

IBM Netcool Operations Insight Version 1.4 Deployment Guide

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International Technical Support Organization

IBM Netcool Operations Insight Version 1.4 Deployment Guide

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Note: Before using this information and the product it supports, read the information in "Notices" on page v.

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This edition applies to IBM Netcool Operations Insight Version 1.4.

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Preface

IBM® Netcool® Operations Insight integrates infrastructure and operations management into a single coherent structure across business applications, virtualized servers, network devices and protocols, internet protocols, and security and storage devices. This IBM Redbooks® publication will help you install, tailor, and configure Netcool Operations Insight Version 1.4.

Netcool Operations Insight consists of several products and components that can be installed on many servers in many combinations. You must make many decisions, both critical and personal preference. The purpose of this document is to accelerate the initial deployment of Netcool Operations Insight by making preferred practice choices.

The target audience of this book is Netcool Operations Insight deployment specialists.

Authors

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Fernando de Andrade Cavalcanti is an IBM IT Specialist Expert/L2 who has been certified since 2010. He is also certified at the IBM IT Architect Foundation Level. Fernando has 17 years of experience in IT. He joined IBM in 2007 (from the acquisition of Vallent) and worked mainly with the IBM Tivoli® portfolio. He worked as the subject matter expert (SME) and IT Architect who was responsible for the Netcool environments of large GTS Strategic Outsourcing accounts. He is responsible for designing architectures for Netcool infrastructures, migrating from Tivoli Enterprise Console to Netcool, integrating new event sources, developing automation, managing the health of Netcool complex environments, and maintaining the lifecycle of Netcool products.





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Steven Shuman started as an electrical and acoustics engineer. He now works to solve network configuration management issues at companies around the globe as an IBM Netcool Configuration Manager Architect, as part of IBM Systems/Middleware Group. He has over 20 years of software, IT, and networking experience with deep expertise in network device operations and configuration. Steve has been associated with the Netcool Configuration Manager product and its clients from the beginning of Netcool Configuration Manager.

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1

Introduction to IBM Netcool Operations Insight deployment

IBM Netcool Operations Insight (Netcool Operations Insight) is a bundle of products that is based on the IBM Netcool suite. All of these products need to be configured to exchange data among them. This book begins with a brief description of the Netcool Operations Insight components to better clarify the available features and capabilities. Then, we describe the architecture and the environment that will be used in this book, including the relationships and connections between the Netcool Operations Insight components. You can reference the contents of this chapter while you execute the actual deployment in your environment.

This chapter has the following sections:

- 1.1, "Netcool Operations Insight at a glance" on page 2
- 1.2, "Netcool Operations Insight in an IT Service Management context" on page 4
- 1.3, "Netcool Operations Insight Dashboard Application Services Hub" on page 5
- ▶ 1.4, "Architecture" on page 16

1.1 Netcool Operations Insight at a glance

IBM Netcool Operations Insight uses real-time alarm and alert analytics, which are combined with broader historic data analytics. Netcool Operations Insight is powered by the fault management capabilities of IBM Tivoli Netcool/OMNIbus and IBM leading big data technologies within IBM Operations Analytics - Log Analysis, providing powerful event search and historical analysis in a single solution.

Netcool Operations Insight consists of a base solution for managing and analyzing application monitoring environments and also an optional extension that is called *Networks for Operations Insight*. This optional extension widens the scope to include network discovery, visualization, event correlation, topology-based root-cause analysis, and configuration and compliance management. The Networks for Operations Insight capability is provided through the Network Manager and Netcool Configuration Manager products.

In addition, you can also set up IBM Network Performance Insight as part of your Netcool Operations Insight solution to monitor network traffic performance, and you can integrate with further solutions, such as IBM Alert Notification and IBM Runbook Automation.

Netcool Operations Insight integrates infrastructure and operations management into a single coherent structure across business applications, virtualized servers, network devices and protocols, internet protocols, and security and storage devices.

Netcool Operations Insight includes the following capabilities.

1.1.1 Event search

Event search applies the search and analysis capabilities of Operations Analytics - Log Analysis to events that are monitored and managed by Tivoli Netcool/OMNIbus. Events are transferred from the ObjectServer through the Gateway for Message Bus to Operations Analytics - Log Analysis, where they are ingested into a data source and indexed for searching. After the events are indexed, you can search every occurrence of real-time and historical events.

The Tivoli Netcool/OMNIbus Insight Pack is installed in Operations Analytics - Log Analysis and provides custom apps that search the events based on various criteria. The custom apps can generate dashboards that present event information to show how your monitoring environment is performing over time. With keyword searches and dynamic drill-down functions, you can go deeper into the event data for detailed information. The apps can be run from the Operations Analytics - Log Analysis.

Tooling can be installed into the Web GUI that launches the apps from the right-click menus of the Event Viewer and the Active Event List. An "event reduction wizard" is also supplied that includes information and apps that can help you analyze and reduce volumes of events and minimize the "noise" in your monitored environment.

1.1.2 Event Analytics

Event Analytics performs statistical analysis of Tivoli Netcool/OMNIbus historical event data. It can identify seasonal patterns, such as when, and how frequently events occur. Seasonality analyses are output in reports and graphs so that you can easily find seasonal patterns. For example, an event that periodically occurs at an unscheduled specific time is highlighted. You can use the information from the seasonality reports to create network, device, or suppression rules to reduce the number of events.

Event Analytics can determine the events that have a statistical tendency to occur together and output the results on a scheduled basis as *event groups*. You can deploy valid event groups as Netcool/Impact *correlation rules*. The rules act on the event data and show a single parent event from the event group, with all other events in the group as children. Event groups reduce the number of events that are presented to operators.

Event Analytics is installed as two separate packages. One package is installed in Netcool/Impact, and the other package is installed in the Netcool/OMNIbus Web GUI. Both packages are required for Event Analytics to work.

1.1.3 Networks for Operations Insight

Networks for Operations Insight is an optional feature that can be added to a deployment of the base Netcool Operations Insight solution to provide service assurance in dynamic network infrastructures. The capabilities of Networks for Operations Insight include network discovery, visualization, event correlation and root-cause analysis, and configuration and compliance management. It contributes to overall operational insight into application and network performance management. The Networks for Operations Insight capability is provided through the Network Manager and Netcool Configuration Manager products.

1.1.4 Topology search

The *topology search* capability is an extension of the Networks for Operations Insight feature. It applies the search and analysis capabilities of Operations Analytics - Log Analysis to give insight into network performance. Events that were enriched with network data are analyzed by the Network Manager Insight Pack and are used to calculate the lowest-cost routes between two endpoints on the network topology over time. The events that occurred along the routes over the specified time period are identified and shown by severity. The topology search requires the Networks for Operations Insight feature to be installed and configured.

1.1.5 IBM Connections integration

IBM Connections is a leading social software platform that can help your organization to engage the right people, accelerate innovation, and deliver results. Netcool/Impact enables social collaboration through IBM Connections by automatically providing updates to key stakeholders. It provides integration to IBM Connections by using a Netcool/Impact *IBMConnections* action function. Users can use the IBMConnections action function to query forums and topics lists, create a new forum, create a new topic, and update existing topics.

This integrated, security-rich platform helps people engage with networks of experts in the context of critical business processes. Now, everyone can act with confidence and anticipate and respond to emerging opportunities.

1.1.6 Network performance monitoring

Network Performance Insight is a flow-based network traffic performance monitoring system. It provides comprehensive and scalable visibility of network traffic with visualization and reporting of network performance data for complex, multivendor, and multitechnology networks.

1.1.7 IBM Alert Notification

IBM Alert Notification provides instant notification of alerts for any critical IT issues across multiple monitoring tools. It gives IT staff instant notification of alerts for any issues in your IT operations environment.

1.1.8 IBM Runbook Automation

IBM Runbook Automation empowers IT operations teams to be more efficient and effective. Operators can focus their attention where it is needed and receive guidance to the best resolution with recommended actions and pre-filled context. With Runbook Automation, you can perform these tasks:

- Investigate and delegate problems faster and more efficiently.
- Diagnose and fix problems faster and build operational knowledge.
- Create, publish, and manage runbooks and automations easily.
- ► Track achievements and identify opportunities for improvement.

1.2 Netcool Operations Insight in an IT Service Management context

Netcool Operations Insight provides end-to-end insight for smarter business decisions. It simplifies operations and reduces the cost of operations. Netcool Operations Insight provides services management personnel with improved visibility with the introduction of Network Health Dashboard, Network discovery, visualization, monitoring and event correlation, and root-cause analysis, which drives down the meantime to repair.

Netcool Operations Insight gives IT Service Management personnel agile operations by providing the following functions (Figure 1-1 on page 5):

- Consolidated management:
 - Use off-the-shelf integrations for rapid deployment
 - Correlate, enrich, and consolidate events into a single view
 - Scale from the smallest to the largest environments
- ► Analytics:
 - Gain data-driven actionable insight from high-volume operations data
 - Identify frequent events
 - Recognize patterns
 - Recommend grouping and suppression
- Automation:
 - Streamline operations
 - Eliminate manual steps by automating actions
 - Automate routing processes
 - Take immediate action
- Built-in expertise:
 - Take advantage of decades of IBM experience across thousands of clients
 - Reduce actionable events as a default



Figure 1-1 shows Netcool Operations Insight in an IT Service Management context.

Figure 1-1 Netcool Operations Insight in an IT Service Management context

1.3 Netcool Operations Insight Dashboard Application Services Hub

Netcool Operations Insight combines Netcool OMNIbus and Netcool Impact with the power of analytics and modern mobile dashboards to increase the effectiveness, efficiency, and reliability of operations management while it simplifies or removes administrative tasks, radically improving time to value and total cost of ownership (TCO).

IBM Dashboard Application Services Hub (DASH) service is a common web portal for IBM Netcool suite. When you log in to the DASH, you will get access to the Content Page, OMNIbus Web GUI, Network Manager topology views, discovery configuration, and other integrations.

Through the navigation bar, you can access navigation tools, such as the Search, Favorites, and Product pages. See Figure 1-2. Product pages provide access to DASH pages for each integrated product.



Figure 1-2 DASH navigation bar

Follow these steps to explore the options:

1. Click any folder to navigate to its content pages. (A *folder* is a logical grouping for related pages, and you can assign any icon to it.) Click the **Samples** folder icon to see its contents (Figure 1-3).



Figure 1-3 Samples folder



2. Open the eDayTrader Dashboard Sample application to see a page with an example dashboard. Figure 1-4 shows an example dashboard.

Figure 1-4 Example dashboard

3. Click the **Administration** folder, as shown in Figure 1-5. It contains the Netcool OMNIbus Web GUI and Network Manager administration GUI. Use it to create OMNIbus filters, views, tool, menus, and Network Manager polling policies.

Q	Administration
\star	Event Management Tools
	Filters
.0.	Views
	Relationships
\bigcirc	Tool Configuration
	Tool Prompt Configuration
A	Menu Configuration
æ	Metrics
	CGI Registry
hin *	Maps
24	Map Creation
<u></u>	Map Resources
	Data Sources
*	Event Database Query
	Network
	Database Access Configuration
	Network Polling
	Management Database Access

Figure 1-5 Administration folder

4. Click the **Discovery** folder, as shown in Figure 1-6, to open the Network Discovery Configuration page and the Network Discovery Status page. The pages are the same pages that were in Tivoli Integrated Portal.



Figure 1-6 Network Discovery configuration and status pages

Enhancements were added in V1.4, such as the discovery of Cisco WiFi Access Point (Figure 1-7), which performs modeling for layer 2/3, subsystem identifier (SSID), 802.11 spec, channels, and dependencies on Dynamic Host Configuration Protocol (DHCP).



Figure 1-7 Cisco WiFi discovery

5. Click the **Incident** folder, as shown in Figure 1-8, to open OMNIbus Web GUI views and Network views. You can navigate through the Event Dashboard, Event List, and Active Event List (AEL), and work with OMNIbus events. You can navigate through the Network views, Hop view, Health view, Fault-Finding view, Simple Network Management Protocol (SNMP) Management Information Base (MIB) Browser view, and real-time graphing.



Figure 1-8 Events and Network Availability views

- 6. Pay attention to the new feature in this release, which is the Network Health Dashboard. The Network Health Dashboard answers these questions at a glance (Figure 1-9):
 - What devices or interfaces were down longer than 1 hour or 24 hours?
 - How is the availability level trending over the last 24 hours?
 - What are the worst performers?
 - Did any configuration changes coincide with this incident?
 - What events are active?

work Health Da	ashboard ×										1
twork Views	s - Default Bo	kmark	Non Available Resources	54	Top Performers						
w		ax Unique			Metric SnmpLinkStatus		Order Admin	nDown +		Mit Show Ch	art 🖽 Show
O NCOMS		a 46	Snmp Poll Fail 1 6								
• Alert vie	riewis	46	Link State 5		172 20 247 1/ BR1/0 1						
O * All Rout	uters	13	Interface Ping		170.00 4 61 0 1 46 1 1						
O'Al Swit	tches	28	Device Ping		1/2.20.1.0[0[10]]						
O * Custom	n View	0 0			172.20.1.6[0[15]]						
Oevice	Classes	3 46	No Response		172.20.1.6[Se0/1/1:						
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Figure 1-9 Network Health Dashboard

7. Use the Unavailable Resources and Percentage Availability widgets to understand your network availability status in real time. This display gives you information about SNMP polling failures and your ability to ping a device. It provides information about the interface link state and your ability to ping the interface. You use the Network Views bookmark to segment your network, for example, if you want to see only router availability, click the All Routers bookmark. See Figure 1-10.

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Figure 1-10 Resource availability

8. In the All Routers health dashboard (Figure 1-11), you can view your network configuration timeline of changes. Moreover, you can drill down into the configuration history to see device listings and the details about changes that were made. If a change in your configuration caused an error in your network, you can trace it.



Figure 1-11 Network Configuration Manager configuration changes over time

- 9. Click the Insights folder (Figure 1-12) to open the analytics pages:
 - Seasonal Events
 - Related Events

Both pages are empty after installation and require configuration. Statistical analysis of Tivoli Netcool/OMNIbus historical event data is shown here. Insights can identify seasonal patterns, such as when and how frequently events occur.



Figure 1-12 Netcool Operations Insight Analytics

Seasonality analyses are output in reports and graphs so that you can discover recurring event patterns. See Figure 1-13.



Figure 1-13 Seasonality analysis in Netcool Operations Insight

10. Click the **Reporting** folder icon (Figure 1-14) to navigate through tens of predefined reports that are installed and ship with the Netcool Operations Insight components. Reports are built on top of the IBM Tivoli Common Reporting engine. You get OMNIbus historical reports as part of the OMNIbus installation, which is used by the analytics engine. Approximately 55 reports for Tivoli Network Manager are available if you install the product. For Tivoli Netcool Configuration Manager, approximately 15 reports about compliance and security are available. Moreover, a customized report is available by using the Report Studio tool.



Figure 1-14 Reporting link

11.See Figure 1-15 for the installed package reports.

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		Name 🖗				
	-	Common Reporting				
	=	ITNCM Reports				
	-	Netcool_OMNIbus				
	-	Network Manager				

Figure 1-15 Preformatted reporting

12. Click the **Configurations** folder icon to open the IBM Tivoli Netcool Configuration Manager (ITNCM) base and compliance GUI. See Figure 1-16. You still get the JNLP application when you click one of the applications.



Figure 1-16 Netcool Configuration Manager client launch

13. Click the **Console Integrations** icon to open any integrated product. Based on your installation, only Netcool Impact might be installed, or Netcool Impact and Network Performance Insight (NPI) might be installed. See Figure 1-17.

Console	Integrations	
Network Perf	ormance Insight	Console Integrations
System Co	nfiguration	Impact
Domain N	ames	Home
Interfaces		Impact
Retention	Profiles	
Threshold	S	1

Figure 1-17 Console Integrations

14. Click **Impact** to open the Netcool Impact GUI. See Figure 1-18. *Impact* is a core component for Netcool Operations Insight. All enhancements and event analytics depend on it.

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CommandLineManager							
DatabaseEventListener	8						
DefaultEmailReader	3						
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GefaultPolicyActivator	2						
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EmailSender	8						
LeventProcessor							
HibernatingPolicyActivator							
ITNMEventListener	8						
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Figure 1-18 Impact GUI

Looking for more information?

For more information about Netcool Operations Insight, see the following Redbooks publications, which include actual product scenarios and use cases:

- Improving Operations Effectiveness and Efficiency with IBM Netcool Operations Insight: A Scenarios Guide, SG24-8352
- Delivering Consistency and Automation with Operational Runbooks, REDP-5347

1.4 Architecture

This section shows the high-level architecture of the environment that was used in this book. It also includes other details, such as the necessary IBM DB2® instances and the relationships and connections among the Netcool Operations Insight components.

1.4.1 High-level architecture

Figure 1-19 on page 17 shows the high-level architecture that was used to deploy a multiple tiered Netcool Operations Insight environment with high availability (HA). The following Netcool Operations Insight components are depicted in this diagram:

- IBM Tivoli Netcool/OMNIbus (OMNI)
- ► IBM Jazz[™] for Service Management (JazzSM)
- IBM DB2
- IBM Tivoli Netcool Impact (NCI)
- ► IBM Tivoli Network Manager (NM)
- IBM Tivoli Netcool Configuration Manager (NCM)
- IBM Operations Analytics Log Analysis (IOALA)



Figure 1-19 shows a high-level view of the architecture.

Figure 1-19 High-level architecture

Legend for Figure 1-19:

- Red arrows are gateways.
- Dashed lines are user interface connections.
- Gray boxes are servers.
- Dotted red boxes are virtual server pairs.

In Figure 1-19, JazzSM is deployed for HA. It collects data from the following sources:

- Network Manager servers
- Netcool Configuration Manager
- Netcool Impact
- ► DB2
- IBM Operations Analytics Log Analysis
- Netcool/OMNIbus

1.4.2 Database and connections that were used in the environment

Figure 1-20 shows the Netcool Operations Insight environment from a database perspective. It shows the relationships of each Netcool Operations Insight component and the DB2 instance that they connect to.



Figure 1-20 Database connections in Netcool Operations Insight

1.4.3 Ports that are used

Table 1-1 shows the main ports that are needed during the Netcool Operations Insight deployment.

Netcool Operations Insight component	Port used
Omnibus - Aggregation Layer (AGG)	4100
Omnibus - Collection Layer	4101
Omnibus - Display Layer	4102
JazzSM	16310 - 16316
Impact	16311
Log Analysis	9987
Network Manager	7968

Table 1-1 Main ports that are used for Netcool Operations Insight

Note: The Network Configuration Manager ports are not included in Table 1-1 because Network Configuration Manager was not part of the basic deployment that we performed in this book. The ports for Network Configuration Manager will be mentioned in 2.8, "IBM Netcool Configuration Manager" on page 175.



Figure 1-21 show a diagram from the perspective of the ports. It shows the ports that were used in our environment for the connections among all of the Netcool Operations Insight components.

Figure 1-21 Ports that are used to connect the Netcool Operations Insight components

In addition to these environment-specific ports, each product also uses other ports. A full list of ports that are used for each product is available in the IBM Knowledge Center documentation for each product:

https://ibm.biz/BdrFcE

For instance, Figure 1-22 shows a full list of the ports that are used for the Netcool Impact deployment.

Data source	Default port number
DB2 data source	50000
Derby data source	1527. The default Derby replication port is 4851.
Generic SQL data source	5432
HSQLDB data source	9001
Informix data source	1526
MS_SQL Server data source	1433
MYSQL data source	3306
Object Server data source	4100
Oracle data source	1521
PostGreSQL data source	5432
Sybase data source	5000
UI data provider data source	16310
LDAP data source	The default value is set to a common port number: 389.

Figure 1-22 Full list of ports for Netcool Impact

Another example, which is shown in Figure 1-23, shows a full list of ports that are used for Network Manager.

Port	Protocol	Description
22	SSH over TCP/IP	If SSH support is enabled, the Telnet Helper uses this port to communicate with network devices.
23	Telnet over TCP/IP	If SSH support is not enabled, the Telnet Helper uses this port to communicate with network devices.
161	SNMP	Port 161 is the default port on network devices to which SNMP queries are sent during the discovery and monitoring processes.
162	UDP	Default trap port. Used by the Trap polling agent. If more than one application/process needs access to this port, ncp_trapmux, the SNMP trap multiplexer, can be used to forward traps. The SNMP trap multiplexer, the Trap discovery agent, and the Trap polling agent can all be configured to use a different port.
1883	Message Queuing Telemetry Transport (MQTT)	Default port used by Really Small Message Broker for inter-process communication.
4100	TCP/IP	Default ObjectServer port. This must be entered at install time. Defined in interfaces. Arch on the ObjectServer workstation. This port is used by the ncp_g_event process to communicate with the ObjectServer.
7968	TCP/IP	Default port for access to the Network Manager server from Dashboard Application Services Hub. This is used by the Discovery Configuration GUI and it is defined in the ServiceData.cfg configuration file. If you want to change this port, edit the ServiceData.cfg configuration file and restart the ncp_model process and the ncp_config process using CTRL.
16310	HTTP	Default port for the Dashboard Application Services Hub. The Dashboard Application Services Hub allocates the next thirteen ports up from the port specified for the Dashboard Application Services Hub during the installation for its own use. By default, this port redirects to 16316.
16311	HTTPS	Default secure port for the Dashboard Application Services Hub.
33000	TCP/IP	By default, the multicast IP address 225.13.13.13 and port 33000 are used to enable the discovery helpers and discovery agents to locate the Helper server. This multicast address is specified in the file <code>\$NCHOME/etc/precision/ServiceData.cfg</code> .
		Once a process has located the Helper server, a TCP connection is established on a port assigned by the operating system.
50000	TCP/IP	Default DB2® database port.

Figure 1-23 Full list of ports that are used for Network Manager deployment

1.4.4 Usernames and passwords that are used for each component

The usernames and passwords that are used in our deployment for each component of Netcool Operations Insights are listed.

Operating system users and groups

Table 1-2 lists the operating system users.

Username	Password	Where used
root	r00to1	Secure Shell (SSH) login
netcool	object00	Installation of products
db2inst1	object00	DB2
db2fenc1	object00	DB2
dasusr1	object00	DB2
ncim	object00	IBM Tivoli Network Manager DB2 user

Table 1-2 Users

Table 1-3 lists the operating system groups that we used.

Table 1-3 Groups

GroupName	Where used	
ncoadmin	omnibus nco_pa	

Jazz users (file-based repository)

Table 1-4 lists the Jazz users.

Table 1-4 Jazz users

Username	Password	Where used
smadmin	object00	JazzSM administration

LDAP users (Active Directory)

Table 1-5 lists the Lightweight Directory Access Protocol (LDAP) users.

Table 1-5 LDAP users

Username	Password	Where used
smadmin2	netcool	Jazz
ncoadmin	netcool	Omnibus
impactadmin	netcool	Impact
unityadmin	netcool	Log Analysis

Important: Do not create smadmin in the LDAP server because Jazz requires that the username variables are unique across all repositories. The smadmin username is a fixed internal "FileBased" variable.

Netcool Omnibus

Table 1-6 lists the Netcool Omnibus users.

Table 1-6 Netcool Omnibus

Username	Password	Where used
impactconnect	netcool	Impact connections
itnmconnect	netcool	Network Manager connections
jazzconnect	netcool	Jazz and Web GUI
2

IBM Netcool Operations Insight installation and basic configuration

This chapter describes the installation and the basic configuration of the following IBM Netcool Operations Insight components:

- ▶ 2.1, "Installation Manager" on page 24
- 2.2, "IBM DB2" on page 27
- 2.3, "IBM Tivoli Netcool/OMNIbus" on page 41
- ► 2.4, "IBM Tivoli Netcool Impact" on page 77
- ▶ 2.5, "IBM Tivoli Network Manager" on page 95
- ► 2.6, "IBM Jazz for Service Management (JazzSM)" on page 116
- ▶ 2.7, "IBM Operations Analytics Log Analysis" on page 147
- ▶ 2.8, "IBM Netcool Configuration Manager" on page 175

2.1 Installation Manager

This section describes the installation and basic configuration of IBM Installation Manager (Installation Manager).

2.1.1 Introduction

This section covers the *basic* installation of Installation Manager only. Installation Manager is required to be installed in all servers that are used in the environment of this book. As a preferred practice, follow the standard settings in Table 2-1 for the remainder of this book when you install Installation Manager in each server.

Table 2-1 Installation Manager settings

Setting	Value
Installation Manager Installation directory	/opt/IBM/netcool/IM/InstallationManager/eclipse
Installation Manager Data directory	/opt/IBM/netcool/IM/IBMIMData
Installation Manager Shared Data directory	/opt/IBM/netcool/IM/IBMIMShared

Note: Installation Manager replaces the Deployment Engine (DE) that was used to install the previous versions of the Netcool products.

2.1.2 Check the prerequisites

No prerequisites exist for Installation Manager.

2.1.3 Installation and basic configuration

The installation packages of the products include Installation Manager. If needed, you can download the *latest* version of IBM Installation Manager from IBM Fix Central and search for IBM Installation Manager:

http://www.ibm.com/support/fixcentral/

We will install the Installation Manager by using the **groupinst** command. Other options are described in the following link if you need further information:

https://ibm.biz/Bdrr5e

Preparing the environment

Example 2-1 shows the commands to prepare the environment for the Installation Manager installation. You can reuse them in all of the servers of the environment where a Netcool Operations Insight component will be installed.

Example 2-1 Preparing the environment for the Installation Manager installation

```
# As root user:
#-----
# Assuming netcool user has not been created yet:
groupadd ncoadmin
useradd -c "Netcool User" -g ncoadmin netcool
```

```
passwd netcool
# in our case 'object00' for the netcool user
```

```
mkdir -p /opt/IBM/netcool
```

cd /opt chown -R netcool:ncoadmin IBM

As netcool user:
----cd /opt/IBM/netcool

mkdir IM cd IM mkdir -p InstallationManager/eclipse mkdir IBMIMData mkdir IBMIMShared

cd /opt/IBM/netcool mkdir core NcKL

Assuming the installation file of IM was downloaded to /mnt/ITSO_SHARE/IM
cd /mnt/ITSO_SHARE/IM
unzip agent.installer.linux.gtk.x86_64_1.8.4001.20160217_1716.zip

Running the installer

Example 2-2 shows the command to install the Installation Manager in one step by using the console mode and setting up the preferred practice directories.

Example 2-2 Installing Installation Manager

```
cd /mnt/ITSO_SHARE/IM
./groupinstc -dL /opt/IBM/netcool/IM/IBMIMData -acceptLicense
-installationDirectory /opt/IBM/netcool/IM/InstallationManager/eclipse
Installed com.ibm.cic.agent_1.8.4001.20160217_1716 to the
/opt/IBM/netcool/IM/InstallationManager/eclipse directory.
```

When you run Installation Manager in *group* mode as we did in Example 2-2, you might see the following error when you start Installation Manager, "Locking is not possible in the directory when running in group mode." This error is a known error, and it is described in the following technote:

https://ibm.biz/BdrD7R

Example 2-3 shows the commands that must be executed to avoid the issue that is described in the previous URL.

Note: The issue that is described in the URL was seen in Installation Manager 1.8.4. It is possible that you will not experience the same issue in recent versions of Installation Manager.

Example 2-3 Changing file permissions after the Installation Manager installation

As root:

```
chmod 777
/opt/IBM/netcool/IM/InstallationManager/eclipse/configuration/org.eclipse.osgi/.ma
nager/.fileTableLock
chmod 777
```

/opt/IBM/netcool/IM/InstallationManager/eclipse/configuration/org.eclipse.core.run time/.manager/.fileTableLock chmod 777 /opt/IBM/netcool/IM/InstallationManager/eclipse/configuration/org.eclipse.equinox. app/.manager/.fileTableLock

chmod -R g+rwx /opt/IBM/netcool/IM/InstallationManager/eclipse/configuration
chgrp -R ncoadmin /opt/IBM/netcool/IM/InstallationManager/eclipse/configuration

2.1.4 Verification

To verify the Installation Manager installation, you can try to register repositories in Installation Manager.

Registering the repositories in Installation Manager on each server

We assume that Network File System (NFS) is mounted in the central repository directory on each server, the next step is to launch Installation Manager and register the repositories.

Important: Installation Manager supports several installation modes, such as GUI, Console, Silent, and HTTP. However, not all products support all modes. So, we assume that you have X/vnc setup, or equivalent, and will use the GUI mode.

Follow these steps:

1. Start the Installation Manager GUI by running this command:

/opt/IBM/netcool/IM/InstallationManager/eclipse/IBMIM

- 2. Select File \rightarrow Preferences \rightarrow Repositories.
- Click Add Repository to browse for the repository. If the repositories are on the disk or DVD, click Browse to locate the repository.config file or the diskTag.inf file inside the repository that you want to add.

Tip: If the top-level directory contains both the repository.config file and the **groupinst** command, this directory is the Installation Manager installation media. Look for a subdirectory that contains the actual repository.

Figure 2-1 shows an example of a repository that is added to the Installation Manager repositories.

			IBM Installation Manager			- 🗉 🗙
<u>F</u> ile <u>H</u> e			Preferences			
IBM I	type filter text		Repositories			
	Repositories		Repositories:			
	Appearance		Location	Connection	Add Repository	
	Files for Rollback				Edit Papasitary	
	🕀 Help		Add Repository			
Minesee.	🗄 Internet	Add	a repository	P	Remove Repository	
	Passport Advanta	Spe	cify a repository and add to the repository preference list.		Move Up	
	Secure Storage	Repo	sitory:		Move Down	
	Updates	/mnt	/	Browse	Clear Credentials	
					Test Connections	
8						
			Cancel	ОК	(including the	
	l	_			J	
			Search service repositories during installation and updates			
				Restore Defa	ults Apply	

Figure 2-1 Adding a repository in Installation Manager

- 4. If the repository is available through HTTP, type the URL.
- For IBM Passport Advantage[®], select File → Preferences → Passport Advantage. You will need your IBM ID and password.
- 6. Click **OK** to verify access to the repository. Also, you can click **Test Connections** to check all added repositories.

2.2 IBM DB2

This section describes the installation and basic configuration of IBM DB2 Version 10.5.03.

Note: In this example, we use the DB2 package, DB2_Svr_10.5.0.3_Linux_x86-64.tar.gz, which corresponds to the part number CRYY2ML. To download IBM Netcool Operations Insight V1.4, see this website:

https://ibm.biz/BdrD7y

2.2.1 Introduction

This environment uses two servers for DB2 for high availability (HA). We describe both the installation and initial setup of DB2 for use in this environment.

For this deployment, we used the settings in Table 2-2.

Table 2-2 Settings for the DB2 installation

Setting	Value
DB2 installation directory	/opt/ibm/db2/v10.5_03
DB2 Admin User/password	dasusr1/object00
DB2 User/password	db2inst1/object00
DB2 Fenced User/password	db2fenc1/object00

2.2.2 Check the prerequisites

For this version, the name of the prerequisite check script for DB2 is called **db2prereqcheck**. In our environment, this script is in the /mnt/ITS0_SHARE/DB2 directory. The script will check for all of the packages that are needed for DB2. Example 2-4 shows how we ran the script.

Important: The script must be run as the root user. The DB2 prerequisites tool is in the DB2 installation image.

Example 2-4 db2prereqcheck script

```
# su - root
Password:
[root@DBServ-a server2]# cd /mnt/ITS0_SHARE/DB2
[root@DBServ-a server2]# ls
db2 db2checkCOL.tar.gz db2_deinstall db2ls
db2setup ibm_im nlpack
db2checkCOL_readme.txt db2ckupgrade db2_install db2prereqcheck doc
installFixPack
[root@DBServ-a server2]# ./db2prereqcheck
```

Example 2-5 shows the output of this script.

Example 2-5 db2prereqcheck output

```
Checking DB2 prerequisites for DB2 database version "10.5.0.3" on operating system "Linux"
```

```
Validating "openibd" ...
DBT3564E The db2prereqcheck utility was unable to find the package "openibd" on
host "DBServ-a".
ERROR : Requirement not matched.
for some of the few errors as an example:
Install pam.i686 and this will clear a lot of the errors
As for this error:
Validating "openibd" ...
DBT3564E The db2prereqcheck utility was unable to find the package "openibd" on
host "DBServ-a". ERROR : Requirement not matched
```

Ignore it, since this is for Purescale and it is not needed for DB2 installation. Then, run db2 install.

Tip: In the last line of Example 2-5 on page 28, the **db2prereqcheck** output states "Then, run db2 install." However, we install DB2 by using **db2setup**, not **db2_install**.

A few required files are missing. DB2 requires the dapl sg3_utils, sg_persist libstdc++, rdma.noarch pam.i686, and glibc-utils.x86 files. You can install these files by using the yum install command in Linux.

You need to set the **ulimit** on the operating system as shown in Example 2-6 and in Example 2-7.

Example 2-6 Setting the ulimit

ulimit -n 4096

Configuring Linux

You need to disable SELINUX in the /etc/selinux/config file, as shown in Example 2-7.

Example 2-7 Disable SELINUX

vi /etc/selinux/config
SELINUX=disabled

Increase the number of open files (Example 2-8).

Example 2-8 Increasing the nofile

vi /etc/security/limits.conf						
netcool	hard	nofile	1048576			
netcool	soft	nofile	1048576			
@ncoadmin	hard	nofile	1048576			
@ncoadmin	soft	nofile	1048576			

Increase the number of processes (Example 2-9).

Example 2-9 Increasing nproc

/i /etc/	/security	/limits.d	/90-nproc.conf
*	soft	nproc	1048576
root	soft	nproc	unlimited

Note: Depending on the type of Linux that you use, the nproc configuration can also be in /etc/security/limits.conf.

2.2.3 Installation and basic configuration

Perform the following steps as the root user to install DB2:

1. To start the installation, type db2setup from /mnt/ITS0_SHARE/db2/server.

Example 2-10 shows the output of this command.

Example 2-10 db2setup command output

```
[root@DBServ-a db2]# cd server/
[root@DBServ-a server]# ls
db2 db2checkCOL.tar.gz db2_deinstall db2ls
db2setup installFixPack
db2checkCOL_readme.txt db2ckupgrade db2_install db2prereqcheck ibm_im
nlpack
[root@DBServ-a server]# ./db2setup
DBI1190I db2setup is preparing the DB2 Setup wizard which will guide
you through the program setup process. Please wait.
```

2. As shown in Figure 2-2, click I accept the terms in the license agreement. Click Next.

DB2 Setup - DB2 Server Edition				
Software License Agreement				
Please read the following license agreement carefully.				
IMPORTANT: READ CAREFULLY				
Two license agreements are presented below.				
1. IBM International License Agreement for Evaluation of Programs 2. IBM International Program License Agreement				
If Licensee is obtaining the Program for purposes of productive use (other than evaluation, testing, trial "try or buy," or demonstration): By clicking on the "Accept" button below, Licensee accepts the IBM International Program License Agreement, without modification.				
If Licensee is obtaining the Program for the purpose of evaluation, testing, trial "try or buy," or demonstration (collectively, an "Evaluation"): By clicking on the "Accept" button below, Licensee accepts both (i) the IBM International License Agreement for Evaluation of Program (the "Evaluation License"), without modification; and (ii) the IBM International Program				
License Agreement (the "IPLA"), without modification. The Evaluation License will apply during the term of Licensee's Evaluation. The IPLA will automatically apply if Licensee elects to retain the Program after the Evaluation (or obtain additional copies of the Program for use after the Evaluation) by entering into a procurement agreement (e.g., the IBM International Passport Advantage or the IBM Passport Advantage Express agreements).				
The Evaluation License and the IPLA are not in effect concurrently neither modifies the I accept the terms in the license agreement. I do not accept the terms in the license agreement.				

Figure 2-2 Accept the license agreement

3. Choose the installation type, as shown in Figure 2-3. Click **Typical** and click **Next**.

	DB2 Setup - DB2 Server Edition
Introduction Software License Agreement Installation type Installation action Installation directory DAS user Instance setup Partitioning options Instance-owning	Select the installation type Typical: 1110 - 1340 MB © Compact: 1020 - 1230 MB © Custom: 1020 - 1260 MB Information about the installation type Typical The typical setup includes basic database server function, database
2. Instance owning user 10. Fenced user 11. Notification setup 12. Contact 13. Summary	The typical setup includes basic database server function, database administration tools, and most product features and functionality. To add features for application development and other optional functionality later in the setup process, click Custom. To view all available features and those selected for a typical installation, press the View Features button. <u>View Features</u>
	A I I I I I I I I I I I I I I I I I I I

Figure 2-3 Installation type

4. For the installation action, select **Install DB2 Server Edition on this computer** as the product to install, as shown in Figure 2-4. Click **Next**.

	DB2 Setup - DB2 Server Edition
 Introduction Software License Agreement Installation type Installation action Installation directory 	Select installation, response file creation, or both The DB2 Setup wizard can install DB2 Server Edition on this computer, create a response file that you can use to install this product on a computer later, or both. If you are setting up a Server Edition partitioned database environment, you can also create a response file to install DB2 on the other computers that will act as database partition servers.
<u>6</u> . DAS user <u>7</u> . Instance setup <u>8</u> . Partitioning options <u>9</u> . Instance-owning user 1 <u>0</u> . Fenced user	 Install DB2 Server Edition on this computer Save my installation settings in a response file No software will be installed on this computer. Install DB2 Server Edition on this computer and save my settings in a response file
12. Contact 13. Summary	Response file name /root/db2server.rsp
	ack Next ▶ Einish Cancel Help

Figure 2-4 Select DB2 Server Edition

5. Choose the installation directory, as shown in Figure 2-5. We chose /opt/ibm/db2/V10.5_03 for our location.



Figure 2-5 Choose the directory

6. Select the user to run the DB2 Administration Server (DAS). See Figure 2-6. The preferred practice is to use the default, which is dasusr1. Click **Next**.

	DB2 Setup -	DB2 Server E	dition	×
Introduction Software License Agreement Installation type Installation action S. Installation directory	Set user inform Server The DB2 Administration required by the DB2 too run the DAS. Specify the New user	nation for Server (DAS) run Is. A user with a e required user i	the DB2 A s on your compu- minimal set of p nformation for th	dministration Iter to provide support Irivileges is required to the DAS.
Z. Instance setup 3. Partitioning options 9. Instance-owning user 10. Fenced user 11. Notification setup 12. Contact 13. Summary	UID Group name GID Password Confirm password Home directory Existing user User name	dasadm1		✓ Use default UID
	ack Next Fin	nish Cance	i	Help

Figure 2-6 Create the DB2 administration user

7. For the partitioning options, select **Single partition instance** to create the DB2 instance (Figure 2-7). Click **Next**.

	DB2 Setup - DB2 Server Edition
 Introduction Software License Agreement Installation type Installation action Installation directory DAS user Instance setup Partitioning options Instance-owning user Fenced user Notification setup Contact Summary 	 Set up partitioning options for the DB2 instance. A DB2 instance can have one or more database partitions, which exist on one or more computers. Select the partitioning options for this instance. The number of partition specified will be reserved in the services file. Image partition instance Image partition instance Multiple partition instance Selecting this option will create two response files. Refer to the DB2 information Center to read about the additional steps needed to prepare your DPF environment. To use this functionality, you must have a Database Partitioning Feature license.
	ack Next Einish Cancel Help

Figure 2-7 Create the instance

8. As shown in Figure 2-8, you enter the password for the user that owns the instance. The default for the DB2 instance is db2inst1. Enter the password. Click **Next**.

	DB2 Setup -	- DB2 Server Edition	– ¤ X
 Introduction Software License Agreement Installation type Installation action Installation directory DAS user Instance setup Partitioning options Instance-owning 	Set user inform Specify the instance-ow this user to perform insi the user's home directo user name. New user User name UID Group name	nation for the DB2 inst ning user information for the DB2 in tance functions, and will store insta ory. The name of the instance will be db2inst1	tance owner Istance. DB2 will use nce information in the same as the
user 1 <u>0</u> . Fenced user 11. Notification setup 12. Contact 13. Summary	Password Confirm password Home directory Existing user User name	/home/db2inst1	✓ Use default <u>G</u> ID
	ack Next Ei	nish Cancel	Help

Figure 2-8 Enter the password for the db2inst1 user

9. Enter the user information for the fenced user. The default is db2fenc1. Enter the password, as shown in Figure 2-9. Click **Next**.

	DB2 Setup -	DB2 Server Edition	×
Introduction Software License Agreement Installation type Installation action Installation directory DAS user Instance setup Partitioning options Instance-owning user I. Notification setup I. Contact I. Summary	Set user inform Specify the required info functions (UDFs) and st User name UID Group name GID Password Confirm password Home directory Existing user User name	nation for the fenced user. Fenced ored procedures will execute under db2fenc1 db2fadm1 /home/db2fenc1	user ed user defined this user and group. ✓ Use default UID ✓ Use default <u>G</u> ID
	ack Next Fi	nish Cancel	Help

Figure 2-9 Enter the password

10. The Set up notifications window is shown in Figure 2-10. We do not set up our DB2 server to send notifications in this example. Click **Do not set up your DB2 server to send notifications at this time** (default). Click **Next**.

	DB2 Setup - DB2 Server Edition
<u>1</u> . Introduction	Set up notifications
 Software License Agi Installation type Installation action Installation directory DAS user 	You can set up your DB2 server to automatically send e-mail or pager notifications to alert administrators when a database needs attention. The contact information is stored in the administration contact list. You need an unauthenticated SMTP server to send these notifications.
7. Instance setup	Notification SMTP server
9. Instance-owning use 10. Fenced user 11. Notification setup 12. Summary	Administration contact list location
	recorded in the administration notification log.

Figure 2-10 Set up notifications window

11. The summary window is shown in Figure 2-11. If you are satisfied with the settings, click **Finish** to start copying files.

	DB2 Setup - DB2 Server B	Edition	_ _ ×
 Introduction Software License Agi Installation type Installation action Installation directory DAS user 	Start copying files The DB2 Setup wizard has enough infor files. If you want to review or change a satisfied with the settings, click Finish t Current settings Product to install:	rmation to start copying the p my settings, click Back. If you to begin copying files. DB2_Server E	orogram are dition
 b. DAS user 7. Instance setup 8. Partitioning options 9. Instance-owning use 10. Fenced user 11. Notification setup 12. Summary 	Installation type: Previously Installed Components: Base client support Java support SQL procedures Base server support Connect support DB2 data source support IBM Software Development Kit (DB2 LDAP support DB2 Instance Setup wizard Integrated Flash Copy Support Communication support - TCP/IP Tivoli SA MP DB2 Update Service Replication tools Somple database source	Typical (SDK) for Java(TM)	
	ack <u>E</u> inish Canc	cel	Help

Figure 2-11 Summary page

12. The DB2 installation progress window is displayed. Click **Next**. See Figure 2-12.

Installing DB2 Server	Edition 💷
Please wait while the DB2 Setup wizar dition and performs the required cor ake several minutes.	d installs DB2 Server ifiguration. This may
Task: Setting DB2 library path	
0%	100%
0% Overall progress:	100%

Figure 2-12 Installation progress

13.As shown in Figure 2-13, the installation setup was successful. Click Finish.

Setup Complete
Setup has completed successfully
f you have not already done so, it is recommended that you complete the post-install steps after installation.
You can also review the log file for more details of the setup process. The setup log files db2setup.log and db2setup.err are located in the /tmp directory.
Post-install steps Log file
If you have not already done so, it is recommended that you complete the following steps.
Required steps:
In order to start using DB2 you need to logon using a valid user ID such as the DB2 instance owner's ID "db2inst1".
You can connect to the DB2 instance "db2inst1" using the port number "50000". Record it for future reference.
Click Finish to exit.
Einish

Figure 2-13 Setup complete

2.2.4 Verification

To verify the DB2 installation, as the db2inst1 user, try to start and stop DB2 with the **db2start** and **db2stop** commands. The path for these commands is /home/db2inst1/sqllib/adm/.

2.3 IBM Tivoli Netcool/OMNIbus

This section describes the installation and basic configuration of IBM Tivoli Netcool/OMNIbus (Netcool/OMNIbus or OMNIbus).

2.3.1 Introduction

Netcool/OMNIbus comes with a set of predefined requirements for the operating system. To verify the requirements that are needed for the installation of each Netcool Operations Insight component, we use the IBM Prerequisite Scanner, which is documented at the following website:

https://ibm.biz/Bdrr5b

Follow the instructions at the website to download the IBM Prerequisite Scanner. You must download it and extract the files in the package before you can use it.

The IBM Prerequisite Scanner checks the requirements against the installed operating system. (IBM Prerequisite Scanner Version 1.2.0.17 was used in this document.)

For this deployment, the settings in Table 2-3 were used.

