



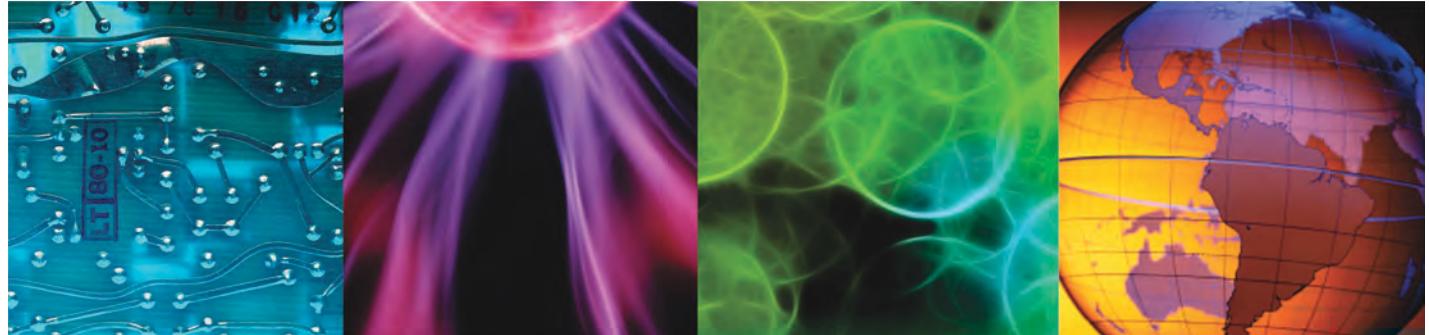
IBM Training

IBM Monitoring 8.1.3 Implementation and Administration

Course Exercises

Course code TM673G ERC 1.0

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About these exercises

There are five virtual machines in your environment.

1. APM: This system hosts the IBM Performance Monitoring environment, which includes the Management information Node (MIN) and a Monitoring Agent for Linux Operating System. The user ID is root and the password is object00.
2. LIN1: This system hosts a WebSphere Application Server. It is used to install a Monitoring Agent for WebSphere Application Server, a Monitoring Agent for HTTP, and a Monitoring Agent for Linux Operating System. The user ID is root and the password is object00.
3. ITM: This system hosts an IBM Tivoli Monitoring 6.3 environment, which includes the Monitoring Server, Portal Server, Portal Client, and an IBM Tivoli Monitoring Operating System agent. It has no IBM Monitoring components. It is used to demonstrate the integration of IBM Tivoli Monitoring with IBM Monitoring. The user ID is root and the password is object00.
4. LIN5: This system hosts an IBM Tivoli Common Reporting environment. It is used to demonstrate the integration of IBM Tivoli Common Reporting with IBM Monitoring. The user ID is root and the password is object00.
5. LIN3: This system hosts a Netcool/OMNibus 8.1 environment. It is used to demonstrate the integration of Netcool/OMNibus with IBM Monitoring. The login user ID is netcool and the password is object00.

There are six units to the course, as outlined here:

1. [Introduction to IBM Monitoring exercises](#)

In these exercises, you verify the lab environment.

2. [Installation exercises](#)

The exercises guide you through the installation of the Performance Management server and several monitoring agents.

3. [Administering and using IBM Performance Management exercises](#)

In these exercises, you validate the installation of the Performance Management Server and the Monitoring agents. You create applications that are composed of the data from the monitoring agents. You create new users and assign capabilities to those users. You also explore the Attribute details of various agents and save customized charts with other users.

4. [Managing events and thresholds exercises](#)

In these exercises, you learn the relationship between thresholds and events. You create thresholds that test for simple and multiple conditions. You create thresholds that run commands to solve the issue it detected. You adjust resource groups and learn the impact of these adjustments on thresholds and events.

5. [Integrating IBM Monitoring with other products exercises](#)

In these exercises, you integrate IBM Monitoring with IBM Tivoli Monitoring, IBM Netcool/OMNIbus, and IBM Dashboard Application Services. You also configure email notification and examine other advanced configuration options.

6. [Reporting and 7-day comparison exercises](#)

In these exercises, the objective is to learn how to use the Historical 7-Day Comparison and how to install and access Tivoli Common Reporting reports.



1 Introduction to IBM Monitoring exercises

Six systems are used with the exercises in this course:

1. **APM:** This system hosts the IBM Performance Monitoring environment, which includes the Management information Node (MIN) and a Monitoring Agent for Linux Operating System. The user ID is **root** and the password is **object00**.
2. **WIN1:** This system is used to install a Monitoring Agent for Windows Operating System. The user ID is **Administrator** and the password is **object00**.
3. **LIN1:** This system hosts a WebSphere Application Server. It is used to install a Monitoring Agent for WebSphere Application Server, a Monitoring Agent for HTTP, and a Monitoring Agent for Linux Operating System. The user ID is **root** and the password is **object00**.
4. **ITM:** This system hosts an IBM Tivoli Monitoring 6.3 environment, which includes the Monitoring Server, Portal Server, Portal Client, and an IBM Tivoli Monitoring Operating System agent. It has no IBM Monitoring components. It is used to demonstrate the integration of IBM Tivoli Monitoring with IBM Monitoring. The user ID is **root** and the password is **object00**.
5. **LIN5:** This system hosts an IBM Tivoli Common Reporting environment. It is used to demonstrate the integration of IBM Tivoli Common Reporting with IBM Monitoring. The user ID is **root** and the password is **object00**.
6. **LIN3:** This system hosts a Netcool/OMNibus 8.1 environment. It is used to demonstrate the integration of Netcool/OMNibus with IBM Monitoring. The login user ID is **netcool** and the password is **object00**.

Objectives

In these exercises, you verify the lab environment.

You do the following operations.

- Start the VMs APM and LIN1. The first four units use these two systems. The other systems are started in exercises from later units.
- Check network connectivity to these two systems

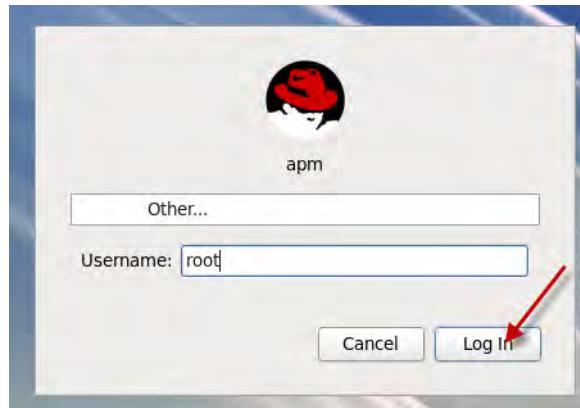
Exercise 1 Starting the virtual images



Note: The actual procedures for starting the virtual images might be different, depending on the hosting environment. Your instructor can provide site-specific procedures.

Perform the following steps:

1. Start the **APM** VM. Each hosting environment can have a different method for starting systems. Follow the local environment instructions.
2. At the login prompt, click **Other**, enter the user name **root**, and click **Log In**.



3. Enter the password **object00** and press Enter.
4. Start the **LIN1** VM. Follow the local environment instructions.

5. At the login prompt, enter the user name **root** and click **Log In**.



6. At the password prompt, enter **object00** and press Enter.

Exercise 2 Verifying network connectivity

When the images are started and logged in, ping each system from its neighbors. This action verifies that the host names are correct in each system hosts file, and that the systems can be accessed in the network.

1. On the VM named APM, double-click the Terminal icon to open a terminal window.



There are two other ways to open the terminal window. You can right-click the Terminal icon and select **Open**. You can also right-click in an empty part of the desktop, and from the drop-down window, select **Open in Terminal**.

2. From the open terminal window, enter this command to verify the network connectivity from APM to LIN1:

```
ping lin1 -c 3
```

```
[root@apm ~]# ping lin1 -c 3
PING lin1.ibm.edu (192.168.1.104) 56(84) bytes of data.
64 bytes from lin1.ibm.edu (192.168.1.104): icmp_seq=1 ttl=64 time=1.35 ms
64 bytes from lin1.ibm.edu (192.168.1.104): icmp_seq=2 ttl=64 time=1.05 ms
64 bytes from lin1.ibm.edu (192.168.1.104): icmp_seq=3 ttl=64 time=0.926 ms

--- lin1.ibm.edu ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2005ms
rtt min/avg/max/mdev = 0.926/1.113/1.356/0.179 ms
[root@apm ~]#
```

A successful ping has 0% packet loss.

3. On the lin1 system, open a GNOME Terminal window.



4. Issue these commands to ping APM and WIN1:

```
ping apm -c 3
```

Examine the responses for successful pings.



Important: Notify your instructor if any of the images fail to start, or if any of the pings are not successful.



2 Installation exercises

The exercises guide you through the installation of the Performance Management server and several monitoring agents.

Exercise 1 Installing the Performance Management server

The installation procedure involves expanding the installation files on the system, and running the installation script.

You must run as the **root** user to install the server.

When you start the installation, a prerequisite checker reviews your Red Hat Enterprise Linux system to ensure that it meets the software, memory, and disk requirements. Any missing prerequisites are shown in a message. An absolute prerequisite, such as an out-of-date library or insufficient disk space, stops the installation. You must address the missing prerequisite before you can start the installation again. A soft prerequisite, such as low available memory, does not stop the installation, but is displayed in a message.

1. Open a Linux terminal window on the VM named APM, right-click the desktop, and click **Open in Terminal**. Change to directory `/downloads/IM813`.

```
cd /downloads/IM813
```

2. List the files in the directory.

```
ls
```

3. Change to the directory that is called server and list the contents of the directory by using the ls command.

```
cd server  
ls
```

2 Installation exercises

Exercise 1 Installing the Performance Management server

4. Extract the file that contains the Performance Management server to a new directory called **server** by running the **tar** command:

```
tar -xvf ipm_monitoring_8.1.3.tar
```

The screenshot shows a terminal window titled "root@apm:/downloads/IM813/server". The terminal session is as follows:

```
[root@apm /]# cd /downloads/IM813/
[root@apm IM813]# ls
agents  reports  server
[root@apm IM813]# cd server
[root@apm server]# ls
ipm_monitoring_8.1.3.tar
[root@apm server]# tar -xvf ipm_monitoring_8.1.3.tar
```

5. Install the performance management server by entering the following command:

```
./install.sh
```



Hint: If you miss a parameter or select an incorrect option, stop the installation process (Ctrl+C) and start again.

6. Accept the default of no when asked if you want to upgrade from an existing installation of the Performance Management Server.
7. Review the offering that is displayed and enter **1** (yes) to continue with the installation.
8. Enter **2** to accept the default **/opt/ibm**.
9. Enter **1** to accept the agreement and continue.

The screenshot shows a terminal window titled "root@apm:/downloads/IM813/server". The terminal session is as follows:

```
[root@apm server]# ./install.sh

Do you want to upgrade from an existing installation of the Performance Management server [ 1-yes or 2-no; "no" is default ]?

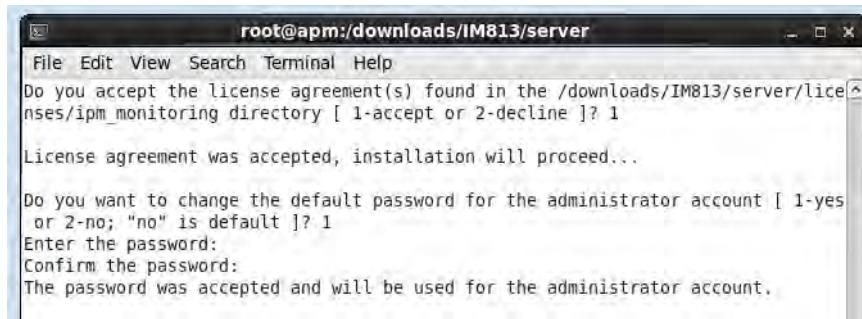
This script will install IBM Monitoring (8.1.3.0).

Do you want to continue [ 1-yes or 2-no; "yes" is default ]? 1

Do you want to change the default installation directory ( /opt/ibm ) [ 1-yes or 2-no; "no" is default ]?

Do you accept the license agreement(s) found in the /downloads/IM813/server/licenses/ipm_monitoring directory [ 1-accept or 2-decline ]? 1
```

10. After you are prompted to change the default password for the administrator account, enter **1** (yes) and create a new password of **object00**. After you answer the prompt to change the administrator password, the installation continues.



```
root@apm:downloads/IM813/server
File Edit View Search Terminal Help
Do you accept the license agreement(s) found in the /downloads/IM813/server/lice[nses/ipm_monitoring directory [ 1-accept or 2-decline ]? 1
License agreement was accepted, installation will proceed...
Do you want to change the default password for the administrator account [ 1-yes or 2-no; "no" is default ]? 1
Enter the password:
Confirm the password:
The password was accepted and will be used for the administrator account.
```

11. After you are asked whether you want to configure your agent installation images and Hybrid Gateway installation image (if used) to connect to the server, enter **1** (yes) to configure the images now.
12. Provide the path to the directory on the server where the agent images and Hybrid Gateway are stored, in this case, **/downloads/IM813/agents/**.
13. Accept the default location for the preconfigured agent installation images by pressing Enter.



```
root@apm:downloads/IM813/server
File Edit View Search Terminal Help
Agent installation images must be configured to connect to this server. If you have downloaded the agent images to the same system as the server, you can configure the agent images now.

Do you want to configure the compressed (*.zip or *.tar) agent installation files now [ 1-yes or 2-no; "yes" is default ]? 1
Enter the path to the directory where you downloaded the compressed agent (and/or Hybrid Gateway) installation images (e.g. /opt/agents).
Enter the path: /downloads/IM813/agents/
Enter the path to the directory where configured agent installation images can be stored.
Enter the path or accept the default [/opt/ibm/ccm/depot]:
```

14. Accept the default server IP address for the agents and Hybrid Gateway to use by pressing Enter.

2 Installation exercises

Exercise 1 Installing the Performance Management server

15. After you are prompted to enter the host name and IP address of the server that you use to log in to the Performance Management console, accept the default values.

```
root@apm:/downloads/IM813/server
File Edit View Search Terminal Help
e server.
Enter the IP address/hostname or accept the default [192.168.1.102]:  

Enter the hostname and IP address of the server that will be used in a web browser to log in to the Performance Management console. Accept the default values or provide your own.  

Default values:  

  Fully qualified domain name: apm.ibm.edu  

  Short hostname: apm  

  IP: 192.168.1.102  

Do you want to use these values [ 1-yes or 2-no; "yes" is default ]? 1
```

16. After you are prompted to install the database or connect to an existing DB2® database, enter **1** to install the default database.

```
root@apm:/downloads/IM813/server
File Edit View Search Terminal Help
Do you want to use these values [ 1-yes or 2-no; "yes" is default ]?  

Do you want to install the database or connect to an existing DB2? [ 1-install database or 2-connect to existing database; "1-install database" is default ]? 1
```

The installer installs the server components and support files. No further user input is required.

The prerequisite checker runs first, and then the installation. The installer configures the components, which can take up to 1 hour to complete.

```
root@apm:/downloads/IM813/server
File Edit View Search Terminal Help
Version: 1.2.0.17
Build : 20150827
OS name: Linux
User name: root

Machine Information
Machine name: apm
Serial number: VMware-56 4d 32 09 5e 87 4d 1e-8f 5b 72 b9 79 ba ab b3

Scenario: Prerequisite Scan
IPDB2 - IBM Performance Management and IBM DB2 Server [version 08010300]:  

Overall result: PASS
Detailed results are also available in /opt/ibm/ccm/logs/apm-prs_20160623_142934/result.txt

No further user input is required. The installation and configuration of components is now starting and may take up to one hour to complete. The installation log is available at "/opt/ibm/ccm/logs/apm-server-install_20160623_142934.log".
Installing DB2. Please wait...
Installing the Performance Management server. Please wait...
```

```
root@apm:downloads/IM813/server
File Edit View Search Terminal Help

Installing the Performance Management server. Please wait...
Starting components of the Performance Management server...
.....
.....
Configuring components of the Performance Management server...

All components are configured successfully.

Configuring agent installation images...
Agent installation images have been configured and are available in the following directory: /opt/ibm/ccm/depot.

The configuration of agent installation images can also be done manually.
To do this manual configuration, first create configuration packages by using the following script: /opt/ibm/ccm/make_configuration_packages.sh. Then, use the output packages from the first script and run the following one: /opt/ibm/ccm/configure_agent_images.sh.

Installer has detected existing keyfiles and/or agent configuration directories.
They have been renamed to . If you want to use them to configure your server and/or agents please review the documentation.

Finalizing the installation...

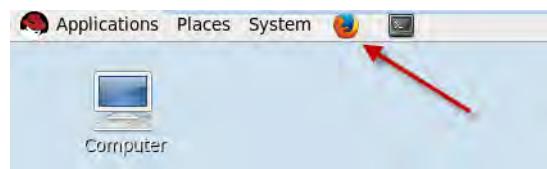
The server size has been configured as 'extra_small' based on the number of CPUs, amount of memory and free disk space. To reconfigure the server size, run script /opt/ibm/ccm/server_size.sh with the desired size as a parameter. Valid sizes are: extra_small, small, medium.
Please review the documentation at http://ibm.biz/mon_doc for more information.
To begin using the product, copy the configured agent images to the systems running the applications you want to monitor and install the agents. Log in to the Performance Management console using https://apm.ibm.edu:9443 and review the topics on the "Getting Started" page.

[root@apm server]#
```

Validating the Installation

The way to validate the installation was successful is to attempt to log in to the Performance Management Console.

17. On the APM VM, open a Firefox browser.



18. Open this web page:

<https://apm.ibm.edu:9443>

2 Installation exercises

Exercise 1 Installing the Performance Management server

19. Click I Understand the Risks.



20. Click Add Exception.



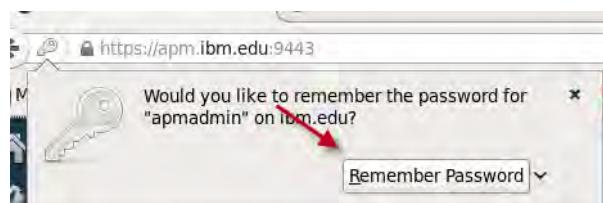
21. Click Confirm Security Exception.



22. Click **I Understand the Risks** again.
23. Click **Add Exception** again.
24. Click **Confirm Security** Exception again.
25. Sign-in with the user ID of **apmadmin** and a password of **object00**, and click **Log In**.



26. Click **Remember Password**.



You validated that the Performance Management Console is functional. Because no agents are installed, there is no data to collect.

Exercise 2 Installing agents on Linux

Installation of agents on one platform is similar to others. This exercise guides you through installing the Monitoring Agent for Linux OS.

Installing the Monitoring Agent for Linux OS

1. On VM LIN1, open a Gnome terminal window.



2. Change to the **/downloads** folder, create a subfolder that is called **IM813**. Change to the **/downloads/IM813** folder, create a folder that is called **agent**, and change to the **/downloads/IM813/agent** folder.

```
File Edit View Terminal Help
lin1:~ # cd /downloads
lin1:/downloads # mkdir IM813
lin1:/downloads # cd IM813
lin1:/downloads/IM813 # mkdir agent
lin1:/downloads/IM813 # cd agent
lin1:/downloads/IM813/agent #
```

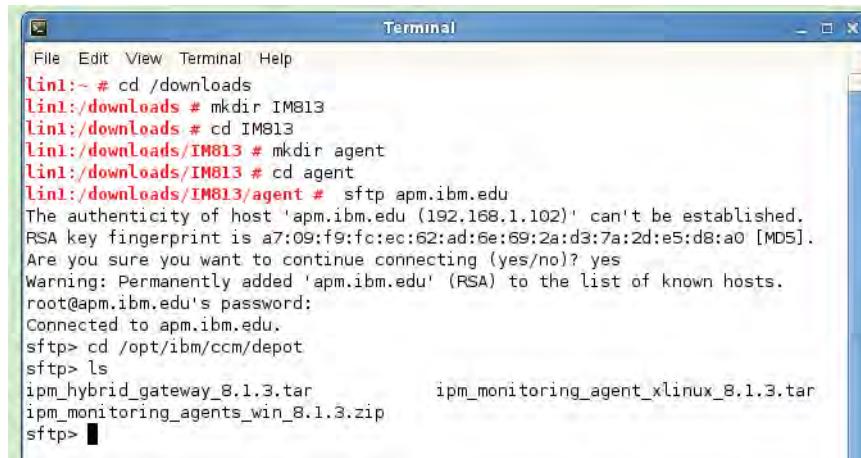
3. Open a secure FTP command to **apm.ibm.edu**:

`sftp apm.ibm.edu`

4. Enter **yes** to confirm the authenticity of the host, and supply the password of **object00**.

```
File Edit View Terminal Help
lin1:~ # cd /downloads
lin1:/downloads # mkdir IM813
lin1:/downloads # cd IM813
lin1:/downloads/IM813 # mkdir agent
lin1:/downloads/IM813 # cd agent
lin1:/downloads/IM813/agent # sftp apm.ibm.edu
The authenticity of host 'apm.ibm.edu (192.168.1.102)' can't be established.
RSA key fingerprint is a7:09:f9:fc:ec:62:ad:6e:69:2a:d3:7a:2d:e5:d8:a0 [MD5].
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'apm.ibm.edu' (RSA) to the list of known hosts.
root@apm.ibm.edu's password:
Connected to apm.ibm.edu.
sftp> #
```

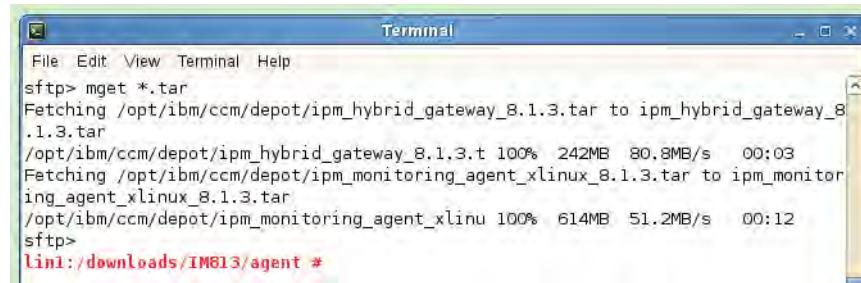
5. Change to the directory where the configured agent images are stored: **/opt/ibm/ccm/depot/** folder, and list the files that are there.



```
Terminal
File Edit View Terminal Help
Lin1:~ # cd /downloads
Lin1:/downloads # mkdir IM813
Lin1:/downloads # cd IM813
Lin1:/downloads/IM813 # mkdir agent
Lin1:/downloads/IM813 # cd agent
Lin1:/downloads/IM813/agent # sftp apm.ibm.edu
The authenticity of host 'apm.ibm.edu (192.168.1.102)' can't be established.
RSA key fingerprint is a7:09:f9:fc:ec:62:ad:6e:69:2a:d3:7a:2d:e5:d8:a0 [MD5].
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'apm.ibm.edu' (RSA) to the list of known hosts.
root@apm.ibm.edu's password:
Connected to apm.ibm.edu.
sftp> cd /opt/ibm/ccm/depot
sftp> ls
ipm_hybrid_gateway_8.1.3.tar          ipm_monitoring_agent_xlinux_8.1.3.tar
ipm_monitoring_agents_win_8.1.3.zip
sftp> 
```

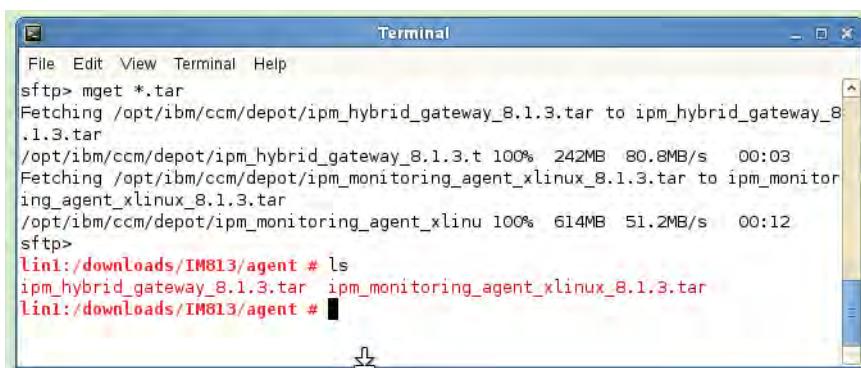
6. Transfer the tar files in the depot on the APM server to LIN1 server:

```
mget *.tar
```



```
Terminal
File Edit View Terminal Help
sftp> mget *.tar
Fetching /opt/ibm/ccm/depot/ipm_hybrid_gateway_8.1.3.tar to ipm_hybrid_gateway_8
.1.3.tar
/opt/ibm/ccm/depot/ipm_hybrid_gateway_8.1.3.t 100% 242MB 80.8MB/s 00:03
Fetching /opt/ibm/ccm/depot/ipm_monitoring_agent_xlinux_8.1.3.tar to ipm_monitor
ing_agent_xlinux_8.1.3.tar
/opt/ibm/ccm/depot/ipm_monitoring_agent_xlinu 100% 614MB 51.2MB/s 00:12
sftp>
Lin1:/downloads/IM813/agent #
```

7. Close the secure transfer command with the command **exit**, and list the contents of the current directory.



```
Terminal
File Edit View Terminal Help
sftp> mget *.tar
Fetching /opt/ibm/ccm/depot/ipm_hybrid_gateway_8.1.3.tar to ipm_hybrid_gateway_8
.1.3.tar
/opt/ibm/ccm/depot/ipm_hybrid_gateway_8.1.3.t 100% 242MB 80.8MB/s 00:03
Fetching /opt/ibm/ccm/depot/ipm_monitoring_agent_xlinux_8.1.3.tar to ipm_monitor
ing_agent_xlinux_8.1.3.tar
/opt/ibm/ccm/depot/ipm_monitoring_agent_xlinu 100% 614MB 51.2MB/s 00:12
sftp>
Lin1:/downloads/IM813/agent # ls
ipm_hybrid_gateway_8.1.3.tar  ipm_monitoring_agent_xlinux_8.1.3.tar
Lin1:/downloads/IM813/agent #
```

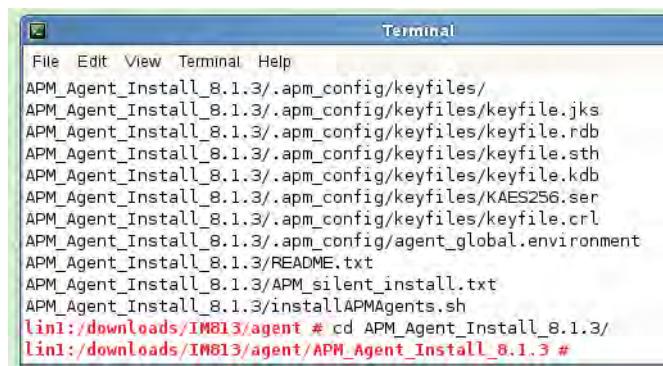
8. Extract the file **ipm_monitoring_agents_xlinux_8.1.3.tar**.

```
tar -xvf ipm_monitoring_agents_xlinux_8.1.3.tar
```

2 Installation exercises

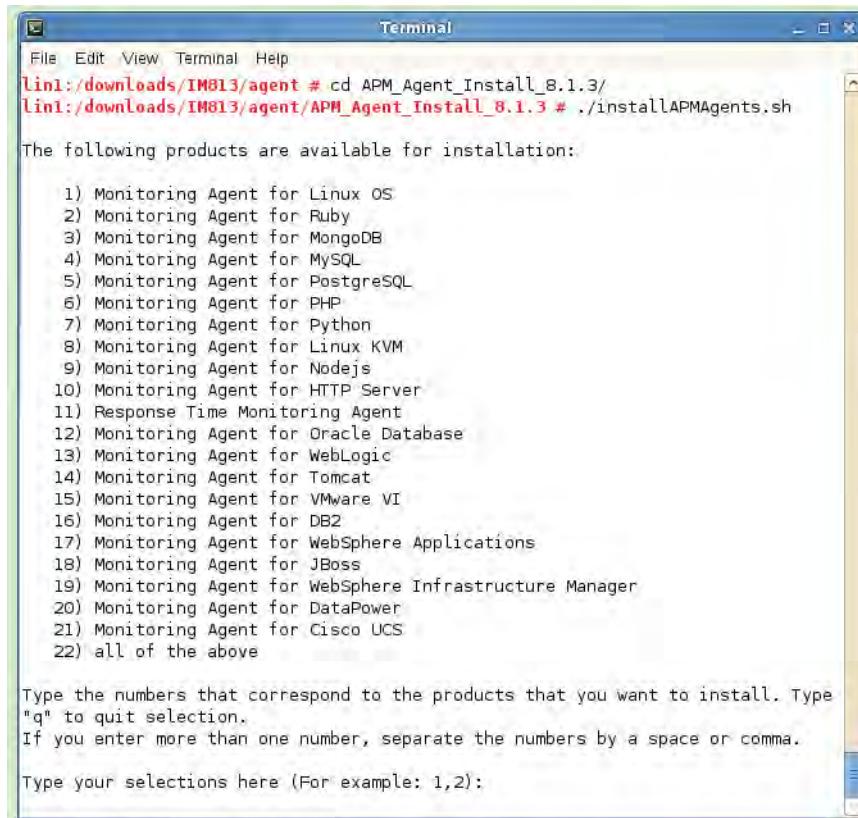
Exercise 2 *Installing agents on Linux*

9. Change to the directory **/downloads/IM813/agent/APM_Agent_Install_8.1.3**.



```
Terminal
File Edit View Terminal Help
APM_Agent_Install_8.1.3/.apm_config/keyfiles/
APM_Agent_Install_8.1.3/.apm_config/keyfiles/keyfile.jks
APM_Agent_Install_8.1.3/.apm_config/keyfiles/keyfile.rdb
APM_Agent_Install_8.1.3/.apm_config/keyfiles/keyfile.sth
APM_Agent_Install_8.1.3/.apm_config/keyfiles/keyfile.kdb
APM_Agent_Install_8.1.3/.apm_config/keyfiles/KAES256.ser
APM_Agent_Install_8.1.3/.apm_config/keyfiles/keyfile.crl
APM_Agent_Install_8.1.3/.apm_config/agent_global.environment
APM_Agent_Install_8.1.3/README.txt
APM_Agent_Install_8.1.3/APM_silent_install.txt
APM_Agent_Install_8.1.3/installAPMAgents.sh
lin1:/downloads/IM813/agent # cd APM_Agent_Install_8.1.3/
lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 #
```

10. Run the command **./installAPMAgents.sh**.



```
Terminal
File Edit View Terminal Help
lin1:/downloads/IM813/agent # cd APM_Agent_Install_8.1.3/
lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 # ./installAPMAgents.sh

The following products are available for installation:

1) Monitoring Agent for Linux OS
2) Monitoring Agent for Ruby
3) Monitoring Agent for MongoDB
4) Monitoring Agent for MySQL
5) Monitoring Agent for PostgreSQL
6) Monitoring Agent for PHP
7) Monitoring Agent for Python
8) Monitoring Agent for Linux KVM
9) Monitoring Agent for Nodejs
10) Monitoring Agent for HTTP Server
11) Response Time Monitoring Agent
12) Monitoring Agent for Oracle Database
13) Monitoring Agent for WebLogic
14) Monitoring Agent for Tomcat
15) Monitoring Agent for VMware VI
16) Monitoring Agent for DB2
17) Monitoring Agent for WebSphere Applications
18) Monitoring Agent for JBoss
19) Monitoring Agent for WebSphere Infrastructure Manager
20) Monitoring Agent for DataPower
21) Monitoring Agent for Cisco UCS
22) all of the above

Type the numbers that correspond to the products that you want to install. Type "q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

Type your selections here (For example: 1,2):
```

11. Select **1** to install the Monitoring Agent for Linux OS.

12. Press Enter to confirm your selection.

13. Press Enter to confirm the agent home of **/opt/ibm/apm/agent**.

14. Select **1** to accept the license agreement.

The screenshot shows a terminal window titled "Terminal". The window contains the following text:

```
File Edit View Terminal Help
17) Monitoring Agent for WebSphere Applications
18) Monitoring Agent for JBoss
19) Monitoring Agent for WebSphere Infrastructure Manager
20) Monitoring Agent for DataPower
21) Monitoring Agent for Cisco UCS
22) all of the above

Type the numbers that correspond to the products that you want to install. Type
"q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

Type your selections here (For example: 1,2): 1

The following agents will be installed:

Monitoring Agent for Linux OS

Are your selections correct [ 1-Yes, 2-No; default is 1 ]?

Please specify the agent home (default: /opt/ibm/apm/agent):

The agent will be installed in /opt/ibm/apm/agent

Do you accept the license agreement(s) found in the directory /downloads/IMB13/a
gent/APM_Agent_Install_8.1.3/licenses?

Please enter [ 1-to accept the agreement, 2-to decline the agreement ] : 1

User has accepted the license agreement(s).

Monitoring Agent for Linux OS will be installed.

Installing Monitoring Agent for Linux OS.
```

The agent installation takes approximately 5 minutes.

2 Installation exercises

Exercise 2 Installing agents on Linux

15. Look for a message indicating that the installation of the agent was successful.

The following agents were installed successfully into the /opt/ibm/apm/agent directory:

Monitoring Agent for Linux OS

Agent status:
Agent is running. Process ID is 16253
Server connection status: Connecting
For more information, see the following file: /opt/ibm/apm/agent/logs/lz_ServerConnectionStatus.txt

The installation log file is /opt/ibm/apm/agent/logs/APMAgents_install.log.

For any agent that is running, the agent is configured with the default settings .

To configure your agents, use the following detailed instructions:

For Performance Management on Cloud:
<http://ibm.biz/kc-ipmcloud-configagent>

For Performance Management (on premises):
<http://ibm.biz/kc-ipm-configagent>

As part of the configuration instructions, you will use the following commands to configure and manage each installed agent:
Monitoring Agent for Linux OS /opt/ibm/apm/agent/bin/os-agent.sh start or stop or status or uninstall

```
#####
#####lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3#
```

It takes several minutes for the agent that you installed to show in the Performance Management console. Do not wait for it; proceed to the next exercise. The installation will be validated in the next unit exercises.

Installing the Monitoring Agent for HTTP on Linux

Installation of extra agents after you already installed one has the benefit of avoiding the step of transferring the agent software to the target. This exercise guides you through installing the Monitoring Agent for HTTP on the LIN1 VM.

16. On VM LIN1, continue by using the already opened terminal window.
17. Change to the directory `/downloads/IM813/agent/APM_Agent_Install_8.1.3`.
18. Run the command `./installAPMAgents.sh`.

```
#####
lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 # ./installAPMAgents.sh

The following products are available for installation:

1) Monitoring Agent for Linux OS
2) Monitoring Agent for Ruby
3) Monitoring Agent for MongoDB
4) Monitoring Agent for MySQL
5) Monitoring Agent for PostgreSQL
6) Monitoring Agent for PHP
7) Monitoring Agent for Python
8) Monitoring Agent for Linux KVM
9) Monitoring Agent for Nodejs
10) Monitoring Agent for HTTP Server
11) Response Time Monitoring Agent
12) Monitoring Agent for Oracle Database
13) Monitoring Agent for WebLogic
14) Monitoring Agent for Tomcat
15) Monitoring Agent for VMware VI
16) Monitoring Agent for DB2
17) Monitoring Agent for WebSphere Applications
18) Monitoring Agent for JBoss
19) Monitoring Agent for WebSphere Infrastructure Manager
20) Monitoring Agent for DataPower
21) Monitoring Agent for Cisco UCS
22) all of the above

Type the numbers that correspond to the products that you want to install. Type
"q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

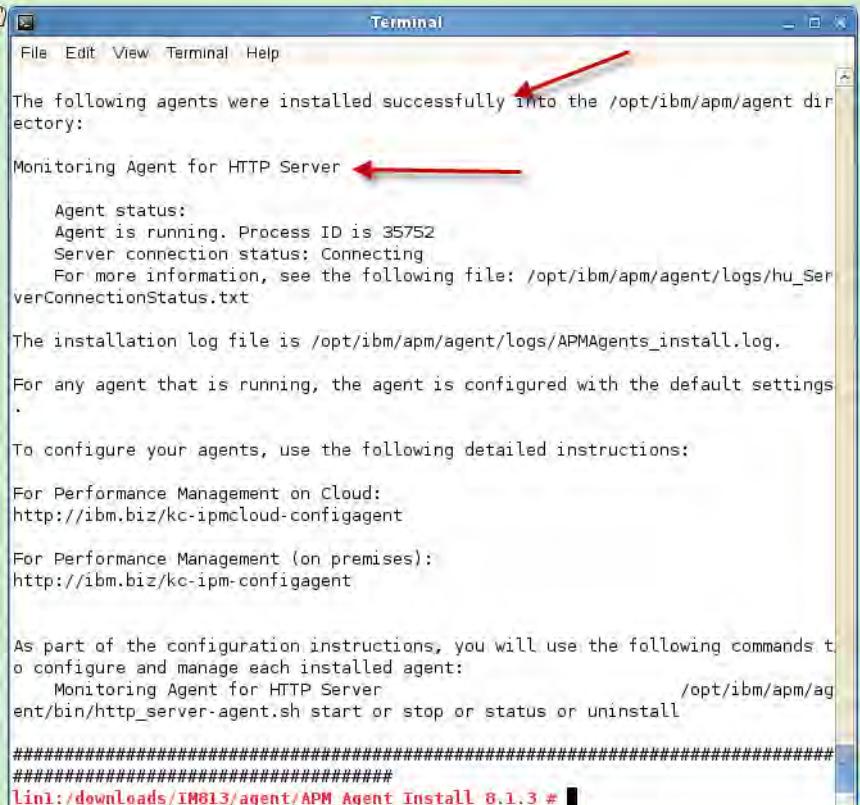
Type your selections here (For example: 1,2): 10
```

19. Select **10** to install the Monitoring Agent for HTTP Server.
20. Press Enter to confirm your selection.
21. Press Enter to confirm the agent home of `/opt/ibm/apm/agent`.
22. Select **1** to accept the license agreement.

2 Installation exercises

Exercise 2 Installing agents on Linux

The agent installation takes approximately 5 minutes.



The following agents were installed successfully into the /opt/ibm/apm/agent directory:

Monitoring Agent for HTTP Server

Agent status:
Agent is running. Process ID is 35752
Server connection status: Connecting
For more information, see the following file: /opt/ibm/apm/agent/logs/hu_ServerConnectionStatus.txt

The installation log file is /opt/ibm/apm/agent/logs/APMAgents_install.log.

For any agent that is running, the agent is configured with the default settings.

To configure your agents, use the following detailed instructions:

For Performance Management on Cloud:
<http://ibm.biz/kc-ipmcloud-configagent>

For Performance Management (on premises):
<http://ibm.biz/kc-ipm-configagent>

As part of the configuration instructions, you will use the following commands to configure and manage each installed agent:
Monitoring Agent for HTTP Server /opt/ibm/apm/agent/bin/http_server-agent.sh start or stop or status or uninstall

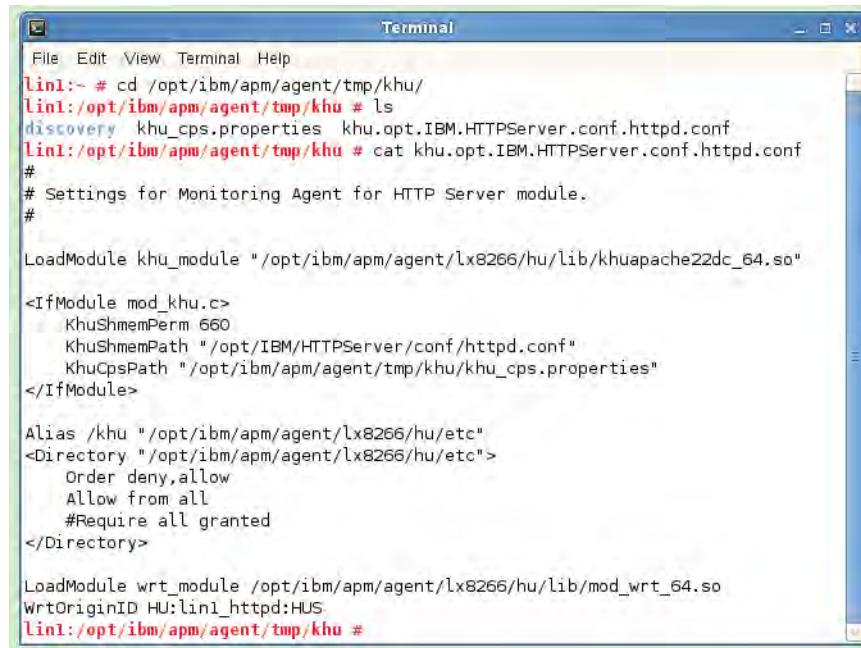
```
lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 #
```

The Monitoring Agent for HTTP needs some manual configuration to collect the necessary data.

23. On the LIN1 VM, open a new Gnome terminal window.

24. Change directory to **/opt/ibm/apm/agent/tmp/khu** and list the contents of the directory.

25. Display the contents of the file **khu.opt.IBM.HTTPServer.conf.httpd.conf** by using the **cat** command.



The screenshot shows a terminal window titled "Terminal". The command entered was "cat khu.opt.IBM.HTTPServer.conf.httpd.conf". The output displays the configuration file content, which includes settings for the Monitoring Agent for HTTP Server module, including module load paths and directory configurations. The file ends with a comment "# WrtOriginID HU:lin1_httpd:HUS". The terminal prompt "lin1:/opt/ibm/apm/agent/tmp/khu #" is visible at the bottom.

```
File Edit View Terminal Help
lin1:~ # cd /opt/ibm/apm/agent/tmp/khu/
lin1:/opt/ibm/apm/agent/tmp/khu # ls
discovery khu_cps.properties khu.opt.IBM.HTTPServer.conf.httpd.conf
lin1:/opt/ibm/apm/agent/tmp/khu # cat khu.opt.IBM.HTTPServer.conf.httpd.conf
#
# Settings for Monitoring Agent for HTTP Server module.
#
LoadModule khu_module "/opt/ibm/apm/agent/lx8266/hu/lib/khuapache22dc_64.so"
<IfModule mod_khu.c>
    KhuShmemPerm 660
    KhuShmemPath "/opt/IBM/HTTPServer/conf/httpd.conf"
    KhuCpsPath "/opt/ibm/apm/agent/tmp/khu/khu_cps.properties"
</IfModule>
Alias /khu "/opt/ibm/apm/agent/lx8266/hu/etc"
<Directory "/opt/ibm/apm/agent/lx8266/hu/etc">
    Order deny,allow
    Allow from all
    #Require all granted
</Directory>
LoadModule wrt_module /opt/ibm/apm/agent/lx8266/hu/lib/mod_wrt_64.so
WrtOriginID HU:lin1_httpd:HUS
lin1:/opt/ibm/apm/agent/tmp/khu #
```

This IBM HTTP Server configuration file must include the **khu.opt.IBM.HTTPServer.conf.httpd.conf** file to collect data for the Monitoring Agent for HTTP.

26. Open up new Gnome terminal window or continue by using the already opened terminal window.

27. Change to the **/opt/IBM/HTTPServer/conf** directory.

```
cd /opt/IBM/HTTPServer/conf
```

28. Make a backup copy of the file **httpd.conf**.

```
cp httpd.conf httpd.conf.orig
```

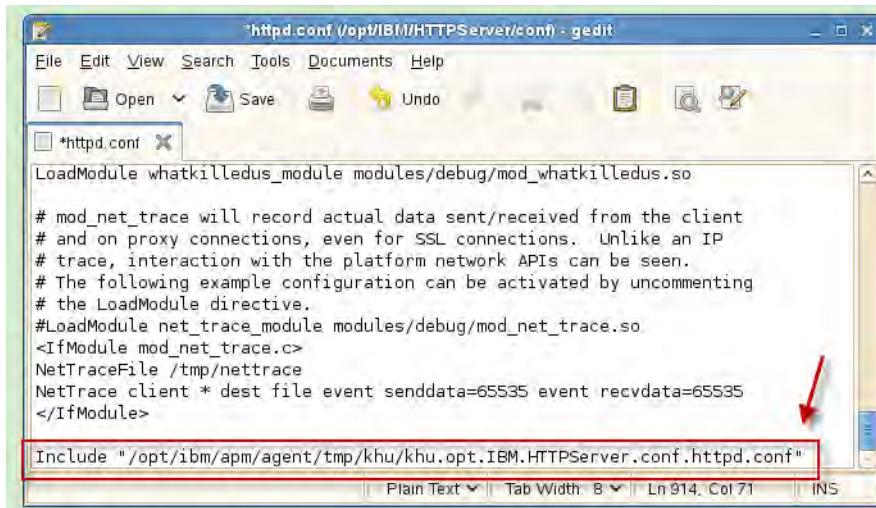
29. Edit the file **httpd.conf** using the **gedit** editor.

2 Installation exercises

Exercise 2 Installing agents on Linux

30. Scroll to the bottom of the file and add the line:

```
Include "/opt/ibm/apm/agent/tmp/khu/khu.opt.IBM.HTTPServer.conf.httpd.conf"
```



Hint: This setting is case-sensitive. Confirm that you the quotation marks are placed as shown.

31. Save the change and close gedit.

32. Change to the directory **/opt/IBM/HTTPServer/bin**.

33. Recycle the IBM HTTP Server to pick up the configuration changes.

```
./apachectl stop  
./apachectl start
```

```
File Edit View Terminal Help  
lin1:/opt/IBM/HTTPServer/conf # cp httpd.conf httpd.conf.orig  
lin1:/opt/IBM/HTTPServer/conf # gedit httpd.conf  
lin1:/opt/IBM/HTTPServer/conf # cd /opt/IBM/HTTPServer/bin/  
lin1:/opt/IBM/HTTPServer/bin # ./apachectl stop  
[Thu Jun 23 18:01:34 2016] [notice] mod_wrt: shared memory attached. pid: 51015,  
sconf->pid: 51015  
lin1:/opt/IBM/HTTPServer/bin # ./apachectl start  
[Thu Jun 23 18:01:38 2016] [notice] mod_wrt: shared memory initialized. pid: 510  
69  
lin1:/opt/IBM/HTTPServer/bin #
```

Hint: This error messages can be ignored.

Installing the Monitoring Agent for WebSphere Applications on Linux

This exercise guides you through installing the Monitoring Agent for WebSphere Applications on the LIN1 Linux-based VM.

34. On VM LIN1, start WebSphere by right-clicking the shortcut on the desktop that is labeled **Start WebSphere** and selecting **Open**.



WebSphere Application Server starts.



```
File Edit View Terminal Help
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server1/startServer.log
ADMU0128I: Starting tool with the AppSrv01 profile
ADMU3100I: Reading configuration for server: server1
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server server1 open for e-business; process id is 54970
lin1:~ #
```

35. On VM LIN1, open a Gnome terminal window, or continue by using the already opened terminal window.



36. Change to the directory **/downloads/IM813/agent/APM_Agent_Install_8.1.3**.

37. Run the command **installAPMAgents.sh**.

```
Terminal
File Edit View Terminal Help
#####
lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 # ./installAPMAgents.sh
The following products are available for installation:
1) Monitoring Agent for Linux OS
2) Monitoring Agent for Ruby
3) Monitoring Agent for MongoDB
4) Monitoring Agent for MySQL
5) Monitoring Agent for PostgreSQL
6) Monitoring Agent for PHP
7) Monitoring Agent for Python
8) Monitoring Agent for Linux KVM
9) Monitoring Agent for Nodejs
10) Monitoring Agent for HTTP Server
11) Response Time Monitoring Agent
12) Monitoring Agent for Oracle Database
13) Monitoring Agent for WebLogic
14) Monitoring Agent for Tomcat
15) Monitoring Agent for VMware VI
16) Monitoring Agent for DB2
17) Monitoring Agent for WebSphere Applications 17
18) Monitoring Agent for JBoss
19) Monitoring Agent for WebSphere Infrastructure Manager
20) Monitoring Agent for DataPower
21) Monitoring Agent for Cisco UCS
22) all of the above

Type the numbers that correspond to the products that you want to install. Type "q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

Type your selections here (For example: 1,2): 17
```

38. Select **17** to install the Monitoring Agent for WebSphere Applications.

39. Press Enter to confirm your selection.

40. Press Enter to confirm the agent home of **/opt/ibm/apm/agent**.

41. Select 1 to accept the license agreement.

The screenshot shows a terminal window titled "Terminal". The user is prompted to select products to install, specifically listing options 17 through 22. The user types "17" and selects "Monitoring Agent for WebSphere Applications". The terminal then asks for confirmation ("Are your selections correct [1-Yes, 2-No; default is 1]?") and specifies the agent home directory ("Please specify the agent home (default: /opt/ibm/apm/agent)"). It then asks if the user accepts the license agreement ("Do you accept the license agreement(s) found in the directory /downloads/IMB13/agent/APM_Agent_Install_8.1.3/licenses?"). The user enters "1" to accept. Finally, it confirms the selection ("Monitoring Agent for WebSphere Applications will be installed.") and starts the installation ("Installing Monitoring Agent for WebSphere Applications").

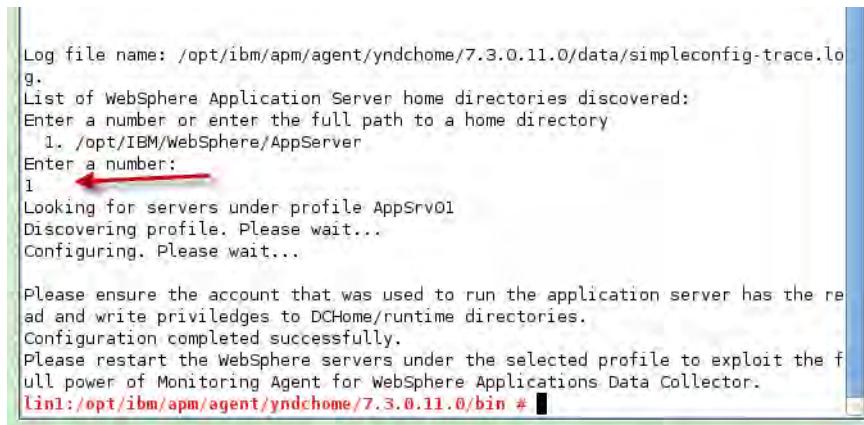
The agent installation takes approximately 5 minutes.

