes aggregated = 12 Months  • Entity metrics 6 hours aggregated = 12 Months  • Entity metrics daily aggregated data = 12 Months  • Entity metric Threshold state data = 90 days</td>
<td></td>
</tr>
</tbody>
</table>

**Related information:**

- Hardware requirements for Tivoli Network Manager 4.2
- Tivoli Netcool/OMNIbus 8.1.0 - Sizing your deployment
- Jazz for Service Management Detailed System Requirements
Software requirements

The supported operating systems, modules, and third-party applications for Network Performance Insight.

Software requirements for Network Performance Insight.

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Red Hat Linux" /></td>
<td>7.2</td>
</tr>
</tbody>
</table>

Note: Network Performance Insight and its related services are supported on RHEL operating system only.

Table 1. Supported web browsers

<table>
<thead>
<tr>
<th>Web browsers</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet Explorer</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Mozilla Firefox ESR</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Google Chrome</td>
<td>Latest version with in 90 days of release</td>
</tr>
</tbody>
</table>

Table 1. Supported web browsers

Note: Enable JavaScript and cookies.

<table>
<thead>
<tr>
<th>Table 2. Prerequisite software</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jazz for Service Management</td>
<td>1.1.3.0</td>
</tr>
<tr>
<td>IBM Tivoli Netcool/OMNibus</td>
<td>8.1.0</td>
</tr>
<tr>
<td></td>
<td>Apply Fix Pack 8</td>
</tr>
<tr>
<td>IBM Tivoli Netcool/OMNibus Web GUI v8.1</td>
<td>8.1.0</td>
</tr>
<tr>
<td>for Netcool Operations Insight v1.3</td>
<td>Apply Fix Pack 7</td>
</tr>
<tr>
<td>IBM Tivoli Network Manager IP Edition</td>
<td>4.2.0.1</td>
</tr>
</tbody>
</table>

Table 2. Prerequisite software

<table>
<thead>
<tr>
<th>Table 3. Bundled software</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Front End Toolkit</td>
<td>1.5.x</td>
</tr>
<tr>
<td>IBM SDK, Java Technology Edition 64-bit</td>
<td>8.0.2.10 (Version 8, Service Refresh 2 Fix Pack 10)</td>
</tr>
</tbody>
</table>

Table 3. Bundled software

<table>
<thead>
<tr>
<th>Table 4. Supported hypervisors</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Hat Enterprise Linux with KVM</td>
<td>RHEL 7</td>
</tr>
<tr>
<td>VMware ESXi</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>5.1</td>
</tr>
</tbody>
</table>

Table 4. Supported hypervisors

Related information:

<System requirements for BigInsights>
Disk space partitioning for Network Performance Insight and related directories

Based on the hardware specification for Network Performance Insight agent node, refer to the following suggestion on disk space partitioning.

Table 5. Recommended directory structure for Network Performance Insight nodes

<table>
<thead>
<tr>
<th>Directory</th>
<th>Disk space</th>
</tr>
</thead>
<tbody>
<tr>
<td>/</td>
<td>150 GB</td>
</tr>
<tr>
<td>/home</td>
<td>150 GB</td>
</tr>
<tr>
<td>/var</td>
<td>200 GB</td>
</tr>
<tr>
<td>/opt</td>
<td>500 GB</td>
</tr>
<tr>
<td>&lt;/data1&gt;</td>
<td>6000 GB</td>
</tr>
</tbody>
</table>

Note: You might need to partition the directories depending on your environment, the size of your network, and the amount of data you plan to store. If your environment has a different hardware specification, contact IBM Support for more information.

Related concepts:

Hardware requirements
Hardware specifications vary according to the size of your network and server topology that you want to use.
Chapter 2. Planning for Network Performance Insight installation

Before you install the product, read the hardware and software requirements.

Related concepts:

- Chapter 1, “System requirements,” on page 1
- Complete set of requirements for IBM Network Performance Insight 1.2.0.

Suggested node and services layout

Use the following guide lines for setting up your IBM Open Platform with Apache Spark and Apache Hadoop and Network Performance Insight services in your cluster.

Ambari agent deployment deploys Network Performance Insight service layer and application binary to the cluster hosts, and installs each component to the default location /opt/IBM/npi and the IBM Open Platform with Apache Spark and Apache Hadoop components to /usr/iop/current directory.

Multi-node cluster deployment

It is suggested that you have at least one Ambari server node and the rest of them as Ambari agents. In the diagram HOST A is the Ambari server and HOST B and C are the Ambari agents.

Note: Make sure that you install Manager Service and Kafka Broker in all Ambari agent nodes.

Note: Because Zookeeper requires a majority, it is best to use an odd number of machines. For example, with four machines ZooKeeper can only handle the failure
of a single machine; if two machines fail, the remaining two machines do not constitute a majority. However, with five machines ZooKeeper can handle the failure of two machines.

**Stand-alone deployment**

A minimal deployment is used primarily for demonstration or evaluation purposes, and installs the product on the smallest number of machines possible, with minimal user input. When you perform a minimal deployment installation, all the Network Performance Insight services and related components are installed on the same server.
Platform support

All Network Performance Insight components must be installed on Red Hat Linux, Version 7.2 only.

Co-location rules

While it is possible to deploy all the Network Performance Insight and its associated components on a single instance for evaluation purpose. Typically, you must have at least three hosts; one master Ambari server, and two Ambari agent slaves for Network Performance Insight cluster.

You must plan for servers to install Jazz for Service Management and other Netcool Operations Insight components.

Related information:

Performing a fresh installation

Network Performance Insight installation media

How to get the product distribution.

The installation media can be obtained from two routes:

- Electronic installation images that licensed customers can download from the IBM Passport Advantage website.
- Offering DVDs

Downloading the IBM Open Platform with Apache Spark and Apache Hadoop

Download the IBM Open Platform with Apache Spark and Apache Hadoop components.

About this task

Download the following packages to a single location of your choice. For example, opt/IBM/Installers/NPI that is referred to as <DIST_DIR>.

- ambari-2.2.0.el7.x86_64.tar.gz
- iop-4.2.0.0.el7.x86_64.tar.gz
- iop-utils-1.2.0.0.el7.x86_64.tar.gz

Note: You do not need to extract these packages.

Procedure

Download the following packages:

- Ambari
- IOP
- IOP-UTILS
Obtaining Installation Manager

IBM Installation Manager is a single installation program that uses remote or local software repositories to install, modify, or update certain IBM products. Network Performance Insight can be installed by using IBM Installation Manager v1.8.4 or later.

About this task

- Obtain Installation Manager software from [Fix Central](#).
- Install Installation Manager.

Default ports that must be opened for a typical installation

Before you install IBM Open Platform with Apache Spark and Apache Hadoop software, use the values in this table to plan for any conflicts that might exist in your system.