Table 2-3 Settings for the OMNIbus installation

Setting	Value
OMNIbus installation directory	/opt/IBM/tivoli/netcool/
OMNIbus Linux User/password	netcool/object00
OMNIbus ObjectServer Admin User/password	root/ <no password=""></no>
\$NCHOME	/opt/IBM/tivoli/netcool/
\$OMNIHOME	/opt/IBM/tivoli/netcool/omnibus

2.3.2 Check the prerequisites

The same user who installs the products must run the Prerequisite Scanner. In this case, the user is netcool. Follow these steps to check the prerequisites:

1. Run the **prereq_checker.sh** script for OMNIbus as the user netcool, as shown in Example 2-11.

Example 2-11 Running the prerequisite checker script for OMNIbus

<pre>[netcool@Omni-A prereq]# ./prere</pre>	q checker.sh	"NOC 08010000" detail	
IBM Prerequisite Scanner	-		
Version: 1.2.0.17			
Build : 20150827			
OS name: Linux			
User name: netcool			
Machine Information			
Machine name: Omni-A			
Serial number: VMware-42 16 c7	bb 11 31 ef	63-35 bc 57 c1 01 c6 cd fb	
Scenario: Prerequisite Scan			
NOC - Tivoli Netcool/OMNIbus All	Components	[version 08010000]:	
Property	Result	Found	Expected
======	======	=====	
OS Version	PASS	Red Hat Enterprise Linux Server rel	AIX V6.1 AIX V7.1
			Solaris V10 (SPARC)
			Solaris V11.* (SPARC)
			RedHat Enterprise Linux Server 5.*
			RedHat Enterprise Linux Server 6.*
			SRedHat Enterprise Linux Server /.*
			Suse Linux Enterprise Server II
Cauluahitaatuwa	DACC	v06_64	SUSE LINUX Enterprise Server 12
Memony	PASS	X00_04 A 590P	X00_04
Disk	PASS	4.300D	40D
os snace imshared	PASS	33702MB	[dir:root=/opt:ron root=USERHOME]331MB
os space indata	PASS	33702MB	[dir:root=/var:non_root=USERHOME]2MB
os package audit-libs x86 64	PASS	audit-libs-2 4 1-5 el7 x86 64	audit-libs-2 3 3-4 el7 x86 64+
os package expat x86 64	PASS	expat-2 1 0-8 e17 x86 64	expat-2 1 0-8 e17 x86 64+
os package fontconfig x86 64	PASS	fontconfig-2 10 95-7 el7 x86 64	fontconfig=2 10 95-7 e17 x86 64+
os.package.freetype.x86_64	PASS	freetyne-2.4.11-9.e17.x86.64	freetype-2.4.11-9.e17.x86_64+
os.package.glibc.x86_64	PASS	alibc-2.17-78.el7.x86.64	alibc-2.17-55.el7 0.3.x86 64+
os.package.libICE.x86 64	PASS	libICE-1.0.8-7.el7.x86 64	libICE-1.0.8-7.el7.x86 64+

os.package.libSM.x86_64	PASS	libSM-1.2.1-7.el7.x86_64	libSM-1.2.1-7.el7.x86_64+
os.package.libX11.x86_64	PASS	libX11-1.6.0-2.1.el7.x86_64 libX11-1.6.0-2.1.el7.x86_64+	
os.package.libXau.x86_64	PASS	libXau-1.0.8-2.1.el7.x86_64	libXau-1.0.8-2.1.el7.x86_64+
os.package.libXcursor.x86_64	PASS	libXcursor-1.1.14-2.1.el7.x86_64	libXcursor-1.1.14-2.1.el7.x86_64+
os.package.libXext.x86_64	PASS	libXext-1.3.2-2.1.el7.x86_64	libXext-1.3.2-2.1.el7.x86_64+
os.package.libXfixes.x86_64	PASS	libXfixes-5.0.1-2.1.el7.x86_64	libXfixes-5.0.1-2.1.el7.x86_64+
os.package.libXft.x86_64	PASS	libXft-2.3.1-5.1.el7.x86_64	libXft-2.3.1-5.1.el7.x86_64+
os.package.libXi.x86_64	PASS	libXi-1.7.2-2.1.el7.x86_64	libXi-1.7.2-2.1.el7.x86_64+
os.package.libXmu.x86_64	PASS	libXmu-1.1.1-5.1.el7.x86_64	libXmu-1.1.1-5.1.el7.x86_64+
os.package.libXp.x86_64	FAIL	Unavailable	libXp-1.0.2-2.1.el7.x86_64+
os.package.libXpm.x86_64	PASS	libXpm-3.5.10-5.1.el7.x86_64	libXpm-3.5.10-5.1.el7.x86_64+
os.package.libXrender.x86_64	PASS	libXrender-0.9.8-2.1.el7.x86_64	libXrender-0.9.8-2.1.el7.x86_64+
os.package.libXt.x86_64	PASS	libXt-1.1.4-6.1.el7.x86_64	libXt-1.1.4-6.1.el7.x86_64+
os.package.libXtst.x86_64	PASS	libXtst-1.2.2-2.1.el7.x86_64	libXtst-1.2.2-2.1.el7.x86_64+
os.package.libgcc.x86_64	PASS	libgcc-4.8.3-9.el7.x86_64	libgcc-4.8.2-16.el7.x86_64+
os.package.libidn.x86_64	PASS	libidn-1.28-3.el7.x86_64	libidn-1.28-3.el7.x86_64+
os.package.libjpeg-turbo.x86_64	PASS	libjpeg-turbo-1.2.90-5.el7.x86_64	libjpeg-turbo-1.2.90-5.el7.x86_64+
os.package.libpng12.x86_64	FAIL	Unavailable	libpng12-1.2.50-6.el7.x86_64+
os.package.libstdc++.x86_64	PASS	libstdc++-4.8.3-9.el7.x86_64	libstdc++-4.8.2-16.el7.x86_64+
os.package.libuuid.x86_64	PASS	libuuid-2.23.2-21.el7.x86_64	libuuid-2.23.2-16.el7.x86_64+
os.package.libxcb.x86_64	PASS	libxcb-1.9-5.el7.x86_64	libxcb-1.9-5.el7.x86_64+
os.package.motif.x86_64	FAIL	Unavailable	motif-2.3.4-7.el7.x86_64+
os.package.nss-softokn-freebl.x86_6	4 PASS	nss-softokn-freebl-3.16.2.3-9.el7.x	. nss-softokn-freebl-3.15.4-2.el7.x86_64+
os.package.pam.x86_64	PASS	pam-1.1.8-12.el7.x86_64	pam-1.1.8-9.el7.x86_64+
os.package.zlib.x86_64	PASS	zlib-1.2.7-13.el7.x86_64	zlib-1.2.7-13.el7.x86_64+
os.package.gtk2.x86_64	PASS	gtk2-2.24.22-5.el7_0.1.x86_64	gtk2-2.24.22-5.e17.x86_64+
Aggregated Properties for Scanned P	roducts:		
Property	Result	Found	Expected
======		=====	======

 Property
 Result
 Found
 Expected

 ----- ----- ----- -----

 /
 PASS
 33792.00MB
 947MB

 Memory
 PASS
 4.58GB
 4.00GB

Overall result: FAIL (NOC 08010000: FAIL)

Detailed results are also available in /tmp/prereq/result.txt

2. Install each of the missing packages until you get the overall result of PASS. Example 2-12 shows how to fix this problem in a Linux environment.

Example 2-12 Insta	alling .	missing	packag	les
--------------------	----------	---------	--------	-----

[root@Omni-A	prereg]#	yum	install	libXp.x86 64	libpng12.x86	64	motif.x86 64
-		•				_	_

- 3. After you install the missing packages and fix any other errors, rerun the prerequisite checker script.
- 4. After all of the prerequisites are fulfilled, the following message is shown at the end of the script's execution:

Overall result: PASS (NOC 08010000: PASS)

2.3.3 Installation and basic configuration

This section describes the OMNIbus installation and the initial configuration of the high-availability, three-tiered architecture that we will use in our environment. During the following installation, the user netcool was used unless another user is specified.

Installing OMNIbus

Perform the following steps on all servers with an OMNIbus component:

1. Use the following command to start the Installation Manager that was installed in 2.1, "Installation Manager" on page 24 (Example 2-13).

Example 2-13 Starting the Installation Manager

```
cd /opt/IBM/netcool/IM/InstallationManager/eclipse
./IBMIM
```

Figure 2-14 shows the installation Manager GUI.



Figure 2-14 Installation Manager GUI

 Add all of the ObjectServer repositories by using File → Preferences → Repositories. Browse for and select a repository name on the Add Repository window to add to the repository preference list. Click OK. See Figure 2-15.

		IBM Installation Manager		
<u>F</u> ile <u>H</u> e		Preferences		
IBM I	type filter text	A Repositories		
	Repositories	Repositories:		
	Appearance	Location Connection	Add Repository	
	+ Help	Add Repository	Edit Repository	
	 Internet 	Add a repository	Remove Repository	
	Passport Advanta	Specify a repository and add to the repository preference list.	Move Up	
() () ()	Secure Storage	Repository:	Move Down	
	Updates	/mnt/ITSO_SHARE/OMNI/Base/OMNIbusRepository/repository.config	Clear Credentials	
			Test Connections	
		Cancel OK	(including the	
		Search service repositories during installation and updates.		
		Restore Def	aults Apply	

Figure 2-15 Add one repository

- 3. As shown in Table 2-4, add multiple repositories that are included in the following source files:
 - OMNIbus-v8.1.0.5-Core.linux64.zip, which is the core package for OMNIbus, including Fix Pack 5 (FP5)
 - 8.1.0-TIV-OMNIbusCore-linux-x86 64-FP0007.zip, which is Fix Pack 7 (FP7)

Table 2-4 Installation repositories

Installation file	Repository directory
OMNIbus-v8.1.0.5-Core.linux64.zip	<pre><extracted_dir>/Base/OMNIbusRepository</extracted_dir></pre>
8.1.0-TIV-OMNIbusCore-linux-x86_64-FP0007.zip	<pre><extracted_dir>/OMNIbusRepository/composite</extracted_dir></pre>

- 4. Two options are available for this installation:
 - You can add all of the repositories together and run the installation. This approach installs OMNIbus Core plus FP5 and FP7 in a single execution of the Installation Manager.
 - You can install OMNIbus Core plus FP5 first and then use the update process to install FP7.

Note: For the next few steps, until step 8 of this procedure, OMNIbus Core plus FP5 was installed in advance. Therefore, the window captures show only the steps to upgrade to FP7 because they are similar to the clean installation.

Repositories:		
Location	Connection	Add Repository
<pre>//mnt/ITSO_SHARE/OMNI/Base/OMNIbusRepository/repository.config</pre>	2	Edit Penository
/mnt/ITSO_SHARE/OMNI/Base_FP7/OMNIbusRepository/composite/reposito	2) -1 	
		Remove Repository
		Move Up
		Move Down
	Clear Credentials	
	Test Connections	
Service repositories are remote locations where updates or extensions to packag itself) are stored.	es (including the li	nstallation Manager
Search service repositories during installation and updates.		
	Restore D	Defaults Apply
	Cano	cel OK

Figure 2-16 OMNIbus repositories

6. In the main Installation Manager window, because OMNIbus Core plus FP5 was installed in advance, click **Update** (Figure 2-14 on page 44). For the initial installation of OMNIbus Core plus FP5, we selected **Install** on this step.

7. Start the installation (Figure 2-17). Click Next.

	IBM Installation Mana	ger			
Jpdate Packages					P
elect a package group to find updates for.					Le
Package Group Name	Directory				
🗽 IBM Netcool Core Components	/opt/IBM/tivoli/netco	ol			
Update all packages with recommended updat	es and recommended fixes				
etails					1
3M Netcool Core Components					
' Shared Resources Directory: /opt/IBM/netcool/	IM/IBMIMShared				
Installation Directory: /opt/IBM/tivoli/netcool					
Translations: English					
Architecture: 64-bit					
stalled Packages and Fixes					
IBM Tivoli Netcool/OMNIbus 8.1.0.5					
	_				
		< Back	Nexts	Undata	Cancal

Figure 2-17 Installation packages

- 8. Click I accept the terms of the license agreement. Click Next.
- 9. Select Version 8.1.0.7 (Figure 2-18) and click Next.



Figure 2-18 Selecting the packages

10. Review the Summary information and click Install (Figure 2-19).

Install Dackages			
Review the summary inform	ation		
Install Licenses	Location Features Summ	lary	
Target Location			
Package Group Name:	IBM Netcool Core Components		
Installation Directory:	/opt/IBM/tivoli/netcool		
Shared Resources Director	y: /opt/IBM/netcool/IM/IBMIMShared		
Packages			
Packages			
🗆 🧊 IBM Tivoli Netcool/O	MNIbus 8.1.0.7		
🗆 🗞 Administrator comp	oonents		
🚯 Administrator Gl	JI		
🚯 Administrator to	ols		
TEC migration			
Environment		Disk Space Information	
English		Total	Available Space
		1	32.11 GB
		Total Download Size: 368.30 MB	
		Total Installation Size: 996.11 MB	
Repository Information			
0		< Back Next > Install	Cancel
Eiguro 2 10 Summ	any window		

Figure 2-19 Summary window

11. When the installation is complete, review the information. If you did not perform the initial OMNIbus configuration, configure it now. In this case, select **Netcool/OMNIbus Initial Configuration Wizard**, and click **Finish** (Figure 2-20).

Netcool/OMNIbus Initial Configuration Wizard option: This important feature was recently added to Netcool Operations Insight. It saves significant initial configuration effort.

Which program do you want to start? Netcool/OMNIbus Initial Configuration Wizard None	
 Netcool/OMNIbus Initial Configuration Wizard <u>N</u>one 	
O <u>N</u> one	

Figure 2-20 Packages that were installed

Initial configuration

If you selected Netcool/OMNIbus Initial Configuration Wizard and clicked Finish in Figure 2-20 on page 49, the Initial Configuration Wizard opens (Figure 2-21).

Perform these steps:

1. Click **Next** to start the basic configuration of OMNIbus.

Netcool/OMNIbus Initial Configuration Wizard
Initial Configuration Wizard
The wizard will guide you through creating your configuration for your Tivoli Netcool/OMNIbus environment.
The configuration is saved to a file called the deployment descriptor that you can apply on any computer where this wizard is installed.
You can configure a distributed deployment now and assign each component to a specific computer. When you apply the deployment descriptor on each computer, only components that are intended for that computer will be configured there.
Before you start, assess your requirements and plan your deployment. You will be asked to provide the following information: The number of Collection and Display layer ObjectServers required if any.
Details of the computers that will host each component
Process Agent details for each computer
Aggregation layer ObjectServer details
Collection layer ObjectServer details (optional) Display layer ObjectServer details (optional)
- Display layer objectivel details (optional)
Back Next Exit

Figure 2-21 Initial Configuration Wizard

2. Select Create a new configuration and click Next (Figure 2-22).



Figure 2-22 Create a new configuration

- 3. For the multitiered architecture that we are building, follow these steps (Figure 2-23):
 - a. Check Aggregation backup.
 - b. Set the Primary Collection ObjectServer to 1.
 - c. Check Collection backup.
 - d. Set the Display ObjectServers to 2.
 - e. Click Next.

Note: For more information about the multitiered environment, see the following link: https://ibm.biz/BdrRn4

N	etcool/O	MNIbus Initial Configuration Wizard
Multitier ObjectS	erve	ers
Tivoli Netcool/OMNIbus can be depl capacity. Select one or more Collec	oyed in a tion or Di	multitiered configuration to increase performance and event handling splay ObjectServers only if your operating environment requires them.
Aggregation backup	•	The Aggregation layer is the central point where events from all sources are aggregated and processed. A primary Aggregation ObjectServer is always created. A backup Aggregation ObjectServer is strongly recommended in production environments.
Primary Collection ObjectServers	1 ~	Collection ObjectServers collect incoming events from probes and forward them to the Aggregation layer.
Collection backup	?	Include a backup Collection ObjectServer for every primary Collection ObjectServer.
Display ObjectServers	2 🝾	Display ObjectServers ease the load on the Aggregation layer by forwarding events to clients such as the Web GUI. If Display ObjectServers are to be deployed a minimum of 2 are recommended for resiliency.
		Back Next Exit

Figure 2-23 Configuring a multitiered environment

4. Add the fully qualified domain name (FQDN) host name of the primary OMNIbus and the NCHOME directory and click **Add**. Add the same information for the secondary OMNIbus server. Click **Next** (Figure 2-24).

t	Netcool/OMNIbus Initial Configuration Wizard
Define	host computers
In a typical cor environment, e	nfiguration, most of the components are installed on separate computers. For each computer in your enter the host name and the Tivoli Netcool/OMNIbus installation directory.
Enter a host na names (FQDN)	ame. To ensure that all computers in your deployment recognize each other, use fully qualified domain such as myhost.example.com.
* Host	
Enter the Tivo NCHOME envi	li Netcool/OMNIbus installation directory. The installation directory is typically defined by the ronment variable.
* NCHOME	
	Add
	Delete
Omni–A.swg.l	pe.ibm.com - /opt/IBM/tivoli/netcool
Omni–B.swg.l	be.ibm.com - /opt/IBM/tivoli/netcool
	Back Next Exit

Figure 2-24 Defining host computers

5. Enter the settings for the Process Agent and click **Next** (Figure 2-25).

	Netcool/OMNIbus Init	ial Configuration Wizard _ 💷 🗙
Process	Agent configuration	ิ่งท
A process agent computer. Each p	(PA) that manages Tivoli Netcool/OMNIb process agent must have a unique name.	us component processes is created for each host
🗆 Process Agent	t on Omni_A.swg.be.ibm.com	
Computer	Omni_A.swg.be.ibm.com:/opt/IBM/netco	ol
PA name	OMNI_A_PA	
* Name prefix	OMNI_A	The prefix defaults to the name of the computer. You can optionally change the prefix to help you identify the process agent.
* PA port	4200	The port number must be unique on the computer where the agent is running.
🕀 Process Agent	: on Omni_B.swg.be.ibm.com	Real Next Fair

Figure 2-25 Process agent settings

6. Enter the settings for the Aggregation layer and click **Next** (Figure 2-26).

	Netcool/OMNIbus Initial Co	nfiguration Wizard	_		×
Aggregatio	n layer configurati	on			
The Aggregation layer is bidirectional ObjectServ	s the central point where events from al ver gateway is configured on the same co	l sources are aggregated and processed. mputer as the backup ObjectServer.	۹,		
Primary Aggregate					1
ObjectServer name	AGG_P				
* Computer	Omni_A.swg.be.ibm.com - /opt/IBI ~	Select the computer that will host the ObjectServer.			
Name prefix		You can add a prefix to help you to iden ObjectServer.	tify th	e	
		The ObjectServer listens for client pro- this port. The port number must be unio the computer where the ObjectServer	jrams jue on is	on	
* Server port	4100	running. Ensure that client programs ca this port through any firewalls that are present. Ports 4100 to 4199 are typic used. Port 0 is not allowed.	n acce ally	SS	
		The ObjectServer listens for realtime c such as gateways and Event list, on this	ients, port.		
		Back	Next	E	xit

Figure 2-26 Aggregation layer configuration

7. Enter the settings for the Collection layer and click **Next** (Figure 2-27).

	Netcool/OMNIbus Initial Co	nfiguration Wizard	_ = ×
Collection	layer configuration		
A Collection ObjectSer unidirectional ObjectSe ObjectServer.	ver collects incoming events from probe rver gateway. The gateway is configured	and forwards them to the Aggregation l on the same computer as the Collection	ayer via a
Primary Collection 1			
ObjectServer name	COL_P_1		
* Computer	Omni_A.swg.be.ibm.com - /opt/IBI ~	Select the computer that will host the ObjectServer.	
Name prefix		You can add a prefix to help you to ider ObjectServer.	tify the
		The ObjectServer listens for client pro this port. The port number must be uni the computer where the ObjectServer	grams on que on is
* Server port	4101	running. Ensure that client programs ca	an access
		this port through any firewalls that are present. Ports 4100 to 4199 are typic used. Port 0 is not allowed.	ally
		The ObjectServer listens for realtime of	lients,
		Back	Next Exit

Figure 2-27 Collection layer configuration

8. Continue the configuration of the other layers and gateways. In the Configuration summary window, confirm that all of the settings are configured and click **Next** (Figure 2-28).

Netcool/OMNIbus Initial Configuration Wizard	-		×
Configuration summary			
Here is a summary of the configuration components you have set.			I
ObjectServers			
Collection layer			
COL_P_1			
⊕ COL_B_1		- 1	
C_TO_A_GATE_P_1		- 1	
		- 1	
🗄 Aggregation layer		- 1	
🗄 Display layer		- 1	
Process agents		- 1	
OMNI_A_PA			
			1
			I
	N		
Back	Next	EX	π

Figure 2-28 Configuration summary

9. Review the Save configuration window. We will import the descriptor and the instruction files to the Backup OMNIbus server. Click **Next** (Figure 2-29).

	Netcool/OMNIbus Initial Configuration Wizard	-		×
Save co	nfiguration			
The configuration instructions for a to save the config	i is about to be saved to a deployment descriptor file. An instruction file is created that c pplying the configuration on other computers. Enter names and locations for both files. (guration to disk.	ontair Click I	ns Next	
* Descriptor file	/opt/IBM/tivoli/netcool/omnibus/etc/deployment_descriptor.xml	Brov	vse	
	Warning: Existing file will be overwritten.			
* Instruction file	/opt/IBM/tivoli/netcool/omnibus/etc/icw_instructions.txt	Brov	vse	
	Warning: Existing file will be overwritten.			
	Back	Nex	tE	xit

Figure 2-29 Save the configuration

10. Review the "Apply the configuration" window and click Next (Figure 2-30).

		Netcool/OMNIbus Initial Configuration Wizard	1	_ 0	×			
Apply the configuration								
The file	The deployment descriptor has been saved. Now you must apply the configuration to each computer. The following file contains the required instructions and a checklist of the computers in your configuration:							
/opt/IBM/tivoli/netcool/omnibus/etc/icw_instructions.txt								
If you are ready to apply the configuration to this computer click Next now. If you prefer to apply the configuration later click Exit now, and follow the instructions when you are ready. The following components must be configured on this computer.								
	Component	Action			- 11			
	Interfaces file	Update /opt/IBM/tivoli/netcool/etc/omni.dat and run nco_igen			- 11			
	Process agent	Create configuration for this computer			- 11			
					- 11			
					- 1			
					- 1			
					- 11			
					- 11			
			Back	Next	Exit			



The installation and basic configuration of OMNIbus are complete.

Follow these steps to install and configure the Backup OMNIbus server, Omni-B:

- After you complete the steps in the Primary OMNIbus server, you must install and configure the Backup OMNIbus server, Omni-B. Repeat the steps of the "Installing OMNIbus" on page 44. When you are ready to perform the basic configuration ("Initial configuration" on page 50), instead of selecting "Create a new configuration", select Apply an existing configuration in this computer.
- 2. Ensure that the deployment_descriptor.xml file is copied from the Primary OMNIbus server to the Backup OMNIbus server. Click **Next** (Figure 2-31), and browse to locate the XML file in the Backup OMNIbus server.

Netcool/OMNIbus Initial Configuration Wizard	_	E	×				
Choose a task							
Create a new configuration.							
Edit an existing configuration.							
Apply an existing configuration on this computer							
В	ack Ne	xt	Exit				

Figure 2-31 Reusing the previous configuration

Complete the steps of the wizard to finish the configuration of the Backup OMNIbus server, Omni-B.

Initializing the primary aggregation ObjectServer

In Omni-A, initialize the ObjectServer AGG_P and include the SQL import file to apply to this AGG_P ObjectServer (Example 2-14).

Example 2-14 Initializing the ObjectServer

```
cd $NCHOME/omnibus/extensions/multitier/objectserver
$NCHOME/omnibus/bin/nco dbinit -server AGG P -customconfigfile aggregation.sql
```

The following objects are created for the ObjectServer:

- Properties file
- Default database tables
- Default data
- Default users
- Default groups
- Default roles

The SQL customization is also applied.

Example 2-15 shows how to start the ObjectServer AGG_P.

Example 2-15 Starting the ObjectServer AGG_P

```
$NCHOME/omnibus/bin/nco_objserv -name AGG_P &
```

After you start the ObjectServer, you can run the following command to confirm that the nco_objserv process is running:

ps -ef | grep nco_objserv

Initializing the backup aggregation ObjectServer

In Omni-B, initialize the ObjectServer AGG_B and include the SQL import file to apply to this ObjectServer (Example 2-16).

Example 2-16 Initializing the ObjectServer AGG_B

cd \$NCHOME/omnibus/extensions/multitier/objectserver
\$NCHOME/omnibus/bin/nco_dbinit -server AGG_B -customconfigfile aggregation.sql

The properties file, default database tables, default data, default users, default groups, and default roles are created for the ObjectServer. The SQL customization is also applied. If the ObjectServer name ends in _B (based on the naming conventions), the *backup ObjectServer* property is automatically set to TRUE and the corresponding automations that are required by the backup ObjectServer are enabled.

Example 2-17 shows how to start the ObjectServer AGG_B.

Example 2-17 Starting the ObjectServer AGG_B

\$NCHOME/omnibus/bin/nco_objserv -name AGG_B &

Configuring the bidirectional aggregation ObjectServer gateway

In Omni-B, perform the following steps to configure the bidirectional aggregation ObjectServer gateway:

1. Copy the multitiered property files for the gateway to the default location where configuration and properties files are held as shown in Example 2-18.

Example 2-18 Copy the multitiered files for the gateway

cp \$NCHOME/omnibus/extensions/multitier/gateway/AGG_GATE.* \$NCHOME/omnibus/etc/.

2. Start the gateway. Example 2-19 shows how to start the gateway AGG_GATE.

Example 2-19 Starting the aggregation gateway

\$NCHOME/omnibus/bin/nco_g_objserv_bi -propsfile \$NCHOME/omnibus/etc/AGG_GATE.props&

Initializing the primary collection ObjectServer

Initialize the ObjectServer COL_P_1 and apply the SQL import file to be applied to this ObjectServer (Example 2-20).

Example 2-20 Initializing the ObjectServer

```
cd $NCHOME/omnibus/extensions/multitier/objectserver
$NCHOME/omnibus/bin/nco_dbinit -server COL_P_1 -customconfigfile collection.sql
```

The properties file, and the default database tables, data, users, groups, and roles are created for the ObjectServer. The SQL customization is also applied.

Example 2-21 shows how to start the ObjectServer COL_P_1.

Example 2-21 Starting the ObjectServer

\$NCHOME/omnibus/bin/nco_objserv -name COL_P_1 &

Configuring the unidirectional primary collection ObjectServer gateway

Copy the multitiered property files for the gateway to the default location where configuration and properties files are held (Example 2-22).

Example 2-22 Copy the multitier files for the gateway

```
cp $NCHOME/omnibus/extensions/multitier/gateway/C_TO_A_GATE.map \
$NCHOME/omnibus/etc/.
```

cp \$NCHOME/omnibus/extensions/multitier/gateway/C_TO_A_GATE_P_1.* \
\$NCHOME/omnibus/etc/.

Example 2-23 shows how to start the gateway C_TO_A_GATE_P_1.

Example 2-23 Starting the collection gateway

\$NCHOME/omnibus/bin/nco_g_objserv_uni -propsfile \
\$NCHOME/omnibus/etc/C_TO_A_GATE_P_1.props &

Initializing the backup collection ObjectServer

Run the following steps in the backup collection ObjectServer COL_B_1.

Initialize the ObjectServer COL_B_1 and apply the SQL import file to apply to this ObjectServer (Example 2-24).

Example 2-24 Initializing the ObjectServer

```
cd $NCHOME/omnibus/extensions/multitier/objectserver
$NCHOME/omnibus/bin/nco dbinit -server COL B 1 -customconfigfile collection.sql
```

The properties file, and the default database tables, data, users, groups, and roles are created for the ObjectServer. The SQL customization is also applied.

Example 2-25 shows how to start the ObjectServer COL_B_1.

Example 2-25 Starting the ObjectServer

```
$NCHOME/omnibus/bin/nco_objserv -name COL_B_1 &
```

Configuring the unidirectional backup collection ObjectServer gateway

Run the following steps for the *backup* collection ObjectServer COL_B_1.

Copy the multitiered property files for the gateway to the default location where configuration and properties files are held (Example 2-26).

Example 2-26 Copy the multitier files for the gateway

cp \$NCHOME/omnibus/extensions/multitier/gateway/C_TO_A_GATE.map \
\$NCHOME/omnibus/etc/.

cp \$NCHOME/omnibus/extensions/multitier/gateway/C_TO_A_GATE_B_1.* \
\$NCHOME/omnibus/etc/.

Example 2-27 shows how to start the gateway C_TO_A_GATE_B_1.

Example 2-27 Starting the collection gateway

```
$NCHOME/omnibus/bin/nco_g_objserv_uni -propsfile \
$NCHOME/omnibus/etc/C_TO_A_GATE_B_1.props &
```

Initializing the display ObjectServer 1

Initialize the ObjectServer DIS_1 and include the SQL import file to apply to this ObjectServer. The additional command-line options -desktopserver, -dsddualwrite, and -dsdprimary are required for the initialization of display layer ObjectServers.

Note: The -dsdprimary command-line option is set to the name of the virtual ObjectServer pair in the aggregation layer. See Example 2-28.

Example 2-28 Initializing the ObjectServer

```
$NCHOME/omnibus/bin/nco_dbinit -server DIS_1 -desktopserver -dsddualwrite \
-dsdprimary AGG_V -customconfigfile \
$NCHOME/omnibus/extensions/multitier/objectserver/display.sql
```

The properties file, and the default database tables, data, users, groups, and roles are created for the ObjectServer. The ObjectServer is created as a desktop ObjectServer with dual-write mode enabled. The SQL customization is also applied.

Example 2-29 shows how to start the ObjectServer DIS_1.

Example 2-29 Starting the ObjectServer

\$NCHOME/omnibus/bin/nco_objserv -name DIS_1 &

Configuring the unidirectional display ObjectServer 1 gateway

Perform the following steps to configure the unidirectional display ObjectServer 1 gateway:

1. Copy the multitiered property files for the gateway to the default location where configuration and properties files are held (Example 2-30).

Example 2-30 Copy the multitier files for the gateway

cp \$NCHOME/omnibus/extensions/multitier/gateway/A_TO_D_GATE.map \
\$NCHOME/omnibus/etc/.

cp \$NCHOME/omnibus/extensions/multitier/gateway/A_TO_D_GATE.tblrep.def \
\$NCHOME/omnibus/etc/.

cp \$NCHOME/omnibus/extensions/multitier/gateway/A_TO_D_GATE_1.props \
\$NCHOME/omnibus/etc/.

Start the gateway. Example 2-31 shows how to start the gateway A_TO_D_GATE_1.

Example 2-31 Starting the collection gateway

```
$NCHOME/omnibus/bin/nco_g_objserv_uni -propsfile \
$NCHOME/omnibus/etc/A_TO_D_GATE_1.props &
```

Initializing the display ObjectServer 2

On Omni-B, initialize the ObjectServer DIS_2 and include the SQL import file to apply to this ObjectServer (Example 2-32).

Example 2-32 Initializing the ObjectServer on Omni-B

```
$NCHOME/omnibus/bin/nco_dbinit -server DIS_2 -desktopserver -dsddualwrite \
-dsdprimary AGG_V -customconfigfile \
$NCHOME/omnibus/extensions/multitier/objectserver/display.sql
```

The properties file, and the default database tables, data, users, groups, and roles are created for the ObjectServer. The ObjectServer is created as a desktop ObjectServer with dual-write mode enabled. The SQL customization is also applied.

Example 2-33 shows how to start the ObjectServer DIS_2.

Example 2-33 Starting the ObjectServer

\$NCHOME/omnibus/bin/nco_objserv -name DIS_2 &

Configuring the unidirectional display ObjectServer 2 gateway

Perform the following steps to configure the unidirectional display ObjectServer 2 gateway:

1. Copy the multitiered property files for the gateway to the default location where configuration and properties files are held (Example 2-34).

Example 2-34 Copy the multitier files for the gateway

cp \$NCHOME/omnibus/extensions/multitier/gateway/A_TO_D_GATE.map \
\$NCHOME/omnibus/etc/.

cp \$NCHOME/omnibus/extensions/multitier/gateway/A_T0_D_GATE.tblrep.def \
\$NCHOME/omnibus/etc/.

cp \$NCHOME/omnibus/extensions/multitier/gateway/A_TO_D_GATE_2.props \
\$NCHOME/omnibus/etc/.

2. Start the gateway. Example 2-35 shows how to start the gateway A_TO_D_GATE_2.

Example 2-35 Starting the collection gateway

```
$NCHOME/omnibus/bin/nco_g_objserv_uni -propsfile \
$NCHOME/omnibus/etc/A_TO_D_GATE_2.props
```

Configuring the historical event database

ObjectServers and Gateways are now all up and running. Next, you need to enable historical event data. Perform the following steps:

- 1. Create the REPORTER database in DB2.
- On Omni-A, install and configure the Java Database Connectivity (JDBC) gateway to send the event data to DB2 tables.

For more information about this configuration, see the following link:

https://ibm.biz/Bdrr5p

Use the following steps to configure the historical event database in the environment.

Installing the JDBC gateway

Note: In our scenario, we deploy the JDBC gateway in Omni-A where the Primary ObjectServer, AGG_P, is running. Another option is to install the JDBC gateway in the DB2 server where the REPORTER database will be located.

Perform the following steps to install the JDBC gateway:

1. In the Primary ObjectServer, start Installation Manager to add the necessary repositories:

/opt/IBM/netcool/IM/InstallationManager/eclipse/IBMIM

 Add the JDBC gateway repositories by selecting File → Preferences → Repositories → Add Repository. 3. Table 2-5 shows the necessary files for the JDBC gateway installation.

Table 2-5 JDBC gateway repositories

Installation file	Description		
NCOMNI_GTW_JDBC.zip	JDBC gateway installation file		
im-nco-g-reporter-4_0.zip	Patch for the JDBC gateway		
im-nco-g-jdbc-rpt-scripts-1_0.zip	Reporting database creation scripts		

Tip: One of the features of Installation Manager is that all platforms can be shipped in a single compressed file, which means that you do not need to select the platform that you require. Installation Manager selects the platform for you.

4. Figure 2-32 shows the JDBC gateway repositories that are imported to Installation Manager.

	Preferences		
type filter text 🧳	↓ ↓ ↓ ↓ ↓		
Repositories	Repositories:		
Appearance	Location	Connec	Add Repository
Files for Rollback	/mnt/ITSO_SHARE/OMNI/Base/OMNIbusRepository/repository.config	?	Edit Papasitany
🗄 Help	<pre>/mnt/ITSO_SHARE/OMNI/Base_FP7/OMNIbusRepository/composite/reposito</pre>	2	Edit Repository
🗄 Internet	/mnt/ITSO_SHARE/OMNI/Probes_Gates/NCOMNI_GTW_JDBC.zip	9	Remove Repository
Passport Advantage	<pre>/mnt/ITSO_SHARE/OMNI/Probes_Gates/im-nco-g-reporter-4_0.zip</pre>	9 <u>4</u>	Move Up
Secure Storage	<pre>////////////////////////////////////</pre>	<u>4</u> 1.	Move Down
Updates			Clear Credentials Test Connections

Figure 2-32 Importing JDBC gateway repositories

5. Select the OMNIbus Gateway packages to install as shown in Figure 2-33.

Select packages to install:					
			*** *		
Installation Packages	Status	Vendor	License Key Type		
🖃 🔲 🗊 IBM Tivoli Netcool/OMNIbus	Installed				
🗆 🕼 Version 8.1.0.7	Installed	IBM			
😑 🎯 🕼 Netcool/OMNIbus Gateway nco-g-jdbc					
✓ 🛱 Version 1.6.0.0	Will be installed	IBM			
😑 🧭 ঝ Netcool/OMNIbus Gateway nco-g-jdbc-reporting-scripts					
✓ 👯 Version 1.1.0.0	Will be installed	IBM			
😑 🎯 🕼 Netcool/OMNIbus Gateway nco-g-reporter-scripts					
₩ ¹⁰ Version 1.4.0.0	Will be installed	IBM			
Show <u>a</u> ll versions		Check for Other V	ersions, Fixes, and Extensions		
Details			I		
Netcool/OMNIbus Gateway nco-g-jdbc-reporting-scripts 1.1.0.0	D				
Netcool/OMNIbus Gateway nco-g-jdbc-reporting-scripts More info					
Repository: /mnt/ITSO_SHARE/OMNI/Probes_Gates/im-nco-g-jdbc-	Repository: /mnt/ITSO_SHARE/OMNI/Probes_Gates/im-nco-g-jdbc-rpt-scripts-1_0.zip				

Figure 2-33 Selecting the JDBC gateway packages

6. Review the installation summary and complete the installation (Figure 2-34).

Review the summary informat	tion.					
Install Licenses	Location Features Summar	TY				
Target Location						
Package Group Name:	IBM Netcool Core Components					
Installation Directory: /opt/IBM/tivoli/netcool						
Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared						
Packages						
Packages						
🚯 Netcool/OMNIbus Gat	eway nco-g-jdbc 1.6.0.0					
💫 Netcool/OMNIbus Gat	eway nco-g-jdbc-reporting-scripts 1.1.0.0					
🚯 Netcool/OMNIbus Gat	eway nco-q-reporter-scripts 1.4.0.0					
Environment		Disk Space Information				
English			Total Available Space			
		1	30.80 GB			
		Total Download Size: 444.8 KB				
		Total Installation Size: 1.64 MB				
Repository Information						

Figure 2-34 Reviewing the summary for the JDBC installation

7. Review the installation results and click **Finish** (Figure 2-35).

😑 🦉 IBM N	etcool Core Compone	nts			
<table-cell> Net</table-cell>	cool/OMNIbus Gatewa	ay nco-g-jdbc 1.6.0	0.0		
<table-cell> Net</table-cell>	cool/OMNIbus Gatewa	ay nco-g-jdbc-repo	orting-scripts 1.1	0.0	
<table-cell> Net</table-cell>	cool/OMNIbus Gatewa	ay nco-g-reporter-	scripts 1.4.0.0		

Figure 2-35 JDBC gateway installation results

Configuring the interfaces file

Perform the following steps to configure the interfaces file:

1. Append the following lines to \$NCHOME/etc/omni.dat in Omni-A, as shown in Example 2-36.

Example 2-36 Configure the interface for the Reporter gateway

```
[G_JDBC]
{
    Primary: Omni-A.swg.be.ibm.com 4320
}
```

2. Run the nco_igen command to regenerate the interfaces file:

\$NCHOME/bin/nco_igen

Configuring the database schema

This step needs to be executed in the DB_A server of the environment. If DB2 is not installed yet, you must perform the DB2 installation. See 2.2, "IBM DB2" on page 27. Resume with the following steps:

If DB2 is installed in the DB_A server, proceed with the following steps:

 Copy the file \$OMNIHOME/gates/reporting/db2/db2.reporting.old.sql from Omni-A to the DB_A server.

Note: The file name is db2.reporting.old.sq1. This script has additional code that is needed to create the REPORTER database.

Log in as db2inst1 in DBServ-a and execute the SQL script:

[db2inst1@DBServ-a]\$ db2 -td0 -vf db2.reporting.old.sq]

The following output is expected:

COMMIT WORK DB20000I The SQL command completed successfully.

Configuring the database connection

Perform the following steps to configure the database connection:

 Copy the DB2 drivers to \$0MNIH0ME/gates/java. The DB2 drivers are in the /opt/ibm/db2/V10.5*/java directory in DBServ-a. You need to copy the driver files from the DBServ-a server to Omni-A. Then, on the Omni-A server, copy the driver to \$0MNIH0ME/gates/java as shown in Example 2-37.

Example 2-37 Copying the DB2 driver files

ср	db2jcc.jar	db2jcc_license_	_cu.jar	\$OMNIHOME/gates/java
----	------------	-----------------	---------	-----------------------

Create the gateway user in the AGG_P server with password netcool. If you need more information about how to create a user in OMNIbus, see the following link:

https://ibm.biz/Bdrr58

Configuring the props file

Perform the following steps to configure the props file:

1. Edit the JDBC gateway properties files. Example 2-38 shows the properties that you need to modify in \$0MNIHOME/etc/G_JDBC.props.

Important: The first property in Example 2-38, the *Gate.Jdbc.Mode: 'REPORTING'* property, is important because this property is the only mode that is supported by IBM Operations Analytics - Log Analysis, which we will install later in this book.

Example 2-38 Properties of the G_JDBC gateway

```
#
#
Reporting mode properties
#
Gate.Jdbc.Mode: 'REPORTING' # STRING (JDBC gateway mode (AUDIT|REPORTING))
# Table properties
Gate.Jdbc.StatusTableName: 'REPORTER_STATUS' # STRING (Target table for alerts.status)
Gate.Jdbc.JournalTableName: 'REPORTER_JOURNAL' # STRING (Target table for alerts.journal)
```

```
Gate.Jdbc.DetailsTableName: 'REPORTER_DETAILS' # STRING (Target table for alerts.details)
# JDBC Connection properties
Gate.MapFile: '$OMNIHOME/gates/jdbc/reporting.jdbc.map' # STRING (Path to data mapping
file.)
Gate.Jdbc.Driver: 'com.ibm.db2.jcc.DB2Driver' # STRING (JDBC Driver)
Gate.Jdbc.Url: 'jdbc:db2://172.16.61.137:50000/REPORTER' # STRING (JDBC connection URL)
Gate.Jdbc.Username: 'db2inst1' # STRING (JDBC username)
Gate.Jdbc.Password: 'object00
' # STRING (JDBC password)
Gate.Jdbc.InitializationString: '' # STRING (JDBC connection timeout)
Gate.Jdbc.InitializationString: '' # STRING (JDBC connection initialization string)
# ObjectServer Connection properties
Gate.RdrWtr.Server: 'AGG_P' # STRING ([RdrWtr] Name of the ObjectServer to connect too.)
Gate.RdrWtr.Password: 'netcool' # STRING ([RdrWtr] Password of the user to connect as.)
```

2. To start the gateway, execute following command:

\$OMNIHOME/bin/nco_g_jdbc

3. Check the \$0MNIHOME/log/G_JDBC.log to confirm the gateway is running with no errors.

Configuring the Process Agent

The Process Agent (PA) needs to be configured to control all of the OMNIbus processes.

The Tivoli Netcool/OMNIbus process control system: The process control system performs two primary tasks. It manages local and remote processes, and it runs external procedures that are specified in automations. You can use process control to simplify the management of Tivoli Netcool/OMNIbus components, such as ObjectServers, probes, and gateways. You can install process agents (PA) on each host and configure them to manage processes.

The configured process agents cooperate automatically and understand their own configuration. They start processes, and they can keep those processes running. You can define processes that are dependent on other processes, and processes that have timed threshold dependencies. If a managed host is restarted, the process agent can be configured to restart local components automatically.

In this deployment scenario, the PA needs to be configured on all servers that carry an Omnibus component, which are Omni-A and Omni-B in our environment.

Follow these steps to configure the PA:

1. Set up the PA authentication by installing the **startup** script by running the following command as the root user, as shown in Example 2-39.

Example 2-39 Installing the startup script

```
# /opt/IBM/tivoli/netcool/omnibus/install/startup/linux2x86install
Enter value for $NCHOME [/opt/IBM/tivoli/netcool]:
This script copies a startup script into the /etc/init.d directory to enable
you to automatically start and stop Netcool/OMNIbus processes.
It does this by:
Copying linux2x86/etc/rc.d/init.d/nco to /etc/init.d/nco
Running "/sbin/chkconfig --add nco"
```

Do you wish to continue (y/n)? [y] y Name of the Process Agent Daemon [NCO_PA]: OMNI_A_PA Should OMNI_A_PA run in secure mode (y/n)? [y] n Enif required [27000@localhost]: Scripts installed.

Edit /etc/init.d/nco (Example 2-40).

Example 2-40 Configuring the nco file

```
# vi /etc/init.d/nco
Change the following line to append "-admingroup ncoadmin" at the end of the
command line:
${OMNIHOME}/bin/nco_pad -name ${NCO_PA} -authenticate PAM -admingroup ncoadmin
-redirectfile ${OMNIHOME}/log/pa_redir.log > /dev/null 2> /dev/null
```

 Create the configuration files for Tivoli Netcool/OMNIbus services by running the following commands (Example 2-41).

Example 2-41 Create the service configuration files

```
cd /etc/pam.d
cp system-auth /etc/pam.d/nco_objserv # Required for the ObjectServer
cp system-auth /etc/pam.d/netcool # Required for the process agent
cp system-auth /etc/pam.d/nco_g_objserv_uni # Required for the gateway
cp system-auth /etc/pam.d/nco_g_objserv_bi # Required for the gateway
cp system-auth /etc/pam.d/nco_g_jdbc # Required for the gateway
```

 As the netcool user, copy the configuration files by running the following commands (Example 2-42).

Example 2-42 Copying the configuration files

cd \$OMNIHOME/etc cp nco_pa.props OMNI_A_PA.props cp nco_pa.conf OMNI_A_PA.conf

5. Configure the props file by appending the following lines (Example 2-43).

Example 2-43 Configure the props file

vi OMNI_A_PA.props		
Name: 'OMNI_A_PA' #	STRING	(Name that server is to use)
ConfigFile: '\$OMNIHOME/etc/OMNI_A_PA.conf' #	STRING	(The name of the configuration file)
<pre>MessageLog: '\$OMNIHOME/log/OMNI_A_PA.log' #</pre>	STRING	(Path to the message log file)
<pre>PropsFile: '\$OMNIHOME/etc/OMNI_A_PA.props' #</pre>	STRING	(Path to the properties file)
PidFile: './var/OMNI_A_PA.pid' #	STRING	(Filename for pid storage relative to \$OMNIHOME (UNIX))

6. Configure the OMNI_A_PA.conf file. Example 2-44 shows how you need to configure the .conf file.

Note: The *SCALAGateway* configuration is included in Example 2-44 for later usage.

Example 2-44 OMNI_A_PA.conf file

```
#NCO_PA3
#
# Process Agent Daemon Configuration File 1.1
#
```

```
#
# List of Processes.
#
nco process 'AggObjectServer P'
{
        Command '$OMNIHOME/bin/nco objserv -name AGG P -pa OMNI A PA' run as 1001
        Host
                        =
                                'Omni-A'
                                True
        Managed
                        =
        RestartMsg
                        =
                                '${NAME} running as ${EUID} has been restored on
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
        RetryCount
                        =
                                0
        ProcessType
                        =
                                PaPA_AWARE
}
nco process 'ColObjectServer P 1'
{
        Command '$OMNIHOME/bin/nco_objserv -name COL_P_1 -pa OMNI_A_PA' run as
1001
        Host
                                'Omni-A'
                        =
                        =
        Managed
                                True
                                '${NAME} running as ${EUID} has been restored on
        RestartMsg
                        =
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
                                0
        RetryCount
                        =
        ProcessType
                                PaPA AWARE
                        =
}
nco_process 'DispObjectServer_1'
{
        Command '$OMNIHOME/bin/nco objserv -name DIS 1 -pa OMNI A PA' run as 1001
                                'Omni-A'
        Host
                        =
                        =
        Managed
                                True
        RestartMsg
                        =
                                '${NAME} running as ${EUID} has been restored on
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
        RetryCount
                                0
                        =
                                PaPA AWARE
        ProcessType
                       =
}
nco_process 'ColToAggP_1'
{
        Command '$OMNIHOME/bin/nco g objserv uni -propsfile
$OMNIHOME/etc/C_TO_A_GATE_P_1.props' run as 1001
        Host
                                'Omni-A'
                        =
                        =
        Managed
                                True
                                '${NAME} running as ${EUID} has been restored on
        RestartMsg
                        =
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
                                0
        RetryCount
                        =
        ProcessType
                        =
                                PaPA_AWARE
}
nco process 'AggToDisp 1'
{
```

```
Command '$OMNIHOME/bin/nco g objserv uni -propsfile
$OMNIHOME/etc/A TO D GATE 1.props' run as 1001
                               'Omni-A'
       Host
                      =
       Managed
                       =
                               True
                               '${NAME} running as ${EUID} has been restored on
       RestartMsg
                       =
${HOST}.'
                               '${NAME} running as ${EUID} has died on ${HOST}.'
       AlertMsg
                       =
                               0
       RetryCount
                       =
       ProcessType =
                               PaPA AWARE
}
nco process 'JDBCGateway'
{
        Command '$OMNIHOME/bin/nco g jdbc -propsfile $OMNIHOME/etc/G JDBC.props'
run as 1001
                               'Omni-A'
       Host
                       =
       Managed
                       =
                               True
       RestartMsg
                       =
                                '${NAME} running as ${EUID} has been restored on
${HOST}.'
       AlertMsg
                               '${NAME} running as ${EUID} has died on ${HOST}.'
                       =
       RetryCount
                               0
                       =
       ProcessType
                       =
                               PaPA AWARE
}
nco process 'SCALAGateway'
{
        Command '$OMNIHOME/bin/nco g xml -propsfile
$OMNIHOME/gates/xml/scala/G SCALA.props' run as 1001
       Host
                       =
                               'Omni-A'
       Managed
                       =
                               True
       RestartMsg
                               '${NAME} running as ${EUID} has been restored on
                       =
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
       AlertMsg
                       =
       RetryCount
                       =
                               0
       ProcessType =
                               PaPA AWARE
}
#
# List of Services.
#
nco_service 'Core'
{
       ServiceType
                       =
                               Master
        ServiceStart
                       =
                               Auto
       process 'AggObjectServer P' NONE
       process 'ColObjectServer_P_1' NONE
       process 'DispObjectServer 1' NONE
       process 'ColToAggP 1' 'AggObjectServer P'
       process 'AggToDisp 1' 'AggObjectServer P'
       process 'JDBCGateway' 'AggObjectServer P'
       process 'SCALAGateway' 'AggObjectServer_P'
}
nco service 'InactiveProcesses'
{
```

```
ServiceType = Non-Master
ServiceStart = Non-Auto
}
#
# Routing Table Entries.
#
# 'user'
                - (optional) only required for secure mode PAD on target host
#
                   'user' must be member of UNIX group 'ncoadmin'
# 'password' - (optional) only required for secure mode PAD on target host
#
                   use nco pa crypt to encrypt.
nco_routing
{
        host 'Omni-B.swg.be.ibm.com' 'OMNI B PA'
        host 'Omni-A' 'OMNI A PA'
}
```

7. Start the Process Agent (PA).

Note: Ensure that you stop any Netcool processes that are running before you restart the PA.

The PA can be started in one of the following two ways:

- Call the script from init.d as the root user (Example 2-45).

Example 2-45 First option to start PA

/etc/init.d/nco start

Note: Due to a current known issue in RedHat 7 where the nco.service is not configured correctly, this method does not start the PA. If you use RedHat 7, until this issue is resolved, use the second method to start PA.

Call the nco_pad with all of the arguments as the root user. See Example 2-46.

Example 2-46 Second option to start PA

```
/opt/IBM/tivoli/netcool/omnibus/bin/nco_pad -name OMNI_A_PA -authenticate PAM
-admingroup ncoadmin
```

Example 2-47 shows the commands to manage PA.

Tip: You can also install the history gateway on the Tivoli Data Warehouse server.