The Monitoring Agent for WebSphere Applications needs some manual configuration to collect the necessary data.

42. On the VM LIN1, open a new Gnome terminal window or continue by using an already opened terminal window.
43. Change directory to **/opt/ibm/apm/agent/ynndchome/7.3.0.11.0/bin/** and run the **./simpleconfig.sh** command.

The screenshot shows a terminal window titled "Terminal". The user changes the directory to "/opt/ibm/apm/agent/ynndchome/7.3.0.11.0/bin/" and runs the command "./simpleconfig.sh". A note at the bottom of the terminal window states: "Please note, if you have installed your Monitored WebSphere instance using non-root credentials, Ensure that this user has read and write access to files under dchome directory. For more information, see the Monitoring Agent for WebSphere Applications Installation Guide."

44. Enter **1** to select the default WebSphere Application Server home directory.



```
Log file name: /opt/ibm/apm/agent/yndchome/7.3.0.11.0/data/simpleconfig-trace.log.
List of WebSphere Application Server home directories discovered:
Enter a number or enter the full path to a home directory
  1. /opt/IBM/WebSphere/AppServer
Enter a number:
1
Looking for servers under profile AppSrv01
Discovering profile. Please wait...
Configuring. Please wait...

Please ensure the account that was used to run the application server has the read and write privileges to DCHome/runtime directories.
Configuration completed successfully.
Please restart the WebSphere servers under the selected profile to exploit the full power of Monitoring Agent for WebSphere Applications Data Collector.
lin1:/opt/ibm/apm/agent/yndchome/7.3.0.11.0/bin #
```

45. Wait for the configuration to complete.

46. Restart the WebSphere Application Server using the **Stop WebSphere** shortcut on the desktop and the **Start WebSphere** shortcut.

Installing the Monitoring Agent for DB2 on Linux

This exercise guides you through installing the Monitoring Agent for DB2 on the LIN1 VM.

47. On VM LIN1, open a Gnome terminal window, or continue by using the already opened terminal window.



48. Change to the directory **/downloads/IM813/agent/APM_Agent_Install_8.1.3**

49. Run the command **./installAPMAgents.sh**.

50. Select **16** to install the Monitoring Agent for DB2.

51. Press Enter to confirm your selection.

52. Press Enter to confirm the agent home of **/opt/ibm/apm/agent**.

53. Select **1** to accept the license agreement.

The agent installation takes approximately 5 minutes.

A screenshot of a terminal window titled 'Terminal'. The window shows the following output:

```
#####
The following agents were installed successfully into the /opt/ibm/apm/agent directory:
Monitoring Agent for DB2
Agent instance status:
No instances

The installation log file is /opt/ibm/apm/agent/logs/APMAgents_install.log.

For any agent that is not running, you must configure the agent before it can be started.

To configure your agents, use the following detailed instructions:

For Performance Management on Cloud:
http://ibm.biz/kc-ipmcloud-configagent

For Performance Management (on premises):
http://ibm.biz/kc-ipm-configagent

As part of the configuration instructions, you will use the following commands to configure and manage each installed agent:
Monitoring Agent for DB2                                         /opt/ibm/apm/agent/bin/db2-agent.sh config or start or stop or status or uninstall
#####
lin:/downloads/IM813/agent/APM_Agent_Install_8.1.3 #
```

Two red arrows point to the text 'Monitoring Agent for DB2' and 'lin:/downloads/IM813/agent/APM_Agent_Install_8.1.3 #'. The first arrow points to the line 'Monitoring Agent for DB2' in the middle of the output. The second arrow points to the prompt at the bottom of the window.

2 Installation exercises

Exercise 2 Installing agents on Linux

The Monitoring Agent for DB2 needs some manual configuration to collect the necessary data.

54. On LIN1, open a new Gnome terminal window or continue by using the already opened terminal window.

The user that runs the Monitoring Agent for DB2 must have sufficient authority with DB2. Because you installed the Monitoring Agent for DB2 agent as root, the agent will run under root. Verify that **root** is a member of the **db2iadm1** group.

55. Run the following command and confirm that root is listed.

```
getent group db2iadm1
```

```
Terminal
File Edit View Terminal Help
lin1:/ # getent group db2iadm1
db2iadm1:!:114:root
lin1:/ #
```

56. Change to the **/usr/local/bin** directory. Display the contents of the **db2script.sh** script using the **cat** command. These commands set the permissions so that the agent can collect the necessary data. Run the **./db2script.sh** command.

```
Terminal
File Edit View Terminal Help
lin1:/ # cd /usr/local/bin
lin1:/usr/local/bin # cat db2script.sh
#!/bin/bash
set +e
db2 " connect to tradedb user db2inst1 using object00
db2 " GRANT SELECT ON SYSIBADM.LOG_UTILIZATION TO USER db2inst1
      "
db2 " GRANT SELECT ON SYSIBADM.SNAPDB TO USER db2inst1
      "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.SNAP_GET_APPL(VARCHAR(),INTEGER) TO USER db2inst1
      "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.SNAPSHOT_TBS_CFG(VARCHAR(255),INTEGER) TO USER db2inst1
      "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.ENV_GET_DB2_SYSTEM_RESOURCES(INTEGER) TO USER db2inst1
      "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.ENV_GET_SYSTEM_RESOURCES() TO USER db2inst1
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.ADMIN_GET_DBP_MEM_USAGE() TO USER db2inst1
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.ADMIN_GET_DBP_MEM_USAGE() TO USER db2inst1
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_BUFFERPOOL(VARCHAR(),INTEGER) TO USER db2inst1
      "
db2 " GRANT SELECT ON SYSIBADM.MON_BP_UTILIZATION TO USER db2inst1
      "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_BUFFERPOOL(VARCHAR(),INTEGER) TO USER db2inst1
      "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_PKG_CACHE_STMT(CHAR(),VARCHAR(),CLOB(),INTEGER) TO USER db2inst1 "
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_PKG_CACHE_STMT(CHAR(),VARCHAR(),CLOB(),INTEGER) TO USER db2inst1"
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_PKG_CACHE_STMT(CHAR(),VARCHAR(),CLOB(),INTEGER) TO USER db2inst1"
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_PKG_CACHE_STMT(CHAR(),VARCHAR(),CLOB(),INTEGER) TO USER db2inst1"
db2 " GRANT EXECUTE ON FUNCTION SYSPROC.MON_GET_PKG_CACHE_STMT(CHAR(),VARCHAR(),CLOB(),INTEGER) TO USER db2inst1"
```

57. Change to the **/opt/ibm/apm/agent/samples** directory, and list the contents.

58. Make a backup copy of the sample configuration file, **DB2_silent_config.txt**.

```
cp DB2_silent_config.txt DB2_silent_config.orig
```

59. Open the file DB2_silent_config.txt using gedit.

```
gedit DB2_silent_config.txt
```

60. Update two entries to the DB2 PARAMETERS:

```
KUD_DB2_SQL_PATH=/opt/ibm/apm/agent/config/kudcussql.properties  
KUD_DIAGLOG_PATH=/home/db2inst1/sqllib/db2dump
```

```
#####
# PRIMARY CONFIGURATION #####
CMSCONNECT=NO

#####
# DB2 PARAMETERS #####
# The absolute path and file name for DB2 customized SQL definition file
KUD_DB2_SQL_PATH=/opt/ibm/apm/agent/config/kudcussql.properties

# The directory of the DB2 diagnostics log file. It includes path only
KUD_DIAGLOG_PATH=/home/db2inst1/sqllib/db2dump

# Use the MSGID to filter the Diagnostic log. The MSGID filter requires the regular expression
KUD_DIAGLOG_MSGID_FILTER=

# A Yes or No preference as to whether DB2 agent should monitor partitions in remote hosts
KUD_MONITOR_REMOTE_PARTITIONS=Yes

# A Yes or No preference as to whether DB2 agent should monitor all databases
KUD_MONITOR_ALL_DATABASES=Yes
```



Note: The statements are already in the **DB2_silent_config.txt** file. You need to update them providing the values as indicated.

61. Save the **DB2_silent_config.txt** file and close gedit.

62. In a Gnome terminal window, run the commands:

```
cd /opt/ibm/apm/agent/bin/  
. ./db2-agent.sh config db2inst1 /opt/ibm/apm/agent/samples/DB2_silent_config.txt
```

```
lin1:/opt/ibm/apm/agent/config # cd ..  
lin1:/opt/ibm/apm/agent # cd bin  
lin1:/opt/ibm/apm/agent/bin # . ./db2-agent.sh config db2inst1 /opt/ibm/apm/agent/  
samples/DB2_silent_config.txt  
Configuring Monitoring Agent for DB2  
Configuration completed successfully.  
Automatic start at system initialization has been configured.  
Automatic stop at system shutdown has been configured.  
lin1:/opt/ibm/apm/agent/bin #
```



Hint: The instance name is **db2inst1** with the final character being the digit one (1) and not the lower case letter L (l).

63. Start the Monitoring Agent for DB2:

```
./db2-agent.sh start db2inst1
```

```
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh start db2inst1
Sourcing db2profile for user db2inst1
Processing. Please wait...
Starting the Monitoring Agent for DB2...
Monitoring Agent for DB2 started
lin1:/opt/ibm/apm/agent/bin #
```

Installing the Response Time Monitoring Agent on Linux

This exercise guides you through installing the Response Time Agent on the LIN1 Linux based VM.

64. On VM LIN1, open a Gnome terminal window, or continue by using the already opened terminal window.
65. Change to the directory `/downloads/IM813/agent/APM_Agent_Install_8.1.3`.
66. Run the command `./installAPMAgents.sh`.
67. Select **11** to install the **Response Time Monitoring Agent**.

```
Terminal
File Edit View Terminal Help
#####
lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 # ./installAPMAgents.sh

The following products are available for installation:
1) Monitoring Agent for Linux os
2) Monitoring Agent for Ruby
3) Monitoring Agent for MongoDB
4) Monitoring Agent for MySQL
5) Monitoring Agent for PostgreSQL
6) Monitoring Agent for PHP
7) Monitoring Agent for Python
8) Monitoring Agent for Linux KVM
9) Monitoring Agent for Nodejs
10) Monitoring Agent for HTTP Server
11) Response Time Monitoring Agent
12) Monitoring Agent for Oracle Database
13) Monitoring Agent for WebLogic
14) Monitoring Agent for Tomcat
15) Monitoring Agent for VMware VI
16) Monitoring Agent for DB2
17) Monitoring Agent for WebSphere Applications
18) Monitoring Agent for JBoss
19) Monitoring Agent for WebSphere Infrastructure Manager
20) Monitoring Agent for DataPower
21) Monitoring Agent for Cisco UCS
22) all of the above

Type the numbers that correspond to the products that you want to install. Type
"q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

Type your selections here (For example: 1,2): 11
```

68. Press Enter to confirm your selection.
69. Press Enter to confirm the agent home of `/opt/ibm/apm/agent`.
70. Select **1** to accept the license agreement.

The agent installation takes approximately 5 minutes.

2 Installation exercises

Exercise 2 Installing agents on Linux

These messages indicate a successful installation:

The following agents were installed successfully into the /opt/ibm/apm/agent directory:

Response Time Monitoring Agent

Agent status:
Agent is running. Process ID is 4153
Server connection status: Connecting
For more information, see the following file: /opt/ibm/apm/agent/logs/t5_ServerConnectionStatus.txt

The installation log file is /opt/ibm/apm/agent/logs/APMAgents_install.log.

For any agent that is running, the agent is configured with the default settings.

To configure your agents, use the following detailed instructions:

For Performance Management on Cloud:
<http://ibm.biz/kc-ipmcloud-configagent>

For Performance Management (on premises):
<http://ibm.biz/kc-ipm-configagent>

As part of the configuration instructions, you will use the following commands to configure and manage each installed agent:
Response Time Monitoring Agent /opt/ibm/apm/agent/bin/rt-agent.sh start or stop or status or uninstall

```
#####
#####lin1:/downloads/IM813/agent/APM_Agent_Install_8.1.3 #
```



3 Administering and using IBM Performance Management exercises

In these exercises, you validate the installation of the Performance Management Server and the Monitoring agents. You create applications that are composed of the data from the monitoring agents. You create new users and assign capabilities to those users. You also explore the Attribute details of various agents and save customized charts with other users.

Exercise 1 Driving HTTP transactions with Firefox

With IBM HTTP Server Response Time plug-in, top 10 resource timings are collected by default if your browser has JavaScript enabled.

1. Open a Firefox Browser on LIN1 VM by double-clicking the Firefox icon on the desktop.



2. Observe that the Firefox browser opens to the URL:

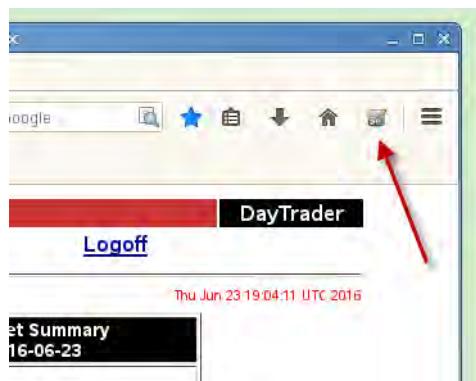
<http://lin1.ibm.edu/daytrader/scenario>

The DayTrader scenario is a sample application that steps through a scenario of logging in to a stock trading application, making a sale, and then updating the portfolio.

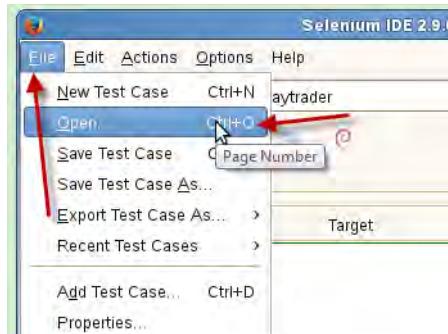
symbol	price	change
s:100	62.19	-26.81
s:101	64.55	-32.45
s:102	97.45	-17.55
s:103	165.73	11.73
s:104	199.14	48.14

symbol	price	change
s:199	154.03	-42.87
s:198	10.41	3.41
s:197	94.68	17.68
s:196	115.24	-48.76
s:195	114.57	-26.33

3. Click the Selenium IDE button in the upper right of the browser.



4. Click File > Open.



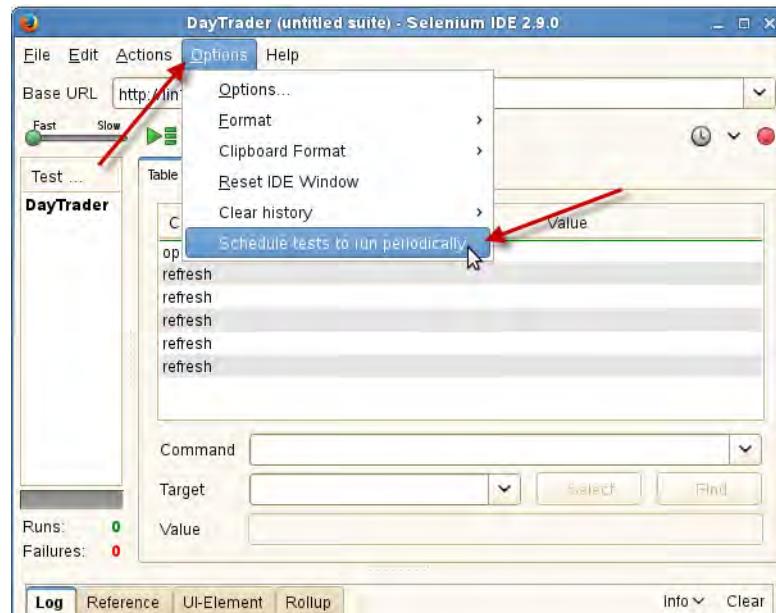
5. Click DayTrader.



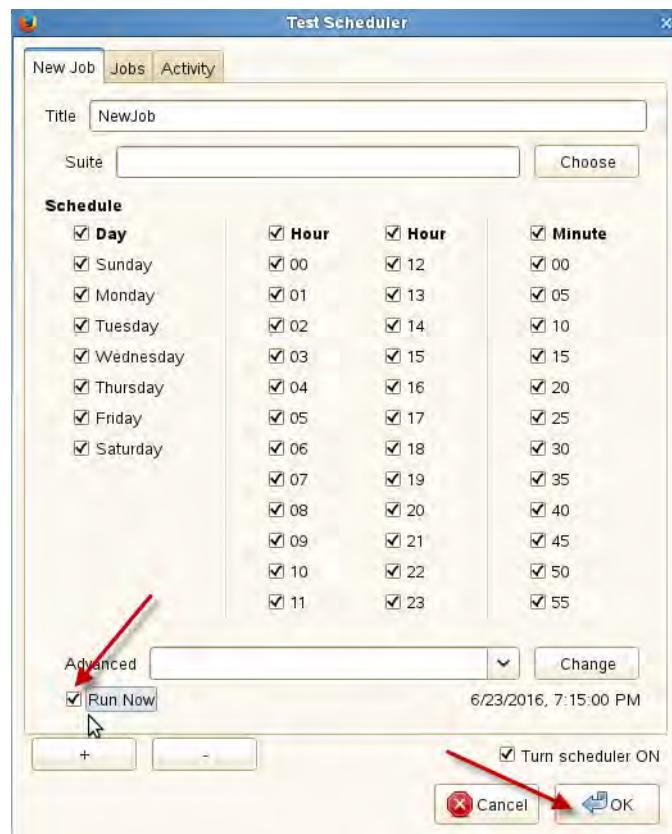
6. Click Open.



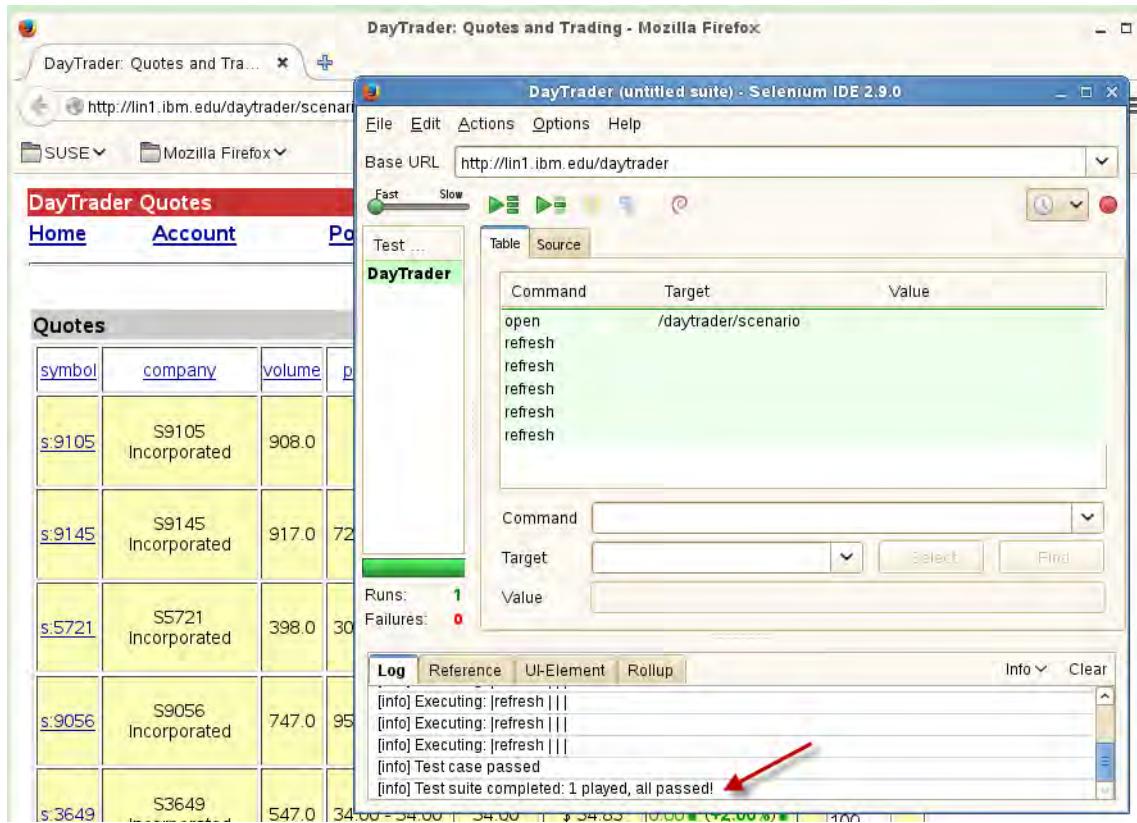
7. Click Options > Schedule tests to run periodically.



8. Accept the default timings and click Run Now. Click OK.



9. Observe the Daytrader scenario web page refresh. This will repeat every 5 minutes until you stop the Selenium tool from running.



These steps create multiple transactions for the Response Time agent to collect, as you see in future exercises.

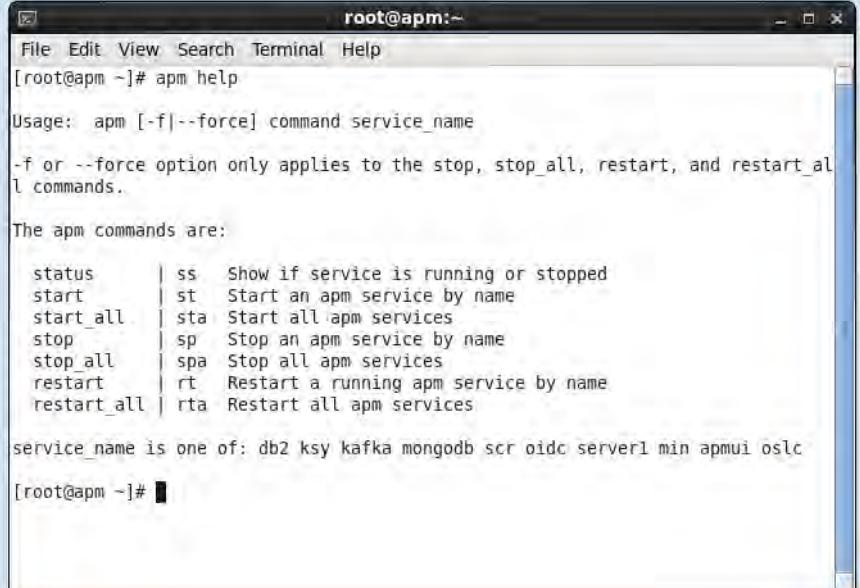
Exercise 2 Managing the Performance Management Server

The Performance Management server is normally started automatically after it is installed. You can manage the Performance Management server by using the **apm** command.

1. From the APM VM, open a terminal window.
2. From the terminal window, run this command:

```
apm help
```

Examine the various commands that can be run against the service names.



```
root@apm:~#
[root@apm ~]# apm help
Usage: apm [-f|--force] command service_name
-f or --force option only applies to the stop, stop_all, restart, and restart_all commands.

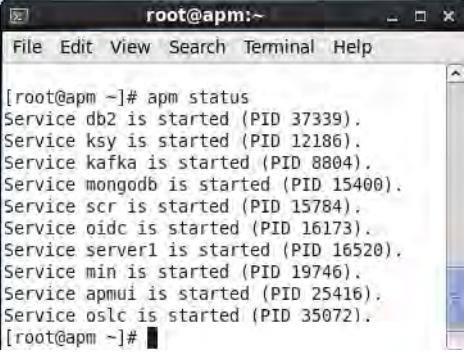
The apm commands are:

status      | ss  Show if service is running or stopped
start       | st  Start an apm service by name
start_all   | sta Start all apm services
stop        | sp  Stop an apm service by name
stop_all    | spa Stop all apm services
restart     | rt  Restart a running apm service by name
restart_all | rta Restart all apm services

service_name is one of: db2 ksy kafka mongodb scr oidc server1 min apmui oslc
[root@apm ~]#
```

- To examine whether services are started or not, run this command:

`apm status`

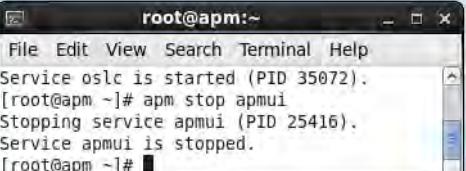


```
root@apm:~#
[root@apm ~]# apm status
Service db2 is started (PID 37339).
Service ksy is started (PID 12186).
Service kafka is started (PID 8804).
Service mongodb is started (PID 15400).
Service scr is started (PID 15784).
Service oidc is started (PID 16173).
Service server1 is started (PID 16520).
Service min is started (PID 19746).
Service apmui is started (PID 25416).
Service oslc is started (PID 35072).
[root@apm ~]#
```

The Performance Management console connects to the apmui service. You can log in to the console if this service is started.

- Stop the service with this command:

`apm stop apmui`



```
root@apm:~#
[root@apm ~]# apm stop apmui
Stopping service apmui (PID 25416).
Service apmui is stopped.
[root@apm ~]#
```

- When the apmui service is stopped, open a Firefox browser by clicking the Firefox icon from the toolbar.



- Open the browser to this URL:

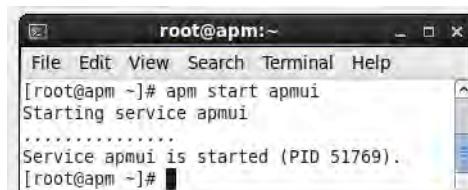
<https://apm.ibm.edu:9443>

Because the **apmui** service is stopped, you see this message and cannot connect to the server. Leave this window open.



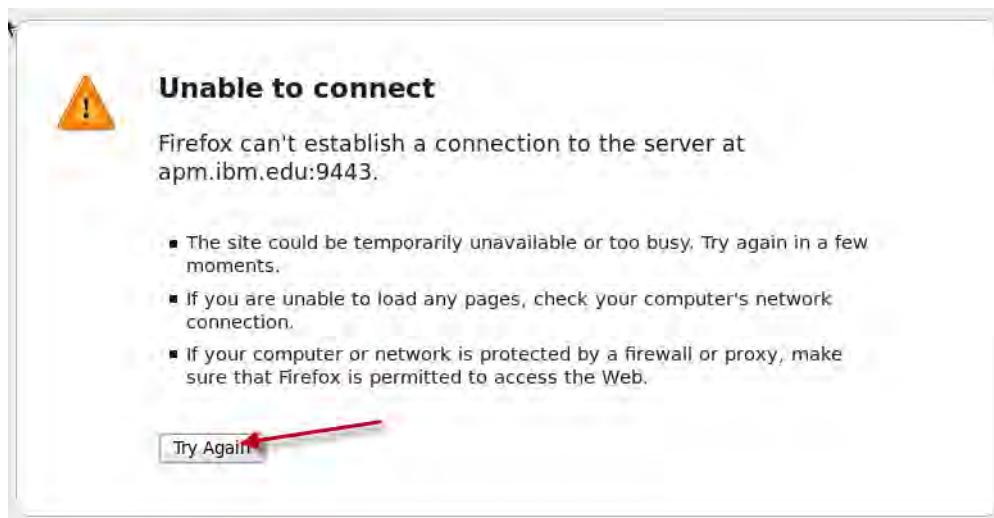
- From the Terminal window, start the apmui service.

`apm start apmui`



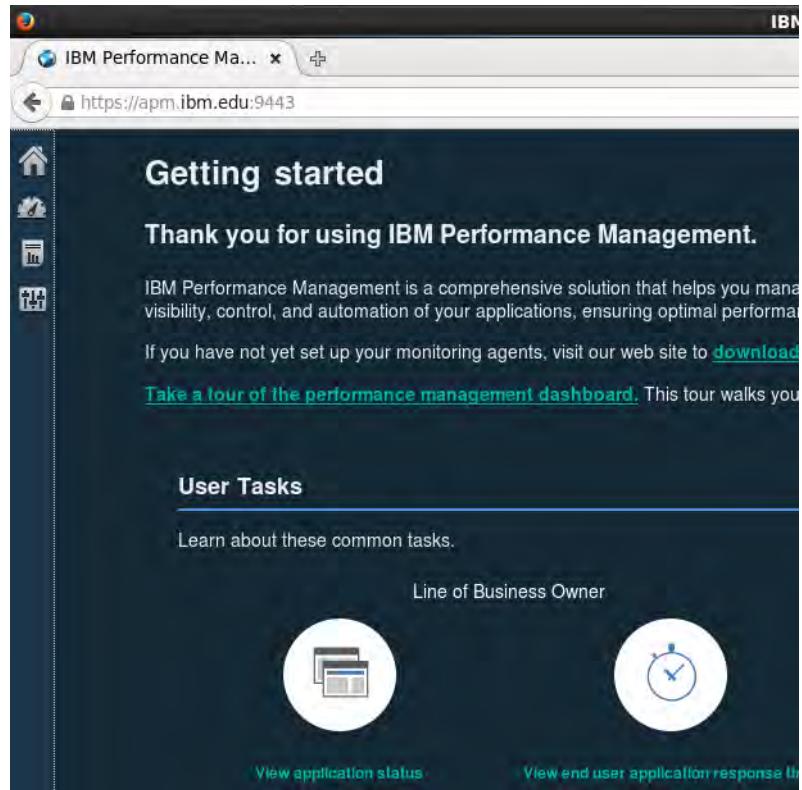
```
root@apm:~ File Edit View Search Terminal Help [root@apm ~]# apm start apmui Starting service apmui ..... Service apmui is started (PID 51769). [root@apm ~]#
```

- From the Firefox window where you were unable to connect before, click the **Try Again** button.

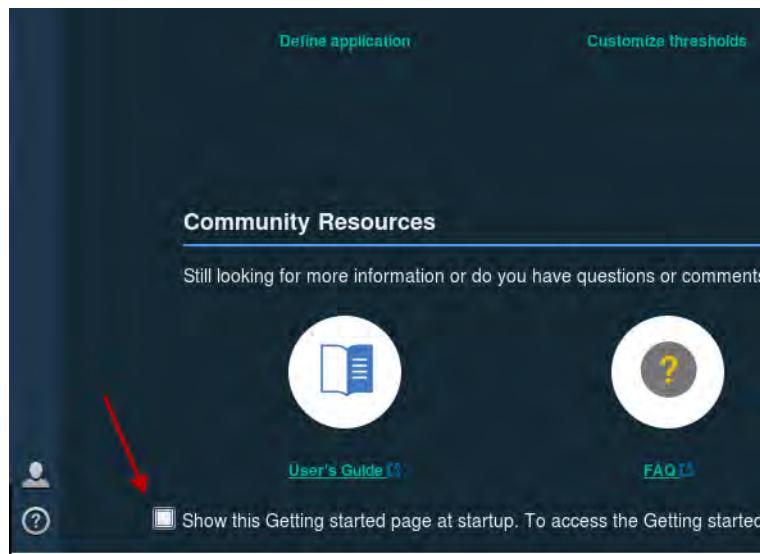


- At the login prompt, enter the user name **apmadmin** and the password **object00**. Click **Log In**.

When the **apm** console opens, a **Getting started** window opens.

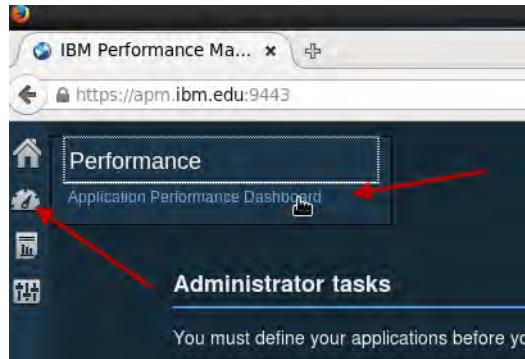


10. Scroll to the bottom of the screen where you see this option:



11. Clear the **Show this Getting started page** check box.

12. Place the cursor over the Performance icon, which looks like a gauge. Click **Application Performance Dashboard**.



This action opens the Application Dashboard.

13. Minimize the Firefox window. You use it in future exercises.

Exercise 3 Managing agents

In this exercise, you issue commands that manage agents, and verify the results of the commands that you issue.

1. On the LIN1 VM, run these commands to stop the Monitoring Agent for Linux OS:

```
cd /opt/ibm/apm/agent/bin
./os-agent.sh stop
```

```
File Edit View Terminal Help
lin1:~ # cd /opt/ibm/apm/agent/bin/
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh stop
Processing. Please wait...
Stopping Monitoring Agent for Linux OS ...
Monitoring Agent for Linux OS was stopped gracefully.
lin1:/opt/ibm/apm/agent/bin #
```

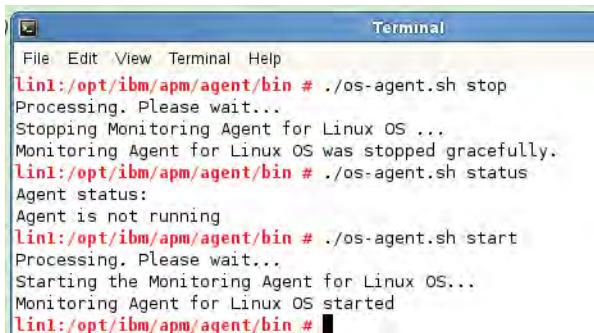
2. Check the status of the Monitoring Agent for Linux OS with this command:

```
./os-agent.sh status
```

```
File Edit View Terminal Help
lin1:~ # cd /opt/ibm/apm/agent/bin/
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh stop
Processing. Please wait...
Stopping Monitoring Agent for Linux OS ...
Monitoring Agent for Linux OS was stopped gracefully.
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh status
Agent status:
Agent is not running
lin1:/opt/ibm/apm/agent/bin #
```

3. Restart the Monitoring Agent for Linux OS with this command:

```
./os-agent.sh start
```



A terminal window titled "Terminal" showing the execution of the command `./os-agent.sh start`. The output indicates the agent is not running, it processes, stops the monitoring agent, and then starts it again, successfully. The terminal prompt is `lin1:/opt/ibm/apm/agent/bin #`.

```
File Edit View Terminal Help
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh stop
Processing. Please wait...
Stopping Monitoring Agent for Linux OS ...
Monitoring Agent for Linux OS was stopped gracefully.
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh status
Agent status:
Agent is not running
lin1:/opt/ibm/apm/agent/bin # ./os-agent.sh start
Processing. Please wait...
Starting the Monitoring Agent for Linux OS...
Monitoring Agent for Linux OS started
lin1:/opt/ibm/apm/agent/bin #
```

Some agents have multiple instances. These agents require you to provide the instance name that you want to manage.

4. Run this command to observe the status of the Monitoring Agent for DB2 db2inst1 instance.

```
./db2-agent.sh status db2inst1
```



A terminal window titled "Terminal" showing the execution of the command `./db2-agent.sh status db2inst1`. The output shows the agent instance status as running with PID 22167, and the server connection status as connected. A file path for more information is provided. The terminal prompt is `lin1:/opt/ibm/apm/agent/bin #`.

```
File Edit View Terminal Help
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh status db2inst1
Agent instance status:
db2inst1 is running, PID 22167
Server connection status: Connected
For more information, see the following file: /opt/ibm/apm/agent/logs/ud_db2inst1_ServerConnectionStatus.txt
lin1:/opt/ibm/apm/agent/bin #
```

5. Stop the Monitoring Agent for DB2 db2inst1 instance.

```
./db2-agent.sh stop db2inst1
```

6. Run the status command for the Monitoring Agent for DB2 db2inst1 instance.

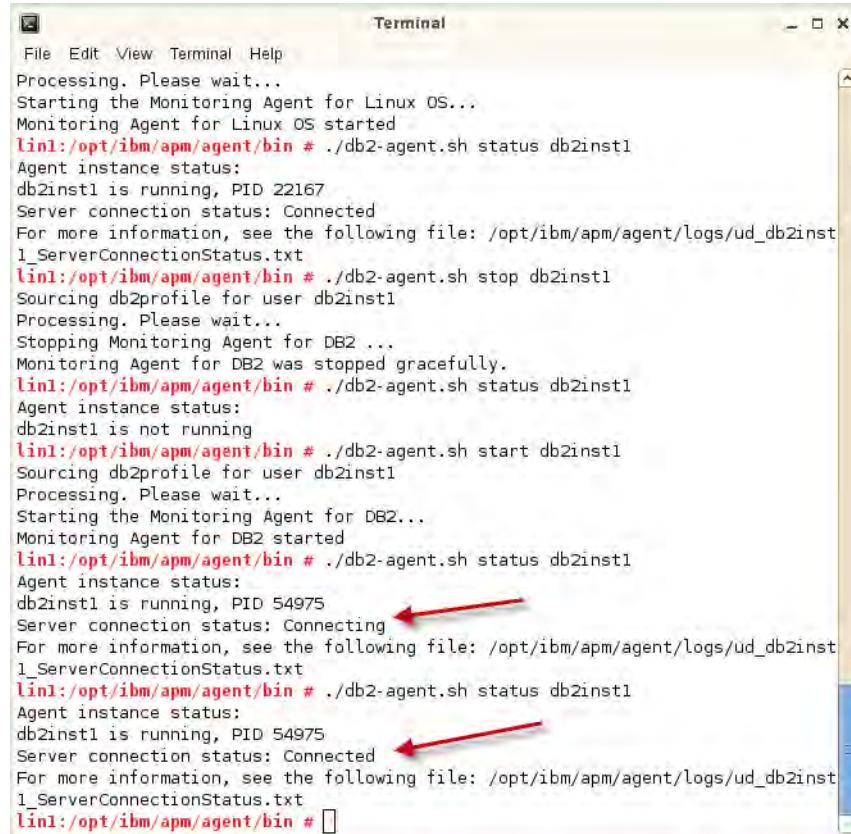
```
./db2-agent.sh status db2inst1
```

7. Restart the Monitoring Agent for DB2 db2inst1 instance.

```
./db2-agent.sh start db2inst1
```

8. Run the status command for the Monitoring Agent for DB2 db2inst1 instance.

```
./db2-agent.sh status db2inst1
```



The terminal window shows the following sequence of commands and their output:

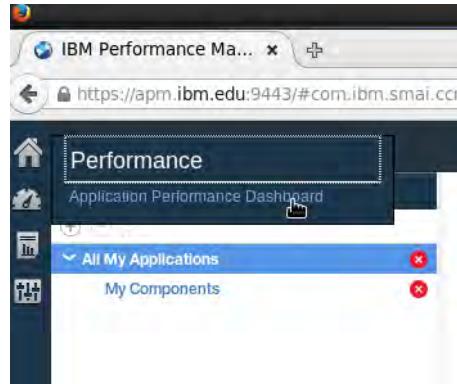
```
Processing. Please wait...
Starting the Monitoring Agent for Linux OS...
Monitoring Agent for Linux OS started
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh status db2inst1
Agent instance status:
db2inst1 is running, PID 22167
Server connection status: Connected
For more information, see the following file: /opt/ibm/apm/agent/logs/ud_db2inst1_ServerConnectionStatus.txt
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh stop db2inst1
Sourcing db2profile for user db2inst1
Processing. Please wait...
Stopping Monitoring Agent for DB2 ...
Monitoring Agent for DB2 was stopped gracefully.
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh status db2inst1
Agent instance status:
db2inst1 is not running
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh start db2inst1
Sourcing db2profile for user db2inst1
Processing. Please wait...
Starting the Monitoring Agent for DB2...
Monitoring Agent for DB2 started
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh status db2inst1
Agent instance status:
db2inst1 is running, PID 54975
Server connection status: Connecting ←
For more information, see the following file: /opt/ibm/apm/agent/logs/ud_db2inst1_ServerConnectionStatus.txt
lin1:/opt/ibm/apm/agent/bin # ./db2-agent.sh status db2inst1
Agent instance status:
db2inst1 is running, PID 54975
Server connection status: Connected ←
For more information, see the following file: /opt/ibm/apm/agent/logs/ud_db2inst1_ServerConnectionStatus.txt
lin1:/opt/ibm/apm/agent/bin #
```

Two red arrows point to the "Connecting" and "Connected" status lines in the terminal output, highlighting the connection status of the monitoring agent.

Exercise 4 Creating your first application

Before you can open the Application Performance Dashboards for viewing Key Performance Indicators from your managed systems, you organize your managed resources into applications. Use the tools in the navigator Applications toolbar to add or edit applications and their supporting software resources, or to remove an application. When you add an application, you can create a new application and apply the managed resources that are available, or you can select one from any discovered applications. In this exercise, you will add a Monitoring Agent for Linux OS to an application.

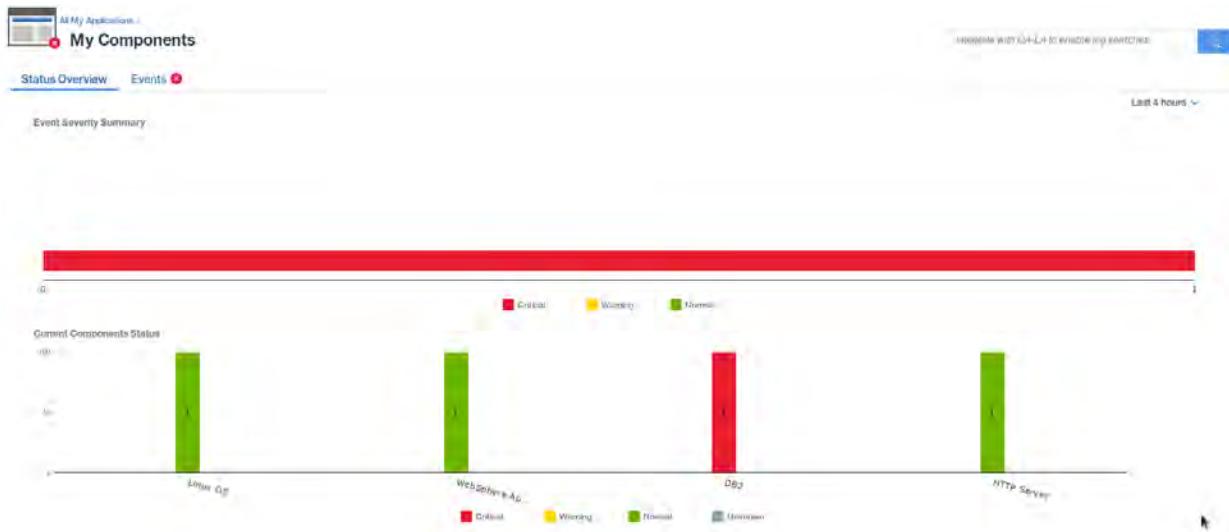
1. On the APM VM, log in to the Performance Management Console if you are not already logged in with a user ID of **apmadmin** and a password of **object00**.
After logging in to the Performance Management console.
2. Click **Performance > Application Performance Dashboard**.



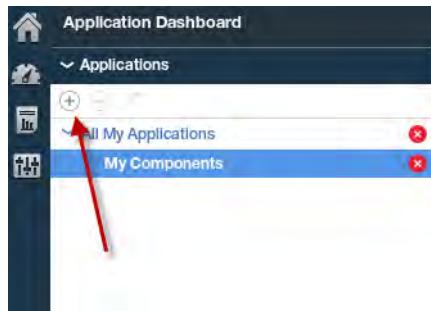
Observe that only the product provided My Components appears under All My Applications and that currently you have no applications that are defined.

The screenshot shows the 'Application Dashboard' interface. In the 'Applications' section, 'All My Applications' is expanded, showing one item: 'My Components'. A red 'X' icon next to the entry indicates a critical issue. Below this, there are summary counts for different status levels: 1 Critical, 0 Warnings, 0 Errors, and 0 Unknown. The 'Groups' and 'Instances' sections are also visible.

- Click **My Components** to see the agents that are connected to the Performance Management Server from the prior exercises.



4. To add an application, click the plus sign (+).



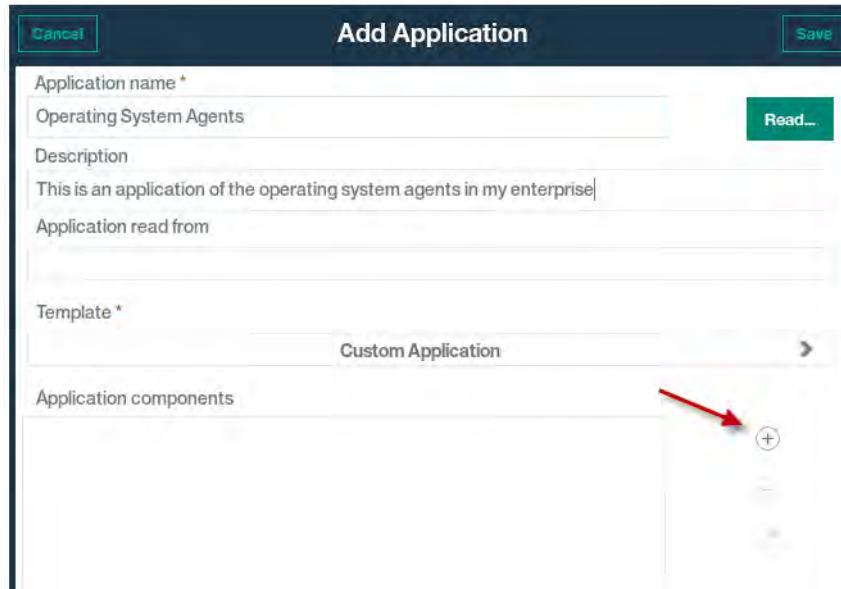
The Add Application window opens.

A screenshot of the 'Add Application' dialog box. The title bar says 'Add Application' with 'Cancel' and 'Save' buttons. The form fields include:

- 'Application name *': A text input field with placeholder 'Enter a unique name' and a green 'Read...' button.
- 'Description': A text input field.
- 'Application read from': A text input field.
- 'Template *': A dropdown menu set to 'Custom Application'.
- 'Application components': A large text area with a '+' icon on its right side.

5. Enter an application name of **Operating System Agents**. Enter a description of **This is an application of the operating system agents in my enterprise**.

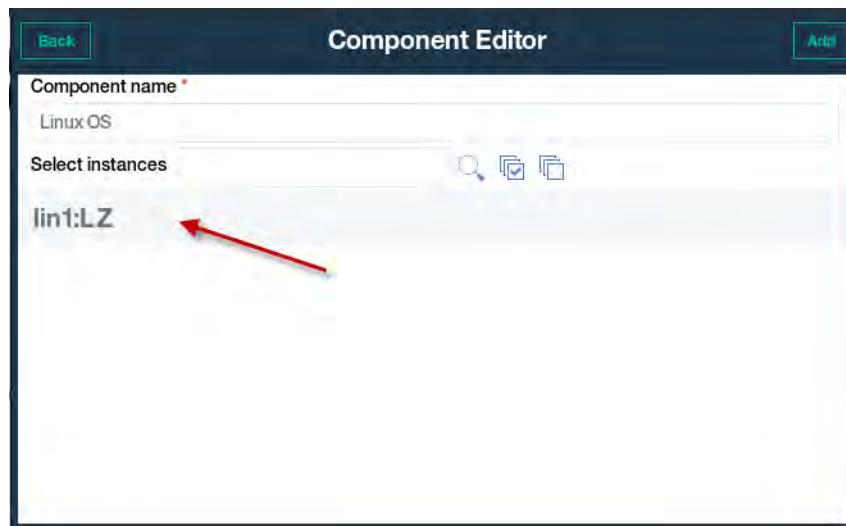
6. Click the plus sign (+) to add an application component:



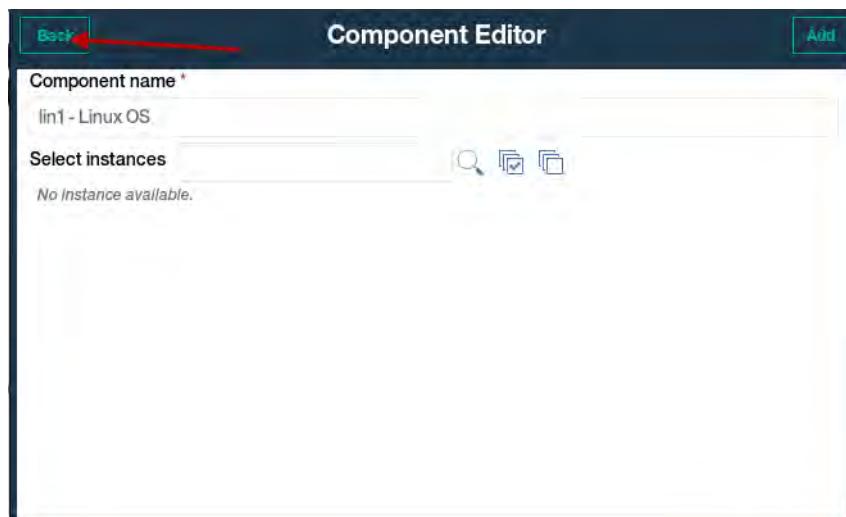
7. Scroll down and click **Linux OS**.



8. Click the **lin1:LZ** instance, and click **Add**.



9. Click **Back**.

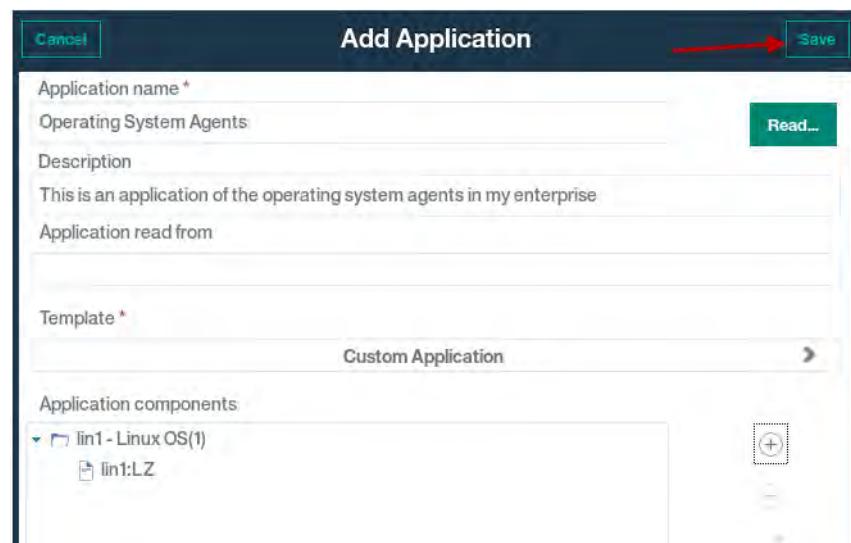


Note: You add more OS agents later in the course. At this point, the only OS agent that exists is the one installed on LIN1

10. Click **Close**.



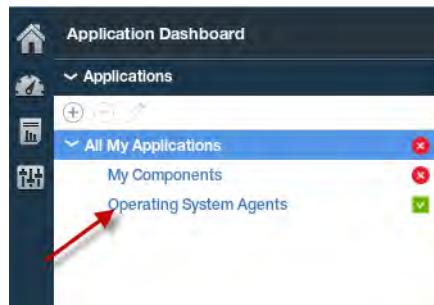
11. Click **Save** after you confirm that the application matches the screen capture:



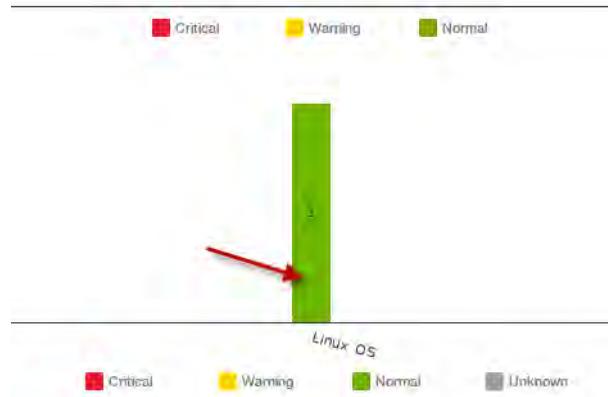
12. Click **OK**.