<table>
<thead>
<tr>
<th>Service</th>
<th>User</th>
<th>Protocol</th>
<th>Port number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambari Metrics</td>
<td>ams</td>
<td>tcp</td>
<td>60200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6188</td>
</tr>
<tr>
<td></td>
<td>ams</td>
<td>tcp6</td>
<td>37266</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>45884</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>61181</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>61310</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>41824</td>
</tr>
<tr>
<td>HDFS</td>
<td>hdfs</td>
<td>tcp</td>
<td>50090</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8010</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8020</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>50070</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>58042</td>
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<td></td>
<td></td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td>50075</td>
</tr>
<tr>
<td>KAFKA</td>
<td>kafka</td>
<td>tcp6</td>
<td>56969</td>
</tr>
<tr>
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<td>6667</td>
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<tr>
<td>Service</td>
<td>User</td>
<td>Protocol</td>
<td>Port number</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>Network Performance Insight services</td>
<td>netcool</td>
<td>tcp6</td>
<td>2552</td>
</tr>
<tr>
<td>Ambari Server</td>
<td>root</td>
<td>tcp6</td>
<td>8670</td>
</tr>
<tr>
<td>YUM Repository</td>
<td>root</td>
<td>tcp6</td>
<td>9091</td>
</tr>
<tr>
<td>Service</td>
<td>User</td>
<td>Protocol</td>
<td>Port number</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td>----------</td>
<td>---------------------</td>
</tr>
<tr>
<td>YARN</td>
<td>yarn</td>
<td>tcp6</td>
<td>7337</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8025</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>8030</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>8040</td>
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<td></td>
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<td></td>
<td>8042</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>8050</td>
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<td></td>
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<td></td>
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<td>8141</td>
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<td>8188</td>
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<td></td>
<td></td>
<td></td>
<td>10200</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>13562</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>45454</td>
</tr>
<tr>
<td>For Spark Executors</td>
<td>yarn</td>
<td>tcp6</td>
<td>46100 - 46600</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>47100 - 47600</td>
</tr>
<tr>
<td>ZooKeeper</td>
<td>zookeeper</td>
<td>tcp6</td>
<td>2182</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2888</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3888</td>
</tr>
</tbody>
</table>

**Related information:**

[IBM BigInsights - Get ready to install](#)

**Cluster behavior**

Provides the relevance between Network Performance Insight and its related services with the node behavior in a cluster.

Network Performance Insight supports the following types of node behavior.

**Cluster singleton**

A clustered singleton service (also known as an HA singleton) is a service that is deployed on multiple nodes in a cluster, but is providing its service on only one of the nodes. The node that is running the singleton service is typically called the oldest node.

**Load balancing**

Load balancing improves the distribution of workloads across multiple nodes where each of the node serves different set of clients that are mutually exclusive.

**Managed load balancing**

The difference between Load Balancing with Managed load balancing here is that, node acts as manager node to monitor the load balancing activities. The manager node monitors and distributes the workload among the active nodes.

**Data replication**

A replication strategy determines the nodes where data replicas are placed. The replicas on multiple nodes are stored to ensure reliability and fault tolerance.
Monitoring in each node

A service that is installed on each node in a cluster, where it monitors and provides information on the installed nodes.

Single instance

A service that is installed on a single node in a cluster, which provides its service across all nodes.

The following table lists the service components and their node behavior. Use the following information as guidance to set up your environment.

Table 6. Cluster node behavior

<table>
<thead>
<tr>
<th>Services</th>
<th>Service Type</th>
<th>Service Components</th>
<th>Cluster node behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPI</td>
<td>Master</td>
<td>Manager</td>
<td>Monitoring on each node</td>
</tr>
<tr>
<td>Slave</td>
<td>DNS</td>
<td>Cluster singleton</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Entity Analytics</td>
<td>Cluster singleton</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Event</td>
<td>Cluster singleton</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Flow Analytics</td>
<td>Managed load balancing</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Flow Collector</td>
<td>Load balancing</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Tivoli Network Manager Collector</td>
<td>Cluster singleton</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Storage</td>
<td>Cluster singleton</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Threshold</td>
<td>Cluster singleton</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>UI</td>
<td>Load balancing</td>
<td></td>
</tr>
<tr>
<td>HDFS</td>
<td>Master</td>
<td>NameNode</td>
<td>Single instance</td>
</tr>
<tr>
<td>Master</td>
<td>SNameNode</td>
<td>Single instance</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>DataNode</td>
<td>Data replication</td>
<td></td>
</tr>
<tr>
<td>YARN</td>
<td>Master</td>
<td>Timeline Server</td>
<td>Single instance</td>
</tr>
<tr>
<td>Master</td>
<td>Resource Manager</td>
<td>Single instance</td>
<td></td>
</tr>
<tr>
<td>Slave</td>
<td>Node Manager</td>
<td>Managed load balancing</td>
<td></td>
</tr>
<tr>
<td>ZooKeeper</td>
<td>Master</td>
<td>ZooKeeper</td>
<td>Data replication</td>
</tr>
</tbody>
</table>
Table 6. Cluster node behavior (continued)

<table>
<thead>
<tr>
<th>Services</th>
<th>Service Type</th>
<th>Service Components</th>
<th>Cluster node behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambari Metrics</td>
<td>Master</td>
<td>Collector</td>
<td>Single instance</td>
</tr>
<tr>
<td></td>
<td>Slave</td>
<td>Monitor</td>
<td>Monitoring on each node</td>
</tr>
<tr>
<td>Kafka</td>
<td>Master</td>
<td>Kafka Broker</td>
<td>Data replication</td>
</tr>
<tr>
<td></td>
<td>Master</td>
<td>Kafka Connect</td>
<td>Single instance</td>
</tr>
<tr>
<td>MapReduce2</td>
<td>Master</td>
<td>History Server</td>
<td>Single instance</td>
</tr>
</tbody>
</table>

Required information

Collect the following information before you start your installations.

• The fully qualified domain name (FQDN) for each host in your system, and the components that you want to set up on different hosts. The Ambari installation wizard does not support IP addresses. Use `hostname -f` to check for the FQDN.

• The base directories for the following components:
  – NameNode data
  – DataNodes data
  – MapReduce data
  – ZooKeeper data
  – Various log, pid, and database files according to your installation type

Users and groups for Network Performance Insight

• root
• netcool

  The `netcool` user is created during Network Performance Insight installation and all Network Performance Insight services are run as `netcool` user.

• smadmin

Users and groups for IBM Open Platform with Apache Spark and Apache Hadoop

<table>
<thead>
<tr>
<th>Service</th>
<th>Group</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS</td>
<td>hadoop</td>
<td>hdfs</td>
</tr>
<tr>
<td>MapReduce</td>
<td>hadoop</td>
<td>mapred</td>
</tr>
<tr>
<td>YARN</td>
<td>hadoop</td>
<td>yarn</td>
</tr>
<tr>
<td>Ambari Metrics</td>
<td>hadoop</td>
<td>ams</td>
</tr>
<tr>
<td>Kafka</td>
<td>hadoop</td>
<td>kafka</td>
</tr>
<tr>
<td>Spark</td>
<td>hadoop</td>
<td>spark</td>
</tr>
<tr>
<td>ZooKeeper</td>
<td>hadoop</td>
<td>zookeeper</td>
</tr>
</tbody>
</table>

Note: Click Admin > Service Accounts to see the user information from your Ambari server.
Chapter 3. Installing prerequisite software

Install the prerequisite products before you install Network Performance Insight.

Installing Jazz for Service Management

The Jazz for Service Management installation supports different installation scenarios, user types, installation modes, and server topologies according to your organization needs and target server environments. You can use either a launchpad or IBM Installation Manager to install and configure Jazz for Service Management. You can install and configure one or more integration services on a one, two, or three servers.

About this task

To plan the Jazz™ for Service Management installation, you must choose your installation scenario. This choice depends on the following factors:

- Number of integration services to install
- Reuse the existing database and application server middleware
- Installation mode
- User type

These factors determine your installation scenario that you use to install Jazz for Service Management. You can also use the decision maps. See Installation decision maps.