Example 2-47 Commands to manage PA

```
      Check the status of the services and processes of the PA:

      [netcool@Omni-A ~]$ nco_pa_status -server OMNI_A_PA -user netcool -password

      object00

      Service Name
      Process Name

      Hostname
      User

      Status
      PID

      Core
      AggObjectServer_P

      Omni-A
      netcool

      RUNNING
      1018
```

```
ColObjectServer_P_1 Omni-A
                                                            RUNNING
                                                                       1019
                                                   netcool
                    DispObjectServer_1 Omni-A
                                                   netcool
                                                             RUNNING
                                                                       1020
                                                   netcool
                                        0mni-A
                    ColToAggP_1
                                                             RUNNING
                                                                       1021
                    AggToDisp 1
                                        Omni-A
                                                   netcool
                                                            RUNNING
                                                                       1022
                    JDBCGateway
                                        Omni-A
                                                   netcool
                                                            RUNNING
                                                                       1024
                                         _____
                                                      Start a service (this command will start all of the components of the defined
Service, according to the sequence defined in Example 2-44 on page 69):
nco pa start -server OMNI A PA -user netcool -password object00 -service Core
Start a process:
nco pa_start _server OMNI A PA -user netcool -password object00 -process
AggObjectServer_P
Stop a process:
nco pa stop -server OMNI A PA -user netcool -password object00 -process
AggObjectServer_P
Stop PA:
nco pa shutdown -server OMNI A PA -user netcool -password object00
Repeat steps 1 - 7 for the backup ObjectServer, Omni-B. When you run the steps, replace
```

```
OMNI A PA with OMNI B PA.
```

10.Also, you neeed to make a few changes in the OMNI_B_PA.conf file in your environment. Example 2-48 shows the differences in *OMNI B PA* in our environment in **bold**.

Example 2-48 OMNI_B_PA.conf file

```
#NCO_PA3
#
# Process Agent Daemon Configuration File 1.1
#
# List of Processes.
nco_process 'AggObjectServer_B'
        Command '$OMNIHOME/bin/nco_objserv -name AGG_B -pa OMNI_B_PA' run as 1001
        Host
                                 'Omni-B'
                        =
        Managed
                         =
                                 True
        RestartMsg
                                 '${NAME} running as ${EUID} has been restored on
                        =
${HOST}.'
                                 '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
        RetryCount
                                 0
                                 PaPA AWARE
        ProcessType
                        =
}
nco_process 'ColObjectServer_B_1'
{
        Command '$OMNIHOME/bin/nco_objserv -name COL_B_1 -pa OMNI_B_PA' run as
1001
                                 'Omni-B'
        Host
                         =
        Managed
                         =
                                 True
        RestartMsg
                         =
                                 '${NAME} running as ${EUID} has been restored on
${HOST}.'
```

```
AlertMsg
                                '${NAME} running as ${EUID} has died on ${HOST}.'
                        =
        RetryCount
                        =
                                0
                                PaPA AWARE
        ProcessType
                        =
}
nco process 'DispObjectServer_2'
{
        Command '$OMNIHOME/bin/nco_objserv -name DIS_2 -pa OMNI_B_PA' run as 1001
        Host
                        =
                                'Omni-B'
        Managed
                        =
                                True
        RestartMsg
                                '${NAME} running as ${EUID} has been restored on
                        =
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
        RetryCount
                        =
                                0
        ProcessType
                                PaPA_AWARE
                       =
}
nco_process 'ColToAggB_1'
{
        Command '$OMNIHOME/bin/nco g objserv uni -propsfile
$OMNIHOME/etc/C_TO_A_GATE_B_1.props' run as 1001
        Host
                                'Omni-B'
                       =
        Managed
                        =
                                True
                                '${NAME} running as ${EUID} has been restored on
        RestartMsg
                        =
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
                                0
        RetryCount
                        =
                                PaPA AWARE
        ProcessType
                        =
}
nco process 'AggToDisp_2'
{
        Command '$OMNIHOME/bin/nco_g_objserv_uni -propsfile
$OMNIHOME/etc/A_TO_D_GATE_2.props' run as 1001
        Host
                        =
                                'Omni-B'
        Managed
                        =
                                True
                                '${NAME} running as ${EUID} has been restored on
        RestartMsg
                        =
${HOST}.'
        AlertMsg
                        =
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        RetryCount
                        =
                                0
        ProcessType
                                PaPA_AWARE
                        =
}
nco_process 'AggregationGateway'
{
        Command '$OMNIHOME/bin/nco_g_objserv_bi -propsfile
$OMNIHOME/etc/AGG_GATE.props' run as 1001
                                'Omni-B'
        Host
                        =
        Managed
                        =
                                True
        RestartMsg
                                '${NAME} running as ${EUID} has been restored on
                        =
${HOST}.'
                                '${NAME} running as ${EUID} has died on ${HOST}.'
        AlertMsg
                        =
        RetryCount
                        =
                                0
        ProcessType
                        =
                                PaPA_AWARE
}
```

```
#
# List of Services.
#
nco service 'Core'
{
                                Master
        ServiceType
                        =
        ServiceStart
                        =
                                Auto
        process 'AggObjectServer_B' NONE
        process 'ColObjectServer_B_1' NONE
        process 'DispObjectServer_2' NONE
        process 'ColToAggB_1' 'AggObjectServer_B'
        process 'AggToDisp 2' 'AggObjectServer B'
        process 'AggregationGateway' 'AggObjectServer_B'
}
nco_service 'InactiveProcesses'
{
        ServiceType
                                Non-Master
                        =
        ServiceStart
                                Non-Auto
                        =
}
#
# Routing Table Entries.
#
#
  'user'
                - (optional) only required for secure mode PAD on target host
#
                   'user' must be member of UNIX group 'ncoadmin'
#
  'password'
                - (optional) only required for secure mode PAD on target host
#
                   use nco pa crypt to encrypt.
nco routing
{
        host 'Omni-B.swg.be.ibm.com' 'OMNI B PA'
        host 'Omni-A' 'OMNI A PA'
```

2.3.4 Verification

Perform the following steps to verify the installation:

 Example 2-49 shows the complete \$0MNIHOME/etc/omni.dat for this environment (including the G_SCALA configuration that will be performed later in this book). Review the omni.dat file in Omni-A and Omni-B to confirm that they are correct.

Example 2-49 The omni.dat file

```
[netcool@Omni-A etc]$ cat omni.dat
[AGG_P]
{
          Primary: Omni-A.swg.be.ibm.com 4100
}
[AGG_B]
{
          Primary: Omni-B.swg.be.ibm.com 4100
```

```
}
[COL_P_1]
ł
        Primary: Omni-A.swg.be.ibm.com 4101
[COL_B_1]
{
        Primary: Omni-B.swg.be.ibm.com 4101
}
[DIS_1]
{
        Primary: Omni-A.swg.be.ibm.com 4102
}
[DIS 2]
{
        Primary: Omni-B.swg.be.ibm.com 4102
[AGG_V]
{
        Primary: Omni-A.swg.be.ibm.com 4100
        Backup: Omni-B.swg.be.ibm.com 4100
[AGG_GATE]
        Primary: Omni-B.swg.be.ibm.com 4300
[C_TO_A_GATE_P_1]
        Primary: Omni-A.swg.be.ibm.com 4300
[C_TO_A_GATE_B_1]
        Primary: Omni-B.swg.be.ibm.com 4303
[A_TO_D_GATE_1]
{
        Primary: Omni-A.swg.be.ibm.com 4301
[A_TO_D_GATE_2]
        Primary: Omni-B.swg.be.ibm.com 4302
[OMNI A PA]
        Primary: Omni-A.swg.be.ibm.com 4200
[OMNI_B_PA]
{
        Primary: Omni-B.swg.be.ibm.com 4200
}
[G_JDBC]
{
        Primary: Omni-A.swg.be.ibm.com 4320
}
```

```
[G_SCALA]
{
    Primary: Omni-A.swg.be.ibm.com 4305
}
```

- If any event sources point to your Netcool Operations Insight environment, configure them to the COL_P OMNIbus server. If you need to perform initial tests, use the Simnet Probe to send sample alerts:
 - a. Append the following line to the \$0MNIHOME/probes/linux2x86/simnet.props file:

Server : 'COL_P_1'

b. Start the probe (Example 2-50).

Example 2-50 Starting the Simnet Probe

```
/opt/IBM/tivoli/netcool/omnibus/probes/nco p simnet &
```

To view the events, you can start an Event List. For more information about monitoring events, see the following link:

https://ibm.biz/Bdrr5g

2.4 IBM Tivoli Netcool Impact

The installation and basic configuration of IBM Tivoli Netcool Impact (Impact) are described.

2.4.1 Introduction

Netcool Impact offers a set of predefined requirements for the operating system. These requirements are documented on the IBM documentation server:

https://ibm.biz/Bdrr5b

The IBM Prerequisite Scanner (version 1.2.0.17 in this book) checks these requirements against the installed operating system. For this deployment, the settings that are shown in Table 2-6 were used.

Setting	Value
Default Directory	/opt/IBM/tivoli/netcool/impact/
OMNIbus User/password	impactconnect/netcool
Impact GUI user/password	impactadmin/netcool
\$IMPACT_HOME	/opt/IBM/tivoli/netcool/impact/

Table 2-6 Settings for the Netcool Impact installation

2.4.2 Check the prerequisites

Important: The Prerequisite Scanner must be run by the same user that installs the products.

Run the command to start the scanner. Add the missing packages and correct the operating system settings. Set the environment variable IMPACT_PREREQ_BOTH based on your type of installation. Because we installed both Netcool Impact (NCI) and the Impact GUI components on the same server, we ran export IMPACT_PREREQ_BOTH=True. See Example 2-51.

Tip: In the **export IMPACT_PREREQ_BOTH** parameter, TRUE means check for both Netcool Impact and Impact GUI and FALSE means check for Netcool Impact only.

Example 2-51 Prerequisite Scanner command

<pre>su - netcool export IMPACT_PREREQ_BOTH=True mkdir /tmp/prereq cd /tmp/prereq/ tar xvf /mnt/ITS0_SHARE/precheck_unr [netcool@Impact-a prereck]\$./prered IBM Prerequisite Scanner Version: 1.2.0.17 Build : 20150827 OS name: Linux User name: netcool</pre>	ix_2015082; 1_checker.:	7.tar Sh NCI detail		
Machine Information Machine name: Impact-a Serial number:				
Scenario: Prerequisite Scan				
NCI - Tivoli Netcool/Impact [version Property =======	07010001] Result	l: Found		Expected
OS Version	PASS	Red Hat Enterprise Linux Ser	rver rel	RedHat Enterprise Linux Server 5.5 RedHat Enterprise Linux Server 5.6 RedHat Enterprise Linux Server 5.7 RedHat Enterprise Linux Server 5.8 RedHat Enterprise Linux Server 5.9 RedHat Enterprise Linux Server 6.0 RedHat Enterprise Linux Server 6.1 RedHat Enterprise Linux Server 6.2 RedHat Enterprise Linux Server 6.3 RedHat Enterprise Linux Server 6.3 RedHat Enterprise Linux Server 6.4 RedHat Enterprise Linux Server 6.5 RedHat Enterprise Linux Server 7.0 RedHat Enterprise Linux Server 7.1 SUSE Linux Enterprise Server 11 AIX V6.1 AIX V7.1 Solaris V10 (SPARC)
os.architecture os.space.opt_root os.space.opt_nonroot os.space.home_root os.space.home_nonroot os.RAMSize os.swapSize numLogicalCPU intel.cpu os.package.libgcc.i686 os.package.glibc.i686	PASS PASS PASS PASS PASS PASS PASS FAIL libg FAIL glib	64-bit NOT_REQ_CHECK_ID 33GB NOT_REQ_CHECK_ID 33792MB 7.6GB 38 8 2.70GHz cc-4.8.3-9.e17.i686 c-2.17-78.e17.i686	6GB+ libgc glibc	64-bit [dir:root=/opt]30GB [dir:root=/var,unit:MB]700 [dir:non_root=USERHOME,unit:MB]700 6GB 2 2GHz :c-4.8+ :-2.17+
Aggregated Properties for Scanned Pr Property ========	roducts: Result ===== PASS	Found ===== 33.00GB		Expected ======= 30.68GB
Overall result: FAIL (NCI 07010001:	FAIL)			
Environment variable settings: [IMI	PACT_PRERE	<pre>2_BOTH=True, IMPACT_PREREQ_GL</pre>	JI=[Not Four	nd], IMPACT_PREREQ_IMPACT=[Not Found]]
Detailed results are also available	in /tmp/p	rereck/result.txt		

sudo su yum install libgcc.i686 glibc.i686

2.4.3 Installation and basic configuration

Perform the following steps:

1. Start the previously installed Installation Manager by using the following commands (Example 2-52). Figure 2-36 shows the Installation Manager GUI.

Example 2-52 Starting the Installation Manager

cd /opt/IBM/netcool/IM/InstallationManager/eclipse
./IBMIM

Tip: If you see unexpected results, check the following logs to help in troubleshooting:

- \$IMPACT_HOME/logs/impactserver.log
- \$IMPACT_HOME/logs/guiserver.log

	IBM Installation Manag	er	_ 🗆 ×
File Help			
IBM Installation Manager			
	Install Install software packages.		
	Update Discover and install updates and fixes to installed software Darkages		
	Modify	Roll Back	
	Change installed software packages by adding or removing features and functions.	Uninstall	
IBM.			

Figure 2-36 Installation Manager GUI

2. Add all of the Impact server repositories by selecting File \rightarrow Preferences \rightarrow Repositories \rightarrow Add Repository. See Figure 2-37.

			IBM Installation Manager			- • ×	
<u>F</u> ile <u>H</u> e			Preferences				
IBM I	type filter text		Repositories		♦ < ♥ < ▼		
	Repositories		Repositories:				
	Appearance		Location	Connection	Add Repository		
	 Help 		Add Repository		Edit Repository		
	🗄 Internet	Add	a repository	P	Remove Repository		
	Passport Advanta	Spec	ify a repository and add to the repository preference list.		Move Up		
	Secure Storage Move Down						
	Updates //mnt/ITSO_SHARE/NCI/Base/ImpactRepository/disk1/diskTag.inf Clear Credentials						
					Test Connections	Margan	
			Cancel	ОК	(including the		
		_	Search service repositories during installation and undated				
			· Search service repositories during instattation and updates				
				Restore Defa	ults Apply		
	٢			Canad		and the second	
191	U			Cancel	OK		

Figure 2-37 Add a repository

As shown in Table 2-7, multiple repositories are included in the following source files:

- Impact-v7.1.0.4.linux64.zip is the core package for Impact.
- Impact-v7.1.0.4-NOI.linux64.zip is the Netcool Operations Insight extensions package.
- 7.1.0-TIV-NCI-LINUX-FP0005.zip is Fix Pack 5.

Table 2-7 Installation repositories

Installation file	Repository directory		
Impact-v7.1.0.4.linux64.zip	<pre><extracted_dir>/ImpactRepository/disk1</extracted_dir></pre>		
Impact-v7.1.0.4-NOI.linux64.zip	<pre><extracted_dir>/ImpactRepository/disk1</extracted_dir></pre>		
Impact-v7.1.0.4-NOI.linux64.zip	<pre><extracted_dir>/ImpactExtRepository/disk1</extracted_dir></pre>		
7.1.0-TIV-NCI-LINUX-FP0005.zip	<pre><extracted_dir>/ImpactRepository/disk1</extracted_dir></pre>		
7.1.0-TIV-NCI-LINUX-FP0005.zip	<pre><extracted_dir>/ImpactExtRepository/disk1</extracted_dir></pre>		

3. Add all of them together (Figure 2-38). Click OK.



Figure 2-38 All Impact repositories

- 4. Start the installation. Select all of the packages (Figure 2-39). Because you added all of the repositories, including the fix packs, Installation Manager, which is patched to the latest version, such as 7.1.0.5, installs directly. Click **Next**.
- 5. Click I accept the terms of the license agreement (Figure 2-17 on page 47). Click Next.

	IBM Installation Manager		_ =
Install Packages			
Select packages to install:			1
Installation Packages	Status	Vendor	License Key Type
🖃 📝 🗊 IBM Tivoli Netcool/Impact GUI Server			
	Will be installed	IBM	
🖃 📝 🗊 IBM Tivoli Netcool/Impact Server			
♥ Q Version 7.1.0.5	Will be installed	IBM	
= 🧭 🖗 IBM Tivoli Netcool/Impact Server Extensions	for Netcool Operat		
	Will be installed	IBM	
		Check for Other Ver	sions Fixes and Extensions
Show all versions			profile, i frides, and excertisions
Snow <u>a</u> ll versions			
Details		2	
Snow <u>all versions</u> Details IBM Tivoli Netcool/Impact Server Extensions for N The Impact Server Extensions package contains extra State Server	Vetcool Operations Insight 7.1.0.5	M Netcool Operations	Insight The Impact
Snow <u>all versions</u> Details IBM Tivoli Netcool/Impact Server Extensions for N The Impact Server Extensions package contains extra Server Extensions package must be installed with the	Jetcool Operations Insight 7.1.0.5 Impact Server features that work with IBI Impact Server package. <u>More info</u>	M Netcool Operations	Insight. The Impact
Snow <u>all versions</u> Details IBM Tivoli Netcool/Impact Server Extensions for N The Impact Server Extensions package contains extra Server Extensions package must be installed with the • Repository: /mnt/ITSO_SHARE/NCI/FP5/ImpactExtF	Jetcool Operations Insight 7.1.0.5 Impact Server features that work with IBI Impact Server package. <u>More info</u> Repository	M Netcool Operations	Insight. The Impact
 Snow <u>all versions</u> Details IBM Tivoli Netcool/Impact Server Extensions for N The Impact Server Extensions package contains extra Server Extensions package must be installed with the • Repository: /mnt/ITSO_SHARE/NCI/FP5/ImpactExtR	Vetcool Operations Insight 7.1.0.5 Impact Server features that work with IBI Impact Server package. <u>More info</u> Vepository	M Netcool Operations	Insight. The Impact
Snow <u>all versions</u> Details IBM Tivoli Netcool/Impact Server Extensions for N The Impact Server Extensions package contains extra Server Extensions package must be installed with the • Repository: /mnt/ITSO_SHARE/NCI/FP5/ImpactExtF	Jetcool Operations Insight 7.1.0.5 Impact Server features that work with IBI Impact Server package. <u>More info</u> Repository	M Netcool Operations	Insight. The Impact
 Snow <u>all versions</u> Details IBM Tivoli Netcool/Impact Server Extensions for N The Impact Server Extensions package contains extra Server Extensions package must be installed with the Repository: /mnt/ITSO_SHARE/NCI/FP5/ImpactExtF) 	Jetcool Operations Insight 7.1.0.5 Impact Server features that work with IBI Impact Server package. <u>More info</u> Repository	M Netcool Operations	Insight. The Impact

Figure 2-39 Install packages

6. Modify the Shared Resources Directory with the correct path as shown in Figure 2-40. Click **Next**.

IBM Installation Manager	_ = ×
Install Packages	
Select a location for the shared resources directory.	
Install Licenses Location Features Summary	
When you install packages, files are stored in two locations: 1) The shared resources directory - resources that can be shared by multiple packages. 2) The installation directory - any resources that are unique to the package that you are installing. Important: You can only select the shared resources directory the first time you install a package with the IBM Installation Ma best results select the drive with the most available space because it must have adequate space for the shared resources of f packages.	nager. For uture
Shared <u>R</u> esources Directory: /opt/IBM/netcool/IM/IBMIMShared Disk Space Information	Bro <u>w</u> se
Volume Available Space	
/ 32.08 GB	
Omega Back Next > Install	Cancel

Figure 2-40 Shared Resources Directory

7. You can see the installation directory (Figure 2-41).

agei	
e packages can be installed into a common packag te a new one.	e group
tory Archit	tecture
cool/impact 64-bit	
Disk Space Information	Browse
/ 32.08 GB	
<u>`</u>	
	e packages can be installed into a common packag te a new one. tory Archit cool/impact 64-bit Disk Space Information Volume Available Space / 32.08 GB

Figure 2-41 Installation directory

8. Click **Next** again after you change the path to /opt/IBM/tivoli/netcool/impact.

9. The next window that opens is the User Registry configuration (Figure 2-42).

	IBM Installation	n Manager	
nstall Packages			_
Fill in the configurations for the	packages.		7
Install Licenses	Location Features Summary		
🛙 🧊 Common Configurations	Common Configurations		
🕏 User Registry	User Registry		
User ID and Password	Select the user registry to use for user r	nanagement and authentication.	
Profile Ports	ObjectServer		
Nameserver	ObjectServer with SSL		
🛙 🧊 IBM Tivoli Netcool/Impact	LDAP		
Impact Server	DAP with SSL		
Derby Database	🔿 Local File Based		
	OMNIbus ObjectServer		
	The OMNIbus ObjectServer Super User running.	must exist and the OMNIbus ObjectServer must be configured a	nd
	Primary Host	Omni_A.swg.be.ibm.com	
	Primary Port	4100	
	Backup Host (Optional)	Omni_B.swg.be.ibm.com	
	Backup Port (Optional)	4100	
	Super or Administrator User ID	impactconnect	
	Super or Administrator User Password	•••••	
	Confirm Password	•••••	
		< Back Next > Install C	ancel

Figure 2-42 User Registry

10. The impact connect user must exist in the user repository. In this installation, the impact connect user is created in the aggregation ObjectServers. Ensure that the impact connect user is created in the aggregation ObjectServers before you continue (Figure 2-43). If you need more information about how to create a user in OMNIbus, see the following link:

https://ibm.biz/Bdrr58

Note: The ObjectServer repository is used for the initial configuration of Impact only. Later, we configure the Lightweight Directory Access Protocol (LDAP) repository and use it instead. Then, we remove the ObjectServer repository.

Click Next.

	IBM Installation Manager	
Install Packages		
Fill in the configurations for the	packages.	1
Install Licenses	Location Features Summary	
Common Configurations User Registry	Common Configurations User ID and Password	
🕏 User ID and Password	Provide an administrative user ID and password for Impact	
Profile Ports Nameserver	Impact User ID	
🛙 🧊 IBM Tivoli Netcool/Impact	impactadmin	
Impact Server Derby Database	Impact Password (Minimum 6 characters)	
	Confirm Impact Password	
)	< <u>B</u> ack Next > Install	Cancel

Figure 2-43 User ID and Password for the Impact administrator

11.Leave the default ports in Figure 2-44 and click Next.

	IBM Installation Manager	_ = X
Install Packages		
Fill in the configurations for the	packages.	
Install Licenses	Location Features Summary	
 Common Configurations User Registry User ID and Password Profile Ports Nameserver IBM Tivoli Netcool/Impact Impact Server Derby Database 	Common Configurations Profile Ports Impact requires a range of ports to run. Specify the starting port of the range. Starting port number for Impact Server 9080 Starting port number for GUI Server 16310	
0	< Back Next > Install	Cancel

Figure 2-44 Ports that are used

12.Configure the nameserver. This configuration is identical for both Impact servers, as shown in Figure 2-45.

Note: Ignore the error about the nameserver that cannot be found.

	IBM Installation Manager	×
Install Packages		
Fill in the configurations for the	packages.	
Install Licenses	Location Features Summary	
 Common Configurations User Registry 	Common Configurations Nameserver	
User ID and Password	Nameserver	
Profile Ports	The installed server uses the Impact Nameserver to publish its services. When Impact runs inside a cluster,	
💝 Nameserver	participate in cluster management.	
🗆 🧊 IBM Tivoli Netcool/Impact		
Impact Server	Primary Nameserver Host Impact_A.swg.be.ibm.com	
Derby Database	Primary Nameserver Port 9080	
	Secondary Nameserver Host Impact_B.swg.be.ibm.com	
	Secondary Nameserver Port 9080	
	Local Host Specify a fully qualified local host name. A fully qualified local host name is required to create server certificate. Local Host Impact_B.swg.be.ibm.com	
0	< <u>Back</u> <u>Next</u> > Install Cancel	

Figure 2-45 Secondary nameserver configuration

13.Configure the panel for a unique Impact instance name. Figure 2-46 shows the configuration for Impact-a.

Tip: The instance name is different, but both configurations use the same cluster name.

	IBM Installation Manager	_ = ×
Install Packages		
Fill in the configurations for the	packages.	
Install Licenses	Location Features Summary	
 Common Configurations User Registry 	Configuration for IBM Tivoli Netcool/Impact Server 7.1.0.5 Impact Server	bich
 User ID and Password Profile Ports 	cluster the instance belongs to. The command line port is used by Impact for it's command line service.	men
Nameserver	Instance Name	
IBM Tivoli Netcool/Impact	NCI	
👽 Impact Server	Cluster Name	
Derby Database	NCICLUSTER	
	Command Line Port	
	2000	
Ð	< Back Next > Install	Cancel

Figure 2-46 Configure the Impact name

	IBM Installation Manager	_ =
Install Packages		
Fill in the configurations for the	packages.	
Install Licenses	Location Features Summary	
 Common Configurations User Registry User ID and Password Profile Ports Nameserver IBM Tivoli Netcool/Impact Impact Server 	Configuration for IBM Tivoli Netcool/Impact Server 7.1.0.5 Impact Server The instance name will act as a unique identifier for the server instance and the cluster name defines w cluster the instance belongs to. The command line port is used by Impact for it's command line service. Instance Name NCI2 I Cluster Name	/hich
Derby Database	NCICLUSTER Command Line Port 2000	

14. Figure 2-47 shows the configuration for impact-b.

Figure 2-47 Configure the secondary Impact name

- 15.Next, configure the purpose of the Impact server, which differs for the Impact servers:
 - a. For Impact-A.swg.be.ibm.com, choose **Primary Database on this machine which also functions in a clustered environment and needs a Backup Database defined.** See Figure 2-48.

	IBM Installation Manager	
nstall Packages		
Fill in the configurations for the	: packages.	- and the second se
Install Licenses	Location Features Summary	
Common Configurations	Configuration for IBM Tivoli Netcool/Impact Server 7.1.0.5	
User Registry	Derby Database	
User ID and Password	Impact uses an embedded Derby Database for storing data for Impact Solutions and Impact Reporting Tools. If you are using a	
Profile Ports	stand-alone Impact Server, add the Derby primary host and port information to the panel. For an Impact clustered environment you must also add a Derby backup host and port to replicate data.	
Nameserver		- 1
🧊 IBM Tivoli Netcool/Impact		
Impact Server	Select the Derby Type.	
💝 Derby Database	PrimaryStandAlone - An Impact Server with no other cluster members. No need to define a Backup Database.	
	Primary - Database on this machine which also functions in a clustered environment and needs a Backup Database defined.	1
	Naither - A cluster member which will point to a Primary and Backup Database	1
	Vieterer - A ceaseer member which with point to a rinnary and backup bacabase.	- 1
	Derby Primary Host	1
	Impact_A.swq.be.ibm.com	
	Derby Primary Port	-1
	1527	
	Derby Backup Host	-1
	Impact_B swq.be.ibm.com	٦.
	Derby Backup Port	-1
	1527	
	Derby Replication Port	
	4851	
		1
	< Back Navts Install Ca	ncel
	С Даск Псих, шлай си	neer

Figure 2-48 Configure the primary derby database

b. For Impact-B.swg.be.ibm.com, choose **Backup - Database on this machine which also functions in a clustered environment and needs a Primary Database defined.** See Figure 2-49. Click **Next**.

	IBM Installation Manager
nstall Packages	
Fitt in the configurations for the	
Install / Licenses /	Location Features Summary
Common Configurations User Registry	Configuration for IBM Tivoli Netcool/Impact Server 7.1.0.5 Derby Database
User ID and Password Profile Ports	Impact uses an embedded Derby Database for storing data for Impact Solutions and Impact Reporting Tools. If stand-alone Impact Server, add the Derby primary host and port information to the panel. For an Impact cluste environment you must also add a Derby backup host and port to replicate data.
 Nameserver IBM Tivoli Netcool/Impact 	
Impact Server Oerby Database	Select the Derby Type. O PrimaryStandAlone - An Impact Server with no other cluster members. No need to define a Backup Datab
	O Primary - Database on this machine which also functions in a clustered environment and needs a Backup D
	Backup - Database on this machine which also functions in a clustered environment and needs a Primary D
	Derby Primary Host Impact_A.swg.be.ibm.com
	Derby Primary Port
	1527
	Derby Backup Host
	Impact_B.swg.be.ibm.com
	Derby Backup Port
	1527
	Derby Replication Port
	4851

Figure 2-49 Configure the secondary derby database

16. Start the installation (Figure 2-50) by clicking Install.

rmation
Total Available Space
32.08 GE
Size: 508.11 MB
Size: 1.70 GB

Figure 2-50 Installation summary review and start

17. Wait for the installation to finish (Figure 2-51).

Note: You can ignore the error to connect to the backup ObjectServer in Figure 2-51 if you know that the backup ObjectServer is not running.

	IBM Installation Manager	_ = ×
Install Packages		->
		Parallel and Par
	The packages are installed. <u>View Log File</u>	
	Multiple informations are generated. IMPACTIN0237I Failed to connect to Backup ObjectServer	k
	The following packages were installed:	
	9 % IBM Tivoli Netcool Impact	
	🗊 IBM Tivoli Netcool/Impact GUI Server 7.1.0.5	
	IBM Tivoli Netcool/Impact Server 7.1.0.5	
	IBM Tivoli Netcool/Impact Server Extensions for Netcool Operations Insight 7.1.0.5	
	l Note: If the packages support rollback, the temporary directory contains rollback files for installed packages. You can delete the files on the <mark>Files for rollback</mark> preference page.	
•		<u>F</u> inish

Figure 2-51 Successful installation
2.4.4 Verification

You can verify the installation.

Impact NameServer

You can check the running nameserver cluster through this URL:

http://impact-a.swg.be.ibm.com:9080/nameserver/services

Log in with impactadmin. The result is similar to Figure 2-52.

IBM Tivoli N	letcool/Impact - N	×	🗄 IBM Knowledge Center - C 😫 🔶 🕂				
🗲 🕑 impa	ct-a.swg.be. ibm.con	1: 9080/na	meserver/services 🔍 🧟 🦉				
Netcool N	ameserver is 1	runnin	ıg.				
Current clu	ister state table :	at this l	ocation:				
RPL# SEI	F		URL				
0 ***	• UP http	://impa	ct-A.swg.be.ibm.com:9080/nameserver/services				
1	UP http	://impa	ct-b.swg.be.ibm.com:9080/nameserver/services				
	\sim						
Last 100 co	mmands receive	d:					
RECORD	RECV	TIME	PARAMETERS				
4	1461781481536	0	ACCS=api ACTN=login DESI=-1 TYPE=ERROR DATA=37 (UNINITIALIZED_CONTENT) SHOWSYS=false SUPRES				
3	1461781478532	0	CS=api ACTN=login DESI=-1 TYPE=ERROR DATA=37 (UNINITIALIZED_CONTENT) SHOWSYS=false SUPRESS				
2	1461781475522	0	S=api ACTN=login DESI=-1 TYPE=ERROR DATA=37 (UNINITIALIZED_CONTENT) SHOWSYS=false SUPRESS				
1	1461781475522	0	ACCS=api ACTN=login DESI=-1 TYPE=ERROR DATA=37 (UNINITIALIZED_CONTENT) SHOWSYS=false SUPRES				

Figure 2-52 Nameserver status

2.5 IBM Tivoli Network Manager

This section describes the installation and basic configuration of IBM Tivoli Network Manager (Network Manager).

2.5.1 Introduction

Network Manager comes with a set of predefined requirements for the operating system. These requirements are documented on the IBM documentation server:

https://ibm.biz/BdrrNb

The IBM Prerequisite Scanner (version 1.2.0.17 in this book) will check these requirements against the installed operating system.

Note: The prerequisite configuration file for Tivoli Network Manager 4.2 is included in IBM Prerequisite Scanner 1.2.0.18. You can refer to the following Quick Start Guide for Prerequisite Scanner 1.2.0.18:

https://ibm.biz/BdrrNg

For this deployment, we used the settings in Table 2-8.

Setting	Value
Default directory	/opt/IBM/netcool/core/
OMNIbus user/password	itnmconnect/netcool
Network Manager GUI user/password	itnmadmin/netcool
\$NCHOME	/opt/IBM/netcool/core
\$ITNMHOME	<pre>\$NCHOME/precision</pre>

 Table 2-8
 Settings for the Network Manager installation

2.5.2 Check the prerequisites

The Prerequisite Scanner must be run by the user that installs the products. Run the command, add the missing packages, and correct the operating system settings. On the Tivoli Network Manager Core server, set the environment variable tnmCORE=True. This value forces the Prerequisite Scanner to detect the requirement for that component only. Example 2-53 shows how to run the command to check the prerequisites.

Example 2-53 Prerequisite Scanner command

su - netcool export tnmCORE=True			
[root@itnm-a precheck]# ./pre IBM Prerequisite Scanner Version: 1.2.0.17 Build : 20150827 OS name: Linux User name: root	req_checker.sh	"TNM 04200000" details	
Machine Information Machine name: itnm-a Serial number: VMware-42 16	f2 60 a4 6d 2c	da-e2 e8 2f f4 d0 d9 b0 51	
Scenario: Prerequisite Scan			
TNM - IBM Tivoli Network Manag Property =======	ger [version O4 Result ======	200000]: Found	Expected
OS Version	PASS	Red Hat Enterprise Linux Server rel	AIX V6.1 AIX V7.1 RedHat Enterprise Linux Server 6.* RedHat Enterprise Linux Server 7.* SuSE Linux Enterprise Server 11.*
Memory	WARN	5.88GB	2-8GB
os.space.tmp	PASS	93GB	1GB
os, space, var	PASS	93GB	1GB
os.localhostInHostsFile	PASS	True	True
network.ipv4Available	PASS	True	True
network.dns	PASS	True	True
network.pinglocalhost	PASS	True	True
network.pingSelf	PASS	True	True
os.ulimit	PASS	8192	[type:filedescriptor]imit]8192+.unlimited
os.ulimit	PASS	65536	[type:maxprocesses]imit]16384+.unlimited
Disk	PASS	93.00GB	70GB
os.swapSize	WARN	3.87GB	4GB+
os.SELinux	PASS	Disabled	[source:Command]Disabled
os.lib.libstdc.so.6_64	PASS	/usr/lib64/libstdc++.so.6	/usr/lib64/libstdc++.so.6

os.package.python	PASS	python-2.7.5-16.el7.x86_64	python-2.6.6+
os.package.libstdc++.x86_64	PASS	libstdc++-4.8.3-9.el7.x86_64	libstdc++-4.8.2+
Aggregated Properties for Scanned	d Products:		
Property	Result	Found	Expected
=======	======	=====	=======
/	PASS	93.00GB	72.00GB
Memory	WARN	5.88GB	2.00-8.00GB
Overall result: WARNING (TNM (04200000: WA	RNING)	
Environment variable settings: [tnmCORE=tru	e, tnmGUI=[Not Found]]	
Detailed results are also availal	ole in /mnt/	/ITSO_SHARE/ITNM/precheck/result.txt	

2.5.3 Installation

Follow these steps:

 Before you install the Network Manager core, extract the db2_creation_scripts.tar.gz DB2 creation scripts into a temporary folder on the DB2 database server DBServ-a.swg.be.ibm.com, as shown in Example 2-54. You can find this file in the top directory of the ITNM repository.

Example 2-54 Extract the DB2 creation scripts

SQL authorization ID = DB2INST1

```
tar xzvf /mnt/ITS0_SHARE/ITNM/Base/db2_creation_scripts.tar.gz
As root, create the ncim user on the OS.
useradd ncim -g db2iadm1
passwd ncim (netcool)
As db2inst1, create the database.
su - db2inst1
./create db2 database.sh ITNM ncim
DB20000I The CREATE DATABASE command completed successfully.
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 10.5.3
You can issue database manager commands and SQL statements from the command
prompt. For example:
   db2 => connect to sample
   db2 => bind sample.bnd
For general help, type: ?.
For command help, type: ? command, where command can be
the first few keywords of a database manager command. For example:
? CATALOG DATABASE for help on the CATALOG DATABASE command
                 for help on all of the CATALOG commands.
? CATALOG
To exit db2 interactive mode, type QUIT at the command prompt. Outside
interactive mode, all commands must be prefixed with 'db2'.
To list the current command option settings, type LIST COMMAND OPTIONS.
For more detailed help, refer to the Online Reference Manual.
db2 =>
  Database Connection Information
Database server
                      = DB2/LINUXX8664 10.5.3
```

Local database alias = ITNM

```
db2 => db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => db2 => DB20000I The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB20000I The SOL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB200001 The SQL command completed successfully.
db2 => DB200001 The SQL command completed successfully.
db2 => DB200001 The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => db2 => DB200001 The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => DB200001 The SQL command completed successfully.
db2 => DB20000I The SQL command completed successfully.
db2 => db2 => DB20000I The SQL command completed successfully.
db2 => db2 => DB20000I The UPDATE DATABASE MANAGER CONFIGURATION command completed successfully.
SQL1362W One or more of the parameters submitted for immediate modification
were not changed dynamically. Client changes will not be effective until the
next time the application is started or the TERMINATE command has been issued.
Server changes will not be effective until the next DB2START command.
db2 => DB20000I The UPDATE DATABASE MANAGER CONFIGURATION command completed successfully.
db2 => db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
SQL1363W One or more of the parameters submitted for immediate modification
were not changed dynamically. For these configuration parameters, the database
must be shut down and reactivated before the configuration parameter changes
become effective.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB200001 The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB200001 The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
SQL1363W One or more of the parameters submitted for immediate modification
were not changed dynamically. For these configuration parameters, the database
must be shut down and reactivated before the configuration parameter changes
become effective.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
SQL1363W One or more of the parameters submitted for immediate modification
were not changed dynamically. For these configuration parameters, the database
must be shut down and reactivated before the configuration parameter changes
become effective.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
SQL1363W One or more of the parameters submitted for immediate modification
were not changed dynamically. For these configuration parameters, the database
must be shut down and reactivated before the configuration parameter changes
become effective.
db2 => DB20000I The UPDATE DATABASE CONFIGURATION command completed successfully.
db2 => db2 => DB20000I The SQL command completed successfully.
```

```
db2 => DB20000I The SQL command completed successfully.
db2 => db2 => DB20000I The SQL command completed successfully.
db2 => db2 => DB20000I The SQL DISCONNECT command completed successfully.
db2 => DB20000I The QUIT command completed successfully.
db2 => DB20000I The QUIT command completed successfully.
Database Connection Information
Database server = DB2/LINUXX8664 10.5.3
SQL authorization ID = DB2INST1
Local database alias = ITNM
DB20000I The SQL DISCONNECT command completed successfully.
```

2. Start the core installation on the itnm-a.swg.be.ibm.com core server. Start the previously installed Installation Manager as shown in Example 2-55.

Example 2-55 Starting the Installation Manager

```
cd /opt/IBM/netcool/IM/InstallationManager/eclipse
./IBMIM
```

3. Figure 2-53 shows the Installation Manager GUI.

	IBM Installation Manag	er	- • ×
File Help			
IBM Installation Manager			
	Install Install software packages.		
	Update Discover and install updates and fixes to installed software packages.		
A	Modify Change installed software	Roll Back	
	packages by adding or removing features and functions.	Uninstall	
IBM.			

Figure 2-53 Installation Manager GUI

4. Add all of the Network Manager server repositories by selecting File \rightarrow Preferences \rightarrow Repositories \rightarrow Add Repository. Browse for the repository. Click OK.

Eile Hel		Proforoncos			
IBM Ir type filt		Freferences			
	er text 🛛 🔏	Repositories			
Repos Appea Files	sitories arance for Rollback	Repositories:	Connection	Add Repository	
🕀 Help		Add Repository		Edit Repository	
🕀 Intern Passp	net Add	a repository ify a repos [‡] ory and add to the repository preference list.		lemove Repository Move Up	
Lindat	Repos	sitory:		Move Down	
oput	/mnt/	/ITSO_SHARE/ITNM/Base/repositories/disk1/diskTag.inf	✓ <u>B</u> rowse…	Clear Credentials	
				Test Connections	
		Cancel	ОК	; (including the	
		Search service repositories during installation and updates.	Restore Defa	ults Apply	
IBN ?			Cancel	ОК	

Figure 2-54 shows how to add the Network Manager core repository.

Figure 2-54 Add a repository

5. Start the installation. Figure 2-55 shows the Installation Packages component selection panel. Select only the **Network Manager Core Components** and **Network Manager topology database creation scripts** and click **Next**.

IBM Inst	tallation Manager		
Install Packages			
Select packages to install:			7
Installation Packages	Status	Vendor	License Key Type
🗖 🕵 🕅 Network Manager Core Components			
Image: State of the state o	Will be installed	IBM	
🖃 🎯 🗊 Network Manager topology database creation scripts			
	Will be installed	IBM	
🗆 🗏 🕼 Network Manager GUI Components			
🗆 🛱 Version 4.2		IBM	
🗆 🗇 🗊 Network Manager Reports			
🗆 🕼 Version 4.2		IBM	
Show <u>a</u> ll versions		Check for Other	Versions, Fixes, and Extensions
Details			
Network Manager Core Components 4.2			
Network device discovery, polling, and root cause analysis processe being discovered. <u>More info</u>	es. Must be installed on a m	achine that has goo	od access to the networks
Repository: /mnt/ITSO_SHARE/ITNM/Base/repositories/disk1			
	< Back	<u>N</u> ext >	Install

Figure 2-55 Select Network Manager components

6. Select Next to accept the license agreement, as shown in Figure 2-56.

IE	BM Installation Manager				
Install Packages Read the following license agreements carefully.					
Install Prerequisite Licenses Location	n Features Summary				
Network Manager Core Components	ΝΟΤΙCΕ				
License Agreement Network Manager topology database creation scripts License Agreement 	This document includes License Information documents below for multiple Programs. Each License Information document identifies the Program(s) to which it applies. Only those License Information documents for the Program(s) for which Licensee has acquired entitlements apply.				
	LICENSE INFORMATION The Programs listed below are licensed under the following License Information terms and conditions in addition to the Program license terms previously agreed to by Client and IBM. If Client does not have previously agreed to license terms in effect for the Program, the IBM International Program License Agreement (Z125-3301-14) applies.				
I accept the terms in the license agreements	Program Name: IBM Tivoli Network Manager IP Edition Base 4.2 Program Number: 5724-545 Print All				
○ I <u>d</u> o not accept the terms in the license agreements ⑦	< Back Next > Install Cancel				

Figure 2-56 License Agreement

7. As shown in Figure 2-57, change the default shared resources directory. We used the /opt/IBM/netcool/IM/IBMIMShared shared resources directory. Click **Next**.

		IBM Ins	allation Manager			_ □ >			
Install P	ackages								
Select a lo	ocation for the sha	red resources directory.							
Install	Prerequisite	e Licenses Location	Features Summary						
M 1 2 Ir b	When you install packages, files are stored in two locations: 1) The shared resources directory - resources that can be shared by multiple packages. 2) The installation directory - any resources that are unique to the package that you are installing. Important: You can only select the shared resources directory the first time you install a package with the IBM Installation Manager. For best results select the drive with the most available space because it must have adequate space for the shared resources of future								
Shared Res	sources Directory:	/opt/IBM/netcool/IM/IBMIMShared				Browse			
Volume	Available Space								
/	92 13 GB								
			< Back	Next >	Install	Consol			
0				INEXL >	1 SLOLL	L and A			
?						Cancel			

Figure 2-57 Shared resources

8. Figure 2-58 shows the installation directory selection. Leave it as it is. Click Next.

	IBM Installation Manager	
Install Packages A package group is a location that contains one or more parand will share a common user interface. Select an existing Install Prerequisite Licenses Locat O Use the existing package group O Create a new package group	ckages. Some compatible packages can be installed into a o package group, or create a new one. tion Features Summary	common package group
Package Group Name	Installation Directory	Architecture
📜 IBM Netcool Core Components	/opt/IBM/netcool/core	64-bit
Installation Directory: //opt/IBM/netcool/core Architecture Selection: 32-bit 64-bit Details Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMS	Disk Space Information	B <u>r</u> owse
Shared Resources Directory, Jopund-Infractouring Directory	Volume Available Space / 92.13 GB	
)	< Back Next >	Install

Figure 2-58 Installation directory

9. As shown in Figure 2-59, all selected packages will be installed. Click Next.

IBM	Installation Manage	er			-	
Install Packages						5
Select the features to install.						-
Install Prerequisite Licenses Location	Features S	Summary				
Features						
= 🥰 🕷 Network Manager Core Components 4.2						
Core components						
Additional cryptographic routines						
∃ 📝 🗊 Network Manager topology database creation scripts 4	1.2					
DB2 Database Server creation scripts						
Oracle Database Server creation scripts						
□ <u>S</u> how dependencies			<u>E</u> xpand All	<u>C</u> ollapse All	<u>R</u> estore Defaul	t
Selected by Installation Manager because of dependencies						
Details						
Network Manager Core Components 4.2						
)		< <u>B</u> ack	<u>N</u> ext >	Insta	Canc	el
0		< <u>B</u> ack	<u>N</u> ext >	Insta	all Ca	inc

Figure 2-59 Install Packages window

10. Figure 2-60 shows the ObjectServer configuration panel. You cannot configure the failover capability yet. Therefore, we use the Primary Aggregation ObjectServer (AGG_P). We change this name later. Click **Next**.

Tip: If you do not select the check box, you also choose to skip the configuration of the ObjectServer for Network Manager. We configure the Network Manager, triggers, and user accounts later in "Configuration" on page 113 when we finish the failover changes.

		IBM Installation Manager	_ 🗉 ×
Install Packages Fill in the configurations for the	packages.		-
Install Prerequisite Install Prerequisite Image: Network Manager Core Core ObjectServer Configurat Image: Network Manager users Network Manager users Network domain name Image: Topology Database Poller Aggregation	Licenses Configuration for ObjectServer Con Name: Host: Port: Super user ID: Password: Skip ObjectS	Location Features Summary or Network Manager Core Components 4.2 Giguration AGG_P Omni_a.swg.be.ibm.com 4100 itnmconnect ••••••• Server connection details verification and configuration.	
3	Skipping Object: the ObjectServe	Server connection details verification will also skip any additional configuration required er by Network Manager. Further manual configuration will be required.	f in Cancel

Figure 2-60 OMNIbus configuration panel

Note: The user itnmconnect needs to be configured in ObjectServer before you execute the step in Figure 2-60.

11. Figure 2-61 configures the default Network Manager users and password. The same password is used for both users.

IBM Installation Manager	. o x
Install Packages Fill in the configurations for the packages.	-
Install Prerequisite Licenses Location Features Summary Image: Stress Configuration for Network Manager Core Components 4.2 Network Manager users Network Manager users Network Manager users Network Manager users Network domain name Network domain name Network domain name Poller Aggregation Network domain name Password for already existing user will not be changed. Password: Image: Confirm password for these new users below. The same password is used for both u Image: Poller Aggregation Password: Image: Confirm password: I	iey isers.
(?) < Back Next > Install Ca	ancel

Figure 2-61 Network Manager users and password



	IBM Installation Ma	ñager		- D ×
Install Packages				
Fill in the configurations for the packages.				
Install Prerequisite Licenses	Location Features	Summary		
 I Network Manager Core Cc ObjectServer Configurat Network domain not not server and the initial name of discovered and methods. 	r Network Manager Core Co ame of the network domain. A network	omponents 4.2 work domain represent	s a collection of netw	vork entities to be
♦ Network domain name Network domain	name: NCOMS			
O Topology Database				
0		< Back	Next > Inst	Cancel

Figure 2-62 Network domain name

Important: This name is *not* the name of the ObjectServer. This name is used inside Network Manager to label the network partition that will be discovered and monitored.

13. Figure 2-63 shows the DB2 configuration window.

		IBM Installation Manager	- • X
Install Packages			
Fill in the configurations for the	packages.		
Install Prerequisite	Licenses L	ocation Features Summary	
 I Network Manager Core Co ObjectServer Configurat Network Manager users Network domain name Topology Database Poller Aggregation 	Configuration for Topology Database Network Manager database and the Database server t Database server t Oracle Database name:	Network Manager Core Components 4.2 needs a topology database to store discovery results. Please configure the type of connection details. ype-)	
	Server host:	dbserv_a.swg.be.ibm.com	
	Server port:	50000	
	User ID:	ncim	
	Password:	••••	
	🕜 Create tables	to hold topology data in selected database.	
	🗆 Skip database	connection details verification.	
0		< Back Next > Install	Cancel

Figure 2-63 DB2 configuration

Note: The user and database must exist already.