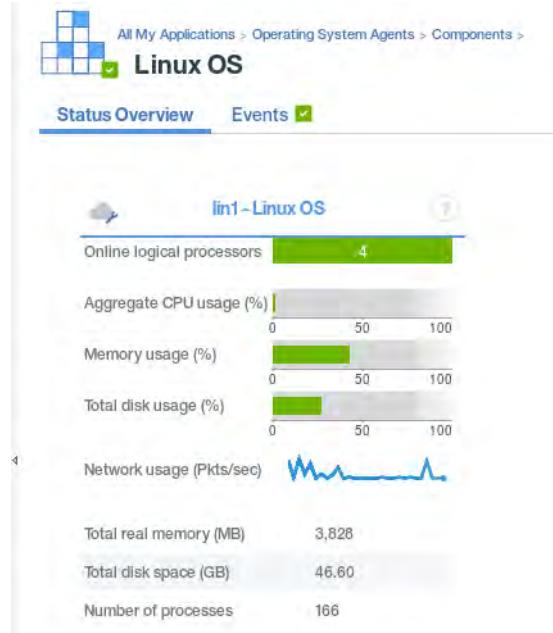
13. Click the **Operating System Agents** application:



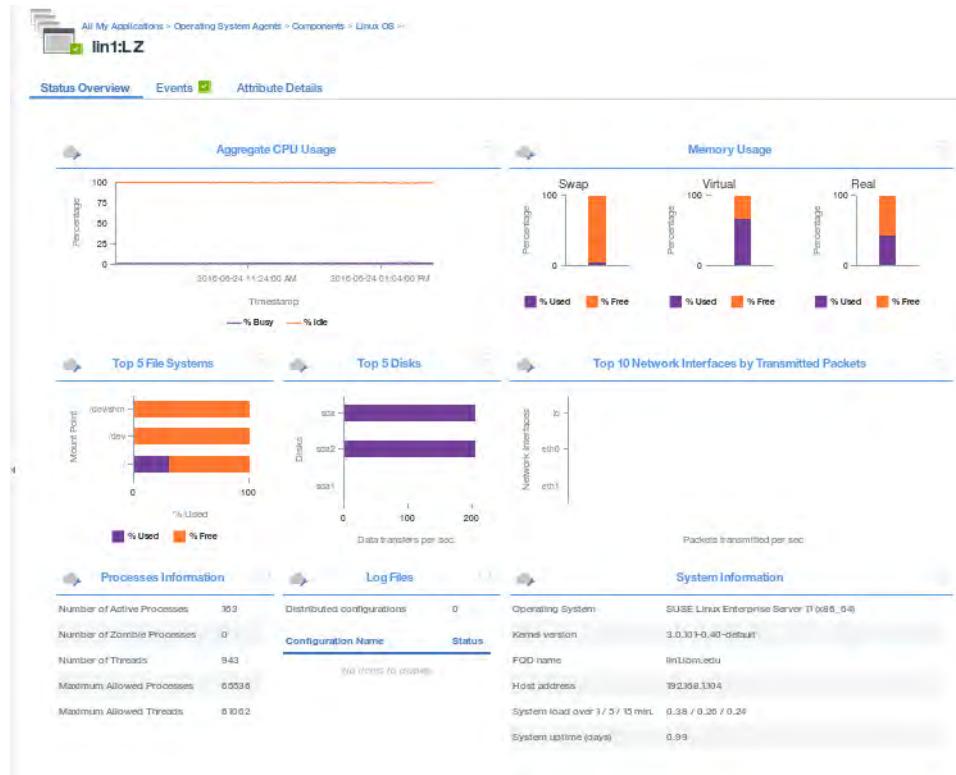
14. Click the **Linux OS** bar to explore the data that is collected by the Monitoring Agent for Linux OS.



15. Review the data in the status overview widget for this agent.



16. Click the Linux OS Status widget and explore the data that is presented.



17. Answer these questions about the data that is collected by the Monitoring Agent for Linux OS:



Hint: You can click the widgets to see the detailed data.

- What is the percentage of Idle CPU? _____
- What is the percentage of SWAP memory in use? _____
- What is the peak paging rate for the operating system over the last 4 hours? _____
- What is the percentage of disk used on the / file system? _____
- What is the size of the / file system? _____
- What is the current number of processes that are running? _____
- What is the process that is using the most CPU? _____
- What is the IP address of the host where the agent is running? _____
- What is the peak aggregate network interface I/O rate over the last 4 hours? _____

Exercise 5 Creating your second application

Your second application contains the five agents that you installed on the LIN1 VM. This application provides a comprehensive view of the health of the host, and the software that is running on it.

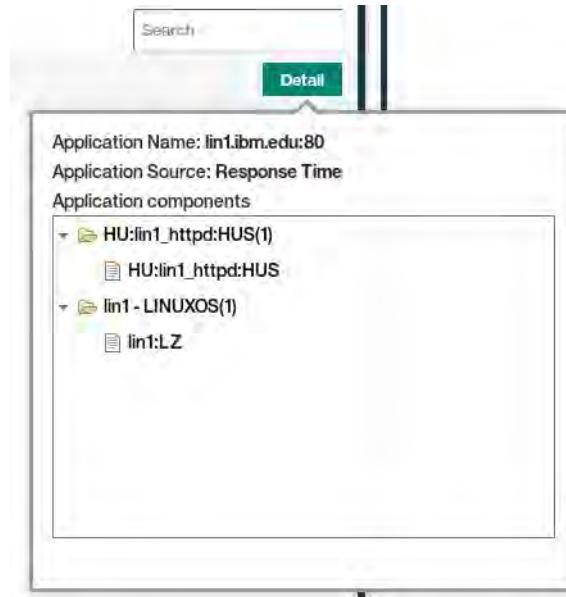
1. To add an application, click the plus sign (+) on the Application Dashboard.
2. Click **Read**.

The screenshot shows the 'Add Application' dialog box. It has fields for 'Application name' (with placeholder 'Enter a unique name'), 'Description', 'Application read from', 'Template' (set to 'Custom Application'), and 'Application components'. A red arrow points to the green 'Read...' button at the top right of the dialog.

3. Click **Detail** to the right of **lin1.ibm.edu:80**:

The screenshot shows the 'Read Application' dialog box. It lists 'lin1.ibm.edu:80' under 'Application Source: Response Time'. A red arrow points to the green 'Detail' button at the bottom right of the dialog.

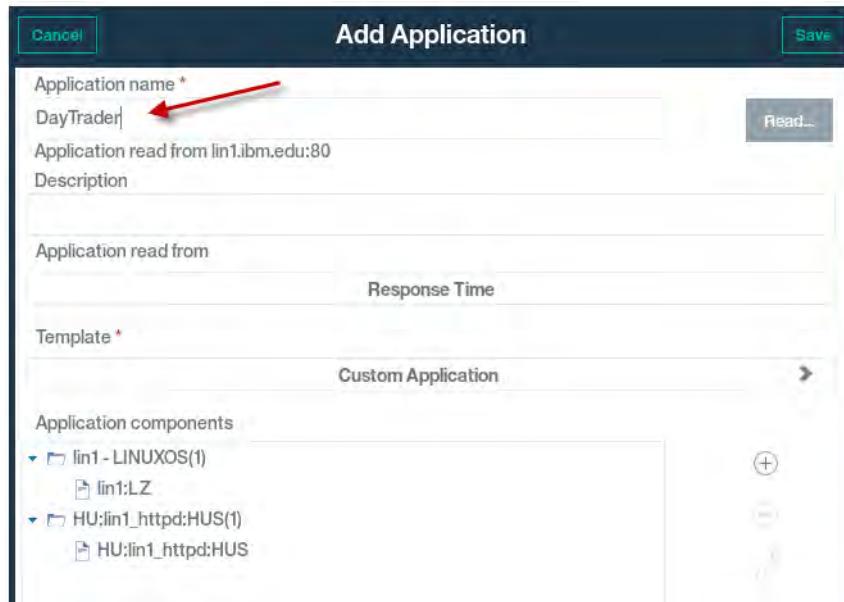
4. Observe the discovered components, the Monitoring Agent for HTTP Server and the Monitoring Agent for Linux OS.



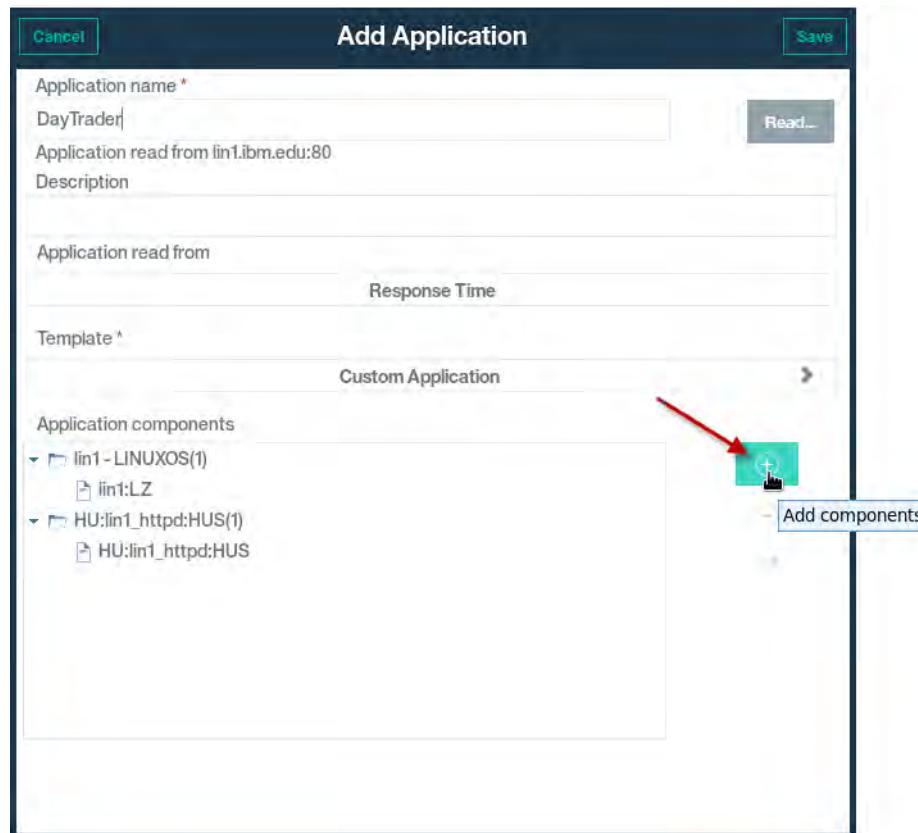
5. Click the radio button to the left of **lin1.ibm.edu:80**.



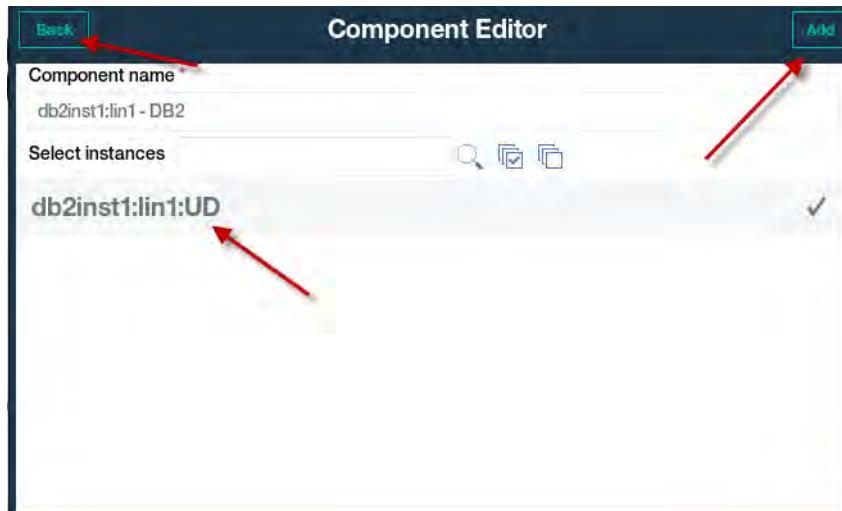
6. Change the application name to **DayTrader**. DayTrader is the name of the sample application that is running on the WebSphere Application Server on the LIN1 server.



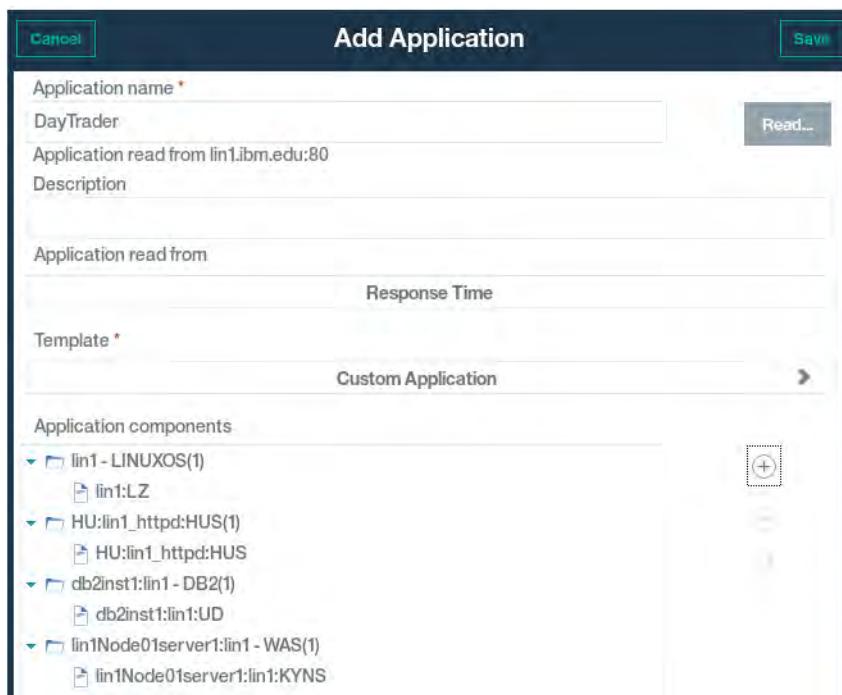
7. Click the plus sign to add a component.



8. Select DB2 from the list, the DB2 instance **db2inst1:lin1:UD**. Click **Add**. Click **Back**.

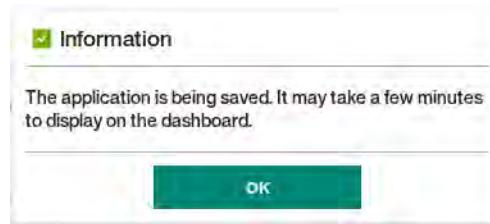


9. In a similar manner, add the WebSphere Application Server instance **lin1Node01server1:lin1:KYNS**.
10. Select **Close**. Confirm that your environment matches this screen capture:

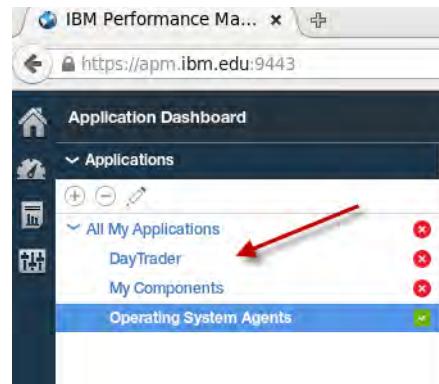


11. Click **Save**.

12. Click **OK**.



13. Click the **DayTrader** application.



The data should look similar to this screen capture:



14. Answer these questions about the data:

- What is the name of the busiest thread pool in the WebSphere Application Server?

- What is the average lock time used in the database TRADEDDB?_____

- What is the highest number of requests received by the Daytrader application in the last 4 hours?_____

- What is the peak request rate per minute in the last hour on the HTTP server in the hour?

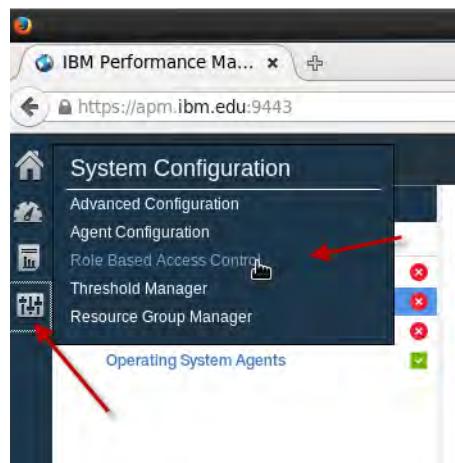
Exercise 6 Managing user permissions in the Performance Management console

Security in Performance Management is based on roles. A role is a group of permissions that control the actions you can perform in Performance Management. You can create customized roles in Performance Management. You can assign users and user groups to existing default roles or to customized roles. You can assign permissions to customized roles, or you can assign more permissions to existing default roles. You can assign users and user groups to multiple roles. Permissions are cumulative. That is, a user or user group is assigned all the permissions for all their roles.

Performance Management uses the WebSphere Application Server Liberty profile basic registry as the default method for user authentication. Alternatively, you can use an LDAP registry for user authentication.

This exercise guides you through updating the WebSphere Application Server Liberty profile basic registry to add users and groups, and assign roles and permissions to various users.

1. Log in to the Performance Management Console if you are not already logged in with a user ID of **apmadmin** and a password of **object00**.
2. On the Firefox Browser on the APM virtual machine. Click **System Configuration > Role Based Access Control**.



3. Click the **Roles** tab, and observe the four default roles. Review the descriptions.

The screenshot shows a web browser window for the IBM Performance Management console at the URL https://apm.ibm.edu:9443/#com.ibm.smai.rbac.ui_rbac. The title bar says "IBM Performance Ma...". The main content area has a header "Home > Role Based Access Control" and "Role Based Access Control Manage user access using roles.". Below this, there are three tabs: "Roles" (which is selected and highlighted in blue), "User Groups", and "Individual Users". The main content area under "Roles" is titled "Role" and lists four options: "Monitoring Administrator", "Monitoring User", "Role Administrator", and "System Administrator", each preceded by a radio button.

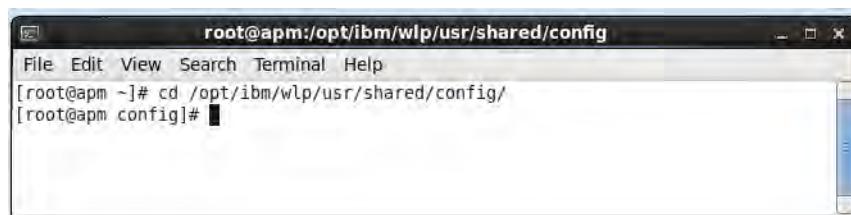
4. Click the **User Groups** tab, and observe there are no user groups defined.

The screenshot shows the same web browser window as the previous one, but now the "User Groups" tab is selected (highlighted in blue). The main content area is titled "User Groups" and displays a blank page with no visible content or tables.

5. Click the **Individual Users** tab, and observe a single user, **apmadmin**.

The screenshot shows a web browser window titled "IBM Performance Ma...". The URL is https://apm.ibm.edu:9443/#/com.ibm.smai.rbac.ui_rbac. The page displays the "Role Based Access Control" section with a sub-header "Manage user access using roles.". There are three tabs at the top: "Roles", "User Groups", and "Individual Users", with "Individual Users" being the active tab. Below the tabs, there is a heading "User" and a list containing a single item: "apmadmin".

6. Open a terminal window on the APM virtual machine.
7. Change to the /opt/ibm/wlp/usr/shared/config folder.



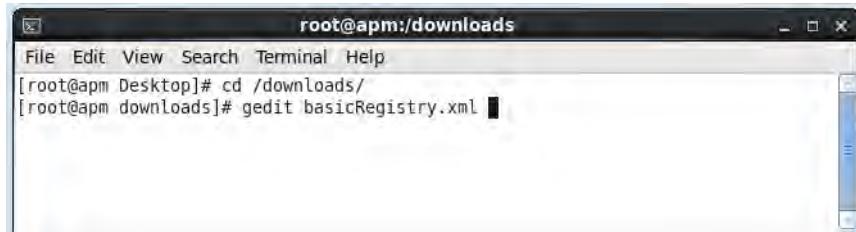
8. Display the contents of the file **basicRegistry.xml** using the gedit editor.

The screenshot shows the "gedit" XML editor displaying the "basicRegistry.xml" file. The file content is as follows:

```
<server>
    <basicRegistry id="basic" realm="customRealm">
        <user id="apmadmin" name="apmadmin" password="{aes}AEwuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
    </basicRegistry>
</server>
```

Notice that there is one user ID defined, for **apmadmin**, and that the password is encrypted.

9. In another terminal window, display the contents of the provided **basicRegistry.xml** file in the **/downloads** directory by using the gedit editor.



10. Observe the seven users and five groups that are defined, and that the users are added to appropriate groups. Observe that the password string is different than the password string in [Step 8](#) on page 59.

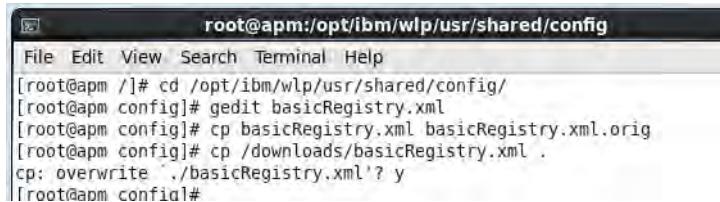
```

<server>
    <basicRegistry id="basic" realm="customRealm">
        <user id="apmadmin" name="apmadmin" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <user id="apmadmin1" name="apmadmin1" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <user id="apmadmin2" name="apmadmin2" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <user id="apmuser1" name="apmuser1" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <user id="apmuser2" name="apmuser2" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <user id="apmuser3" name="apmuser3" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <user id="apmuser4" name="apmuser4" password="{aes}AEwuuuzrMA1Uq63Xgr+5RpVqzV0HTWlgsxHXmQERF6ZJW"/>
        <group name="admins">
            <member name="apmadmin" />
        </group>
        <group name="admins1">
            <member name="apmadmin1" />
            <member name="apmadmin" />
        </group>
        <group name="admins2">
            <member name="apmadmin2" />
            <member name="apmadmin" />
        </group>
        <group name="users12">
            <member name="apmuser1" />
            <member name="apmuser2" />
        </group>
        <group name="users34">
            <member name="apmuser3" />
            <member name="apmuser4" />
        </group>
    </basicRegistry>
</server>

```

11. From the **basicRegistry.html** file in **/opt/ibm/wlp/usr/shared/config** folder, copy the password string into your clipboard (everything in between the double-quotes).
12. Close the gedit editor.
13. Make a backup of the **basicRegistry.xml** file in the **/opt/ibm/wlp/usr/shared/config** folder and name the backup **basicRegistry.xml.orig**.

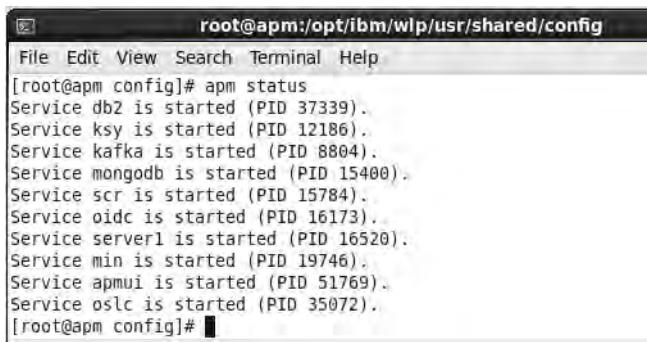
14. Copy the **basicRegistry.xml** file from the **/downloads** folder to the **/opt/ibm/wlp/usr/shared/config** folder.



```
root@apm:/opt/ibm/wlp/usr/shared/config
File Edit View Search Terminal Help
[root@apm ~]# cd /opt/ibm/wlp/usr/shared/config/
[root@apm config]# gedit basicRegistry.xml
[root@apm config]# cp basicRegistry.xml basicRegistry.xml.orig
[root@apm config]# cp /downloads/basicRegistry.xml .
cp: overwrite './basicRegistry.xml'? y
[root@apm config]#
```

15. Edit the new **basicRegistry.xml** file and update all the passwords to be the password string from your clipboard.
16. From a terminal window, run the **apm status** command to list the status of all the components of the Performance Management Server.

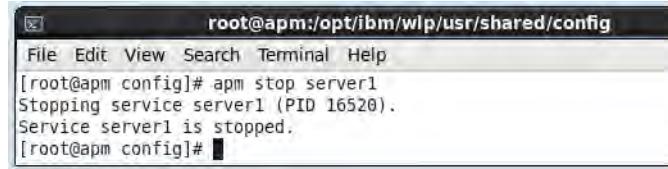
```
apm status
```



```
root@apm:/opt/ibm/wlp/usr/shared/config
File Edit View Search Terminal Help
[root@apm config]# apm status
Service db2 is started (PID 37339).
Service ksy is started (PID 12186).
Service kafka is started (PID 8804).
Service mongodb is started (PID 15400).
Service scr is started (PID 15784).
Service oidc is started (PID 16173).
Service server1 is started (PID 16520).
Service min is started (PID 19746).
Service apmui is started (PID 51769).
Service oslc is started (PID 35072).
[root@apm config]#
```

17. Stop the Liberty server (server1). This command takes approximately 2 minutes.

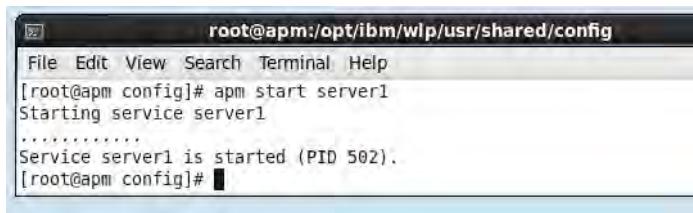
```
apm stop server1
```



```
root@apm:/opt/ibm/wlp/usr/shared/config
File Edit View Search Terminal Help
[root@apm config]# apm stop server1
Stopping service server1 (PID 16520).
Service server1 is stopped.
[root@apm config]#
```

18. Restart the Liberty server. This command takes approximately 4 minutes.

```
apm start server1
```



```
root@apm:/opt/ibm/wlp/usr/shared/config
File Edit View Search Terminal Help
[root@apm config]# apm start server1
Starting service server1
.....
Service server1 is started (PID 502).
[root@apm config]#
```

19. Close the Firefox browser.

20. Return to the Performance Management console and log in. Click **System Configuration > Role Based Access Control**.



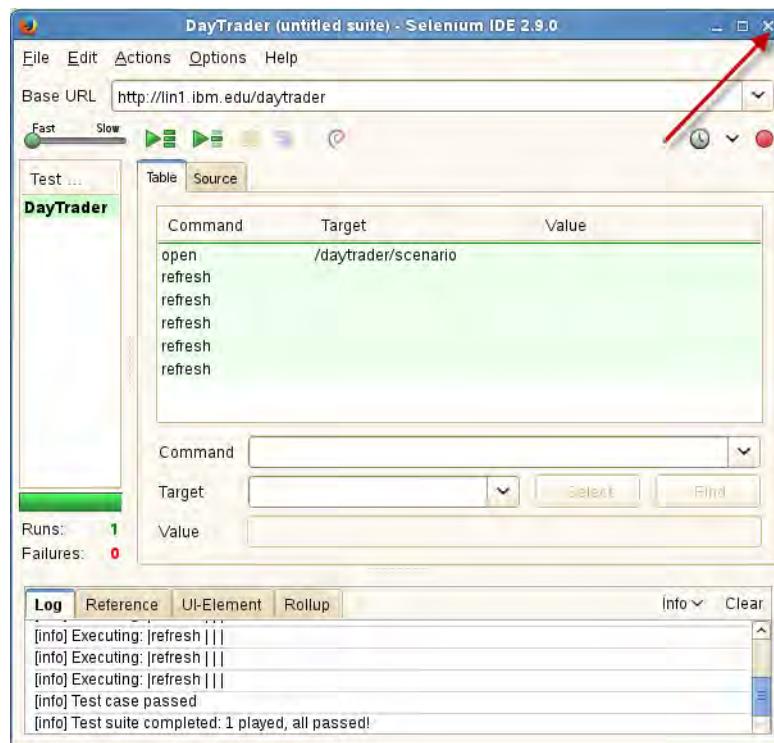
21. Observe the contents of the **User Groups** tab and the **Individual Users** tab and see how they match up with the contents of the **basicRegistry.xml** file.

A screenshot of the 'Role Based Access Control' interface. At the top, there are tabs for 'Home', 'Role Based Access Control', 'Roles', 'User Groups' (which is currently selected and highlighted in blue), and 'Individual Users'. Below these tabs, under the heading 'User Groups', there is a list of five entries, each preceded by a radio button: 'admins', 'admins1', 'admins2', 'users12', and 'users34'. The background of the interface is dark, and the text is white or light-colored.

Impact of roles on user IDs

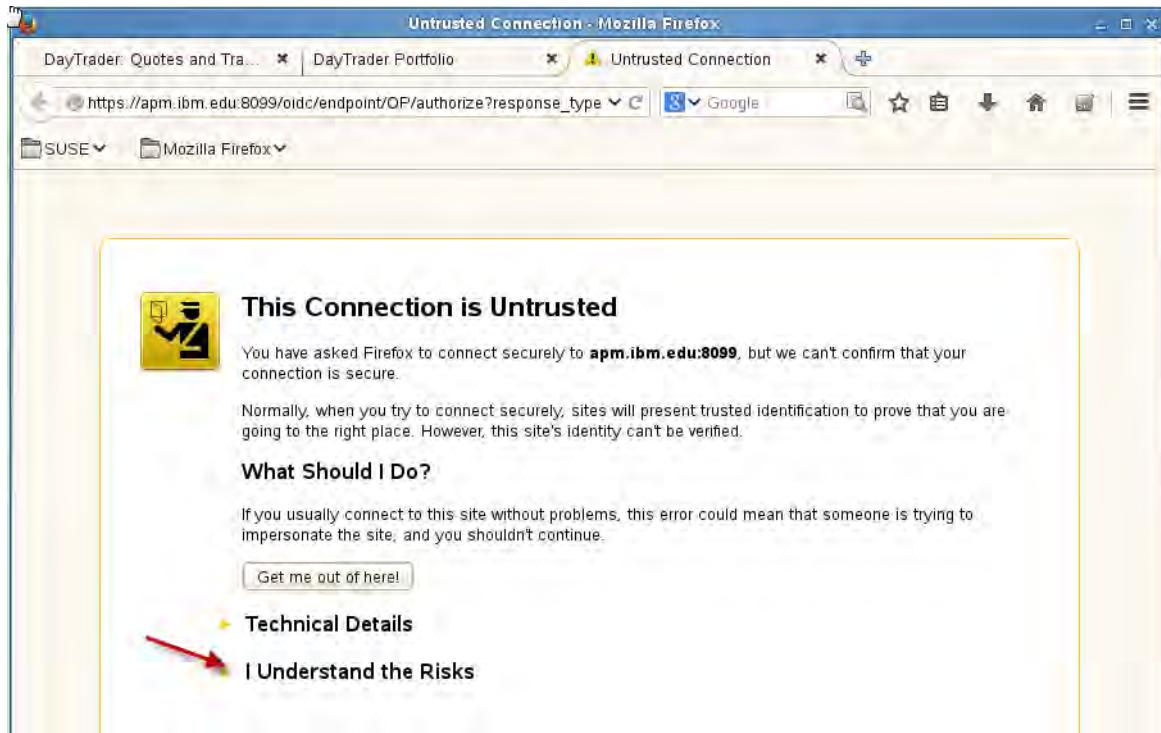
The remaining steps for this exercise guide you through accessing the Performance Management console with different user IDs and seeing the impact on what your user ID can see and do. You update the roles from the **apmadmin** user ID on the APM VM. You test various user IDs on the LIN1 VM.

22. On the LIN1 VM, stop the Selenium tool from updating the DayTrader application by closing out the tool.

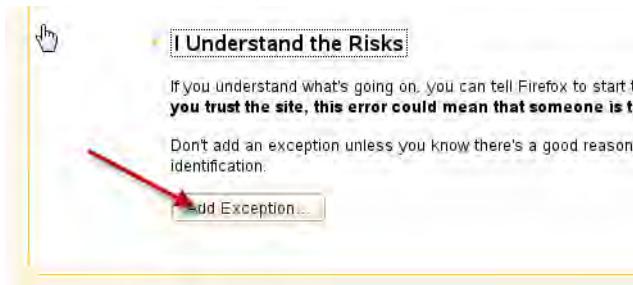


23. Log in with **apmadmin1** user ID on the LIN1 VM:
 - a. On the LIN1 VM, open the Firefox browser to this URL:
<https://apm.ibm.edu:9443>

- b. If prompted, click **I Understand the Risks > Add Exception**. Otherwise, continue to step e.



- c. Click **Add Exception**.

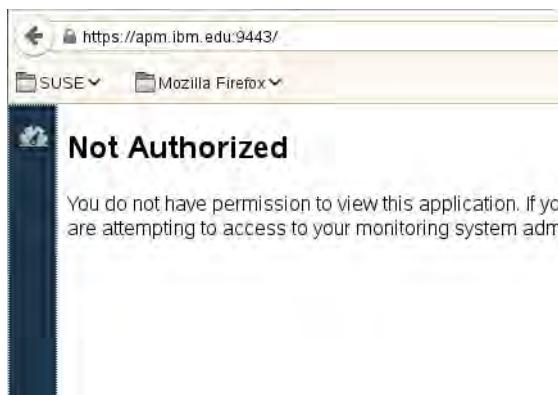


- d. Click **Confirm Security Exception**.



- e. Instead of using the **apmadmin** login, use **apmadmin1** to log in, with a password of **object00**.

This screen capture shows the expected result:



This Not Authorized message opens because even though **apmadmin1** is a valid user, the user does not have any permissions or roles in the Performance Management Server.

24. On the APM VM, in Firefox return to the Performance Management console. Click **System Configuration > Role Based Access Control**, and select **Individual Users**.

25. Select **apmadmin1**, and click the Edit icon as shown:

The screenshot shows the 'Role Based Access Control' interface with the 'Individual Users' tab selected. A list of users is displayed, including 'apmadmin1'. A red arrow points to the edit icon (pencil) next to 'apmadmin1'.

26. Observe that **apmadmin1** currently has no roles. Select the roles **Monitoring Administrator** and **Role Administrator**. Scroll down and click **Save**. Click **Close**.

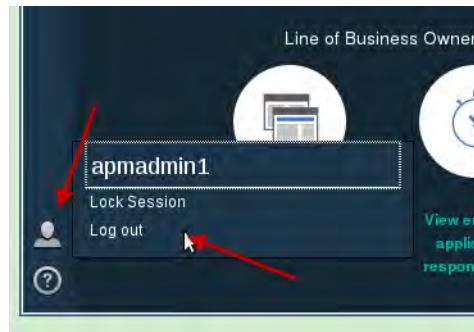
27. Return to the Firefox browser on the LIN1 VM. Click the Refresh icon in the browser.

The screenshot shows a Firefox browser window with the title 'IBM Performance Management - Mozilla Firefox'. The address bar shows 'https://apm.ibm.edu:9443/'. The main content area displays a 'Not Authorized' message: 'You do not have permission to view this application. If you require access to the application are attempting to access to your monitoring system administrator.' A red arrow points to the refresh icon in the browser's toolbar.

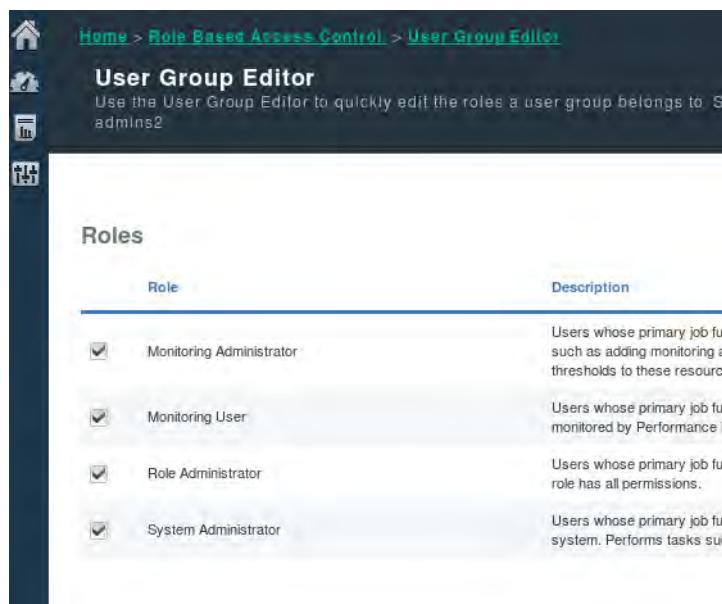
28. Confirm that **apmadmin1** user ID has the rights to be a Monitoring and Role Administrator.

The screenshot shows a Firefox browser window with the title 'IBM Performance Management'. The address bar shows 'https://apm.ibm.edu:9443/'. The main content area displays a 'System Configuration' menu with several options: 'Advanced Configuration', 'Agent Configuration', 'Role Based Access Control' (which is highlighted with a red box), 'Threshold Manager', and 'Resource Group Manager'. A red arrow points to the 'Role Based Access Control' option in the menu.

29. On the LIN1 VM, log out of the user **apmadmin1**.



30. On the APM VM in Firefox, return to the Performance Management console. Click **System Configuration > Role Based Access Control**, and select **User Groups**.
31. Select the **admins2** group, and select the Edit icon. This group has two users, **apmadmin** and **apmadmin2**, although you cannot see this in the User Group Editor.
32. Give this group access to all roles, and click **Save**. Click **Close**.



Role	Description
<input checked="" type="checkbox"/> Monitoring Administrator	Users whose primary job function is monitoring. Such users can add monitoring agents, define thresholds for these resources, and view performance data.
<input checked="" type="checkbox"/> Monitoring User	Users whose primary job function is monitoring. Such users can monitor by Performance Management.
<input checked="" type="checkbox"/> Role Administrator	Users whose primary job function is managing roles. This role has all permissions.
<input checked="" type="checkbox"/> System Administrator	Users whose primary job function is system management. Performs tasks such as defining system resources, defining thresholds for these resources, and viewing performance data.

33. Log in with **apmadmin2** user ID on the LIN1 VM:
 - a. On the LIN1 VM, open the Firefox browser to this URL:
<https://apm.ibm.edu:9443>
 - b. Instead of using the **apmadmin1** login, use **apmadmin2** to log in, with a password of **object00**.
- The user ID **apmadmin2** has all the same rights as the **apmadmin** user ID.

34. Confirm that **apmadmin2** user ID has the rights to be a Monitoring and Role Administrator.

The screenshot shows a Firefox browser window titled "IBM Performance Management - Mozilla Firefox". The address bar shows "https://apm.ibm.edu:9443/" and the page title is "DayTrader: Quotes and Tra... DayTrader Portfolio IBM Performance Management". The left sidebar has a "System Configuration" section with icons for Advanced Configuration, Agent Configuration, Role Based Access Control (which is selected), Threshold Manager, and Resource Group Manager. The main content area displays the "BM Performance Management" logo and a brief description of the solution. A message at the bottom encourages users to download agents and take a tour of the performance management dashboard.

35. Log out of the **apmadmin2** user ID.

36. From the APM VM Firefox browser, assign the user ID **apmuser1** only the Monitoring User role.

The screenshot shows the "Individual User Editor" interface. The URL in the address bar is "Home > Role Based Access Control > Individual User Editor". The page title is "Individual User Editor" and it says "Use the Individual User Editor to quickly edit the roles a user belongs to". Below this, it shows "apmuser1:users12". The main content is a "Roles" table:

Role	Description
<input type="checkbox"/> Monitoring Administrator	Users whose primary function is monitoring. Such as adding monitoring thresholds to thresholds.
<input checked="" type="checkbox"/> Monitoring User	Users whose primary function is monitoring by Perl scripts.
<input type="checkbox"/> Role Administrator	Users whose primary function is managing roles. Has all permission.
<input type="checkbox"/> System Administrator	Users whose primary function is managing the system. Performs system level tasks.

A red arrow points to the "Monitoring User" row, indicating it is selected.

37. Click **Save**.

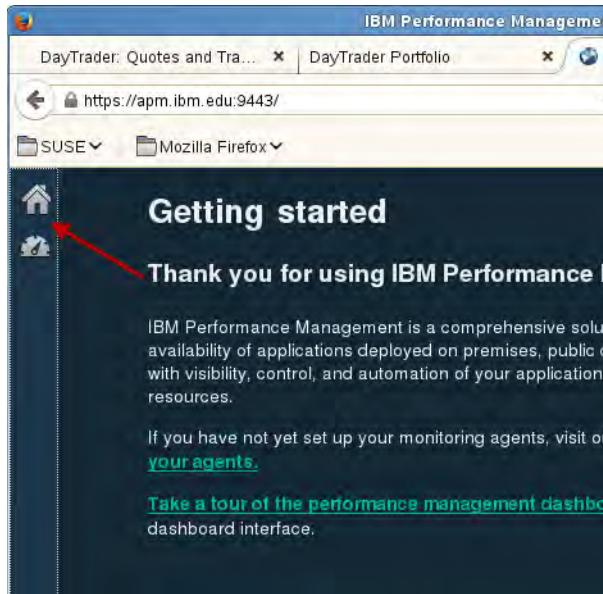
38. Log in with **apmuser1** user ID on the LIN1 VM:

- On the LIN1 VM, open the Firefox browser to the URL

<https://apm.ibm.edu:9443>

- Instead of using the **apmadmin2** login, use **apmuser1** to log in, with a password of **object00**.

From the **apmuser1** login, observe that two icons that are missing that you saw in prior examples. The System Configuration and Reporting icons are removed. This user does not have the role to run reports or update the advanced settings.



39. Log out of the **apmuser1** user ID.
40. On the APM VM in Firefox, return to the Performance Management console. Click **System Configuration > Role Based Access Control**, and click **Roles**.

41. Click the plus (+) sign to create a new role.

The screenshot shows the 'Role Based Access Control' page in the IBM Performance Management console. The URL is https://apm.ibm.edu:9443/#com.ibm.smai.rbac.ui_rbac. The page displays a list of roles with their descriptions. A red arrow points to the 'New' button in the top right corner of the table header.

Role	Description
Monitoring Administrator	Users whose primary job function is to use Performance Management to monitor systems. Performs tasks such as adding monitoring applications, creating thresholds, adding groups of resources, and distributing the thresholds to these resource groups.
Monitoring User	Users whose primary job function is to configure and maintain the health and state of systems that are monitored by Performance Management.
Role Administrator	Users whose primary job function is to create access control policies for Performance Management. This role has all permissions.
System Administrator	Users whose primary job function is to perform administration tasks for the Performance Management system. Performs tasks such as configuring the Event Manager, or configuring the Hybrid Gateway.

42. Enter **Operating System User** for the role name. For the role description, enter **Users whose primary job function is to monitor Operating Systems**. Click the **users34** user group.



Note: The users34 user group has two members, **apmuser3** and **apmuser4**.

The screenshot shows the 'Role Editor' interface in the IBM Performance Management console. The 'Role Name' field is populated with 'Operating System User'. The 'Role Description' field contains the text 'Users whose primary job function is to monitor Operating Systems.'. In the 'User Groups' section, there is a list of groups: 'users12', 'users34' (which is selected and highlighted in blue), 'admins2', 'admins', and 'admins1'. A red arrow points to the 'users34' checkbox. At the bottom right of the editor are 'Cancel' and 'Save' buttons.

43. Click **Assign Permissions to Role**, and click the **Resource Permission** tab.

44. Click the **View** button to the right of **Application Performance Dashboard**.

45. Expand **Applications**, and click the **View** button to the right of **Operating System Agents**.
Click **Save**.

The screenshot shows the 'Role Editor' page. At the top, there is a 'Role Name*' field containing 'Operating System User' and a 'Role Description' field stating 'Users whose primary job function is to monitor Operating Systems.' Below this, there are two main sections: 'Assign Users to Role' and 'Assign Permissions to Role'. The 'Assign Permissions to Role' section is expanded, showing a table of permissions categorized under 'System Configuration Permissions' and 'Resource Permissions'. The 'Resource Permissions' tab is selected. In the 'Permissions' table, the 'View' column has a checked checkbox for 'Operating System Agents', while other items like 'Application Performance Dashboard' and 'DayTrader' have unchecked checkboxes. Red arrows point from the left margin to the 'Assign Permissions to Role' button and from the top margin to the 'Resource Permissions' tab. At the bottom of the table are 'Cancel' and 'Save' buttons.

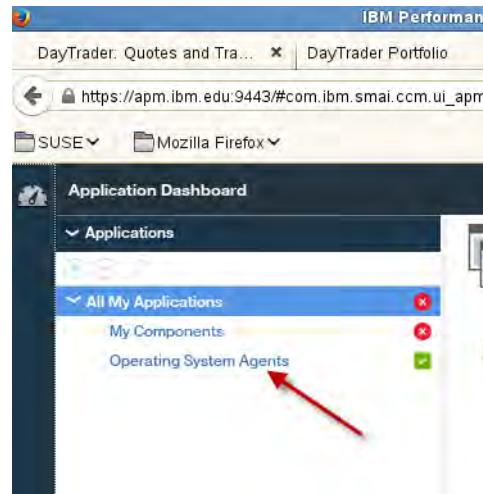
46. Log In with **apmuser3** user ID on the LIN1 VM:

- On the LIN1 VM, from a Firefox browser go to this URL:
<https://apm.ibm.edu:9443>
- Instead of using the **apmuser1** login, use **apmuser3** to log in, with a password of **object00**.

47. Open the Application Performance Dashboard.



48. Observe that you can now see the Operating System Agents application, but not the DayTrader application. Explore the contents of the Operating System Agents application.



49. Log out of the **apmuser3** user ID,

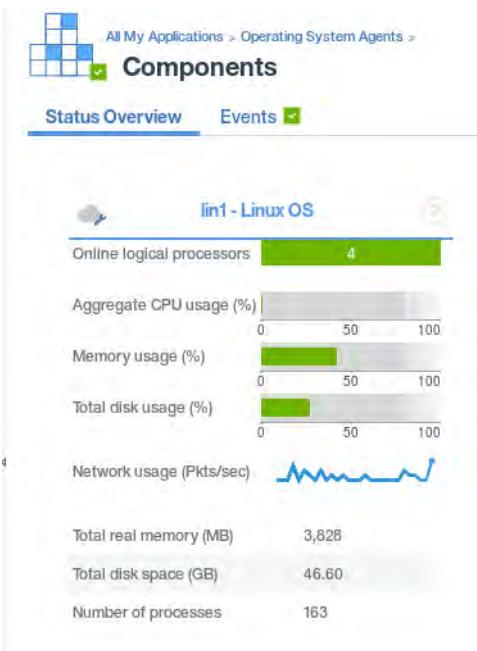
50. Restart the Selenium tool to continue the load on the DayTrader application. The instructions are in [Exercise 1, “Driving HTTP transactions with Firefox,”](#) on page 31.

Exercise 7 Attribute details

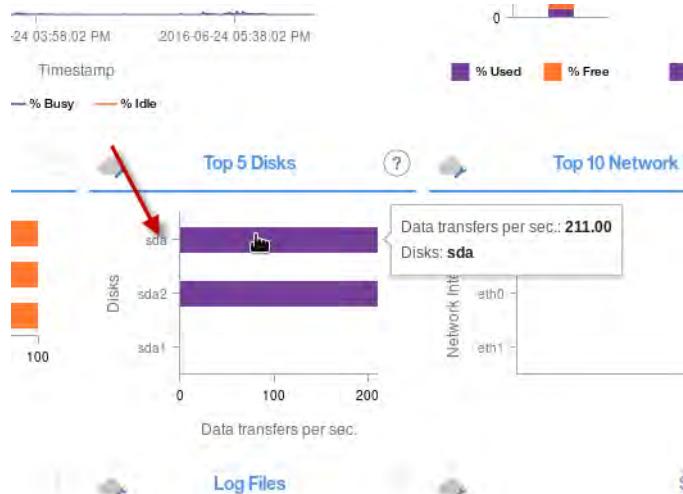
When the data that you are investigating is not found in the widget of an agent, but the agent is collecting the data, you can view the data from the **Attribute Details** tab. This exercise guides you through the process of displaying data that an agent collects that is not displayed in a widget.

For this scenario, assume that you are trying to justify a new, faster, disk drive for the LIN1 server. You were told that you must get the metrics for the average service time from the Linux OS agent data set KLZIOEXT, attribute name AVGSVCTM, which is read from **/proc/diskstats** (2.6 kernel) or **/proc/partitions** (2.4 kernel).

1. On the APM VM, log in to the Performance Management Console if you are not already logged in with a user ID of **apmadmin** and a password of **object00**.
2. Locate the summary widget for the Monitoring Agent for Linux OS that is running on LIN1 server. Click the summary widget.