Important: Do not install Jazz for Service Management 1.1.3.0 on a Solaris machine in a distributed or a stand-alone environment.

Related information:

- Jazz for Service Management Version 1.1.3.0 Readme
- Installing Jazz for Service Management

Quick reference to Jazz for Service Management installation

Use this information to download and install Jazz for Service Management 1.1.3.0. Jazz for Service Management Version 1.1.3.0 is a full refresh of Jazz for Service Management Version 1.1 Base with Modification 3.

This table summarizes the steps to plan and install Jazz for Service Management.
<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
</table>
| Download and extract the software | Download and extract the Jazz for Service Management Version 1.1.3.0 and other required components from IBM Passport Advantage.  
- 1.1.3.0-TIV-JazzSM-multi.zip: 64-bit, multiplatform IBM Installation Manager software package repository for the following Jazz for Service Management integration services and components:  
- IBM Dashboard Application Services Hub 3.1.3.0  
- Jazz for Service Management extension for IBM WebSphere Version 1.1.3.0  
- IBM Tivoli Common Reporting 3.1.3.0  
**Note:** Tivoli Common Reporting is not required for working with Network Performance Insight 1.2.0.  
- 3.1.3.0-TIV-JazzSM-TCR-COGNOS-platform.tar.gz|.zip: Platform-specific IBM Cognos Business Intelligence Reporting for Tivoli Common Reporting Version 3.1.3.0.  
**Note:** Cognos is not required for working with Network Performance Insight 1.2.0. |
| System requirements | Assess the hardware and software requirements. See [Hardware and software requirements](#). |
| Plan your installation | You can choose to perform a full or custom installation of Jazz for Service Management. Different factors determine which installation scenario you must choose, for example, the integration services to install, business and security policies, your target environments, and user types. See [Planning your deployment](#). |
| Prepare your environment | Prepare your environment whether you perform a fresh or upgrade. See [Preparing your environment](#). |
### Task Description

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
</table>
| Perform a fresh installation | 20 GB of free disk space is required for a fresh installation. Follow these steps:  
  - Download and extract 1.1.3.0-TIV-JazzSM-multi.zip to a local directory, for example, <JazzSM_FP_Home>.  
  - Add the JazzSM_FP_Home/1.1.3.0-TIV-JazzSM-multi/JazzSMFPRepository/disk1/diskTag.inf file along with the repository locations for any other earlier Jazz for Service Management versions to Installation Manager > File > Preferences > Add Repository.  
  - Follow the installation instructions. See Performing a full installation. |
| Perform an upgrade | Jazz for Service Management Version 1.1.3.0 can be installed on top of earlier Jazz for Service Management releases (1.1.1.0.0, 1.1.0.2, 1.1.0.3, 1.1.1.0, 1.1.2.0, 1.1.2.1). Use IBM Installation Manager in GUI or silent modes to first update the Jazz for Service Management extension for IBM WebSphere and then install Jazz for Service Management Version 1.1.3.0 for Dashboard Application Services Hub installation. See Applying fix pack by using Installation Manager GUI mode. |
| Perform postinstallation tasks | Verify the installation. See Post-installation tasks. |
| Configure communication with Dashboard Application Services Hub and Network Performance Insight | See Configure Jazz for Service Management portalConfiguring IBM Network Performance Insight. |

**Related information:**

- Jazz for Service Management Version 1.1.3.0 Readme
- Download Jazz for Service Management Version 1.1.3.0
- Jazz for Service Management Detailed System Requirements
- Jazz for Service Management on IBM Knowledge Center

**Starting Jazz for Service Management application servers**

You can start any Jazz for Service Management virtualization and reporting servers by using the IBM WebSphere startServer command. You might need to restart the application server after you complete a configuration task for an integration service, or after you stop the application server for maintenance.

**About this task**

The same procedure applies to any Jazz for Service Management application server.
**Procedure**

1. On the relevant Jazz for Service Management server, open a command window.
2. Change to the JazzSM_WAS_Profile/bin directory.
   The default location for `<JazzSM_WAS_Profile>` is `/opt/IBM/JazzSM/profile`.
3. Run the following command:

   ```bash
   ./startServer.sh server_name
   ```

   Where

   `server_name`
   Enter the name of the application server that was specified when the application server profile was created.

   For example, server1.

**Related information:**

- Common directory locations

**Stopping Jazz for Service Management application servers**

You can stop any Jazz for Service Management application server by using the IBM WebSphere `stopServer` command. You might need to restart the application server after you complete a configuration task for an integration service, or stop the application server for maintenance. To start the server again, use the `startServer` command.

**Procedure**

1. On the relevant Jazz for Service Management server, open a command window.
2. Change to the WAS_HOME/bin directory. The default location for `<JazzSM_WAS_Profile>` is `/opt/IBM/JazzSM/profile`.
3. Run the following command:

   ```bash
   ./stopServer.sh <server_name> -username <WAS_admin_user_name> -password <WAS_admin_password>
   ```

   Where

   `server_name`
   Enter the name of the application server that was specified when the application server profile was created. For example, server1.

   `WAS_admin_user_name`
   The default user name is `smadmin`.

   `WAS_admin_password`
   Password that is specified at the time of installation.

**Example**

```
stopServer.sh server1 -username smadmin -password jazzsmpwd
```

**Related information:**

- Common directory locations
Uninstalling Jazz for Service Management

You can uninstall most integration services and the application server by using Installation Manager GUI mode or silent mode. You might need to clean up the remaining directories after a successful uninstallation or a failed installation.

Procedure

Use IBM Installation Manager in GUI or silent modes to uninstall Jazz for Service Management Version 1.1.3.0.

See Uninstalling fix packs by using Installation Manager GUI mode.

See Uninstalling fix pack by using Installation Manager silent mode.

Important: When you revert to the previous version of Jazz for Service Management, Installation Manager does not automatically account for interim fixes. You must manually install interim fixes after you roll back.

Related information:

Installing Network Manager

Use this information to install and configure IBM Tivoli Network Manager IP Edition and IBM Tivoli Netcool/OMNIbus that are required for using Network Performance Insight.

Quick reference to Tivoli Network Manager installation

Use this information as a quick reference to install and configure Tivoli Network Manager.

The following table lists the high-level steps for installing Tivoli Network Manager.