14.Do not change the Python path, as shown in Figure 2-64. Click **Next**.

	IBM Installation Manager	- • ×
Install Packages		
Fill in the configurations for the p	ackages.	
Install Prerequisite	Licenses Location Features Summary	
 I Network Manager Core Cc ObjectServer Configurat Network Manager users Network domain name Topology Database Poller Aggregation 	Configuration for Network Manager Core Components 4.2 Poller Aggregation The poller aggregation engine requires Python version 2.6 or 2.7 to be installed on this server. En path to the Python installation. Python path: //usr/bin/python	er the
3	< Back Next > Install	Cancel

Figure 2-64 Python path

15. Figure 2-65 shows the Install Packages panel. Click **Install** and wait until the installation completes.

Install Packages c Review the summary information. Install Prerequisite Licenses Location Features Summary Target Location Package Group Name: IBM Netcool Core Components Installation Directory: /opt/IBM/netcool/Core Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared Packages Packages Packages Core components © Network Manager Core Components 4.2 Core components © Additional cryptographic routines Shared Delogy database creation scripts 4.2 © Database Server creation scripts Oracle Database Server creation scripts Installation Directory Information Disk Space Information Environment Disk Space Information English Total Available Sp / 92.13 Total Installation Size: 485.45 MB Total Installation Size: 1.71 GB * Repository Information		IBM Insta	llation Manager	
Review the summary information. Install Package Group Name: IBM Netcool Core Components Installation Directory: / opt/IBM/netcool/IM/IBMIMShared Packages Packages Packages Packages Packages Oracle Database Server creation scripts Biglish Total Available Sp / optic ID Download Size: 485.45 MB Total Installation Size: 1.71 GB	Install Packages			
Install Prerequisite Licenses Location Features Summary Target Location Package Group Name: IBM Netcool Core Components Installation Directory: /opt/IBM/netcool//ore Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared Packages Packages Packages	Review the summary informat	tion.		4
Target Location Package Group Name: IBM Netcool Core Components Installation Directory: /opt/IBM/netcool/core Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared Packages Packages Packages	Install Prerequisite	Licenses Location Fe	atures Summary	
Package Group Name: BM Netcool Core Components Installation Directory: /opt/IBM/netcool/Core Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared Packages Packages □ ① Network Manager Core Components 4.2 □ Core components □ Additional cryptographic routines □ ① Network Manager topology database creation scripts 4.2 □ ① Network Manager topology database creation scripts □ ② Network Manager topology database creation scripts □ ② Network Manager topology database creation scripts □ ③ Oracle Database Server creation scripts □ ↓	Target Location			
Installation Directory: /opt/IBM/netcool/Core Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared Packages Packages Packages O Network Manager Core Components 4.2 Additional cryptographic routines N Additional cryptograph	Package Group Name:	IBM Netcool Core Components		
Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared Packages Packages Packages Additional cryptographic routines Additional cryptographic routine	Installation Directory:	/opt/IBM/netcool/core		
Packages Packages Packages Additional cryptographic routines Additional cryptograph	Shared Resources Directory:	/opt/IBM/netcool/IM/IBMIMShared		
Packages Network Manager Core Components 4.2 Core components Additional cryptographic routines Network Manager topology database creation scripts 4.2 DB2 Database Server creation scripts Oracle Database Server creation scripts Environment English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB	Packages			
Network Manager Core Components 4.2 Additional cryptographic routines Network Manager topology database creation scripts 4.2 DB2 Database Server creation scripts Oracle Database Server creation scripts Forvironment Environment English Total Available Spider 485,45 MB Total Download Size: 485,45 MB Total Installation Size: 1.71 GB Repository Information Sector 485,45 MB Cancel Component Component August 2000 Component C	Packages			
Core components Additional cryptographic routines Network Manager topology database creation scripts 4.2 DB2 Database Server creation scripts Oracle Database Server creation scripts Disk Space Information Environment English Total Available Spice I g2.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information Seck Next > Install Can	🗆 🧊 Network Manager Cor	e Components 4.2		
Image: Additional cryptographic routines Image: Additional cryp	🚯 Core components			
Network Manager topology database creation scripts 4.2 DB2 Database Server creation scripts Oracle Database Server creation scripts Disk Space Information Total Available Sp / 92.13 Total Installation Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information	🚯 Additional cryptogra	phic routines		
© DB2 Database Server creation scripts © Oracle Database Server creation scripts Disk Space Information Environment English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Download Size: 1.71 GB Repository Information (Spack Next > Install Can	🗆 🧊 Network Manager topo	ology database creation scripts 4.2		
Control Database Server creation scripts Disk Space Information Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information Repository Information	🕼 DB2 Database Serve	r creation scripts		
Environment Disk Space Information English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information	🕼 Oracle Database Ser	ver creation scripts		
Environment Disk Space Information English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information				
Environment Disk Space Information English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information Can				
Environment Disk Space Information English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information Can				
English Total Available Sp / 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information	Environment		Disk Space Information	
/ 92.13 Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information	English			Total Available Space
Total Download Size: 485.45 MB Total Installation Size: 1.71 GB Repository Information			/	92.13 GB
Total Installation Size: 1.71 GB Repository Information < Back			Total Download Size: 485.45 MB	
Repository Information (Back Next > Install Can			Total Installation Size: 1.71 GB	
< Back Next > Install Can	Repository Information		k	
<pre>< Back Next > Install Can</pre>				
)		< Back Next >	Install Cancel

Figure 2-65 Install Packages Summary

16. Figure 2-66 shows the completed installation.

	IBM Installation Manager	_ = ×
Install Packages		
	The packages are installed. <u>View Log File</u>	
	To complete the Network Manager installation, you must run the script /opt/IBM/netcool/ core/precision/scripts/setup_run_as_setuid_root.sh as root. See the <u>Post installation tasks</u> in the installation documentation.	
	The following packages were installed:	
	□ [®] t _a IBM Netcool Core Components	
	🗊 Network Manager Core Components 4.2	
	Network Manager topology database creation scripts 4.2	
	Note: If the packages support rollback, the temporary directory contains rollback files for installed packages. You can delete the files on the <u>Files for rollback</u> preference page.	
0		Finish

Figure 2-66 Installation summary

After a successful installation, post-installation steps for non-root users are required, as described in the following document:

https://ibm.biz/BdrrNV

Example 2-56 shows the implementation of these steps in our environment.

Example 2-56 Steps for non-root users

```
su - root
/opt/IBM/netcool/core/precision/scripts/
./setup_run_as_setuid_root.sh
. /opt/IBM/netcool/core/env.sh
cd /opt/IBM/netcool/core/precision/install/scripts
./create_all_control.sh
```

Tip: Edit **create_all_control.sh** and comment out (by using the # sign) the "nco" line below:

\$NCHOME/precision/install/scripts/nco_create_control_scripts.sh \$1

Note that only two lines ar in the file. All other lines are the header comments:

\$NCHOME/precision/install/scripts/nco_create_control_scripts.sh \$1
\$NCHOME/precision/install/scripts/ncp_create_control_scripts.sh \$1

The edited version is shown:

```
#$NCHOME/precision/install/scripts/nco_create_control_scripts.sh $1
$NCHOME/precision/install/scripts/ncp_create_control_scripts.sh $1
```

The GUI is installed during the installation of IBM Jazz for Service Management (JazzSM).

Configuration

You need to configure the Network Manager core server for failover, as described in the following document:

https://ibm.biz/BdrrNA

Configuring the ObjectServer for Network Manager

Configure the ObjectServer for Network Manager if you skipped this step during the installation:

 Connect to any ObjectServer of the failover pair, for example, the Omni-A server. Copy the \$NCHOME/etc/interfaces.arch file from the NCHOME location of the ObjectServer to the NCHOME installation location on the server where Network Manager is installed. See Example 2-57.

```
Example 2-57 Interfaces.arch file copy
```

```
Connect to Omni-a, then:

cd $NCHOME/etc

scp interfaces.linux2x86 itnm-a.swg.be.ibm.com:/opt/IBM/netcool/core/etc

netcool@itnm-a.swg.be.ibm.com's password:

interfaces.linux2x86 itnm-b.swg.be.ibm.com:/opt/IBM/netcool/core/etc

netcool@itnm-b.swg.be.ibm.com's password:

interfaces.linux2x86
```

 Change the ConfigItnm.<DOMAIN>.cfg configuration to point to the primary and secondary Network Manager domains, and change the itnmDomain.objectServer to point to the AGG_V virtual ObjectServer. Perform these functions on both itnm core servers, as shown in Example 2-58.

Example 2-58 Change the ConfigItnm.<DOMAIN>.cfg configuration

```
vi /opt/IBM/netcool/core/etc/precision/ConfigItnm.NCOMS.cfg
insert into itnmDomain.failover
(
    FailoverEnabled,
    PrimaryDomainName,
    BackupDomainName,
    VirtualDomainName
)
```

```
values
(
    1,
    "NCOMS",
    "NCOMS_B",
    "NCOMS_V"
);
insert into itnmDomain.objectServer
(
        ServerName
)
values
(
        "AGG_V"
);
```

3. Add the Network Manager triggers and GUI user accounts to the ObjectServer:

a. Move this file to the ObjectServer server:

```
$NCHOME/precision/install/data/create_itnm_triggers.sql
create_itnm_triggers.sql
```

- b. Add the Network Manager triggers by running this command:
 - nco_sql -server AGG_P -user root -password '' < create_itnm_triggers.sql</pre>
- c. Create the accounts in the ObjectServer by using the nco_config administration GUI:

itnmadmin in the System group itnmuser in the Normal and ISQLWrite groups

Completing the Network Manager failover configuration

Complete the Network Manager failover configuration with the following steps:

 You must use the \$NCHOME/etc/precision/ServiceData.cfg file to set up a TCP socket connection between the primary and backup Network Manager domains on the primary itnm core server. See Example 2-59. This step adds the default line that is shown in step 4 to the ServiceData.cfg file.

Example 2-59 Set up a TCP socket connection

```
cd /opt/IBM/netcool/core/precision/bin
./ncp_virtualdomain -domain NCOMS
( IBM Tivoli Network Manager )
Copyright (C) 1997 - 2015 By IBM Corporation. All Rights Reserved. See product
license for details.
```

IBM Tivoli Network Manager Version 4.2 (Build 11) 64 bit created by ncpbuild at 08:57:51 Sat Jan 23 GMT 2016

ncp_virtualdomain[9621] Becoming Primary for tier 1

 Add the following lines to \$NCHOME/etc/precision/ServiceData.cfg on the backup itnm server on itnm-b:

```
SERVICE: ncp_virtualdomain DOMAIN: NCOMS_V ADDRESS: 172.16.61.140 PORT: 49810
SERVERNAME: itnm-a DYNAMIC: NO
```

See Example 2-60.

Example 2-60 ServiceData.cfg

```
vi $NCHOME/etc/precision/ServiceData.cfg
SERVICE: ncp_virtualdomain DOMAIN: NCOMS_V ADDRESS: 172.16.61.140 PORT: 49810
SERVERNAME: itnm-a DYNAMIC: NO
```

3. Restart the itnm core service on the primary server as the user netcool. See Example 2-61.

Example 2-61 Restart the itnm core service

itnm_stop ncp
itnm_start ncp

 On the itnm-b server, edit env.sh to include PRECISION_DOMAIN=NCOMS_B, as shown in Example 2-62.

Example 2-62 Edit env.sh

vi /opt/IBM/netcool/core/env.sh NCHOME=/opt/IBM/netcool/core; export NCHOME ITNMHOME=\$NCHOME/precision; export ITNMHOME PRECISION_DOMAIN=NCOMS_B; export PRECISION_DOMAIN

5. Restart the backup itnm instance (Example 2-63). It now restarts as domain NCOMS_B.

Example 2-63 Restart the backup itnm instance

itnm_stop ncp
itnm start ncp

2.5.4 Verification

Verify the installation. Review the log file for the ncp_virtualdomain that is in /opt/IBM/netcool/core/log/precision, as shown in Example 2-64. Look for the "Connection" messages and determine whether any errors exist.

Example 2-64 The log file for the ncp_virtualdomain

```
2016-05-05T19:29:50: Information: I-VER-001-001: [990959424t] Logging for ncp virtualdomain
initialized at level 'warn'
2016-05-05T19:29:50: Information: I-VER-001-023: [990959424t] Process run as: ncp virtualdomain
2016-05-05T19:29:50: Information: I-VER-001-022: [990959424t] Command line args: -domain
NCOMS B -latency 200000 -debug 0 -messagelevel warn -logdir /opt/IBM/netcool/core/log/precision
-tracefd 4
2016-05-05T19:29:50: Information: I-FAI-001-003: [990959424t] Operating as the backup domain in
a failover pair to primary domain 'NCOMS'
2016-05-05T19:29:50: Information: I-VIR-001-016: [990959424t] Primary domain is 'NCOMS'
2016-05-05T19:29:50: Information: I-VIR-001-017: [990959424t] Backup domain is 'NCOMS B'
2016-05-05T19:29:50: Information: I-VIR-001-018: [990959424t] Virtual domain is 'NCOMS V'
2016-05-05T19:29:51: Information: I-MOM-001-013: [990959424t] Connected to broker: 127.0.0.1:1883
using clientId: ncp virtualdomain 15295 NCOMS B
2016-05-05T19:29:51: Information: I-VIR-001-035: [990959424t] Waiting 2 health check periods
before accepting health check updates and OQL gueries
2016-05-05T19:29:51: Information: I-MOM-001-056: [990959424t] Starting process heartbeat
```

2016-05-05T19:29:51: Information: I-MOM-001-001: [990959424t] ncp_virtualdomain[15295] Version 4.2 (Build 11) 64 bit on linux2x86 becoming Primary 2016-05-05T19:29:53: Information: I-VIR-001-028: [930039552t] Requesting initial topology from Primary domain 2016-05-05T19:29:53: Information: I-VIR-001-020: [930039552t] Connection made to primary domain NCOMS 2016-05-05T19:29:53: Information: I-VIR-001-022: [923735808t] Updating topology in backup domain

2.6 IBM Jazz for Service Management (JazzSM)

This section describes the installation and basic configuration of IBM JazzSM.

2.6.1 Introduction

JazzSM combines data from integrated services to provide access to users to all data within a single page, including reporting, security, and administration. Users can use JazzSM to connect to DB2, IBM WebSphere®, Dashboard Application Services Hub (DASH), registry services, security services, and reporting services.

JazzSM adds value through these capabilities:

- Functions as the main entry point for the configuration of several Netcool Operations Insight components
- Offers users the capability to link resources to management capabilities
- Provides real-time data

2.6.2 Check the prerequisites

We show you how to get your server ready and how to check for all requirements before you install any of the products.

JazzSM has a set of predefined requirements for operating systems. These requirements are documented on the IBM documentation server:

https://ibm.biz/Bdrr7d

Example 2-65 shows an example from the command output.

Note: In Example 2-65, we show the prerequisite checking for Tivoli Common Reporting (TCR) because the checking is the most complete checking for JazzSM. Depending on your deployment needs, additional scripts exist in **JazzSMScripts** that you might need to run. For our scenario, the checking for Tivoli Common Reporting was enough.

Example 2-65 Running the precheck script for JazzSM

```
Run the precheck script for JazzSM
[root@jazz-a PrereqScanner]# 1s
                                               lib
                                                        NCM.sh precheck.log
                                                                                 properties
                                                                                                Readme.html TAD 720.sh
api
        codename.cfg LCM.sh
TADDMScripts TCR.sh
                        UNIX Linux build.num JazzSMScripts LCM_TAD_plugin_readme.txt licenses nls
                                                                                                       prereq_checker.sh
PRSResults.xsd result.txt TAD_722_plugin_readme.txt TAD.sh
                                                                   TWSScripts xml
[root@jazz-a PrereqScanner]# ./prereq_checker.sh TCR detail
IBM Prerequisite Scanner
    Version: 1.2.0.16
    Build : 20150429
    OS name: Linux
```

User name: root

Machine Information Machine name: jazz-a Serial number: VMware-42 16 ce f3 3b b3 c8 27-be 2b ed 20 9b 19 a5 58

Scenario: Prerequisite Scan

TCR - Tivoli Common Reporting [vers Property	ion 030102 Result	200]: Found	Expected
OS Version	PASS	Red Hat Enterprise Linux Server rel	AIX V6.1 AIX V7.1 Red Hat Enterprise Linux Server release 5.6+ Red Hat Enterprise Linux Server release 6.* Red Hat Enterprise Linux Server release 7.* SuSE Linux Enterprise Server 10 (*) SuSE Linux Enterprise Server 11 (*)
os.architecture	PASS	64-bit	64-bit
os.ulimit	FAIL	1024	<pre>[type:filedescriptorlimit]2048+,unlimited</pre>
os.RAMSize	PASS	3.7GB	3GB
os.space.tmp	PASS	33GB	1GB
os.localhostInHostsFile	PASS	True	True
os.space.opt_root_min	PASS	33/92MB	[dir:root=/opt/IBM,unit:MB]1024
os.space.opt_non_root_min	PASS	NOI_REQ_CHECK_ID	[dir:non_root=USERHUME/IBM,unit:MB]1024
os.package.compat-libstuc++-33	PAIL	Unavallable	compat = 11DStuc++=-33=-3.2.3=-01+
os package openmotif22	FATI	Unavailable	$compat-gript-2.3.4-2.20^{\circ}$
os package openmotif	FATI	Unavailable	openmotif=2 3+
os.tar	PASS	Available	Available
os.ulimit	FAIL	1024	[type:filedescriptor]imit]2048+.unlimited
os.lib.libXm.so.4 32	FAIL	Unavailable	/usr/lib/libXm.so.4
os.lib.libXm.so.4_64	FAIL	Unavailable	/usr/lib64/libXm.so.4
os.lib.libXmu.so.6_32	FAIL	Unavailable	/usr/lib/libXmu.so.6
os.lib.libXt.so.6_32	FAIL	Unavailable	/usr/lib/libXt.so.6
os.1ib.1ibX11.so.6_32	FAIL	Unavailable	/usr/lib/libX11.so.6
os.lib.libSM.so.6_32	FAIL	Unavailable	/usr/lib/libSM.so.6
OS.IID.IIDIUE.SO.0_32		Unavailable	/USY/IID/IIDILE.SO.0
05.110.110 $Xext. so 0.32$	FAIL	Unavailable	/usr/lib/lib/r so 6
os lib libych so 1 32	FAIL	Unavailable	/usr/lib/libych so 1
os.lib.libXau.so.6 32	FAIL	Unavailable	/usr/lib/libXau.so.6
os.lib.libXtst.so.6 32	FAIL	Unavailable	/usr/lib/libXtst.so.6
os.lib.libfreetype.so.6 32	FAIL	Unavailable	/usr/lib/libfreetype.so.6
os.lib.libuuid.so.1_32	FAIL	Unavailable	/lib/libuuid.so.1
os.lib.libgcc_s.so.1_32	FAIL	Unavailable	/lib/libgcc_s.so.1
os.lib.libc.so.6_32	FAIL	Unavailable	/lib/libc.so.6
os.lib.libXft.so.2_32	FAIL	Unavailable	/usr/lib/libXft.so.2
os.lib.libXrender.so.1_32	FAIL	Unavailable	/usr/lib/libXrender.so.1
os.lib.libtontconfig.so.1_32	FAIL	Unavailable	/usr/lib/libfontconfig.so.1
os.lib.libjpeg.so.62_32	FAIL		/usr/lib/libjpeg.so.62
os.lib.libdl.co.2.22			/usr/lib/libdl.co.2
os lib libernat so 1 32	FATI	Unavailable	/lib/libevnat so 1
os.lib.libz.so.1 32	FAIL	Unavailable	/lib/libz.so.1
os.lib.libm.so.6 32	FAIL	Unavailable	/lib/libm.so.6
os.lib.libstdc.so.5 32	FAIL	Unavailable	/usr/lib/libstdc++.so.5
os.lib.libstdc.so.6 32	FAIL	Unavailable	/usr/lib/libstdc++.so.6
os.lib.libLdLinux	FAIL	Unavailable	/lib/ld-linux.so.2
os.lib.libFreebl3	FAIL	Unavailable	/lib/libfreebl3.so
os.package.glibc.i686	FAIL	Unavailable	glibc.i686+
Aggregated Properties for Scanned P Property	roducts: Result	Found	Expected
======		=====	
/	PASS	33.00GB	2.00GB
Overall result: FAIL (TCR 030102	00: FAIL)		
Environment variable settings: [Ja	zzSM_Fresl	nInstall=[Not Found]]	
Detailed results are also available	in /mnt/	ITSO_SHARE/Jazz/PrereqScanner/result.txt	

You need to fix any of the FAIL messages before you proceed, which we did in the other products that are already installed in this book.

Configuring Linux

You need to disable SELinux in /etc/selinux/config, as shown in Example 2-66.

Example 2-66 Disable SELinux

vi /etc/selinux/config SELINUX=disabled

Increase the number of open files (nofile), as shown in Example 2-67.

Example 2-67 Increasing the nofile

vi /etc/securi	ty/limits	.conf	
netcool	hard	nofile	1048576
netcool	soft	nofile	1048576
@ncoadmin	hard	nofile	1048576
@ncoadmin	soft	nofile	1048576

Increase the number of processes (nproc), as shown in Example 2-68.

Example 2-68 Increasing nproc

vi/etc/s	ecurity/	limits.d/9	90-nproc.conf
*	soft	nproc	1048576
root	soft	nproc	unlimited

Note: Depending on the type of Linux distribution, the nproc configuration can also be in /etc/security/limits.conf.

2.6.3 Installation

Because of the distributed installation of our scenario (DB2 and JazzSM are installed on different servers), you need to create the Tivoli Common Reporting database (TCRDB) before you install JazzSM. The following URL has more details about these steps:

https://ibm.biz/Bdrr57

Follow these steps:

1. Create the tcruser and the TCRDB on the DB2 server first (Example 2-69).

Example 2-69 Creating the tcruser

```
For example, as root, on DBServ-a: useradd tcruser
```

 Run the command to generate the tcr_create_db2_cs.sq1 in the ContentStoreDatabase directory (Example 2-70).

Example 2-70 Generate content store

cd /mnt/ITS0_SHARE/Jazz/JazzSM/TCRCognos/ContentStoreDatabase
./TCR_generate_content_store_db2_definition.sh <database_name> tcruser

3. As the db2inst1 user, run the SQL script that was generated (Example 2-71).

Note: Because DB2 is on a remote server in this example, you must copy the file to the DB2 server to run the following example. For more information, see the IBM Knowledge Center:

https://ibm.biz/BdrrN3

Example 2-71 Running the SQL script

```
su - db2inst1
db2 -vtf
/mnt/ITS0_SHARE/Jazz/JazzSM/TCRCognos/ContentStoreDatabase/tcr_create_db2_cs.sq1
```

- 4. On the JazzSM servers, install the DB2 client. The following URLs explain how to install the DB2 client:
 - https://ibm.biz/BdrrNk
 - https://ibm.biz/BdrrNt
- 5. Catalog the remote server (Example 2-72).

Example 2-72 Catalog the remote server

db2 catalog tcpip4 node DBServ-a remote 172.16.61.137 server db2inst1

After you configure the TCRDB, perform the following steps to install JazzSM:

 Install JazzSM as the user netcool. From /mnt/ITS0_SHARE/Jazz/JazzSM, start the Installation Manager (Example 2-73).

Example 2-73 Starting the Installation Manager

```
su - netcool
export DISPLAY=:1
cd /opt/IBM/netcool/IM/InstallationManager/eclipse
./IBMIM
```

2. After you issue the command, launch the GUI. Select File \rightarrow Preferences. See Figure 2-67.



Figure 2-67 Choose a custom installation

3. The Preferences window (Figure 2-68) opens, where you add a repository. Click **Add Repository**. Add a repository for all of the products to install.

0	Preferences		
4	Repositories		\$ • \$ • •
Repositories Appearance	Repositories:		
Files for Rollback	Location	Connection	Add Repository
> Help			Edit Repository
Passport Advantage			Remove Repositor
Secure Storage			Move Up
opuates			Move Down
			Clear Credentials
			Test Connections
	Service repositories are remote locations where updates or extensions to packag are stored. ☑ Search service repositories during installation and updates.	es (including the Inst Restore D	allation Manager itsel
0		Cancel	ок
0		Cancel	ОК

Figure 2-68 Add a repository

Table 2-9 shows all of the repositories that we used in this book for the JazzSM installation. Several packages need more than one repository.

Table 2-9 Repositories that are needed for JazzSM

Packages	Repositories
IBM_WAS_FOR_JSM_FOR_LNX_ML.zip	/mnt/ITSO_SHARE/Jazz/JazzSM/WASRepository/disk1
JAZZ_FOR_SM_1.1.2.0_FOR_LNX.zip	/mnt/ITSO_SHARE/Jazz/JazzSM/JazzSMRepository/disk1
1.1.2-TIV-JazzSM-multi-FP001.zip	/mnt/ITSO_SHARE/Jazz/JazzSM_FP1.1.2.1/JazzSMFPRepository/disk1
ITCR_3.1.2.1_FOR_LINUX.tar.gz	/mnt/ITSO_SHARE/Jazz/JazzSM/TCRCognos
OMNIbus-v8.1.0.4-WebGUI.Linux64.zip	/mnt/ITSO_SHARE/OMNI/core/OMNIbusWebGUI_NOIExtensionsRepository
	/mnt/ITSO_SHARE/OMNI/core/OMNIbusWebGUIRepository
OMNIbus-v8.1.0-WebGUI-FP5-IM-Extensions-linux64-UpdatePack	/mnt/ITSO_SHARE/OMNI/webGUI_NOI_FP5/OMNIbusWebGUI_NOIExtensionsRepository
.210	/mnt/ITSO_SHARE/OMNI/webGUI_NOI_FP5/OMNIbusWebGUIRepository
OMNIbus-v8.1.0-WebGUI-FP5-IM-linux64-UpdatePack.zip	/mnt/ITSO_SHARE/OMNI/webGUI_FP5/OMNIbusWebGUIRepository
ITNP_IP_LIN.zip	/mnt/ITSO_SHARE/ITNM/Base/repositories/disk1
NTWRK_HLTH_DSHBRD_V4.2_LNX.zip	/mnt/ITSO_SHARE/ITNM/NTWRK_HLTH_DSHBRD_V4.2_LNX/repositories/disk1

- 4. The following screen captures show the repositories for the products that we will install.
- 5. Add a repository for WebSphere Application Server (WAS). Click **Browse**. Drill down to Jazz/JazzSM/WASRepository/disk1/. Choose **diskTag.inf**. See Figure 2-69. Click **OK**.

Add a repository Specify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/Jazz/JazzSM/WASRepository/disk1/diskTag.inf	~	Browse
Cancel		ок

Figure 2-69 Add a repository for WebSphere Application Server

- 6. Add a repository for JazzSM. Click Browse. Drill down to
 - Jazz/JazzSM/JazzSMRepository/disk1/ and choose **diskTag.inf**. See Figure 2-70. Click **OK**.

Add a repository Specify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/Jazz/JazzSM/JazzSMRepository/disk1/diskTag.int		Browse
Cancel		ок
Cancel		ок

Figure 2-70 Add a repository for JazzSM

 Add a repository for OMNIbus Web GUI. Click Browse. Drill down to /OMNI/webGUIOMNIbusWebGUIRepository/composite/. Under /OMNI/webGUIOMNIbusWebGUIRepository/composite/, choose repository.config. See Figure 2-71. Click OK.

Add a repository Specify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/OMNI/webGUI/OMNIbusWebGUIRepository/composite/repository.config		Browse
Ca	ncel	ок

Figure 2-71 Add a repository for OMNIbus Web GUI

- 8. Add a repository for Network Manager. Click **Browse**. Under
 - /ITNM/Base/repositories/disk1/, choose diskTag.inf. See Figure 2-72. Click OK.

Add a repository Specify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/ITNM/Base/repositories/disk1/diskTag.inf	<u> </u>	Browse
	Cancel	ок

Figure 2-72 Add a repository for Network Manager

9. Add a repository for the JazzSM fix pack. Click **Browse**. Under /Jazz/JazzSM_FP1.1.2.1/JazzSMFPRepository/disk1/, choose **diskTag.inf**. See Figure 2-73. Click **OK**.

Add a repository Specify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/Jazz/JazzSM_FP1.1.2.1/JazzSMFPRepository/disk1/diskTag.inf	~	Browse
	Cancel	ок

Figure 2-73 Add a repository for the JazzSM fix pack

10.Add a repository for WebGUI_NOI. Click Browse. Under /OMNI/core/OMNIbusWebGUI_NOIExtensionsRepository/, choose repository.config. See Figure 2-74. Click OK.

Add a repository Specify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/OMNI/core/OMNIbusWebGUI_NOIExtensionsRepository/repository.config	~	Browse
	Cancal	01
	Cancel	ОК

Figure 2-74 Add a repository for the WebGUI_NOI

٥	Preferences	
type filter text 🛛 🔏	Repositories	\$ · \$ · •
Repositories Appearance Files for Rollback Help Internet Passport Advantage Secure Storage Updates	Repositories: Location Com ✓ /mnt/ITSO_SHARE/Jazz/JazzSM/WASRepository/disk1/diskTag.inf 4 ✓ /mnt/ITSO_SHARE/Jazz/JazzSM/JazzSMRepository/disk1/diskTag.inf 4 ✓ /mnt/ITSO_SHARE/OMNI/webGUI/OMNIbusWebGUIRepository/composit 4 ✓ /mnt/ITSO_SHARE/OMNI/webGUI_NO1_FP5/OMNIbusWebGUIRepository/composit 4 ✓ /mnt/ITSO_SHARE/OMNI/webGUI_FP5/OMNIbusWebGUIRepository/com 4 ✓ /mnt/ITSO_SHARE/OMNI/webGUI_P5/OMNIbusWebGUIRepository/com 4 ✓ /mnt/ITSO_SHARE/OMNI/webGUI_NO1_FP5/OMNIbusWebGUIRepository/com 4 ✓ /mnt/ITSO_SHARE/ITNM/Base/repositories/disk1/diskTag.inf 4 ✓ /mnt/ITSO_SHARE/ITNM/NTWRK_HLTH_DSHBRD_V4.2_LNX/repositories/ 4	Add Repository Edit Repository Remove Repository Move Up Move Down Clear Credentials Test Connections
	 Service repositories are remote locations where updates or extensions to package Installation Manager itself) are stored. Search service repositories during installation and updates. 	es (including the efaults Apply
0	Cance	ЮК

11. After you add all of the repositories that you need, click **OK**. See Figure 2-75.

Figure 2-75 List of repositories



12. Click **Install** to start the installation, as shown in Figure 2-76.

Figure 2-76 Click Install to start the installation

13.Install the WebSphere Application Server packages first. Figure 2-77 shows our selections. Click **Next**.

🙀 type filter text	🏼 🖉 🕱 🛛 3 packages a	ire selected.		-+i -+i
Installation Packages		Status	Vendor	License Key Type
 IBM WebSphere Application 	n Server	Will be installed	IBM	
I D Retwork Manager Core Con D Q Version 4.2	mponents		IBM	
Image: Construction of the second	y database creation scripts		IBM	
 IBM WebSphere SDK Java 1 IBM Version 7,0.8.0 	Technology Edition (Optional)	Will be installed	IBM	
 ✓ □ ♣ Jazz for Service Management □ ♣ Version 1.1.0.2 ✓ ✔ ♣ Jazz for Service Management 	ent extension for IBM WebSphe ent extension for IBM WebSphe	re 8.0 re 8.5	IBM	
Show all versions			Check for Othe	er Versions, Fixes, and Extensio
Details				
IBM WebSphere SDK Java Tech	nology Edition (Optional)	7.0.8.0		
IBM SDKs provide a full-function So programming interfaces (APIs). Witi API level; and continue the "write o allows users to run Java Application	ftware Development Kit (SDK) h the IBM SDK, Java Technolog nce, run anywhere" Java parad Is. The SDK also contains addit	for Java, compliant with th y Edition you can: develop, igm at the Java API level. T ional developer tools that	e Oracle(TM) Java , test and deploy Ja The SDK contains th enable developers 1	SE 7 application va applications at the Java 7 e Runtime Environment that to create Java Applications.

Figure 2-77 Install WebSphere Application Server packages first

14. Accept the terms of the license agreements. See Figure 2-78. Click Next.

Licenses Location Features Summ	
7 IBM WebSphere Application Server	International Program License Agreement
Software License Agreement	Part 1 - General Terms
 Jazz for Service Management extension for IBM WebSphere 8.5 Software License Agreement 	BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, CLICKING ON AN "ACCEPT" BUTTON, OR OTHERWISE USING THE PROGRAM, LICENSEE AGREES TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON BEHALF OF LICENSEE, YOU REPRESENT AND WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND LICENSEE TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS,
	 * DO NOT DOWNLOAD, INSTALL, COPY, ACCESS, CLICK ON AN "ACCEPT" BUTTON, OR USE THE PROGRAM; AND * PROMPTLY RETURN THE UNUSED MEDIA, DOCUMENTATION, AND PROOF OF ENTITLEMENT TO THE PARTY FROM WHOM IT WAS OBTAINED FOR A REFUND OF THE AMOUNT PAID. IF THE PROGRAM WAS DOWNLOADED, DESTROY ALL COPIES OF THE PROGRAM. 1. Definitions "Authorized Use" - the specified level at which Licensee is authorized to execute or run the Program. That level may be measured by
l accept the terms in the license agreements	bumber of usersmillions of service units ("MSUs")_ Processor Value
I do not accent the terms in the license acreements	EUICA

Figure 2-78 Accept the terms of the license agreements

15.On the Install Packages window (Figure 2-79), verify the installation directory *for each package*, and click **Next**.

matum / Econor	Location Feat	ures Summary				
Use the existing pace	kage group					
<u>Create a new packa</u>	ge group					
Package Group Name		Installation Directo	ory		Architecture	
N. IBM WebSphere A	pplication Server V8.5	/opt/IBM/netcool/V	NebSphere			
Package Group Name:	IBM WebSphere Application Se	erver V8.5				
nstallation <u>D</u> irectory:	/opt/IBM/netcool/WebSphere				Bro	wse
		-				
Details			Disk Spa	ce Information		
Shared Resources Dire	ctory: /opt/IBM/netcool/IBMIMS	Shared	Volume	Available Space		
			1	29.38 GB		
	k					
	· · ·					

Figure 2-79 Verify the installation directory

16.Figure 2-80 shows the packages to install. Click Next.

Select the features to install.				1
Install Licenses Location Features Summary				
Features				
IBM WebSphere Application Server 8.5.5.4				
🗹 🔀 IBM WebSphere SDK Java Technology Edition (Optional) 7.0.8.0				2227-00-022-00-000-000-00-00-00-00-00-00-00-
Image:	2			
- Chan dependencies		[
_ <u>s</u> now dependencies			Mapse All	ore Default
Selected by Installation Manager because of dependencies				
Details				
BM WebSphere Application Server 8.5.5.4				
	acad Java Diatform	Enterprise Editio	n (Java EE) compl	liant 🔤
The IBM WebSphere Application Server family is the leading open standards-b	aseu java Flationin,	and the print of a circle	the second s	

Figure 2-80 Packages to install
17.Click Install. See Figure 2-81.

Install Packages		-N
Review the summary information.		7
Install Licenses Location Features	Summary	
Target Location		
Package Group Name: IBM WebSphere Application Server	V8.5	
Installation Directory: /opt/IBM/netcool/WebSphere		
Shared Resources Directory: /opt/IBM/netcool/IBMIMShared		
Packages		
Packages		
▼		
WebSphere Application Server Full Profile		
IBM WebSphere SDK for Java Technology Edition 6		
IBM WebSphere SDK Java Technology Edition (Optional) 7.	0.8.0	
🗢 🖗 Jazz for Service Management extension for IBM WebSpher	re 8.5 1.1.0.2	
🚯 Install JazzSM WebSphere Extension		
Environment	Disk Space Information]
English		Total Available Space
	T	29.38 GB
	Total Download Size: 1.08 GB	
	Total Installation Size: 2.37 GB	
Repository Information		
٩	< Back Navt >	Install

Figure 2-81 Review the summary information and start the installation

18. Figure 2-82 shows the progress of the package installation.

Install Cicenses Cocation Feature	s Summary	
Target Location		
Package Group Name: IBM WebSphere Applicati	on Server V8.5	
Installation Directory: /opt/IBM/netcool/WebSph	ere	
Shared Resources Directory: /opt/IBM/netcool/IBMIMS	hared	
Packages		
Packages		
♥		
WebSphere Application Server Full Profile		
👂 🚯 IBM WebSphere SDK for Java Technology Editi	on 6	
🕼 IBM WebSphere SDK Java Technology Edition (Op	ptional) 7.0.8.0	
	WebSphere 8.5 1.1.0.2	
🚯 Install JazzSM WebSphere Extension		
Environment	Disk Space Information	
English		Total Available Space
	7	29.38 GI
	Total Download Size: 1.08 GB	
	Total Installation Size: 2.37 GB	
Repository Information		

Figure 2-82 Installation in progress

19. Ensure that you select **None** in Figure 2-83 and click **Finish**.

Profile Management Tool to create a profile. Profile Management Tool to create an application server profile Log on to IBM Dashboard Application Services Hub None Select "None" for profile creation The WebGui Install will perform this task

Figure 2-83 Select None and click Finish

20.At this point, WebSphere and JazzSM are installed. You will repeat the installation and select the rest of the GUI components. Or, you might choose to select all of these GUI components in a single installation.

You will select the following packages to complete the GUI installation:

- Reporting Services
- IBM Dashboard Application Services Hub (DASH)
- IBM Tivoli Netcool/OMNIbus Web GUI
- Network Manager GUI Components
- Network Health Dashboard
- Network Manager Reports
- 21.Install Dashboard Application Services Hub (DASH) and Network Manager GUI Components. Figure 2-84 shows our selections. Click **Next**.

🌺 type filter text	📄 🖉 🖾 💈 packag	es are selected.			- <u>+</u> -+1
Installation Packages		Status	Vendor	License Key Ty	/pe
🗌 ቢ Version 1.1.2.0			IBM		
 IBM Dashboard Application Set Image: Image of the set of the	rvices Hub	Will be installed	IBM		
Image: Constraint of the service			IBM		
 Image: Wetwork Manager GUI Compored Image: Wetwork Manager G	nents	Will be installed	IBM		
✓ ☑ 🖗 Network Health Dashboard ☑ 🛱 Version 4.2		Will be installed	IBM		
✓ ✓ I Network Manager Reports					
🗹 🕼 Version 4.2		Will be installed	IBM		
Show all versions			Check for Oth	er Versions, Fixes, and I	Extensio
Details					
Network Manager Reports 4.2					
Reports that use data from Network Ma specific parameters, and historical SNM	nager to present variou P information. You mus	is metrics in your network, for it install Tivoli Common Report	example, device of the second se	onnectivity, technology ng the reports. <u>More inf</u>	- <u>)</u>
Repository: /tmp/cicvolcache_netcoo	l/com.ibm.tivoli.netcoo	l.itnm.core_4.2.0.20160131_08	807/md		

Figure 2-84 Installing DASH and Network Manager GUI Components

22. Accept the terms of the license agreements. See Figure 2-85. Click Next.

IBM Dashboard Application Services Hub	LICENSE INFORMATION
Software License Agreement	The Programs listed below are licensed under the following License Information terms and
Network Manager Reports	conditions in addition to the Program license terms previously agreed to by Client and IBM.
License Agreement	If Client does not have previously agreed to license terms in effect for the Program, the IBM
Reporting Services	international Program License Agreement (2125-5501-14) applies.
Software License Agreement	Program Name: Jazz for Service Management 1.1.2.0 Program Number: Component
	As described in the international Program License Agreement ("IPLA") and this License Information, IBM grants Licensee a limited right to use the Program. This right is limited to the level of Authorized Use, such as a Processor Value Unit ("PVU"), a Value Unit ("VU"), or other specified level of use, paid for by Licensee as evidenced in the Proof of Entitlement. Licensee's use may also be limited to a specified machine, or only as a Supporting Program, or subject to other restrictions. As Licensee has not paid for all of the economic value of the Program, no other use is permitted without the payment of additional fees. In addition, as stated in the IPLA, Licensee is not authorized to use the Program to provide
	commercial IT services to any third party, to provide commercial hosting or timesharing, or to sublicense, rent, or lease the Program unless expressly provided for in the applicable agreements under which Licensee obtains authorizations to use the Program. Additional rights may be available to Licensee subject to the payment of additional fees or under
	different or supplementary terms. IBM reserves the right to determine whether to make such additional rights available to Licensee.

Figure 2-85 Accept the terms of the license agreements

23. Verify the installation directory for each package group and click **Next**, as shown in Figure 2-86.

Install Licenses Location Features	Summary	
Package Group Name	Installation Directory	Architecture
🗢 🔨 Core services in Jazz for Service Management	/opt/IBM/netcool/JazzSM/	64-bit
 IBM Dashboard Application Services Hub 3.1.2.0 Reporting Services 3.1.2.0 IBM Netcool GUI Components Network Manager Reports 4.2 	/opt/IBM/netcool/gui	64-bit
Package Group Name: Core services in Jazz for Service Man Installation Directory: //opt/IBM/netcool/JazzSM/ Architecture Selection: O 32-bit	agement	Browse
Details	Disk Space Information	
Shared Resources Directory: /opt/IBM/netcool/IBMIMShared	Volume Available Space / 26.91 GB	

Figure 2-86 JazzSM installation

Install Liconsos	acation Easturac Su	mman 1			
Score services in Jazz for Si ♥ ① Common Configuration:	Common Configurations for C WebSphere Configuration	ore services in Jazz for Se	rvice Managem	ient	
 WebSphere Configure Ports Configuration IBM Dashboard Applica Context Root 	WebSphere installation location Profile deployment type	/opt/IBM/netcool/WebSphere Create WebSphere profile	:		Browse
 Reporting Services 3.1.: Database Configurat Cognos Install Image 	Profile details Profile location Profile name	/opt/IBM/netcool/jazzSM//prof	ile		Browse
 ✓ ◎ Network Manager Repo ◎ Jazz for Service Man ◎ Tazalan Database 	Node name Server name	JazzSMNode01 server1			
o lopology Database	User name	smadmin			
	Password confirmation	•••••			
iii D					

24. Accept the WebSphere default user ID, as shown in Figure 2-87.

Figure 2-87 Accept the WebSphere default user ID

Tip: After you enter the password in Figure 2-87, click Validate to verify the connections.

25. Accept the default ports in Figure 2-88. Click Next.

Install 🔪 Licenses 义 I	ocation Features Summary				
 Section Section Section	Common Configurations for Core services Ports Configuration	in Jazz for Se	ervice Manager	nent	
WebSphere Configuration IBM Dashboard Application	Configure the various network ports to which th Management listens.	e WebSphere A	pplication Server	profile for Jazz for Service	•
Context Root	HTTP transport port	16310			
 ✓ ∅ Reporting Services 3.1.: O Database Configurat 	HTTPS transport secure port	16311			
Ognos Install Image	Bootstrap port	16312			
 [™] IBM Netcool GUI Compone [™] Network Manager Repo 	SOAP connector port	16313			
O Jazz for Service Man	IPC connector port	16314			
O Topology Database	Administrative console port	16315			
	Administrative console secure port	16316			
	High availability manager communication port	16318			
	ORB listener port	16320		5	
	SAS SSL server authentication port	16321			
	CSIV2 client authentication listener port	16322			
an 🔊	<u> </u>	m			>

Figure 2-88 Accept the default ports

20.110 instantion of the bazzow (DAOI) packages starts. Dee Figure 2.05.	26. The installation of the .	JazzSM (DASH) packad	ges starts. See Figure 2-89.
--	-------------------------------	----------------------	------------------------------

Install Cicenses I	ocation	Features Summa	ry		
 ^e Core services in Jazz for S ^e Common Configuration: ^e WebSphere Configuration: 	Configuration Context Root	for IBM Dashboard	Application Services H	lub 3.1.2.0	
 ☑ Ports Configuration ✓ (i) IBM Dashboard Applica 	Context Root	/ibm/console			
🤝 Context Root					
 Reporting Services 3.1.: Database Configurat Cognos Install Image 					
✓ ¹ IBM Netcool GUI Compone					
Iazz for Service Mani					
O Topology Database					
< III >					

Figure 2-89 Install the DASH packages

Install Licenses Location Features Summany				
install / Licenses / Location / Teatures / Summary				
eatures				
IBM Dashboard Application Services Hub 3.1.2.0				
🗹 梦 Installation				
Configuration				
🛛 🖃 🧊 Reporting Services 3.1.2.0				
🗢 🖃 🕼 Schema				
🗹 🔣 Installation				
Configuration				
🗹 🔣 Installation				
Configuration				
🛛 🗹 🧊 Network Manager Reports 4.2				
Network Manager Reports				
	(F)	(<u></u>)	(n	6 II
j <u>≥</u> now dependencies	Expand All	Collapse All	Restore De	arault
Selected by Installation Manager because of dependencies				
etails				
onfiguration				

27. Install the Tivoli Common Reporting package. See Figure 2-90. Click Next.

Figure 2-90 Tivoli Common Reporting installation

Tip: To avoid the message, "Unable to connect to the Cognos content store", ensure that you create the tcruser first by using the command **useradd tcruser** on the DB2 server and initialize and start the TCRDB. See 2.6.3, "Installation" on page 118.

28.As shown in Figure 2-91, install the database client for Tivoli Common Reporting and click **Test connection**.

Install 🔪 Licenses 🔬 I	Location Feature	ures Summary	
 Section 2 Section 2 Se	Configuration for Re Database Configuration	Reporting Services 3.1.2.0 on	
 WebSphere Configuration Ports Configuration IBM Dashboard Applica 	Host name Remote database	172.16.61.137 TCRDB	
 Context Root Reporting Services 3.1.: Database Configurat Cognos Install Image 	User name Password	db2inst1	
 ⁴ ¹ ¹ ¹ ¹ ¹ ¹ ¹ ¹ ¹ ¹	Database port numbe	ber 50000	
un 🔊			

Figure 2-91 Install the database client for Tivoli Common Reporting

29.As shown in Figure 2-92, confirm the Tivoli Common Reporting (TCR) directory and click **Validate**. In our environment, the TCR directory is under /mnt/ITS0_SHARE/Jazz/JazzSM/TCRCognos.

Note: These files are the same files that you unpacked from ITCR_3.1.2.1_FOR_LINUX.tar.gz.

Install Licenses	Location Features Summary	
 ^e Core services in Jazz for Si ^e ⁽ⁱ⁾ Common Configuration: ⁱⁱⁱ WebSphere Configuration ⁱⁱⁱⁱ Ports Configuration 	Configuration for Reporting Services 3.1.2.0 Cognos Install Image Location Note: Specify the complete path upto TCRCognos (ex: <extracted location="">/TCRCogno</extracted>	ıs)
 IBM Dashboard Applica Context Root Reporting Services 3.1.: Database Configurat Cognos Install Image Cognos Install Image IBM Netcool GUI Compone IBM Network Manager Repo Jazz for Service Mana Topology Database 	Cognos Install Image //mnt/ITSO_SHARE/Jazz/JazzSM/TCRCognos	Browse

Figure 2-92 Validate the connection

30.As shown in Figure 2-93, verify the packages that you need to install and click Next.

Note: As shown in Figure 2-93, we did not check the option "Install event search with IBM Operations Analytics - Log Analysis" on purpose because event search needs the Log Analysis server to be installed and running.