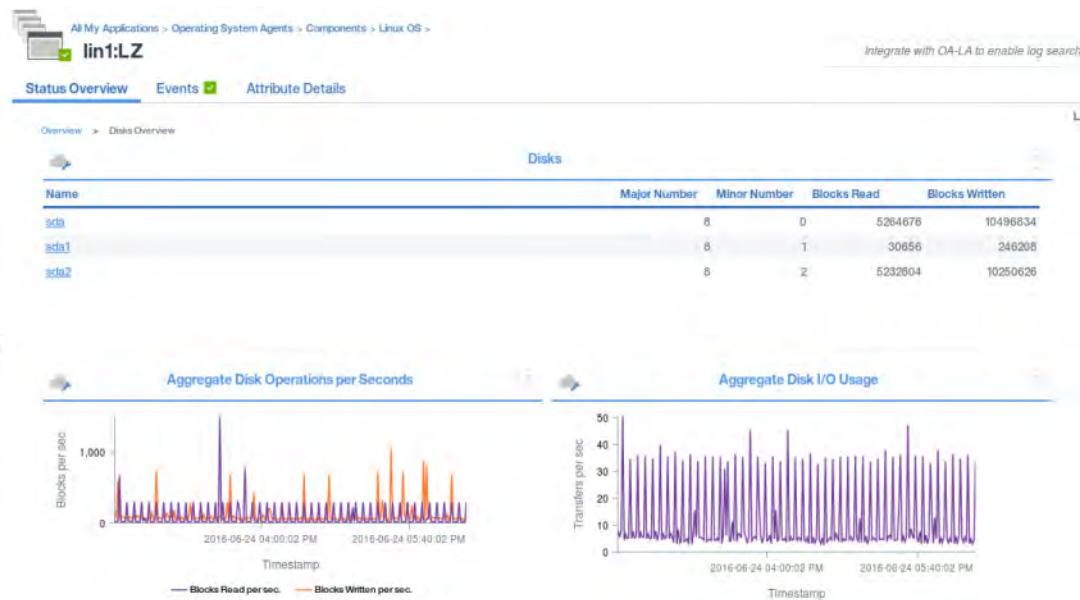


- Click the **sda** disk in the Top 5 Disks widget.



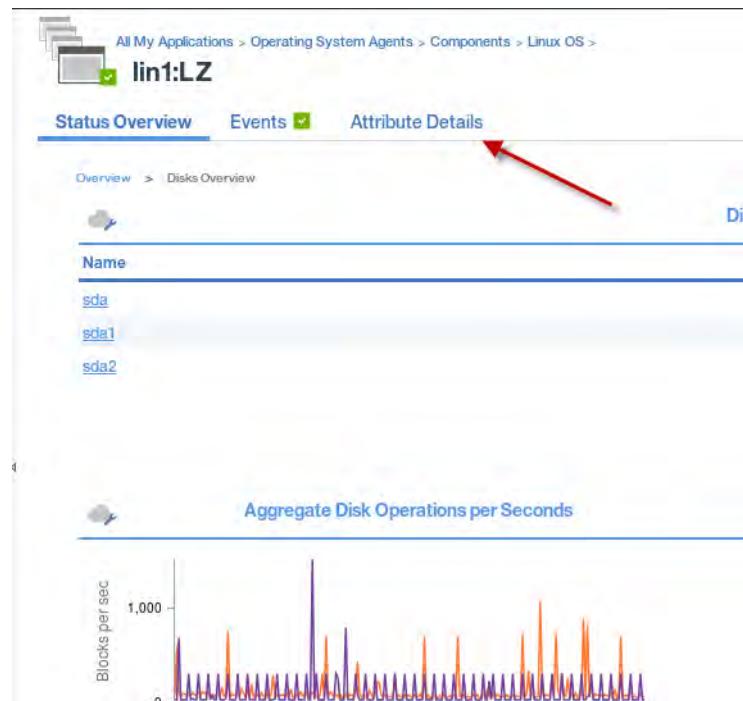
Look at the data presented. The data shows the data transfers per second at the current time, but it does not display the metric that you require to justify your new disk.

- Click the Top 5 Disks widget.



Data is provided on blocks read, blocks written, and disk usage per second, but the key metric that you need is not shown. To find this metric, you use the **Attribute Details** tab.

5. Click **Attribute Details**.



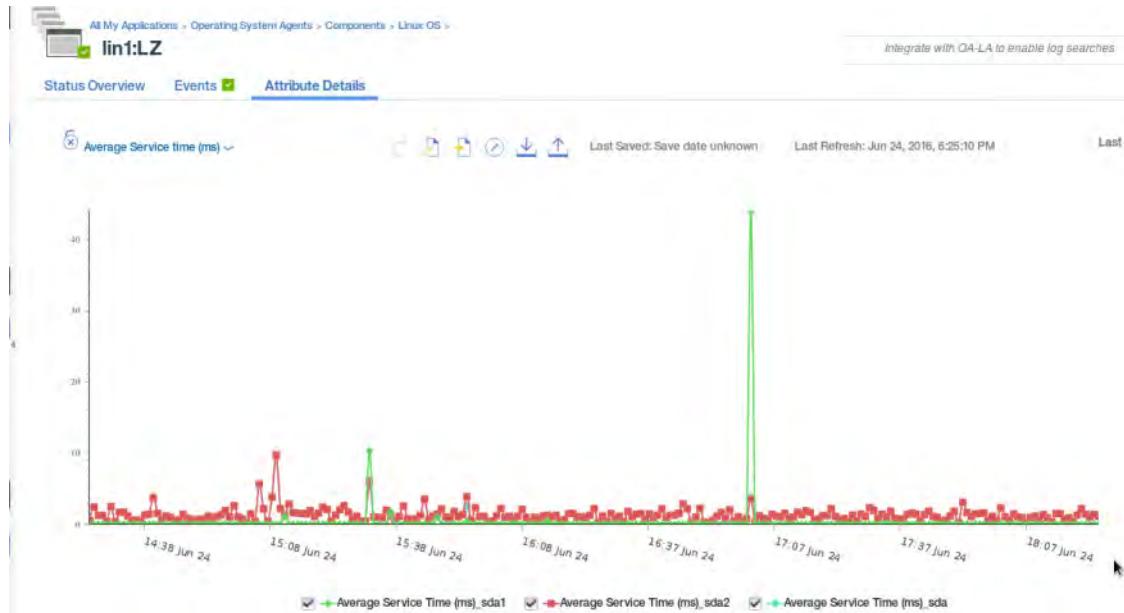
6. Enter the title **Average Service time (ms)**. Select the type **Historical**. Select **Line Chart**. Select the data set **KLZ_IO_Ext** and the attribute **Average Service time (ms)**.

The screenshot shows the 'Attribute Details' tab selected in the navigation bar. The 'Enter title:' field contains 'Average Service time (ms)'. The 'Choose a type:' section has 'Historical' selected. Under 'Choose a chart or table:', there are two icons: a line graph and a table. A note says '* Choose the metrics:'. Below this, the 'Data Set' section lists several options, with 'KLZ_IO_Ext' selected. To the right, the 'Attributes' section lists several options, with 'Average Service Time (ms)' checked. At the bottom right, it says 'Total: 6 Selected: 1'.

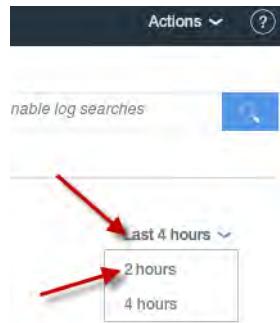
7. Click **Preview Results**.



The chart shows the results for the past 4 hours.

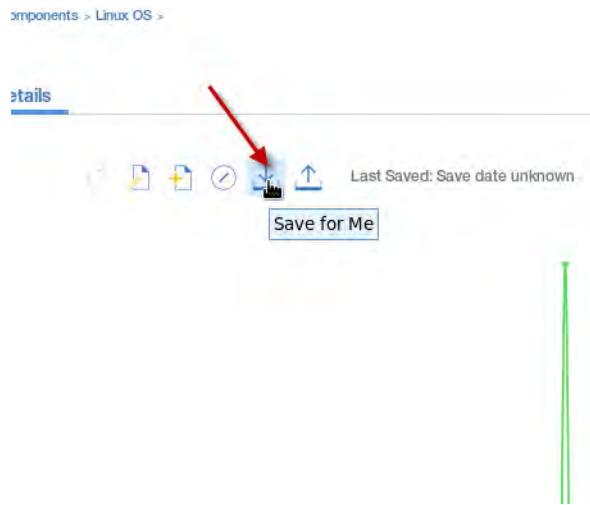


8. Change the time to the last 2 hours by selecting **Last 4 Hour(s)** in the upper right, and selecting **2 hours**.

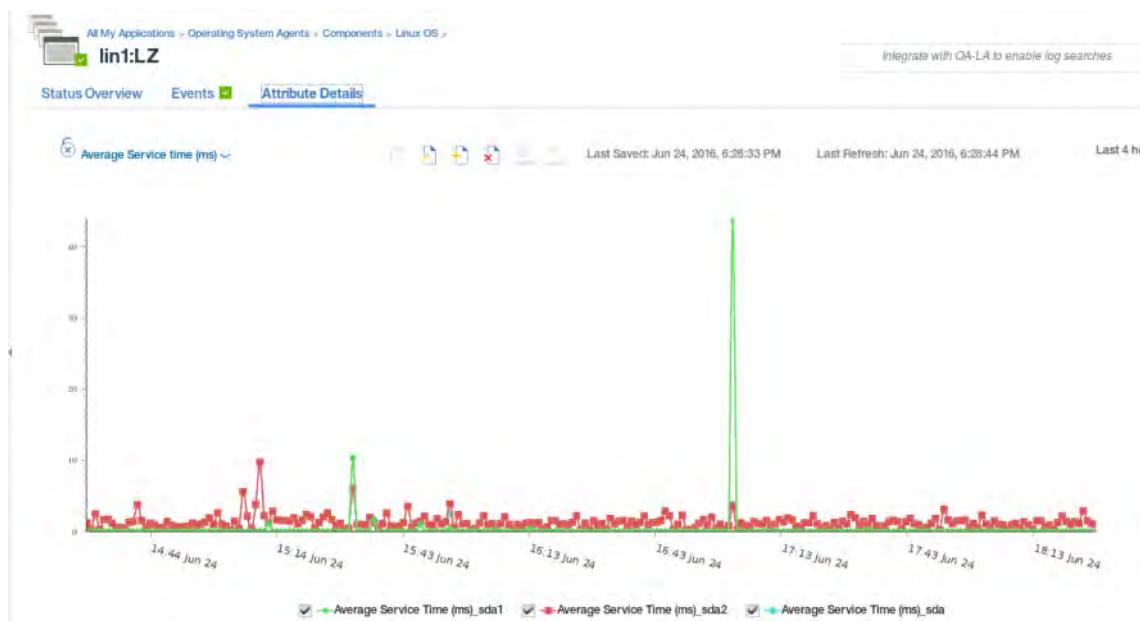


You can save this chart.

9. Click the **Save for Me** button.

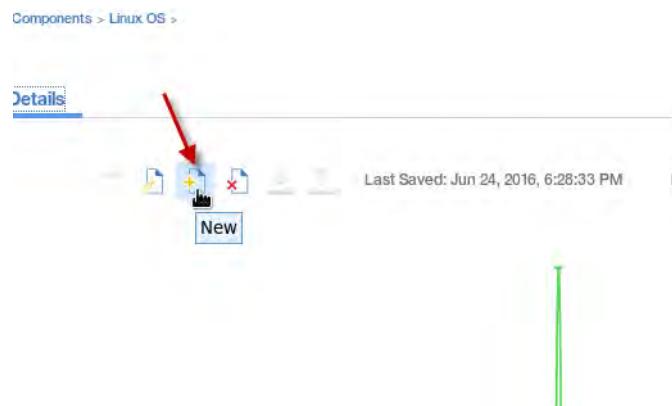


10. Click the **Status Overview** tab.
11. Click the **Attribute Details** tab. Observe that the chart is presented without going through the steps that were required before.



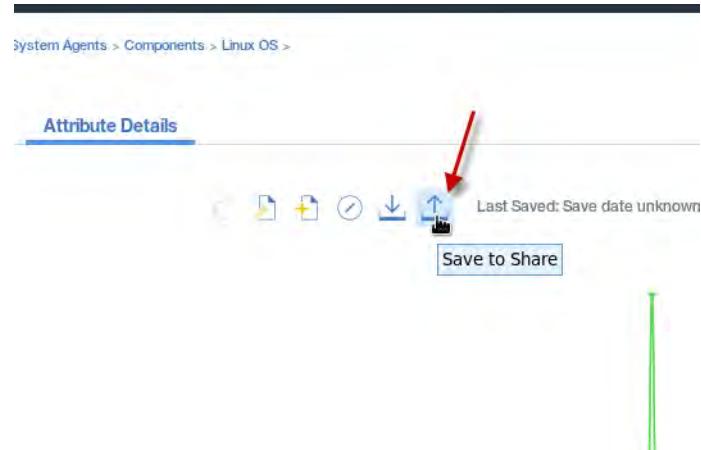
You can also share charts with other users.

12. Click **New**.



13. Click the data set **KLZ_IO_Ext**, and the attribute **Average Service time (ms)**. Click **Historical** and **Line Chart**. Enter a title of **Average Service time (ms)**.
14. Click **Preview Results**.

15. Click **Save to Share**.



16. On LIN1 VM, open the Firefox browser to this URL:

<https://apm.ibm.edu:9443>

17. Use **apmuser3** to log in, with a password of **object00**.



18. Navigate to the **Attribute Details** tab of the Monitoring Agent for Linux OS on the LIN1 server, and observe the shared chart.



Exercise 8 Configuring and using the Log File agent

This exercise guides you through the steps to configure the Log File agent that is part of the Operating System agent. You load a configuration and format file and distribute the configuration to a specific server, and view the results.

1. On the APM VM, open a terminal window and change to the **/downloads** folder. List the contents of the folder and observe there are two files names **WAS(fmt)** and **WAS.conf**.

```
root@apm ~]# cd /downloads/
[root@apm downloads]# ls
backgrounds      cscsRoleAdmin.new    lz_history.xml
basicRegistry.xml  IM813            oauthVariables-onprem.xml
commonRegistry   ldapRegistry.xml   search.properties
[root@apm downloads]#
```

2. Use gedit to review the contents of the **WAS.fmt** file and the **WAS.conf** file.

The configuration file points to the log location.

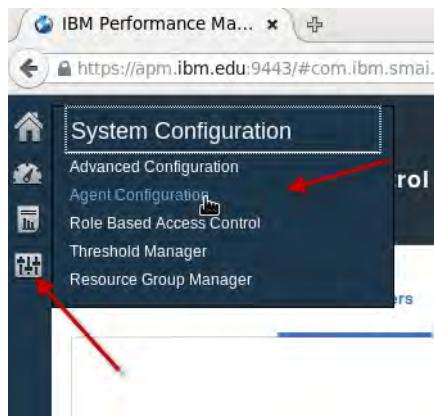
```
*WAS.conf (/downloads) - gedit
File Edit View Search Tools Documents Help
Open Save Undo
*WAS.conf
LogSources=/opt/IBM/WebSphere/AppServer/profiles/AppSrv01/logs/server1/SystemOut.log
UnmatchLog=/tmp/WAS.unmatched
IncludeEIFEventAttr=yes
ConfigFilesAreUTF8=Y
```

The format file describes what to do with the log. In this case, you retrieve all records.

```
WAS.fmt (/downloads) - gedit
File Edit View Search Tools Documents Help
Open Save Undo
WAS.fmt
REGEX ALLLINE
(.*)
msg $1
END
```

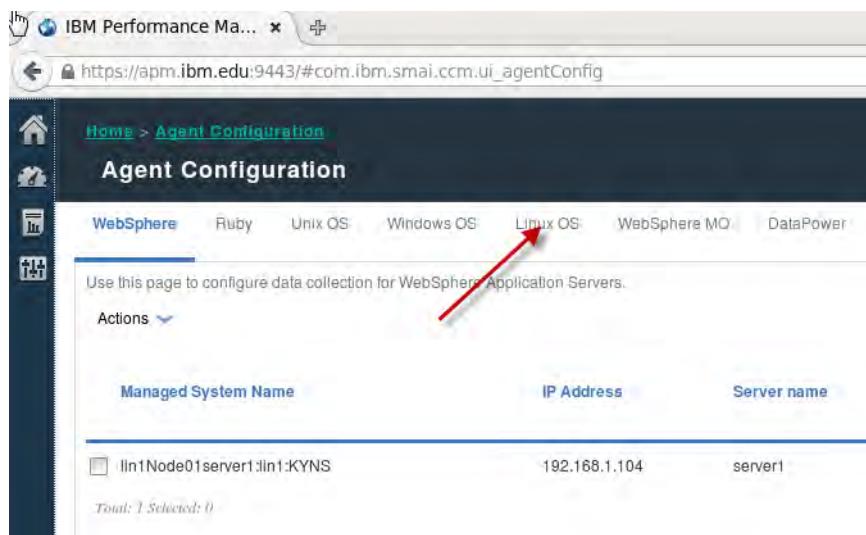
To enable the OS agents to monitor log files, you must upload the configuration file and format file and specify to which OS agent the configuration applies. The OS agent downloads the .conf and .fmt files and the agent monitors the log files that you specify in the configuration.

3. On the APM VM, click **System Configuration > Agent Configuration**.

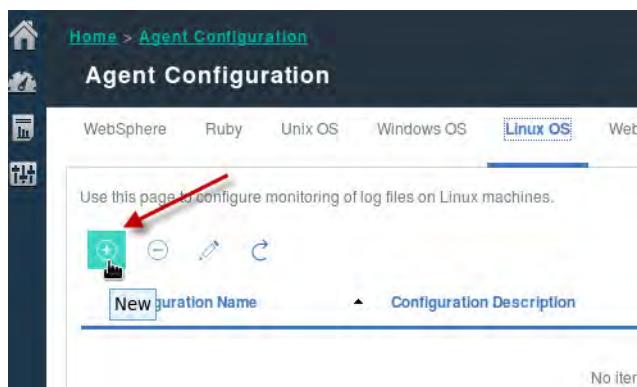


The Agent Configuration page includes tabbed pages for the OS agents. Each page shows the configuration details that you include to monitor log files for the specific OS agent.

4. Click the **Linux OS** tab.



5. To create a configuration, click the (+) icon to open the New Log File Configuration window.



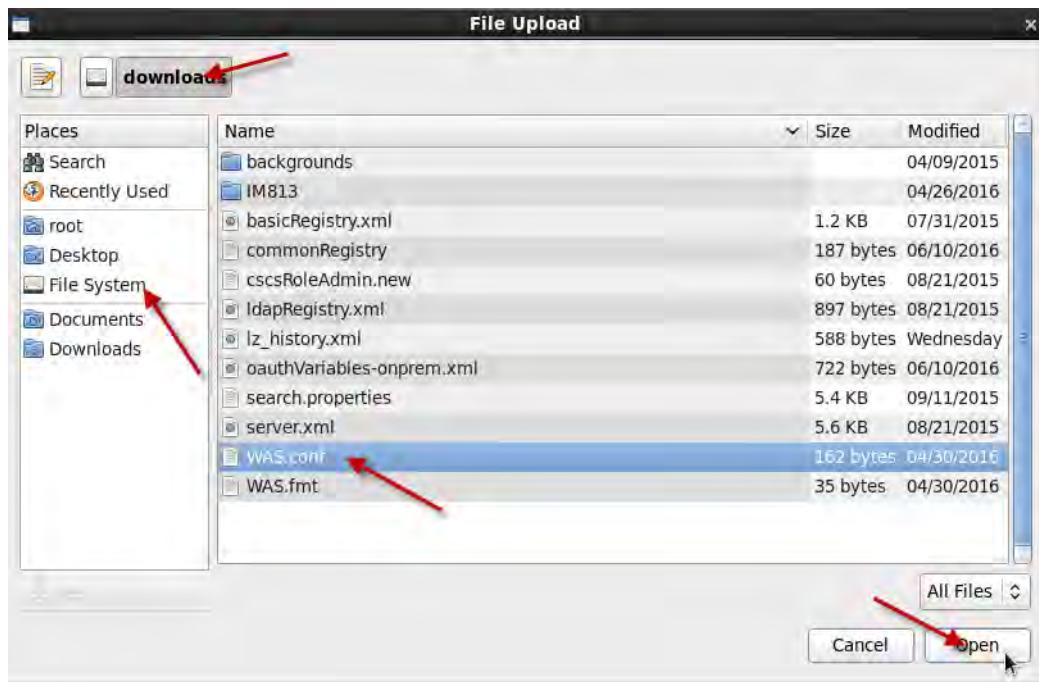
6. Enter the name WAS for the configuration and a description of the configuration.

New Log File Configuration

Configuration Name *	WAS
Configuration Description	This log file is for the WebSphere Application Server
Select Conf File	Select a .conf file to complete this required field
Select FMT File	Select a .fmt file to complete this required field

Done Cancel

7. Click **Select Conf File** and navigate to the **/downloads** folder and select the **WAS.conf** file.
Click **Open**.



8. Click **View** beside the **WAS.conf** file that you uploaded.

New Log File Configuration

Configuration Name * WAS

Configuration Description This log file is for the WebSphere Application Server

Select Conf File WAS.conf View

Select FMT File Select a .fmt file to complete this required field View

9. Observe this is the same file that you reviewed earlier. Click **Close**.

10. Repeat the process to upload the **WAS.fmt** file and confirm the contents.

11. Click **Done** after uploading both files.

New Log File Configuration

Configuration Name * WAS

Configuration Description This log file is for the WebSphere Application Server

Select Conf File WAS.conf View

Select FMT File WAS.fmt View

Done Cancel

12. Click **Close**.

13. On the OS agent tab, select the WAS configuration that you uploaded.

The screenshot shows the 'Agent Configuration' page for the Linux OS tab. A red arrow points to the 'WAS' configuration entry in the list, which is highlighted. The configuration details shown are: Configuration Name: WAS, Configuration Description: This log file is for the WebSphere Application Server, and Configuration File: WAS.conf.



Important: The .conf and .fmt files distributed to the agents are renamed to the configuration name that you define.

The OS agent tab shows the configuration that you created and the agents where you deploy them.

14. To deploy the configuration, in the Log Configuration Distributions List table, select the **LIN1 OS** agent and click **Apply Changes**.

The screenshot shows the 'Log Configuration Distributions List' table. A red arrow points to the 'Apply Changes' button at the top of the table. The table has columns: Name, Distributions, Status, Managed system name, and Version. One row is visible: Name: lin1:LZ, Status: OK, Managed system name: lin1:LZ, Version: 06.35.11. A tooltip 'Total: 1 Selected: 0' is shown below the table.

15. Click **Close**.

Observe that the Distribution count changed from 0 to 1.

The screenshot shows a table with the following columns: Configuration File Name, Distributions, Status, and Managed by. A red arrow points to the 'Distributions' column for the row where Configuration File Name is 'WAS.conf'. The value '1' is displayed in the 'Distributions' column for this row. The status is 'Status' and the managed by field is 'Managed by'.

Configuration File Name	Distributions	Status	Managed by
WAS.conf	1		

Total: 0 Selected: 0

16. Wait 5 minutes for the definition to be distributed to LIN1.
17. On LIN1 VM, to create some log traffic, stop the WebSphere Application Server by double-clicking the **Stop WebSphere** shortcut on the desktop.



18. Restart the WebSphere Application Server by double-clicking the **Start WebSphere** shortcut on the desktop.

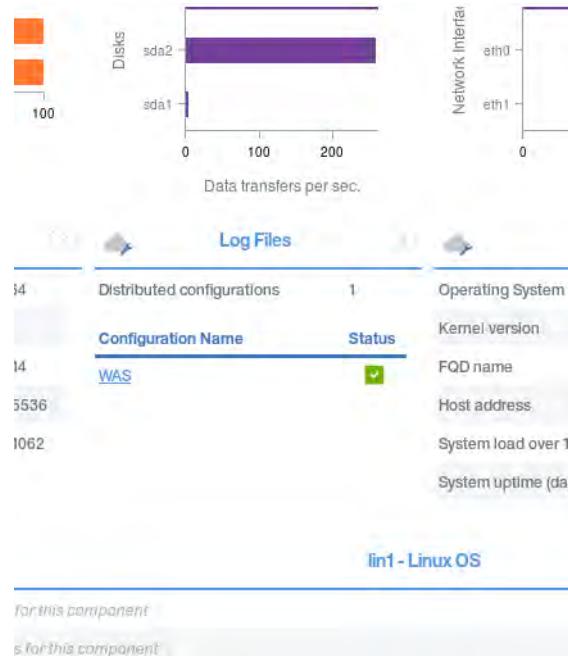


19. On the APM VM, click Application Performance Dashboard > Operating System Agents > Linux OS > Status Overview.

The screenshot shows the Application Performance Dashboard interface. In the top right corner, there is a breadcrumb navigation path: All My Applications > Operating System Agents > Components > Linux OS >. Below this, the title "lin1:LZ" is displayed. The main content area is titled "Status Overview". There are three tabs: "Status Overview" (selected), "Events" (with a green checkmark), and "Attribute Details".

- Aggregate CPU Usage:** A line chart showing CPU usage over time. The Y-axis is "Percentage" from 0 to 100. The X-axis is "Timestamp" showing 2016-07-01 03:02:45 PM. Two lines are shown: "% Busy" (blue) and "% Idle" (orange). The "% Busy" line starts at ~50%, drops to near 0% by 03:02:45 PM, and then rises sharply to ~100% by 03:04:45 PM. The "% Idle" line starts at ~50%, rises to ~100% by 03:02:45 PM, and remains flat until 03:04:45 PM.
- Top 5 File Systems:** A bar chart showing file system usage. The Y-axis is "Unit Point". The chart shows two bars: "/dev/shm" (orange) and "/dev" (orange).
- Top 5 Disks:** A bar chart showing disk usage. The Y-axis is "Sks". The chart shows four bars: "sda" (purple), "sda2" (purple), "sda1" (purple), and "sda3" (purple).

20. Scroll down, and observe the Log Files widget.



21. Click the WAS log file.

22. Click the hyperlink below the File Name header.

Configuration	Description	Subnode Name	Configuration File	Type
WAS	This log file is for the WebS...	LZ:lin1_WAS	/opt/ibm/apm/agent/localconfig/lz/log_discovery/WAS.conf	log

Monitored Logs						
File Name	File Type	File Status	Processed Records	Matched Records	File Size	Current
/opt/IBM/WebSphere/App...	REGULAR FILE	OK	0	0	386744	

23. Review the Log File Events.

Configuration	File Name	File Type	File Status	Processed Records	Matched Records	File Size
WAS	/opt/IBM/WebShe...	REGULAR F...	OK	0	0	386:

Log File Events	
Timestamp	Message
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:210 UTC] 000000be ServletWrapp I com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I: [D
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:354 UTC] 000000be ServletWrapp I com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I: [I
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:906 UTC] 000000be Runtime I CWWJP9990I: openJpa.Runtime: Info: Starting OpenJPA 2.2.3-SNAPSHOT
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:955 UTC] 000000be jdbc_JDBC I CWWJP9990I: openJpa.jdbc.JDBC: Info: Using dictionary class "com.ibm
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:992 UTC] 000000be InternalGener I DSRA8203I: Database product name : DB2/LINUXX8664
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:992 UTC] 000000be InternalGener I DSRA8204I: Database product version : SQL09074
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:993 UTC] 000000be InternalGener I DSRA8205I: JDBC driver name : IBM DB2 JDBC Universal Driver Arch
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:993 UTC] 000000be InternalGener I DSRA8206I: JDBC driver version : 3.62.56
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:993 UTC] 000000be InternalGener I DSRA8218I: JDBC driver specification level : 3.0
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:993 UTC] 000000be InternalDB2Un I DSRA8212I: DataStoreHelper name is: com.ibm.websphere.rsadapte
Jul 01, 2016 15:25:05	[7/1/16 15:25:00:994 UTC] 000000be WSRdbDataSour I DSRA8208I: JDBC driver type : 4
Jul 01, 2016 15:25:05	[7/1/16 15:25:02:071 UTC] 000000be ServletWrapp I com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I: [D

Exercise 9 Configuring LDAP to work with IBM Monitoring (optional)

As you learned in [Exercise 6, “Managing user permissions in the Performance Management console,”](#) on page 57, security in Performance Management is based on roles.

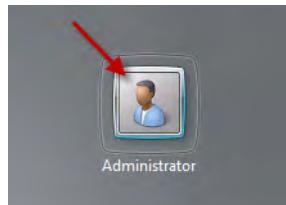
You used a WebSphere Application Server Liberty profile basic registry as the method for user authentication. Alternatively, you can use a Lightweight Directory Access Protocol (LDAP) registry for user authentication. This exercise guides you through enabling the Performance Management Server to use LDAP for security.



Attention: If you attempt this optional exercise, you *must* complete it to move on to the remaining exercises in the course. Ask your instructor how much time is left before you attempt it. It takes approximately 45 minutes to complete.

Starting the ITM VM

1. Start the ITM VM. This system hosts an IBM Tivoli Monitoring environment. Follow the local environment instructions.
2. Click the icon that is labeled **Administrator**. At the password prompt, enter **object00**, and press Enter.

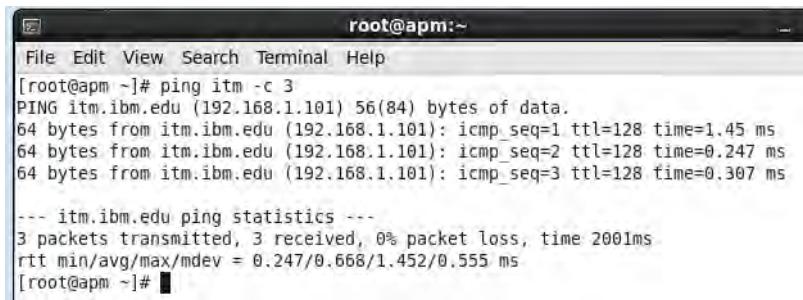


Updating the `ldapRegistry.xml` file

3. Log in to the Performance Management Console, if you are not already logged in, with a user ID of **apmadmin** and a password of **object00**.
4. Open a terminal window on the APM VM.

IBM Tivoli Directory Services is providing LDAP services on the ITM VM.

5. Confirm that you can ping the ITM VM.



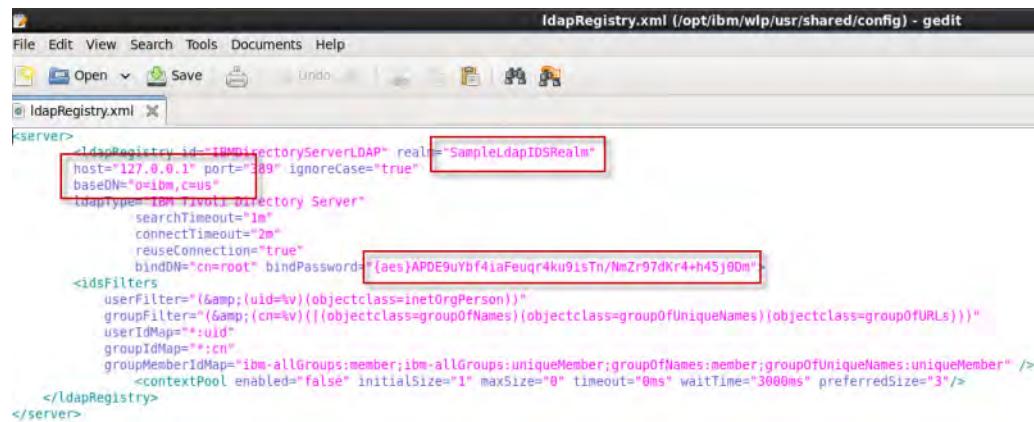
```
root@apm:~#
File Edit View Search Terminal Help
[root@apm ~]# ping itm -c 3
PING itm.ibm.edu (192.168.1.101) 56(84) bytes of data.
64 bytes from itm.ibm.edu (192.168.1.101): icmp_seq=1 ttl=128 time=1.45 ms
64 bytes from itm.ibm.edu (192.168.1.101): icmp_seq=2 ttl=128 time=0.247 ms
64 bytes from itm.ibm.edu (192.168.1.101): icmp_seq=3 ttl=128 time=0.307 ms

--- itm.ibm.edu ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2001ms
rtt min/avg/max/mdev = 0.247/0.668/1.452/0.555 ms
[root@apm ~]#
```

6. Change to the /opt/ibm/wlp/usr/shared/config folder.



7. Display the contents of the file **IdapRegistry.xml** by using the gedit editor.

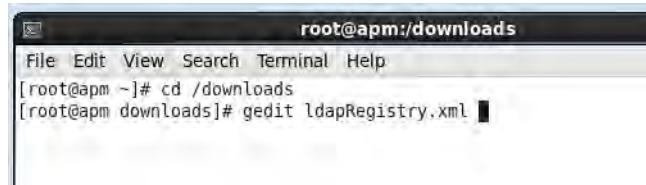


```
File Edit View Search Tools Documents Help
Open Save Undo
IdapRegistry.xml (/opt/ibm/wlp/usr/shared/config) - gedit
<server>
    <ldapRegistry id="IBM_DIRECTORY_SERVER_LDAP" realm="SampleLdapIDSRealm"
        host="127.0.0.1" port="389" ignoreCase="true"
        baseDN="o=ibm,c=us">
        <ldapType>IBM Tivoli Directory Server</ldapType>
        <searchTimeout>1s</searchTimeout>
        <connectTimeout>2m</connectTimeout>
        <reuseConnection>true</reuseConnection>
        <bindDN>cn=root</bindDN>
        <bindPassword>{aes}APDE9uYbf4IaFeuqr4Ku91sTn/NsZr97dKr4+h45j00m</bindPassword>
        <idsFilters>
            <userFilter>(uid=%v)(objectClass=inetOrgPerson)</userFilter>
            <groupFilter>(&(|(cn=%v)((|(objectClass=groupOfNames)(objectClass=groupOfUniqueNames)(objectClass=groupOfURLs))))</groupFilter>
            <userIdMap>:uid</userIdMap>
            <groupIdMap>*:cn</groupIdMap>
            <groupMemberIdMap>ibm-allGroups:member;ibm-allGroups:uniqueMember:groupOfNames:member;groupOfUniqueNames:uniqueMember</groupMemberIdMap>
        </idsFilters>
    </ldapRegistry>
</server>
```

8. Observe that defaults are provided for several key items, but they do not match your environment:

- LDAP host IP address
- realm name
- baseDN name
- bindDN name

9. In another terminal window, display the contents of the provided **ldapRegistry.xml** file in the **/downloads** directory by using the gedit editor.



10. Observe that there these fields are set to match your LDAP, which runs on the ITM VM.

- LDAP host IP address
- realm name
- baseDN name
- bindDN name

```

<server>
  <ldapRegistry id="IBMDirectoryServerLDAP" realm="APMRealm"
    host="192.168.1.181" port="389" ignoreCase="true"
    baseDN="cn=APMRealm,ou=admins,o=ibm,c=edu"
    ldapType="IBM Tivoli Directory Server"
    searchTimeout="1m"
    connectTimeout="2m"
    reuseConnection="true"
    bindDN="cn=root" bindPassword="{xor}MD010jwrb28=>">
    <idsFilters>
      userFilter="(&uid=%v)(objectclass/inetOrgPerson)"
      groupFilter="(&cn=%v)(|(objectclass/groupOfNames)(objectclass/groupOfUniqueNames)(objectclass/groupOfURLs))"
      userIdMap="*:uid"
      groupIdMap="*:cn"
      groupMemberIdMap="ibm-allGroups:member;ibm-allGroups:uniqueMember;groupOfNames:member;groupOfUniqueNames:uniqueMember" />
    </contextPool enabled="false" initialSize="1" maxSize="0" timeout="0ms" waitTime="3000ms" preferredSize="3"/>
  </ldapRegistry>
</server>

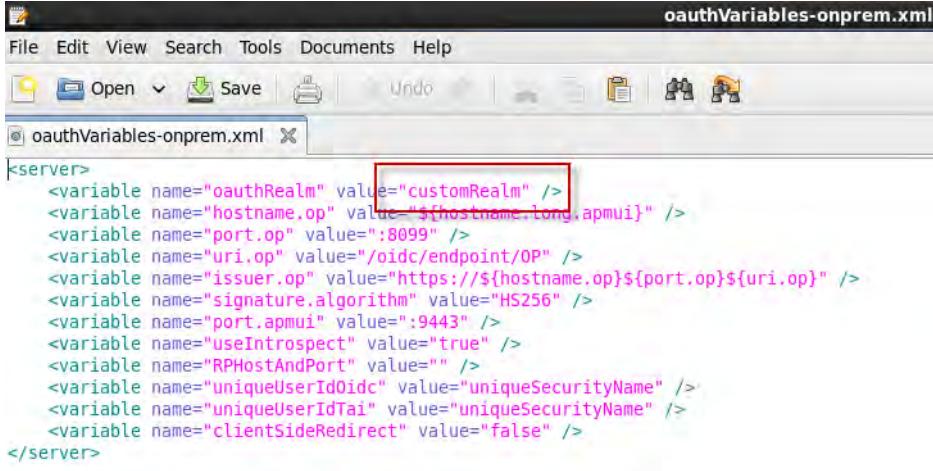
```

11. Close the gedit editor.

12. Make a backup of the **ldapRegistry.xml** file in the **/opt/ibm/wlp/usr/shared/config** folder, and copy the **ldapRegistry.xml** file from the **/downloads** folder to **/opt/ibm/wlp/usr/shared/config** folder.



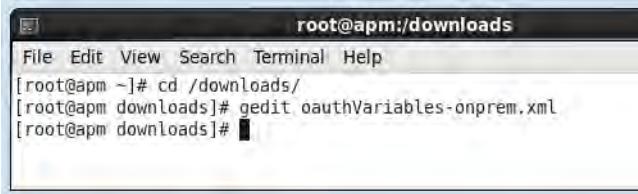
13. Display the contents of the file **oauthVariables-onprem.xml** by using the gedit editor.



```
<server>
<variable name="oauthRealm" value="customRealm" />
<variable name="hostname.op" value="${hostname.long.apmui}" />
<variable name="port.op" value=":8099" />
<variable name="uri.op" value="/oidc/endpoint/OP" />
<variable name="issuer.op" value="https://${hostname.op}${port.op}${uri.op}" />
<variable name="signature.algorithm" value="HS256" />
<variable name="port.apmui" value=":9443" />
<variable name="useIntrospect" value="true" />
<variable name="RPHostAndPort" value="" />
<variable name="uniqueUserIdOidc" value="uniqueSecurityName" />
<variable name="uniqueUserIdTai" value="uniqueSecurityName" />
<variable name="clientSideRedirect" value="false" />
</server>
```

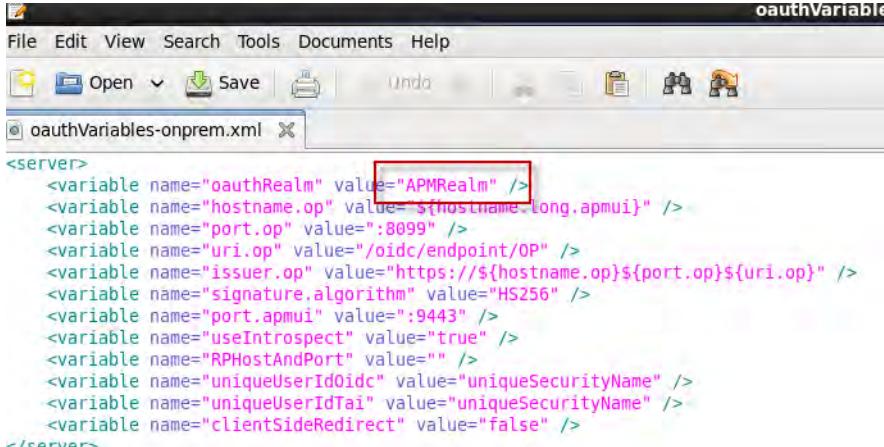
Observe that the value for "oauthRealm" is "customRealm" and this does not match the value in your LDAP of APRealm.

14. Display the contents of the provided **oauthVariables-onprem.xml** file in the **/downloads** directory by using the gedit editor.



```
root@apm:/downloads
File Edit View Search Terminal Help
[root@apm ~]# cd /downloads/
[root@apm downloads]# gedit oauthVariables-onprem.xml
[root@apm downloads]#
```

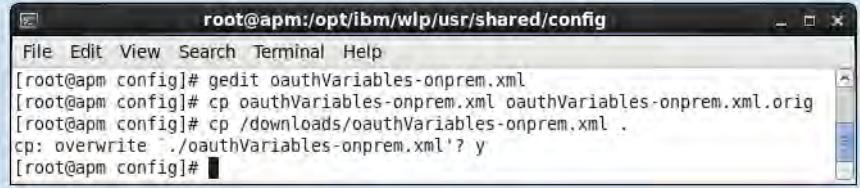
Observe that the realm value in the first stanza is set to match the realm name in your LDAP, which runs on the ITM VM.



```
<server>
<variable name="oauthRealm" value="APMRealm" />
<variable name="hostname.op" value="${hostname.long.apmui}" />
<variable name="port.op" value=":8099" />
<variable name="uri.op" value="/oidc/endpoint/OP" />
<variable name="issuer.op" value="https://${hostname.op}${port.op}${uri.op}" />
<variable name="signature.algorithm" value="HS256" />
<variable name="port.apmui" value=":9443" />
<variable name="useIntrospect" value="true" />
<variable name="RPHostAndPort" value="" />
<variable name="uniqueUserIdOidc" value="uniqueSecurityName" />
<variable name="uniqueUserIdTai" value="uniqueSecurityName" />
<variable name="clientSideRedirect" value="false" />
</server>
```

15. Close the gedit editor.

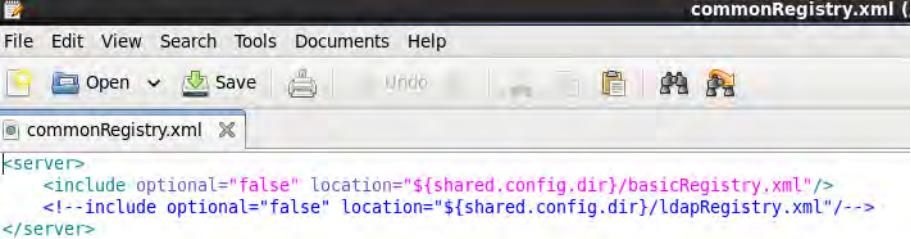
16. Make a backup of the **oauthVariables-onprem.xml** file in the **/opt/ibm/wlp/usr/shared/config** folder, and copy the **oauthVariables-onprem.xml** file from the **/downloads** folder to **/opt/ibm/wlp/usr/shared/config** folder.



```
root@apm:/opt/ibm/wlp/usr/shared/config
File Edit View Search Terminal Help
[root@apm config]# gedit oauthVariables-onprem.xml
[root@apm config]# cp oauthVariables-onprem.xml oauthVariables-onprem.xml.orig
[root@apm config]# cp /downloads/oauthVariables-onprem.xml .
cp: overwrite './oauthVariables-onprem.xml'? y
[root@apm config]#
```

Updating the commonRegistry.xml file

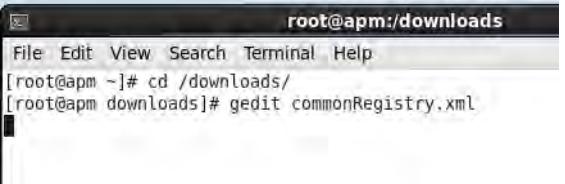
17. Display the contents of the file **commonRegistry.xml** by using the gedit editor.



```
commonRegistry.xml (
File Edit View Search Tools Documents Help
Open Save Undo
commonRegistry.xml X
<server>
  <include optional="false" location="${shared.config.dir}/basicRegistry.xml"/>
  <!--include optional="false" location="${shared.config.dir}/ldapRegistry.xml"-->
</server>
```

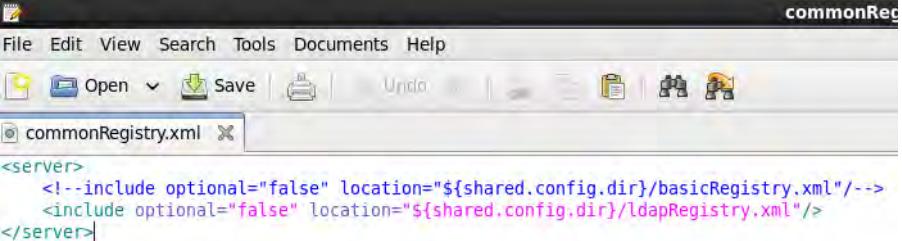
Observe the two statements. These statements show the default security settings that the Performance Management Server uses, which is using the **basicRegistry.xml** file for authentication and group definitions. The **--** string on the second statement around the **ldapRegistry.xml** file is a comment.

18. Display the contents of the provided **commonRegistry.xml** file in the **/downloads** directory by using the gedit editor.



```
root@apm:/downloads
File Edit View Search Terminal Help
[root@apm ~]# cd /downloads/
[root@apm downloads]# gedit commonRegistry.xml
```

Observe that the values are set to use LDAP authentication instead of the basic registry.



```
commonReg
File Edit View Search Tools Documents Help
Open Save Undo
commonRegistry.xml X
<server>
  <!--include optional="false" location="${shared.config.dir}/basicRegistry.xml"-->
  <include optional="false" location="${shared.config.dir}/ldapRegistry.xml"/>
</server>
```

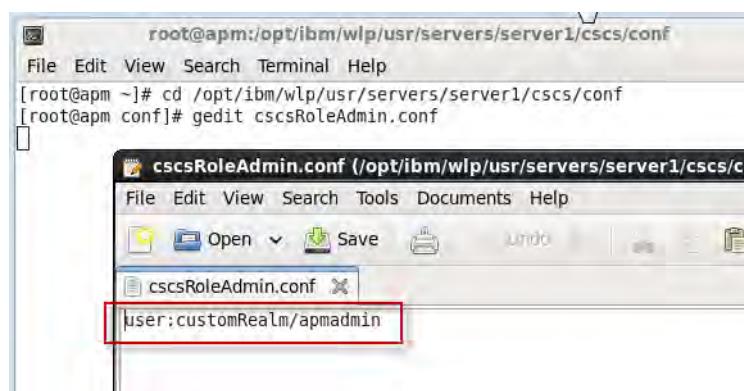
19. Close the gedit editor.
20. Make a backup of the **commonRegistry.xml** file in the **/opt/ibm/wlp/usr/shared/config** folder, and copy the **commonRegistry.xml** file from the **/downloads** folder to **/opt/ibm/wlp/usr/shared/config** folder.

```
root@apm:/opt/ibm/wlp/usr/shared/config
File Edit View Search Terminal Help
[root@apm config]# gedit oauthVariables-onprem.xml
[root@apm config]# cp oauthVariables-onprem.xml oauthVariables-onprem.xml.orig
[root@apm config]# cp /downloads/oauthVariables-onprem.xml .
cp: overwrite './oauthVariables-onprem.xml'? y
[root@apm config]#
```

Changing the default apmadmin user

The default user for Performance Management is **apmadmin**, and the default realm is **customRealm**. By default, **apmadmin** has the Role Administrator role. This default user is defined in the **basicRegistry.xml** file in the **/opt/ibm/wlp/usr/shared/config** folder. You must change the default user for one of the following reasons because you are changing user authentication from basic registry to LDAP.

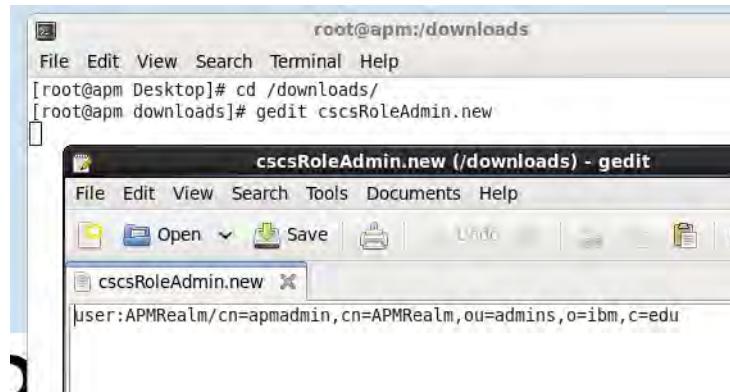
21. Change to the **/opt/ibm/wlp/usr/servers/server1/cscs/conf** directory.
22. Display the contents of the file **cscsRoleAdmin.conf** by using the **gedit** command.



Observe that the user ID and the realm do not match the baseDN entry from step [Step 10](#) on page 92.

23. Create a backup of the **cscsRoleAdmin.conf** file in this directory called **cscsRoleAdmin.conf.orig**.

24. Display the contents of the provided **cscsRoleAdmin.new** file in the **/downloads** directory by using the gedit editor.

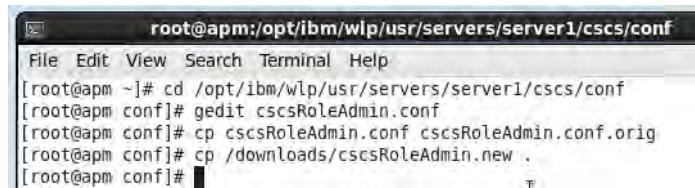


```
root@apm:downloads
File Edit View Search Terminal Help
[root@apm Desktop]# cd /downloads/
[root@apm downloads]# gedit cscsRoleAdmin.new

cscsRoleAdmin.new (/downloads) - gedit
File Edit View Search Tools Documents Help
Open Save Undo Redo Cut Copy Paste
cscsRoleAdmin.new X
user:APMRealm/cn=apmadmin,cn=APMRealm,ou=admins,o=ibm,c=edu
```

Observe how the realm and common name (cn) entries match the settings [Step 10](#) on page 92.

25. Copy the **cscsRoleAdmin.new** file from the **/downloads** folder to the **/opt/ibm/wlp/usr/servers/server1/cscs/conf** folder.