Table 7. Quick reference for installing Tivoli Network Manager

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read deployment considerations and system requirements for Network Manager.</td>
<td>Planning for installation</td>
</tr>
<tr>
<td>Before you install Network Manager, you must complete extra tasks, depending on your environment.</td>
<td>Preparing to install</td>
</tr>
<tr>
<td>Action</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Install the prerequisites, associated products, and components of Network Manager in the order that they are presented here. | Installing Network Manager and related components:  
- Installing and configuring IBM Installation Manager  
- Installing and configuring a topology database  
- Installing and configuring Tivoli Netcool/OMNibus  
- Installing the Network Manager core components  
- Installing WebSphere Application Server  
- Installing Dashboard Application Services Hub  
- Installing Tivoli Netcool/OMNIbus Web GUI  
  - Planning for installation or upgrade  
  - Installing and updating the Web GUI component  
  - Gathering installation information  
  - Installing the Web GUI |
| Install the components that are required to work with Network Performance Insight. |  
- Installing the Network Health Dashboard  
- Installing Device Dashboard  
- Installing the Network Manager GUI components  
- Optional: Installing Reporting Services  
- Optional: Installing Network Manager reports  
  **Note:** The optional components are not required for working with Network Performance Insight. |
| After you install Network Manager, you need to perform some postinstallation tasks. | Postinstallation tasks |
| Optional: If your installation fails for some reason, use the IBM Installation Manager to remove or roll back the product to previous version.  
  **Note:** Uninstallation of the product by removing files and directories can cause problems when you reinstall. | Uninstalling Network Manager |
| You must uninstall the products and components in the order that is specified. You can install fix packs, and roll back to a previous version by using IBM Installation Manager. | Installing and uninstalling fix packs |

**Related information:**
Quick reference to Network Manager configuration

Perform these basic steps to configure Network Manager after the installation is complete. You can then use the system.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra configuration tasks on UNIX systems.</td>
<td>Configuring Network Manager for UNIX operating systems</td>
</tr>
<tr>
<td>Change the appearance and functionality of the Hop Views; update MIB information; and configure the presentation of events from unmanaged devices.</td>
<td>Configuring GUIs</td>
</tr>
<tr>
<td>If you change the IP address and hostname of the server where any of the components of Network Manager or integrated products are installed, you must configure Network Manager and associated components and products.</td>
<td>Changing the IP address and hostname of the Network Manager installation</td>
</tr>
<tr>
<td>Set the appropriate environment variables by running the environment scripts.</td>
<td>Setting environment variables</td>
</tr>
</tbody>
</table>

Related information:

- Configuring Network Manager
Chapter 4. Preparing your environment

Before you run the installation, you must prepare your target environments.

Before you begin

Before you begin the Network Performance Insight installation, install Jazz for Service Management.

Setting up a local file system for installation

Copy and extract the contents of the Network Performance Insight installation media to your local file system. You can obtain the installation media in the form of a DVD or an electronic image from IBM Passport Advantage.

About this task

Download the Network Performance Insight installation media that contains the npi-IMrepo.tar.gz file to a directory on the host where you want to install the application.

Procedure

1. On the target host, log in as root user.
2. Extract the Network Performance Insight installation media to the <DIST_DIR>.

Related information:

IBM Passport Advantage

Setting SSH passwordless login

You must set up passwordless SSH connections for the Ambari server host to remotely connect to all other Ambari agent hosts that are in the cluster, and also the Dashboard Application Services Hub server without entering the password.

Procedure

1. Log in to the system where you want to install Ambari server host as root user.
2. On this Ambari server host, generate the public and private SSH keys with the following command:

   ```
   ssh-keygen -t rsa
   ```

   Accept all the default values at the prompts.

   A new public key (id_rsa.pub) is generated on the Ambari server host under .ssh directory as a file name authorized_keys.

3. From the Ambari server host, copy the SSH public key (id_rsa.pub) to the root account on the Ambari agent hosts by using the following commands:

   ```
   ssh-copy-id -i ~/.ssh/id_rsa.pub root@<myserver1.ibm.com>
   ssh-copy-id -i ~/.ssh/id_rsa.pub root@<myserver2.ibm.com>
   ssh-copy-id -i ~/.ssh/id_rsa.pub root@<myserver3.ibm.com>
   ```

   Note: You might have to enter the password for the first time to copy the key.
4. Ensure that permissions on your .ssh directory are set to 700 and the permissions on the authorized_keys file in that directory are set to either 600 or 640.
   chmod 700 /root/.ssh
   chmod 600 /root/.ssh/authorized_keys

5. From the Ambari server host, connect to each Ambari agent host in the cluster by using SSH to test your connections. For example, enter the following command:
   ssh root@<myserver1.ibm.com>
   Enter Yes if you encounter this message:
   Are you sure you want to continue connecting (yes/no)?

6. Repeat the connection attempt from the Ambari server host to each Ambari agent host to make sure that the Ambari server can connect to each Ambari agent.

Preparing to run the prerequisite scanner

In addition to Network Performance Insight- specific tasks, complete these common tasks before you start an installation.

Before you begin

The Ambari installer pulls some packages from the base operating system repositories. For example, for RHEL systems, make sure that you have the Red Hat Linux and Red Hat Optional repository channels that are configured and set up before installation.

About this task

Use the root user account to perform the following steps.

Procedure

1. Ensure that adequate disk space exists for the root partition.
   You can find the Ambari service directories in /usr/iop/current. The logs for each service can be found in /var/log/<service>.
   You need enough space for these directories and users. Minimum 80 GB disk space is required

2. Edit the /etc/hosts file to include the IP address, fully qualified domain name, and short name of each host in your cluster, which is separated by spaces.
   Ensure that all characters in host names are lowercase. The format is IP_address domain_name short_name.
   In the following example, assume that node1 is the host that is used for the Ambari setup and the Ambari server:
   127.0.0.1 localhost.localdomain localhost
   123.123.123.123 node1.abc.com node1
   123.123.123.124 node2.abc.com node2
   123.123.123.125 node3.abc.com node3

   a. Run the following commands in succession to disable the firewall (iptables) on all nodes in your cluster.
      For RHEL 7.x
systemctl stop firewalld.service
systemctl disable firewalld.service

b. For Linux x86_64 systems only, disable the Transparent Huge Pages for each client node in your cluster. Run the following command on each Ambari client node:
echo never > /sys/kernel/mm/transparent_hugepage/enabled

c. On all servers in your cluster, disable IPv6 by using the following command.
From the command line, enter ifconfig to check whether IPv6 is running.
In the output, an entry for inet6 indicates that IPv6 is running.

4. Ensure that your environment does not include any existing Ambari installation files, by running a search for the string ambari.
The following code returns nothing if no Ambari installation files exist:
yum list installed | grep -i ambari

5. Ensure that the ulimit properties for your operating system are configured on /etc/security/limits.conf file as follows:
   *
   - nofile 65536
   *
   - nproc 65536

6. Enable the Network Time Protocol (NTP/NTPD) service on the management node and allow the clients to synchronize with the master node.
The IBM Open Platform with Apache Spark and Apache Hadoop installation program synchronizes the other server clocks with the master server during installation.

7. All hosts in your system must be configured for DNS and Reverse DNS.

8. Disable SELinux before you install IBM Open Platform with Apache Spark and Apache Hadoop and it must remain disabled for IBM Open Platform with Apache Spark and Apache Hadoop to function.

9. Ensure that the ZONE parameter value is valid, which means that it must match an actual file name in /usr/share/zoneinfo. Ensure the Timezone file /usr/share/zoneinfo/<Time Zone file> is valid by running the following command:
timedatectl status

10. Unset JAVA_HOME environment variable.

11. Remove the following HTTPD and its related packages permanently:
    APR
    APR-UTILS
    HTTPD-TOOLS
    HTTPD

12. Remove the following PostgreSQL related packages:
    postgresql-server
    postgresql
    postgresql-libs

Related information:

IBM BigInsights: Preparing your environment
Directories created when installing IBM Open Platform with Apache Spark and Apache Hadoop
Running the prerequisite scanner

The `prereq_check.sh` script that is available in the installation package is used for checking the prerequisites. This tool is a scanning tool that performs identification, checking, and verification of prerequisites for Network Performance Insight software before the actual installation takes place.