Select the reatures to install.				
Install Licenses Location Features Summ	mary			
Features				6
🕨 🗹 🗿 IBM Dashboard Application Services Hub 3.1.2.1				
🗢 📄 🗊 Reporting Services 3.1.2.1	er werdenin . Nordenieszandan			
👂 🖃 🏡 Schema				
Image: Application				
🗢 🖃 🗊 IBM Tivoli Netcool/OMNIbus Web GUI 8.1.0.5				
✓ Install base features				
 Install event search with IBM Operations Analytics - Log A 	nalysis			
🗢 🗹 🙀 Netcool Operations Insight Extensions for IBM Tivoli Netcool/	OMNIbus Web GUI 1.4.0.1			nonononosti
Install Event Analytics				
🗢 🗹 🔀 Network Manager GUI Components 4.2				
✓ Product Files				
🗢 🗹 🔀 Network Health Dashboard 4.2				
Product Files				
🗢 📝 🛍 Network Manager Reports 4.2				
Show dependencies		Expand All	lapse All Rest	tore Default
Selected by Installation Manager because of dependencies				
Details				
BM Dashboard Application Services Hub 3.1.2.1				
BM Dashboard Application Services Hub is the user interface in Jazz f BM products and related applications. Select IBM Dashboard Applicat	or Service Management, ar ion Services Hub offering to	d provides a singl install and deplo	e portal for admi / IBM Dashboard	inistering 1
		<u></u>		

Figure 2-93 Verify the packages that you need to install

31.Install the Network Manager packages. As shown in Figure 2-94, we accept the default port, 4100.

Note: As shown in Figure 2-94, due to a limitation of the configuration wizard, for now, we set up the connection to the primary ObjectServer, AGG_P, but we will modify the data source later for high availability.

Install Cicenses	Location F	Features Summary				
 Core services in Jazz for S Common Configuration: 	Configuration ObjectServer Cor	for Network Manager GUI Con nfiguration	nponents 4.	2		
 WebSphere Configura Ports Configuration IBM Dashboard Applica Context Root 	Network Manag named ObjectS be running duri Network Manag	ger uses event data from a Netcoc lerver used by the Web GUI for even ng installation. Enter the connecti ger to use.	l/OMNIbus We ent informatio on details of th	ebGUI data source n. This Netcool/O ne Netcool/OMNI	e. A data source is MNIbus Objectser bus ObjectServer f	a ver must for
 ✓ ∅ Reporting Services 3.1.: ☑ Database Configurat 	Name:	AGG_P				
🖾 Cognos Install Image	Host:	omni_a.swg.be.ibm.com				
 IBM Netcool GUI Compone Ight Network Manager GUI (Port:	4100				
🤝 ObjectServer Configu	Super user ID:	root				
Network Manager us Or Topology Database	Password:	[
	Create/over	write WebGUI data source				
k	Create a new d source exists, t source, clear th instructions in t	ata source in Netcool/OMNIbus W his option will overwrite it. If you is option and configure the WebGU the post-installation tasks section	ebGUI and con want Network JI data source in the Networ	figure Network M Manager to use a manually after in k Manager docun	lanager to use it. I a specific existing nstallation. Use the nentation.	f a data data e

Figure 2-94 Accept the default port

Important: Whether you check "Create/overwrite WebGUI data source" or not, ensure that the \$NCHOME/etc/precision/ModelNcimDb.</br>

32. Enter the password, as shown in Figure 2-95, and click Next.

Install <u>Licenses</u>	Location Featu	res Summary			
 ♥ Core services in Jazz for S ♥ () Common Configuration: 	Configuration for M Network Manager use	letwork Manage rs	GUI Component	s 4.2	
 WebSphere Configura Ports Configuration IBM Dashboard Applica Context Root 	Network Manager cr do not already exist. The password of an	eates two users in . Enter a password i already existing us	the Netcool/OMNIbu for these new users er will not be change	is ObjectServer: itn below. The same pa ed.	madmin and itnmuser, if they assword is used for both users
 Reporting Services 3.1.: Database Configurat Cognos Install Image IBM Netcool GUI Compone Network Manager GUI (ObjectServer Configu Network Manager us Topology Database 	Password: Confirm password:	•••••			

Figure 2-95 Set the password

- 33.Configure the topology database connection. Enter the values that are shown in Figure 2-96:
 - For the database name, enter ITNM.
 - For the server host, enter 172.16.61.137.
 - For the server port, enter 50000.
 - For the user ID, enter ncim.
 - For the password, enter the password for the ncim user.

Accept all of the defaults.

Install Licenses	Location Feal	tures Sumn	hary		
 ✓ ⁴/₂ Core services in Jazz for Sⁱ ✓ [®] Common Configuration: 	Configuration for Network Manager GUI Components 4.2 Topology Database				
 ☑ WebSphere Configuration ☑ Ports Configuration ☑ IBM Dashboard Applica ☑ Context Root ☑ Context Root ☑ Database Configurat 	Network Manager database and the Database server t	needs a topology connection details type	database to store discovery results. I s.		
Cognos Install Image	Database name:	ITNM			
✓ Q IBM NetCool Gol Compone ✓ Q Network Manager GUI (Server host:	172.16.61.137			
DbjectServer Configu	Server port:	50000			
V Topology Database	User ID:	ncim			
	Password:	•••••			

Figure 2-96 Configure the topology database connection

34. Verify the installation packages and click **Install** as shown in Figure 2-97.



Figure 2-97 Verify the installation packages

35.Click Finish when it completes.

2.6.4 Verification

You can perform the following verification of the installation.

Open the DASH login page. For instance, to verify the jazz-a installation in our scenario, we opened the following URL in the browser:

https://jazz-a.swg.be.ibm.com:16311/ibm/console/

Ensure that you use the correct host name for your scenario and open the URL in your browser. You see the DASH login page. Log in with the smadmin user to verify that DASH works.

2.7 IBM Operations Analytics - Log Analysis

This section describes the installation and basic configuration of IBM Operations Analytics - Log Analysis (Log Analysis).

2.7.1 Introduction

Log Analysis comes with set of predefined requirements for the operating system. These requirements are documented on the IBM documentation server:

https://ibm.biz/BdrrNc

Prepare your system for the installation based on these requirements.

Table 2-10 shows the default installation directory.

Table 2-10 Settings for installing the IBM Operations Analytics - Log Analysis

Setting	Value
Default Directory	/opt/IBM/netcool/LogAnalysis/
\$SCALA_HOME	/opt/IBM/netcool/LogAnalysis/
\$UNITY_HOME	/opt/IBM/netcool/LogAnalysis/

2.7.2 Check the prerequisites

At the time of writing this book, Prerequisite Scanner did not support Log Analysis. This support became available shortly before we published the book. For more information, see the following link:

https://ibm.biz/BdrrNB

2.7.3 Setting the ulimit

You need to set the ulimit on the operating system (Example 2-74).

vi /etc/secur	ity/limits	.conf	
netcool	hard	nofile	4096
netcool	soft	nofile	4096
@ncoadmin	hard	nofile	4096
@ncoadmin	soft	nofile	4096

Example 2-74 Setting the ulimit

2.7.4 Installation and basic configuration

Due to a known limitation, Log Analysis cannot reuse an existing "group-mode" Installation Manager. You need to install a new one by using the **install.sh** script:

1. As the netcool user, launch the Installation Manager, as shown in Example 2-75.

Example 2-75 Launch the Installation Manager

```
mkdir LA
cd LA
tar xvzf 0ALA_1.3.2_ENTRY_LINUX_64_BIT.tar.gz
./install.sh
```

2. Select all packages to install and click **Next**. See Figure 2-98.

IBM	Installation Manager		
Install Packages			
Select packages to install:			
Installation Packages	Status	Vendor	License Key Type
□ ♥			
🕼 🕅 Version 1.8.2	Will be installed	IBM	No key required
🖃 📝 🗊 IBM Operations Analytics - Log Analysis			
	Will be installed	IBM	
Show all versions		Check for Other Ve	ersions, Fixes, and Extensions
Details			
Details			
Details IBM® Installation Manager 1.8.2 The IBM® Installation Manager is a tool that you can use to insta	all and maintain your software p	backages. <u>More info</u>	
Details IBM® Installation Manager 1.8.2 The IBM® Installation Manager is a tool that you can use to insta • Repository: /mnt/ITSO_SHARE/IOALA/LA/im.linux.x86	all and maintain your software p	oackages. <u>More info</u>	
Details IBM® Installation Manager 1.8.2 The IBM® Installation Manager is a tool that you can use to insta • Repository: /mnt/ITSO_SHARE/IOALA/LA/im.linux.x86	all and maintain your software p	backages. <u>More info</u>	
Details IBM® Installation Manager 1.8.2 The IBM® Installation Manager is a tool that you can use to insta • Repository: /mnt/ITSO_SHARE/IOALA/LA/im.linux.x86	all and maintain your software p	oackages. <u>More info</u>	
Details IBM® Installation Manager 1.8.2 The IBM® Installation Manager is a tool that you can use to insta • Repository: /mnt/ITSO_SHARE/IOALA/LA/im.linux.x86	all and maintain your software p	backages. <u>More info</u>	



3. Click I accept the terms in the license agreements, as shown in Figure 2-99, and click Next.

	IBM Installation Manager	_ = ×
Install Packages Read the following license agreements carefully		-
Install Licenses Location	Features Summary	
 IBM Installation Manager 	IMPORTANT: READ CAREFULLY	
License Agreement	Two license agreements are presented below.	
 IBM Operations Analytics - Log Analysis License Agreement 	 IBM International License Agreement for Evaluation of Programs IBM International Program License Agreement If Licensee is obtaining the Program for purposes of productive use (other than evaluating trais "try or buy," or demonstration): By clicking on the "Accept" button below, Licensee accepts the IBM International Program License Agreement, without modification If Licensee is obtaining the Program for the purpose of evaluation, testing, trial "try or lo or demonstration (collectively, an "Evaluation"): By clicking on the "Accept" button below, Licensee accepts both (i) the IBM International License Agreement for Evaluation of Program Evaluation License"), without modification; and (ii) the IBM International Program License Agreement (the "IPLA"), without modification. The Evaluation License will apply during the term of Licensee's Evaluation. The IPLA will automatically apply if Licensee elects to retain the Program after the Evalor obtain additional copies of the Program for use after the Evaluation) by entering into procurement agreement (e.g., the IBM International Passport Advantage or the IBM Pastor and Comparison of the Program for use after the Evaluation and the program for the Pastor and the program for the Pastor and the program for the Program for use after the Evaluation by entering into procurement agreement (e.g., the IBM International Passport Advantage or the IBM Pastor and the program for the Program for the Pastor and the Pastor agreement (e.g., the IBM International Passport Advantage or the IBM Pastor and the program for the Pastor and the program for the Pastor and the program for the program for the Pastor and the program for the Pastor and the program for the Pastor and for the Pastor and for the program for the program for the Pastor and for the program for the Pastor and for the pastor and for the pastor and for the	ion, on. buy," byw, bgrams luation o a ssport
I accept the terms in the license agreements	Pr	int All
\bigcirc I $\underline{d}o$ not accept the terms in the license agree	ments	
0	< Back Next > Install	Cancel

Figure 2-99 Accept the licensing agreement terms for both licenses

4. As shown in Figure 2-100, change the shared resources directory to /opt/IBM/netcool/IM/IBMIMShared and the installation manager directory to /opt/IBM/netcool/IM/InstallationManager/eclipse. Click **Next**.

IBM Installation Manager	
nstall Packages	_
Select a location for the shared resources directory and a location for Installation Manager.	
Install Licenses Location Features Summary	
When you install packages, files are stored in two locations:	
1) The shared resources directory - resources that can be shared by multiple packages.	
2) The installation directory - any resources that are unique to the package that you are installing.	
Important: You can only select the shared resources directory the first time you install a package with the IBM Installa For best results select the drive with the most available space because it must have adequate space for the shared res future packages.	tion Manager. cources of
Shared <u>R</u> esources Directory: /opt/IBM/netcool/IM/IBMIMShared	Bro <u>w</u> se
Shared <u>R</u> esources Directory: <u>/opt/IBM/netcool/IM/IBMIMShared</u>	Bro <u>w</u> se
Shared <u>R</u> esources Directory: /opt/IBM/netcool/IM/IBMIMShared Once installed, IBM Installation Manager will be used to install, update, modify, manage and uninstall your packages. Installation <u>M</u> anager Directory: /opt/IBM/netcool/IM/InstallationManager/eclipse	Bro <u>w</u> se Br <u>o</u> wse
Shared Resources Directory:	Browse
Shared Resources Directory: Volume Available Space Volume Available Space	Browse Browse

Figure 2-100 Installation Manager paths

5. As shown in Figure 2-101, keep the default installation directory and click **Next**.

		IBM Installation Manager				
nstall Packages A package group is a location	that contains one or more	packages. Some compatible pack	ages can be	installed into a	a common pac	ckage group 🚽
Install Licenses	Location Feature	res Summary	w one.			
O Use the existing package	group					
Create a new package group of the second	pup					
Package Group Name		Installation Directory			Ar	rchitecture
🚴 IBM Operations Analytic	cs - Log Analysis	/opt/IBM/netcool/LogAna	lysis		64	4-bit
Package Group Name: IBM	Operations Analytics - Log	Analysis				
Package Group Name: IBM Installation <u>D</u> irectory: /opt Architecture Selection: O Details	Operations Analytics - Log /IBM/netcool/LogAnalysis 32-bit	Analysis	Disk Space	e Information		B <u>r</u> owse
Package Group Name: IBM Installation <u>D</u> irectory: /opt Architecture Selection: O Details Shared Resources Directory:	Operations Analytics - Log //BM/netcool/LogAnalysis 32-bit	Analysis	Disk Space	e Information		B <u>r</u> owse
Package Group Name: IBM Installation <u>D</u> irectory: /opt Architecture Selection: O Details Shared Resources Directory;	Operations Analytics - Log /IBM/netcool/LogAnalysis 32-bit	Analysis	Disk Space Volume /	e Information Available Space 32.35 GB	ce	Browse
Package Group Name: IBM Installation <u>D</u> irectory: /opt Architecture Selection: O Details Shared Resources Directory:	Operations Analytics - Log /IBM/netcool/LogAnalysis 32-bit 64-bit /opt/IBM/netcool/IM/IBM	Analysis	Disk Space Volume /	e Information Available Space 32.35 GB	ce	B <u>r</u> owse

Figure 2-101 Installation directory

6. Select the packages that are shown as selected in Figure 2-102 and click Next.

IBM Ir	nstallation Mar	ager			
Install Packages					
Select the features to install.					
Install Licenses Location Features	Summary				
Features					
😴 🛱 IBM® Installation Manager 1.8.2					
😑 🖃 🗊 IBM Operations Analytics - Log Analysis 1.3.2.0					
IBM Operations Analytics - Log Analysis 1.3.2.0					
Apache Solr 5.2.1					
Show dependencies			Expand All C	ollapse All	Restore Default
%- Selected by Installation Manager because of dependencies					
Details					
IBM® Installation Manager 1.8.2					
0		< Back	Next >	Instal	Cancel

Figure 2-102 Installation packages

Tip: The Apache Solr package can be distributed on another server, if necessary. For more information, see this website:

https://ibm.biz/BdrrNE

7. Leave the default ports as shown in Figure 2-103 and click Next.

IBM Installation Manager					_ = X
Install Packages Fill in the configurations for the packages.					
Install Licenses Location Features Summary					
☐ IBM Operations Analytics - Cont	figuration for IBM Operations Ana Operations Analytics - Log Analysis	alytics – Log Analysis Port Configuration:	1.3.2.0		
Ар	plication WebConsole Port:	9988			
App	plication WebConsole Secure Port:	9987			
Dat	tabase Server Port:	1627			
EIF	Receiver Port:	5529			
Zoo	oKeeper Port:	12181			
Apa	ache Solr Search Port:	8983			
Apa	ache Solr Stop Port:	7205			
0		< Back	Next >	Install	Cancel

Figure 2-103 Default ports

8. Click Install as shown in Figure 2-104.

	IBM Installation Manager	_ = ×			
Install Packages					
Review the summary information.					
Install Licenses	Location Features Summary				
Target Location					
Package Group Name:	IBM Operations Analytics - Log Analysis				
Installation Directory:	/opt/IBM/netcool/LogAnalysis				
Shared Resources Directory: /opt/IBM/netcool/IM/IBMIMShared					
Packages					
Packages					
🗊 IBM® Installation Mana	ger 1.8.2				
🗆 🧊 IBM Operations Analyti	cs - Log Analysis 1.3.2.0				
🚯 IBM Operations Anal	rtics - Log Analysis 1.3.2.0				
🕼 Apache Solr 5.2.1					
Environment	Disk Space Information				
English	Total Ava	ailable Space			
	1	32.35 GB			
	/mnt/ITSO_SHARE	23.34 GB			
	Total Download Size: 1.00 GB				
	Total Installation Size: 3.56 GB				
Repository Information					
0	< Back Next > Install	Cancel			

Figure 2-104 Install

9. Wait for the installation to finish.

Configuration

The configuration of Log Analysis is documented in the following document:

```
https://ibm.biz/BdrrNX
```

Follow these steps to configure Log Analysis:

1. Alter the Aggregation ObjectServers to enable the *scala_triggers* trigger group as shown in Example 2-76.

Example 2-76 Alter triggers

```
./nco_sql -server AGG_P -user root -password ''
1> alter trigger group scala_triggers set enabled true;
2> go
(0 rows affected)
1> alter trigger scala_reinsert set enabled true;
2> go
(0 rows affected)
1> alter trigger scala_insert set enabled true;
```

```
2> go
(0 rows affected)
1>exit
```

- 2. Alter the ObjectServer AGG_B to enable the scala_triggers trigger group.
- 3. Apply the Insight Packs on the ioala-a server as shown in Example 2-77.

Example 2-77 Insight Pack command

su netcool
mkdir /opt/IBM/netcool/LogAnalysis/unity_content/OMNIbus
mkdir /opt/IBM/netcool/LogAnalysis/unity_content/NetworkManager/
cp /mnt/ITS0_SHARE/OMNI/OMNIbusInsightPack_v1.3.0.2.zip
/opt/IBM/netcool/LogAnalysis/unity_content/OMNIbus/
cp /mnt/ITS0_SHARE/ITNM/NetworkManagerInsightPack_v1.3.0.0.zip
/opt/IBM/netcool/LogAnalysis/unity_content/NetworkManager/
cd /opt/IBM/netcool/LogAnalysis/utilities
./pkg_mgmt.sh -install
/opt/IBM/netcool/LogAnalysis/unity_content/OMNIbus/OMNIbusInsightPack_v1.3.0.2.zip
BUILD SUCCESSFUL
Total time: 4 seconds
./pkg_mgmt.sh -install
/opt/IBM/netcool/LogAnalysis/unity_content/NetworkManager/NetworkManagerInsightPack_v1.3.0.0.zi
BUILD SUCCESSFUL
Total time: 4 seconds

- 4. Create the OMNIbus data source by using the following steps:
 - a. Log in to the Operations Analytics Log Analysis UI with the default login credentials (user: unityadmin and password: unityadmin) at this URL:

https://ioala-a.swg.be.ibm.com:9987/Unity

b. On the Operations Analytics - Log Analysis UI, select the Create Data Source wizard to create a data source into which the event data is ingested. The OMNIbus1100 data source can ingest data for both the Tivoli Netcool/OMNIbus Insight Pack and the Network Manager Insight Pack. Log in to this URL:

https://ioala-a.swg.be.ibm.com:9987/Unity/





Figure 2-105 Getting Started window

c. Click **Start Now** under the Create Data Source wizard. Figure 2-106 shows the Create Data Source wizard.



Figure 2-106 Create Data Source wizard

d. Configure the data source with the host name where the nco-g-xml gateway is configured, as shown in Figure 2-107, and click **Next**.

* Select Locat	ion * Select [Data * Set Attributes	
If you want to inges file to monitor chan as a remote log file	t data into the Log Anal ges to a file. Select Cus agent, Logstash, or th	ysis server, use the wizard to configure a data source. Select Local or Remote stom when data is sent to the Log Analysis server from external sources such e data collector client. Learn More	
	 Local file 		
	Remote file		
	Custom		
	* Host name:	ioala-a.swg.be.ibm.com	
* Required			

Figure 2-107 Data source location host name

e. As shown in Figure 2-108, for the file path, enter AGG_V. For the type, enter OMNIbus1100. For Collection, enter OMNIbus1100-Collection. Click **Next**.

Select Loo	cation	Select Data	* Set Attri	butes		
Enter the locati More	ion and type of	data for this data s	ource. The file pa	th is not validated	when you select t	he custom option. Lean
	* File path:	AGG_V				
	* Type:	OMNIbus1100			•	
* Required	Collection:	OMNIbus1100-C	Collection		~	

Figure 2-108 Selecting the data

f. As shown in Figure 2-109, enter omnibus for the name of the new data source and click **Finish**.

Note: The name *omnibus* is mandatory because it was configured in the Insight Pack as the default data source name.

Select Location	* Select Data	* Set Attributes
Enter a name for the ne lore	ew data source. Optional	ly, set a description and assign the source to a group of sources. Learn
	* Name: or	nnibus
	Description:	
* Required	Group:	•
* Required	Group:	•

Figure 2-109 Add a data source

g. With the data source in place, you can configure the nco-g-xml gateway (or SCALA gateway) for OMNIbus. For more information, see this website:

https://ibm.biz/BdrrN4

The configuration of the nco-g-xml gateway (or SCALA gateway) for OMNIbus involves the following steps:

i. Add the nco-g-xml gateway on the IBM Operations Analytics - Log Analysis server. (You will need to install the gateway's support on this server, too.) Use **IBMIM** to add the repository from the Im-nco-g-xml-7_0.zip to the Installation Manager, as shown in Figure 2-110.

This gateway will be installed near the destination (ioala-a server) because the gateway and IBM Operations Analytics - Log Analysis cannot fail over.

Edit Repository		
Edit repository Modify a repository and add to the repository preference	ce list.	
Repository: /mnt/ITSO_SHARE/OMNI/Probes_Gates/Im-nco-g-xml-	7_0.zip	<u>B</u> rowse
	Cancel	ОК

Figure 2-110 Configuring the nco-g-xml gateway

ii. Select Netcool/OMNIbus Gateway nco-g-xml as shown in Figure 2-111.

IBM Insta	llation Manager		_ 0
nstall Packages			
Select packages to install:			1
🔍 type filter text 🖉 🛛 🕮 🕮 🖉 🔍 🔍 🕄 🔍 🔍 🔍 🔍	elected.		->1 ->1
Installation Packages	Status Installed	Vendor IBM	License Key Type
🗉 🗖 🕼 Netcool/OMNIbus Gateway nco-g-jdbc	Installed		
🗆 🙀 Version 1.6.0.0	Installed	IBM	
🗄 🗖 🕼 Netcool/OMNIbus Gateway nco-g-jdbc-reporting-scripts	Installed		
🗆 🙀 Version 1.1.0.0	Installed	IBM	
🗉 🗖 🕼 Netcool/OMNIbus Gateway nco-g-reporter-scripts	Installed		
🗆 🙀 Version 1.4.0.0	Installed	IBM	
🖉 🕼 Netcool/OMNIbus Gateway nco-g-xml			
☞ ₿ Version 1.7.0.0	Will be installed	IBM	
Show <u>a</u> ll versions		Check for Other Ve	rsions, Fixes, and Extensions
Jetails			
Netcool/OMNIbus Gateway nco-g-xml 1.7.0.0			
Netcool/OMNIbus Gateway nco-g-xml <u>More info</u>			
• Repository: /mnt/ITSO_SHARE/OMNI/Probes_Gates/Im-nco-g-xml-	7_0.zip		
	< Back	<u>N</u> ext >	Install

Figure 2-111 Select an installation package

- iii. Click **Next** and wait until the installation is finished. Then, continue with the configuration.
- 5. Create a gateway server in the Netcool/OMNIbus interfaces file by using the following commands (Example 2-78).

Example 2-78 G_SCALA

```
vi $NCHOME/etc/omni.dat
[AGG_V]
{
Primary: Omni-A.swg.be.ibm.com 4100
Backup: Omni-B.swg.be.ibm.com 4100
}
[G_SCALA]
{
Primary: Omni-A.swg.be.ibm.com 4305
}
$NCHOME/bin/nco_igen
```

6. Configure the G_SCALA.props properties file, including the specification of the .map mapping file, as shown in Example 2-79.

Example 2-79 Configure the G_SCALA.props properties file

<pre>cd /opt/IBM/tivoli/netcool/omni vi G SCALA.props</pre>	bus/gates/xml/scala
Gate.Reader.TblReplicateDefFile	: '\$OMNIHOME/gates/xml/scala/xml.reader.tblrep.def'
<pre># Gate.MapFile configures the gatew # datasource in the Netcool/Operat the version of the # insight pack you have installed</pre>	vay to send data required by the OMNIbus1100 ions Insight Pack. Use the map file that corresponds to in SCALA.
<pre># Map file for OMNNIbusInsightPack</pre>	version 1.3.0.2 and above.
Gate.MapFile	: '\$OMNIHOME/gates/xml/scala/xml1302.map'
<pre># Map file for OMNIbusInsightPack v</pre>	versions 1.3.0.0 and 1.3.0.1
#Gate.MapFile	: '\$OMNIHOME/gates/xml/scala/xml1300.map'
<pre># Map file for the insight pack in</pre>	Netcool/Operations Insight Versions 1.1 and 1.2
#Gate.MapFile	: '\$OMNIHOME/gates/xml/scala/xml.map'
Gate.StartupCmdFile	: '\$OMNIHOME/gates/xml/scala/xml.startup.cmd'
Gate.XMLGateway.TransformerFile	: '\$OMNIHOME/java/conf/scalaTransformers.xml'
Gate.XMLGateway.TransportFile	: '\$OMNIHOME/java/conf/scalaTransport.properties'
Gate.XMLGateway.TransportType	: 'SCALA'
Gate.XMLGateway.DateFormat	: 'yyyy-MM-dd\'T\'HH:mm:ssZ'
####################	
# Omnibus settings	
Gate.Reader.Server	: ' <i>AGG_V</i> '
Gate.Reader.Username	: ' <i>root</i> '
Gate.Reader.Password	: '' # nco_g_crypt output
Gate.Reader.Description	: 'SCALA Gateway Reader'

7. Configure the endpoint in the scalaTransformers.xml file, as shown in Example 2-80.

Example 2-80 Configure the endpoint

```
cd /opt/IBM/tivoli/netcool/omnibus/java/conf
vi scalaTransformers.xml
<tns:transformer name="netcoolEvents" type="northbound"
endpoint="https://ioala-a:9987/Unity/DataCollector"
className="com.ibm.tivoli.netcool.integrations.transformer.XSLTThreadTransformer">
```

Important: The host name that is used in the configuration needs to be identical to the certificate that is imported in Example 2-81 on page 163.

8. If, due to network security reasons, a Secure Sockets Layer (SSL) connection is required from the Log Analysis server to the Object Servers, perform the following steps to configure the SSL connection. See the following document for details:

https://ibm.biz/BdrrNr

Example 2-81 shows how we implemented this SSL connection in our environment.

Example 2-81 Configure the SSL connection

```
mkdir $OMNIHOME/java/security/
keytool -genkey -alias MyOmnibus -keystore $OMNIHOME/java/security/client.jks \
$0MNIHOME/bin/nc httpcertimport -k $0MNIHOME/java/security/cacerts.jks -h \
ioala-a.swg.be.ibm.com:9987 --alias ioala-a
Enter password for keystore
Reenter password for keystore
Obtaining certificates from server ...
Server Sent 1 certificate(s):
1 Subject CN=ioala-a, OU=IT, O=IBM, C=US
   Issuer CN=ioala-a, OU=IT, O=IBM, C=US
   sha1 :b8 31 a1 ed 6c 51 ec 2d d4 31 75 06 18 3f 87 8d 3a d4 f6 f0
   Signature algorithm used:SHA1withRSA
   Valid from Apr 29, 2016 to Apr 29, 2018
   Certificate Subject Alternative Name(s)
   localhost
   ioala-a
   IOALA-A
   IOALA-a
   localhost.localdomain
   172.16.61.139
Enter the number of a certificate you trust and want to add to the keystore or 'q'
to quit: [1]
Added certificate to keystore file
'/opt/IBM/tivoli/netcool/omnibus/java/security/cacerts.jks' using alias 'ioala-a'.
```

Important: In our environment, the server did not send a fully qualified domain name (FQDN) certificate. (See the response under "*Certificate Subject Alternative Name(s)*" in Example 2-81.) Confirm from the certificate response whether you received an FQDN certificate, and change the name in the scalaURL property correctly (in Example 2-82). Otherwise, the SSL connection fails.

 Configure the transport properties in the scalaTransport.properties file, as shown in Example 2-82.

Example 2-82 Configuring the transport properties

```
cd /opt/IBM/tivoli/netcool/omnibus/java/conf
vi scalaTransport.properties
# Example format of SCA-LA properties file
# Uncomment the relevant lines and change the settings accordingly
#
# scalaURL - the URL of a target system to connect to
# scalaURL=http(s)://some.host.com:port/Unity/DataCollector
scalaURL=https://ioala-a:9987/Unity/DataCollector
#
# scalaRetryMax - The maximum number of attempts to successfully connect to data
collector before dropping message. Value of zero is to retry indefinitely.
# scalaRetryMax=0
#
# scalaRetryPeriod - The amount of time in seconds between each reconnection
attempt to the data collector.
# scalaRetryPeriod=30
```

```
#
# keyStore - the keyStore that contains the private keys for any https ports (see
JVM property javax.net.ssl.keyStore)
# keyStore=/the/path/to/the/keystore
keyStore=$OMNIHOME/java/security/client.jks
# keyStorePassword - the password to the keyStore that contains the private keys
for any https ports (see JVM property javax.net.ssl.keyStorePassword)
 kevStorePassword=netcool
# trustStore - the trustStore that contains the server's public key for any https
clients (see JVM property javax.net.ssl.trustStore)
# trustStore=/the/path/to/the/truststore
trustStore=$OMNIHOME/java/security/cacerts.jks
# trustStorePassword - the password to the trustStore that contains the server's
public key for any https clients (see JVM property
javax.net.ssl.trustStorePassword)
 trustStorePassword=netcool
# threadPoolSize - the number of threads that the http servers share to process
incoming requests
# threadPoolSize = 16
# username - the username to use for authentication with the data collector.
username = unityadmin
# password - the password to use for authentication with the data collector.
password = unityadmin
#
# eventBufferSize - the maximum number of events to contain in each batch of log
record data sent to the SCA-LA data collector.
# eventBufferSize = 200
#eventBufferSize = 3
## eventBufferFlushTime - the amount of time to wait for new events in seconds
before flushing the buffer. Flush timer is reset on each event added to the batch.
# eventBufferFlushTime = 30
# enableTrace - enable diagnostic tracing of communications between the SCA-LA
transport and the data collector.
# enableTrace = true
# readTimeout - socket timeout for reading responses from SCA-LA, in seconds
# readTimeout = 30
# jsonMsgHostname - The hostname that corresponds to the data source for ingested
data.
jsonMsgHostname = IOALA-A.swg.be.ibm.com
# jsonMsgPath - The path that corresponds to the data source for ingested data.
jsonMsgPath = AGG V
```

Tip: During the installation and configuration, it is useful to set the eventBufferSize = 3 because this setting facilitates quicker debugging of the event flow in the logs. Two log files are associated with this event flow:

On OMNIbus:

/opt/IBM/tivoli/netcool/omnibus/log/G_SCALA.log

On Log Analysis:

/opt/IBM/netcool/LogAnalysis/logs/GenericReceiver.log

Configuring the Network Manager integration

Configure the Network Manager integration, which is documented at this website:

```
https://ibm.biz/BdrrNX
```

Follow these steps to configure the Network Manager integration:

 On the JazzSM servers, edit the Network_Topology_Search/NM_EndToEndSearch.properties file as shown in Example 2-83.

Example 2-83	Network	Topology	Search/NM	EndToEndS	Search.prope	rties file
,		- 1 0)-			1 1	

vi

\$UNITY_HOME/AppFramework/Apps/NetworkManagerInsightPack_V1.3.0.0/Network_Topology_ Search/NM_EndToEndSearch.properties

2. Alter the fields as indicated in Example 2-84.

Example 2-84 Edit the Network_Topology_Search/NM_EndToEndSearch.properties file

ncp.dla.datasource.type = db	
ncp.dla.datasource.driver	= com.ibm.db2.jcc.DB2Driver
ncp.dla.datasource.url =	= jdbc:db2://172.16.61.137/ITNM
ncp.dla.datasource.schema	= ncim
ncp.dla.datasource.ncpgui.schema	= ncpgui
ncp.dla.datasource.username	= ncim
ncp.dla.datasource.password	= netcool
ncp.dla.datasource.encrypted	= false
ncp.dla.datasource.keyFile	=
<pre>\$SCALA_HOME/wlp/usr/servers/Unity/keystore/unity</pre>	.ks
ncp.dla.datasource.loginTimeout	= 5

3. Verify the installed Insight Packs with the following command (Example 2-85).

Example 2-85 Use the pkg_mgmt.sh

```
cd /opt/IBM/netcool/LogAnalysis/utilities/
./pkg_mgmt.sh -list
.Buildfile: /opt/IBM/netcool/LogAnalysis/utilities/pkg_mgmt.xml
initializeCustomTasks:
main:
[packagemanager] 04/30/16 17:23:24:363 CEST [main] INFO - PrerequisitesManager :
CTGLC0044I : Running prerequisite checks...
[packagemanager] 04/30/16 17:23:24:368 CEST [main] INFO - PrerequisitesManager :
CTGLC0045I : Prerequisite checks passed
```

[packagemanager] 04/30/16 17:23:24:369 CEST [main] INF0 - ContentPackManager : CTGLC0030I : Listing installed insight packs started... [packagemanager] 04/30/16 17:23:24:440 CEST [main] INFO - ContentPackManager : [packagemanager] GAInsightPack v1.1.1.3 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] NetworkManagerInsightPack v1.3.0.0 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] DB2InsightPack v1.1.0.2 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] DB2AppInsightPack v1.1.0.3 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] OMNIbusInsightPack v1.3.0.2 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] WASInsightPack v1.1.0.3 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] WindowsOSEventsInsightPack v1.1.0.4 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] SyslogInsightPack v1.1.0.3 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] JavacoreInsightPack v1.1.0.3 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] WASAppInsightPack v1.1.0.3 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] WebAccessLogInsightPack v1.1.0.2 /opt/IBM/netcool/LogAnalysis/unity content [packagemanager] 04/30/16 17:23:24:442 CEST [main] INFO - ContentPackManager : CTGLC0031I : Listing completed successfully BUILD SUCCESSFUL

Total time: 1 second

Add Log Analysis integration to the OMNIbus Web GUI part of JazzSM

Perform the following steps to add the Log Analysiss integration to the OMNIbus Web GUI part of JazzSM.

Important: You must execute these steps on every JazzSM server.
Follow these steps:

1. As the user netcool, launch the Installation Manager, as shown in Example 2-86.

Example 2-86 Launch the Installation Manager

cd ./IBMIM

2. Click Modify. Select IBM Netcool GUI Components, as shown in Figure 2-112. Click Next.

IBI	M Installation Manager	_ [
Modify Packages		E
Select a package group to modify.		e e
Package Group Name	Directory	
84 IBM WebSphere Application Server V8.5	/opt/IBM/netcool/WebSphere	
${^{\mathrm{E}}\!}_{\!\mathrm{R}_{\!\mathrm{a}}}$ Core services in Jazz for Service Management	/opt/IBM/netcool/JazzSM	
🔩 IBM Netcool GUI Components	/opt/IBM/netcool/gui	
Details		2
BM Netcool GUI Components		
Shared Resources Directory: /opt/IBM/netcool/IBMIMSh	hared	
 Installation Directory: /opt/IBM/netcool/gui 		
Translations: English		
Architecture: 64-bit		
Installed Packages and Fixes		
 IBM Tivoli Netcool/OMNIbus Web GUI 8.1.0.5 		-
	etcool/OMNIbus Web GUI 1.4.0.1	
 Netcool Operations Insight Extensions for IBM Tivoli Netcool 		
 Netcool Operations Insight Extensions for IBM Tivoli No Network Manager GUI Components 4.2 		
 Netcool Operations Insight Extensions for IBM Tivoli Network Manager GUI Components 4.2 		t.
Netcool Operations Insight Extensions for IBM Tivoli N Network Manager GUI Components 4.2	C Pack Next > Madi	fy Cancel

Figure 2-112 Netcool GUI Components

 Select all features under IBM Tivoli Netcool/OMNIbus Web GUI to install. Ensure that you check Install event search with IBM Operations Analytics - Log Analysis (Figure 2-113) and click Next.

IBM Installation Manag	er			_ 0
Modify Packages				R
Select the features to install or clear the features to remove.				9
Modify Features Summary				
Features				
▽ 🗹 🗊 IBM Tivoli Netcool/OMNIbus Web GUI 8.1.0.5				
✓				
Install event search with IBM Operations Analytics - Log Analysis	>			
▷ ☑ 🕼 Netcool Operations insight Extensions for 16M Tryon Netcool/OMNIbus W	/eb GUI 1.4.0.1			
V V konstanting of the second seco				
V Retwork Health Dashboard 4.2				
V V Network Manager Reports 4.2				
	< Back	Next >	Modify	Cancel
		<u> </u>		

Figure 2-113 Select all Netcool/OMNIbus GUI components

4. As shown in Figure 2-114, leave the default paths. Enter the smadmin password and click **Next**.

		IBM Installat	tion Manager				
Modify Packages Fill in the configurations for the	packages.						E
Modify Features	Summary						
✓ ⑦ Common Configurations	Common Confi WebSphere Appli	gurations cation Server and J	azz for Service Manaç	jement pr	roperties		
Retwork Manager GUI Cor Jazz for Service Manage	Installation	Directory Detail	ls				
✓ ∅ IBM Tivoli Netcool/OMNIb	WebSphere Ap	plication Server	/opt/IBM/netcool/We	bSphere			Bro <u>w</u> se
C Integrate with IBM Ope	Jazz for Servic	e Management UI	/opt/IBM/netcool/Jaz	zSM/ui			Bro <u>w</u> se
	Profile Deta	ils					
	Server name	server1					
	User name	smadmin					
	Password	•••••					
< III)							
)			< <u>B</u>	ack	<u>N</u> ext >	Modify	Cancel

Figure 2-114 Enter profile details

5. As shown in Figure 2-115, type the smadmin password again and click **Next**.

	IBM Installation Manager
Modify Packages Fill in the configurations for the	vackages.
Modify Features	Summary
 ✓ (i) Common Configurations ☑ WebSphere Application ✓ (i₀) Network Manager GUI Cor 	Configuration for Network Manager GUI Components 4.2 Jazz for Service Management properties WebSphere Application Server administrator permissions are required to perform this operation. Enter the
 ✓ Jazz for Service Manage ✓ ⑦ IBM Tivoli Netcool/OMNIb ③ Integrate with IBM Ope 	credentials of an existing Jazz for Service Management user that has administrative permissions. User name smadmin
	Password
< III >	
0	< <u>B</u> ack <u>N</u> ext > Modify Cancel

Figure 2-115 Type the password

- 6. Configure the panel as shown in Figure 2-116 and click Next:
 - For the URL protocol type, enter https.
 - For the URL host name, enter ioala-a.swg.be.ibm.com.
 - For the URL port number, enter 9987.
 - For the URL context root, enter Unity.
 - For the data source name, enter omnibus.
 - For the user name, enter Unityadmin.
 - For the password, enter the password for the Unityadmin user.

٩		BM Installation Manager	r	_ = ×
Modify Packages Fill in the configurations for the	packages.			
Modify Features	Summary			
 ✓ (i) Common Configurations ☑ WebSphere Application ✓ (i) Network Manager GUI Cor ☑ Jazz for Service Manage ✓ (i) IBM Tivoli Netcool/OMNIb ◇ Integrate with IBM Ope 	Configuration for I Integrate with IBM Op URL protocol type URL host name URL port number URL context root Data source name User name Password	BM Tivoli Netcool/OMNIb erations Analytics - Log Anal https ioala-a.swg.be.ibm.com 9987 Unity omnibus Unityadmin •••••••	bus Web GUI 8.1.0.5	
< <u> </u>			< <u>B</u> ack <u>N</u> ext > Modify	Cancel

Figure 2-116 Log Analysis configuration

7. Click **Modify**, as shown in Figure 2-117.

IBM Installa	ation Manager _ G
Modify Packages	F
Review the summary information.	
Modify Features Summary	
Target Location	
Package Group Name: IBM Netcool GUI Components	
Installation Directory: /opt/IBM/netcool/gui	
Shared Resources Directory: /opt/IBM/netcool/IBMIMShared	
Features	
Adding Feature	Removing Feature
▼	
K	•
Environment	Disk Space Information
English	Total Available Space
	/ 17.89 GB
	Total Download Size: 21.0 KB
	Total Installation Size: 406.9 KB
Repository Information	
	<pre>< Back Next > Modify Cancel</pre>

Figure 2-117 Modify Packages window

8. Wait until the installation is complete, as shown in Figure 2-118. Click **Finish**.

۵	IBM Installat	ion Manager	_ 0 ×
Modify	Packages		
	The modification com	pleted successfully. <u>View Log File</u>	
	The following package was modified:	None of the following packages were modified:	
	IBM Tivoli Netcool/OMNIbus Web GUI	 Network Manager Reports Netcool Operations Insight Extensions for IBM Tivoli Netco Network Manager GUI Components Network Health Dashboard 	
	Note: If the packages support rollback, the temporary direct the files on the <u>Files for rollback</u> preference page.	tory contains rollback files for installed packages. You can delete	
0			<u>F</u> inish

Figure 2-118 Installation completed

2.7.5 Verification

Perform the following steps to verify the successful installation:

1. Log in to https://ioala-a.swg.be.ibm.com:9987/Unity as shown on Figure 2-119.



Figure 2-119 Login window

2. You can also see the ingestion of data from the nco-g-xml gateway by using the Administrative Settings option, as shown in Figure 2-120.



3. Click Server Statistics, as shown in Figure 2-121.

IBM Operations Analytics - Log Analysis	Launch Search Learn More - unityadmin - IBM.
Getting Started Data Types Data Sources Roles Users Server Statistics	
The Server Statistics workspace displays information about the data that has been inspeted into the server for search. The summary area shows the current and peak rolling thirly day average ingestion rate. The chart can be used to site in the statistics. Learn More	se the rolling thirty day average against the amount of data ingested daily for any given time period. Use the
30 day ingestion average: 0.0001 GB	
Peak 30 day ingestion average: 0.0001 GB	
Date of peak 30 day ingestion average: Thu May 05 2018	
Star Date: 4/S2016 End Date: 5/S2016	
Daily Billable Ingestion and Rolling 30 day Average	
0.0014-1 Dany ingesion total University of the second seco	
0.0012	
0.0012 -	
0.0011-	
0.001 -	
0.0009-	
0.0008-	
e 0.007-	
- 20 - 0.000	
0.005	
0.0004 -	
0.003-	
0.0002-	
0.0001-	
4/5/16 4/6/16 4/7/16 4/6/16 4/6/16 4/10/16 4/11/16 4/12/16 4/13/16 4/14/16 4/15/16 4/16/16 4/17/16 4/18/16 4/20/16 4/20/16 4/21/16 4/22/16 4/24/16 4/25/16 4/ Date (UTC)	/26/16 4/27/16 4/28/16 4/29/16 4/30/16 5/1/16 5/2/16 5/3/16 5/4/16 5/5/16 5/6/16

Figure 2-121 Server Statistics option

The Server Statistics window shows you the daily intake of events. You can also drill down to a more detailed view.

2.8 IBM Netcool Configuration Manager

The basic installation of IBM Netcool Configuration Manager is described.

Note: Although Netcool Configuration Manager (NCM) is included in the high-level architecture in the beginning of the document, we installed it in a separate environment from the rest of the installed Netcool Operations Insight (NOI) components when we created this book. Therefore, you might see different servers and database names that are mentioned in this section.

2.8.1 Introduction

Netcool Configuration Manager comes with a set of predefined requirements for the operating systems, databases, and hardware.

These requirements are documented on the IBM documentation server:

https://ibm.biz/BdrrNz

Note: The current Prerequisite Scanner does not support Netcool Configuration Manager Version 6.4.1.0/1. This support will be available for version 6.4.2.1, which was not available at the time of writing this book.

2.8.2 Installation and basic configuration

Perform the following steps:

1. Download and extract the necessary files that correspond to your server operating system. You can obtain the correct part numbers at this website:

https://ibm.biz/BdrFAn

2. Create a set of repository directories, as shown in Table 2-11.

Table 2-11 Repository directories

Repository location	Contents
/opt/IBM/noi_repo/ncm	Netcool Configuration Manager
/opt/IBM/noi_repo/jazz	JazzSM
/opt/IBM/noi_repo/websphere	WebSphere

3. Start the previously installed Installation Manager by using the following command (Example 2-87).

cd /opt/IBM/netcool/IM/InstallationManager/eclipse ./IBMIM

Figure 2-122 shows the Installation Manager GUI.



Figure 2-122 Installation Manager GUI

 Add all of the Netcool Configuration Manager, WebSphere, and JazzSM server repositories to Installation Manager by clicking File → Preferences → Repositories. Select Add Repository. Click OK. See Figure 2-123.

/pe filter text 🛛 🦼	Preferences Repositories		(
Repositories	Repositories:		
Files for Rollback	Location	Connection	Add Repository
Help	<pre>/opt/IBM/noi_repo/jazz/JazzSMRepository/disk1/diskTag.inf</pre>	9	
Internet	✓ /opt/IBM/noi_repo/ncm/repository.config	9	Edit Repository
Passport Advantage	/opt/IBM/noi_repo/websphere/repository.config	4	Remove Repositor
Secure Storage			Move Up
opuates			Move Down
			Clear Credentials
			Test Connections
	Service repositories are remote locations where updates or extens Manager itself) are stored. Search service repositories during installation and updates.	sions to packages (including the Installati
		Restore I	Defaults Apply
)		Can	cel ОК

Figure 2-123 Adding the repositories

- 5. Start the installation. Due to Netcool Configuration Manager product requirements, a *second* installation of JazzSM is needed. You cannot reuse the existing JazzSM that we installed previously in this book. Therefore, you need to install WebSphere, IBM Dashboard Application Services Hub (DASH), and JazzSM before you install Netcool Configuration Manager. For this first run, select the following packages (Figure 2-125 on page 178):
 - IBM WebSphere Application Server Version 8.5.5.7
 - Optional: IBM WebSphere SDK Java Technology Edition
 - Jazz for Service Management extension for IBM WebSphere Application Server 8.5
 - IBM Dashboard Application Services Hub
- 6. Click Next and accept the terms of the license agreement.

Modify the Shared Resources Directory with the correct path (/opt/IBM/netcool/IM/IBMIMShared) as shown in Figure 2-124. Click Next.

Install Packages		
Select a location for the shared res	purces directory.	
Install Licenses	ocation Features Summary	
When you install packages	files are stored in two locations:	
1) The shared resources di	ectory - resources that can be shared by multiple packages.	
 2) The installation director 	/ - any resources that are unique to the package that you are installing.	
Important: You can only se	lect the shared resources directory the first time you install a package with the l	BM Installation Manager, Fo
Important: You can only se best results select the driv packages.	lect the shared resources directory the first time you install a package with the l re with the most available space because it must have adequate space for the sha	BM Installation Manager. For ared resources of future
Important: You can only se best results select the driv packages.	lect the shared resources directory the first time you install a package with the I e with the most available space because it must have adequate space for the sha	BM Installation Manager. Foi ared resources of future

Figure 2-124 Shared Resources Directory

8. The installation directory for WebSphere and JazzSM is displayed, as shown in Figure 2-125.

	IBM Installation Manager	_ □
Install Packages The packages will be installed into the indicated	package groups. Select the package group to change the ir	nstallation directory.
Install Licenses Location	Features Summary	,
Package Group Name	Installation Directory	Architecture
 BM WebSphere Application Server V8.5 IBM WebSphere Application Server 8.5.5 IBM WebSphere SDK Java Technology Edition Jazz for Service Management extension 	/opt/IBM/netcool/WebSphere/AppServer 5.7 dition (Optiona n for IBM WebS	
 [®]_{Ba} Core services in Jazz for Service Managem IBM Dashboard Application Services Hu 	hent /opt/IBM/netcool/JazzSM lb 3.1.2.1	64-bit
Package Group Name: Core services in Jazz for	Service Management	
Installation Directory: //opt/IBM/netcool/JazzSM	M	B <u>r</u> owse
Architecture Selection: 🔾 32-bit 💿 64-bit		
Details	Disk Space Infor	mation
Shared Resources Directory: /opt/IBM/IM/IBMIM	IShared Volume Availab / 39.00 0	ble Space GB

Figure 2-125 Installation Directory

- 9. Click **Next** again to select the language translations.
- 10.Click Next to verify the packages.