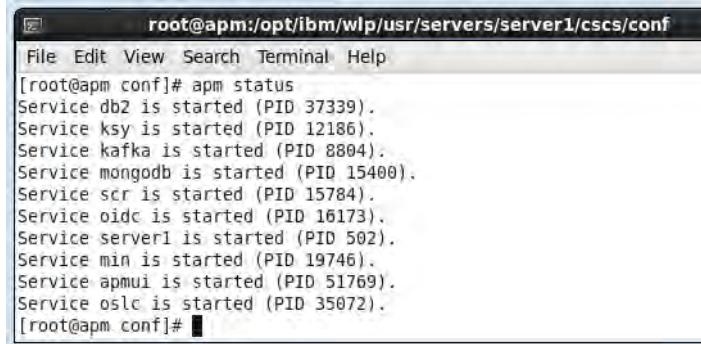


```
root@apm:/opt/ibm/wlp/usr/servers/server1/cscs/conf
File Edit View Search Terminal Help
[root@apm ~]# cd /opt/ibm/wlp/usr/servers/server1/cscs/conf
[root@apm conf]# gedit cscsRoleAdmin.conf
[root@apm conf]# cp cscsRoleAdmin.conf cscsRoleAdmin.conf.orig
[root@apm conf]# cp /downloads/cscsRoleAdmin.new .
[root@apm conf]#
```

 **Note:** Do not replace the **cscsRoleAdmin.conf** file. You made a backup of the **cscsRoleAdmin.conf** file in case you need to reset the Performance Management Server to use the **basicRegistry.xml** file. After the Performance Management Server is recycled, the **cscsRoleAdmin.new** file replaces the **cscsRoleAdmin.conf** file.

26. From a terminal window, issue the **apm status** command to list the status of all the components of the Performance Management Server.

apm status



```
root@apm:/opt/ibm/wlp/usr/servers/server1/cscs/conf
File Edit View Search Terminal Help
[root@apm conf]# apm status
Service db2 is started (PID 37339).
Service ksy is started (PID 12186).
Service kafka is started (PID 8804).
Service mongodb is started (PID 15400).
Service scr is started (PID 15784).
Service oidc is started (PID 16173).
Service server1 is started (PID 502).
Service min is started (PID 19746).
Service apmui is started (PID 51769).
Service oslc is started (PID 35072).
[root@apm conf]#
```

27. Stop all of the Performance Management Server services.

```
apm stop_all
```

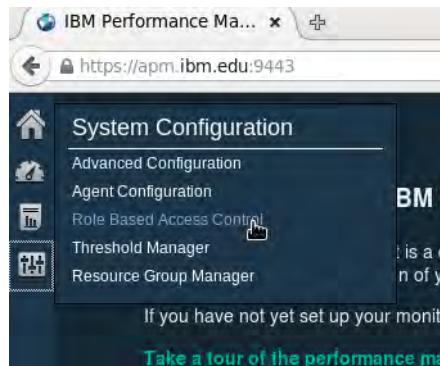
28. Restart all of the Performance Management Server services.

```
apm start_all
```

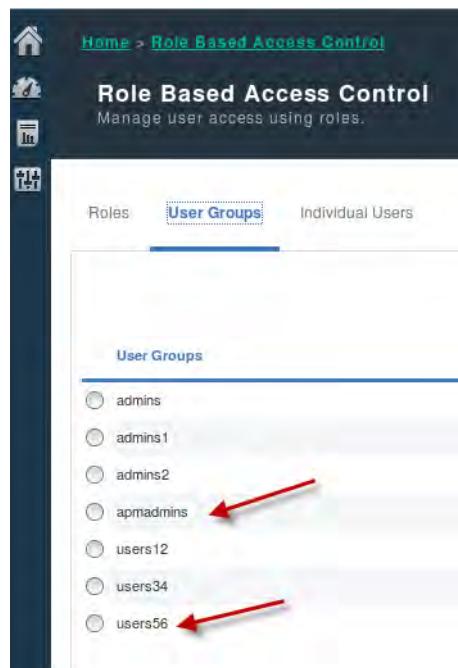
29. Close the Firefox browser, if it was open from a prior exercise.

30. Log in to the Performance Management Console with a user ID of **apmadmin** and a password of **object00**.

31. Return to the Performance Management console and log in. Click **System Configuration > Role Based Access Control**.



32. Observe the contents of the **User Groups** tab and see that you added two groups that are not in the **basicRegistry.xml** file, but are defined in LDAP.

A screenshot of the "Role Based Access Control" interface. The title bar says "Home > Role Based Access Control". The main content area has tabs: Roles, User Groups (which is selected and highlighted in blue), and Individual Users. Below the tabs, there is a section titled "User Groups" with a list of groups. The groups listed are: admins, admins1, admins2, apmadmins (with a red arrow pointing to it), users12, users34, and users56 (with another red arrow pointing to it). The "apmadmins" and "users56" entries are the ones that were added via LDAP.

33. Observe the contents of the **Individual Users** tab and see that you added two user IDs that are not in the **basicRegistry.xml** file, but are defined in LDAP.

The screenshot shows the 'Role Based Access Control' interface with the 'Individual Users' tab selected. The list of users is as follows:

- apmadmin (selected)
- apmadmin1
- apmadmin2
- apmuser1
- apmuser2
- apmuser3
- apmuser4
- apmuser5
- apmuser6

Two red arrows point to the entries for 'apmuser5' and 'apmuser6', highlighting them as new additions.

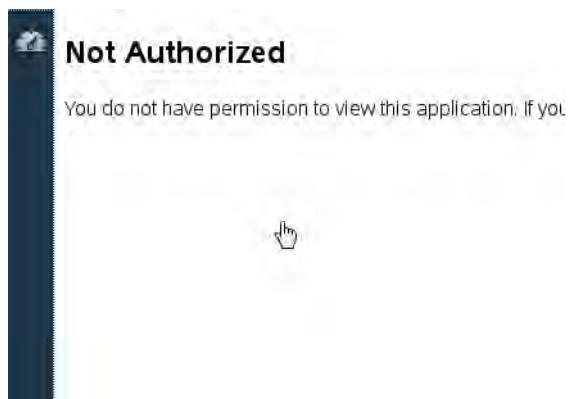
Impact on user IDs

The movement of access definitions from remaining steps for this exercise guide you through accessing the Performance Management console with different user IDs. You also see the impact on what your user ID can access. You update the roles from the **apmadmin** user ID on the APM VM. You test various user IDs on the LIN1 VM.

34. Log in with **apmadmin1** user ID on the LIN1 VM with these steps:

- On the LIN1 VM, open the Firefox browser to this URL:
<https://apm.ibm.edu:9443>
- Instead of using the **apmadmin** login, use **apmadmin1** to log in, with a password of **object00**.

The following screen capture shows the expected result:



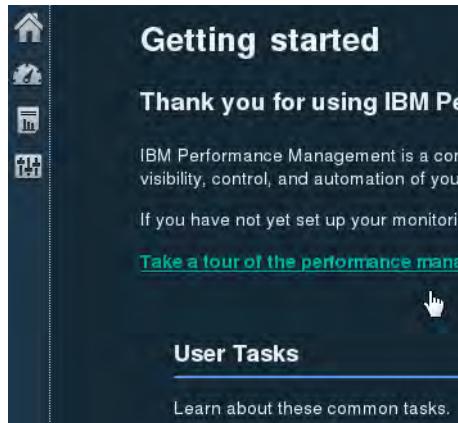
Note: You receive this result because even though **apmadmin1** is a valid user and was working earlier, the user does not have any permissions or roles in the Performance Management Server. The realm was changed to APMRealm when you changed to using LDAP.

35. On the APM VM in Firefox, return to the Performance Management console. Click **System Configuration > Role Based Access Control**, and click **Individual Users**.
36. Click **apmadmin1**, and click the Edit icon as shown:

A screenshot of the "Role Based Access Control" interface in a Mozilla Firefox browser. The URL is https://apm.ibm.edu:9443/#com.ibm.smai.rbac.ui_rt. The "Individual Users" tab is selected. A red arrow points to the "Edit" icon next to the "apmadmin1" user entry. Another red arrow points to the "Filter" input field at the top right of the user list table.

User	Roles
apmadmin	Monitoring Administrator, Monitoring User, Role Administrator, System Administrator
apmadmin1	(highlighted with a blue bar)
apmadmin2	
apmuser1	
apmuser2	
apmuser3	
apmuser4	
apmuser5	
apmuser6	

37. Observe that **apmadmin1** currently has no roles. Select the roles **Monitoring Administrator** and **Role Administrator**. Scroll down and click **Save**. Click **Close**.
38. Return to the Firefox browser on the LIN1 VM. Click the Refresh icon in the browser.
39. Confirm that **apmadmin1** user ID has the rights to be a Monitoring and Role Administrator.



Optional: You could use the same steps to reapply user authority for **apmadmin2**, **apmuser1**, and **apmuser3**. These user IDs are not used for future exercises.



4 Managing events and thresholds exercises

In these exercises, you learn the relationship between thresholds and events. You create thresholds that test for simple and multiple conditions. You create thresholds that run commands to solve the issue it detected. You adjust resource groups and learn the impact of these adjustments on thresholds and events.

Exercise 1 Installing an operating system agent

To work with resource groups, you must have at least two agents of a managed system type. In this exercise, you install a Monitoring Agent for Linux OS so that when you start the exercise on resource groups, you have a second managed system for the Monitoring Agent for Linux OS. You already installed this agent on the LIN1 server.

Installation of agents on one operating system is similar to the next. This exercise guides you through installing the Monitoring Agent for Linux OS.

1. On virtual machine APM, open a Gnome terminal window.



2. Change to the /downloads folder, change to the subfolder called **IM813**. Change to the **/downloads/IM813** folder, create a folder that is called **IMagent**, and change to the **/downloads/IM813/IMagent** folder.

```
root@apm:/downloads/IM813/IMagent
File Edit View Search Terminal Help
[root@apm ~]# cd /downloads/
[root@apm downloads]# cd IM813
[root@apm IM813]# mkdir IMagent
[root@apm IM813]# cd IMagent/
[root@apm IMagent]#
```

3. From the depot that is at **/opt/ibm/ccm/depot**, copy the preconfigured Linux agent file that is called **ipm_monitoring_agent_xlinux_8.1.3.tar** to the **/downloads/IM813/IM/agent** directory.

```
cp /opt/ibm/ccm/depot/ipm_monitoring_agent_xlinux_8.1.3.tar .
```

```
[root@apm ~]# cd /downloads/
[root@apm downloads]# cd IM813
[root@apm IM813]# mkdir IMagent
[root@apm IM813]# cd IMagent/
[root@apm IMagent]# cp /opt/ibm/ccm/depot/ipm_monitoring_agent_xlinux_8.1.3.tar .
```

4. List the contents of the current directory.

```
[root@apm IM813]# mkdir IMagent
[root@apm IM813]# cd IMagent/
[root@apm IMagent]# cp /opt/ibm/ccm/depot/ipm_monitoring_agent_xlinux_8.1.3.tar .
[root@apm IMagent]# ls
ipm_monitoring_agent_xlinux_8.1.3.tar
[root@apm IMagent]#
```

5. Extract the file **ipm_monitoring_agent_xlinux_8.1.3.tar**.

```
tar -xvf ipm_monitoring_agent_xlinux_8.1.3.tar
```

6. Change to the directory **/downloads/IM813/IMagent/APM_Agent_Install_8.1.3**

7. Run the command **./installAPMAgents.sh**.

8. Select **1** to install the Monitoring Agent for Linux OS.

9. Press Enter to confirm your selection.

10. Press Enter to confirm the agent home of **/opt/ibm/apm/agent**.

11. Select **1** to accept the license agreement.

The agent installation takes approximately 5 minutes. It takes several minutes for the agent you installed to show in the Performance Management console. Do not wait for it. Proceed to the next exercise.

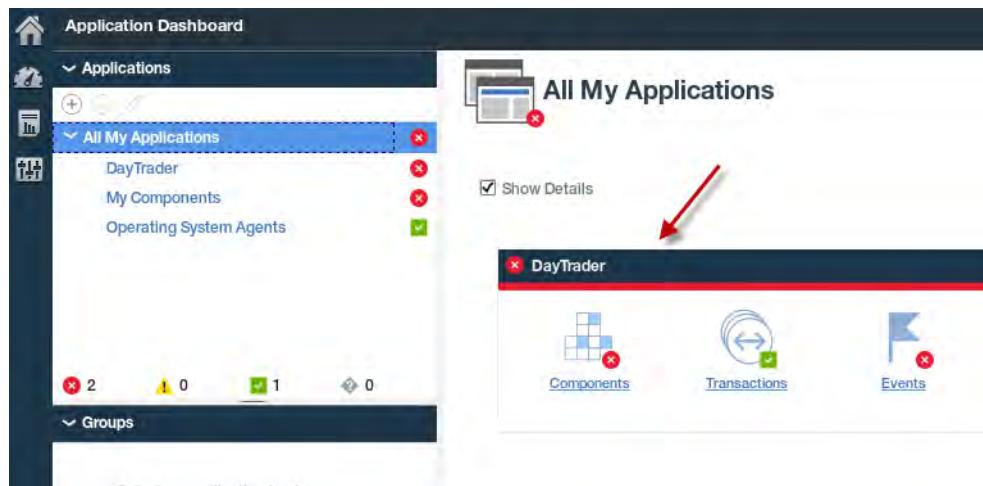


Note: You just installed an IBM Monitoring agent on the same server that has an IBM Tivoli Monitoring Agent. This capability is referred to as agent coexistence.

Exercise 2 Stopping all product-provided thresholds from running

Sometimes, thresholds indicate that there are issues with systems but everything is running as expected. In these cases, you can stop a threshold from sending events to the Performance Management Server.

1. Open the performance management console if you are not already logged in from the APM server by using Firefox to open the web page:
<https://apm.ibm.edu:9443>
2. Open the Application Dashboard, and observe that there might be a red indicator on the DayTrader application.
3. If there is a critical event, select the Events icon in the DayTrader application.

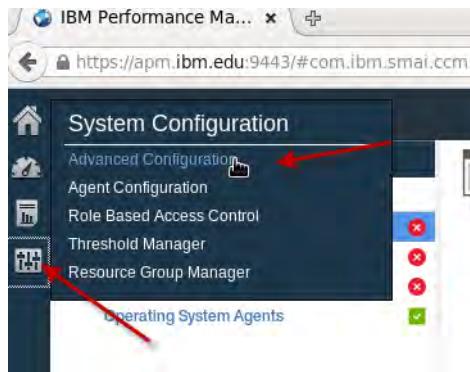


4. Click **Events**. Observe the event with a Critical severity. This is a product-provided threshold. You disable the threshold by continuing the steps in this exercise.

4 Managing events and thresholds exercises

Exercise 2 Stopping all product-provided thresholds from running

5. Click **System Configuration > Advanced Configuration** to open the advanced configuration setting dialog.



6. Select **Threshold Enablement > Select Option**.

A screenshot of the 'Advanced Configuration' page. The left sidebar shows 'Configuration Categories' including UI Integration, Event Manager, MongoDB Configuration, Agent Central Configuration, Data Mart, Hybrid Gateway, Kafka Configuration, Tracking Analytics Service, Agent Subscription Facility, and Thresholds Enablement (highlighted with a red arrow). The main panel is titled 'Parameters' with the sub-instruction 'Configuration for enablement of predefined best practice thresholds.' It contains a 'Choose action to define policy for predefined best practice thresholds' field with a question mark icon and a 'Select option' dropdown menu. The 'Select option' menu is open, showing 'Select option' and 'Disable All' (highlighted with a red arrow). A 'Save' button is at the bottom right.

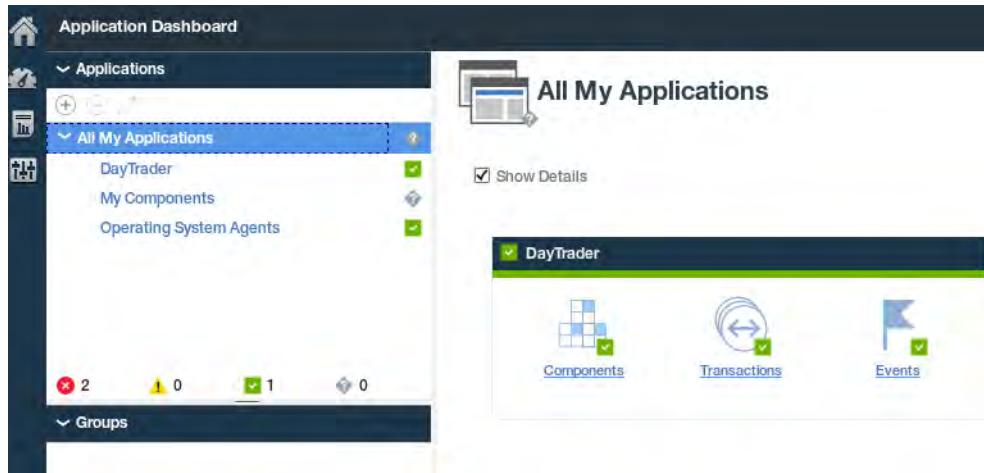
7. Click **Disable All**.

A screenshot of the 'Parameters' configuration page. The left sidebar shows 'Configuration Categories' including UI Integration, Event Manager, MongoDB Configuration, Agent Central Configuration, Data Mart, Hybrid Gateway, Kafka Configuration, Tracking Analytics Service, Agent Subscription Facility, and Thresholds Enablement. The main panel is titled 'Parameters' with the sub-instruction 'Configuration for enablement of predefined best practice thresholds.' It contains a 'Choose action to define policy for predefined best practice thresholds' field with a question mark icon and a 'Select option' dropdown menu. The 'Select option' menu is open, showing 'Select option' and 'Disable All' (highlighted with a red arrow).

8. Click **Save**. Click **Close**.

It can take 5 minutes for this update to show. Thresholds are updated at the agent only when the agent pulls down the new updates, and this interval is 5 minutes.

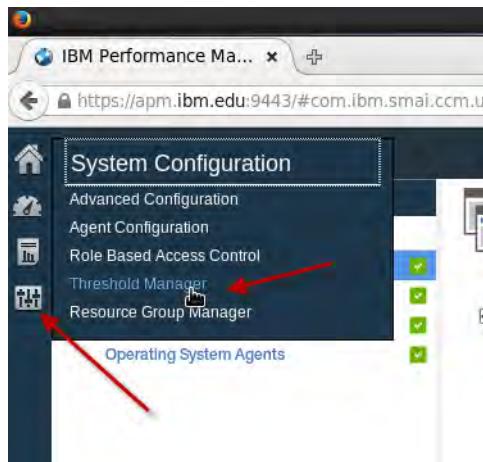
9. Go to the next exercise and validate this event when it is closed later. When the event clears, the DayTrader application has a normal status.



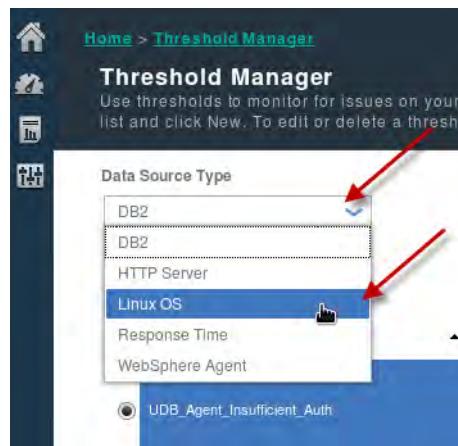
Exercise 3 Changing a threshold

This exercise guides you through the steps to update an existing threshold to change the condition.

1. Click **System Configuration > Threshold Manager** to open the Threshold Manager.



2. Select **Linux OS** from the **Data Source Type** list.



3. Click **Linux_Disk_Space_Low** and click **Edit**.

The screenshot shows a list of data source types under 'Data Source Type'. The 'Linux OS' option is selected. A red arrow points to the 'Edit' button next to 'Linux_Disk_Space_Low'. Another red arrow points to the row for 'Linux_Disk_Space_Low', which is highlighted with a blue selection bar.

Name	Description
Linux_BP_SpaceUsedPct_Critical	Monitors all mounted percentage. Opens if usage is higher than 99%.
Linux_CPU_Utilization_High	The percentage of CPU usage is higher than 90%.
Linux_CPU_Utilization_High_Warn	The percentage of CPU usage is between 80% and lower than 90%.
Linux_Disk_Space_Low	Disk free space is between 10% and 20%.
Linux_Fragmented_File_System	The percentage of fragmented files is high.
Linux_Mem_Utilization_High_Crit	The percentage of memory usage is higher than 99%.

4. Change the Interval from **5 minutes** to **30 seconds**.

The screenshot shows the configuration details for 'Linux_Disk_Space_Low'. The 'Name' is set to 'Linux_Disk_Space_Low' and the 'Description' is 'Disk free space is between 10% and 20%.' A red arrow points to the 'Interval (HHMMSS)' field, which is currently set to '00 0 30'. The 'Severity' is set to 'Warning'.

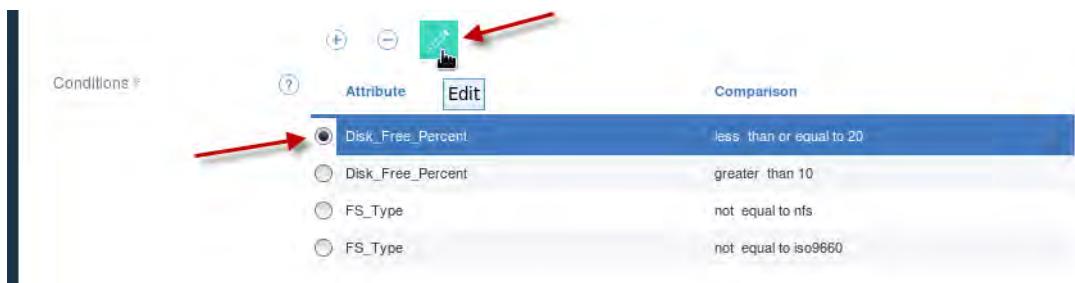
Name	Linux_Disk_Space_Low
Description	Disk free space is between 10% and 20%.
Severity	Warning
Interval (HHMMSS)	00 0 30
Required consecutive samples	1
Data set	KCA LZ Agent Active Runtime Status KCA LZ Agent Availability Management Status

5. Change the Description from **Disk free space is between 10% and 20%** to **Disk free space is less than 99%**.

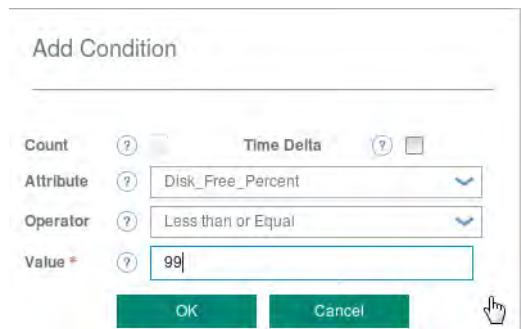
The screenshot shows the configuration details for 'Linux_Disk_Space_Low'. The 'Name' is set to 'Linux_Disk_Space_Low' and the 'Description' is 'Disk free space is less than 99%.' A red arrow points to the 'Description' field. The 'Severity' is set to 'Warning' and the 'Interval (HHMMSS)' is '00 05 00'. The 'Required consecutive samples' is '1'.

Name	Linux_Disk_Space_Low
Description	Disk free space is less than 99%.
Severity	Warning
Interval (HHMMSS)	00 05 00
Required consecutive samples	1

6. Scroll down and change the first condition for the attribute **Disk_Free_Percent** from **less than or equal to 20** to **less than 99**.
- Click **Disk_Free_Percent** and click **Edit**.



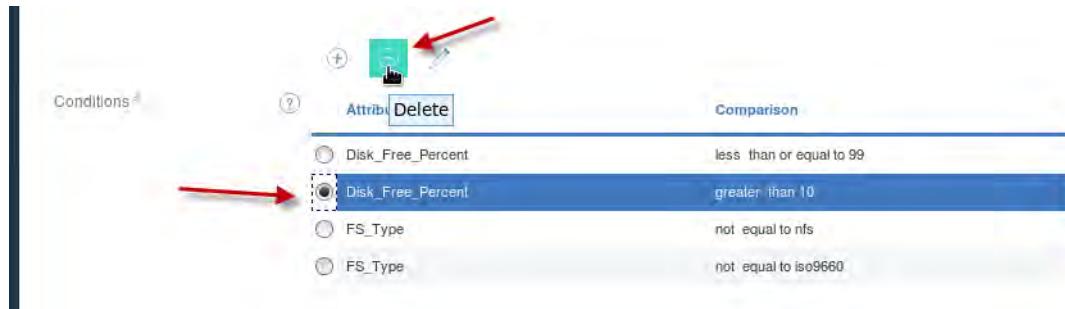
- Change the **Value** field from **20** to **99**.



- Click **OK**.

7. Delete the second Disk_Free_Percent condition.

- Click the second **Disk_Free_Percent** and click **Delete**.



Note: This artificially high value is just an example to exercise the tool and force a threshold to create an event.

8. Select **Linux OS** under the Group Assignment.



9. Click **Save**.

10. Click **Close**.

11. Because it can take 5 minutes for this update to be shown, go to the next exercise and validate this event when it is displayed later. When the event starts, the Operating Systems Agents application has a warning status.



12. Click **Events**.

The events widget show the warning events.

Threshold Name	Status	Severity	Display Item	Source
Linux_Disk_Space_Low	Open	Warning	/dev/shm	/in1:LZ
Linux_Disk_Space_Low	Open	Warning	/	/in1:LZ
Linux_Disk_Space_Low	Open	Warning	/dev	/in1:LZ

13. Click the event that corresponds with the root (/) file system.

Threshold Name	Status	Severity	Display Item
Linux_Disk_Space_Low	Open	Warning	/dev/shm
Linux_Disk_Space_Low	Open	Warning	/
Linux_Disk_Space_Low	Open	Warning	/dev

4 Managing events and thresholds exercises

Exercise 3 Changing a threshold

14. Review the data in the event.

The screenshot shows the 'Events' tab of the 'Operating System Agents' interface. At the top, there are three colored bars: Critical (red), Warning (yellow), and Normal (green). Below them, the status summary is: Total Events: 3, Critical Events: 0, Warning Events: 3, Normal Events: 0. A legend indicates: Critical (red square), Warning (yellow square), and Normal (green square). The main table lists a single threshold:

Threshold Name	Status	Severity	Display Item	Source
Linux_Disk_Space_Low	Open	Warning	/dev/shm	lin1:LZ

A detailed view of the 'Linux_Disk_Space_Low' threshold is shown below the table. It includes fields: Node (lin1:LZ), Threshold ID, Global Timestamp (Jun 28, 2016, 1:54:37 PM), Type (Sampled), Description (Disk free space is less than 99%), and Formula (Disk Free Percent <= 99 AND File System Type != nfs AND File System Type != iso9660). The 'Node' entry 'lin1:LZ' is highlighted with a dashed box and a red arrow pointing to it.

15. Click the lin1:LZ link beside the Node entry.

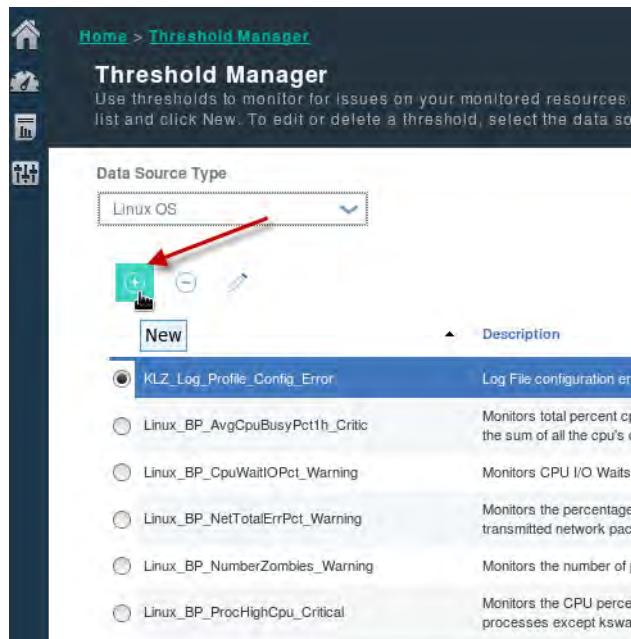
The screenshot shows the 'Events' tab of the 'Operating System Agents' interface. The threshold 'Linux_Disk_Space_Low' is selected. The 'Node' entry 'lin1:LZ' is highlighted with a dashed box and a red arrow pointing to it. A new node entry 'lin1' is also visible in the list.

Observe how you were launched to the status of the node that reported the threshold event.

Exercise 4 Creating a threshold and event

One of the formulas that is useful is the Missing formula. It detects when a selected value is not present in the selected attribute for the data set. For example, you can detect whether a critical process is no longer active on a server. In this example, you monitor the Firefox process on the LIN1 server. In reality, this process is not a critical process, but it serves as an easy example.

1. Click **System Configuration > Threshold Manager** to open the Threshold Manager.
2. Select **Linux OS** from the **Data Source Type** list, and click **New**.



3. Name this threshold **Linux_Missing_Process** and provide a description.

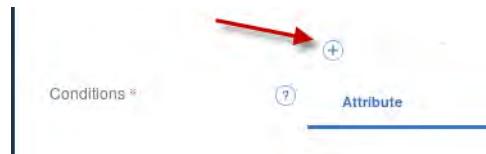
4 Managing events and thresholds exercises

Exercise 4 Creating a threshold and event

4. Select **Critical** for the severity, and set the **Interval** field to **30 seconds**. Set the **Data set** parameter to **Linux Process**. Change the display item to **Process_Command_Name**.

Name * Linux_Missing_Process
Description Search for a missing process.
Severity Critical
Interval (HHMMSS) 0 0 30
Required consecutive samples 1
Data set Linux Process
Display item Process_Command_Name
Logical operator And (&)

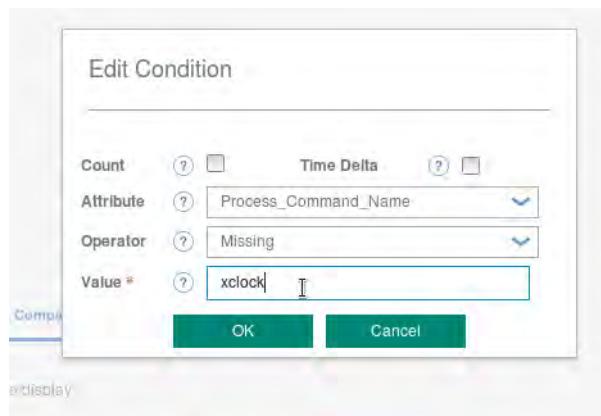
5. Click the New icon (the plus sign, +) to the right of **Conditions**.



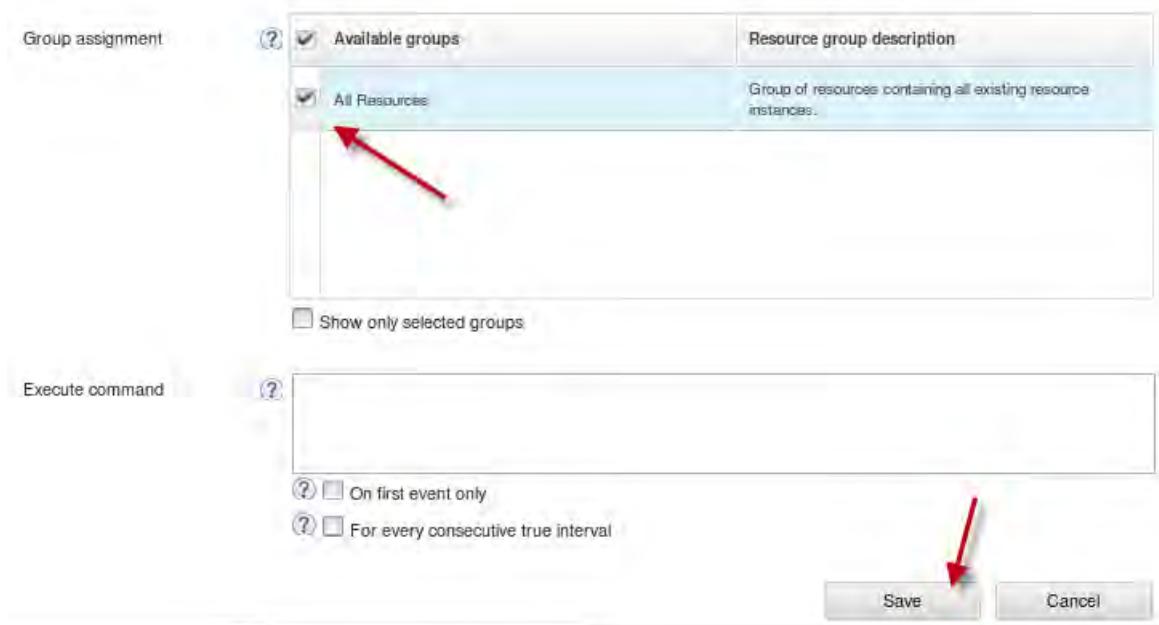
6. Select the **Process_Command_Name** for the attribute and **Missing** for the operator.

Edit Condition
Count Time Delta
Attribute Process_Command_Name
Operator Equal
Value Missing

7. For the **Value** field, enter the name of the process, **xclock**. Click **OK**.



8. Select **Linux OS** for group assignment. Click **Save**.

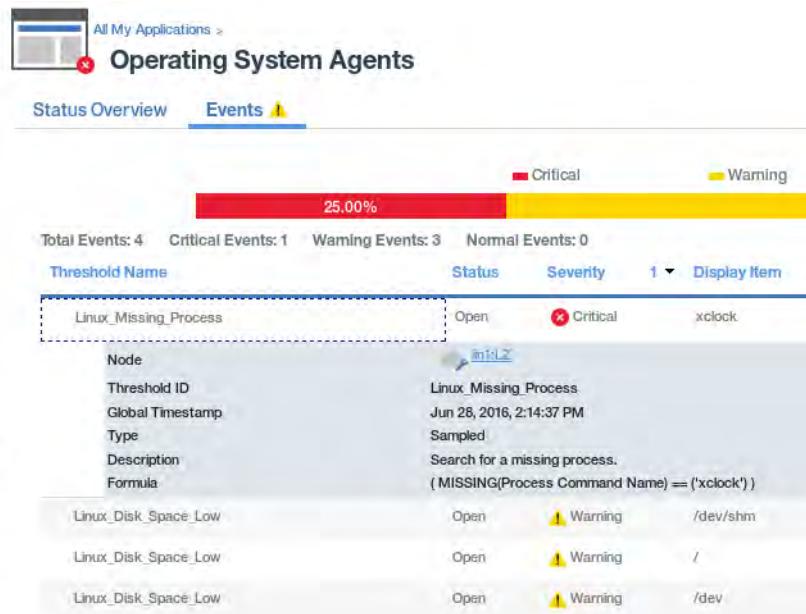


9. Click **Close**.

4 Managing events and thresholds exercises

Exercise 4 Creating a threshold and event

10. Because it can take 5 minutes for this update to show, go to the next exercise and validate this event when it is displayed later. When the event starts, the Operating Systems Agents application has a critical status, and the event shows in the **Event Status** list.



Exercise 5 Running a command from a threshold

Application Performance Management supports running a script or a command to address issues that it detects. This exercise guides you through using this powerful capability.

By now, you see the event from [Unit 4, Exercise 3](#) on page 106.

1. Adjust the threshold for **Linux_Disk_Space_Low** back to the product provided value of 20. This update closes the event.



Hint: Use the **Edit** button to update the threshold.

The screenshot shows a list of monitoring events. The 'Edit' button for the 'Linux_Disk_Space_Low' event is highlighted with a red arrow. The event details are as follows:

Name	Description
Linux_BP_SpaceUsedPct_Critical	Monitors all mounted file systems for critical percentage. Opens a critical event when usage is higher than 90%.
Linux_CPU_Utilization_High	The percentage of CPU utilization is higher than 90%.
Linux_CPU_Utilization_High_Warn	The percentage of CPU utilization is higher than 80% and lower than 90%.
Linux_Disk_Space_Low	Disk free space is less than 99%.
Linux_Fragmented_File_System	The percentage of i-nodes to used disk is high.
Linux_Mem_Utilization_High_Crit	The percentage of memory utilization is higher than 90%.

2. Edit the threshold for **Linux_Missing_Process**, and add the command to export the display and to start the utility xclock into the **Execute command** field.

```
export DISPLAY=:0.0;/usr/bin/xclock;
```

The screenshot shows the configuration for the 'Linux_Missing_Process' event. The 'Execute command' field contains the command `export DISPLAY=:0.0;/usr/bin/xclock;`. The 'For every consecutive true interval' checkbox is checked, indicated by a red arrow. Other options shown include 'On first event only' and 'Show only selected groups'.

3. Click **Save**. Click **Close**.

4. Change to the LIN1 server, and watch for the xclock application to open automatically.

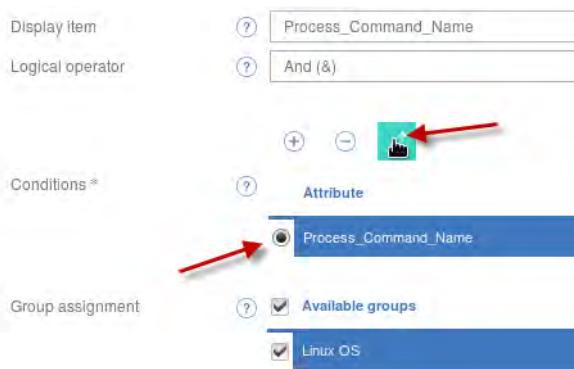


5. Return to the Performance Management Console and watch for the event **Linux_Missing_Process** to close and the **Operating_Systems_Agents** application to return to a normal status.

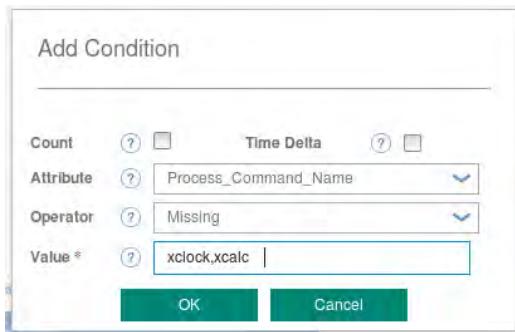
Adjusting the formula to check for multiple processes

You can have the Missing formula to check for more than one value.

6. Edit the threshold for **Linux_Missing_Process**, and adjust the Missing operator to also look for the **xcalc** process. Here are the steps:
- Open the **Linux_Missing_Process** threshold in the Threshold Manager.
 - Scroll down and click the Edit icon, which is beside **Conditions**.



- c. Change the **Value** field to **xclock,xcalc**.



Hint: Separate the two values with a comma (,).

- d. Click **OK**.
7. Remove the **Execute** command.
8. Select **Save**.
9. Select **Close**.
10. On LIN1, close out xclock and see that the threshold create the event.



Hint: The xclock application may be automatically restarted by the former version of the threshold. If so, close it out until it stays closed. The threshold is updated every 5 minutes.

11. Because it can take 5 minutes for this update to be shown, go to the next exercise and validate this event when it is displayed later. When the event starts, the Operating Systems Agents application has a critical status, and both processes that are down generate events.

Threshold Name	Status	Severity	Display Item
Linux_Missing_Process	Open	Critical	xcalc
Linux_Missing_Process	Open	Critical	xclock

12. On LIN1, start the calculator application to see the impact.

`xcalc`

13. Observe the event close for the xcalc process.

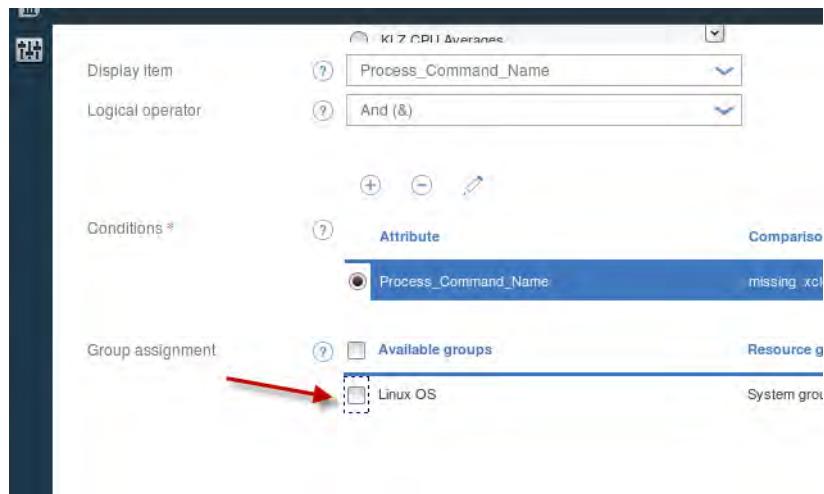
Threshold Name	Status	Severity	Display Item
Linux_Missing_Process	Open	Critical	xclock

14. Start xclock on the LIN1 server and observe the other event close.

```
xclock
```

15. After the event Linux_Missing_Process closes for both xclock and xcalc, disable the threshold from running by using these steps.

- In the Threshold editor, edit the Threshold Linux_Missing_Process.
- Clear the Group Assignment Linux OS.



- Click **Save**.
- Click **OK**.
- Click **Close**.

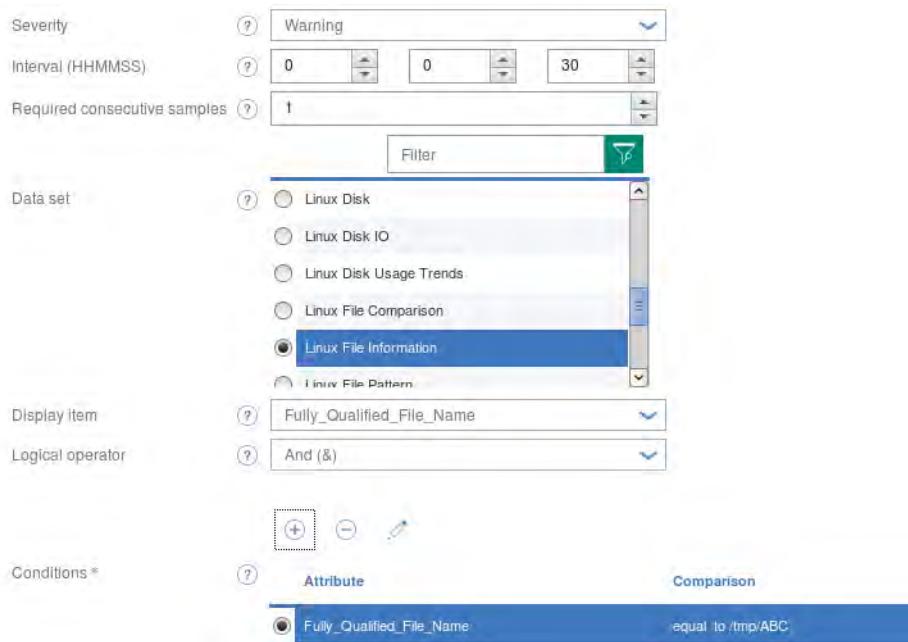
Exercise 6 Creating a threshold with multiple conditions

There are occasions when a single test on a threshold is not enough to detect an issue. Fortunately, the Threshold Manager supports multiple conditions. This exercise creates a threshold with several conditions.

1. Create the file `/tmp/ABC` on both the APM and LIN1 servers.

```
touch /tmp/ABC
```

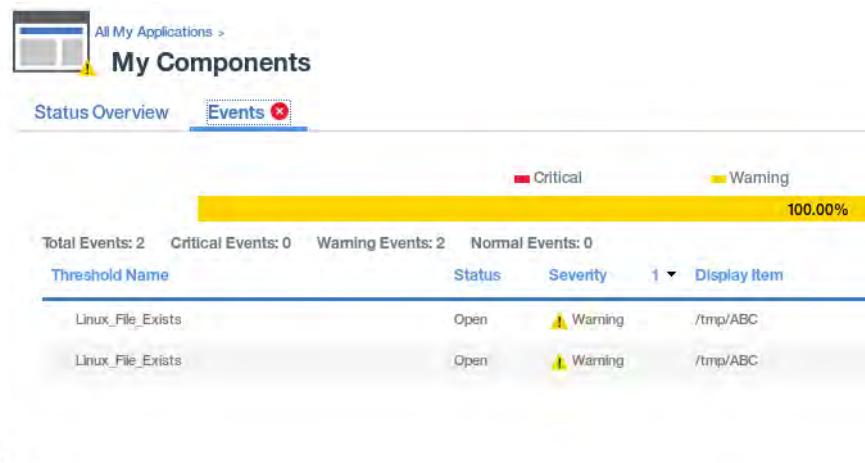
2. In the Threshold Manager, create a new threshold with a name of **Linux_File_Exists**. Have it check the interval every 30 seconds. Set the severity to **Warning**. Use the data set **Linux File Information**. Set the **Display item** field to **Fully_Qualified_File_Name**, and use the **Equal** Condition, with a value of `/tmp/ABC`.



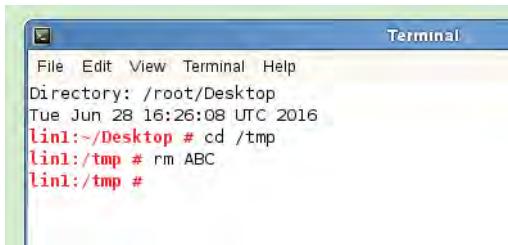
4 Managing events and thresholds exercises

Exercise 6 Creating a threshold with multiple conditions

- Set the Group Assignment to be **Linux OS**. Click **Save**. Click **Close**. Look for the events in the My Components application.

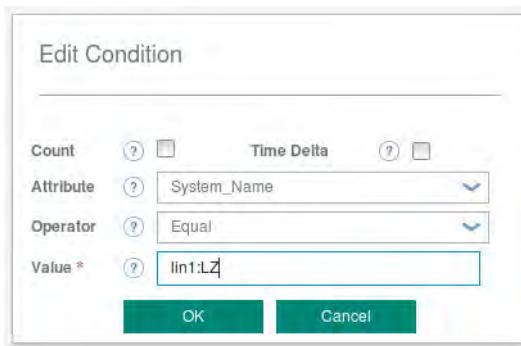


- When the threshold evaluates true and creates two events, delete the **ABC** file on the **/tmp** folder on both the APM VM and the LIN1 VM. Observe the situations close.



- Create another threshold that is called **Linux_File_Exists_2**. Use identical values to **Linux_File_Exists**.
- Modify **Linux_File_Exists_2** to add a condition to check for the **System_Name** to be **lin1:LZ**.
 - In the **Conditions** section, click the New icon and edit the condition that is shown.
 - Click **OK**.
 - Select the **System_Name** attribute.
 - Select **Equal** in the **Operator** list.

- e. Provide a value of **lin1:LZ**.



- f. Click **OK**.

- g. Confirm that your conditions look like this screen capture. Select **Linux OS** for the Group Assignment.

The screenshot shows the 'Edit Condition' dialog with the following settings:

- Data set:** Linux File Information
- Display item:** Fully_Qualified_File_Name
- Logical operator:** And (&)
- Conditions:**
 - Fully_Qualified_File_Name: equal to /tmp/ABC
 - System_Name: equal to lin1:LZ
- Group assignment:** Available groups (checked), Linux OS (selected)

- h. Click **Save**.

- i. Click **Close**.

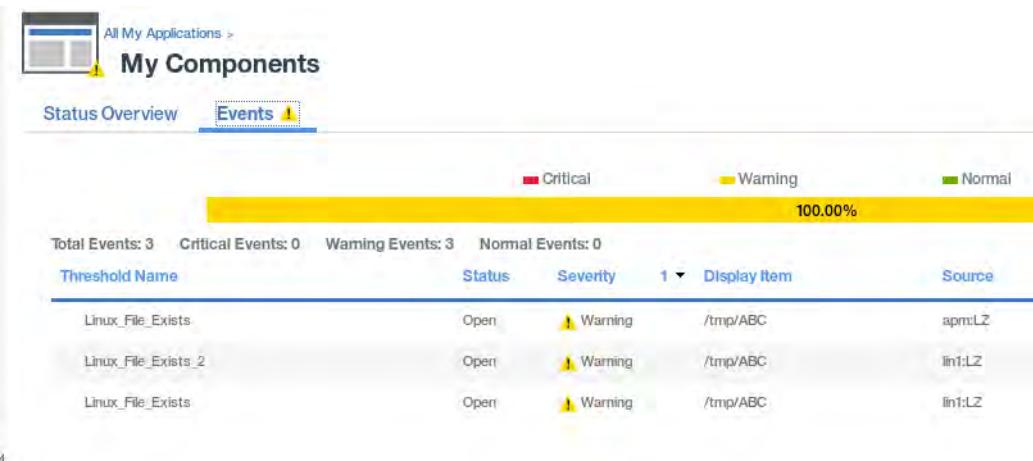
7. Create the file **/tmp/ABC** on both the APM and LIN1 servers.

```
touch /tmp/ABC
```

4 Managing events and thresholds exercises

Exercise 6 Creating a threshold with multiple conditions

After several minutes, you have three events from these two thresholds.



Exercise 7 Resource Group Management

Resource groups are named collections that can be assigned to event thresholds. You can mix different types of monitoring resources in a group; thresholds are distributed to resources of the same type.

Working with the All Resources group

1. Open the performance management console if you are not already logged in from the APM server by using Firefox to open the web page:
<https://apm.ibm.edu:9443>
2. Click **System Configuration > Resource Group Manager** to open the Resource Group Manager.



You start with a resource group name for each agent type that has connected to the Performance Management Server.

Resource group name	Resource group description	Resource group type
DB2	System group containing all DB2 resources	System Defined
HTTP Server	System group containing all HTTP Server resources.	System Defined
HTTP Server Agent	This system group contains resources of type HTTP Server Agent, but members of this group cannot be added to an application and do not have events displayed in the Performance Management console	System Defined
Linux OS	System group containing all Linux OS resources.	System Defined
Web Response Time	System group containing all Web Response Time resources.	System Defined
WebSphere Agent	This system group contains resources of type WebSphere Agent, but members of this group cannot be added to an application and do not have events displayed in the Performance Management console	System Defined
WebSphere App Server	System group containing all WebSphere App Server resources.	System Defined

- Click the **Edit** button so that you can review the settings for the DB2 resource group.

The screenshot shows the Resource Group Manager interface. At the top, there is a navigation bar with icons for Home, Resource Group Manager, and other system monitoring tools. Below the navigation bar, the title "Resource Group Manager" is displayed, followed by a brief description: "Use the Resource Group Manager to organize your monitored system members of the same resource type. To create a group, click New. To edit an existing group, click Edit." A toolbar below the title includes a plus sign icon for creating new groups and an "Edit" button, which is highlighted with a blue border. The main area lists resource groups with their descriptions:

Resource group name	Description
DB2	System group containing all DB2 resources
HTTP Server	System group containing all HTTP servers
HTTP Server Agent	This system group contains resource types that cannot be assigned to an application. To edit this group, click Edit in the toolbar above.
Linux OS	System group containing all Linux operating systems

- Observe the group name, group description, and the resource assignment. Scroll down to observe all of the resources. Observe all the thresholds.
- Open the **Linux OS** group.