**Procedure**

Run the tool as follows:

```
./prereq_check.sh
```

The output from the scan can be located in a file at the following location:

```
/tmp/prereq_check_<timestamp>.out
```

Setting Kernel parameters

Setting the `ulimit` and kernel parameters in Network Performance Insight nodes.

**About this task**

Run the following steps to set the `ulimit` and kernel parameters.

**Note:** You can see the error messages in Ambari start operation stderr and Network Performance Insight log file if the `ulimit` or the kernel settings are not set correctly during Storage or Flow Collector services start-ups.

**Procedure**

1. Log in as root user to change the Linux kernel parameters.
2. Edit the `/etc/sysctl.conf` file to add or modify the kernel parameters.

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

   Change the `/etc/sysctl.conf` to ensure that the values are set on a system start.
   a. Run `sysctl -p` as root user to refresh with the new configuration in the current environment.
3. From the Network Performance Insight node, edit the `/etc/security/limits.conf` file to add or modify the hard and soft limit to at least 20000 for the number of open files as follows:

   ```
   netcool hard nofile 20000
   netcool soft nofile 20000
   ```
4. Log out and log in the session again as root user for the changes to take effect.
Chapter 5. Installing Network Performance Insight

Use this information to install Network Performance Insight for the first time in a fresh, stand-alone environment.

Before you begin

- Ensure that Jazz for Service Management is installed.
- Ensure that Security Socket Layer (SSL) communication is configured.
- Ensure that the necessary user permissions are in place for all the installation directories.

About this task

You have two options for installing.

Procedure

- Install by using IBM Installation Manager GUI mode.
- Install by using IBM Installation Manager silent mode.

Installation directory structure

Use this information to understand the default directories that are created during installation.