Install Licenses	Location Features Su	Immany	
 Common Configurations WebSphere Configuration Ports Configuration IBM Dashboard Application 	Common Configurations WebSphere Configuration WebSphere installation location Profile deployment type	/opt/IBM/netcool/WebSphere/AppServer Create WebSphere profile	Browse
Context Root	Profile details Profile location	/opt/IBM/netcool/JazzSM/profile	Browse
	Profile name	JazzSMProfile]
	Server name	serverl]
	User name	smadmin]
	Password Password confirmation	••••••	1

11.Enter the JazzSM password. See Figure 2-126. Click Next.

Figure 2-126 User ID and password

12. Click Validate. After the successful validation, click Next.

13.Leave the default ports that are shown in Figure 2-127 and click Next.

~	Common Configurations 🖾 WebSphere Configuratio	Common Configurations Ports Configuration			
~	 Ports Configuration IBM Dashboard Application Context Root 	Configure the various network ports to which the WebSphere Application Server profile for Jazz for Serv Management listens.			
		HTTP transport port	16310		
		HTTPS transport secure port	16311		
		Bootstrap port	16312		
		SOAP connector port	16313 #		
		IPC connector port	16314		
		Administrative console port	16315		
		Administrative console secure port	16316		
		High availability manager communication port	16318		
		ORB listener port	16320		
		SAS SSL server authentication port	16321		
<		CSIV2 client authentication listener port	16322		

Figure 2-127 Leave the default ports

14. Accept the default context root by selecting Next, as shown in Figure 2-128.



Figure 2-128 Context Root window

15. Review the packages to install and select Install. See Figure 2-129.

Tip: Remember to scroll down in the Packages window to review all packages and expand the Repository Information to verify.

istall Packages		
eview the summary information.		7
Install Licenses Location Features	Summary	
arget Location		
Shared Resources Directory: /opt/IBM/IM/IBMIMShared		
ackages		
Packages	Installation Directory	
IBM WebSphere Application Server V8.5	/opt/IBM/netcool/WebSphere/AppServer	=
WebSphere Application Server Full Profile		
👂 🗞 IBM WebSphere SDK for Java Technology Edi	lition 6	
RM WebSobere SDK Java Technology Edition (Ontion	-
nvironment	Disk Space Information	
nglish	Total Availab	le Space
	1	39.00 GB
	Total Download Size: 1.40 GB	
	Total Installation Size: 3.53 GB	
Repository Information		
iles will be retrieved from the following locations:		
Repository	Download Size	A
		1
✓ /opt/IBM/noi_repo/websphere		
 ✓ /opt/IBM/noi_repo/websphere ✓ IBM WebSphere Application Server 8.5.5.7 	1.09 GB	

Figure 2-129 Install packages

16.After the installation of WebSphere and JazzSM completes, choose **None** on the final window and click **Finish**.

17. The IBM Installation Manager start window opens. Select Install.

18. Select the **Netcool Configuration Manager** package on the Install Packages window. Click **Next**, as shown in Figure 2-130.

🗌 type filter text 🖉 🖄 1 package is	selected.		+1
Installation Packages	Status	Vendor	License Key Type
$oldsymbol{ abla}$ \square [] Application Client for IBM WebSphere Application Server			
🗌 🕼 Version 8.5.5.7		IBM	
🗢 🔲 🗊 IBM HTTP Server for WebSphere Application Server			
🗌 🕼 Version 8.5.5.7		IBM	
▽ 🗌 🗊 IBM WebSphere Application Server	Installed		
🗌 🕼 Version 8.5.5.7	Installed	IBM	
🗢 🗹 🖗 Netcool Configuration Manager			
🗹 🕼 Version 6.4.2.1	Will be installed	IBM	
🗌 🧊 Pluggable Application Client for IBM WebSphere Applicati	on Se		
🗢 🗌 🧊 Web Server Plug-ins for IBM WebSphere Application Serve	er		
🗌 🕼 Version 8.5.5.7		IBM	
Show <u>a</u> ll versions		Check for Othe	er Versions, Fixes, and Extensior
Details			
Netcool Configuration Manager 6.4.2.1			
Netcool Configuration Manager More info			
Bepository: /opt/IBM/poi_repo/pcm			

Figure 2-130 Netcool Configuration Manager installation selection

19.On the next window, click I accept the terms in the license agreement. Click Next. See Figure 2-131.

Install Licenses Location Features Summary	
LICENSE INFORMATION	
The Programs listed below are licensed under the following License Information terms previously agreed to by Client and IBM. If Client does not have previously agreed to li International Program License Agreement (Z125-3301-14) applies.	s and conditions in addition to the Program license terms icense terms in effect for the Program, the IBM
Program Name: IBM Tivoli Netcool Configuration Manager Base V6.4.2 Program Number: 5725-F56	
Program Name: IBM Tivoli Netcool Configuration Manager Configuration Standard Dev Program Number: 5725-F56	vice V6.4
Program Name: IBM Tivoli Netcool Configuration Manager Configuration Standard Bas Program Number: 5725-F56	sic Device V6.4
Program Name: IBM Tivoli Netcool Configuration Manager SmartModel Basic Device V Program Number: 5725-F56	V6.4
Program Name: IBM Tivoli Netcool Configuration Manager SmartModel Device V6.4 Program Number: 5725-F56	
Program Name: IBM Tivoli Netcool Configuration Manager SmartModel Complex Devi Program Number: 5725-F56	ice V6.4
As described in the International Program License Agreement ("IPLA") and this License	e Information IBM grants Licensee a limited right to use
 I <u>a</u>ccept the terms in the license agreement 	Print All
\bigcirc I <u>d</u> o not accept the terms in the license agreement	
	< Back Next > Install Cancel

Figure 2-131 Netcool Configuration Manager licenses

20. Accept the default installation directory for the Netcool Configuration Manager installation, as shown in Figure 2-132. Click **Next**.

Install Packages						
A package group is a loc group and will share a co	ation that contains one or more pack	ages. Some compatil	ole packages car or create a new o	be installed into a one.	common packa	ge 🔚
Install Licenses	s Location Features	Summary				
O Use the existing pack	kage group					
 <u>C</u>reate a new packag 	e group					
Package Group Name		Installation Directo	ry		Archited	ture
. Netcool Configurat	ion Manager	/opt/IBM/tivoli/net	cool/ncm		64-bit	
Package Group Name: M Installation <u>D</u> irectory: (Architecture Selection:	Netcool Configuration Manager /opt/IBM/tivoli/netcool/ncm O 32-bit 64-bit					Browse
Details			Disk Spa	ce Information		
Shared Resources Direct	tory: /opt/IBM/IM/IBMIMShared		Volume /	Available Space 34.54 GB		
D		[< <u>B</u> ack	<u>N</u> ext >	Install	Cancel

Figure 2-132 Default Installation Directory

21. Choose the type of installation that is required. In this example, we chose a combined Presentation Server and Worker Server type of installation, as shown in Figure 2-133. Click **Next**.

Install Licenses Location Features Summary					
Features					
🗢 🖬 🕼 Netcool Configuration Manager 6.4.2.1					
V 🖃 🚳 ITNCM					
Reports					
🗢 🖃 🕼 Server Installation Type					
Presentation Server and Worker Server					
Worker Server	=				
	7				
□ Show dependencies	Expand All Collapse All Restore Default				
Selected by Installation Manager because of dependencies					
Details					
Netcool Configuration Manager 6.4.2.1					
Netcool Configuration Manager					

Figure 2-133 Netcool Configuration Manager Server Installation Type

22. Enter the database details:

- For the database name, enter ncm6421.
- For the server host, enter localhost.
- For the server port, enter 50000.
- For the user ID, enter icosuser.
- For the password, enter the password for the icosuser user.

Important: The database must be created before you proceed.

After you enter the database details, click **Next**, as shown in Figure 2-134.

Database Configuration	Database Configurat	ion
 ITNCM Server Configura NCM JazzSM Details 	Netcool Configurat database and the o Database server t DB2 (default) Oracle 11 Oracle 12	tion Manager needs a database to store device configurations. Please configure the type of connection details. type
	Database name: Server host: Server port: User ID: Password:	ncm6421 localhost 50000 icosuser a

Figure 2-134 Entering the database details

23. The database connection details are verified. When the Warning pop-up window opens, you must confirm that this process will load the database at the conclusion of the Netcool Configuration Manager installation. Click **OK**. See Figure 2-135.

<u>0</u>	Warning	×
	The database schema ncm6421 has no pre-existing tables in it, Thi load the database as part of the install for your convenience.	s install will
	Cancel Details >>	ок

Figure 2-135 Database load warning

24. Complete the Netcool Configuration Manager Server configuration. Enter the ftpuser password, SMTP server (localhost), and Network Manager integration details. These settings are shown in Figure 2-136 and Figure 2-137 on page 187. (Scroll down to see the second window.)

Install Sicenses	Location Features Summary	
 Common Configurations Database Configuratior 	Common Configurations ITNCM Server Configuration	
ITNCM Server Configura ONCM JazzSM Details	Root Realm	
	FTP Server	172.16.61.202
	FTP User Account	icosftp
	FTP user Password	
	FTP User Password Confirmation	••••••
	FTP User Account Directory	/home/icosftp
	SMTP Server	localhost
	A unique name for this Instance of ITNCM	Worker1
	Administration Port	8101
	Log Server Port	8102
	Log Server Admin Port	8103
	Compliance Administrative Port + next five consecutive ports.	8110
	IDT Daemon Port	8104

Figure 2-136 Common configurations

Tip: The NM Hostname (see the red box in Figure 2-137) refers to the Network Manager GUI server.

🗢 🧊 Common Configurations	Common Configurations					
Database Configuration	ITNCM Server Configuration					
🔷 ITNCM Server Configura	Is This the main IDT Server	^				
O NCM JazzSM Details	Yes					
	O No					
	Select the type of install you require.					
	☑ Activate Configuration-Core					
	☑ Activate Compliance-Core					
	☑ Is this an integrated NCM - NM Install?					
	The NM Hostname ncm_UI					
	The port to connect to	16311				
	The NM User	[itnmadmin =				
	The NM User Password					
	NM User Password Confirmation	•••••				
	The realm to import the devices to remove the @ symbol if specifying an exact domain.	ITNCM/@DOMAI				
< · · · · · · · · · · · · · · · · · · ·	K	>				

Figure 2-137 Common configurations

Tips: Use an IP address for the FTP server because the Domain Name System (DNS) is not configured for many network devices, especially in a lab setting.

Provide a more meaningful name for the Netcool Configuration Manager unique name, such as NCMLab1, or a name that describes the specific installation.

25.On the next window, provide the JazzSM password that was used in the previous installation step. Click **Next** and a password verification pop-up window opens. After successful validation, the next window opens. See Figure 2-138.

 Common Configurations Database Configuration TNCM Server Configuration NCM JazzSM Details 	NCM JazzSM Details Netcool Configuration Ma Service Hub. Please confi	s mager needs to deploy a Web Application into the IBM Dashboard Applica irm the install location of the Jazz for Service Management instance you v	ation want to use.
	Installation Directory Det /opt/IBM/netcool/JazzSI	ails M	Bro <u>w</u> se
	JazzSM user credentials User name	smadmin	
	Password Password Confirmation	······	
<u>(m)</u>		< Back Next >	Ca

Figure 2-138 JazzSM password

26. The next window provides a summary of the installation. If acceptable, click **Install** to proceed. See Figure 2-139.

Install Packages		
Review the summary information.		1-
Install Licenses Location Features	Summary	
Target Location		
Package Group Name: Netcool Configuration Manager		
Installation Directory: /opt/IBM/tivoli/netcool/ncm		
Shared Resources Directory: /opt/IBM/IM/IBMIMShared		
Packages		
Packages		
🚯 Presentation Server and Worker Server		
Environment	Disk Space Information	
English		Total Available Space
	1	30.50 GB
	Total Download Size: 211.26 MB	
	Total Installation Size: 433.85 MB	
Popository Information		

Figure 2-139 Installation summary

27. After the installation completes, the installed packages window opens. Click **Finish** to proceed, as shown in Figure 2-140.

∀	uration Manager	6401			
Netcool Col	inguration Manager	0.4.2.1			
lote: If the nackades	support rollback the	e temporary direct	tory contains roll	back files for	

Figure 2-140 Successful installation

Verification

You can perform the following steps to verify the installation.

Netcool Configuration Manager Server

Check the installation of the Netcool Configuration Manager server by issuing the following command from the /opt/IBM/tivoli/netcool/ncm/bin directory:

./itncm.sh status

The result is similar to Example 2-88.

Example 2-88 Server status

```
_____
Netcool Configuration Manager Status
-----
Deployment Type = GUI + Worker Server
Base Worker Server = Enabled
Compliance Core = Enabled
Components
_____
Worker Server = NOT RUNNING
Compliance Core = NOT RUNNING
GUI Server = NOT RUNNING
Logging level
_____
Log status unavailable
Load version
_____
6.4.2.1-0-32
Database
_____
Hostname/IP Address = localhost
Database Name = ncm6421
```

Installing the Netcool Configuration Manager drivers

In this portion of the installation, the Netcool Configuration Manager drivers are installed. With the release of Drivers 20, new groupings of drivers were created:

- Standard Drivers
- SmartModel Basic
- SmartModel Cisco
- SmartModel Juniper
- SmartModel Other
- SmartModel Archive
- SmartModel Complex

For a complete listing of the driver assemblies, their individual installers, and the installation instructions, see the Netcool Configuration Manager Drivers 20 release notes:

https://ibm.biz/BdrrNm

Tip: Create separate directories on the servers for each of the driver assemblies to facilitate the installation.

Additional configuration

This chapter assumes that you completed the steps in Chapter 2, "IBM Netcool Operations Insight installation and basic configuration" on page 23". Therefore, the IBM Netcool Operations Insight environment works, and it receives and processes alerts. The basic automation occurs, and the IBM Jazz for Service Management (JazzSM) console shows events.

In addition to the basic configuration, you can configure several other features in Netcool Operations Insight. In this chapter, we describe how to configure these additional capabilities of Netcool Operations Insight.

This chapter has the following sections:

- ▶ 3.1, "Configure single sign-on, LDAP, and SSL" on page 194
- 3.2, "Netcool Operations Insight extensions" on page 209
- ► 3.3, "Load balancing for JazzSM" on page 222

3.1 Configure single sign-on, LDAP, and SSL

You need to configure Dashboard Application Services Hub (DASH) as the main console that is accessed by the users. With DASH as the main console, you can open other GUIs, such as the Impact GUI and the Operations Analytics - Log Analysis GUI from DASH. You need to configure a central Lightweight Directory Access Protocol (LDAP) server and single sign-on (SSO). Also, the servers that are involved need to exchange Secure Sockets Layer (SSL) certificates.

Tip: The central LDAP server will be required for the SSO (single sign-on) configuration. For a seamless integration among all of the Netcool Operations Insight components and consoles, it is a preferred practice to configure SSO in your environment.

For more information about these configurations, see the following resources:

- https://ibm.biz/BdE79r
- https://ibm.biz/BdrEju

3.1.1 Integrating DASH and Impact

The following general steps integrate the DASH and Impact consoles:

- 1. The DASH (Jazz for Service Management) installation must be configured to use a central user repository for user authentication.
- 2. The DASH installation must be configured for SSO.
- 3. The Netcool/Impact installation must be configured to use the same central user repository as your DASH to authenticate the users.
- 4. Your Netcool/Impact installation must be configured for SSO.

Important: For the SSO to work, your Impact server must be on the same domain as your DASH server.

- 5. Restart both the Impact and DASH servers.
- 6. Complete the configuration steps in the DASH GUI for console integration.
- 7. Create the Impact data provider connection.

Detailed implementation steps

Perform the following steps to integrate DASH and Impact.

Configuring the Dashboard Application Services Hub to use a central user repository

Configure DASH to use a central user repository:

1. Add the LDAP user registry as a federated repository as described in the following document:

https://ibm.biz/Bdrr7R

Cell=JazzSMNodeU1Cell, Profile=JazzSMProfile	
Global security	2 .
Global security > Federated repositories > Manage repositories Specifies the configuration for secure access to a Lightweight I General Properties * Repository identifier ITSO-LDAP Repository adapter class name com.ibm.ws.wim.adapter.ldap.LdapAdapter * Directory type Microsoft Windows Active Directory * Primary host name itso-ad.swg.be.ibm.com Failover server used when primary is not available:	ies > New Directory Access Protocol (LDAP) repository with optional failover servers. Security Bind distinguished name CN=Administrator,CN=Users,DC=ITSO,DC=IBM,DC=COM Bind password intervent Federated repository properties for login Uid LDAP attribute for Kerberos principal name
Select Failover Host Name Port	Certificate mapping EXACT_DN
Add	Certricate filter
ignore	Require SSL communications
none	Centrally managed Manage endpoint security configurations
Custom properties	Use specific SSL alias
New Delete	NodeDefaultSSLSettings 👻 🗏 <u>SSL configurations</u>
Select Name Value	

Figure 3-1 shows how to add the details for the LDAP server.

Figure 3-1 Details for the LDAP server

2. Configure the LDAP federated repository as described in the following document:

https://ibm.biz/Bdrr7F

3. Figure 3-2 shows how to add a repository to the list of repositories of the realm. Click **Add repositories** and configure the base entry as shown.

<u>Global security</u> > <u>Federated repositories</u> > Repository reference
Specifies a set of identity entries in a repository that are referenced by a base (or parent) entry into the directory informatio multiple subtrees of the same repository are included in the same realm, it might be necessary to define additional distingu set of entries within the realm.
General Properties
* Repository ITSO-LDAP 💌 New Repository *
* Unique distinguished name of the base (or parent) entry in federated repositories DC=ITSO,DC=IBM,DC=COM
Distinguished name in the repository is different
Distinguished name of a subtree in the main repository
Apply OK Reset Cancel

Figure 3-2 LDAP base entry

It is a preferred practice to rename the realm to a more meaningful name. In our case, we renamed it to LDAPRealm.

Important: If the repository was configured for the ObjectServer, you must remove the repository now.

4. Figure 3-3 shows how the federated repositories appear at the end of this step.

bal security		
Global security > Federated repositories By federating repositories, identities stored in multiple rep file-based repository that is built into the system, in one re- covered Remonstries	oositories can be managed in a single, virtual real or more external repositories, or in both the built-i	n. The realm can consist of identities in the n repository and one or more external repositories
k Realm name LDAPRealm		
+ Primary administrative user name smadmin		
Server user identity		
Automatically generated server identity		
Server identity that is stored in the repository Server user ID or administrative user on a Version Password	<u>6.0.x n</u> ode	
 Ignore case for authorization Allow operations if some of the repositories are down Repositories in the realm: Add repositories (LDAP, custom, etc)) Use built- 	n repository Remove	
Select Base Entry	Repository Identifier	Repository Type
You can administer the following resources:		
DC=ITSO,DC=IBM,DC=COM	ITSO-LDAP	LDAP:AD
o=defaultWIMFileBasedRealm	InternalFileRepository	File
Total 2	1	

Figure 3-3 Federated repositories for the LDAP configuration

5. Configure the LDAP users in the console as described in the following document:

https://ibm.biz/Bdrr7E

Tip: When the steps refer to Users and Groups \rightarrow Manage Users, these steps are performed in the WebSphere Administrative Console.

Also, to log in to the WebSphere Administrative Console, you must log in as smadmin.

Configuring the Dashboard Application Services Hub for single sign-on Configure DASH for SSO:

 Configure SSO on the application server as described in following document: https://ibm.biz/Bdrr7H

Tip: Netcool/Impact and DASH must use the same domain name.

2. Figure 3-4 shows how to configure DASH for SSO.

Cell=JazzSMNode01Cell, Profile=JazzSMProfile
Global security
<u>Global security</u> > Single sign-on (SSO)
Specifies the configuration values for single sign-on.
General Properties
🗹 Enabled
Requires SSL
Domain name
swg.be.ibm.com
Interoperability mode
LTPA V1 cookie name
LTPA V2 cookie name
LtpaToken2
Web inbound security attribute propagation
Set security cookies to HTTPOnly to help prevent cross-site scripting attacks
Apply OK Reset Cancel

Figure 3-4 SSO for DASH

Configuring Netcool/Impact in the same central user repository as Dashboard Application Services Hub

Perform the following steps to configure Netcool/Impact in the same central user repository as DASH:

1. Configure LDAP for Netcool/Impact as described in the following document:

https://ibm.biz/Bdrr7r

Example 3-1 shows how the \$IMPACT_HOME/install/security/impactdap.properties file was configured in our environment.

Example 3-1 Settings for the impactdap.properties file

```
LDAPServerType="Microsoft Active Directory"
LDAPHost="itso-ad.swg.be.ibm.com"
LDAPPort="389"
LDAPBindDN="CN=Administrator,CN=Users,DC=ITSO,DC=IBM,DC=COM"
LDAPBaseEntry="DC=ITSO,DC=IBM,DC=COM"
LDAPSSLEnabled="false"
LDAPSSORealm="LDAPRealm"
```

```
# Advanced LDAP Repository Settings
LDAPIgnoreCase="true"
LDAPCertificateMapMode="EXACT_DN"
LDAPCertificateFilter=""
LDAPSearchTimeout="8m"
```

```
# Custom LDAP Search Filtering (Default values for Microsoft Active Directory)
#LDAPUserFilter="(&(sAMAccountName=%v)(objectcategory=user))"
#LDAPGroupFilter="(&(cn=%v)(objectcategory=group))"
#LDAPGroupIdMap="user:sAMAccountName"
#LDAPGroupIdMap="*:cn"
# Custom LDAP Search Filtering (Default values for IBM Tivoli Directory Server)
#LDAPUserFilter="(&(uid=%v)(objectclass=ePerson))"
#LDAPGroupFilter="(&(cn=%v)(|(objectclass=groupOfNames)(objectclass=groupOfUniqueN
ames)(objectclass=groupOfURLs)))"
#LDAPGroupIdMap="*:cn"
#LDAPGroupIdMap="*:cn"
#LDAPGroupMemberIdMap="ibm-allGroups:member;ibm-allGroups:uniqueMember;groupOfName
s:member;groupOfUniqueNames:uniqueMember"
```

2. After you configure the impactdap.properties file, run the **confAuth4LDAP.sh** script. Example 3-2 shows the **confAuth4LDAP.sh** script while it executes.

Example 3-2 Executing the confAuth4LDAP.sh script

[netcool@Impact-B ~]\$ cd \$IMPACT_HOME/install/security netcool@Impact-B security]\$./confAuth4LDAP.sh enable impactadmin netcool object00 netcool

The expected result for the command is the *BUILD SUCCESSFUL* message:

BUILD SUCCESSFUL Total time: 2 minutes 9 seconds

3. To grant additional permissions to the users in Impact, you need to use the **mapRoles.sh** script. Example 3-3 shows how to grant permissions to a user.

Example 3-3 Use the mapRoles.sh script to grant permissions to users in Impact

netcool@Impact-B ~]\$ cd \$IMPACT_HOME/install/security
netcool@Impact-B security]\$./mapRoles.sh -add -user johndoe -roles
ConsoleUser impactMWMUser impactOSLCDataProviderUser impactOpViewUser impactRBAUs
r impactSelectedOpViewUser impactUIDataProviderUser impactWebServiceUser"
dding user johndoe to role ConsoleUser
dding user johndoe to role impactMWMUser
dding user johndoe to role impactOSLCDataProviderUser
dding user johndoe to role impactOpViewUser
dding user johndoe to role impactRBAUser
dding user johndoe to role impactSelectedOpViewUser
dding user johndoe to role impactUIDataProviderUser
dding user johndoe to role impactwebserviceuser

Important: Impact does not verify the existence of the user/group that is used in the command in Example 3-3. So, check the syntax exactly and be aware of case sensitivity if the LDAP requires it.

For more information about each of the Impact roles, see the following website:

https://ibm.biz/Bdrr7s

Configuring single sign-on in Netcool/Impact

Perform the following steps to configure SSO in Netcool/Impact:

1. Configure SSO on Netcool/Impact to DASH as described in the following document:

https://ibm.biz/Bdrr7j

- 2. Set up these parameters in the DASH web administrator console. Customize the parameter values for the SSO domain name parameters to avoid session issues between the SSO and non-SSO web application products that might use the same default SSO domain name value. (See Figure 3-4 on page 197.) We used the following parameters in our configuration:
 - LTPA cookie name: LtpaToken2
 - Domain name: swg.be.ibm.com
 - Realm name: LDAPRealm
- 3. In the WebSphere console, add the Netcool/Impact SSL certificate into the DASH truststore by using the following steps:
 - a. Log in to the WebSphere Application Server on the JazzSM dashboard server by selecting **Console Settings** and **WebSphere Administrative Console**.
 - b. Select Launch WebSphere Administrative Console.
 - c. Under the Security node, select SSL certificate and key management.
 - d. Under the Related Items section, select Key stores and certificates.
 - e. Select NodeDefaultTrustStore.
 - f. Under the Additional Properties section, select Signer Certificates.
 - g. Select Retrieve from port.
 - h. Enter the host, port, and alias details for the GUI server (Figure 3-5 on page 200).
 - i. Select Retrieve signer information.
 - j. Select **OK** and save the configuration.

k. Figure 3-5 shows an example of how to retrieve the signer information.

trificate and key management
$\underline{certificate}$ and key management > Key stores and certificates > NodeDefaultTrustStore > Signer certificates > Retrieve from port
xes a test connection to a Secure Sockets Layer (SSL) port and retrieves the signer from the server during the handshake.
eral Properties
ost
.pact-b.swg.be.ibm.com
ort
311
L configuration for outbound connection
odeDefaultSSLSettings 💌
ias
pact-b
etrieved signer information
etrieved signer information \erial number
Serial number
etrieved signer information Serial number 558121222 ssued to
etrieved signer information serial number 558121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US
etrieved signer information serial number 558121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US csued by
etrieved signer information serial number 558121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US
etrieved signer information Serial number S58121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US
etrieved signer information Serial number S58121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ingerprint (SHA digest)
etrieved signer information Serial number 558121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ingerprint (SHA digest) 3F:5E:34:46:FE:C7:90:E4:47:7C:12:AA:CE:C2:79:0B:D2:8D:C5:9F
etrieved signer information Serial number 558121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ingerprint (SHA digest) 3F:5E:34:46:FE:C7:90:E4:47:7C:12:AA:CE:C2:79:0B:D2:8D:C5:9F 'alidity period
etrieved signer information Serial number 558121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ingerprint (SHA digest) 3F:5E:34:46:FE:C7:90:E4:47:7C:12:AA:CE:C2:79:0B:D2:8D:C5:9F 'alidity period Apr 25, 2026
Serial number S58121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ingerprint (SHA digest) 3F:5E:34:46:FE:C7:90:E4:47:7C:12:AA:CE:C2:79:0B:D2:8D:C5:9F falidity period Apr 25, 2026
Serial number S58121222 ssued to CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ssued by CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US ingerprint (SHA digest) SF:SE:34:46:FE:C7:90:E4:47:7C:12:AA:CE:C2:79:0B:D2:8D:C5:9F falidity period Apr 25, 2026

Figure 3-5 Retrieving signer information

 On the same window, you can configure the signer certificates for all servers that will integrate with DASH. Figure 3-6 shows all of the certificates that are needed in our environment.

SSL certi	ficate and key management			?
SSL c	ertificate and key management > Key s	tores and certificates > NodeDefaultTrust	Store > Signer certificates	
Mana	nes signer certificates in key stores			
	ferences			
e Pi	and the second s			
Ad	d Delete Extract Retrieve from	n port		
D	6 # \$			
Selec	Alias 🗘	Issued to 🗘	Fingerprint (SHA Digest) 🗘	Expiration 🗘
You	can administer the following resources:			
	impact-a	CN=impact-A.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US	CD:8E:54:C5:5F:5A:94:A4:66:E5:35:4B:CA:EB:55:DF:68:E1:C7:D9	Valid from Apr 27, 2016 to Apr 25, 2026.
	impact-b	CN=impact-b.swg.be.ibm.com, O=IBM, OU=ImpactUI, C=US	3F:5E:34:46:FE:C7:90:E4:47:7C:12:AA:CE:C2:79:0B:D2:8D:C5:9F	Valid from Apr 27, 2016 to Apr 25, 2026.
	ioala-a	CN=ioala-a, OU=IT, O=IBM, C=US	88:31:A1:ED:6C:51:EC:2D:D4:31:75:06:18:3F:87:8D:3A:D4:F6:F0	Valid from Apr 29, 2016 to Apr 29, 2018.
	jazz-b	CN=Jazz-B, OU=Root Certificate, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	39:FA:3F:83:6B:3D:C7:DA:F4:44:E2:D8:B4:52:B3:2E:C9:1D:DF:5C	Valid from Apr 27, 2016 to Apr 24, 2031.
	root	CN=Jazz-A, OU=Root Certificate, OU=JazzSMNode01Cell, OU=JazzSMNode01, O=IBM, C=US	80;BC:03:02:53:EA:A6:8D:0E:42:3C:85:F4:75:85:36:CE:CE:F2:D9	Valid from Apr 27, 2016 to Apr 24, 2031.
Tota	I 5			

Figure 3-6 Signer certificates

- 4. For the Impact integration that is described in this section, we will need the *jazz-b*, *impact-a*, and *impact-b* certificates.
- 5. Export the ltpa.keys file from DASH and apply a password to the ltpa.keys file by using the following steps:
 - a. Log in to the WebSphere Application Server on the JazzSM dashboard server by selecting **Console Settings** and **WebSphere Administrative Console**.
 - b. Select Launch WebSphere Administrative Console.
 - c. Under the Security node, start the Global security page.
 - d. On the right, select the LTPA link.
 - e. In the password fields, type a password to use for the ltpa.keys.
 - f. Enter the location where the key will be exported, for example, /tmp/ltpa.keys.
 - g. Select Export Keys.

Figure 3-7 exports the LTPA keys to a temporary directory.

Tip: It is a preferred practice to copy this file to a shared directory where all other servers in the environment can access this file.

al coguritu	
a seconcy	
	Messages
	🗓 The keys were successfully exported to the file /tmp/ltpa.keys.
obal security > LTPA	
crypts authentication uthentication informat	information so that the application server can send the data from one server to another in a secure manner. The encryption of ion that is exchanged between servers involves the LTPA mechanism.
Key generation —	
Authentication data i	s encrypted and decrypted by using keys that are kept in one or more key stores.
Key set aroup	
NodeLTPAKeySetG	oup 🗸 Generate keys
· · ·	
Key set group	<u>8</u>
LTPA timeout	
LTPA timeout value	for forwarded credentials between servers
1440 minutes	
Cross-cell single s	ign-on
- Single sign-on acros	- s cells can be provided by sharing keys and passwords. To share the keys and password, log on to one cell, specify a key file, and
click Export keys. Th	en, log on to the other cell, specify the key file, and click Import keys.
* Password	
•••••	
* Confirm password	
•••••	
Fully qualified key f	ile name
/teen/Itea kous	Import Keun
punpinpa.keys	Import Keys

Figure 3-7 Exporting the LTPA keys to a temporary directory

6. Example 3-4 copies the LTPA keys in Impact.

Example 3-4 Copying the LTPA keys for Impact

For the Impact server, the ltpa.keys are stored in the following directory: \$IMPACT_HOME/wlp/usr/servers/<server name>/resources/security/ where <server name> = "NCI" in this case. Note that for the secondary Impact, the <server name> will be different, for instance, "NCI2".

cp /mnt/ITS0_SHARE/Keys/ltpa.keys \$IMPACT_HOME/wlp/usr/servers/NCI/resources/security/ltpa.keys

Note that "/mnt/ITSO_SHARE/Keys/ltpa.keys" is where the shared LTPA keys file exported from DASH was copied to.

For the GUI Server, the ltpa.keys are stored in the following directory: \$IMPACT_HOME/wlp/usr/servers/ImpactUI/resources/security/

cp /mnt/ITS0_SHARE/Keys/ltpa.keys \$IMPACT_HOME/wlp/usr/servers/ImpactUI/resources/security/ltpa.keys

 Run the SSO configuration script configImpactSS0.sh. Specify the same parameter values that are referenced in step 1 in "Configuring single sign-on in Netcool/Impact" on page 199. Example 3-5 shows the execution of the configImpactSS0.sh script.

Example 3-5 Executing the configImpactSSO.sh script

\$ cd /opt/IBM/tivoli/netcool/impact/install/security

\$./configImpactSSO.sh LDAPRealm LtpaToken2 swg.be.ibm.com netcool netcool

The expected result for the command is the BUILD SUCCESSFUL message:

BUILD SUCCESSFUL Total time: 1 minute 5 seconds

Restart both the Dashboard Application Services Hub and Impact servers Restart both the DASH and Impact servers for the changes to take effect.

Complete configuration steps in the Dashboard Application Services Hub GUI for console integration

Perform the steps for Console Integration as described in the following document:

https://ibm.biz/Bdrr7Y
Figure 3-8 shows the configuration and testing of the console integration of Impact in DASH.

Console Integrations ×							
Console Integration	S						
General information regarding the Console Integration being created or edited. Specify the name of your UI, as you would like it to appear in the navigation/palette.							
 Required field 							
Console Integration ID:	impact-a						
* Console Integration Name:	impact a						
* Console Integration URL:	//impact-a.swg.be.ibm.com:16311/ibm/console/re	est					
Integration Location:	console/Console Integrations	Location					
Save Cancel							
Test your UI to see which	n tasks will be integrated into this conse	ble.					
Test							
Status: Connection Successful							
The following tasks will be integrated into this console. Pages will be added to the navigation tree under the folder impact a. Widgets will be added to the catalog named impact a.							
Name	ID	Roles	Supported Platforms	Federated	Туре		
Impact	impactView	impactAdminUser, impactFullAccessUser, impactOpViewUser, impactMWMAdminUser, impactMWMUser	DESKTOP	true	page		

Figure 3-8 Configuring the console integration

Create the Impact data provider connection

Follow these steps to create the Impact data provider connection:

1. In Figure 3-9, click Connections.

Console Settings					
User Preferences for Netcool/OMNIbus Web GUI					
General					
Catalogs					
Connections					
Console Preference Profiles					
Export Wizard					
Dashboard Hub					
Pages					
Widgets					
Views					
WebSphere Administrative Console					
Console Integrations					
Console Properties					
Console Analytics					
Roles					
Group Roles					
Roles					
User Roles					

Figure 3-9 Click Connections on the Console Settings window

2. In Figure 3-10, click the Create New Connection icon.



Figure 3-10 Create new connection

3. In Figure 3-11, set the connection details and click Search.

Connections ×						
					- 1	
Connections						
Sparify the carvar information and then click Search to a	eas a list of available data providers. You can then select a remote provi	der ontionally modify the connection information and then c	ick OF to create a remote connection			
operay the server information and then ency bearen to	tee a not of available data providero. Fou can then select a remote provi	wer, optionally mouly me connection micrimition, and men e	ack ok to create a reasone connection.			
Server information						
* Protocol: * Host name:					Port	
* Path:					16311	
/ibm/tivoli/rest						
Connection goes through a firewall						
Firewall address	all nort					
i ilewali addiesa	an port					
Use the following credentials to query the remote data	providers					
* Name: * Pas	sword:					
impactadmin •••	•••••					
* Con	firm password:					
•••						
Search						
↓ Nofiter applied ×						
Name	Description		Тире	Provider ID		
	Its Brans In Scalary					
	No nems to display					

Figure 3-11 Connection details

4. Figure 3-12 shows the result of the search. Ensure that the Name field is Impact_NCICLUSTER. Click **OK**.

	** No filter applied 1/2					
	Name	Description	Туре	Provider ID		
C	Impac_NCICLUSTER		Impact_NCICLUSTER	Impact_NCICLUSTER		
3	Total: 1 Selected: 0					
С	onnection information					
11	Vame:					
	Impact_NCICLUSTER					
D	escription:					
	Impact_NCICLUSTER					
• 6	*Prinder IV					
	Impact_NCICLUSTER.impact71.swg.be.ibm.com					
Use the credentials of the user (requires SSO Configuration)						
	OK Cancel					

Figure 3-12 Result of the search

Important: You need to execute the steps that relate to DASH in this section for both Jazz-A and Jazz-B.

Also, you need to execute the steps that relate to Impact for both Impact-A and Impact-B.

3.1.2 Importing the LTPA keys for the SSO in the JAZZ secondary server

To configure SSO in the secondary JazzSM server, follow the steps in this document: https://ibm.biz/Bdrr7z

Ξ.	Messages						
	🗓 The keys were successfully imported from the file /mnt/ITSO_SHARE/Keys/Itpa.keys.						
	⚠ Changes have been made to your local configuration. You can:						
	Save directly to the master configuration.						
	<u>Review</u> changes before saving or discarding.						
	Δ The server may need to be restarted for these changes to take effect.						
<u>Global security</u> > LTPA							
Encrypts authentication authentication informa	i information so that the application server can send the data from one server to another in a secure manner. The encryption of tion that is exchanged between servers involves the LTPA mechanism.						
Key generation							
Authentication data	is encrypted and decrypted by using keys that are kept in one or more key stores.						
Kev set aroup							
NodeLTPAKeySetG	roup 🔻 Generate keys						
Key set group	<u>15</u>						
LTPA timeout							
I TRA timeout value	for forwarded endertials between services						
1440 minutes	för förwarded Gedenidals between servers						
Cross-cell single	sign-on						
Single sign-on acros click Export keys. Th	Single sign-on across cells can be provided by sharing keys and passwords. To share the keys and password, log on to one cell, specify a key file, and dick Export keys.						
* Password	* Password						
•••••							
* Confirm password							
•••••							
Fully qualified key	file name						
/mnt/ITSO_SHARE/	Keys/Itpa.keys Export keys						

Figure 3-13 shows the keys that are imported to the secondary DASH server.

Figure 3-13 Importing LTPA keys in DASH

3.1.3 Configuring IBM Operations Analytics - Log Analysis for SSO with Jazz for Service Management

To configure IBM Operations Analytics - Log Analysis for SSO with JazzSM, follow the steps in this document:

https://ibm.biz/Bdrr7q

Important: When you enable LDAP in Operations Analytics - Log Analysis, ensure that the props file for the G_SCALA gateway is updated with the LDAP user/password that can access Operations Analytics - Log Analysis.

Follow these steps:

1. In this document, for step 2 of this procedure, you need to edit the *ldap_realm_property property* in the ldapRegistryHelper.properties file. For step 3, you need to run the **ldapRegistryHelper.sh** script.

Example 3-6 shows the edit of the ldap_realm_property property. It shows the execution of the **ldapRegistryHelper.sh** script in our environment. It also shows the /opt/IBM/netcool/LogAnalysis/wlp/usr/servers/Unity/ldapRegistry.xml file after you run these steps.

Example 3-6 Configure LDAP for IBM Operations Analytics - Log Analysis

```
[netcool@IOALA-a utilities]$ pwd
/opt/IBM/netcool/LogAnalysis/utilities
vi /opt/IBM/netcool/LogAnalysis/utilities/ldapRegistryHelper.properties
ldap type property=Microsoft Active Directory
ldap hostname property=itso-ad.swg.be.ibm.com
ldap port property=389
ldap baseDN property=DC=ITSO, DC=IBM, DC=COM
ldap_bindDN_property=CN=Administrator,CN=Users,DC=ITSO,DC=IBM,DC=COM
ldap bindPassword property=Object00
ldap realm property=LDAPRealm
ldap id property=LdapRegistryId
ldap ignoreCase property=true
[netcool@IOALA-a utilities]$ ./ldapRegistryHelper.sh config
The expected result is the BUILD SUCCESSFUL message.
[netcool@IOALA-a Unity]$ cat
/opt/IBM/netcool/LogAnalysis/wlp/usr/servers/Unity/ldapRegistry.xml
<server>
    <ldapRegistry
       host="itso-ad.swg.be.ibm.com"
       port="389"
       baseDN="DC=ITSO,DC=IBM,DC=COM"
       bindDN="CN=Administrator,CN=Users,DC=ITSO,DC=IBM,DC=COM"
       bindPassword="{xor}ED010jwrb28="
       realm="LDAPRealm"
       id="LdapRegistryId"
        ignoreCase="true"
       activedFilters="unityactivedfilters"
        ldapType="Microsoft Active Directory">
    </ldapRegistry>
    <activedLdapFilterProperties id="unityactivedfilters"</pre>
        userFilter="(&(sAMAccountName=%v)(objectcategory=user))"
       groupFilter="(&(cn=%v)(objectcategory=group))"
       userIdMap="user:sAMAccountName"
       groupIdMap="*:cn"
       groupMemberIdMap="memberOf:member"/>
</server>
```

 As part of step 4 of the procedure that was described in the URL in the beginning of this section, add the lines that are shown in Example 3-7 to the file /opt/IBM/netcool/LogAnalysis/wlp/usr/servers/Unity/server.xml.

Example 3-7 Added lines

```
<webAppSecurity ssoDomainNames="swg.be.ibm.com" />
<ltpa keysFileName="${server.output.dir}/resources/security/jazz.ltpa.keys"
    keysPassword="netcool" expiration="120" />
```

Add the LDAP admin group to the Log Analysis Admin users as described in the following document:

```
https://ibm.biz/Bdrr7P
```

Example 3-8 show how we performed this step in our environment.

Example 3-8 Adding the LDAP admin group to the Log Analysis Admin users

- 4. Restart the Log Analysis server. To verify that the SSO connection is set up correctly, log in to the JazzSM server. Open a new tab page in the browser and log in to Operations Analytics Log Analysis.
- 5. To test the Operations Analytics Log Analysis integration with DASH, open an Event Viewer in DASH. Figure 3-14 shows an Event Viewer with a selected event.

Q,	Event V	liewer	×										
★	2		Default	• D	Default 🔹 🤡 0 🐺 7 🏨 2 🚺 17 🧼 2 🜌 9						16 4	Enter search term	
2,,	Sev	Ack	Node	Alert Group	Summary	First Occurrence	Last Occurrence	Count	Туре	ExpireTime	Agent	Manager	
	V	No	Sydney	Systems	Machine has gone offline	4/27/16, 10:04 PM	5/2/16, 10:39 PM	7,615	Type Not Set	Not Set	MachineMon	Simnet Probe	
►	V	No	link4	Link	Link Down on port	4/27/16, 10:04 PM	5/2/16, 10:40 PM	60,423	Problem	Not Set	LinkMon	Simnet Probe	
⊕	V	No	Beijing	Stats	Diskspace alert	4/27/16, 10.06 PM	5/2/16, 10:35 PM	13,606	Type Not Set	Not Set	MachineStats	Simnet Probe	
Ē	Ŧ	No	Washington	Systems	Machine has gone offline	4/27/16, 10:04 PM	5/2/16, 10:39 PM	7,599	Type Not Set	Not Set	MachineMon	Simnet Probe	
ा जन	Ŧ	No	London	Systems	Machine has gone offline	4/27/16, 10:04 PM	5/2/16, 10:39 PM	7,594	Type Not Set	Not Set	MachineMon	Simnet Probe	
	¥	No	Moscow	Systems	Machine has gone offline	4/27/16, 10:06 PM	5/2/16, 10:40 PM	7,591	Type Not Set	Not Set	MachineMon	Simnet Probe	
**	V	No	Tokyo	Stats	Diskspace alert	4/27/16, 10:36 PM	5/2/16, 10:40 PM	14,658	Type Not Set	Not Set	MachineStats	Simnet Probe	
	Æ	No	Beijing	Stats	Diskspace alert	4/27/16, 10:04 PM	5/2/16, 10:40 PM	45,919	Type Not Set	Not Set	MachineStats	Simnet Probe	
												Simnet Probe	
	E.	No	Omni_A	DBStatus	Details count (alerts.details): 0	5/2/16, 10:36 PM	5/2/16, 10:36 PM	1	Information	330	OMNIbus SelfMonitoring	OMNIbus Self Monitoring	
	E.	No	Washington	Systems	Machine has gone online	4/27/16, 10:05 PM	5/2/16, 10:40 PM	7,598	Type Not Set	Not Set	MachineMon	Simnet Probe	
		No	Moscow	Systems	Machine has gone online	4/27/16, 10:06 PM	5/2/16, 10:40 PM	7,591	Type Not Set	Not Set	MachineMon	Simnet Probe	
	1	No	Omni_A	DBStatus	Event count (alerts.status): 40	5/2/16, 10:36 PM	5/2/16, 10:36 PM	1	Information	330	OMNIbus SelfMonitoring	OMNIbus Self Monitoring	

Figure 3-14 Event Viewer

6. Double-click an event to see more detailed information about it. On the Properties for event window, click the **Event Search** tab. Select a search type and a date range. Click **Search**.

If a graph, such as the graph that is shown in Figure 3-15, is shown, even if the graph states "No results found", the IBM Operations Analytics - Log Analysis integration with DASH was configured correctly.

Properties fo	or event 1448	on AGG_P - N	Mozilla Firefox: IBM Edition	Contraction of		x
A https://jaz	z-a.swg.be. ib r	n.com :16311/	ibm/console/v		+ ۹	* -
Propert	ies for e	vent 144	8 on AGG_P			?
Fields	Details	Journal	Event Search			
Search Ty	pe		Event Search for Identifie	r		-
Date Ran	ge		Previous hour			-
					Search	
			Event Search for Identifier			
15-						
별 ¹⁰⁻						
ent Co			No results found.			
ش 5-						
۰4						
	10.10 A	2.2.2.2.4		2 2 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	N.58	
https://io	oala-a.swg.b	e.ibm.com:99	87/Unity/SearchUI?queryStri	ing=NOT%2	Go	
					Close	

Figure 3-15 Event properties

3.2 Netcool Operations Insight extensions

Each of the Netcool Operations Insight components must be configured to enable Netcool Operations Insight extensions, which are additional features and capabilities, such as Seasonality, Event Analytics, and topology search.

3.2.1 Seasonality

You can check whether the seasonality works by logging in to the JazzSM server and clicking **Configure Analytics**, as shown in Figure 3-16.

Note: You need to configure Event Analytics to see the options, as shown in Figure 3-16. For more information, see 3.2.3, "Event Analytics" on page 211.



Figure 3-16 Insights options

Figure 3-17 shows the Configure Analytics page.

Impact × Event Viewer × Configure Analytics ×							
Name	Event Identity	Seasonality Status	Related Event Status	Start Time	End Time	Seasonality Phase	Seasonality Phase Progress
Sample Configuration	SUMMARY	X	X	Feb 2, 2016 11:53:34 PM	May 2, 2016 11:53:34 PM	Queued, Waiting to run	0%

Figure 3-17 Configure Analytics with a status of pending

The status of the service shows a check mark in a green square, as shown in Figure 3-18. The service depends on the status of the current run of the configuration.

Configure Analytics ×	configure Analytics ×							
217 3								
Name	Event Identity	Seasonality Status	Related Event Status	Start Time	End Time	Seasonality Phase	Seasonality Phase Progress	
Sample Configuration	SUMMARY			Feb 4, 2016 12:12:09 AM	May 4, 2016 12:12:09 AM	Completed	100%	

Figure 3-18 Configure Analytics with a successful run

3.2.2 Event integration

Check the server.init file in /opt/IBM/netcool/gui/omnibus_webgui/etc. See Example 3-9.

Example 3-9 The server.init file

```
scala.app.keyword=OMNIbus_Keyword_Search
scala.app.static.dashboard=OMNIbus_Static_Dashboard
scala.datasource=omnibus
scala.url=https://ioala-a.swg.be.ibm.com:9987
scala.version=1.2.0.3
```

This file was created by the event integration component of Web GUI. For more information, see 3.2.1, "Seasonality" on page 210.

3.2.3 Event Analytics

We configure the ObjectServer for Event Analytics, as documented at the following link:

https://ibm.biz/Bdrr7y

Follow these steps:

 On any of the Impact servers, copy relatedevents_objectserver.sql to /mnt/ITS0_SHARE/tmp as shown in Example 3-10.