The screenshot shows the Resource Group Manager interface, similar to the previous one but with the "Linux OS" group selected. The "Edit" button in the toolbar is also highlighted. The main area lists resource groups with their descriptions, and the "Linux OS" group is currently selected, indicated by a dashed selection box around its row.

Resource group name	Description
DB2	System group containing all DB2 resources
HTTP Server	System group containing all HTTP servers
HTTP Server Agent	This system group contains resource types that cannot be assigned to an application. To edit this group, click Edit in the toolbar above.
Linux OS	System group containing all Linux operating systems
Web Response Time	System group containing all Web Response Time monitors
WebSphere Agent	This system group contains resource types that cannot be assigned to an application. To edit this group, click Edit in the toolbar above.
WebSphere App Server	System group containing all WebSphere Application Server monitors

- Locate the thresholds, **Linux_File_Exists**, and **Linux_File_Exists_2** and remove them from the Linux OS group by clearing the check box indicated:

Resource assignment	Available resource	Host name	Type
apm:LZ	apm		Linux OS
lin1:LZ	lin1		Linux OS

Threshold assignment	Threshold name	Description	Type
<input type="checkbox"/> Linux_CPU_Utilization_High_Warn	Linux_CPU_Utilization_High_Warn	The percentage of CPU utilization is higher than 80% and lower than 90%.	Linux OS
<input checked="" type="checkbox"/> Linux_Disk_Space_Low	Linux_Disk_Space_Low	Disk free space is less than 20%.	Linux OS
<input type="checkbox"/> Linux_File_Exists	Linux_File_Exists		Linux OS
<input type="checkbox"/> Linux_File_Exists_2	Linux_File_Exists_2		Linux OS

Two red arrows point to the checkboxes for 'Linux_File_Exists' and 'Linux_File_Exists_2'. A cursor is hovering over the 'Linux_File_Exists_2' checkbox.

Hint: Use the **Filter** field to search on **Linux_File**.

Threshold name	Description	Type	Origin
<input type="checkbox"/> Linux_File_Exists		Linux OS	Custom
<input type="checkbox"/> Linux_File_Exists_2		Linux OS	Custom

A red arrow points from the 'Filter' field to the text 'Linux_File'.

7. Click **Save**.

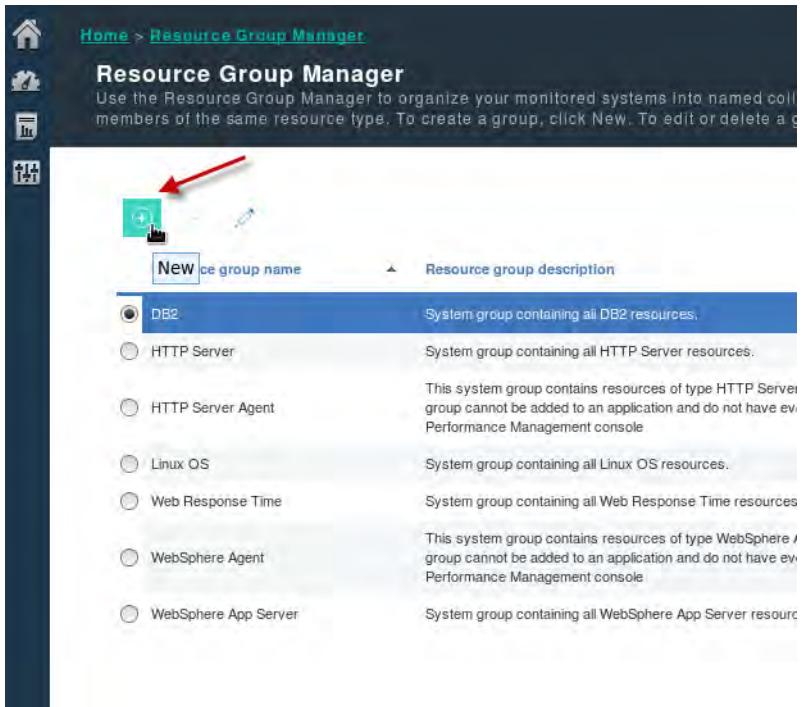
8. Click **Close**.

Because the thresholds were removed from the Resource List, the **Linux_File_Exists** and **Linux_File_Exists2** events close.

Creating a resource group

9. Open the Resource Group Manager.

10. Click the New icon.



11. Enter a Group name of **Linux_WAS_Servers**.

12. Enter a Group description of **This resource group is for Linux servers that have WebSphere Application Servers and the software that supports the application servers.**

13. Select only resources that are running on the LIN1 server.



Hint: Click the **Host name** column to sort the available resources.

- db2inst1:lin1:UD
- HU:lin1_httpd:HUS
- lin1:HU
- lin1:LZ
- in1:T5
- lin1Node01server1:lin1:KYNS
- Primary:lin1:KYNA

Available resource	Host name	Type	Source Domain
db2inst1.lin1.UD	lin1	DB2	On Premises
HU.lin1_httpd.HUS	lin1	HTTP Server	On Premises
lin1.HU	lin1	HTTP Server	On Premises
lin1.LZ	lin1	Linux OS	On Premises

Show only selected resources

14. Select all the thresholds in the **Threshold Assignment** list that pertain to Linux OS.



Hint: Select the Type column to sort by type of thresholds.

Threshold name	Description	Type	Origin
Svr_Fail_Req_Rate_High	The failed request rate in the last sampling interval is larger than 5%.	HTTP Server	Predefined
KLZ_Log_Profile_Config_Error	Log File configuration error.	Linux OS	Predefined
Linux_BP_AvgCpuBusyPct1h_Critic	Monitors total percent cpu (system + user) busy for the sum of all the cpu's on the system.	Linux OS	Predefined

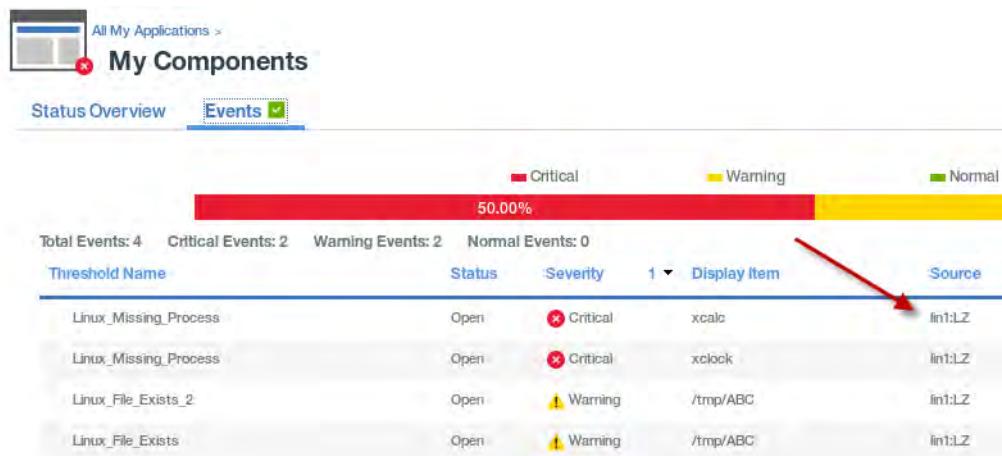
Show only selected thresholds

Save Cancel

15. Click **Save**.

16. On the LIN1 VM, close the xcalc and xclock applications.

17. Wait a few minutes and open the **Events** for My Components option.



Because the **Linux_File_Exists** and **Linux_File_Exists2** events are included in this resource list, and the Monitoring Agent for Linux OS on the LIN1 server is included in the resource list, the events return, but only on LIN1, not on the APM server.

Also, observe the events from the Linux_Missing_Process have been redistributed and are true provided you closed xclock and xcalc.



5 Integrating IBM Monitoring with other products exercises

By using agents and advanced configuration, you integrate IBM Monitoring with other products. Advanced configuration is also used for more settings.

In these exercises, you integrate IBM Monitoring with IBM Tivoli Monitoring, IBM Netcool/OMNibus, and IBM Dashboard Application Services. You also configure email notification and examine other advanced configuration options.

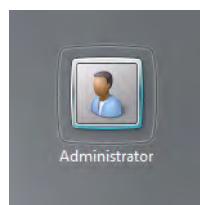
Exercise 1 Integrating with IBM Tivoli Monitoring: Hybrid Gateway

Customers need to manage both IBM Tivoli Monitoring 6.3 agents and IBM Performance Management agents. In an environment that includes both IBM Tivoli Monitoring 6.3 and IBM Performance Management products, you can install the IBM Performance Management Hybrid Gateway to provide a consolidated view of managed systems from both domains.

This exercise uses the ITM, APM, LIN1, and LIN3 VMs.

Starting the ITM VM

1. If the ITM VM is not already started, start it. This system hosts an IBM Tivoli Monitoring environment. Follow the local environment instructions.
2. Click the icon that is labeled **Administrator**. At the password prompt, enter **object00**, and press Enter.



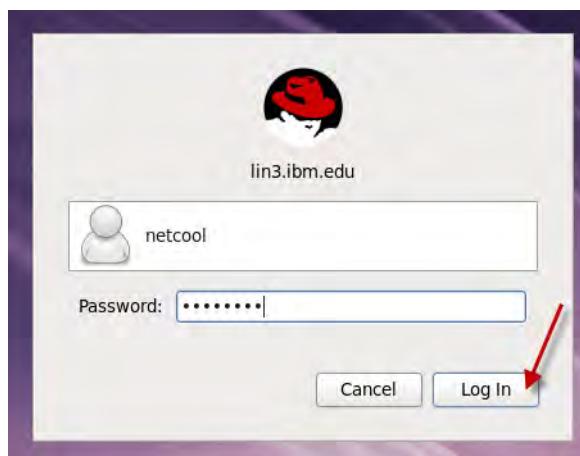
Starting the LIN3 VM

The APM VM is where IBM Performance Management 8.1.3 is already started and running. The LIN3 VM has a Netcool/OMNIbus 8.1 environment. When all of the images start and you log in to them, ping each one from its neighbors to validate network connections.

3. Start the LIN3 VM. Follow the local environment instructions.
4. Click **netcool**, which is the user ID (not **root** or **Administrator**).

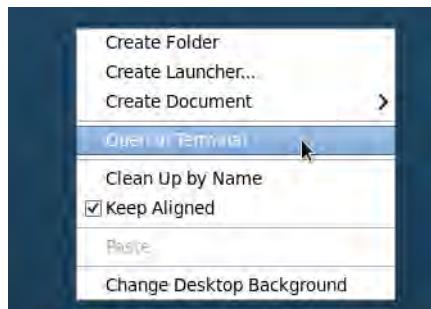


5. Enter **object00** for the password.



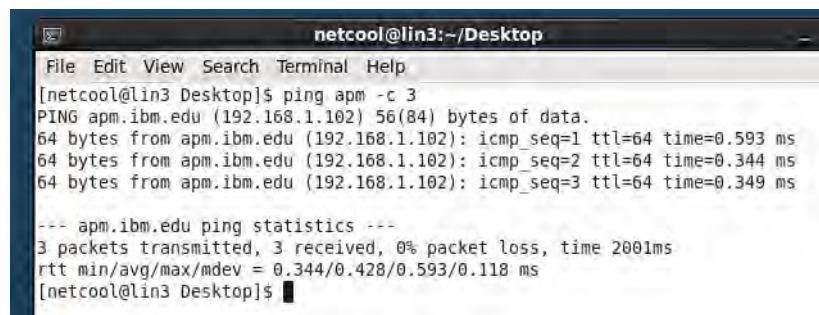
OMNIbus starts automatically.

6. On the LIN3 VM, right-click anywhere on the desktop. From the drop-down window, click **Open in Terminal**.



7. Ping the APM VM with this command:

```
ping apm -c 3
```



A terminal window titled "netcool@lin3:~/Desktop" showing the output of a ping command. The command "ping apm -c 3" is run, followed by three lines of ICMP echo replies from the host "apm.ibm.edu". Below the replies, statistics are displayed: 3 packets transmitted, 3 received, 0% packet loss, and a round-trip time of 2001ms with a minimum/average/max deviation of 0.344/0.428/0.593 ms.

```
[netcool@lin3 Desktop]$ ping apm -c 3
PING apm.ibm.edu (192.168.1.102) 56(84) bytes of data.
64 bytes from apm.ibm.edu (192.168.1.102): icmp_seq=1 ttl=64 time=0.593 ms
64 bytes from apm.ibm.edu (192.168.1.102): icmp_seq=2 ttl=64 time=0.344 ms
64 bytes from apm.ibm.edu (192.168.1.102): icmp_seq=3 ttl=64 time=0.349 ms

--- apm.ibm.edu ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2001ms
rtt min/avg/max/mdev = 0.344/0.428/0.593/0.118 ms
[netcool@lin3 Desktop]$
```

A successful ping displays 0% packet loss.

8. Notify your instructor if an image fails to start or if any of the pings are not successful.

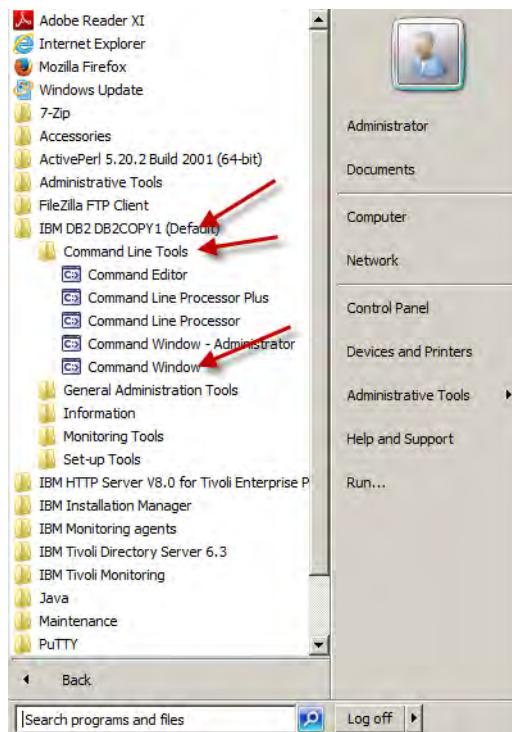
9. Ping the ITM VM with this command:

```
ping itm -c 3
```

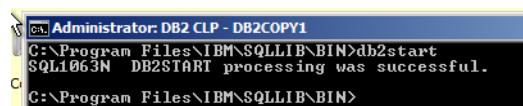
A successful ping displays 0% packet loss.

10. On the ITM VM, make sure that DB2 is started.

- a. Click **Start > All Programs > IBM DB2 DB2COPY1 (Default) > Command Line Tools > Command Window.**



- b. Run the command **db2start**.



An administrator command prompt window titled "Administrator: DB2 CLP - DB2COPY1". The command "db2start" is run, and the output shows "DB2START processing was successful." The prompt then returns to the "C:\Program Files\IBM\SQLLIB\BIN>" directory.

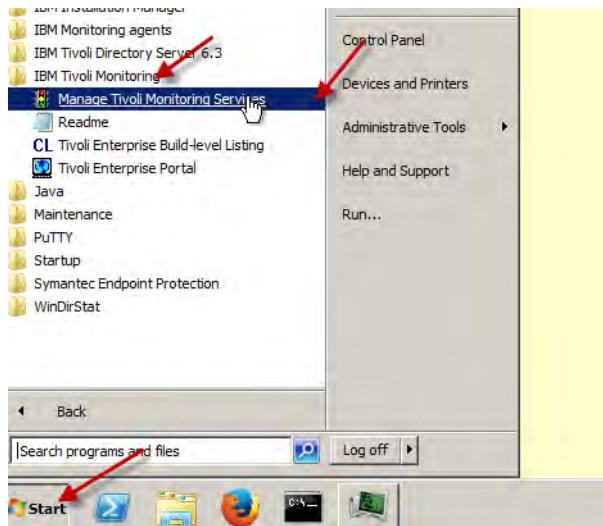
```
C:\Administrator: DB2 CLP - DB2COPY1
C:\Program Files\IBM\SQLLIB\BIN>db2start
SQL1063N DB2START processing was successful.

C:\Program Files\IBM\SQLLIB\BIN>
```

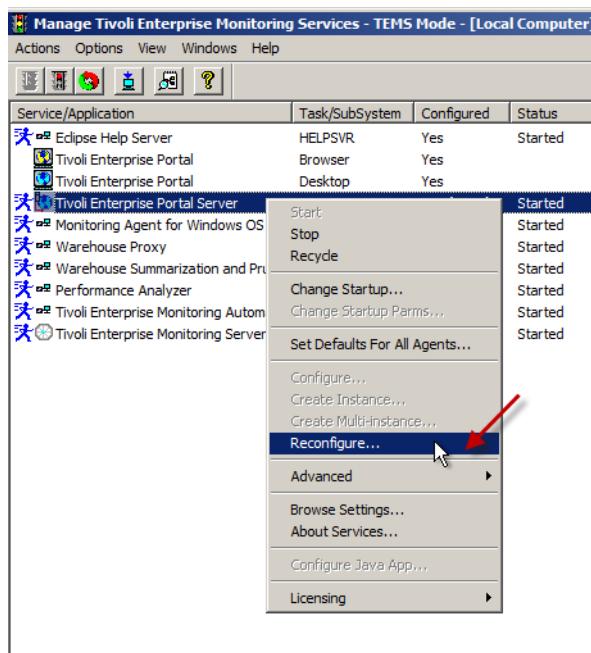


Hint: If you receive an error message that indicates DB2 is already started, you can ignore the message.

11. On the ITM VM, click **Start > All Programs > IBM Tivoli Monitoring > Manage Tivoli Monitoring Services.**



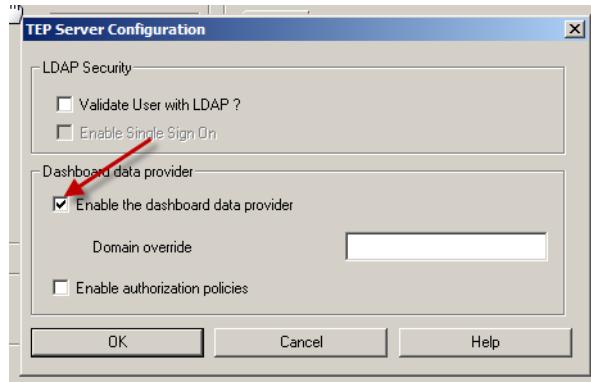
12. Highlight the Tivoli Enterprise Portal Server service. Right-click and select **Reconfigure**.



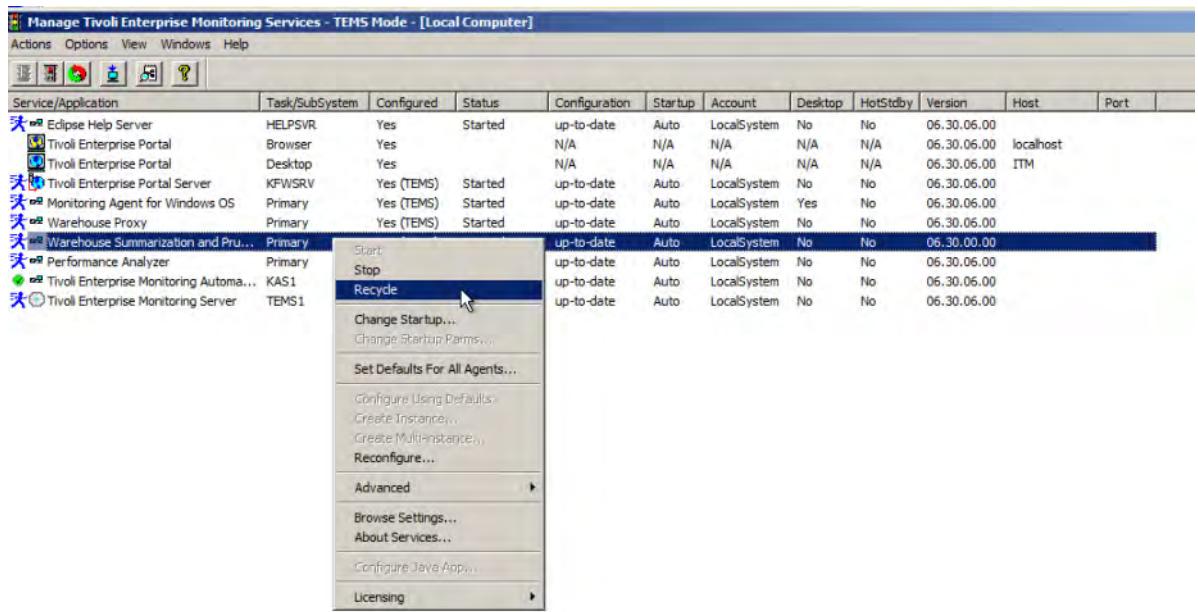
13. Click **Yes** to the prompt in the Start Configuration window about stopping the service.

14. On the Tivoli Enterprise Portal Server Configuration window, click **OK**.

15. On the next TEP Server Configuration window, ensure that the check box is selected for **Enable the dashboard data provider**. Click **OK** on this window and either **OK** or **Yes** on several other windows that open. The portal server is recycled.



16. Highlight the Warehouse Summarization and Pruning Agent Tivoli Enterprise Portal Server service. Right-click and click Recycle.



17. Close the Manage Tivoli Enterprise Monitoring Services application by clicking the X in the upper right corner.

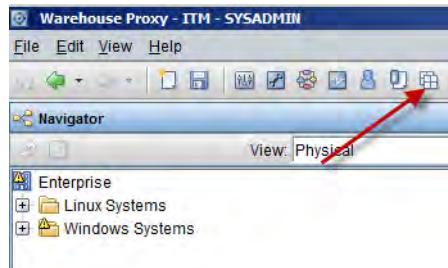
18. From the desktop of the ITM VM, double-click the Tivoli Enterprise Portal icon.



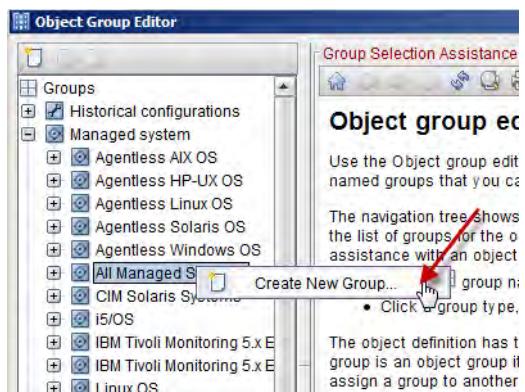
19. Log In to the Tivoli Enterprise Portal with the Logon ID **sysadmin** and password **object00**. Click **OK**.



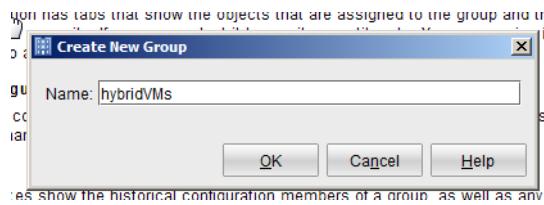
20. From the Tivoli Enterprise Portal desktop, open the Object Group Editor icon. Click the icon that looks like a pair of two-by-two squares.



21. From the Object Group Editor, expand **Managed System** then click **All Managed Systems** to highlight it. Right-click and select **Create New Group**.

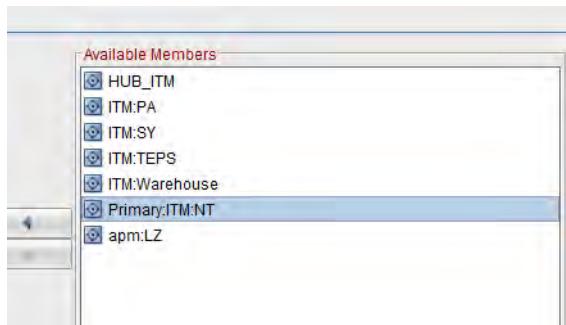


22. In the Create New Group window, enter the name **hybridVMs**, and click **OK**. The name that you enter is case-sensitive.

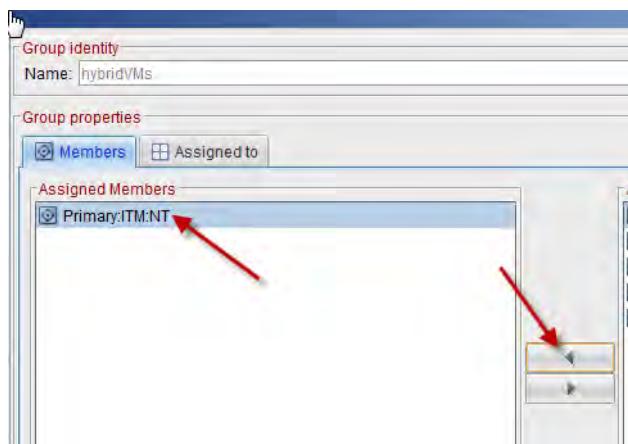


When you build a new group in your production environment, you choose multiple managed systems to be members of the new group. In this class, to keep the environment simple, you use one managed system as a member of the group.

23. In the **Available Members** box, click **Primary:ITM:NT** to highlight it.



24. Click the left arrow to move **Primary:ITM:NT** to the **Assigned Members** pane.

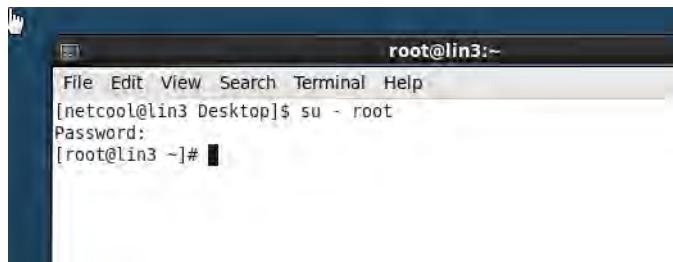


25. Near the lower-right corner of the Object Group Editor window, click **OK** to save the hybridVMs managed system name group.

The hybrid gateway installation

The hybrid gateway must be installed in your Tivoli Monitoring environment on a system with Red Hat Enterprise Linux (RHEL) Server 6 Update 2 or later. It also cannot be installed where the Performance Management Server is running. In this environment, use LIN3.

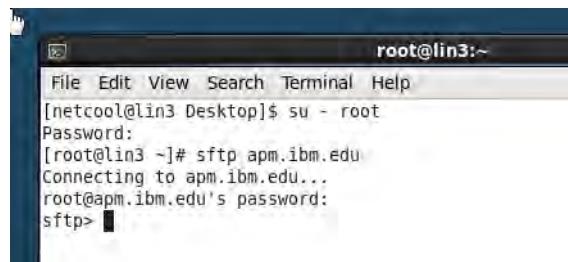
26. Open a terminal window on the LIN3 VM. Issue the command to switch the user to root. At the prompt, reply with the password **object00**.



27. Issue this command to begin a file transfer session with the APM VM:

```
sftp apm.ibm.edu
```

At the prompt about the authenticity of apm.ibm.edu, reply yes. At the password prompt, enter **object00**.



28. Copy the hybrid gateway code from the APM VM to the LIN3 VM where the code is running.
Issue these commands.

```
cd /opt/ibm/ccm/depot
ls -l
get ipm_hybrid_gateway_8.1.3.tar /downloads/ipm_hybrid_gateway_8.1.3.tar
exit
```

```
[netcool@lin3 Desktop]$ su - root
[Password:
[root@lin3 ~]# sftp apm.ibm.edu
Connecting to apm.ibm.edu...
root@apm.ibm.edu's password:
sftp> cd /opt/ibm/ccm/depot
sftp> ls -l
-rw-r--r-- 1 root      root      254105600 Jun 27 21:45 ipm_hybrid_gateway_8.1.
3.tar
-rw-r--r-- 1 root      root      643665920 Jun 27 21:40 ipm_monitoring_agent_xl
inux_8.1.3.tar
-rw-r--r-- 1 root      root      550884799 Jun 27 21:45 ipm_monitoring_agents_w
in_8.1.3.zip
sftp> get ipm_hybrid_gateway_8.1.3.tar /downloads/ipm_hybrid_gateway_8.1.3.tar
Fetching /opt/ibm/ccm/depot/ipm_hybrid_gateway_8.1.3.tar to /downloads/ipm_hybri
d_gateway_8.1.3.tar
/opt/ibm/ccm/depot/ipm_hybrid_gateway_8.1.3.t 100% 242MB 60.6MB/s  00:04
sftp> exit
[root@lin3 ~]# ]
```

The **sftp** command places a copy in the LIN3 VM directory **/downloads**.

29. On the LIN3 VM, change the directory to the location of the downloaded hybrid gateway compressed file. Expand the **ipm_hybrid_gateway.8.1.3.tar** file to create **IPM_Hybrid_Gateway_Install_8.1.3**.

```
cd /downloads
ls -l
tar -xvf ipm_hybrid_gateway.tar
ls -l
```

The directory **IPM_Hybrid_Gateway_Install_8.1.3** is created.

30. Install the hybrid gateway.

```
cd IPM_Hybrid_Gateway_Install_8.1.3
ls -l
./install.sh
```

```
[root@lin3 ~]# cd /downloads/IPM_Hybrid_Gateway_Install_8.1.3/
[root@lin3 IPM_Hybrid_Gateway_Install_8.1.3]# ls -l
total 20
drwxr-xr-x 2 root root 4096 Jun 27 21:45 config
drwxr-xr-x 7 root root 4096 Apr 16 04:36 files
-rw-r--r-- 1 root root 493 Apr 16 04:36 install.sh
drwxr-xr-x 2 root root 4096 Jun 27 21:45 licenses
-rw-r--r-- 1 root root 145 Apr 16 04:36 version_product.properties
[root@lin3 IPM_Hybrid_Gateway_Install_8.1.3]# ./install.sh
Checking product prerequisites before installation. You can disable this check by setting environment variable SKIP_PRECHECK.
Setting Prerequisite Scanner output directory to user defined directory: /opt/ibm/hybridgateway/logs/prereqchecker/20160628_194757

IBM Prerequisite Scanner
Version: 1.2.0.17
Build : 20150827
OS name: Linux
User name: root

Machine Information
Machine name: lin3.ibm.edu
Serial number: VMware-56 4d 8b e3 8f ad 43 be-35 13 7b 88 d8 dc d3 07
```

The installation process begins.

31. Respond to the license agreement prompt with **1**. The installation begins. After the installation, the hybrid gateway server is started.

```
lib/com.ibm.ws.webcontainer.security_1.0.9.cl50620160308-1820.jar
Fix has been applied successfully.
Successfully extracted all product files.
smai-itcdp-itmclient      #####
Server hybridgateway created.
Preparing...          #####
smai-agentproxy       #####
Starting server hybridgateway.
Server hybridgateway started with process ID 14461.

Hybrid Gateway installation completed. The installation log file is located at "
/opt/ibm/hybridgateway/logs/install-hybridgateway-20160628194757.log".

Before you can see monitoring data from your IBM Tivoli Monitoring environment in
the Performance Management console, there is one more step: Log in to the Performance Management console and configure the Hybrid Gateway in the System Configuration > Advanced Configuration page. No restart is needed.

Use the following command to manage Hybrid Gateway:
/opt/ibm/hybridgateway/bin/hybridgateway.sh start|stop|status|uninstall

The Hybrid Gateway log files are located in the "/opt/ibm/wlp/usr/servers/hybridgateway/logs" directory.
[root@lin3 IPM_Hybrid_Gateway_Install_8.1.3]#
```

Configuring the hybrid gateway

32. From the APM VM, go to the APM console. Click the System Configuration icon, which looks like three levers. From the System Configuration drop-down window, click **Advanced Configuration**.



33. From the Advanced Configuration Categories, click **Hybrid Gateway**.

Configuration Categories	Parameters
UI Integration	Configuration of the IBM Performance Management Hybrid Gateway for viewing monitoring data
Event Manager	Managed System Group Name <input type="text"/>
MongoDB Configuration	Portal Server Host Name <input type="text"/>
Agent Central Configuration	Portal Server Port <input type="text" value="15200"/>
Data Mart	Portal Server Protocol <input type="text" value="http"/>
Hybrid Gateway	Portal Server User Name <input type="text" value="sysadmin"/>
Kafka Configuration	Portal Server User Password <input type="text"/>
Tracking Analytics Service	Pass-Through Proxy Host Name <input type="text"/>
Agent Subscription Facility	Pass-Through Proxy Port <input type="text" value="0"/>
Thresholds Enablement	Pass Through Proxy Protocol <input type="text" value="http"/>

Save

34. Enter the following changes:

- a. Managed System Group Name must match the case-sensitive name that you created in the Tivoli Enterprise Portal Object Group Editor: **hybridVMs**.
- b. **Portal Server Host Name** is the host name of the IBM Tivoli Monitoring host where the portal server is running: **itm.ibm.edu**.
- c. **Portal Server Port** is the port number that is used for logging in to the IBM Tivoli Monitoring system where the portal server is running: **15200**.

- d. **Portal Server Protocol** is used by IBM Tivoli Monitoring, which is installed on the ITM VM: **http**.
- e. **Portal Server user name** is the logon ID to log in to the Tivoli Enterprise Portal: **sysadmin**.
- f. **Portal Server User Password** is the password that you use to log in the Tivoli Enterprise Portal client: **object00**.

Parameters

Configuration of the IBM Performance Management Hybrid Gateway for viewing monitoring data

Managed System Group Name	<input type="text" value="hybridVMs"/>
Portal Server Host Name	<input type="text" value="itm.ibm.edu"/>
Portal Server Port	<input type="text" value="15200"/>
Portal Server Protocol	<input type="button" value="http"/>
Portal Server User Name	<input type="text" value="sysadmin"/>
Portal Server User Password	<input type="password" value="*****"/>
Pass-Through Proxy Host Name	<input type="text"/>
Pass-Through Proxy Port	<input type="text" value="0"/>
Pass Through Proxy Protocol	<input type="button" value="http"/>

Save

35. When all of the parameters are entered, click **Save**.

36. At the confirmation prompt the configuration is saved, click **Close**.



Note: Because it can take 45 minutes for the ITM - WINDOWSOS window to be shown, go to the next exercise and validate this component when it is displayed later.

Verifying the hybrid gateway

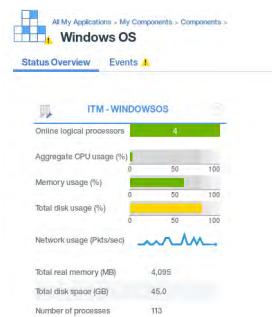
37. On the APM console, click the gauge icon to open the Performance drop-down window. Click Application Performance Dashboard.

38. In the navigator, click **All My Applications**.

39. In the My Applications area, click **My Components**. It opens a window that contains a Current Components Status pane.



40. In the Current Components Status pane, click the **Windows OS** bar to open a page that displays the Windows components.

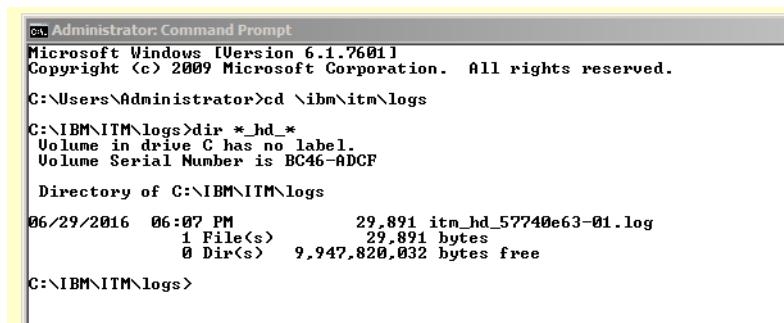


The icon before ITM - WINDOWSOS looks like a building with a wrench. This icon indicates that the component is an agent that is connected through a hybrid gateway environment.

Exercise 2 Integrating with IBM Tivoli Monitoring: using the Tivoli Data Warehouse

IBM Monitoring supports for selected agents storing the historical data in the Tivoli Data Warehouse. This exercise guides you through the steps.

1. On the ITM VM, open a terminal window and change to the folder **c:\ibm\itm\logs**.
2. List all the log files that have the string "**_hd_**" in the file name.



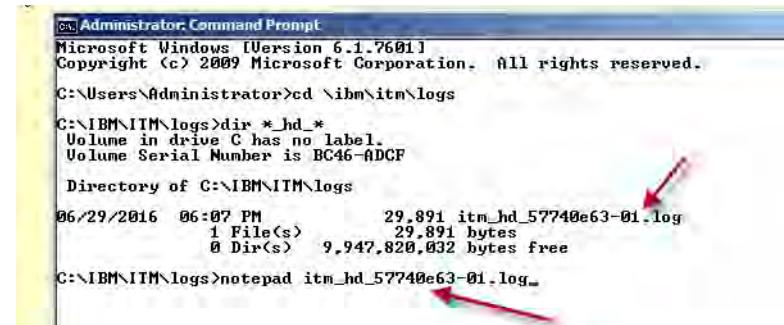
```
C:\ Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>cd \ibm\itm\logs
C:\IBM\ITM\logs>dir *_hd_*
Volume in drive C has no label.
Volume Serial Number is BC46-ADCF

Directory of C:\IBM\ITM\logs
06/29/2016  06:07 PM                29,891 itm_hd_57740e63-01.log
               1 File(s)      29,891 bytes
               0 Dir(s)   9,947,820,032 bytes free

C:\IBM\ITM\logs>
```

3. Open the log file that matches the settings in the prior step in **notepad** that has the most current time stamp.



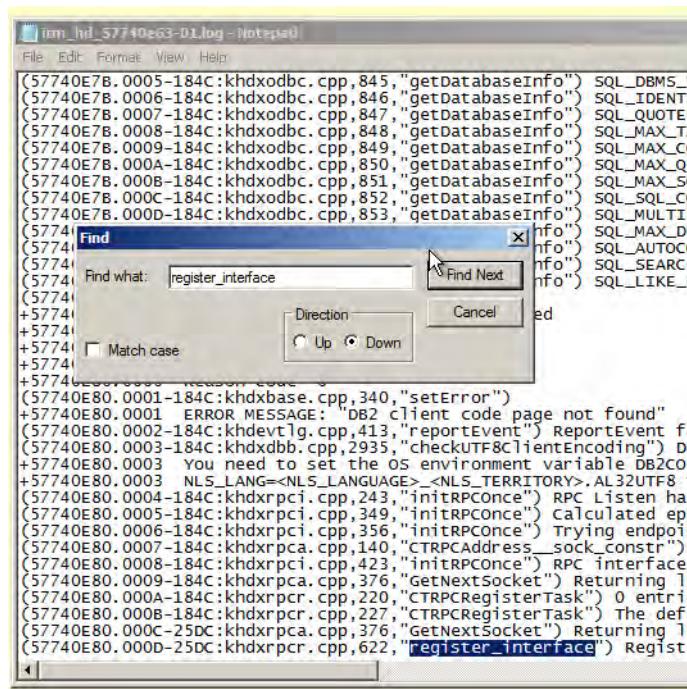
```
C:\ Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>cd \ibm\itm\logs
C:\IBM\ITM\logs>dir *_hd_*
Volume in drive C has no label.
Volume Serial Number is BC46-ADCF

Directory of C:\IBM\ITM\logs
06/29/2016  06:07 PM                29,891 itm_hd_57740e63-01.log
               1 File(s)      29,891 bytes
               0 Dir(s)   9,947,820,032 bytes free

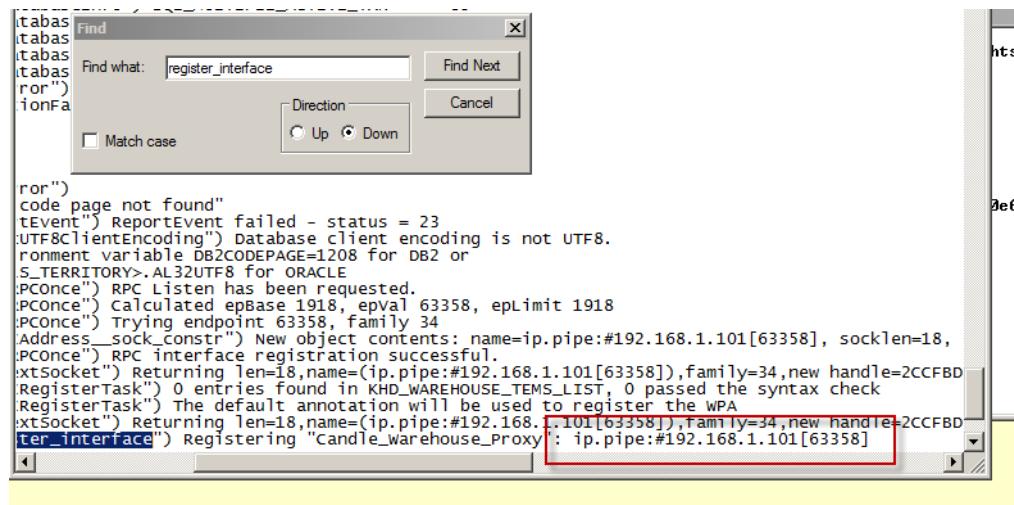
C:\IBM\ITM\logs>notepad itm_hd_57740e63-01.log
```

4. Search for the string "register_interface".



```
(57740E7B.0005-184C:khdxodbc.cpp,845,"getDatabaseInfo") SQL_DBMS_
(57740E7B.0006-184C:khdxodbc.cpp,846,"getDatabaseInfo") SQL_IDENT_
(57740E7B.0007-184C:khdxodbc.cpp,847,"getDatabaseInfo") SQL_QUOTE_
(57740E7B.0008-184C:khdxodbc.cpp,848,"getDatabaseInfo") SQL_MAX_T_
(57740E7B.0009-184C:khdxodbc.cpp,849,"getDatabaseInfo") SQL_MAX_C_
(57740E7B.000A-184C:khdxodbc.cpp,850,"getDatabaseInfo") SQL_MAX_Q_
(57740E7B.000B-184C:khdxodbc.cpp,851,"getDatabaseInfo") SQL_MAX_S_
(57740E7B.000C-184C:khdxodbc.cpp,852,"getDatabaseInfo") SQL_SQL_CI_
(57740E7B.000D-184C:khdxodbc.cpp,853,"getDatabaseInfo") SQL_MULTI_
(57740E80.0001-184C:khdxbase.cpp,340,"setError")
+57740E80.0001 ERROR MESSAGE: "DB2 client code page not found"
(57740E80.0002-184C:khdevtlg.cpp,413,"reportEvent") ReportEvent f.
+57740E80.0003 You need to set the OS environment variable DB2COL
+57740E80.0003 NLS_LANG=<NLS_LANGUAGE>_<NLS_TERRITORY>.AL32UTF8
(57740E80.0004-184C:khdxrpc1.cpp,243,"initRPCOnce") RPC Listen ha
(57740E80.0005-184C:khdxrpc1.cpp,349,"initRPCOnce") Calculated epi
(57740E80.0006-184C:khdxrpc1.cpp,356,"initRPCOnce") Trying endpoint
(57740E80.0007-184C:khdxrpc1.cpp,140,"CTRPCAddress__sock_Constr")
(57740E80.0008-184C:khdxrpc1.cpp,423,"initRPCOnce") RPC interface
(57740E80.0009-184C:khdxrpc1.cpp,376,"GetNextSocket") Returning len=1
(57740E80.000A-184C:khdxrpc1.cpp,220,"CTRPCRegisterTask") 0 entries
(57740E80.000B-184C:khdxrpc1.cpp,227,"CTRPCRegisterTask") The def
(57740E80.000C-25DC:khdxrpc1.cpp,376,"GetNextSocket") Returning len=1
(57740E80.000D-25DC:khdxrpc1.cpp,622,"register_interface") Register
(57740E80.000E-25DC:khdxrpc1.cpp,622,"register_interface") Register
```

5. Scroll to the right, and observe the IP address and the port number. This is the IP address and port number that the warehouse proxy is listening on, and matches the settings that you use in the configuration of the IBM Monitoring agent.

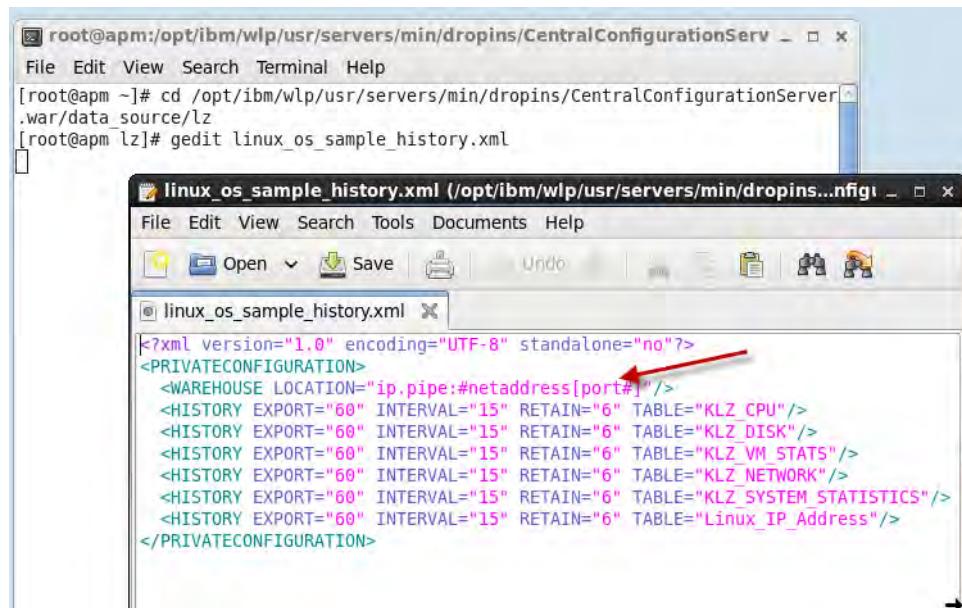


```
(57740E80.0001-184C:khdxbase.cpp,340,"setError")
+57740E80.0001 ERROR MESSAGE: "DB2 client code page not found"
(57740E80.0002-184C:khdevtlg.cpp,413,"reportEvent") ReportEvent f.
+57740E80.0003 You need to set the OS environment variable DB2COL
+57740E80.0003 NLS_LANG=<NLS_LANGUAGE>_<NLS_TERRITORY>.AL32UTF8
(57740E80.0004-184C:khdxrpc1.cpp,243,"initRPCOnce") RPC Listen ha
(57740E80.0005-184C:khdxrpc1.cpp,349,"initRPCOnce") Calculated epi
(57740E80.0006-184C:khdxrpc1.cpp,356,"initRPCOnce") Trying endpoint
(57740E80.0007-184C:khdxrpc1.cpp,140,"CTRPCAddress__sock_Constr")
(57740E80.0008-184C:khdxrpc1.cpp,423,"initRPCOnce") RPC interface
(57740E80.0009-184C:khdxrpc1.cpp,376,"GetNextSocket") Returning len=1
(57740E80.000A-184C:khdxrpc1.cpp,220,"CTRPCRegisterTask") 0 entries
(57740E80.000B-184C:khdxrpc1.cpp,227,"CTRPCRegisterTask") The default annotation will be used to register the WPA
(57740E80.000C-25DC:khdxrpc1.cpp,376,"GetNextSocket") Returning len=1
(57740E80.000D-25DC:khdxrpc1.cpp,622,"register_interface") Register
(57740E80.000E-25DC:khdxrpc1.cpp,622,"register_interface") Register
for")
code page not found"
tEvent") ReportEvent failed - status = 23
=UTF8ClientEncoding") Database client encoding is not UTF8.
nvironment Variable DB2CODEPAGE=1208 For DB2 or
_S_TERRITORY=.AL32UTF8 for ORACLE
.PConce") RPC Listen has been requested.
.PConce") Calculated epBase 1918, epval 63358, eplimit 1918
.PConce") Trying endpoint 63358, family 34
.Address__sock_Constr") New object contents: name=ip.pipe:#192.168.1.101[63358], socklen=18,
.PConce") RPC interface registration successful.
extSocket") Returning len=18,name=(ip.pipe:#192.168.1.101[63358]),family=34,new handle=2CCFB
RegisterTask") 0 entries found in KHD_WAREHOUSE_TEAMS_LIST, 0 passed the syntax check
RegisterTask") The default annotation will be used to register the WPA
extSocket") Returning len=18,name=(ip.pipe:#192.168.1.101[63358]),family=34,new handle=2CCFB
ter_interface") Registering "Candle_warehouse_Proxy": ip.pipe:#192.168.1.101[63358]
```

6. On the APM VM, open a terminal window and change to the directory:

/opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer.war/data_source/lz

7. Display the contents of the **linux_os_sample_history.xml** file by using he gedit command. Observe that the warehouse location is not specified.



```

root@apm:/opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer ~ 
File Edit View Search Terminal Help
[root@apm ~]# cd /opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer
[root@apm ~]# gedit linux_os_sample_history.xml

```

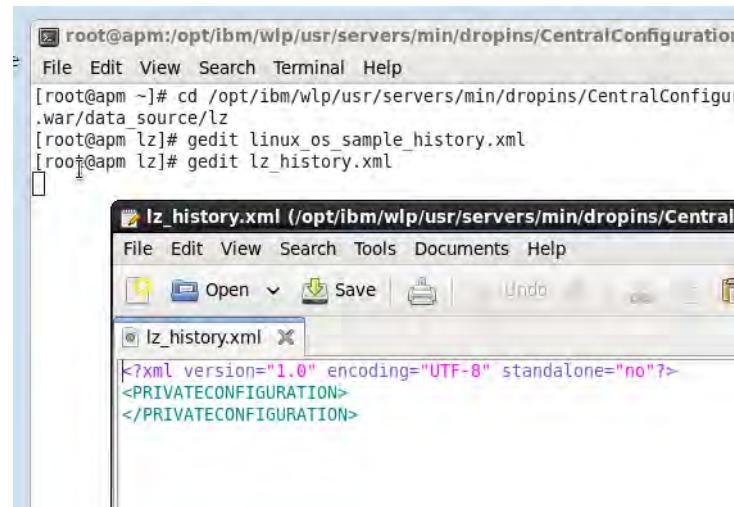
linux_os_sample_history.xml (/opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer)

```

<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<PRIVATECONFIGURATION>
<WAREHOUSE LOCATION="ip.pipe:#netaddress[port#]" />
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_CPU"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_DISK"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_VM_STATS"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_NETWORK"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_SYSTEM_STATISTICS"/>
<HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="Linux_IP_Address"/>
</PRIVATECONFIGURATION>

```

8. Display the contents of the **lz_history.xml** file by using he gedit command. Observe that there are no settings for the warehouse location and no settings for historical data collection.



```

root@apm:/opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer ~ 
File Edit View Search Terminal Help
[root@apm ~]# cd /opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer
[root@apm ~]# gedit linux_os_sample_history.xml
[root@apm ~]# gedit lz_history.xml

```

lz_history.xml (/opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer)

```

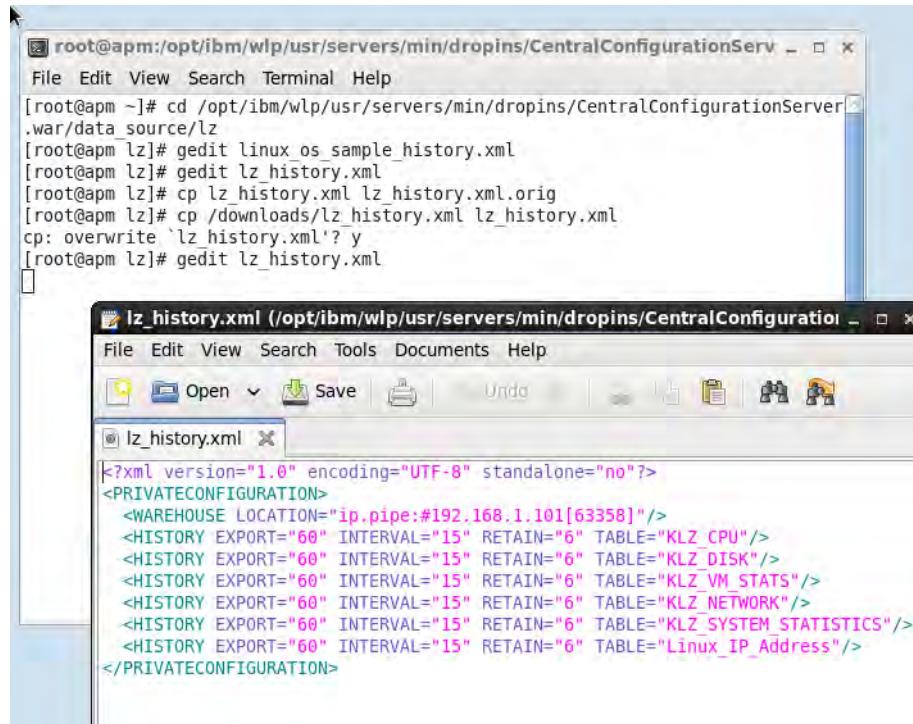
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<PRIVATECONFIGURATION>
</PRIVATECONFIGURATION>

```

9. Make a backup copy of the **lz_history.xml** file.

10. Copy the **lz_history.xml** file from the **/downloads** directory to the current directory.

11. Display the contents of the lz_history.xml file by using the gedit command. Observe that this file specifies the warehouse proxy location that is determined earlier and has several settings for historical data collection.