These directories are created in `/opt/IBM/npi` path. Typically, all the microservices have the directory stack as follows:

```
<NPI_Service>
  |____ bin
  |____ conf
  |      |____ lib
  |____ logs
  |____ var
  |____ work

The `logs` directory contains a separate log file for the microservice.

`installer-tools`
Contains the executable files and the generated SSL certificate.

`npi-connect`
Contains the Kafka connect script that is called from Ambari to start the service. It also contains the JDBC driver files that are needed to connect to IBM DB2, Oracle, and for Kafka to connect to Tivoli Network Manager database.

`npi-dns`
Contains the directories and files that are required for DNS service to function.
npi-entity-analytics
Contains the directories and files that are required for Entity Analytics service to function.

npi-event
Contains the directories and files that are required for Event service to function. STDIN probe is available in this directory.

npi-flow-analytics
Contains the directories and files that are required for Analytics Aggregation service to function.

npi-flow-collector
Contains the directories and files that are required for Flow Collector service to function.

npi-itnm-collector
Contains the directories and files that are required for Tivoli Network Manager - Collector service to function.

npi-jre
Contains the JRE that is bundled with Network Performance Insight.

npi-manager
Contains the directories and files that are required for Network Performance Insight Manager service to function.

npi-storage
Contains the directories and files that are required for Network Performance Insight Storage service to function.

npi-threshold
Contains the directories and files that are required for Threshold service to function.

npi-tools
Contains the encryption script that Ambari uses for encrypting the passwords.

npi-ui Contains the directories and files that are required for UI service to function.

Setting up Installation Manager repositories
Set up the Installation Manager repositories to use for the installation of Network Performance Insight v1.2.0.

Before you begin
Ensure that you have downloaded and extracted the Network Performance Insight software package to the server where you want to install.

About this task
Installation Manager can determine and show the following:
• Available software packages
• Products that are associated with the packages
• Related fix packs and interim fixes
• Checks prerequisites and interdependencies
• Installs the selected packages
Procedure
1. Start Installation Manager in GUI mode by using the following command:
   As root user:
   cd /opt/IBM/InstallationManager/eclipse
   ./IBMIM
   As non-root user:
   cd /<user_home_directory>/IBM/InstallationManager/eclipse
   ./IBMIM
2. Select File > Preferences.
3. In the Preferences > Repositories pane, click Add Repository.
4. Click Browse and browse to the location where Network Performance Insight 1.2.0 package is available.
   For example, <DIST_DIR>.
5. Click OK.
6. Click OK to close the Repositories pane.

Installing Network Performance Insight in GUI mode

You can use IBM Installation Manager to install IBM Open Platform with Apache Spark and Apache Hadoop and Network Performance Insight on a single host or multi-host environments. In wizard mode, you run Installation Manager from a graphical user interface.

About this task

Install Network Performance Insight and its related software by using IBM Installation Manager in GUI mode. The following tasks are accomplished after the installation completes:
• Installs Ambari.
• Installs Network Performance Insight repositories.
• Automates the settings for communicating with Dashboard Application Services Hub.

Procedure
1. Start the Installation Manager in GUI mode by using the following commands as root user:
   cd /opt/IBM/InstallationManager/eclipse
   ./IBMIM
2. Click Install.
   Installation Packages window displays the package that is added to the repository.
3. Select the package to install and click Next.
4. Accept the license agreement and click Next.
5. Select the location of the shared resources directory and click Next.
   The shared resources directory location where the package is copied. By default, it is: /opt/IBM/IBMIMShared.
6. Accept the default location where the Installation Manager extracts the Network Performance Insight bundle for installation by Ambari and click Next.
7. Click Next.
By default, the Network Performance Insight bundle is selected.

8. Enter the path where the downloaded Open Platform with Apache Spark and Apache Hadoop packages and Network Performance Insight are available.
   For example, `<DIST_DIR>`.

9. Enter the Ambari server port number and click **Next**.
   By default, it is 8080.

Configuring Dashboard Application Services Hub SSL integration with Network Performance Insight.

10. Select the **Automate DASH SSL Configuration** check box to accept all the default values.
    The default values are as follows:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connection Detail</strong></td>
<td>Server where Jazz for Service Management must be installed</td>
<td>myserver.ibm.com</td>
</tr>
<tr>
<td><strong>WebSphere AppServer Path</strong></td>
<td>WebSphere Application Server installation path</td>
<td>/opt/IBM/WebSphere/AppServer</td>
</tr>
<tr>
<td><strong>JazzSM Path</strong></td>
<td>Jazz for Service Management installation path</td>
<td>/opt/IBM/JazzSM</td>
</tr>
<tr>
<td><strong>DASH User Name</strong></td>
<td>Dashboard Application Services Hub user name</td>
<td>smadmin</td>
</tr>
<tr>
<td><strong>DASH Password</strong></td>
<td>Dashboard Application Services Hub password</td>
<td>netcool</td>
</tr>
</tbody>
</table>

After you enter the values for the parameters, the following tasks are automated:
- A demo certificate is generated.
- Single sign-on to Dashboard Application Services Hub is configured.
- Dashboard Application Services Hub users and groups are created.
- Users are granted the Roles.

**Note:** Clear the **Automate DASH SSL Configuration** check box and enter different values to generate a custom certificate. You can also configure these settings after the installation is complete.

For more information, see *Configuring Jazz for Service Management after the installation of Network Performance Insight* from *Configuring IBM Network Performance Insight*.

11. Select the **Generate default keystore and certificates** check box to accept all the default values.
    The default values are as follows:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Keystore Password</strong></td>
<td>Accept only alpha-numeric values.</td>
<td>User-defined value. For example, changeit</td>
</tr>
<tr>
<td><strong>Key Password</strong></td>
<td>Accept only alpha-numeric values.</td>
<td>User-defined value. For example, changeit</td>
</tr>
</tbody>
</table>
Table 8. Default settings for keystore (continued)

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alias</td>
<td>Alias is used to generate npi.csr (certificate request) and npi.cer (final certificate). The npi.cer can be imported to security.keystore under this alias.</td>
<td>npi</td>
</tr>
<tr>
<td>Domain Name</td>
<td>Domain name of the server</td>
<td>myserver.ibm.com</td>
</tr>
<tr>
<td>Organization Name</td>
<td>Your organization name</td>
<td>DEMO</td>
</tr>
<tr>
<td>Locality</td>
<td>Your location name with in your organization</td>
<td>DEMO_LOCALITY</td>
</tr>
<tr>
<td>State or Province</td>
<td>Your location state</td>
<td>DEMO_STATE</td>
</tr>
<tr>
<td>Country</td>
<td>Your location country</td>
<td>US</td>
</tr>
</tbody>
</table>

**Note:** The generated files, security.keystore, priv_key.key, and ca.crt are located in /opt/IBM/npi/installer-tools in Ambari server host.

12. Click Next and click Install.
13. Click Finish after the installation completes.

**Related information:**

[IBM Installation Manager V1.8.4 documentation](#)

# Installing Network Performance Insight in silent mode

Use silent installations to deploy software to multiple systems, or to an enterprise. Silent installations are defined by a response file and started from the command line to automate the installation.

**Before you begin**

- Make sure that the response file is defined correctly.
- Make sure that the directory where the response file is available and the response file have write access.

**Procedure**

1. Change to the `<Installation_Manager_Home>/eclipse/tools` directory from command line where `<Installation_Manager_Home>` refers to the installation root directory of IBM Installation Manager. For example, `/opt/IBM/InstallationManager/eclipse/tools`.
2. Run the following command for your platform to silently install the software:
   ```bash
   # ./imcl input <path_response_file> -log <path_log_file> -acceptLicense
   ```
   Where:
   - `<path_response_file>` is the path where response file is available.
   - `<path_log_file>` is the path where the installation log file is created.
   For example:
   ```bash
   ./imcl input <DIST_DIR>/npi_response.xml -log /tmp/install.log -acceptLicense
   ```
   Where `<DIST_DIR>` is the directory where you have the Network Performance Insight repository.
Related concepts:

“Contents of the response file”

The `npi_response.xml` sample file is available in the Network Performance Insight software bundle that contains the settings and preferences to install Network Performance Insight in silent mode.

**Contents of the response file**

The `npi_response.xml` sample file is available in the Network Performance Insight software bundle that contains the settings and preferences to install Network Performance Insight in silent mode.

**Silent installation parameters**

A response file is an XML file that contains information that is required to complete installation operations silently.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>user.packagesArchiveDir</code></td>
<td>Full path to the IOP packages directory, where the following are expected:</td>
<td>Full path to where the Open Platform with Apache Spark and Apache Hadoop packages are available.</td>
</tr>
<tr>
<td></td>
<td><code>ambari-2.2.0.0-beta1.el7.x86_64.tar.gz</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>iop-4.2.0.0-beta1-e17.x86_64.tar.gz</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>iop-utils-4.2.0.0-beta1-e17.x86_64.tar.gz</code></td>