Example 3-10 Copy relatedevents_objectserver.sql to /mnt/ITSO_SHARE/tmp/

```
cd /opt/IBM/tivoli/netcool/impact/add-ons/RelatedEvents
cp db/relatedevents_objectserver.sql /mnt/ITSO_SHARE/tmp/
```

2. Import the custom sql relatedevents_objectserver.sql to *all* ObjectServers as shown in Example 3-11.

Example 3-11 Import the custom sql relatedevents_objectserver.sql

```
$OMNIHOME/bin/nco sql -user root -password ''-server AGG P
</mnt/ITSO SHARE/tmp/relatedevents objectserver.sql
$OMNIHOME/bin/nco sql -user root -password ''-server AGG B
</mnt/ITSO SHARE/tmp/relatedevents_objectserver.sql
$OMNIHOME/bin/nco sql -user root -password '' -server DIS 1 <</pre>
/mnt/ITSO_SHARE/tmp/relatedevents_objectserver.sql
$OMNIHOME/bin/nco sql -user root -password '' -server DIS 2 <</pre>
/mnt/ITSO SHARE/tmp/relatedevents objectserver.sql
$OMNIHOME/bin/nco_sql -user root -password '' -server COL P 1 <</pre>
/mnt/ITSO_SHARE/tmp/relatedevents_objectserver.sql
$OMNIHOME/bin/nco_sql -user root -password '' -server COL_B_1 <</pre>
/mnt/ITSO SHARE/tmp/relatedevents objectserver.sql
$OMNIHOME/bin/nco sql -user root -password ''-server AGG P
</mnt/ITSO SHARE/tmp/relatedevents objectserver update fp5.sql
$OMNIHOME/bin/nco_sql -user root -password ''-server AGG B
</mnt/ITSO SHARE/tmp/relatedevents objectserver update fp5.sql
$OMNIHOME/bin/nco_sql -user root -password '' -server DIS 1 <</pre>
/mnt/ITSO SHARE/tmp/relatedevents objectserver_update_fp5.sql
$OMNIHOME/bin/nco_sql -user root -password '' -server DIS_2 <</pre>
/mnt/ITSO_SHARE/tmp/relatedevents_objectserver_update_fp5.sql
$OMNIHOME/bin/nco_sql -user root -password '' -server COL_P_1 <</pre>
/mnt/ITS0_SHARE/tmp/relatedevents_objectserver_update_fp5.sql
```

This action adds a set of new fields, triggers, and tables to the ObjectServers.

- 3. Reconfigure the gateways to support the new fields:
 - IBMExtractedType
 - IBMProcessingStage
 - ParentIdentifier

This task is partially documented at this website:

https://ibm.biz/Bdrr7v

4. Reconfigure the gateways to support the new fields by logging in to Omni-A as the user netcool and by running the command that is shown in Example 3-12.

Example 3-12 A_TO_D_GATE.map changes

5. You must make the same changes to the AGG_GATE.map file and the A_T0_D_GATE.map file on Omni-B as shown in Example 3-13.

Example 3-13 AGG_GATE.map file

6. At the end of the AGG_GATE.map file, add the configuration for the extra failover capabilities as shown in Example 3-14. For more information, see this website:

https://ibm.biz/Bdrr7v

Example 3-14 AGG_GATE.map

```
cd $OMNIHOME/etc
vi AGG_GATE.map
CREATE MAPPING RE_CACHEMAP
(
'name' = '@name' ON INSERT ONLY,
```

```
'updates' = '@updates'
);
```

7. Edit the AGG_GATE.tblrep.def file to add the commands to the end of the file as shown in Example 3-15.

Example 3-15 AGG_GATE.tblrep.def

```
vi AGG_GATE.tblrep.def
REPLICATE ALL FROM TABLE 'relatedevents.cacheupdates'
USING map 'RE_CACHEMAP';
```

8. On the Impact server, configure the data sources and services that are used by Netcool Operations Insight. Configure the ObjectServer data source as shown in Figure 3-19.

+	- 🖬 📝 📫 🖸 - 🔽 🎇	seasonalReportDataSourceDB2 ×	ObjectServerForNOI ×
	EIC_alerisob		
	BMConnectionsObjectServerDSA	General Settings:	
	■	Provide general information v	vhich describes the data source. An * indicates required fields.
	ImpactDB	* Data Osurra Namar	
l ► Ū	Internal	Data Source Name.	ObjectServerForNOI
	NOIReportDatasource	* Username:	impactconnect
•	ObjectServerForNOI	Password:	•••••
▶ [ObjectServerHistoryDB2ForNOI	Maximum SQL Connection:	30
• [ObjectServerHistoryMSSQLForNOI		*
) · [ObjectServerHistoryOrclForNOI	Databasa Failura Baligr	
	ReceiveFromWBE	Database Failure Folicy.	
) I I	RelatedEventsDatasource	Select what action to take if Ir	npact cannot connect to the database.
) · [SCR_DB		Fail over
▶ 🗄	Schedule		Fail back
	SendToWBE		Disable Backup
► <i>f</i> .	Statistics		
) URL	Primary Source:	
	Z XmIDsaMediatorDataSource	Provide information on the pr	imary database. * marks a required field.
L	detaultopjectserver	* Hest Name:	Omni A swa ha ihm com
		riustivame.	Onnin_A.swg.be.ibin.com
۲ U	seasonairceponDatasource	* Port	4100
			SSL Mode
			Test Connection
		Backup Source:	
		Provide information on the ba	ickup database.
		* Host Name:	omni_b.swg.be.ibm.com
		* Port	4100
			SSL Mode
			Test Connection

Figure 3-19 ObjectServer for Netcool Operations Insight

 In this data source, enter the Primary ObjectServer, Secondary ObjectServer, and their ports. Point the Primary ObjectServer, Secondary ObjectServer, and their ports to the Aggregation Layer ObjectServers and use the previously created ObjectServer's user name: impactconnect. 10.Configure the SeasonalReportDataSourceDB2 data source, which is described at the following website:

https://ibm.biz/Bdrr7m

If you need to create the database manually, follow these steps:

a. Run the commands that are shown in Example 3-16 on any Impact server.

Example 3-16 The seasonality_db2.sql file

cd /opt/IBM/tivoli/netcool/impact/add-ons/Seasonality/db
cp seasonality_db2.sql /mnt/ITS0_SHARE/tmp

b. Run the database creation script on the DB2 Server as user db2inst1, as shown in Example 3-17.

Note: You can change the Seasonality Database to the DB2 instance. For more information, see this website:

https://ibm.biz/Bdrr7K

Example 3-17 Run the database creation script

db2 -tvf /mnt/ITS0_SHARE/tmp/seasonality_db2.sql

11. When the database is created, configure the seasonalReportDataSourceDB2 on the configuration panel, as shown in Figure 3-20.

IBM Tivoli Netcool/Impact 7.1.0.5	
Welcome Data Model Policies Services Operator Vi	iew Event Isolation and Correlation Maintenance Window Reports
	seasonalReportDataSourceDB2 ×
▶ In EIC_alertsdb	
EventrulesDB	General Settings:
IBMConnectionsObjectServerDSA	Provide general information which describes the data source. An * indicates required fields.
	* Date Cauree Name:
▶ Internal	
NOReportDatasource	* Username: db2inst1
ObjectServerForNOI	Password:
ObjectServerHistoryDB2ForNOI	Maximum SQL Connection: 5
ObjectServerHistoryMSSQLForNOI	
ObjectServerHistoryOrclForNOI	Database Failure Policy:
ReceiveFromWBE	Select what action to take if Impact cannot connect to the database
RelatedEventsDatasource	Generit what action to take in impact cannot connect to the database.
► I SCR_DB	Fail over Fail seale
Schedule	Cisable Backup
SendToWBE	() · · · · · · · · · · · · · · · · · · ·
fr Statistics	Primary Source:
URL VmIDsaMediatorDataSource	Provide information on the primary database * marks a required field
IseasonalReportDataSourceDB2 a	* Host Name: 172.16.61.137
▶ [] seasonalReportDatasource	* Port: 50000
	* Database: SEASONDB
	Test Connection
	Backup Source:
	Provide information on the backup database.
	Host Name: 172.16.61.138
	Port. 50000
	Database: SEASONDB
	Test Connection
.	lest connection

Figure 3-20 The seasonalReportDataSourceDB2 tab

12.Configure the ObjectServerHistoryDB2ForNOI data source. Figure 3-21 shows the historical database data source configuration.

	IBM Tivoli Netcool/Impact 7.1.0.5	
	Welcome Data Model Policies Services Operator Vie	w Event Isolation and Correlation Maintenance Window Reports
	1 - 2 7 6 1 0 - 2 1 8	seasonalReportDataSourceDB2 × ObjectServerHistoryDB2ForNOI ×
	▶ 🖡 EIC alertsdb	
	EventrulesDB	General Settings:
	Image: Imag	Provide general information which describes the data source. An * indicates required fields.
	ImpactDB	* Data Source Name: ObjectServerHistoryDB2ForNOI
	Internal	* Username: db2inst1
	NOIReportDatasource	Password:
	ObjectServerForNOI	Maximum SOL Connection:
	ObjectServerHistoryDS2PonOl ObjectServerHistoryMSSQLForNOl	
	ObjectServerHistoryOrclForNOI	Database Failure Policy.
	ReceiveFromWBE	Select what action to take if Impact cannot connect to the database
	RelatedEventsDatasource	
	► SCR_DB	Fail over Fail back
	Schedule	O Disable Backup
	Send lowbe	
	VIL URL	Primary Source:
	Ili XmlDsaMediatorDataSource	Provide information on the primary database. * marks a required field.
	defaultobjectserver	* Host Name: 172.16.61.137
	seasonalReportDatasource	* Port: 50000
		* Database: REPORTER
		Test Connection
		Backup Source:
		Provide information on the backup database.
		* Host Name: localhost
		* Port: 50000
		* Database: database
•		Test Connection

Figure 3-21 ObjectServerHistoryDB2ForNOI

IBM Tivoli Netcool/Impact 7.1.0.5			
Welcome Data Model Policies Services Operator View	v Event Isolation and Correlation	Maintenance Window Reports	
1 - 🖬 🗹 🖬 🗔 - 🔽 🛛 🖄 👘	RelatedEventsDatasource ×		
▶ Internal			
► I RelatedEventsDatasource	General Settings:		
	Provide general information v	which describes the data source. An * indicates required fit	elds.
	* Data Source Name:	RelatedEventsDatasource	
	* Username:	impact	
	Password:	•••••	
	Maximum SQL Connection:	5	
	Database Esilure Rolice		
	Select what action to take if In	nnact cannot connect to the database	
		Eail over	
		Fail back	
		O Disable Backup	
	Primary Source:		
	Provide information on the pri	imary database. * marks a required field.	
	* Host Name:	impact-a.swg.be.ibm.com	
	* Port:	1527	
	* Database:	ImpactDB	
		Test Connection	
	Backup Source:		
	Provide information on the ba	ickup database.	
	* Host Name:	impact-b.swg.be.ibm.com	
	* Port:	1527	
	* Database;	ImpactDB	

13. Also, you must update the RelatedEventsDatasource, as shown in Figure 3-22.

Figure 3-22 RelatedEventsDatasource

Impact ×	
IBM Tivoli Netcool/Impact 7 1 0 5	
Welcome Data Model Policies Services Operator Vi	ew Event Isolation and Correlation Maintenance Window Reports
1 - □ 1 1 1 0 - 2 1 1	seasonalReportDataSourceDB2 × seasonalReportDatasource ×
▶ 🗻 seasonalReportDataSourceDB2 🔒	
▶ 🚺 seasonalReportDatasource 🔒	Derby Data Source Editor General Settings: Provide general information which describes the data source. An * indicates required fields. * Data Source Name: seasonalReportDatasource * Username: impact Password: •••••••
	Maximum SQL Connection: 5
	Database Failure Policy:
	 Select what action to take if Impact cannot connect to the database. Fail over Fail back Disable Backup
	Primary Source:
	Provide information on the primary database. * marks a required field.
	* Host Name: impact-a.swg.be.ibm.com
	* Port 1527 🔺
	* Database: ImpactDB
	Test Connection
	Backup Source:
	Provide information on the backup database.
	* Host Name: impact-B[swg.be.ibm.com
	* Port 1527

14. Change the internal seasonal Report Datasource as shown in Figure 3-23.

Figure 3-23 Change the seasonalReportDatasource

15. Start the services for the Netcool Operations Insight RelatedEvents project. Select **RelatedEvents** as shown in Figure 3-24.

NCI:NCICLUSTER (172.16.61.135:5551	7:NCI) - RelatedEvents
Select Project:	Manage Projects:
🗀 Default	Create Project
EventIsolationAndCorrelation	😢 Edit Current Project
🔇 Global	🗙 Delete Current Project
IBMConnections	🍫 Refresh
🗀 ITM	🔛 Clear all user locks
🗀 ITNM	
C MWM	
🗀 NOI	
CpviewAuth	
C RelatedEvents	
🗀 Reports	
C SNMP	
🗀 Seasonality	
C TADDM	
🗀 WBE	
🗀 WebTop	
🗀 XML	
Figure 3-24 RelatedEvents pro	iject

16.Select the **Services** tab as shown in Figure 3-25.

Impac	t ×	
IBM	1 Tivoli Netcool/Impact 7.1.0.5	
Wel	Icome Data Model Policies Services	Oper
1	• 🖻 🖬 📄 🕨 🥘 l 🖄	
4	ProcessClosedPatternInstances	~
4	ProcessPatternGroupsAllocation	\checkmark
5	ProcessRelatedEventConfig	\checkmark
	ProcessRelatedEventPatterns	
5	ProcessRelatedEventTypes	~
B	ProcessRelatedEvents	

Figure 3-25 Services tab

17.Confirm that all services are started.

18. Start the services for the Netcool Operations Insight Seasonality project. Select **Seasonality** as shown in Figure 3-26.

N	CI:NCICLUSTER (172.16.61.135:55	517:	NCI) -	Seasonality -
Sele	ct Project:	Mana	age Project	s:
	Default		Create Pro	ject
	EventIsolationAndCorrelation	\$	Edit Currei	nt Project
$\langle \mathbf{S} \rangle$	Global	×	Delete Cu	rrent Project
	IBMConnections	ŵ	Refresh	
	ITM	(77	Clear all u	ser locks
	ITNM			
	MWM			
	NOI			
	OpviewAuth			
	RelatedEvents			
	Reports			
	SNMP			
	Seasonality			
	TADDM			
	WBE			
	WebTop			
	XML			
Figu	ire 3-26 Seasonality Project	t		

19.Select the Services tab, as shown in Figure 3-27.

Wel	Icome Data Model Policies Services	Opera	
1	• 🖉 🖬 🔁 🕨 🥚 😤		
F	ProcessSeasonalityAfterAction		
3	ProcessSeasonalityConfig		
.	ProcessSeasonalityEvents		
8	ProcessSeasonalityNonOccurrence		
8	StartSeasonalityProcessing		
9	UpdateSeasonalityExpiredRules		

Figure 3-27 Services tab

20. Confirm that all services are started, except StartSeasonalityProcessing, which is only used to start the Seasonality whenever the server starts. If the services are marked with an X in a red circle, start them.

3.2.4 Topology search

The configuration of the topology search feature is documented at this website: https://ibm.biz/Bdrr76

To configure the topology search feature, follow these steps:

1. Apply the SQL files on the Aggregation and Display Server (Omni-A), as shown in Example 3-18.

Example 3-18 Apply the SQL files on the Aggregation and Display Server

```
cd /opt/IBM/tivoli/netcool/omnibus/bin
./nco_sql -user root -server AGG_P
</opt/IBM/tivoli/netcool/omnibus/extensions/scala/scala_itnm_configuration.sql
./nco_sql -user root -server AGG_B
</opt/IBM/tivoli/netcool/omnibus/extensions/scala/scala_itnm_configuration.sql
./nco_sql -user root -server DIS_1
</opt/IBM/tivoli/netcool/omnibus/extensions/scala/scala_itnm_configuration.sql
./nco_sql -user root -server DIS_2
</opt/IBM/tivoli/netcool/omnibus/extensions/scala/scala_itnm_configuration.sql</pre>
```

2. For the menus, apply the changes to the JazzSM servers. On *both* JazzSM servers, set the username/password in the waapi.init file. See Example 3-19.

Example 3-19 Set the username/password in waapi.init

```
vi /opt/IBM/netcool/gui/omnibus_webgui/waapi/etc/waapi.init
waapi.user:smadmin2
waapi.password:netcool
```

Important: If LDAP is activated, you must use an LDAP user name. Otherwise, use the smadmin user name.

 Apply the scalaEventTopology.xml file by using the runwaapi command. See Example 3-20.

Example 3-20 Apply the scalaEventTopology.xml file

```
cd /opt/IBM/netcool/gui/omnibus_webgui/waapi/bin
./runwaapi -file
/opt/IBM/netcool/gui/omnibus_webgui/extensions/LogAnalytics/scalaEventTopology.xml
```

4. Edit the topoviz.properties file. See Example 3-21.

Example 3-21 Edit the topoviz.properties file

vi /opt/IBM/netcool/gui/precision_gui/profile/etc/tnm/topoviz.properties
topoviz.unity.customappsui=https://ioala-a.swg.be.ibm.com:9987/Unity/CustomAppsUI

5. Add the menu item to the Network view by adding <menu id="Event Search"/> to the ncp topoviz device menu.xml as shown in Example 3-22.

Example 3-22 Add the menu item to the Network view

3.3 Load balancing for JazzSM

This section describes the load balancing configuration for JazzSM and for the UI Data Provider connections to Netcool/Impact.

3.3.1 Load balancing for the Jazz configuration

For more information, see the following document to turn on load balancing for the Jazz configuration:

https://ibm.biz/BdrsBy

Note: Before you join nodes to a cluster, ensure that *each* node uses the same *file-based* repository user ID, which is assigned the role of *iscadmins*.

Follow these steps to turn on load balancing for JazzSM:

- 1. Create a DB2 database that is named dashdb.
- On the JazzSM servers, copy the db2jcc* files to the directory /opt/IBM/netcool/WebSphere/universalDriver/lib/db2/. See Example 3-23.

Example 3-23 Copy the db2jcc* files to /opt/IBM/netcool/WebSphere/universalDriver/lib/db2/

```
cp /opt/IBM/netcool/JazzSM/lib/db2/db2jcc*
/opt/IBM/netcool/WebSphere/universalDriver/lib/db2/
```

```
/opt/IBM/netcool/JazzSM/lib/db2/db2jcc.jar
/opt/IBM/netcool/JazzSM/lib/db2/db2jcc_license_cu.jar
```

3. Configure a data source in the WebSphereAdministrative Console.

Click Launch WebSphere Administrative Console and log in. See Figure 3-28.



Figure 3-28 Launch the WebSphere Administrative Console

4. Figure 3-29 shows the WebSphere Administrative Console. Click Resources.

WebSphere. software		Welcome sma	admin Help Logout	IBM.
View: All tasks 🗸	Welcome			
■ Welcome	Welcome	? = 🗆	About this Integrated Solutions Conso	ole 💶
Guided Activities Guided Activities Subscript Activities Subscrite Subscript Activities Subscript Activities Subs	Integrated Solutions Console provides a s			*
Servers	console for multiple products. The table lis	its the product suites	8.5.5.4 Build Number: cf041446.03	=
Applications	that can be administered through this installation. Select a product suite to view more information.		Build Date: 11/19/14	-
Services			LICENSED MATERIALS PROPERTY OF	- DF
Resources	Suite Name	Version	IBM 5724-108 5724-162	-
Security	WebSphere Application Server	8.5.5.4	5724-H88,5724-H89, 5655-W65 (C)
Environment				
System administration				
Honitoring and Tuning				
Troubleshooting				
E Service integration				
± UDDI				

Figure 3-29 WebSphere Administrative Console

5. Click JDBC \rightarrow JDBC providers. See Figure 3-30.

View:	All tasks 👻		
Welco	me		
Guided Activities			
+ Serve	irs		
🗄 Appli	cations		
🛨 Servi	ces		
🖃 Reso	urces		
 Sc OI JM JD J H Re As Ca Ma UR UR Re 	chedulers bject pool managers S BC JDBC providers Data sources Data sources (WebSphere Application Server V4) source Adapters ynchronous beans che instances il L source Environment		
± Secu	ity		
Envir	onment		
🛨 Syste	em administration		
+ Users	s and Groups		
🛨 Monit	■ Monitoring and Tuning		
∃ Troub	Troubleshooting		
± Servi	ce integration		
± UDDI	1		

Figure 3-30 Click JDBC and select JDBC providers

6. Select Node=JazzSMNode01, Server=server1, as shown in Figure 3-31.

DBC providers				
JDBC providers				
Use this page to edit properties of a JDBC provider. The JDBC provider object encapsulates the specific JDBC driver implementation class for access to the specific vendor database of your environment. Learn more about this task in a <u>quided activity</u> . A guided activity provides a list of task steps and more general information about the topic.				
Scope: Cell=JazzSMNode01Cell	, Node=JazzSMNode01, Server=server1			
Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, <u>see the scope settings help.</u>				
Node=JazzSMNode01, :	Server=server1			
All scopes				
Node=JazzSMNode01				
New Node=JazzSMNode01, S	erver=server1			
Select Name 🗘	Scope 🗘	Description 🗘		
You can administer the following	resources:			
Derby JDBC Provider Node=JazzSMNode01,Server=server1 Derby embedded non-XA JDBC Provider Node=JazzSMNode01,Server=server1 Derby embedded non-XA				
Total 1				

Figure 3-31 Edit the scope

- 7. Select the following options (Figure 3-32):
 - For the database type, select **DB2**.
 - For the provider type, select **DB2 Universal JDBC Driver Provider**.
 - For the implementation type, select **Connection pool data source**.
- 8. Click Next.

Crea	Create a new JDBC Provider			
С	reate a new JDBC Provid	er		
÷	Step 1: Create new	Create new JDBC provider		
	Step 2: Enter database class path information	Set the basic configuration values of a JDBC provider, which encapsulates the specific vendor JDBC driver implementation classes that are required to access the database. The wizard fills in the name and the description fields, but you can type different values.		
	Step 3: Summary	Scope cells:JazzSMNode01Cell:nodes:JazzSMNode01:servers:server1 * Database type DB2 • * Provider type DB2 Universal JDBC Driver Provider • * Implementation type Connection pool data source • * Name DB2 Universal JDBC Driver Provider DB2 Universal JDBC Driver Provider DB2 Universal JDBC Driver Provider Description One-phase commit DB2 JCC provider that supports JDBC 3.0. Data sources that use this provider support only 1-phase commit processing, unless you use driver type 2 with the application server for z/OS. If you use the applic		
	Next Cancel	.#.		

Figure 3-32 Data source

9. If you use DB2, change the class path to /opt/IBM/netcool/JazzSM/lib/db2/ and click **OK**, as shown in Figure 3-33.

	Messages Modifying the implementation class name will eliminate the abia sources and data sources version 4 from templates.	lity to create data
<mark>C provide</mark> this page pecific JC	ars > DB2 Universal JDBC Driver Provider a to edit properties of a Java Database Connectivity (JDBC) provider. The DBC driver implementation class for access to the specific vendor databa n	a JDBC provider object encapsul se of your environment.
General P	Properties	Additional Properties
Scope		Data sources
cells:Ja	zzSMNode01Cell:nodes:JazzSMNode01:servers:server1	 Data sources
* Name		(WebSphere
DB2 Uni	iversal JDBC Driver Provider	Application Server V4)
Descript	tion	
One-ph that use driver ty server f	hase commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit ing.	
One-ph that use driver ty server f process Class pa	aase commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit sing.	
One-ph that use driver ty server f process Class pa /opt/IBI /opt/IBI	asse commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit sing. 	
One-ph that use driver ty server f process Class pa /opt/IBI /opt/IBI	asse commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit sing. 	
One-ph that use driver ty server f process /opt/IBI /opt/IBI /opt/IBI	ase commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit ing. 	
One-ph that use driver ty server f process /opt/IBI /opt/IBI Native li \${DB2U	asse commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit sing. 	
One-ph that use driver ty server f process /opt/IBI /opt/IBI /opt/IBI /opt/IBI	asse commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit ing. 	
One-ph that use driver ty server f process /opt/IBI /opt/IBI /opt/IBI /opt/IBI /opt/IBI /opt/IBI /opt/IBI /opt/IBI	aase commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit sing. 	
One-ph that use driver ty server f process /opt/IBI /opt/IBI /opt/IBI /opt/IBI /opt/IBI /opt/IBI	ase commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit ing. 	
One-ph that use driver ty server f process /opt/IB/ /opt/	asse commit DB2 JCC provider that supports JDBC 3.0. Data sources e this provider support only 1-phase commit processing, unless you use ype 2 with the application server for z/OS. If you use the application for z/OS, driver type 2 uses RRS and supports 2-phase commit sing. ath M/netcool/JazzSM/lib/db2/db2jcc.jar M/netcool/JazzSM/lib/db2//db2jcc_license_cu.jar ibrary path JNIVERSAL_JDBC_DRIVER_NATIVEPATH} ate this resource provider nentation class name m.db2.jcc.DB2ConnectionPoolDataSource OK Reset Cancel	

Figure 3-33 Change the class path to /opt/IBM/netcool/JazzSM/lib/db2/

10. Figure 3-34 shows the Summary. Click **Finish**.

Crea	Create a new JDBC Provider				
C	Create a new JDBC Provider				
	Step 1: Create new	Summary			
	Step 2: Enter	Summary of actions:			
	database class path	Options	Values		
	information	Scope	cells:JazzSMNode01Cell:nodes:JazzSMNode01:servers:server1		
→	Step 3: Summary	JDBC provider name	DB2 Universal JDBC Driver Provider		
		Description	One-phase commit DB2 JCC provider that supports JDBC 3.0. Data sources that use this provider support only 1-phase commit processing, unless you use driver type 2 with the application server for z/OS. If you use the application server for z/OS, driver type 2 uses RRS and supports 2-phase commit processing.		
		Class path	\${DB2UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc.jar \${UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc_license_cu.jar \${DB2UNIVERSAL_JDBC_DRIVER_PATH}/db2jcc_license_cisuz.jar		
		\${DB2UNIVERSAL_JDBC_DRIVER_PATH}			
		\${UNIVERSAL_JDBC_DRIVER_PATH}			
		Native path	\${DB2UNIVERSAL_JDBC_DRIVER_NATIVEPATH}		
		\${DB2UNIVERSAL_JDBC_DRIVER_NATIVEPATH}			
		Implementation class name	com.ibm.db2.jcc.DB2ConnectionPoolDataSource		
	Previous Finish Cancel				

Figure 3-34 Summary

11.Click Data sources.

12. Select the scope and click New (Figure 3-35).

ata sources					2
	essages				
4	Changes have been	n made to your local configuration. You	i can:		
	Save directly to the	e master configuration.			
1	Review changes be	fore saving or discarding.			
4	The server may nee	ed to be restarted for these changes to	take effect.		
Data sources					
Lies this pass to ad-	the estimat of - d-	the surgest that is appreciated with when a	lasted IDRC -	rouidor. The de	
object supplies your	application with conn	ections for accessing the database. Lea	arn more abou	it this task in a	guided
activity. A guided act	ivity provides a list o	f task steps and more general informa	tion about the	topic.	
Scope: Cell=Jazz	SMNode01Cell, Node	=JazzSMNode01, Server=server1			
Scope spec	ifies the level at whic	h the resource definition is visible. For	detailed		
information	n on what scope is an	a now it works, <u>see the scope settings</u>	neip.		
Node=Ja:	zzSMNode01, Server=	server1 🔻			
Preferences					
New Delete	Test connection	Manage state			
Select Name 🛟	JNDI name 🗘	Scope 🗘	Provider 🗘	Description 🗘	Category 🗘
You can administer	the following resourc	es:			
Default	DefaultDatasource	Node=JazzSMNode01,Server=server1	Derby JDBC	Datasource	
Datasource			Provider	for the	
				WebSphere	
				Application	
				Application	
Total 1		1			

Figure 3-35 New data source

13. Type the following information and click **Next** (Figure 3-36):

- For the data source name, type tipds.
- For the Java Naming and Directory Interface (JNDI) name, type jdbc/tipds.

Create a data source Create a data source	-
→ Step 1: Enter basic	Enter basic data source information
data source information Step 2: Select JDBC provider	Set the basic configuration values of a datasource for association with your JDBC provider. A datasource supplies the physical connections between the application server and the database.
Step 3: Enter database specific properties for the	Requirement: Use the Datasources (WebSphere(R) Application Server V4) console pages if your applications are based on the Enterprise JavaBeans(TM) (EJB) 1.0 specification or the Java(TM) Servlet 2.2 specification.
data source Step 4: Setup	Scope cells:JazzSMNode01Cell:nodes:JazzSMNode01:servers:server1
Step 5: Summary	* Data source name tipds
	* JNDI name jdbc/tipds
Next Cancel	

Figure 3-36 Data source

14. Select the JDBC provider that you created, for example, DB2 Universal JDBC Driver Provider, and click **Next** (Figure 3-37).

Creat	e a data source		
Cre	eate a data source		
	Step 1: Enter basic	Select JDBC provider	
→	information Step 2: Select JDBC provider	Specify a JDBC provider to support the datasource. If you choose to create a new JDBC provider, it will be created at the same scope as the datasource. If you are selecting an existing JDBC provider, only those providers at the current scope are available from the list.	
	Step 3: Enter database specific properties for the data source	 Create new JDBC provider Select an existing JDBC provider 	
	Step 4: Setup security aliases	DB2 Universal JDBC Driver Provider	
	Step 5: Summary		
	Previous Next Cance		

Figure 3-37 Select JDBC Provider

15. Change the following properties (Figure 3-38):

- For the driver type, select 4.
- For the database name, type dashdb.
- For the server name, type 172.16.61.137.
- For the port number, type 50000.

Important: Click Use this data source in container managed persistence (CMP).

Create a data source				
Step 1: Enter basic data source	Enter database specific	properties for the data source		
information Step 2: Select JDBC provider	Set these database-specific driver to support the connec	properties, which are required by the database vendor JDBC tions that are managed through the datasource.		
→ Step 3: Enter	Name	Value		
database specific properties for the	* Driver type	4 💌		
data source	* Database name	dashdb		
Step 4: Setup security aliases	* Server name	172.16.61.137		
Step 5: Summary	* Port number	50000		
Use this data source in container managed persistence (CMP)				

Figure 3-38 Data source properties

16.For the mapping-configuration alias, select **DefaultPrincipalMapping** (Figure 3-39) and click **Global J2C authentication alias** to open it in a *new* window.

Create a data source	
Create a data source	
Step 1: Enter basic data source information	Setup security aliases
Step 2: Select JDBC provider Step 3: Enter database specific properties for the data source → Step 4: Setup	Select the authentication values for this resource. Component-managed authentication alias (none) Mapping-configuration alias DefaultPrincipalMapping Container-managed authentication alias
Step 5: Summary	Note: You can create a new J2C authentication alias by accessing one of the following links. Clicking on a link will cancel the wizard and your current wizard selections will be lost. <u>Global J2C authentication alias</u> <u>Security domains</u>
Previous Next Cance	el

Figure 3-39 Mapping-configuration alias

17.Click JAAS - J2C authentication data (Figure 3-40) to open a second window and click New.

Data sources				2 -		
	Messages					
	🛆 Changes have been made to you	r local configuration. You can:				
	Save directly to the master configuration.					
	Review changes before saving or discarding.					
	Δ The server may need to be restarted for these changes to take effect.					
Data sources > JAAS -	- J2C authentication data					
Specifies a list of user	identities and passwords for Java(TM)	2 connector security to use.				
Prefix new alias na	Prefix new alias names with the node name of the cell (for compatibility with earlier releases)					
Apply						
Preferences						
New Delete						
00 # #						
Select Alias 🛟		User ID 🗘	Description 🗘			
None						
Total 0						

Figure 3-40 Click JAAS - J2C authentication data

18. Type the following information and click **OK** (Figure 3-41):

- For the alias, enter db2.
- For the user ID, enter db2inst1.
- For the password, enter netcool.

Data sources	? -
Messages	
⚠ Changes have been made to your local configuration. You can:	
Save directly to the master configuration.	
Review changes before saving or discarding.	
Δ The server may need to be restarted for these changes to take effect.	
Data sources > New	
Specifies a list of user identities and passwords for Java(TM) 2 connector security to use.	
General Properties	
* Alias	
db2	
* User ID	
db2inst1	
* Password	
Description .	
Description	
Apply OK Reset Cancel	



19.Click Save.

20. Click Previous and Next to refresh the window and show the DB2 username.

21.Click **Next**. The next window is the Create a data source window, as shown in Figure 3-42. Click **Next**.

Create a data source	
Create a data source	
Step 1: Enter basic data source information	Setup security aliases
Step 2: Select JDBC provider	Select the authentication values for this resource.
Step 3: Enter database specific properties for the data source	JazzSMNode01/db2 Mapping-configuration alias DefaultPrincipalMapping
→ Step 4: Setup security aliases	Container-managed authentication alias (none)
Step 5: Summary	Note: You can create a new J2C authentication alias by accessing one of the following links. Clicking on a link will cancel the wizard and your current wizard selections will be lost.
	Global J2C authentication alias Security domains
Previous Next Cance	el

Figure 3-42 Mapping

22. Verify the summary and click **Finish** (Figure 3-43).

Step 1: Enter basic	Summary	
information	Summary of actions:	
Step 2: Select JDBC	Options	Values
provider	Scope	cells:JazzSMNode01Cell:nodes:JazzSMNode01:servers:server
Step 3: Enter	Data source name	tipds
database specific properties for the	JNDI name	jdbc/tipds
data source	Select an existing JDBC provider	DB2 Universal JDBC Driver Provider
Step 4: Setup security aliases	Implementation class name	com.ibm.db2.jcc.DB2ConnectionPoolDataSource
Step 5: Summary	Driver type	4
	Database name	dashdb
	Server name	172.16.61.137
	Port number	50000
	Use this data source in container managed persistence (CMP)	true
	Component-managed authentication alias	(none)
	Mapping-configuration alias	DefaultPrincipalMapping
	Container-managed	(none)

Figure 3-43 Summary

		essages				
	4	Changes have bee	n made to your local configuration. You	i can:		
		 Save directly to the 	e master configuration.			
		Review changes be	efore saving or discarding.			
	4	•The server may ne	ed to be restarted for these changes to	take effect.		
ata s	ources					
se thi bject :	is page to edi supplies your	t the settings of a da application with conn	tasource that is associated with your sections for accessing the database. Let	elected JDBC p arn more about	provider. The dat at this task in a	tasource <u>quided</u>
	. A guided act	SMNode01Cell Node:	r task steps and more general informa	tion about the	topic.	
500	per cen-jazz	Simoleorcen, NODE	Sattoningeor, Selver-Server1			
	Scope spec	ifies the level at whic	h the resource definition is visible. For	detailed		
	information	n on what scope is an	d how it works, <u>see the scope settings</u>	help.		
	Node=la:	zzSMNode01, Server=	server1 🔻			
	node ba					
Pref	ferences					
New	Delete	Test connection	Manage state			
	d 👯 🦃					
elect	⊡ ₩ ¥	JNDI name 🗘	Scope 🗘	Provider 🗘	Description 🗘	Category
elect	Name 🗘	JNDI name 🗘	Scope 🗘	Provider 🗘	Description 🗘	Category
ielect You ca	Name \$ an administer Default Datasource	JNDI name 🗘 the following resource DefaultDatasource	Scope 🗘 es: Node=JazzSMNode01,Server=server1	Provider 🗘 Derby JDBC Provider	Description 🗘 Datasource for the WebSphere Default	Category
elect You ca	Name \$	JNDI name 🗘 the following resource DefaultDatasource	Scope 🗘 es: Node=JazzSMNode01,Server=server1	Provider 🗘 Derby JDBC Provider	Description 🗘 Datasource for the WebSphere Default Application	Category
elect You ca	Name \$ an administer Default Datasource tipds	JNDI name 🗘 the following resource DefaultDatasource jdbc/tipds	Scope 🗘 es: Node=JazzSMNode01,Server=server1 Node=JazzSMNode01,Server=server1	Provider 🗘 Derby JDBC Provider DB2 Universal JDBC Driver Provider	Description 🗘 Datasource for the WebSphere Default Application DB2 Universal Driver Datasource	Category
elect (ou ca	Name \$	JNDI name 🗘 the following resource DefaultDatasource jdbc/tipds	Scope 🗘 es: Node=JazzSMNode01,Server=server1 Node=JazzSMNode01,Server=server1	Provider 🗘 Derby JDBC Provider DB2 Universal JDBC Driver Provider	Description 🗘 Datasource for the WebSphere Default Application DB2 Universal Driver Datasource	Category

Figure 3-44 Result

23.Click Save (Figure 3-45).

🖃 M	essa	iges
-----	------	------

- ⚠ Changes have been made to your local configuration. You can:
- <u>Save</u> directly to the master configuration.
- Review changes before saving or discarding.

 igstacless The server may need to be restarted for these changes to take effect.



24. Select **tipds** and click **Test connection** (Figure 3-46) to verify the successful creation of the data source.

New Delete Test connection Manage state								
Select	Name 🛟	JNDI name 🗘	Scope 🗘	Provider 🗘	Description 🗘	Category 🗘		
You can administer the following resources:								
	<u>Default</u> <u>Datasource</u>	DefaultDatasource	Node=JazzSMNode01,Server=server1	Derby JDBC Provider	Datasource for the WebSphere Default Application			
	<u>tipds</u>	jdbc/tipds	Node=JazzSMNode01,Server=server1	DB2 Universal JDBC Driver Provider	DB2 Universal Driver Datasource			
Total 2								

Figure 3-46 Test the connection

25. If the connection test is successful, close the web page and restart the server. See Example 3-24.

```
Example 3-24 Restart the server
```

```
./stopServer.sh server1 -username smadmin -password netcool
```

Tip: To stop and start Jazz without typing the user name and password, change the following file:

/opt/IBM/netcool/JazzSM/profile/properties/soap.client.props

Edit the following lines to include the smadmin user ID and password:

- com.ibm.SOAP.loginUserid=smadmin
- com.ibm.SOAP.loginPassword=netcool
- 26.Enable server-to-server trust on both servers. Edit the ssl.client.props file and uncomment the section that starts with com.ibm.ssl.trustStoreName=AnotherTrustStore so that it looks like Example 3-25.

Example 3-25 Edit the ssl.client.props file

```
vi /opt/IBM/netcool/JazzSM/profile/properties/ssl.client.props
# TrustStore information
com.ibm.ssl.trustStoreName=AnotherTrustStore
com.ibm.ssl.trustStore=${user.root}/config/cells/JazzSMNode01Cell/nodes/JazzSMNode01/tr
ust.p12
com.ibm.ssl.trustStorePassword={xor}CDo9Hgw=
com.ibm.ssl.trustStoreType=PKCS12
com.ibm.ssl.trustStoreFileBased=true
com.ibm.ssl.trustStoreReadOnly=false
```

27. Restart the servers.

28. Retrieve the signers on both servers:

- Example 3-26 shows the operation on Jazz-A.

Example 3-26 Retrieve the signers

```
retrieveSigners.sh NodeDefaultTrustStore AnotherTrustStore -host
jazz-a.swg.be.ibm.com -port 16313
```

••••

Example 3-27 shows the operation on Jazz-B.

Example 3-27 Retrieve the signers

```
./retrieveSigners.sh NodeDefaultTrustStore AnotherTrustStore -host
jazz-b.swg.be.ibm.com -port 16313 -username smadmin -password netcool
```

```
*** SSL SIGNER EXCHANGE PROMPT ***
SSL signer from target host 172.16.61.133 is not found in trust store
/opt/IBM/netcool/JazzSM/profile/config/cells/JazzSMNode01Cell/nodes/JazzSMNode01/trust.p12.
```

Here is the signer information (verify the digest value matches what is displayed at the server):

```
Subject DN: CN=Jazz-A, OU=JazzSMNodeO1Cell, OU=JazzSMNodeO1, O=IBM, C=US
Issuer DN: CN=Jazz-A, OU=Root Certificate, OU=JazzSMNodeO1Cell, OU=JazzSMNodeO1, O=IBM, C=US
Serial number: 76549804258695
Expires: Thu Apr 27 16:30:34 CEST 2017
SHA-1 Digest: 80:BC:03:02:53:EA:A6:8D:0E:42:3C:B5:F4:75:B5:36:CE:CE:F2:D9
MD5 Digest: EF:F8:94:A2:D8:F9:F3:18:A7:D2:8E:66:73:8A:AF:67
Subject DN: CN=Jazz-A, OU=Root Certificate, OU=JazzSMNodeO1Cell, OU=JazzSMNodeO1, O=IBM, C=US
Issuer DN: CN=Jazz-A, OU=Root Certificate, OU=JazzSMNodeO1Cell, OU=JazzSMNodeO1, O=IBM, C=US
Serial number: 76548459208984
Expires: Thu Apr 24 16:30:33 CEST 2031
SHA-1 Digest: 80:BC:03:02:53:EA:A6:8D:0E:42:3C:B5:F4:75:B5:36:CE:CE:F2:D9
MD5 Digest: EF:F8:94:A2:D8:F9:F3:18:A7:D2:8E:66:73:8A:AF:67
```

```
Add signer to the trust store now? (y/n)y
```

 Verify the load balancing implementation. You can verify the status of the cluster by using the following command (Example 3-28).

Example 3-28 Verify the load balancing implementation

cd /opt/IBM/netcool/JazzSM/ui/bin									
./consolecli.sh	ListHANodes -	-username smadmin	password netcool						
NodeName	NodeSta	tus NodeSync	NodeVersion						
Jazz-A:16311	ACTIV	E InSync	3.1.2.1						
Jazz-B:16311	ACTIV	E InSync	3.1.2.1						

3.3.2 Preparing the HTTP server for load balancing

This implementation is based on the documentation at this website:

https://ibm.biz/BdrsBM

You can set up a load-balanced cluster of console nodes with identical configurations to evenly distribute user sessions.

You can create a load-balanced cluster from an existing stand-alone JazzSM application server instance. Its custom data is added to the central repository and later replicated to new nodes as they are added to the cluster.

If you want to add a node to a cluster and the node contains custom data, you must export the data before you join the node to the cluster. The exported data is later imported to one of the nodes in the cluster so that it is replicated across the other nodes in the cluster.

Important: Be careful when you add new nodes to an existing cluster. The custom content of the new nodes will be replaced with the content that is stored in DB2.

Implementation steps

First, you must prepare the HTTP server for load balancing:

- On the load balancer server, you need to install the IBM HTTP server and the IBM HTTP Server Plug-in for IBM WebSphere Application Server as the user netcool. Perform the following steps:
 - a. Extract the WAS_V8.5.5_SUPPL_1_0F_3.zip file, the WAS_V8.5.5_SUPPL_2_0F_3.zip file, and the WAS_V8.5.5_SUPPL_3_0F_3.zip file into the same directory by using the following commands. See Example 3-29.

Example 3-29 Extract the .zip files

```
mkdir /mnt/ITS0_SHARE/Jazz/Websphere_Supp
cd /mnt/ITS0_SHARE/Jazz/Websphere_Supp
unzip WAS_V8.5.5_SUPPL_1_OF_3.zip
unzip WAS_V8.5.5_SUPPL_2_OF_3.zip
unzip WAS_V8.5.5_SUPPL_3_OF_3.zip
```

b. The included Java code (**iKeyman**) needs 32-bit libraries that are added to the operating system. As the root user, run these commands (Example 3-30).

Example 3-30 Add 32-bit libraries to the operating system

```
yum install glibc.i686
yum install libgcc.i686
yum install libXext.i686
yum install libXtst.i686
yum install libXft.i686
```

c. Launch the previously installed Installation Manager. See Example 3-31.

```
Example 3-31 Launch Installation Manager
```

```
su - netcool
./IBMIM
```
d. Add the repository from /mnt/ITS0_SHARE/Jazz/Websphere_Supp, as shown in Figure 3-47.

Edit Repository		
Edit repository		
Modify a repository and add to the repository preference list.		
Repository:		
/mnt/ITSO_SHARE/Jazz/Websphere_Supp/repository.config	~	Browse
Cancel		ОК

Figure 3-47 Edit Repository window

- 2. Now, you can start the installation:
 - a. Select the packages to install as shown in Figure 3-48 and click Next.

	IBM Install	ation Manager		_ 🗉 ×
Install Packages				
Select packages to install:				
Q type filter text	🏽 🛛 🖉 3 packages are	selected.		-11
Installation Packages		Status	Vendor	License Key Type
🖃 🗐 🗊 Application Client for IBM WebS	phere Application Server			
🗆 🕼 Version 8.5.5.0			IBM	
🖃 🎯 🗊 IBM HTTP Server for WebSpher	e Application Server			
		Will be installed	IBM	
🗆 🗇 🗊 IBM WebSphere Application Ser	ver			
🗆 🕼 Version 8.5.5.4			IBM	
🗖 🗊 Pluggable Application Client for	IBM WebSphere Application S	5e		
😑 🎯 🗊 Web Server Plug-ins for IBM We	bSphere Application Server			
🞯 🕼 Version 8.5.5.0		Will be installed	IBM	
😑 🌠 🕅 WebSphere Customization Tooll	oox			
🧭 🕼 Version 8.5.5.0		Will be installed	IBM	
🗆 🔲 🔖 IBM WebSphere SDK Java Techr	ology Edition (Optional)			
🗆 🙀 Version 7.0.8.0			IBM	
Show all versions			Check for Other Versio	ons, Fixes, and Extensions
Details				
WebSphere Customization Toolbox 8	.5.5.0			
WebSphere Customization Toolbox prov	des tools to simply and rapidl	y customize a WebSpher	e Application Server env	ironment <u>More info</u>
 Repository: /mnt/ITSO_SHARE/Jazz/W 	ebsphere_Supp			
0		< Back	Next >	Install Cancel

Figure 3-48 IBM HTTP Server installation

Tip: Ignore the error about an unsupported operating system. In this environment, the error was caused by the use of Red Hat Enterprise Linux 7.1.

b. Click Next. Accept the terms of the license agreement and click Next.

c. Change to the correct IBMIMSHARED path, as shown in Figure 3-49, and click **Next**. To see the Installation Manager installation path, see 2.1, "Installation Manager" on page 24.

				BM Installation	Manager			
nstall F	ackages							
Select a l	ocation for the shar	ed resources o	directory.					7
Install	Prerequisite	License	s Locatio	n Features	Summary	0		
V	Vhen you install pao	kages, files are	e stored in two lo	ocations:				
1) The shared resou	ces directory -	- resources that	can be shared by	multiple packages.			
<u> </u>) The installation d	rectory - any r	esources that ar	e unique to the pa	ckage that you are i	nstalling.		
⚠ "	nportant: You can o	nly select the	shared resource:	s directory the fir:	st time you install a	package with the	IBM Installation M	1anager. For
b	est results select t	he drive with t	he most available:	e space because i	must have adequat	e space for the sh	nared resources of	future
P	ackages.							
hared Re	sources Directory:	/home/netcool	l/IBM/IMShared					Browse.
/	52.00 00							
,	51.00 00							
,								
,								
,								
,								
,					< Back	Next >	Install	Cancel

Figure 3-49 IBMIMSHARED directory

d. Change the installation directory on all of the selected components, as shown in Figure 3-50, and click **Next**.