The terminal window shows the following command history:

```
[root@apm ~]# cd /opt/ibm/wlp/usr/servers/min/dropins/CentralConfigurationServer
[root@apm ~]# .war/data_source/lz
[root@apm lz]# gedit linux os_sample_history.xml
[root@apm lz]# gedit lz_history.xml
[root@apm lz]# cp lz_history.xml lz_history.xml.orig
[root@apm lz]# cp /downloads/lz_history.xml lz_history.xml
cp: overwrite 'lz_history.xml'? y
[root@apm lz]# gedit lz_history.xml
```

The Gedit window displays the content of the lz_history.xml file:

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<PRIVATECONFIGURATION>
    <WAREHOUSE LOCATION="ip.pipe:#192.168.1.101[63358]" />
    <HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_CPU"/>
    <HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_DISK"/>
    <HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_VM_STATS"/>
    <HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_NETWORK"/>
    <HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="KLZ_SYSTEM_STATISTICS"/>
    <HISTORY EXPORT="60" INTERVAL="15" RETAIN="6" TABLE="Linux_IP_Address"/>
</PRIVATECONFIGURATION>
```

 **Note:** You validate the data is collected in the exercises in the next unit of the course.

Exercise 3 Integrating with IBM Tivoli Monitoring: Agent coexistence

You can install IBM Monitoring agents on the same server that has IBM Tivoli Monitoring agents installed. This exercise guides you through that process.



Important: Before attempting this exercise, validate that [Exercise 1, “Integrating with IBM Tivoli Monitoring: Hybrid Gateway,”](#) on page 129 was finished successfully.

When you successfully installed a Linux OS agent on `apm.ibm.edu` in [Exercise 1, “Installing an operating system agent,”](#) on page 101, you installed an IBM Monitoring agent on a server that already had an IBM Tivoli Monitoring Linux OS agent installed. This exercise demonstrates the same capability on a Windows server.

1. On the LIN3 VM, open a terminal window and shut down the hybrid gateway by using these commands:

```
su - root  
/opt/ibm/hybridgateway/bin/hybridgateway.sh stop  
/opt/ibm/hybridgateway/bin/hybridgateway.sh status
```

The screenshot shows a terminal window titled "root@lin3:~". The command `su - root` is run, followed by the password. Then, the command `/opt/ibm/hybridgateway/bin/hybridgateway.sh stop` is executed, which stops the hybrid gateway service. Finally, the command `/opt/ibm/hybridgateway/bin/hybridgateway.sh status` is run, confirming that the server is not running.

```
[netcool@lin3 ~]$ su - root  
Password:  
[root@lin3 ~]# /opt/ibm/hybridgateway/bin/hybridgateway.sh stop  
Stopping server hybridgateway.  
Server hybridgateway stopped.  
[root@lin3 ~]# /opt/ibm/hybridgateway/bin/hybridgateway.sh status  
Server hybridgateway is not running.  
[root@lin3 ~]#
```

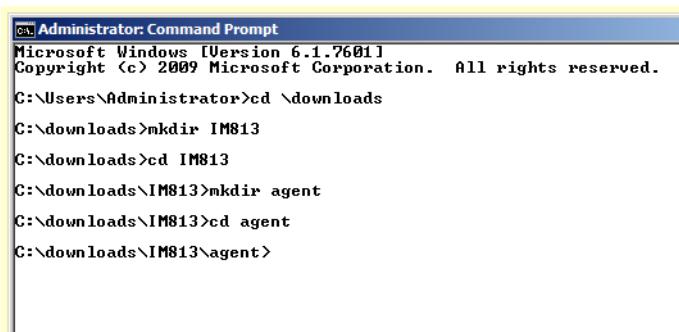


Note: Shutting down the hybrid gateway will confirm that any data showing up for an agent installed on the ITM VM is from the IBM Monitoring Agent and not the IBM Tivoli Monitoring Agent.

2. On VM ITM, open a command prompt window.



3. Change to the **c:\downloads** folder, create a subfolder that is called **IM813**. Change to the subfolder **IM813** and create another subfolder that is called **agent**, and change to the **c:\downloads\IM813\agent** folder.



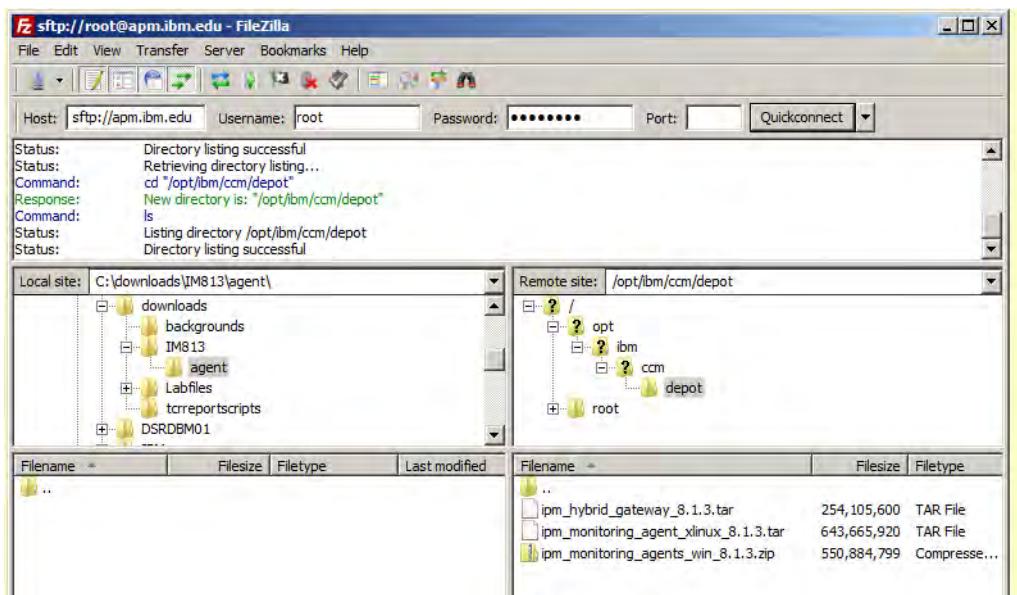
```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>cd \downloads
C:\downloads>mkdir IM813
C:\downloads>cd IM813
C:\downloads\IM813>mkdir agent
C:\downloads\IM813>cd agent
C:\downloads\IM813\agent>
```

4. Double-click the FileZilla icon on the desktop.



5. Enter **apm.ibm.edu** in the **Host** field, **root** in the **Username** field, **object00** in the **Password** field, and **22** in the **Port** field. Click **Quickconnect**.



6. On the Local site window, select the **c:\downloads\IM813\agent** folder.

7. On the Remote site window, select the **/opt/ibm/ccm/depot/** folder.

```
C:\Administrator: Command Prompt
Copyright <c> 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>cd \downloads
C:\downloads>mkdir IM813
C:\downloads>cd IM813
C:\downloads\IM813>mkdir agent
C:\downloads\IM813>cd agent
C:\downloads\IM813\agent>dir
 Volume in drive C has no label.
 Volume Serial Number is BC46-ADCF

 Directory of C:\downloads\IM813\agent

06/29/2016  01:09 PM    <DIR>
06/29/2016  01:09 PM    <DIR>.
06/29/2016  01:10 PM   550,884,799 ipm_monitoring_agents_win_8.1.3.zip
               1 File(s)   550,884,799 bytes
               2 Dir(s)  11,560,165,376 bytes free

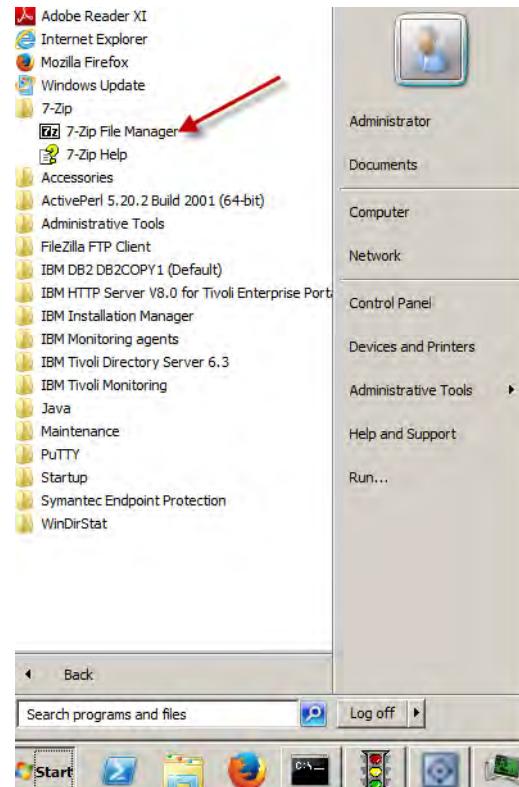
C:\downloads\IM813\agent>_
```

8. Select the file **ipm_monitoring_agents_win_8.1.3.zip** on the right and drag it to the **c:\downloads\IM813\agent** folder on the left.
9. Close FileZilla when the transfer completes.
10. From the command prompt, list the contents of the **c:\downloads\IM813\agent** folder to confirm that the transfer was successful.

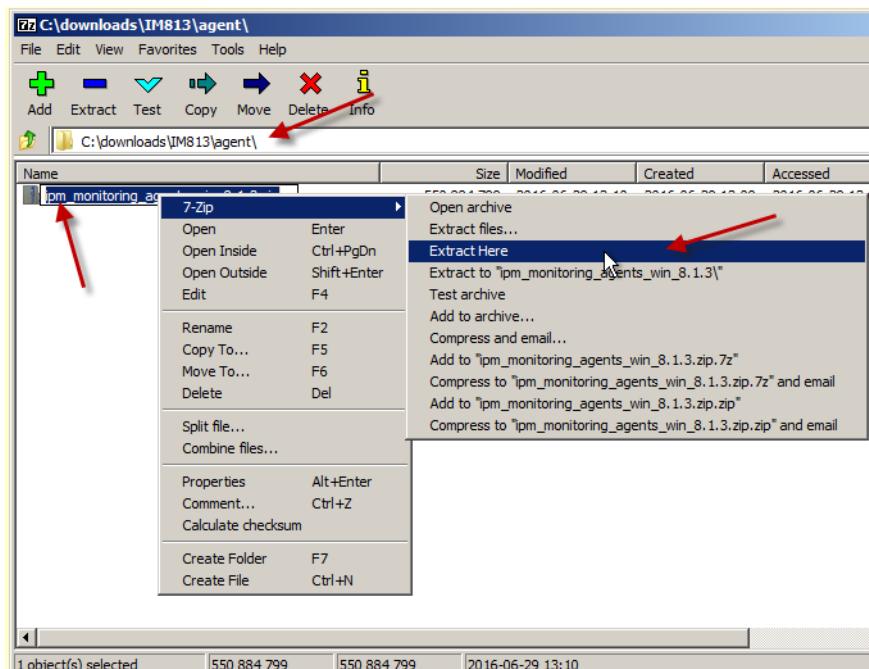
`dir`



11. Open the 7zip File Manager tool by clicking **Start > All Programs>7-Zip>7-Zip File Manager**.



12. Navigate to the folder **c:\downloads\IM813\agent** and right-click the file **ipm_monitoring_agents_win_8.1.3.zip**. Click **7-zip > Extract Here**.



13. When the extraction completes, close **7-zip**.

5 Integrating IBM Monitoring with other products exercises

Exercise 3 Integrating with IBM Tivoli Monitoring: Agent coexistence

14. On the VM APM, verify that you no longer see status for the IBM Tivoli Monitoring Windows OS agent that was validated to be showing status earlier.



15. On the ITM VM, in a command prompt, change directory to this folder:

c:\downloads\IM813\agent\APM_Agent_Install_8.1.3

16. Run the command **installAPMAgents.bat**.

```
Administrator: Command Prompt
C:\Users\Administrator>cd \downloads
C:\downloads>mkdir IM813
C:\downloads>cd IM813
C:\downloads\IM813>mkdir agent
C:\downloads\IM813>cd agent
C:\downloads\IM813\agent>dir
Volume in drive C has no label.
Volume Serial Number is BC46-ADCF
Directory of C:\downloads\IM813\agent
06/29/2016  01:09 PM    <DIR>
06/29/2016  01:09 PM    <DIR>
06/29/2016  01:10 PM           550,884,799 ipm_monitoring_agents_win_8.1.3.zip
                           1 File(s)   550,884,799 bytes
                           2 Dir(s)  11,560,165,376 bytes free
C:\downloads\IM813\agent>cd APM_Agent_Install_8.1.3
C:\downloads\IM813\agent\APM_Agent_Install_8.1.3>installAPMAgents.bat
```

17. Select **1** to install the Monitoring Agent for Windows OS.

18. Press Enter to confirm your selection.

19. Press Enter to confirm the installation directory of C:\IBM\APM.

20. Select 1 to accept the license agreement.

```
C:\Administrator: Command Prompt - installAPMAgents.bat
C:\downloads\IM813\agent>cd APM_Agent_Install_8.1.3
C:\downloads\IM813\agent\APM_Agent_Install_8.1.3>installAPMAgents.bat
The following products are available for installation:
  1) Monitoring Agent for Windows OS
  2) Monitoring Agent for MySQL
  3) Response Time Monitoring Agent
  4) Monitoring Agent for Oracle Database
  5) Monitoring Agent for WebLogic
  6) Monitoring Agent for VMware VI
  7) Monitoring Agent for DB2
  8) Monitoring Agent for WebSphere Applications
  9) Monitoring Agent for Cisco UCS
  10) Monitoring Agent for Microsoft Hyper-V Server
  11) Monitoring Agent for Microsoft IIS
  12) Monitoring Agent for Microsoft SQL Server
  13) Monitoring Agent for Active Directory
  14) Monitoring Agent for Microsoft .NET
  15) Monitoring Agent for Microsoft Exchange Server
  16) Monitoring Agent for Microsoft Cluster Server
  17) Monitoring Agent for MS SharePoint Server
  18) Monitoring Agent for Microsoft Lync Server
  19) all of the above

Type the numbers that correspond to the products that you want to install. Type
"q" to quit selection.
If you enter more than one number, separate the numbers by a space or comma.

Type your selections here <For example: 1,2>: 1

The following agents will be installed:
  Monitoring Agent for Windows OS

Are your selections correct [ 1-Yes, 2-No; default is "1" ]?
Specify the installation directory. [Default is C:\IBM\APM] :
The agents will be installed in C:\IBM\APM.

Do you accept the license agreement(s) found in the directory C:\downloads\IM813
\agent\APM_Agent_Install_8.1.3\licenses?

Please enter [ 1-to accept the agreement, 2-to decline the agreement ] : 1
```

Note: The agent installation takes approximately 5 minutes. It takes several minutes more for the agent that you installed on Windows to connect to the Performance Management server.

5 Integrating IBM Monitoring with other products exercises

Exercise 3 Integrating with IBM Tivoli Monitoring: Agent coexistence

```
ca Administrator: Command Prompt
Machine Information
Machine name: ITM
Serial number: VMware-56 4d 8d af d8 63 40 3c-09 41 f7 ab d6 93 1f d3
OS serial number: 55041-507-1376774-84773

Scenario: Prerequisite Scan

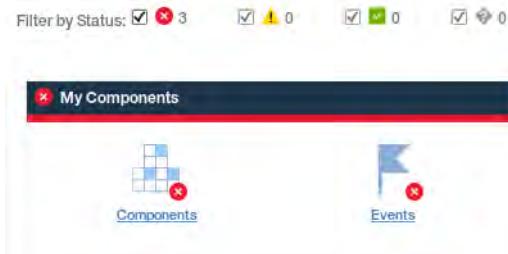
KNT - KNT [version 06351100]:
KIN - KIN [version 08130000]:
KGL - KGL [version 06351100]:
KGS - KGS [version 08005056]:

Overall result: PASS →

Detailed results are also available in: C:\IBM\APM\InstallITM\prereqscan\20160629_132549\result.txt
Installation destination path: C:\IBM\APM
Installing core framework...
Installing Monitoring Agent for Windows OS...
Agent installation completed. The agent was configured and started with default configuration settings.
End running cmd /c "C:\IBM\APM\logs\install_agent_NT.bat"
#####
The following agents were installed successfully into the C:\IBM\APM directory:
Monitoring Agent for Windows OS
Agent status:
Agent is running. Process ID is 0010008
Server connection status: Connecting
For more information, see the following file: C:\IBM\APM\TMAITM6_x64\logs\ntServerConnectionStatus.txt

The installation log file is C:\IBM\APM\logs\IM_Agents_install.log.
To configure your agents, use the following detailed instructions:
For Performance Management on Cloud:
http://ibm.biz/kc-ipmccloud-configagent
For Performance Management (on premises):
http://ibm.biz/kc-ipm-configagent
As part of the configuration instructions, you will use the following commands to configure and manage each installed agent:
Monitoring Agent for Windows OS C:\IBM\APM\bin\os-agent.bat start or stop or
status or uninstall
#####
C:\downloads\IM813\agent\APM_Agent_Install_8.1.3>
```

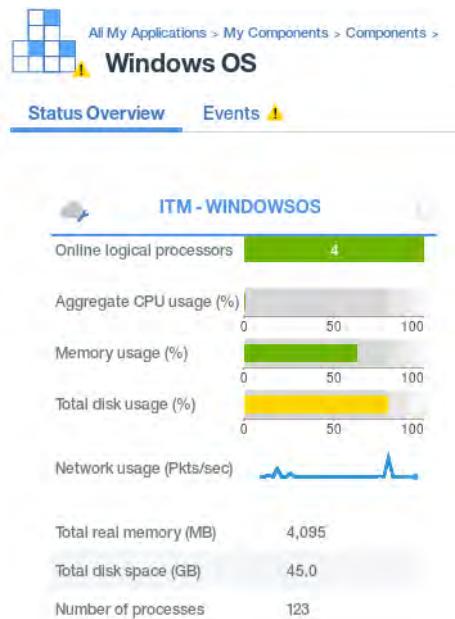
21. In the navigator, click All My Applications > My Components.



22. In the Current Components Status pane, click the **Windows OS** bar to open a page that displays the Windows components.



The Status Overview widget opens.



23. Observe how the icon beside ITM - WINDOWSOS looks like a cloud with a wrench. This icon indicates that the component is from an IBM Monitoring agent.

5 Integrating IBM Monitoring with other products exercises

Exercise 3 Integrating with IBM Tivoli Monitoring: Agent coexistence

24. Compare the icon to the icon that was displayed when the agent was coming from the hybrid gateway component shown here (the icon appeared as a building and the wrench, but now it is a cloud with a wrench):



Exercise 4 Integrating with Netcool/OMNIbus

You can forward events from IBM Performance Management into your on-premises IBM Tivoli Netcool/OMNIbus event manager.

To enable integration with Netcool/OMNIbus, you must copy the event rules to the probe for Tivoli EIF and modify them. You must also update the Netcool/OMNIbus ObjectServer and the database schema, and configure the Performance Management server to forward events.

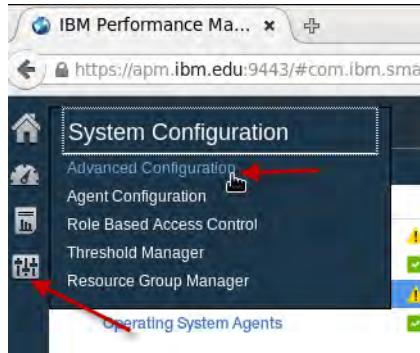
Files that are supplied by IBM Monitoring and implemented with OMNIbus EIF probe

The installation of these files is completed for you on the LIN3 VM with these steps:

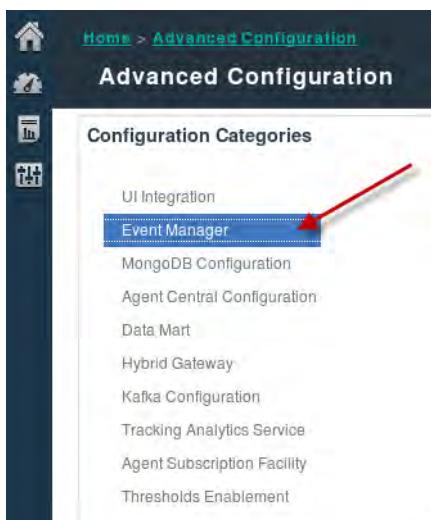
- Files that are on the APM VM in directory **/opt/ibm/ccm/omnibus** that begin with **itm_** are copied to the LIN3 VM in the **/downloads** directory.
- On the LIN3 VM, these files are copied from the **/downloads** to the **/opt/ibm/tivoli/netcool/omnibus/probes/linux2x86** directory.
- The INCLUDE statement is uncommented for **itm_event.rules** in the **tivoli_eif.rules** file in the probe directory, and the file is saved.
- The **itm_apm_event.rules** is copied over the **itm_event.rules** file.
- The Netcool/OMNIbus ObjectServer database schema is updated from a terminal window opened by the **netcool** ID. The **itm_apm_db_update.sql** file is loaded twice into the database with the command **\$OMNIhome/bin/nco_sql -user root -password object00 -server RTP_AGG_P -input \$OMNIHOME/probes/linux2x86/itm_apm_db_update.sql**.
- The port number was changed in the **tivoli_eif.props** file from 9998 to 9011 because the former port is already in use by another product. This same matching port number is also assigned in the **Advanced Configuration > Event Manager** in IBM Performance Management.
- The OMNIbus EIF probe **nco_p_tivoli_eif** is restarted from the **/opt/IBM/tivoli/netcool/omnibus/probes** directory.

Configuring the Performance Management server to send events to Netcool/OMNIbus

1. From the APM VM, go to the APM console. Click the System Configuration icon, which looks like three levers. From the System Configuration drop-down window, click **Advanced Configuration**.



2. From the Advanced Configuration Categories, click **Event Manager**.



3. Make these changes to the Event Manager parameters. Most of the parameters affect the Event Notification, which is not the Netcool/OMNIbus integration. Only two parameters affect the EIF.
 - **EIF Port:** Change from the default 9998 to **9011**.
 - **EIF Event Target(s):** Use the IP address of **192.168.1.106**.

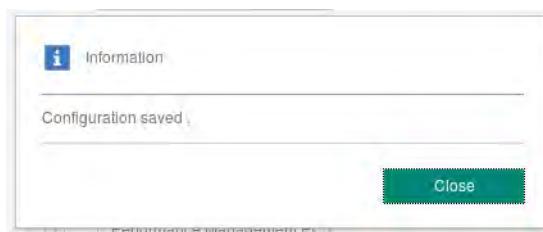
Parameters

Configuration parameters that control the storage and forwarding of received events.

Event Cache Time	60
Pure Event Close Time	24
Master Reset Event	True
EIF Port	9,011
EIF Event Target(s)	192.168.1.106
Target Email Addresses	
Email Subject Line	Performance Management E
Sending Email Account	
Sending Email Account Password	
SMTP Server Address	
Use SSL	False
SMTP Port	25
SSL SMTP Port	465

Save

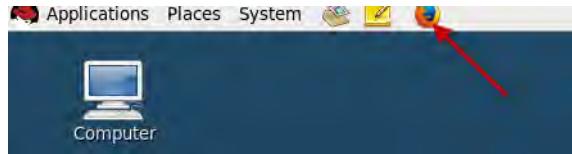
4. Click **Save** to save the changes.
5. Click **Close** to the confirmation that the configuration is saved.



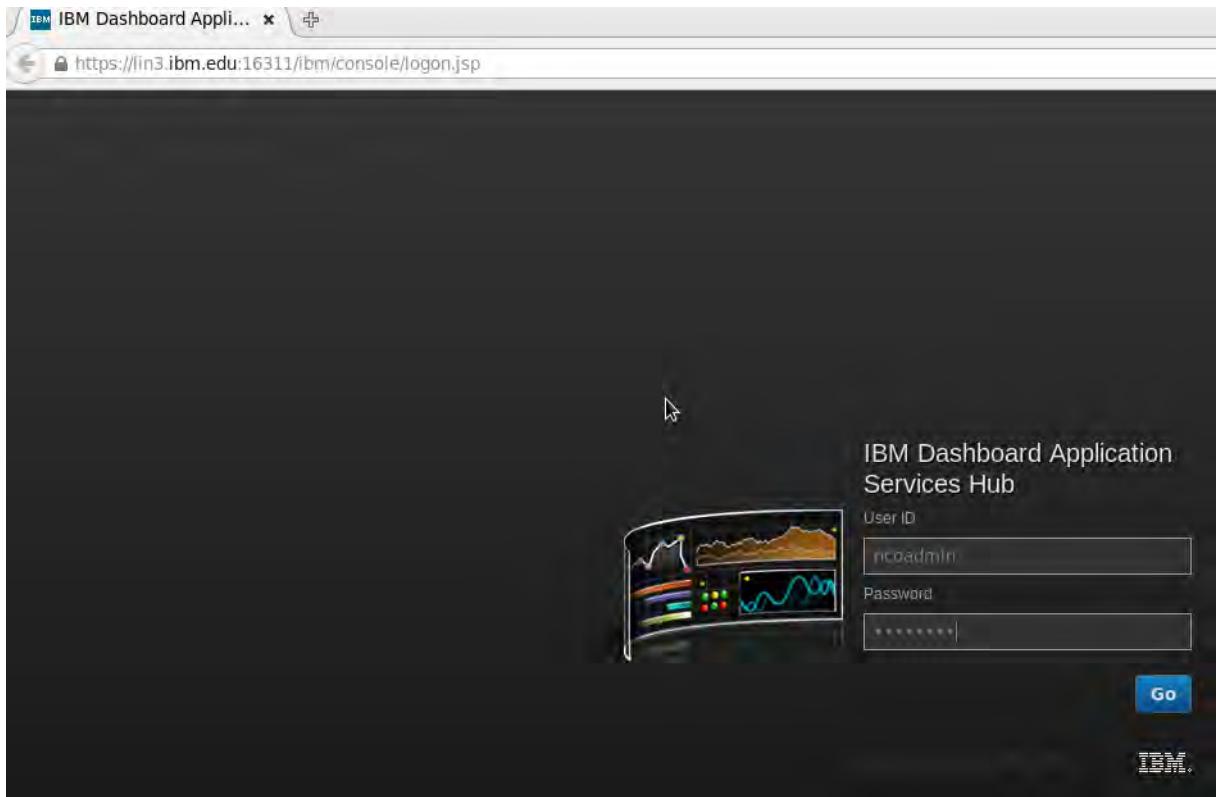
Your Netcool/OMNIbus integration is now complete.

Viewing the events on Netcool/OMNibus

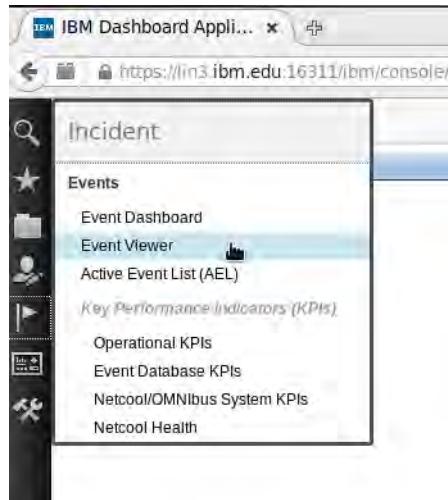
- From the LIN3 VM, open the DASH console. Click the Firefox icon. The home address is set to the IBM Dashboard Application Services Hub.



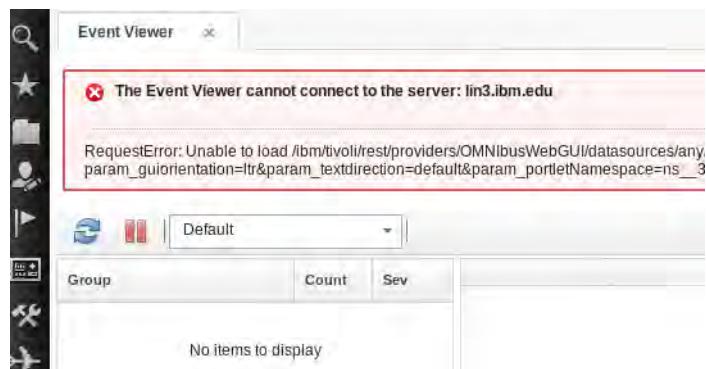
- Log In with the user name **ncoadmin** and the password **object00**.



8. Click the Incident icon, which is a flag. From the Incident drop-down window, select **Event Viewer**.



Hint: If an error occurs while opening the Event Viewer, close the page and open it again.



5 Integrating IBM Monitoring with other products exercises

Exercise 4 Integrating with Netcool/OMNibus

9. You can use this default view. Or you can change this view by clicking the drop-down arrow and select another view. The Last10Mins view can be useful if you have a vast number of events in your system.

The screenshot shows the Event Viewer interface. A red arrow points to the dropdown menu above the table, which is currently set to 'Default'. Another red arrow points to the 'Last10Mins' option in the list of available views.

10. Force one of the thresholds you created earlier to be false, then true. This will create a new event.

11. Sort the Event Viewer by Node.

The screenshot shows the Event Viewer interface with the table sorted by 'Node'. A red arrow points to the 'Node' column header. The table lists several events, each with a severity (Sev), acknowledgement status (Ack), node name (Node), alert group (Alert Group), and summary message.

Sev	Ack	Node	Alert Group	Summary
✗	No	lin1:LZ	ITM_Linux_Process	Linux_Missing_Process[MISSING Process_Command_Name = xclock OR MISSING Proce]
✗	No	lin1:LZ	ITM_Linux_Process	Linux_Missing_Process[MISSING Process_Command_Name = xclock OR MISSING Proce]
!	No	lin1:LZ	TopNodes	Last 5 mins: lin1:LZ sent 4 event(s)
!	No	lin1:LZ	ITM_Linux_File_Information	Linux_File_Exists[Fully_Qualified_File_Name = /tmp/ABC]
!	No	lin1:LZ	ITM_Linux_File_Information	Linux_File_Exists_2[Fully_Qualified_File_Name = /tmp/ABC AND System_Name = lin1:LZ]

12. Look for the Alert Group messages that are from APM or LIN1. These are from IBM Monitoring.

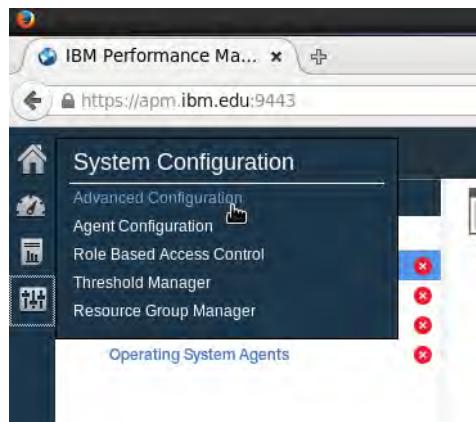
13. Log out of the Omnibus console. Close the Firefox browser.

Exercise 5 Event notification

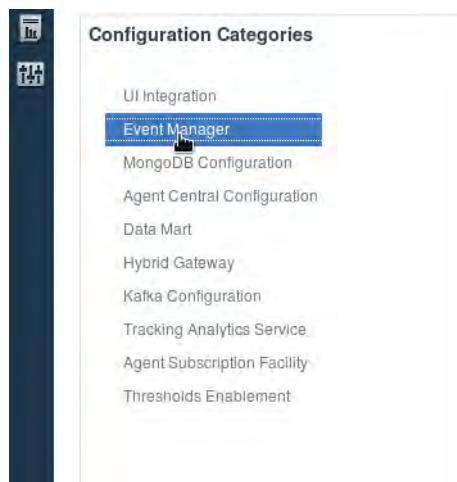
Events that are produced can be sent to email IDs. This exercise uses the Linux provided postfix process as the mail server on the APM VM to avoid installing and introducing another product to this course.

Updating the Advanced Configuration Event Manager

1. From the APM console, click the System Configuration icon, which looks like three levers. Click **Advanced Configuration**.



2. From Advanced Configuration, click **Event Manager**.



3. Make these changes in the parameters.
 - a. Change **Target Email Addresses** to **root@apm.ibm.edu**.
 - b. Leave the **Email Subject Line** as it is because the subject is automatically provided by the Event Manager with each mail that is created.

- c. Change the Sending Email Account to **root**.
- d. Change the **Sending Email Account Password** to **object00**.
- e. Change SMTP Server Address to **apm.ibm.edu**. The SMTP server is a Postfix mail server on the APM VM. In a production environment, this address is your mail server.
- f. Click **Save** to save the configuration.

Parameters

Configuration parameters that control the storage and forwarding of received events.

Event Cache Time	60
Pure Event Close Time	24
Master Reset Event	True
EIF Port	9011
EIF Event Target(s)	192.168.1.106
Target Email Addresses	root@apm.ibm.edu
Email Subject Line	Performance Management Ev
Sending Email Account	root
Sending Email Account Password	*****
SMTP Server Address	apm.ibm.edu
Use SSL	False
SMTP Port	25
SSL SMTP Port	465

Save

4. From the save configuration window, click **Close**.

Examining mail for root on the APM VM

5. On the APM VM, open a terminal window, and resize the window to approximately half the size of the desktop.

- Enter the **mailx** command.

```
mailx
```

```
[root@apm ~]# mailx
Heirloom Mail version 12.4 7/29/08. Type ? for help,
"/var/spool/mail/root": 38 messages 38 new
>N 1 Anacron      Wed Sep  3 04:31 17/664 "Anacron job 'cron.dai"
N 2 Anacron      Thu Sep  4 03:21 17/664 "Anacron job 'cron.dai"
N 3 root@apm.ibm.edu  Wed Jun 29 21:36 92/3636 "NT_Physical_Disk_Busy"
N 4 root@apm.ibm.edu  Wed Jun 29 21:36 84/3544 "NT_Service_Error on P"
N 5 root@apm.ibm.edu  Wed Jun 29 21:36 53/2170 "APM Agent_Offline on "
N 6 root@apm.ibm.edu  Wed Jun 29 21:36 62/2407 "NT_Physical_Disk_Busy"
N 7 root@apm.ibm.edu  Wed Jun 29 21:36 92/3620 "NT_Physical_Disk_Busy"
N 8 root@apm.ibm.edu  Wed Jun 29 21:36 62/2409 "NT_Physical_Disk_Busy"
N 9 root@apm.ibm.edu  Wed Jun 29 21:36 55/2211 "Agent Primary:lin1:KY"
N 10 root@apm.ibm.edu  Wed Jun 29 21:36 55/2192 "Agent Primary:ITM:NT"
N 11 root@apm.ibm.edu  Wed Jun 29 21:36 55/2139 "Agent lin1:HU has res"
N 12 root@apm.ibm.edu  Wed Jun 29 21:36 55/2223 "Agent db2inst1:lin1:U"
N 13 root@apm.ibm.edu  Wed Jun 29 21:36 53/2174 "APM Agent_Offline on "
N 14 root@apm.ibm.edu  Wed Jun 29 21:36 59/2274 "Linux_File_Exists on "
N 15 root@apm.ibm.edu  Wed Jun 29 21:36 59/2285 "Linux_File_Exists_2 o"
N 16 root@apm.ibm.edu  Wed Jun 29 21:36 59/2274 "Linux_Missing_Process"
N 17 root@apm.ibm.edu  Wed Jun 29 21:36 82/3445 "Linux_File_Exists on "
N 18 root@apm.ibm.edu  Wed Jun 29 21:36 82/3507 "Linux_File_Exists_2 o"
N 19 root@apm.ibm.edu  Wed Jun 29 21:36 107/4290 "Linux_Missing_Process"
N 20 root@apm.ibm.edu  Wed Jun 29 21:36 107/4295 "Linux_Missing_Process"
& |
```

Examine the column that displays the subjects in quotation marks. Look for any subjects that match threshold names you used in earlier exercises.

- Each number represents a separate email. At the ampersand prompt, enter a number to view the contents of one of the emails that match a threshold name you recognize.

```
& 10 root@apm.ibm.edu  Wed Jun 29 21:36 82/3445 "Linux_Missing_Process"
N 17 root@apm.ibm.edu  Wed Jun 29 21:36 82/3445 "Linux_File_Exists on "
N 18 root@apm.ibm.edu  Wed Jun 29 21:36 82/3507 "Linux_File_Exists_2 o"
N 19 root@apm.ibm.edu  Wed Jun 29 21:36 107/4290 "Linux_Missing_Process"
N 20 root@apm.ibm.edu  Wed Jun 29 21:36 107/4295 "Linux_Missing_Process"
& 20 |
```

- Examine the email for information from the Event Manager. The configuration of the Event Manager produced the From, To, Subject, and the email text. The following example is the first half of the email.

This example is the first half of the email.

```
root@apm:~  
File Edit View Search Terminal Help  
& 20  
Message 20:  
From root@apm.ibm.edu Wed Jun 29 21:36:47 2016  
Return-Path: <root@apm.ibm.edu>  
X-Original-To: root@apm.ibm.edu  
Delivered-To: root@apm.ibm.edu  
From: root@apm.ibm.edu  
To: root@apm.ibm.edu  
Subject: Linux_Missing_Process on lin1:LZ  
Content-Type: text/plain; charset=us-ascii  
Date: Wed, 29 Jun 2016 21:36:47 +0000 (UTC)  
Status: R  
  
The text below lists the information received from the agent that triggered this event. The IP and Agent values identify the agent that detected the event. The Description and Severity values specify the name of the threshold definition and its severity. Below the Description is a list of all of the attribute/value pairs present in the threshold event, in their raw form.  
  