<td></td>
</tr>
<tr>
<td><code>user.repoHost</code></td>
<td>Host name where the installation is running.</td>
<td>The host name of the Ambari server where installation is running. To determine the host name, run the command:</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code># hostname</code></td>
</tr>
<tr>
<td><code>user.ambariPort</code></td>
<td>By default, Ambari port is 8080. You can customize the port number.</td>
<td>8080</td>
</tr>
<tr>
<td><code>user.dashEnableOption</code></td>
<td>• TRUE: Enables <strong>Automate Remote DASH SSL Configuration</strong> option.</td>
<td>TRUE</td>
</tr>
<tr>
<td></td>
<td>• FALSE: Disables <strong>Automate Remote DASH SSL Configuration</strong> option.</td>
<td>FALSE</td>
</tr>
<tr>
<td><code>user.dashConnection</code></td>
<td>User name that is allowed to log in to Jazz for Service Management server by using the SSH passwordless login. <strong>Note</strong>: This field is applicable only if <code>user.dashEnableOption</code> is TRUE.</td>
<td><code>user@host</code></td>
</tr>
<tr>
<td><code>user.dashSshPort</code></td>
<td>The SSH port number used.</td>
<td>Default is 22.</td>
</tr>
<tr>
<td><code>user.wasPath</code></td>
<td>Full path to the WebSphere Application Server on Jazz for Service Management server. <strong>Note</strong>: This field is applicable only if <code>user.dashEnableOption</code> is TRUE.</td>
<td>Full path where the WebSphere Application Server is available. <code>&lt;WAS_Home&gt;</code></td>
</tr>
<tr>
<td><code>user.jazzsmPath</code></td>
<td>Full path to the Jazz for Service Management server. <strong>Note</strong>: This field is applicable only if <code>user.dashEnableOption</code> is TRUE.</td>
<td>Path where the Jazz for Service Management is installed. <code>&lt;JazzSM_Home&gt;</code></td>
</tr>
<tr>
<td><code>user.dashUserName</code></td>
<td>Administrative user name to log in to Jazz for Service Management server. <strong>Note</strong>: This field is applicable only if <code>user.dashEnableOption</code> is TRUE.</td>
<td>Administrative user name</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Recommended value</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>user.dashPassword</td>
<td>Administrative password to log in to Jazz for Service Management server.</td>
<td>Administrative password</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This field is applicable only if user.dashEnableOption is TRUE.</td>
<td></td>
</tr>
<tr>
<td>user.keystoreOption</td>
<td>USE_EXIST_KEY: Use the existing keystore and certificate.</td>
<td>USE_EXIST_KEY</td>
</tr>
<tr>
<td></td>
<td>USE_DEFAULT_KEY: The keystore and certificates are generated by using the</td>
<td>USE_DEFAULT_KEY</td>
</tr>
<tr>
<td></td>
<td>default values.</td>
<td>USE_CUSTOM_KEY</td>
</tr>
<tr>
<td></td>
<td>USE_CUSTOM_KEY: The keystore and certificates are generated by using the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>values that are provided by users.</td>
<td></td>
</tr>
<tr>
<td>user.existKeystoreFilepath</td>
<td>Full path to the existing keystore file.</td>
<td>Full path to existing keystore</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This field is applicable only if user.keystoreOption is USE_EXIST_KEY.</td>
<td></td>
</tr>
<tr>
<td>user.existCaFilepath</td>
<td>Full path to the existing certificate file.</td>
<td>Full path to existing certificate</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This field is applicable only if user.keystoreOption is USE_EXIST_KEY.</td>
<td></td>
</tr>
<tr>
<td>user.keystorePassword</td>
<td>Password for keystore</td>
<td>User-defined value. For example, changeit.</td>
</tr>
<tr>
<td>user.keyPassword</td>
<td>Password for key</td>
<td>User-defined value. For example, changeit</td>
</tr>
<tr>
<td>user.alias</td>
<td>Alias name</td>
<td>npi</td>
</tr>
<tr>
<td>user.domainName</td>
<td>Domain name</td>
<td>Determined from the host</td>
</tr>
<tr>
<td>user.orgName</td>
<td>Organization name</td>
<td>DEMO</td>
</tr>
<tr>
<td>user.locality</td>
<td>Locality</td>
<td>DEMO_LOCALITY</td>
</tr>
<tr>
<td>user.state</td>
<td>State</td>
<td>DEMO_State</td>
</tr>
<tr>
<td>user.country</td>
<td>Country in 2 characters presentation.</td>
<td>Determined from the host</td>
</tr>
<tr>
<td>version</td>
<td>The version can be found in repository.xml file in the bundle.</td>
<td>The version of the offering in 1.2.0.YYYYMMDD_HHmm format.</td>
</tr>
<tr>
<td></td>
<td><strong>Where,</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>YYYY: year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MM: month</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DD: day</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HH: hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mm: minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>For example,</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;offering id='com.ibm.csi.npi.assembly' version='1.2.0.&lt;build_number&gt;'</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 6. Deploying Network Performance Insight clusters

Use the Ambari installation wizard in your browser to complete your installation, configuration, and deployment of Network Performance Insight components and Hadoop components.

**Before you begin**

- Ensure that you have the SSH Private key for root user on Ambari server host.
- Ensure that you have configured the SSH Passwordless login entry to all target hosts.

**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 **Launch Install Wizard** on the Ambari Welcome page.
   The CLUSTER INSTALL WIZARD opens.
3. Enter a name for the cluster you want to create on the Get Started page and click **Next**.
   **Note:** The name cannot contain blank spaces or special characters.
4. Select **BigInsights 4.2 NPI** stack from the Stacks page and click **Next**.
5. Complete the following steps on the Install Options page:
   a. List all of the nodes that are used in the IBM Open Platform with Apache Spark and Apache Hadoop cluster in **Target Hosts**, pane.
      Specify one node per line, as in the following example:
      node1.abc.com
      node2.abc.com
      node3.abc.com
      **Note:** The host name must be the fully qualified domain name (FQDN).
   b. Select **Provide your SSH Private Key to automatically register hosts** and click **SSH Private Key** link on **Host Registration Information** pane.
      If the root user installed the Ambari server, the private key file is `~/root/.ssh/id_rsa`. You can browse to the `.ssh/id_rsa` file and the Ambari web interface uploads the contents of the key file, or you can open the file and copy and paste the contents into the SSH key field.
   c. Click **Register and Confirm**.
6. Verify that the correct hosts for your cluster are located successfully on the Confirm Hosts page.
   If hosts that are selected are incorrect, remove the hosts one-by-one by following these steps:
   a. Click the box next to the server to be removed.
   b. Click **Remove** in the **Action** column.
   **Note:**
- If warnings are found during the check process, click **Click here to see the warnings** to see the warnings. The Host Checks page identifies any issues with the hosts. For example, a host might have Transparent Huge Pages or Firewall issues.
- Ignore the process issues that are not related to Network Performance Insight.

c. After you resolve the issues, click **Rerun Checks** on the Host Checks page. After you have confirmed the hosts, click **Next**.

7. Select the following services:

<table>
<thead>
<tr>
<th>Service</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDFS</td>
<td>2.7.2</td>
<td>Apache Hadoop Distributed File System (HDFS)</td>
</tr>
<tr>
<td>YARN + MapReduce2</td>
<td>2.7.2</td>
<td>Apache Hadoop NextGen MapReduce (YARN)</td>
</tr>
<tr>
<td>ZooKeeper</td>
<td>3.4.6</td>
<td>Centralized service that provides reliable distributed coordination.</td>
</tr>
<tr>
<td>Ambari Metrics</td>
<td>0.1.0</td>
<td>A system for metric collection that provides storage and retrieval capability for metrics that are collected from the cluster.</td>
</tr>
<tr>
<td>Kafka</td>
<td>0.9.0.1</td>
<td>A high-throughput messaging system.</td>
</tr>
<tr>
<td>NPI</td>
<td>1.2.0.0</td>
<td>Network Performance Insight cluster service</td>
</tr>
<tr>
<td>NPI Spark Client Scala 2.11</td>
<td>1.6.0</td>
<td>Apache Spark is an engine for large-scale data processing. The Apache Spark client library is compiled on Scala 2.11 and is specific to Network Performance Insight 1.2.0.</td>
</tr>
</tbody>
</table>

8. Assign the master nodes to hosts in your cluster for the services you selected on the Assign Masters page and click **Next**.

You can accept the current default assignments. To assign a new host to run services, click the list next to the master node in the left column and select a new host.

9. Assign the slave and client components to hosts in your cluster on the Assign Slaves and Clients page. Select all services for assignment.

Click **all** or **none** to decide the host assignments. Or, you can select one or more components next to a selected host.

10. Click **Next**.

11. Update the configuration settings for the following services on **Customize Services** pane. You can see a set of tabs from where you can manage configuration settings for Hadoop and Network Performance Insight components.

**Note:** Default values are completed automatically when available and they are the recommended values.

- “Customizing HDFS settings” on page 35
- “Customizing YARN settings” on page 35
- Configure communication with Jazz for Service Management. See **Configuring communication with Jazz for Service Management** in Configuring IBM Network Performance Insight
- Configure communication with Tivoli Network Manager. See **Configuring communication with Tivoli Network Manager** in Configuring IBM Network Performance Insight

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12. Click Next after you have reviewed your settings, and completed the configuration of the services.

13. Verify that your settings are correct and click Deploy on the Review page.