			IBM	Installation M	anager			-
nstall Packages								
Select the features to ins	stall.							
Install Prerequi	site Lice	nses L	ocation	Features	Summary			
Features								
🗉 🗐 🗊 IBM HTTP Server	for WebSphe	re Applicatior	n Server 8.5	.5.0				
🗉 🖻 🗊 Web Server Plug	ins for IBM W	/ebSphere Ap	plication Se	rver 8.5.5.0				
🛛 🐨 🗊 WebSphere Cust	omization Tool	lbox 8.5.5.0						
Show dependencies						Expand All	Collapse All	Restore Default
Show dependencies g − Selected by Installatie	on Manager be	cause of dep	endencies			Expand All	Collapse All	Restore Default
Show dependencies 9- Selected by Installati	on Manager be	cause of depe	endencies			Expand All	Collapse All	Restore Default
 Show dependencies Selected by Installati retails 	on Manager be	cause of depo	endencies			Expand All	Collapse All	Restore Default
 Show dependencies Selected by Installati etails MHTTP Server for W 	on Manager be	cause of depo	endencies			Expand All	Collapse All	Restore Default
Show dependencies 9- Selected by Installati 9etails 3M HTTP Server for W	on Manager be ebSphere App	cause of depo	endencies ver 8.5.5.0			Expand All	Collapse All	Restore Default
 Show dependencies Selected by Installati Vetails M HTTP Server for Web M HTTP Server for Web 	on Manager be ebSphere App oSphere Applic	cause of depr blication Ser ation Server	endencies ver 8.5.5.0 provides adv	vanced web ser	ver capabilities wit	Expand All	Collapse All	Restore Default
 Show dependencies Selected by Installati Details MHTTP Server for W- 3M HTTP Server for Wet VebSphere Application S 	on Manager be ebSphere App SSphere Applic erver environn	cause of depo blication Ser nation Server nent. IBM HT	endencies ver 8.5.5.0 provides adv IP Server fo	vanced web ser	ver capabilities wit	Expand All	Collapse All management ar pache HTTP Se	Restore Default and security in a rver.
Show dependencies Selected by Installati Setails M HTTP Server for Web WebSphere Application S	on Manager be ebSphere App DSphere Applic erver environ n	cause of depo blication Ser ation Server nent. IBM HTT	endencies ver 8.5.5.0 provides adv IP Server fo	vanced web ser r WebSphere A	ver capabilities wit Application Server i	Expand All th consistent is based on A	Collapse All management ar pache HTTP Se	Restore Default
Show dependencies Selected by Installati Installs SM HTTP Server for Web WebSphere Application S	on Manager be ebSphere App SSphere Applic erver environn	cause of depo blication Ser ation Server nent. IBM HTT	endencies ver 8.5.5.0 provides adv TP Server fo	vanced web ser r WebSphere A	ver capabilities wit Application Server	Expand All th consistent is based on A	Collapse All management ar pache HTTP Se	Restore Default
Show dependencies 9- Selected by Installati 9 etails 3M HTTP Server for We 9M HTTP Server for Wet VebSphere Application S 905 Space Information	on Manager be ebSphere App SSphere Applic erver environn	cause of depo blication Ser ation Server nent. IBM HTT	endencies ver 8.5.5.0 provides adv IP Server fo	vanced web ser r WebSphere A	ver capabilities wit Application Server i	Expand All	Collapse All management ar pache HTTP Se	Restore Default
Show dependencies 9- Selected by Installati Ietails BM HTTP Server for We WebSphere Application S VebSphere Information	on Manager be ebSphere App Sphere Applic erver environn	cause of depo olication Ser ation Server nent. IBM HT	endencies ver 8.5.5.0 provides adv TP Server fo	vanced web ser r WebSphere A	ver capabilities wit Application Server i	Expand All th consistent is based on A	Collapse All management ar pache HTTP Se	Restore Default
Show dependencies 9- Selected by Installati Ietails 3M HTTP Server for W- 3M HTTP Server for Wet VebSphere Application S Hisk Space Information	on Manager be ebSphere App oSphere Applic erver environn Volume	cause of depo blication Server ration Server nent. IBM HTT Required	endencies ver 8.5.5.0 provides adv IP Server fo Temporary	vanced web ser rr WebSphere A Total	ver capabilities wit Application Server i	Expand All	Collapse All management ar pache HTTP Se	Restore Default nd security in a rver. Available
Show dependencies Selected by Installati Hetails SM HTTP Server for We WebSphere Application S Hisk Space Information	on Manager be ebSphere App oSphere Applic erver environn Volume /	cause of depo blication Server nation Server nent. IBM HT Required 0.0 KB	endencies ver 8.5.5.0 provides adv TP Server fo Temporary 415.79 MR	vanced web ser r WebSphere A Total 415.79 MB	ver capabilities wii Application Server i	Expand All	Collapse All management ar pache HTTP Se	Restore Default and security in a rver. Available 32.08.GB
Show dependencies Setected by Installati Setails SM HTTP Server for Web YebSphere Application S Pisk Space Information Shared Resources Area	on Manager be ebSphere App OSphere Applic erver environn Volume /	cause of depo blication Ser ation Server nent. IBM HT Required 0.0 KB	endencies ver 8.5.5.0 provides adv IP Server fo Temporary 415.79 MB	vanced web ser r WebSphere A Total 415.79 MB	ver capabilities wi Application Server	Expand All	Collapse All management ar pache HTTP Se	Restore Default nd security in a rver. Available 32.08 GB
Show dependencies Setected by Installati Setails SM HTTP Server for Web WebSphere Application S Disk Space Information Shared Resources Area	on Manager be ebSphere App Sphere Applic erver environn Volume /	Required 0.0 KB	endencies ver 8.5.5.0 provides add IP Server fo Temporary 415.79 MB	vanced web ser rr WebSphere A Total 415.79 MB	ver capabilities wit Application Server	Expand All	Collapse All management ar pache HTTP Se	Restore Default nd security in a rver. Available 32.08 GB
Show dependencies Setected by Installati Setails BM HTTP Server for We MHTTP Server for Wet VebSphere Application S Disk Space Information Shared Resources Area 	on Manager be ebSphere Applic oSphere Applic erver environn Volume /	cause of depo ation Server nent. IBM HTT Required 0.0 KB	endencies ver 8.5.5.0 provides adv TP Server fo Temporary 415.79 MB	vanced web ser r WebSphere A Total 415.79 MB	ver capabilities wit Application Server	Expand All th consistent is based on A	Collapse All management ar pache HTTP Se	Restore Default ad security in a rver. Available 32.08 GB

Figure 3-50 Install Packages window

e. Configure the default HTTP port and click Next. See Figure 3-51.

nstall Packages Fill in the configurations for th	re packages.	
Install Prerequisite	Licenses Location Features Summary	
BM HTTP Server for Wet	Configuration for IBM HTTP Server for WebSphere Application Server 8.5.5.0 Web Server Configuration Specify a port number for IBM HTTP Server to communicate. The default port is 8080. If the default port is already in use, then change to another port that is available. Running IBM HTTP Server without root or Administrative privileges might restrict use of ports below 1024. HTTP port: 16310	

Figure 3-51 HTTP port

f. Start the installation by clicking Install as shown in Figure 3-52.

	IBM Installation Manager	
nstall Packages		-1
Review the summary information.		7
Install Prerequisite Licenses Locati	on Features Summary	
Target Location		
Shared Resources Directory: /home/netcool/IBM/IMShar	ed	
ackages		
Packages	Installation Directory	
■ 🗽 IBM HTTP Server V8.5	/opt/IBM/netcool/IBM/HTTPServer	
□ 🗊 IBM HTTP Server for WebSphere Application Ser	rver	
🗄 🏠 Architecture Selection		
$\exists \ {}^{\mathfrak{s}}_{\mathfrak{s}}$ Web Server Plug-ins for IBM WebSphere Application	on Sr /opt/IBM/netcool/IBM/WebSphere/Plugins	
🗆 🗊 Web Server Plug-ins for IBM WebSphere Applica	ation	
🕀 🏠 IBM WebSphere SDK for Java Technology Editi	ion 6	
🗉 🖁 WebSphere Customization Toolbox V8.5	/opt/IBM/netcool/IBM/WebSphere/Toolbox	
WebSphere Customization Toolbox 8.5.5.0		
🚯 Web Server Plug-ins Configuration Tool		
🚯 Profile Management Tool (z/OS only)		
🚯 z/OS Migration Management Tool		
nvironment	Disk Space Information	
nglish		Total Available Space
	1	32.08 GE
	Total Download Size: 415.79 MB	
	Total Installation Size: 1.06 GB	
Repository Information		
	- Back Novt >	Install

Figure 3-52 Installation summary window

g. Wait for the installation to complete, as shown in Figure 3-53. Select the option for the program that you want to start. For our environment, we clicked WebSphere Customization Toolbox. Click Finish.

IBM Installat	tion Manager
stall Packages	
The packages are	installed. <u>View Log File</u>
The following packages were installed:	Which program do you want to start?
□ ¹ IBM HTTP Server V8 5	
IBM HTTP Server for WebSphere Application Server 8 5 5	
Web Server Plug-ins for IBM WebSphere Application Serv	
WebSphere Customization Toolbox V8.5	
WebSphere Customization Toolbox 8 5 5 0	
Note: If the packages support rollback, the temporary directory con on the Files for rollback preference page.	tains rollback files for installed packages. You can delete the files
	Fir

3. Create a CMS-type keystore as described in the following document:

https://ibm.biz/Bdrr7b

Figure 3-54 shows how we exported the SSL certificate from both of the JazzSM servers by using Mozilla Firefox.

🔄 🛈 🔒 https://jazz-a.swg.be. ibm.com :16311/ibm/console/logon.jsp		∀ C ⁴	Q integrate apmui jazz sm
Page Info - https://jazz-a.swg.be.ibm.com.16311/ibm/console/logon.jsp General Media Permissions Security Headers		- • ×	Certificate Viewer: Jazz-A*
Website Identity Website: jazz-a.swg.be.ibm.com:16311 Owner: This website does not supply ownership information. Verified by: IBM		View Certificate	General Details Certificate Hierarchy dJazz-A Jazz-A
Privacy & History Have I visited this website prior to today? Is this website storing information (cookies) on my computer? Have I saved any passwords for this website? Technical Details Connection Encrypted (TLS_DHE_RSA_WITH_AES_128_CBC_SHA, 128 bit keys, TLS 1.0) The page you are viewing was encrypted before being transmitted over the Internet. Encryption makes it difficult for unauthorized people to view information traveling between encoded.	No Yes Yes computers. It is therefore unlikely that anyone read this page	View Cookies View Saved Passwords	Certificate Fields a Jazz-A a Certificate Version Serial Number - Certificate Signature Algorithm - Issuer a Validity Not Before
network.	@ Co	Help Go	Field Value

Figure 3-54 Export certificate

- 4. Save this certificate on the load balancer server. For instance, for Jazz-A, we saved the certificate in the shared directory /mnt/ITS0_SHARE/Jazz/Jazz-A.crt.
- 5. Create the keystore by using the commands that are shown in Example 3-32.

Example 3-32 Create the keystore

cd /opt/IBM/netcool/IBM/WebSphere/Toolbox/ ./java/jre/bin/ikeyman 6. This command opens the iKeyman GUI as shown in Figure 3-55.

IBM Key Management	
Key Database <u>F</u> ile <u>C</u> reate <u>V</u> iew <u>H</u> elp	
Key database information	
DB-Type:	
File Name:	
Token Label:	
Key database content	
Personal Certificates	Receive
	<u>D</u> elete
	Vie <u>w</u> /Edit
	Import
	Recre <u>a</u> te Request
	Rename
	New Self-Si <u>q</u> ned
	Extract Certificate
To start, please select the Key Database File menu to work with a key database	

Figure 3-55 The iKkeyman GUI

7. Select the **Create a new key database file** icon. Change the file name and path as shown in Figure 3-56. Ensure that you select key database type **CMS**. Click **OK**.

New						
<u>K</u> ey database type	CMS 👻					
<u>F</u> ile Name:	pluginļkdb	<u>B</u> rowse				
<u>L</u> ocation:	/opt/IBM/netcool/IBM/HTTPServer/conf/					
	<u>O</u> K <u>C</u> ancel					

Figure 3-56 Enter file name plugin.kdb

Tip: The file is called plugin-key.kdb in several places in the product documentation. The name does not matter, but you must always use the same file name in the following configuration.

8. Type a password and select Stash password to a file. Click OK. See Figure 3-57.

Password Prompt							
<u>P</u> assword:	•••••						
Co <u>n</u> firm Password:	•••••						
Expiration time Stash password Sta	60 Days to a file						
<u>о</u> к	<u>R</u> eset <u>C</u> ancel						

Figure 3-57 Password Prompt window

9. Create at least one personal self-signed certificate. See Figure 3-58.

		ІВМ К	ey Mana	gement -	[/opt/l	BM/ne
Key Database <u>F</u> ile	<u>C</u> reate	<u>V</u> iew	<u>H</u> elp			
n 🚅 🗖	Ŗ Ne	w Ce <u>r</u> ti	ficate Req	uest	Ctrl-R	
	其 Ne	w Se <u>l</u> f-	Signed Ce	rtificate	Ctrl-L	
				`	Key	databa
DR-Type:	110			Create a r	new self-	signed

Figure 3-58 New Self-Signed Certificate option

10.Complete the creation of the certificate as shown in Figure 3-59.

Create New Self-Signed Certificate				
Please provide the following:				
<u>K</u> ey Label	default			
Version	X509 V3 🔻			
K <u>e</u> y Size	2048 💌			
<u>S</u> ignature Algorithm	SHA1WithRSA 🔽			
Co <u>m</u> mon Name (optiona	D loadbalancer			
Or <u>q</u> anization (optiona	b swg			
Org <u>a</u> nizational Unit (optiona	be.ibm.com			
<u>L</u> ocality (optiona	0			
S <u>t</u> ate/Province (optiona	0			
Zipcode (optiona	D			
Co <u>u</u> ntry or region (optiona	D) BE 💌			
Val <u>i</u> dity Period	365 Days			
Subject Alternative Names				
Email A <u>d</u> dress (optiona	D I			
I <u>P</u> Address (optiona	b 172.16.61.200			
D <u>N</u> S Name (optiona	loadbalancer.swg.be.ibm.com			
<u>O</u> K <u>R</u> eset <u>C</u> ancel				

Figure 3-59 Self-signed certificate creation

	IBM Key Management - [/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.kdb]]
Key Database <u>F</u> i	le <u>C</u> reate <u>V</u> iew <u>H</u> elp	
	Key database information	
DB-Type:	CMS	
File Name:	/opt/IBM / netcool / IBM / HTTPServer / conf / plugin. kdb	
Token Label:		
	Key database content	
Signer Certifica	ates 🗸 🗸	<u>A</u> dd
		<u>D</u> elete
		Vie <u>w</u> /Edit
		E <u>x</u> tract
		<u>P</u> opulate
		Rena <u>m</u> e
The requested a	ction has successfully completed!	

11. Import the Jazz certificates. First, switch to Signer Certificates as shown in Figure 3-60.

Figure 3-60 Signer certificates

12. Click Add and browse all of the Jazz certificates. See Figure 3-61.

Open 📐			
<u>F</u> ile Name:	Jazz-A.crt	<u>B</u> rowse	
Location:	/mnt/ITSO_SHARE/Jazz		
	<u>O</u> K <u>C</u> ancel		

Figure 3-61 Jazz certificate

13. Type an alias for each certificate, for example, Jazz-A, as shown in Figure 3-62. Click OK.

	Enter a Label
?	Enter a label for the certificate:
	<u>O</u> K <u>C</u> ancel

Figure 3-62 Jazz-A alias

14.Close the iKeyman utility.

15.Configure the HTTP Server for SSL by using the following commands, as shown in Example 3-33.

Example 3-33 Configure the HTTP Server for SSL

```
cd /opt/IBM/netcool/IBM/HTTPServer/conf/
vi http.conf
Look for the remarked (#) code below and change accordingly
LoadModule ibm ssl module modules/mod ibm ssl.so
Listen 16311
<VirtualHost *:16311>
SSI Enable
SSLProtocolDisable SSLv2
ErrorLog "/opt/IBM/netcool/IBM/HTTPServer/logs/sslerror.log"
TransferLog "/opt/IBM/netcool/IBM/HTTPServer/logs/sslaccess.log"
KeyFile "/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.kdb"
SSLStashfile "/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.sth"
</VirtualHost>
SSLDisable
cd ../bin
./apachectl
start
```

16.Try to open the URL https://loadbalancer.swg.be.ibm.com:16311 in a browser. This action shows the window that is shown in Figure 3-63.



Figure 3-63 HTTP Server

17.Set the clone IDs for all jazz nodes. Edit the server.xml file in

/opt/IBM/netcool/JazzSM/profile/config/cells/JazzSMNode01Cell/nodes/JazzSMNode0 1/servers/server1 on all of the JazzSM servers, as shown in Example 3-34. Log in to the JazzSM servers as the netcool user. Make the following changes that are shown in red in Example 3-34.

Example 3-34 Edit the server.xml

cd /opt/IBM/netcool/JazzSM/profile/config/cells/JazzSMNode01Cell/nodes/JazzSMNode01/servers/server1
vi server.xml

<components <="" th="" xmi:id="WebContainer_1183122130078" xmi:type="applicationserver.webcontainer:WebContainer"></components>
enableServletCaching="false" disablePooling="false" asyncRunnableWorkManager="wm/default">
<statemanagement initialstate="START" xmi:id="StateManageable 1183122130081"></statemanagement>
<pre><services <="" pre="" xmi:id="SessionManager 1183122130078" xmi:type="applicationserver.webcontainer:SessionManager"></services></pre>
enable="true" enableUrlRewriting="false" enableCookies="true" enableSSLTracking="false"
enableProtocolSwitchRewriting="false" sessionPersistenceMode="NONE" enableSecurityIntegration="true"
allowSerializedSessionAccess="false" maxWaitTime="5" accessSessionOnTimeout="true">
<pre><defaultcookiesettings domain="" maximumage="-1" secure="false" xmi:id="Cookie 1183122130078"></defaultcookiesettings></pre>
<sessiondatabasepersistence <="" td="" xmi:id="SessionDatabasePersistence 1183122130078"></sessiondatabasepersistence>
datasourceJNDIName="jdbc/Sessions" userId="db2admin" password="{xor}OzītPjsyNjE=" db2RowSize="ROW_SIZE_4KB"
tableSpaceName=""/>
<pre><tuningparams <="" maxinmemorysessioncount="1000" pre="" usingmultirowschema="false" xmi:id="TuningParams_1183122130078"></tuningparams></pre>
allowOverflow="true" scheduleInvalidation="false" writeFrequency="TIME_BASED_WRITE" writeInterval="10"
writeContents="ONLY UPDATED ATTRIBUTES" invalidationTimeout="30">
<pre><invalidationschedule firsthour="14" secondhour="2" xmi:id="InvalidationSchedule 1183122130078"></invalidationschedule></pre>
<pre><pre><pre>cproperties xmi:id="WebContainer_1183122130078" name="HttpSessionCloneId" value="12345" required="false"/></pre></pre></pre>

Important: The red _ prefixed number must match the number from the above container, as shown in Example 3-34. *The value="12345" needs to be unique on each JazzSM server*.

18.Generate the plug-in cfg files. Run the following commands, as shown in Example 3-35.

Example 3-35 Generate the plug-in cfg files

cd /opt/IBM/netcool/JazzSM/profile/bin/ ./GenPluginCfg.sh IBM WebSphere Application Server, Release 8.5 WebSphere Plugin Configuration Generator Copyright IBM Corp., 1997-2012 PLGC0013I: The plug-in is generating a server plug-in configuration file for all of the servers in the cell. JazzSMNode01Cell. PLGC0005I: Plug-in configuration file = /opt/IBM/netcool/JazzSM/profile/config/cells/plugin-cfg.xml

cp /opt/IBM/netcool/JazzSM/profile/config/cells/plugin-cfg.xml
/mnt/ITS0_SHARE/Jazz/JazzA_plugin-cfg.xml
or

cp /opt/IBM/netcool/JazzSM/profile/config/cells/plugin-cfg.xml
/mnt/ITS0_SHARE/Jazz/JazzB_plugin-cfg.xml

19.On the load balancer server, merge the plug-in cfg files manually. Look for the <ServerCluster start and add the <Server entry from the other .xml file. See Example 3-36.

Example 3-36 Merge the plug-in cfg files manually

cd /mnt/ITSO_SHARE/Jazz/ cp JazzA plugin-cfg.xml plugin-cfg.xml

vi plugin-cfg.xml

<ServerCluster CloneSeparatorChange="false" GetDWLMTable="false" IgnoreAffinityRequests="false" LoadBalance="Round Robin" Name="server1_JazzSMNodeO1_Cluster" PostBufferSize="0" PostSizeLimit="-1" RemoveSpecialHeaders="true" RetryInterval="60" ServerIOTimeoutRetry="-1">

<Server CloneID="12345" ConnectTimeout="0" ExtendedHandshake="false" MaxConnections="-1"
Name="JazzSMNode01_server1" ServerIOTimeout="900" WaitForContinue="false">

<Transport Hostname="Jazz-A.swg.be.ibm.com" Port="16310" Protocol="http"/>

```
<Transport Hostname="Jazz-A.swg.be.ibm.com" Port="16311" Protocol="https">
            <Property Name="keyring" Value="/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.kdb"/>
            <Property Name="stashfile" Value="/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.sth"/>
         </Transport>
      </Server>
      <Server CloneID="23456" ConnectTimeout="0" ExtendedHandshake="false" MaxConnections="-1"</pre>
Name="Jazz
             ode01_server2" ServerIOTimeout="900" WaitForContinue="false">
         <Transport Hostname="Jazz-B.swg.be.ibm.com" Port="16310" Protocol="http"/>
         <Transport Hostname="Jazz-B.swg.be.ibm.com" Port="16311" Protocol="https">
            <Property Name="keyring" Value="/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.kdb"/>
            <property Name="stashfile" Value="/opt/IBM/netcool/IBM/HTTPServer/conf/plugin.sth"/>
         </Transport>
      </Server>
      <PrimaryServers>
         <Server Name="JazzSMNode01_server1"/>
         <Server Name="JazzSMNode01_server2"/>
      </PrimaryServers>
   </ServerCluster>
```

Note: Type the correct CloneID and server name. In our example, the generated plugin-cfg.xml file contained host names only, not the fully qualified domain name (FQDN) host name, so the file was changed to the FQDN.

20.Add this plugin-cfg.xml file in the HTTP Server http.conf file. See Example 3-37.

Example 3-37	Add the plugin-cfg.xm	file in the HTTP	Server http.conf file
	1 0 0		1

```
cd /opt/IBM/netcool/IBM/HTTPServer/conf
vi http.conf
LoadModule was_ap22_module
"/opt/IBM/netcool/IBM/WebSphere/Plugins/bin/64bits/mod_was_ap22_http.so"
WebSpherePluginConfig "/opt/IBM/netcool/IBM/HTTPServer/conf/plugin-cfg.xml"
cd ../bin
./apachectl restart
```

```
21.Test the changes by opening a browser on
http://loadbalancer.swg.be.ibm.com:16311/ibm/console.
```

Note: For more detailed configuration options, see the following URLs:

- Understanding IBM HTTP Server plug-in Load Balancing in a clustered environment: https://ibm.biz/BdrHji
- The plugin-cfg.xml options:

https://ibm.biz/BdrHjb

 Recommended values for web server plug-in config: https://ibm.biz/BdrHje

3.3.3 Enabling load balancing and high availability UI Data Provider Connections to Netcool/Impact

Important: Due to the technical limitations of the IBM HTTP Server, you must deploy this solution on a separate instance.

For more information about this configuration, see the *How to load balance and provide high availability with JazzSM Dashboard Connections* white paper, which is authored by Brian R. Fabec. The paper is available at the following link:

https://ibm.biz/BdrHjV

To provide load balancing for the connections from JazzSM dashboards to the Netcool/Impact GUI servers, you must install and configure an IBM HTTP Server.

The mode that we describe in this book is a round-robin type of configuration. In a round-robin type of configuration, when a connection from the dashboard is made to the HTTP Server, it is directed to one of the Netcool/Impact GUI servers. When another connection is made, it is directed to one of the other Netcool/Impact GUI servers.

The IBM HTTP Server is installed between the Netcool/Impact GUI servers and the JazzSM dashboard server.

JazzSM bundles the WebSphere Application Server Version 8.5 Supplements installation media, which contains the installation packages for the IBM HTTP Server.

Perform the following steps:

1. Install IBM HTTP Server 8.5 on the server. Log in as the netcool user and launch the IBMIM. See Example 3-38.

Example 3-38 Log in as the netcool user and launch the IBMIM

su - netcool
cd /opt/IBM/netcool/IM/InstallationManager/eclipse
./IBMIM

2. Add the repository for WebSphere Application Server Version 8.5 Supplements, as shown in Figure 3-64.

Preferences		凹
type filter text 🛔	Repositories	<⇒ - ⇔
Repositories	Repositories:	
Files for Bollback	Location Connection	Add <u>R</u> epository
▶ Help	✓ /tmp/sup/repository.config	Edit Repository
Internet		Remo <u>v</u> e Repository
Passport Advantage Secure Storage		Move <u>U</u> p
Updates		<u>M</u> ove Down
		<u>C</u> lear Credentials
		Test Connections
	Service repositories are remote locations where updates or extension Installation Manager itself) are stored. Search service repositories during installation and updates.	s to packages (including the
<	Res	tore <u>D</u> efaults <u>A</u> pply
0		Cancel OK

Figure 3-64 Repository

3. Start the installation. Click Install and select the packages that are shown in Figure 3-65.

Install Packages			
Select packages to install:			2
			九
Installation Packages	Status	Vendor	License Key Type
💌 📄 🗊 Application Client for IBM WebSphere Application Serve	r		
🗌 🕼 Version 8.5.0.0		IBM	
💌 🗹 🧃 IBM HTTP Server for WebSphere Application Server			
☑ 🛱 Version 8.5.0.0	Will be installed	IBM	
🗌 🗊 Pluggable Application Client for IBM WebSphere Applica	tio		
🗢 🗹 🗊 Web Server Plug-ins for IBM WebSphere Application Ser	ver		
🗹 🕼 Version 8.5.0.0	Will be installed	IBM	
🗢 🖃 🧊 WebSphere Customization Toolbox			
🗹 🗓 Version 8.5.0.0	Will be installed	IBM	
□ Show <u>a</u> ll versions	<u></u>	heck for Other Versions,	Fixes, and Extensions
Datails	_		Ă
IDM LITTO Convex for WebCobere Application Convex 8 5 0	0		
IBM HTTP Server for WebSphere Application Server provides adv security in a WebSphere Application Server environment. IBM H Apache HTTP Server. <u>More info</u>	vanced web server capa TTP Server for WebSph	abilities with consistent here Application Server	management and is based on
 Repository: /tmp/jazz/sup 			
			-
)	< <u>B</u> ack	<u>N</u> ext >	nstall Cancel

Figure 3-65 Packages

4. Accept the terms of the license agreement and click Next.

5. Choose an installation location and select Next as shown in Figure 3-66.

IBM Installation Manager		
Install Packages The following packag WebSphere Applicati information about 64 Install	es do not support the 64-bit ve on Server version 8.5.0.0. If you -bit mode support for a packag	ersion of Installation Manager that you are using: IBM HTTP Server for u continue, you might have issues with installation and deployment. For ge, see the package documentation.
Package Group Name		Installation Directory Architecture
 ✓ ▲ IBM HTTP Server V ⑥ IBM HTTP Server ✓ ▲ Web Server Plug-in ◎ Web Server Plug-in 	/8.5 r for WebSphere Application Se ns for IBM WebSphere Application	/opt/IB M/HTTPServer er io /opt/IB M/WebSphere/Plugins
 ₩eb Server Plug ✓ WebSphere Custo WebSphere Custo 	mization Toolbox V8.5 tomization Toolbox 8.5.0.0	a، /opt/IBM/WebSphere/Toolbox
Package Group Name: Installation <u>Directory</u> :	IBM HTTP Server V8.5 /opt/IBM/HTTPServer	Browse
Details Shared Resources Dire	ctory: /opt/IBM/IBMIMShared	Disk Space Information Volume Available Space / 25.42 GB
D		< Back Next > Install Cancel

Figure 3-66 Installation directory

6. Select Architecture Selection and select Next. Choose IBM HTTP Server 64-bit with Java, Version 6 and click Next as shown in Figure 3-67.

BIN Installation Manager	
Install Packages	
Select the features to install.	
Install Licenses Location Features Summary	-
Features	
🗢 🗔 🖸 IBM HTTP Server for WebSphere Application Server 8.5.0.0	
🔻 🖃 🐘 Architecture Selection	
IBM HTTP Server 32-bit with Java, Version 6	
☑ IBM HTTP Server 64-bit with Java, Version 6	
🕆 🖃 🚯 IBM WebSphere SDK for Java Technology Edition 6	
IBM 32-bit WebSphere Runtime Environment for Java	
IBM 64-bit WebSphere Runtime Environment for Java	
✓ Web Server Plug-ins Configuration Tool	
🗹 🍲 Profile Management Tool (z/OS only)	
 z/OS Migration Management Tool 	
Show dependencies Expand All Collapse All Restore Default	
😓 - Selected by Installation Manager because of dependencies	
Details	
IBM HTTP Server for WebSphere Application Server 8.5.0.0	
IBM HTTP Server for WebSphere Application Server provides advanced web server capabilities with consistent management and security in a WebSphere Application Server environment. IBM HTTP Server for WebSphere Application Server is based on	
Apache HTTP Server.	
Disk Space Information	•
() < Back Next > install Cancel	1

Figure 3-67 Architecture

7. Choose the HTTP port on which the IBM HTTP Server will communicate and select **Next**. See Figure 3-68.

BM Installation Manager		巴
Install Packages		
Fill in the configurations for t	ne packages.	
Install Licenses	Location Features Summary	
▼ () IBM HTTP Server for Wel	Configuration for IBM HTTP Server for WebSphere Application Server 8.5.0.0 Web Server Configuration	
web server comgara	Specify a port number for IBM HTTP Server to communicate. The default port is 8080. If the default port is already in use, then change to another port that is available. Running IBM HTTP Server without root or Administrative privileges might restrict use of ports below 1024. HTTP port: 80	
I F		
0	< <u>B</u> ack <u>N</u> ext > <u>I</u> nstall	Cancel

Figure 3-68 Port

8. Select Install to start the installation, as shown in Figure 3-69.

BN Installation Manager		프 프 프
Install Packages		-M
Review the summary information.		
Install Licenses Location Features	Summary	
Target Location		
Shared Resources Directory: /opt/IBM/IBMIMShared		
Packages		
Packages	Installation Directory	<u>_</u>
💌 🍾 IBM HTTP Server V8.5	/opt/IBM/HTTPServer	
🗢 🧊 IBM HTTP Server for WebSphere Application Serv		
Architecture Selection		
🗢 🔩 Web Server Plug-ins for IBM WebSphere Application	/opt/IBM/WebSphere/Plugins	
🗢 🧊 Web Server Plug-ins for IBM WebSphere Applicat		
🕨 🚯 IBM WebSphere SDK for Java Technology Editic		
👻 🐁 WebSphere Customization Toolbox V8.5	/opt/IBM/WebSphere/Toolbox	
🗢 🧊 WebSphere Customization Toolbox 8.5.0.0		
🕼 Web Server Plug-ins Configuration Tool		
🕼 Profile Management Tool (z/OS only)		
🐍 z/OS Migration Management Tool		•
Environment	Disk Space Information	
English		Total Available Space
	7	25.42 GB
	Total Download Size: 403.53	MB
	Total Installation Size: 1.03 G	В
Repository Information		
0	< <u>B</u> ack <u>N</u> ext	> <u>I</u> nstall Cancel

Figure 3-69 Install Packages window

9. Select **Finish** to complete the installation process. See Figure 3-70.

Install Packages The packages are installed. <u>View Log File</u> The following packages were installed: The following packages were installed: Much program do you want to start? Which program do
The following packages were installed: The following packages were installed: Uhich program do you want to start? Uhich program do you wa
The packages are installed. View Log File The following packages were installed: Which program do you want to start? Image: Start St
The packages are installed. View Log File The following packages were installed: Which program do you want to start? Image: Start St
The following packages were installed: Which program do you want to start? Image: Start
 IBM HTTP Server V8.5 IBM HTTP Server for WebSphere Application Server (% Web Server Plug-ins for IBM WebSphere Application S
 IBM HTTP Server for WebSphere Application Server (
 Set Web Server Plug-ins for IBM WebSphere Application Se Web Server Plug-ins for IBM WebSphere Application Set WebSphere Customization Toolbox V8.5 WebSphere Customization Toolbox 8.5.0.0
Web Server Plug-ins for IBM WebSphere Application VebSphere Customization Toolbox V8.5 WebSphere Customization Toolbox 8.5.0.0
 WebSphere Customization Toolbox V8.5 WebSphere Customization Toolbox 8.5.0.0
Websphere Customization looidox 8.5.0.0
A start of the applying support on the start support of the start start start and applying so that the start sta
delet the files on the <u>files for rollback</u> preference page.
⑦ <u>F</u> inish

Figure 3-70 Packages are installed

10. Configure the Web Server Plug-in for SSL connectivity.

Important: The keystore that is used by the Web Server Plug-in must be a configuration management system (CMS) keystore. The Java KeyStore (JKS) that is created by the Liberty profile and used by Netcool/Impact cannot be used.

- 11. The CMS keystore must be created by using the **iKeyman** utility and the certificates that are exchanged between the Web Server Plug-in CMS keystore and the Netcool/Impact JKS keystore.
- 12.For each Impact GUI server in the environment, export the SSL certificate from the Netcool/Impact JKS keystore by using the **keytool** command (Example 3-39).

```
Example 3-39 Using the keytool command
```

```
keytool -export -alias default -file /tmp/impact71devlin.crt -keystore
/opt/IBM/tivoli/impact_ha/wlp/usr/servers/ImpactUI/resources/security/key.jks
```

2. Copy all of the exported certificates to the IBM HTTP Web Server.

3. Start the **iKeyman** utility, which is under the WebSphere Customization Toolkit directory (Example 3-40).

Example 3-40 Using the iKeyman utility

\$WCT_HOME/java/jre/bin/ikeyman

13.As shown in Figure 3-71, select the **Create a new key database file** icon (highlighted white page icon).

IBM Key Management	빈
Key Database <u>F</u> ile <u>C</u> reate <u>V</u> iew <u>H</u> elp	
Key database information	
DB-Type:	
File Name:	
Token Label:	
Key database content	
Personal Certificates	Rece <u>i</u> ve
	Delete
	Vie <u>w</u> /Edit
	Im <u>p</u> ort
	Recre <u>a</u> te Request
	Rename
	New Colf-Signed
	new sen-signed
	Extract Certificate
To start, please select the Key Database File menu to work with a key database	

Figure 3-71 The iKeyman utility

14. Select the **CMS** key database type. Provide a location and file name to store the key database file for the WebSphere Customization Toolbox and select **OK**. See Figure 3-72.

💽 New	巴
<u>K</u> ey database type	CMS
<u>F</u> ile Name:	key.kdb Browse
Location:	/opt/IBM/WebSphere/Toolbox/java/jre/bin/
	<u>O</u> K <u>C</u> ancel

Figure 3-72 New key database file

15. Enter the key database type, location, and file name to store the key database file for the HTTP Server plug-in (Figure 3-73). Click **OK**.

Note: This location will be used for the rest of the configuration. In this scenario, we used the location /opt/IBM/HTTPServer/conf/plugin.kdb to store the database key file.

💽 New	E]
<u>K</u> ey database type	CMS	
<u>F</u> ile Name:	plugin.kdb Browse]
Location:	/opt/IBM/HTTPServer/conf	
	<u>O</u> K <u>C</u> ancel	

Figure 3-73 New key database file

16.Enter a keystore password and ensure that **Stash password to a file** is selected. Select **OK**. See Figure 3-74.

Password Prompt	四
<u>P</u> assword:	•••••
Co <u>n</u> firm Password:	•••••
■ Expiration time ✓ Stash password	60 <u>D</u> ays to a file
<u>о</u> к	<u>R</u> eset <u>C</u> ancel

Figure 3-74 Password prompt

17. Create at least one personal self-signed certificate as shown in Figure 3-75.

🖲 IBM Key Man	agement - [/opt/IBM/HTTPServer/conf/plugin.kdb]	巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴巴	
Key Database <u>F</u> i	le <u>C</u> reate <u>V</u> iew <u>H</u> elp		
D 🗳 I			
	Key database information		
DB-Type:	CMS		
File Name:	/opt/IBM/HTTPServer/conf/plugin.kdb		
Token Label:			
	Key database content		
Personal Certif	iicates 🔹	Rece <u>i</u> ve	
* default		<u>D</u> elete	
		Vie <u>w</u> /Edit	
		Export/Import	
		Recreate Request	
		Rena <u>m</u> e	
		Num Calf Gamed	
		New Sen-Signed	
		Extract Certificate	
The requested a	rtion has successfully completed		

Figure 3-75 Menu for personal certificates

18. Select **Signer Certificates** from the Key database content drop-down list box. See Figure 3-76.

	Key database information	
DB-Type:	CMS	
File Name:	/opt/IBM/HTTPServer/conf/plugin.kdb	
Token Label:		
Key database content		
Signer Certificates Add		

Figure 3-76 Self-signed certificate

19. Add each exported SSL certificate that was created to the key database. See Figure 3-77.

🖸 IBM Key Management - [/opt/IBM/HTTPServer/conf/plugin.kdb]			
Key Database <u>F</u> il	Key Database Eile <u>C</u> reate <u>V</u> iew <u>H</u> elp		
	Key database information		
DB-Type:	CMS		
File Name:	/opt/IBM/HTTPServer/conf/plugin.kdb		
Token Label:			
	Key database content		
Signer Certificat	les	▼ <u>A</u> dd	
impact71devlin_ImpactUI Det		Delete	
impact/1devin	2_ImpactUI	View/Edit	
		vie <u>w</u> / Euic	
		E <u>x</u> tract	
		<u>P</u> opulate	
		Rena <u>m</u> e	
The requested action has successfully completed!			

Figure 3-77 Import certificates

20.Close the iKeyman utility.

21. Configure the web server plug-in.

What is a web server plug-in? A *web server plug-in* is used to forward HTTP requests from the IBM HTTP Server to one or more application servers, including WebSphere Liberty, which is the application server platform on top of which Netcool/Impact servers run. The plug-in takes the request and based on the configuration in the plugincfg.xml file maps the URI for the HTTP request to the host name and port number of an application server and forwards the request to the specified application server.

22.Log in to any server in the environment that is a host for an Impact GUI server.

23.Add the following pluginConfiguration element in the

\$IMPACT_HOME/wlp/usr/servers/ImpactUI/server.xml file between the <server> ...// Server> sections (Example 3-41).

Example 3-41 Add the pluginConfiguration element

```
<pluginConfiguration webserverPort="80"
webserverSecurePort="443"
sslKeyringLocation="/opt/IBM/HTTPServer/conf/plugin.kdb"
sslStashfileLocation="/opt/IBM/HTTPServer/conf/plugin.sth"
sslCertlabel="ImpactUI"/>
```

24. Add the following feature element in the

```
$IMPACT_HOME/wlp/usr/shared/config/features.xml file between the <featureManager>
... </featureManager> sections:
```

```
<feature>localConnector-1.0</feature>
```

25.Restart the Netcool/Impact GUI server. Ensure that the Netcool/Impact GUI Server is online and connections are available.

26.Start the **JConsole** utility under the \$IMPACT_HOME/sdk/bin directory. See Figure 3-78.

JConsole: New Connection	X
New Connection	
<u>L</u> ocal Process:	
Name	PID
ws-server, jar NCI2	22313
ws-server.jar ImpactUI	9654
sun.tools.jconsole.JConsole	9828
org.eclipse.equinox.launcher_1.1.1.R36x_v20	8613
<u>Remote Process:</u>	
Usage: <hostname>:<port> OR service:jmx:<protoc< th=""><th>ol>:<sap></sap></th></protoc<></port></hostname>	ol>: <sap></sap>
Username: Password:	
Connect	Ca <u>n</u> cel

Figure 3-78 JConsole utility

27.Select Local Process and choose the ImpactUI process. Select Connect as shown in Figure 3-79.

Tip: The connection operation can take several minutes.

JConsole: New Connection	X
New Connection	
<u>Local Process:</u>	
Name	PID
ws-server.jar NCI2	22313
ws-server.jar.lmpactUl	9654
sun.tools.jconsole.JConsole	9828
org.eclipse.equinox.launcher_1.1.1.R36x_v20	8613
Note: The management agent will be enabled on this	process.
<u>Remote Process:</u>	
Usage: <hostname>:<port> OR service:jmx:<protoc< td=""><td>ol>:<sap></sap></td></protoc<></port></hostname>	ol>: <sap></sap>
<u>U</u> sername: <u>P</u> assword:	
Connect	Ca <u>n</u> cel

Figure 3-79 Local Process



Figure 3-80 shows the new connection.

Figure 3-80 Java console

- 28.Select the **MBeans** tab, and locate com.ibm.ws.jmx.mbeans.generatePluginConfig.
- 29.Under Operations, select the **generateDefaultPluginConfig** operation to generate the plug-in. See Figure 3-81.

💽 Java Monitoring & Management Console		四
<u>Connection</u> <u>W</u> indow <u>H</u> elp		
📄 pid: 9654 ws-server.jar ImpactUI		<u>ہ</u> ت 🗵
Overview Memory Threads Classes VM Summ	ary MBeans	
🗣 🗖 JMImplementation	Operation invocation	
🕈 🔚 WebSphere	void generateDef	aultPluginConfig
← 🛄 FileService	generateber	
FileTransfer	MBeanOperationInfo	
• @ com.ibm.ws.config.serverSchemaGenerator	Name	Value
ү 🧛 🧿 com.ibm.ws.jmx.mbeans.generatePluginConfig	Name	generateDefaultPluginConfig
Operations apparenteDefaultPluginConfig	Description	Operation exposed for management
generatePluginConfig	Impact	UNKNOWN
🗢 🧐 com. ibm. ws. kernel. filemonitor. FileNotificationMBea	ReturnType	void
Image: Image		
► Java lang		
• 🗖 java util logging		
• 🗂 org.apache.cxf		
🗠 🗂 org. apache. derby		
🗣 🛄 osgi.compendium		
🗠 🛄 osgi.core		
	Descriptor	
	Descriptor	Valua
	Name	value
	U	

Figure 3-81 generateDefaultPluginConfig

- 30.Repeat the steps for each Impact GUI server in the environment. The plugin-cfg.xml is generated under the \$IMPACT_HOME/wlp/usr/servers/ImpactUI directory.
- 31.Copy all of the generated plugin-cfg.xml files to the JazzSM Dashboard Component server.
- 32. In the \$JAZZSM/profile/bin directory, use the pluginCfgMerge utility to merge all of the generated plugin-cfg.xml files that were copied. Use the following command to generate the plugin-cfg.xml file that will be used in the IBM HTTP Server by merging the plug-cfg1.xml and plugin-cfg2.xml files. See Example 3-42.

Example 3-42 Merge all of the generated plugin-cfg.xml files

```
./pluginCfgMerge.sh -sortVhostGrp -debug plugin-cfg1.xml plugin-cfg2.xml
plugin-cfg.xml
```

- 33.Copy the generated plugin-cfg.xml file to the server that hosts the IBM HTTP Server under the configuration directory, for example, /opt/IBM/HTTPServer/conf.
- 34.Configure the IBM HTTP Server.
- 35.Add the following lines to the end of the IBM HTTP Server configuration file (httpd.conf) so that the mod_was_app22_http.so has the correct path to the plug-in location. See Example 3-43.

Example 3-43 Add these lines to the end of the IBM HTTP Server configuration file

```
LoadModule was_ap22_module
"/opt/IBM/WebSphere/Plugins/bin/64bits/mod_was_ap22_http.so"
WebSpherePluginConfig "/opt/IBM/HTTPServer/conf/plugin-cfg.xml"
```

36.To enable SSL on the IBM HTTP Web Server, add the following section to the end of the httpd.conf file, as shown in Example 3-44.

Example 3-44 Add this section to the end of the httpd.conf file

```
LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
Listen 443
<VirtualHost *:443>
SSLEnable
</VirtualHost>
KeyFile /opt/IBM/HTTPServer/conf/plugin.kdb
SSLDisable
```

37. Start the IBM HTTP Web Server by using the /apachect1 start command.

Note: You will not be able to log in to the Netcool/Impact GUI successfully by using the load balancer. However, HTTP and HTTPS UI data provider connections from the Dashboard will connect successfully.

38.Configure Dashboard Connections to the load balancer. If SSL UI data provider connections are required, the SSL certificate from the load balancer server needs to be imported into the truststore of the Dashboard server. Import the SSL certificates by using the same method that was used in Figure 3-5 on page 200 (when DASH was integrated with Impact). 39.Log in to the Dashboard server and select **Settings** \rightarrow **Connections**. See Figure 3-82.

	Console Settings
	General
	Catalogs
	Connections
	Console Preference Profiles
	Export Wizard
	Pages
	Widgets
	Views
	WebSphere Administrative Console
	Console Integrations
	Console Properties
	Roles
	Group Roles
	Roles
₽	User Roles
?	

Figure 3-82 Connections

40. Select the previously created **Impact_NCICLUSTER** and click the **Edit existing provider** icon (or add an Impact_NCICLUSTER if it does not exist yet). See Figure 3-83.

Connections ×							
Connections							
The connection manager allows you to configure the local and remote connections for this computer. The list below displays all configurable connections.							
To create a new remote connection, click on the 'Create new remote provider' icon. To edit an existing connection, either select a connection and click on the 'Edit existing provider' button, or right-click on a connection and select the 'Edit' menu option. To delete lowarded where a context disk disk or existence more redected the Totale menu option. To delete							
Name	Туре	Description	Connection	ID			
Impact_NCICLUSTER	Impact_NCICLUSTER	Impact_NCICLUSTER	Remote	Impact_NCICLUSTER			
Tivoli Directory Integrator	ТDI	TDI Generic Data Provider (1.0.39)	Local	TDI			
Netcool/OMNIbus Web GUI	OMNIbusWebGUI	Navigational data model for Netcool/OMNIbus Web GUI	Static	OMNIbusWebGUI			
tip	tip	Tivoli Integrated Portal Data Provider	Static	tip			
Total: 4 Selected: o (1)							

Figure 3-83 Edit Impact_NCICLUSTER

41. Alter the host name to the server name as shown in Figure 3-84. Click **OK**.

Connections ×						
Connections Chanse the name or description to modify this remote connection and click 'OK'						
* Protocol: * Host name:						
HTTPS-TLS V loadbalancer.swg.be.ibm.com						
* Path:						
libmitvoli/rest						
Connection goes through a firewall						
Firewall address Firewal	Firewall address Firewall port					
Use the following credentials to query the remote data providers						
* Name: * Password:						
impactadmin ••••	impactadmin ••••••					
* Contir	m password:					
Search						
\Rightarrow No filter applied \times						
Name	Description		Туре			
		No items to display				
Total: o Selected: o						
Connection information						
* Name:						
Description:						

Figure 3-84 New host name

Now, Dashboard pages can be created by using the IBM HTTP Server, providing load balancing and high availability connections to the Netcool/Impact UI data provider GUI servers.

Troubleshooting

To enable additional logging for the web server plug-in, edit the plugin-cfg.xml file in the configuration directory of the IBM HTTP Server and update the Log element with the correct location and log level for the plug-in logs, for example:

<Log LogLevel="Trace" Name="/opt/IBM/HTTPServer/logs/http-plugin.log"/>

References

For more information, see the following resources:

- Netcool/Impact Clustering overview:
 - https://ibm.biz/Bdrr7p
- Load balancing for DASH:

https://ibm.biz/Bdrr7h

- Configuring a web server plug-in for the Liberty profile: https://ibm.biz/Bdrr7V
- Understanding IBM HTTP Server plug-in Load Balancing in a clustered environment: https://ibm.biz/BdrHji

Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this book.

IBM Redbooks

The following IBM Redbooks publications provide additional information about the topic in this document. Note that some publications referenced in this list might be available in softcopy only.

- Improving Operations Effectiveness and Efficiency with IBM Netcool Operations Insight: A Scenarios Guide, SG24-8352
- Delivering Consistency and Automation with Operational Runbooks, REDP-5347

You can search for, view, download or order these documents and other Redbooks, Redpapers, Web Docs, draft and additional materials, at the following website:

ibm.com/redbooks

Online resources

These websites are also relevant as further information sources:

► IBM Netcool Operations Insight Version 1.4.0.1 Knowledge Center documentation:

https://www.ibm.com/support/knowledgecenter/SSTPTP_1.4.0.1/soc/collaterals/soc_ netops_kc_welcome.html?lang=en

Help from IBM

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