14. See the progress of the installation on Install, Start, and Test page. The progress bar at the top of the page gives the overall status and the main section of the page gives the status for each host. When you click the task, log for a specific task can be displayed.

15. Click Next after the services are installed successfully.

16. Review the completed tasks on the Summary page and click Complete.

Results

It might take a while for Ambari to start all the services. To see the status of all the services in a host, click the Hosts tab in the Ambari server host and then select a host. You can see the services that are started from the Summary page.

What to do next

- Configure Apache Storm Spout. See Configuring Apache Storm Spout in Network Manager in Configuring IBM Network Performance Insight.

Related concepts:

“Cluster behavior” on page 10
Provides the relevance between Network Performance Insight and its related services with the node behavior in a cluster.

Customizing YARN settings

YARN decouples resource management and scheduling capabilities from the data processing component. The YARN framework uses a ResourceManager service, a NodeManagers service, and an Application master service.

Procedure

1. Click YARN > Settings.

2. Configure the required settings as follows:
   - Ensure that the node memory is 15000 MB or more.
   - Ensure that minimum container memory per container is 1024 MB.
   - Ensure that maximum container memory per container is 15000 MB.
   - Set the number of virtual cores to minimum 32.

Related information:

Customizing HDFS settings

Set properties for the NameNode, Secondary NameNode, DataNodes, and some general and advanced properties. Click the name of the group to expand and collapse the display.

Procedure

Click HDFS > Settings.

Accept all the default values for the following required settings:
**Note:** These values are prepopulated based on your choices on previous pages.

- NameNode and DataNode directories as `/<data1>/hadoop/hdfs/namenode` and `/<data1>/hadoop/hdfs/data`.
  Ensure that the `/<data1>` directory has sufficient or the recommended disk space.
- NameNode Java heap size: 1 GB
- NameNode server threads: 800
- Minimum replicated blocks: 100%
- DataNode failed disk tolerance: 0
- DataNode maximum Java heap size: 1 GB
- DataNode max data transfer threads: 4098

**Related concepts:**

- "Hardware requirements" on page 1
  Hardware specifications vary according to the size of your network and server topology that you want to use.
- "Required information" on page 12
  Collect the following information before you start your installations.
Chapter 7. Postinstallation tasks

Perform these postinstallation tasks after the installation of Network Performance Insight is complete.

Verifying the installation

You can verify the Network Performance Insight 1.2.0 installation status.

Before you begin

Make sure that the flow exporter is configured and sending the flow data to the Collector subsystem.

For more information, see Configuring Flow devices.

Procedure

1. Verify the installation logs that are available at /tmp directory.
   To list all the log files, run the following command:
   
   `ls -lrt /tmp/*.log`

   For more information about log files, see Log files in Network Performance Insight in Troubleshooting IBM Network Performance Insight.

2. Log in to Ambari server as follows:
   Log in with default user name as admin and password as admin.
   `http://<myserver.ibm.com>:8080`

   Related tasks:
   - "Verifying the installation"

   You can verify the Network Performance Insight 1.2.0 installation status.
Creating a new user

Security relies on users and user groups. You define the groups to which the users belong in the application server.

About this task

By default the following

Procedure
1. Log in to Jazz™ for Service Management server.
2. Expand Console Settings > WebSphere Administrative Console.
3. Click Launch WebSphere Administrative Console.
4. On the side pane, Users and Groups > Manage Users.
5. Click Create.
6. Specify the required details.
7. Assign this new user to the required groups.
   a. Click Group Membership.
   b. On the Group Membership page, click Search.
   c. In the Available column, select the following groups and click Add:
      • npiuser
      • npiadministrator
      • ConsoleUser
      • ConsoleAdmin
      • WriteAdmin
      • ReadAdmin
      • manager-gui
      • manager-script
      • manager-jmx
      • manager-status
   d. Click Create.

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 admin 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 all the roles and assign to new user.

   Note: Make sure to select the noi_npi and noi_npi_admin roles to work with Device Dashboard. noi_npi and noi_npi_admin roles are created when the Device Dashboard is installed.
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.

Related information:

[Configuring the Device Dashboard]
Chapter 8. Uninstalling Network Performance Insight

Uninstall Network Performance Insight and the related software from the system.

**Before you begin**

Before you uninstall, back up the following artifacts:

- Manually, back up the `/opt/IBM/NPI/installer_tools` folder in the Ambari Server host to save the previous configuration.
- Back up the following files if you plan to reuse them:
  - `security.keystore`
  - `priv_key.key` - private key
  - `ca.crt` - public key

**About this task**

Uninstall the following components that you installed:

- IBM Open Platform with Apache Hadoop components, including YARN, HDFS, and Zookeeper services
- Ambari agents that contain Network Operations Insight instances
- Ambari server

Unistallation of these components includes the following steps:

**Procedure**

- **Remove the working directories**
- **Uninstall the Ambari agent nodes**
- **Uninstall Ambari server host**

**Related information:**
- Removing Tivoli Netcool/OMNIbus
- Uninstalling Network Manager
- Uninstalling Jazz for Service Management and related software

**Uninstalling Ambari agent nodes**

Run the cleanup script to uninstall the Ambari server hosts.

**Before you begin**

- Back up your data.
- On each Ambari agent node, stop the agent:
  `ambari-agent stop`
- From a terminal window on the Ambari server node, stop the Ambari server:
  `ambari-server stop`
- Decommission all the Ambari components.

For more information, see Deleting masters and slaves hosts in a cluster in Administering IBM Network Performance Insight
• Delete hosts.

Procedure
1. Copy the host_cleanup.sh script from /opt/IBM/NPI/installer-tools/host_cleanup.sh to the Ambari agent nodes that you want to uninstall. For example, /tmp/host_cleanup.sh.
2. Stop all the services.
3. Run the script as root user as follows:
   ```
   cd /tmp
   ./host_cleanup.sh
   ```

The host_cleanup.sh script performs the following functions:
• Checks the user who is running the script is root or not
• Checks for the HostCleanup.ini file
• Stops the Ambari server and the Ambari agent, if they are still running.
• Stops the Linux processes that are started by a list of service users. The users are defined in the HostCleanup.ini file. You can also specify a list of Linux processes to be stopped.
• Removes the PRM packages that are listed in the HostCleanup.ini file.
• Removes the Network Performance Insight packages and working folders.
• Removes the service users that are listed in the HostCleanup.ini file.
• Deletes directories, symbolic links, and files that are listed in the HostCleanup.ini file.
• Deletes repositories that are defined in the HostCleanup.ini file.

Related information:

Cleaning up nodes before reinstalling software

Uninstalling Ambari server host

Use IBM Installation Manager to remove the Ambari server host, which is the master node.

Before you begin
• From a terminal window on the Ambari server node, stop the Ambari server:
  ```
  ambari-server stop
  ```
• Ensure that all the Ambari agent nodes are deleted.

Procedure
1. Start the Installation Manager in GUI mode by using the following commands as root user:
   ```
   cd /opt/IBM/InstallationManager/eclipse
   ./IBMIM
   ```
2. In the main Installation Manager window, click Uninstall.
3. Select the offerings that you want to remove and follow the installation wizard instructions to complete the removal.
   • Ambare Server and all the Network Performance Insight microservices are removed.
Removing working directories

If you installed Network Performance Insight related components in a non-root path, you need to manually remove the related working directories. If your installations are in root path, then the host_cleanup.sh script can remove them.

**About this task**

You need to remove the following directories:

**Procedure**

1. Log in to Ambari server host as follows:
   
   ```
   https://<ambari_server_host>:8080
   ```

2. Click the Services > Configs tab.

3. Note down the following directories:

<table>
<thead>
<tr>
<th>Services</th>
<th>Ambari Component directory</th>
<th>Non-root installation path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kafka</td>
<td>Kafka &gt; Configs &gt; Kafka Broker &gt; log.dirs</td>
<td>&lt;data1&gt;/kafka-logs</td>
</tr>
<tr>
<td>HDFS</td>
<td>HDFS &gt; Configs &gt; Settings &gt; NameNode</td>
<td>&lt;data1&gt;/hadoop/hdfs/namenode</td>
</tr>
<tr>
<td></td>
<td>HDFS &gt; Configs &gt; Settings &gt; DataNode</td>
<td>&lt;data1&gt;/hadoop/hdfs/datanode</td>
</tr>
<tr>
<td>YARN</td>
<td>YARN &gt; Configs &gt; Advanced &gt; Application Timeline Server &gt; yarn.timeline-service.leveldb-timeline-store.path</td>
<td>&lt;data1&gt;/var/log/hadoop-yarn/timeline</td>
</tr>
<tr>
<td>Ambari Metrics</td>
<td>Ambari Metrics &gt; Configs &gt; Advanced ams-hbase-site &gt; hbase.rootdir</td>
<td>file://&lt;data1&gt;/var/lib/ambari-metrics-collector/hbase</td>
</tr>
<tr>
<td>ZooKeeper</td>
<td>ZooKeeper &gt; Configs &gt; ZooKeeper &gt; ZooKeeper directory</td>
<td>&lt;data1&gt;/hadoop/zookeeper</td>
</tr>
</tbody>
</table>

4. Go to the specific installation directories and remove them.
Chapter 9. Troubleshooting installation

Problems that might occur during an installation and how to resolve them.

About this task

For all troubleshooting issues in installation of Network Performance Insight, see Troubleshooting Network Performance Insight.
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