Server IP : 192.168.1.102 (apm.ibm.edu)  
Agent IP : 192.168.1.104  
Agent : lin1:LZ  
Severity : critical  
Description: Linux_Missing_Process[MISSING Process_Command_Name = xclock OR MISSING Process_Command_Name = xcalc ]  
ITM_Linux_Process  
ManagedSystemGroups=3  
TenantID=5ABE-3FCF-4F36-230D-1C4E-0731-F9DD-7E33  
adapter_host=lin1.ibm.edu  
apm_hostname=apm.ibm.edu  
appl_label=A:P:S  
busy_cpu_pct=0  
data_set_size=0
```

9. If the email exceeds the length of the screen, type the letter **d** to scroll to the next screen.
10. At the ampersand prompt, type the letter **q** to exit the mailx application.

Exercise 6 DASH with IBM Monitoring data

In this exercise, you create an original page and dashboard that contains IBM Monitoring information.

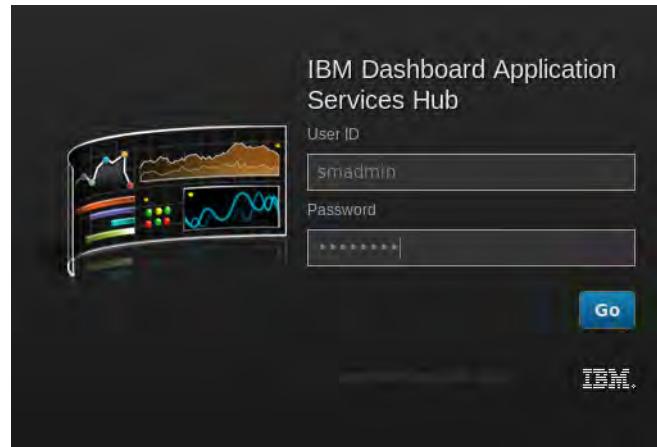
1. From the LIN3 VM, log in to the Dashboard Application Services Hub console. Open a browser and enter this URL:

<https://lin3.ibm.edu:16311/ibm/console/logon.jsp>



Note: This is the home page for the Firefox browser on LIN3.

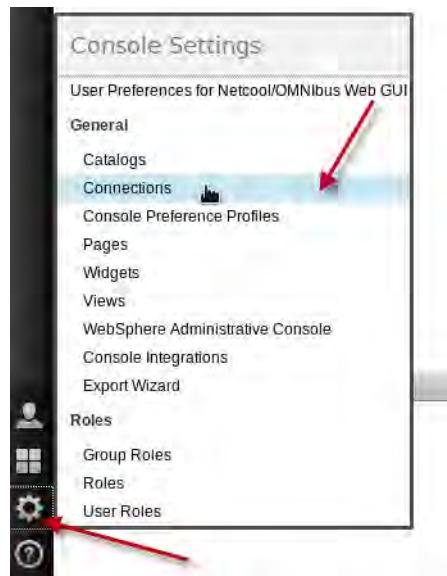
2. Enter the user name **smadmin**, password **object00**, and click **Go**. If you are prompted that another user is logged in with the same user ID, select the choice to log out the other user and click **OK**.



The IBM Dashboard Application Services Hub window opens at the end of the installation of the dashboards. If you are prompted to remember the password, select to remember the password, and click **X** to close that window.

Verifying the KD8 connection

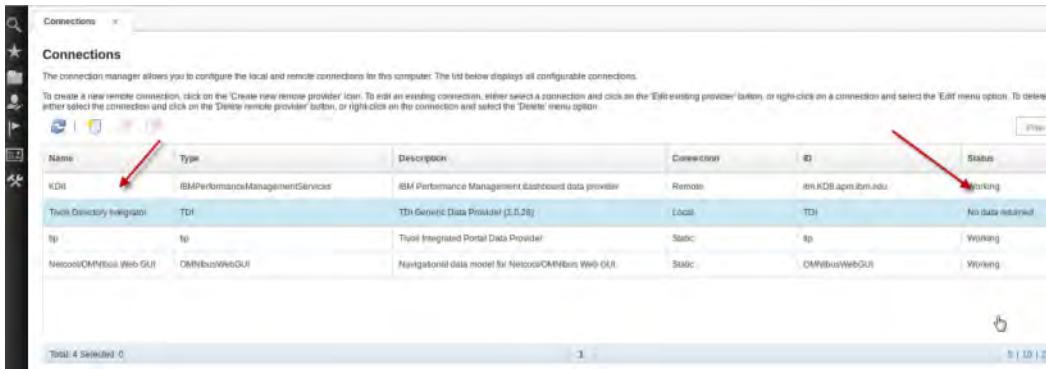
3. Click the gear icon to open the Console Settings window. Under **General**, click **Connections**.



5 Integrating IBM Monitoring with other products exercises

Exercise 6 DASH with IBM Monitoring data

4. Look for the connection that is named KD8 in the list of connections. Examine the status to ensure that it is working. If it is, continue to [Step 6](#) on page 168.

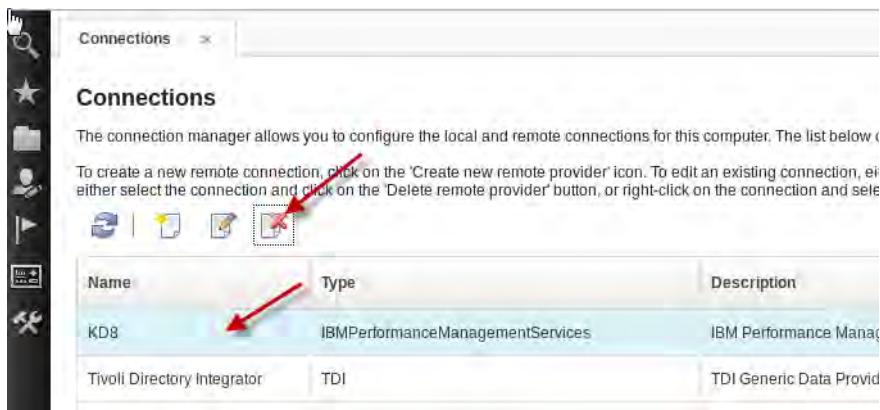


5. If and only if the KD8 connection is not working, follow these steps:



Important: Make sure that the connection is *not* working before you attempt these steps.

- Delete the current KD8 connection.



- Confirm **Delete** when prompted.
- Click **Create** a new remote provider:



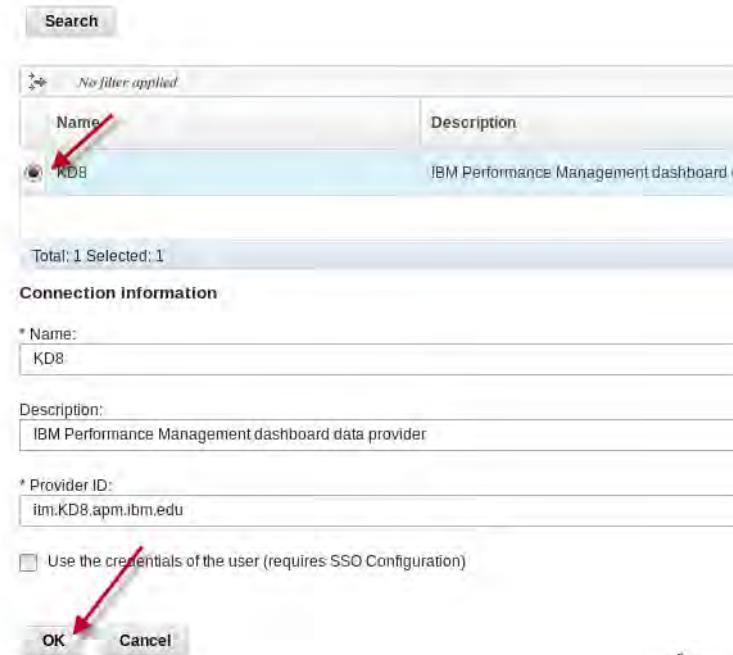
d. Provide these values:

- ◆ Protocol: HTTP
- ◆ Host name: apm.ibm.edu
- ◆ Port number: 8090
- ◆ UserID: smadmin
- ◆ Password: object00

e. Select **Search**.

The screenshot shows the 'Connections' dialog box. At the top, it says 'Connections'. Below that, a message reads: 'Specify the server information and then click Search to see a list of available data providers. You can then select one from the list below.' Under 'Server information', there are fields for 'Protocol' (set to 'HTTP') and 'Host name' (set to 'apm.ibm.edu'). There is also a checkbox for 'Connection goes through a firewall' which is unchecked. Below this, there are fields for 'Firewall address' and 'Firewall port'. A section titled 'Use the following credentials to query the remote data providers' contains fields for 'Name' ('smadmin'), 'Password' (redacted), and 'Confirm password' (redacted). A red arrow points to the 'Search' button at the bottom left of the form.

- f. Select the **KD8** entry and click **OK**.



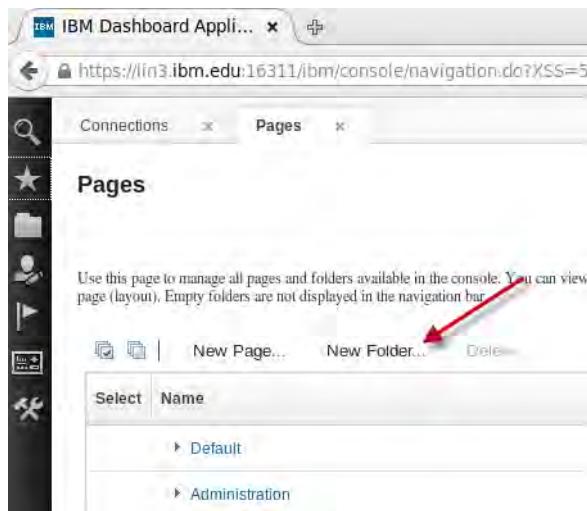
Creating an original page and dashboard

6. Before you create the new page, create a folder by clicking **Console Settings > Pages**.



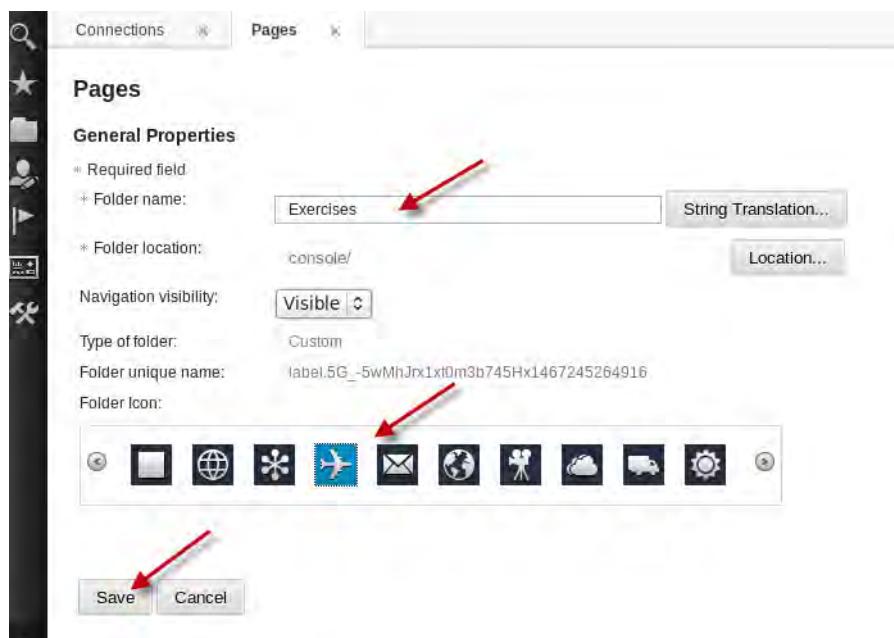
The Pages window opens.

7. Click New Folder.

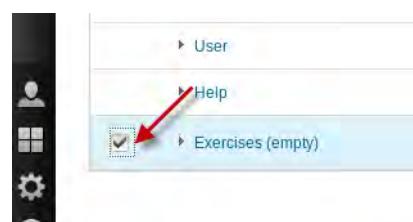


8. Name the folder **Exercises**. Choose an icon, like the airplane. Click **Save**.

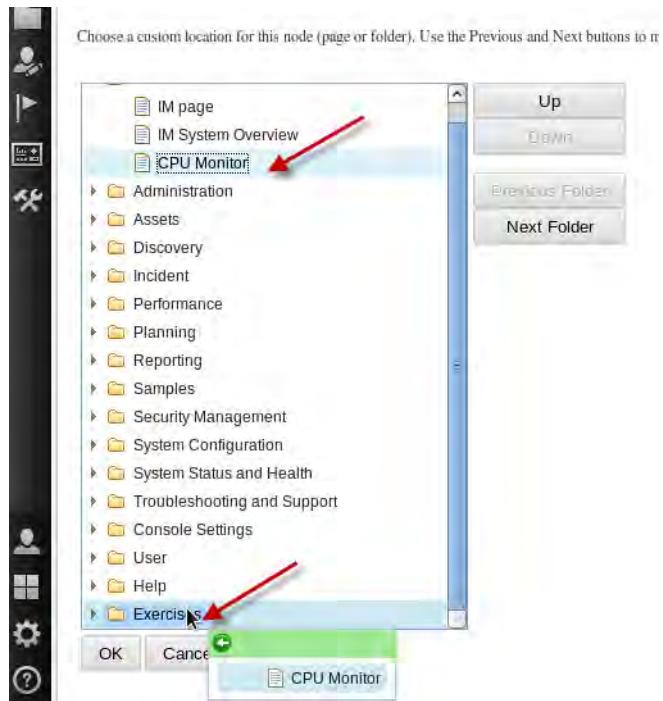
You are still on the **Pages** tab.



9. Scroll down the pages to see the Exercises folder. Check the box for that folder.



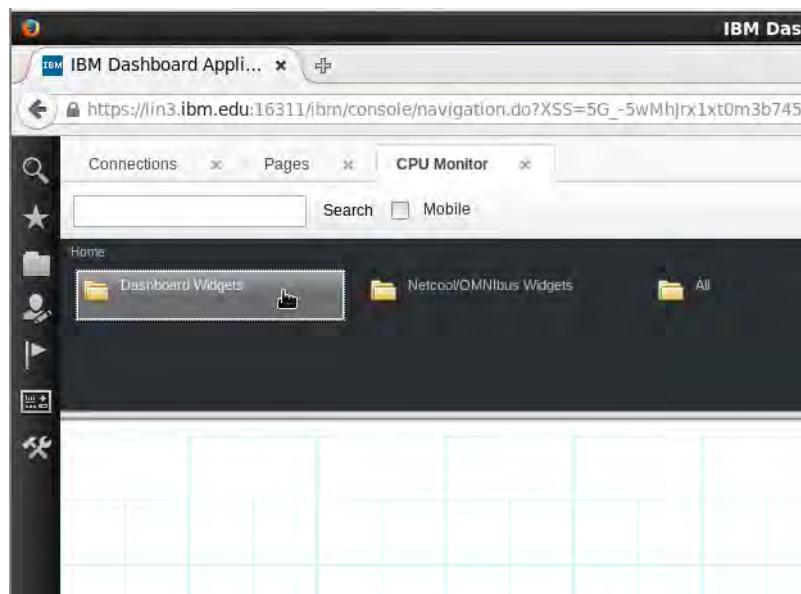
10. Click **New Page**. Name the page **CPU Monitor** and click **Location**. Your CPU Monitor page is placed in the Default folder. Click the CPU Monitor page and drag it down the list of folders until you can drop it on the **Exercises** folder.



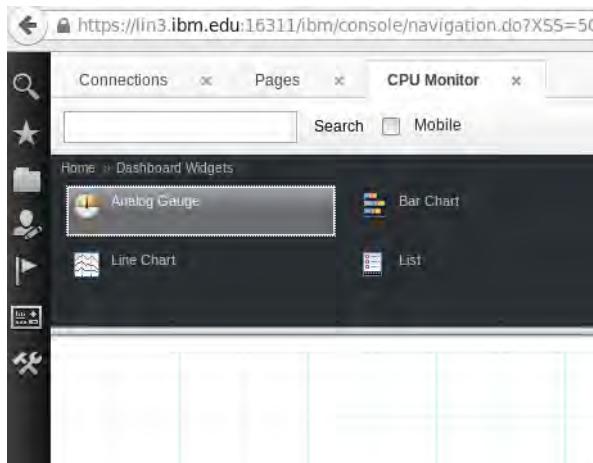
11. Click **OK** for the folder selection and **OK** again on Page Settings.

There are two sets of widgets that you can use to build a page.

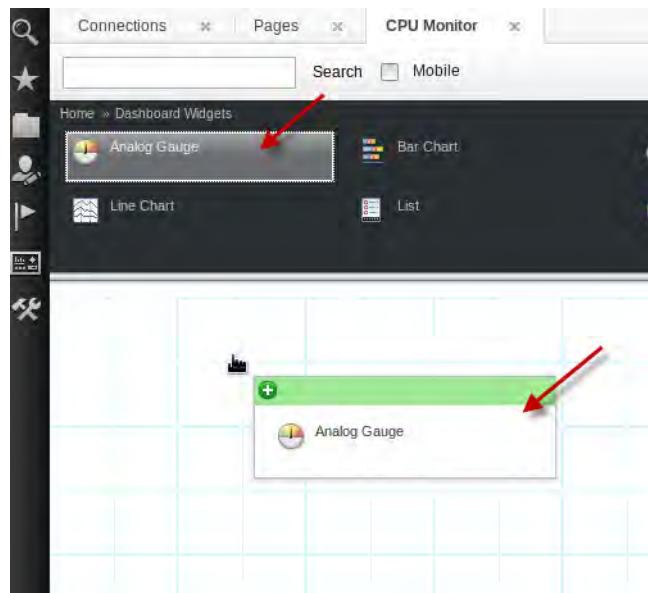
12. Click the Dashboard Widgets icon.



13. Begin building the dashboard with the analog gauge bar.



14. Click the Analog Gauge icon and drag it to the left side of the palette near the top.



15. Read about the widget by clicking the question mark in the upper right corner. Help opens in a new browser window. Close the help browser after reading the procedures.

Analog gauge widget

Analog gauges are used to visually represent a numeric quantity within specified minimum and maximum values.

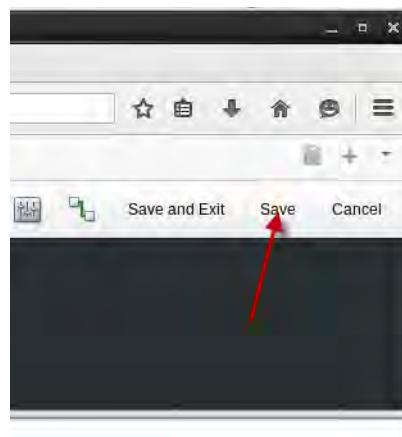
Analog gauge visualizations

The Analog gauge provides a number of visual cues to assist dashboard users in quickly assessing the status of a displayed value. In edit mode, an administrator can specify value ranges for each visualization type. For example, a gauge that reads 0 - 100 can be configured to display a status of critical (red background) for values that are in the range of 80 - 89.

Table 1. Analog gauge background visualizations. This table lists the type of different visual cues that are provided by Analog gauges.

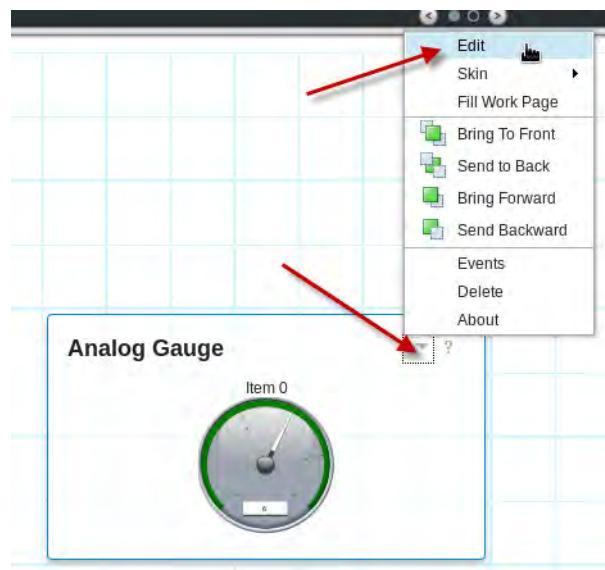
Status type	Visualization
Informational - This status is displayed when the displayed value is within the specified informational range for the parameter that is being monitored. While the status is not normal, it generally does not indicate that a problem exists.	
Normal - This status is displayed when the displayed value is within the specified normal range for the parameter that is being monitored.	
Minor - This status is displayed when the displayed value is within the specified minor abnormal range for the parameter that is being monitored. While the status does not indicate a major issue, it indicates that the reading should not be ignored.	

16. Save your work in progress by clicking **Save** in the toolbar.



Each type of widget has different settings and controls.

17. Edit the widget settings by clicking the Edit Options icon, and clicking **Edit**.

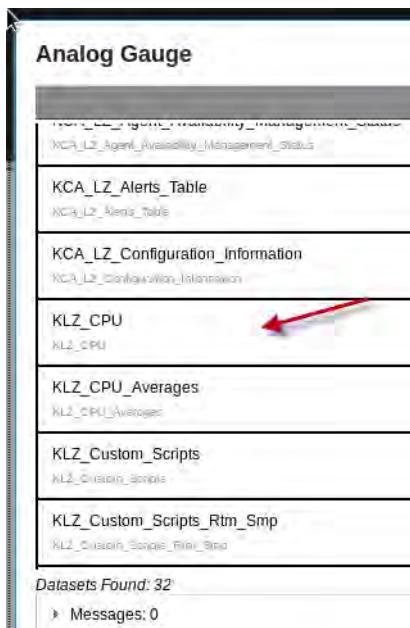


18. Select a data set or attribute group name. Enter **KLZ** in the field and click **Search**.

The screenshot shows the search interface for the Analog Gauge. The search term 'KLZ' is entered in the search field, and the 'Search' button is highlighted with a red arrow. Below the search bar, a message says 'After searching, select a dataset from the search results below to continue.' A list of datasets is displayed, including 'Provider: KDB > Datasource: Linux OS' and several specific datasets like 'KCA_LZ_Agent_Active_Runtime_Status', 'KCA_LZ_Agent_Availability_Management_Status', 'KCA_LZ_Alerts_Table', 'KCA_LZ_Configuration_Information', and 'KLZ_CPU'. At the bottom, it says 'Datasets Found: 32' and 'Messages: 0'.

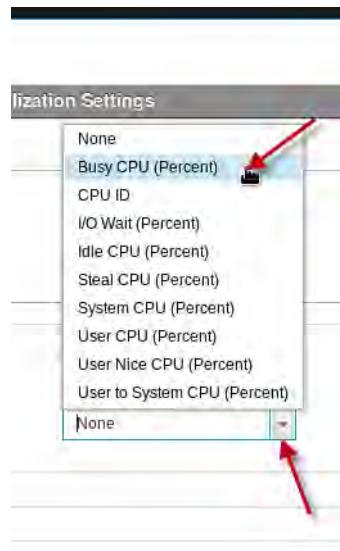
The search returns all attribute groups with *KLZ* in their name.

19. Scroll to locate the KLZ_CPU provider. Click **KLZ_CPU** to select it.



The Required Settings pane opens.

20. Click the arrow next to **None** and select **Busy CPU (Percent)**.



21. Click **Optional Settings** to expand it. Enter **APM Busy CPU Percent** in the **Title** field.

22. Select **Busy CPU Percent** for the **Label above Gauge** field. Set the label at leading edge as **System Name**.

Analog Gauge

Visualization Settings

Map Visualization Attributes to Dataset Columns:

Value <small>Numeric value/status expected</small>	Busy CPU (Percent)
--	--------------------

Optional Settings

Title	APM Busy CPU Percent
--------------	----------------------

Visualization Options:

Label above Gauge <small>Optional, select a property from the list to show its value or type in any custom label</small>	Busy CPU (Percent)
Label at leading edge <small>Optional, select a property from the list to show its value or type in any custom label</small>	System Name

23. Leave the minimum value as **0** and maximum value as **100**.

24. You can provide values that cause the gauge to change color, somewhat like situation states. Enter the following values to set up the gauge thresholds:

Analog Gauge

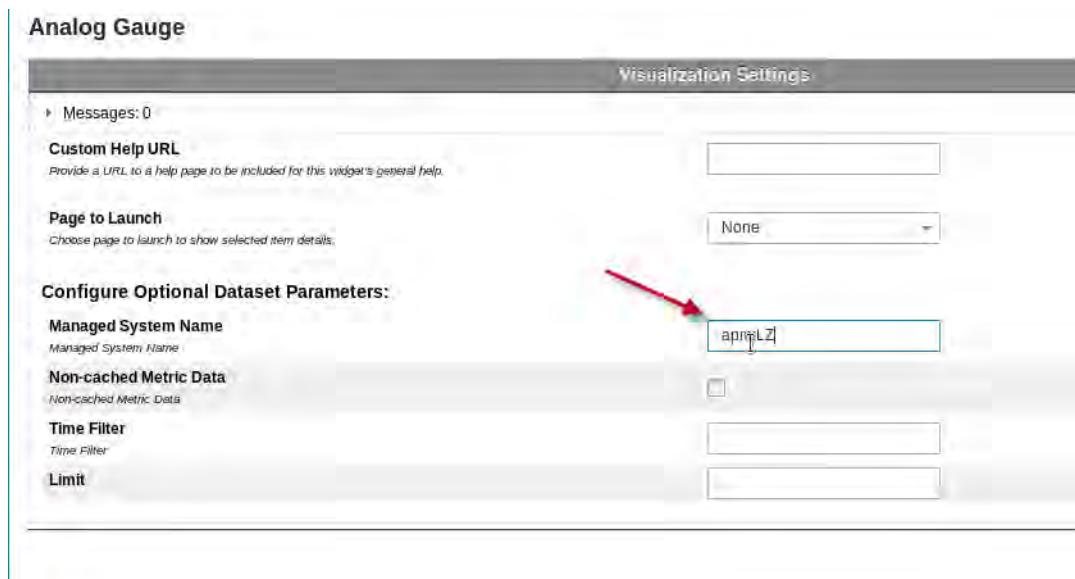
Visualization Settings

Messages: 0

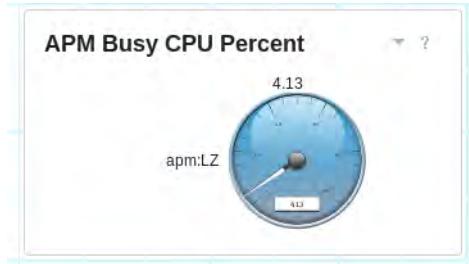
Informational <small>Threshold Value indicating start of Informational Status</small>	0
Normal <small>Threshold Value indicating start of Normal Status</small>	50
Minor <small>Threshold Value indicating start of Minor Warning Status</small>	60
Major <small>Threshold Value indicating start of Major Warning Status</small>	75
Critical <small>Threshold Value indicating start of Critical Status</small>	90
Fatal <small>Threshold Value indicating start of Fatal Status</small>	95

25. You can control the tick marks on the gauge. For this exercise, leave the tick mark settings unchanged.

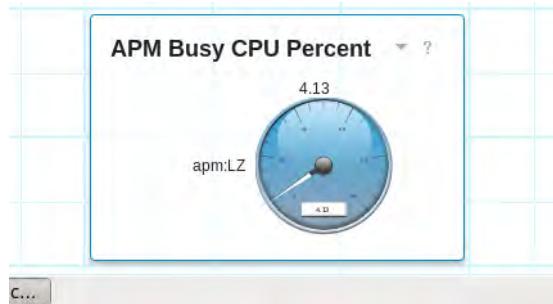
26. Enter the managed system name as **apm:LZ**.



27. Click **OK** to close the configuration window. This example shows the widget.

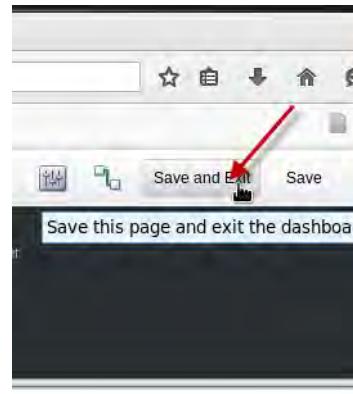


28. Hold the mouse pointer over the left border of the widget. When the mouse becomes a double-ended arrow, drag the left border as far to the right as you can without creating scroll bars or shortening the title. Slowly move the mouse pointer outside the frame and click the palette to release the widget. The widget snaps to the nearest grid line. Do the same thing with the right border, dragging it to the left.

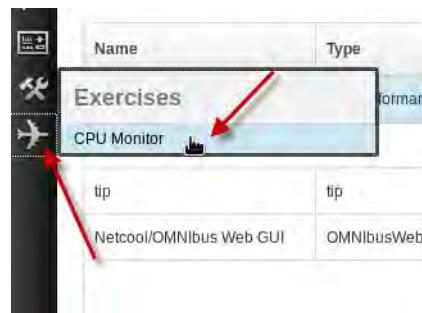


Important: If you close the edit window before you finish or if you want to modify any of the settings, open the Edit window as you did in [Step 17](#) on page 173. Click **Optional Settings**.

29. Test the dashboard by clicking **Save and Exit** in the menu bar. Close the page by clicking the X on the CPU Monitor tab.



30. Click the Airplane icon, and click CPU Monitor.



31. Verify that the result looks similar to this screen capture:





6 Reporting and 7-day comparison exercises

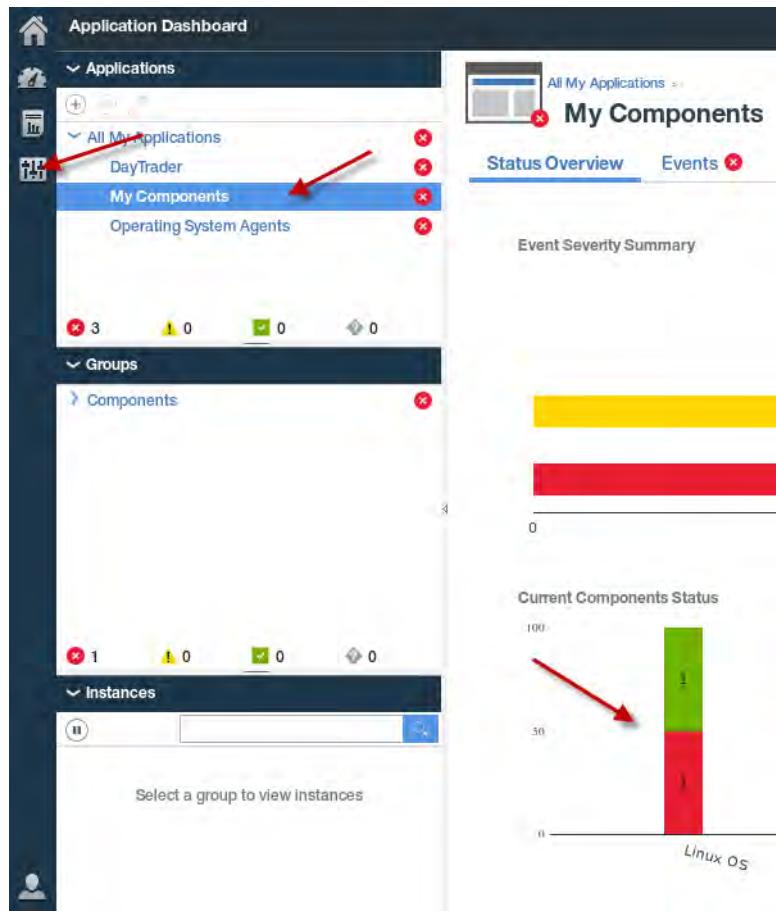
In IBM Monitoring, certain widgets that display information are compared against the same time frames from other days. That is the purpose of Historical 7-Day Comparison.

In these exercises, the objective is to learn how to use the Historical 7-Day Comparison and how to install and access Tivoli Common Reporting reports.

Exercise 1 Historical 7-day comparison

Historical 7-day comparison compares the time range that is displayed in a line chart with the metrics from a different day, up to one week ago. The **Compare to** selection is effective only for the current page. All the dashboards in the current application (or all applications) are affected by the change.

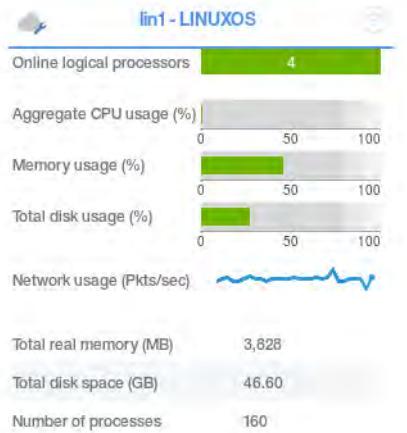
1. From the APM console, click the **Performance (gauge icon)** > **All My Applications** > **My Components** > **Linux OS**.



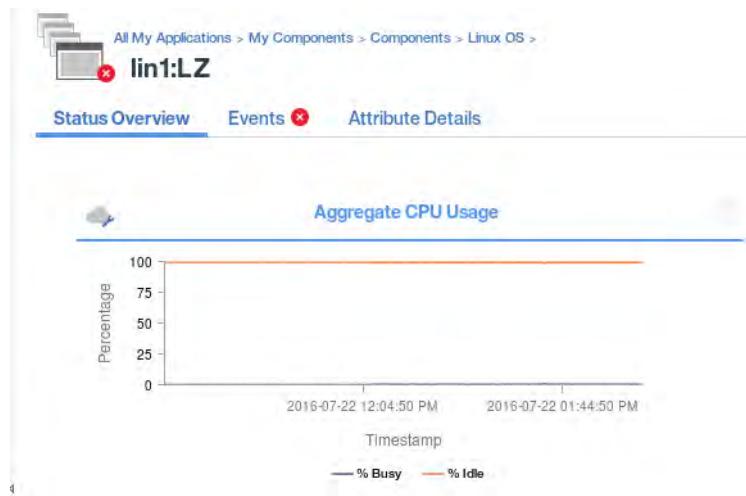
6 Reporting and 7-day comparison exercises

Exercise 1 Historical 7-day comparison

2. In the Linux OS area, in the **Status Overview** tab, click anywhere inside the lin1- LINUXOS area.

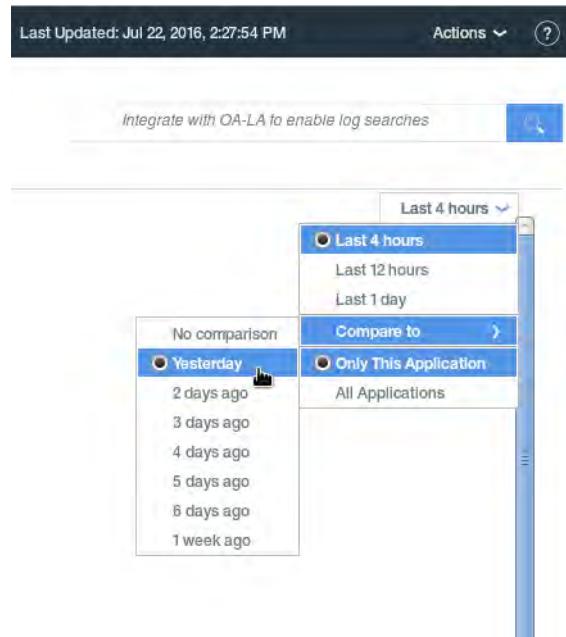


3. Examine the Aggregate CPU Usage chart, which is a line chart. It contains a time stamp legend with a default time range.

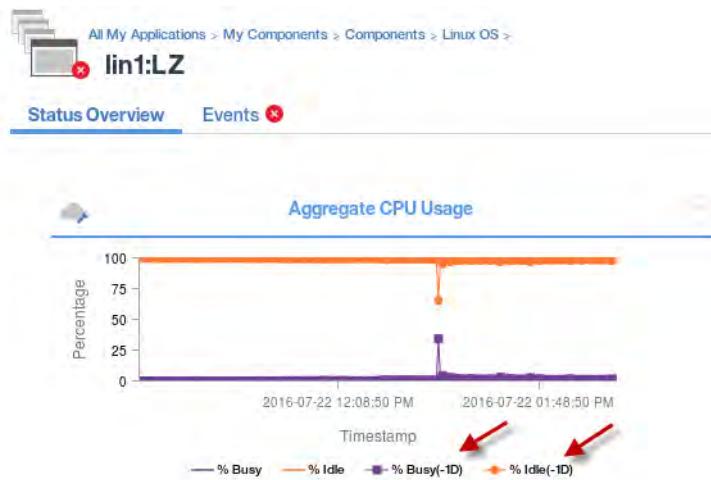


4. In the upper right side of the window that contains all of the widgets, there are controls for the 7-day time span. Where you see **Last 4 hours**, click the down arrow.
5. Click **Compare to** in the drop-down list of options.

6. Select the option **Yesterday**. Your class can have data available from yesterday through today because this is Day 2 of a 2-day class.



Note the changes on the Aggregate CPU Usage widget.

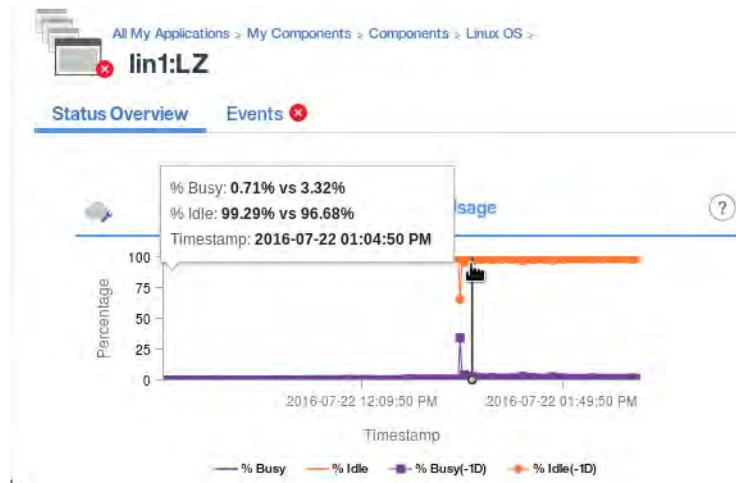


The **Timestamp** legend now has two sets of information, % Busy and % Idle information. The original set, which indicates the more current information, uses solid lines. The second set uses boxes and lines, which makes the lines look thicker and indicates by **(-1D)** that it represents going back 1 day for the same time range.

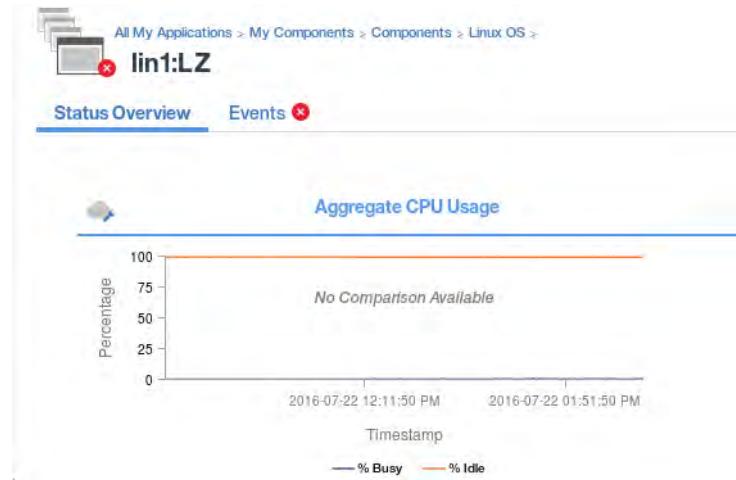
6 Reporting and 7-day comparison exercises

Exercise 1 Historical 7-day comparison

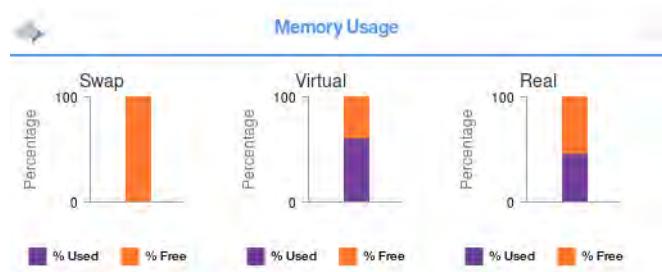
7. Select a point on the line by pressing the left mouse button and holding it down. Now the box represents the two sets of information at that point that are being compared.



8. If data is not available to compare, a message indicates that no data is available. In your class, if you select to compare to **1 week ago** or longer, there is no data. The lack of data is indicated by the words **No Comparison Available**. This example is what you see when you compare to a few days before today.



The Memory Usage widget is to the right of the Aggregate CPU Usage widget. Examine the Swap, Virtual, and Real memory usage bar charts.



9. Because Memory Usage contains bar charts, it shows the current values. To examine memory values in a time range, place the cursor anywhere inside the Memory Usage widget.
10. Click inside the Memory Usage widget to cause more memory-related widgets to show in a new page.

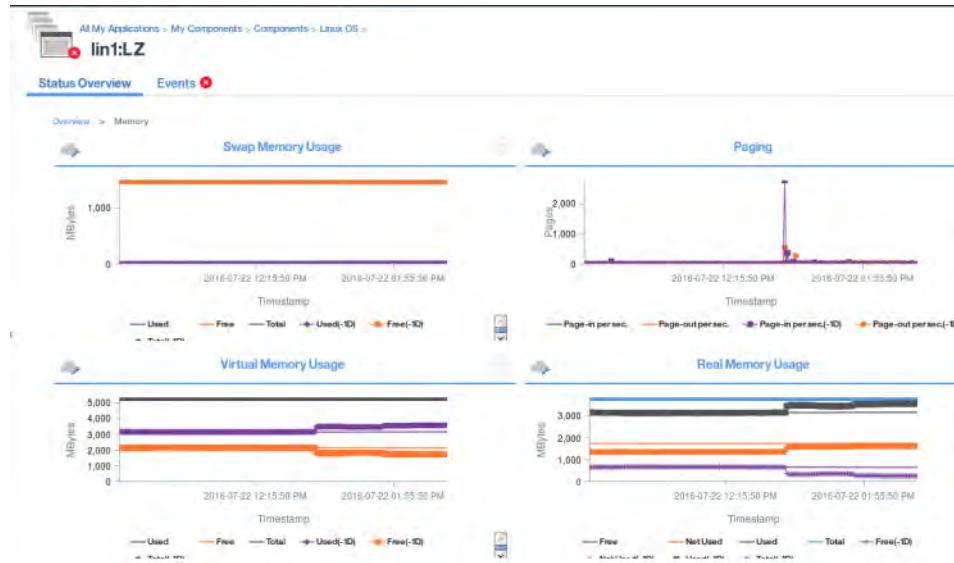


Each of these four memory-related widgets has line charts with time stamps.

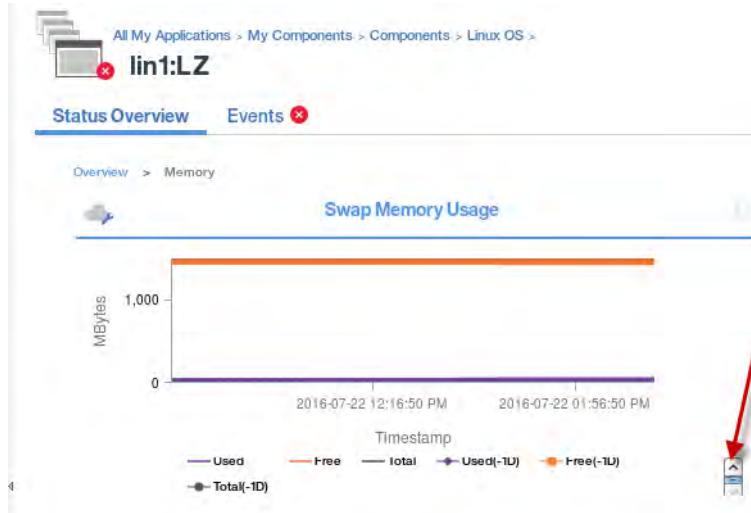
6 Reporting and 7-day comparison exercises

Exercise 1 Historical 7-day comparison

11. From the history selections, choose to compare to **yesterday**. Because all four widgets have time ranges of data, the historical selection applies to all four widgets.



If you see scroll bars in the lower-right corner of the widget, some information isn't being displayed. Scroll downward to see that information. For this example of the Swap Memory Usage widget, there is a fifth legend that you can see only by scrolling downward.

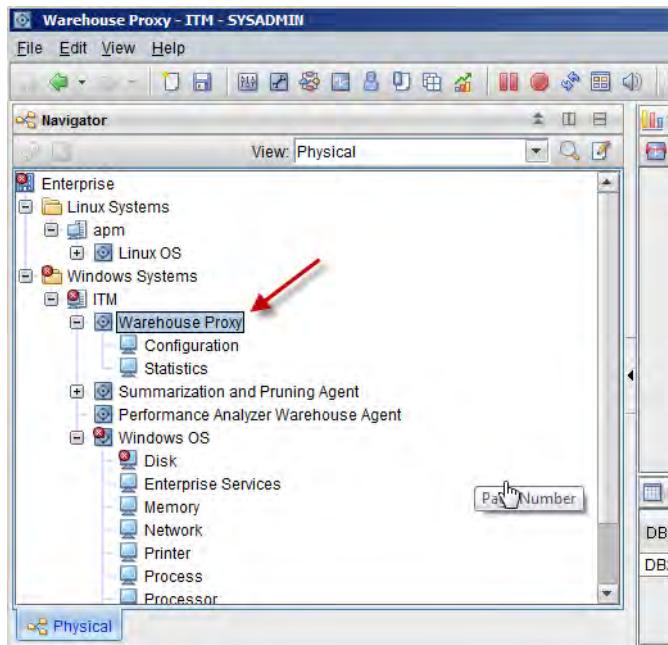


This scrolling effect can be different on everyone's system, depending upon the screen resolution that is being used.

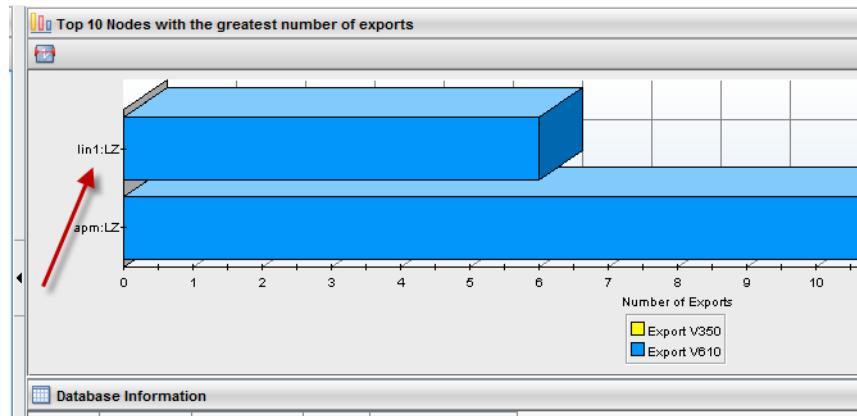
Exercise 2 Running IBM Tivoli Monitoring Reports

This exercise guides you through the steps of running IBM Tivoli Monitoring reports on a Tivoli Common Reporting server. You validate that the configurations in [Exercise 2, “Integrating with IBM Tivoli Monitoring: using the Tivoli Data Warehouse,”](#) on page 142 are successful.

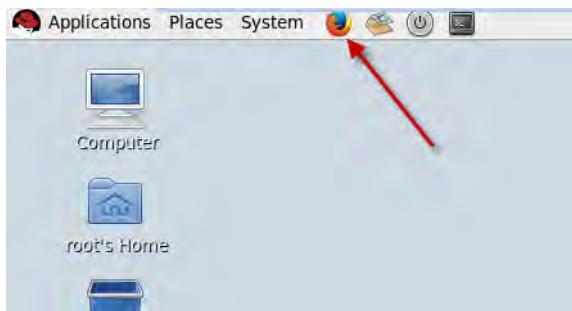
1. On the ITM VM, log in to the Tivoli Enterprise Portal.
2. Open the default workspace for the warehouse proxy agent at **Enterprise > Windows Systems > ITM > Warehouse Proxy**.



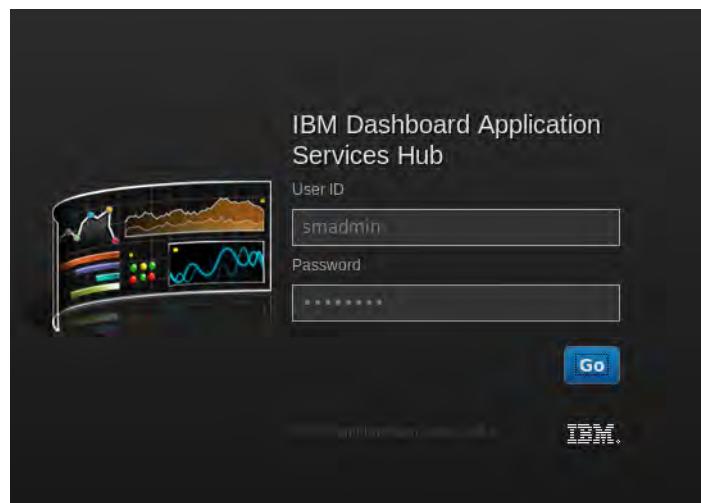
3. Review the view Top 10 Nodes with the greatest number of exports. Observe if lin1:LZ is present. If it is, then the configuration was successful and data is transferring from the IBM Monitoring V8 agent into the IBM Tivoli Monitoring V6 successfully.



4. On the LIN5 VM, log in as **root** and a password of **object00**.
5. Start WebSphere Application Server by double-clicking the shortcut on the desktop. Wait 5 minutes for Tivoli Common Reporting to initialize after WebSphere Application Server starts.
6. After WebSphere Application Server starts, open a Firefox browser.



7. Log in to the Dashboard Application Services Hub as **smadmin** and a password of **object00**.



5) Select **Reporting > Common Reporting**.



8. Select **IBM Tivoli Monitoring OS Agents Reports**.

9. Select **Utilization**.

A screenshot of the 'Common Reporting' interface under 'IBM Cognos Connection'. The navigation bar shows 'Public Folders' and 'My Folders'. Below it, the path 'Public Folders > IBM Tivoli Monitoring OS Agents Reports' is shown. A list of reports is displayed with a red arrow pointing to the 'Utilization' folder.

	Name
<input type="checkbox"/>	Availability
<input type="checkbox"/>	Common Shared Libraries
<input type="checkbox"/>	Prerequisites Validation
<input type="checkbox"/>	Utilization

10. Select **Disk Utilization for a Single Resource**.

11. Select these report parameter settings and accept the defaults if a setting is not specified:

- Date range for the report: **Last 7 days**
- Summarization type: **Hourly**
- OS Type: **Linux**
- Servers: **apm**

Common Reporting

Note: This report requires you to specify the "Summarization type." If you use "Hourly" or "Daily," hours and vacation days. If you use shift hours or vacation days, avoid using the value of "All shift are different from "All shifts" or "All days" respectively in the "Include shift period" and "Include vacation period" dropdown lists.

Date range

Select desired date range for report: * **Last 7 days**

From: Jun 30, 2016 12 : 00 AM

To: Jun 30, 2016 11 : 59 PM

Date range: **Jun 30, 2016**

Summarization selection

Summarization type: * **Hourly**

Include shift periods: * **All shifts** The system detected that

Include vacation periods: * **All days** The system detected that

Resource selection

OS type: * **Linux**

apm
lin1

12. Click Finish.

Resource selection

OS type: * Linux

Servers

- * /dev/hda1
- lin1

File system selection

Include remote file systems: * No

Include pseudo file systems: * No

Forecast

Forecast: * Do not use forecast

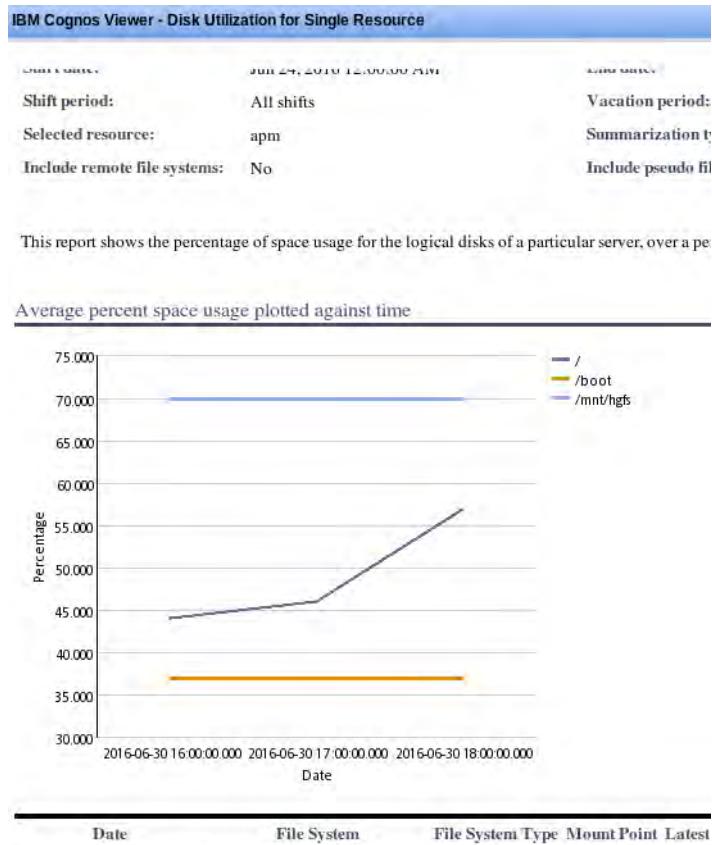
Jun 30, 2016

Forecast period:

12 : 00 AM

Finish

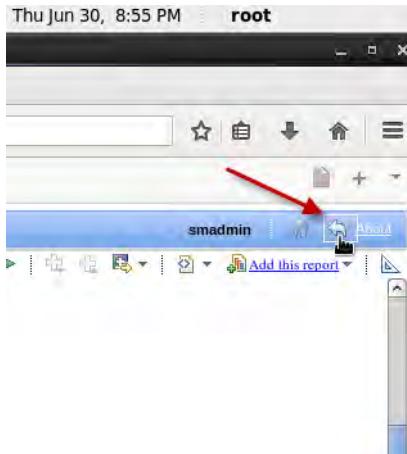
The report runs and the data looks similar to this screen capture:





Note: The **apm:LZ** agent resource is an IBM Tivoli Monitoring OS agent.

13. In the upper right, click **Return**.



14. Run the Disk Utilization for Single Resource report again this time for the **lin1** Linux OS agent.

Date range

Select desired date range for report: *

From:

Date range: To:

Summarization selection

Summarization type: *

Include shift periods: * The system detected th

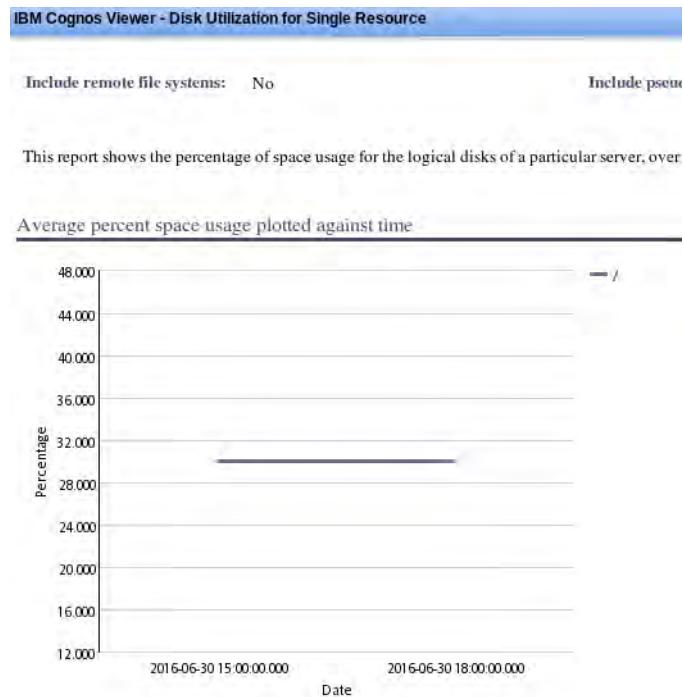
Include vacation periods: * The system detected th

Resource selection

OS type: *

15. Click **Finish**.

The report runs and the data looks similar to this screen capture:



Note: The **lin1:LZ** agent resource is an IBM Monitoring OS agent.

16. Explore other reports as time permits.
17. Log out of the IBM Dashboard Application Services Hub.

Exercise 3 Installing IBM Monitoring reports

IBM Monitoring delivers reports that run with IBM Monitoring agents and use the warehouse database that ships with IBM Monitoring. This exercise guides you through configuring those reports and installing them. You also run the reports after they are installed.

1. On the APM VM, open a terminal window.

2. Change to this directory:

/downloads/IM813/reports

3. List the contents of the directory.



```
root@apm:/downloads/IM813/reports#
File Edit View Search Terminal Help
[root@apm Desktop]# cd /downloads/IM813/reports/
[root@apm reports]# ls
ibm_monitoring_reports_6.1.3.zip
```

This is the report package that IBM Monitoring delivers.

4. Change to the **/opt/ibm/ccm** directory.

5. Run the **configure_reports_images.sh** command to configure the reports:

./configure_reports_images.sh

6. Enter **1** to confirm that you want to begin the installation.

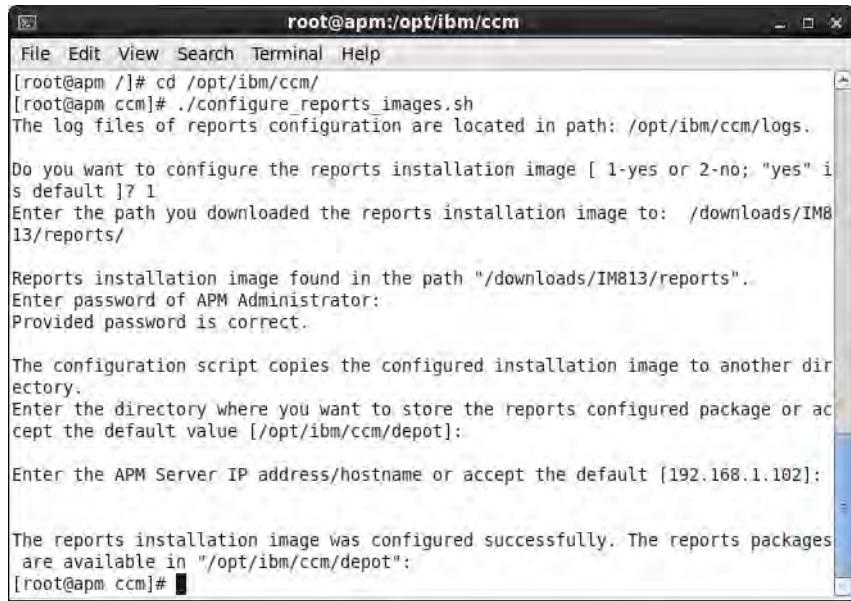
7. Enter the directory location where you downloaded the reports installation image:

/downloads/IM813/reports.

8. Enter **object00** for the password for the Performance Management server.

9. Accept the default value of **/opt/ibm/ccm/depot**.

10. Accept the default for the IP address of the Performance Management server that the Tivoli Common Reporting server communicates with for retrieving data for reports.



The terminal window shows the configuration of the IBM Monitoring Reports package. The user runs the command `./configure_reports_images.sh`. The script asks for the path to the reports installation image, which is set to `/downloads/IM813/reports`. It then asks for the APM Administrator password, which is provided. The configuration script copies the package to the depot directory. Finally, it asks for the APM Server IP address, which is set to `192.168.1.102`. The message indicates that the configuration was successful and the packages are available in `/opt/ibm/ccm/depot`.

```
[root@apm ~]# cd /opt/ibm/ccm/
[root@apm ccm]# ./configure_reports_images.sh
The log files of reports configuration are located in path: /opt/ibm/ccm/logs.

Do you want to configure the reports installation image [ 1-yes or 2-no; "yes" is default ]? 1
Enter the path you downloaded the reports installation image to: /downloads/IM813/reports

Reports installation image found in the path "/downloads/IM813/reports".
Enter password of APM Administrator:
Provided password is correct.

The configuration script copies the configured installation image to another directory.
Enter the directory where you want to store the reports configured package or accept the default value [/opt/ibm/ccm/depot]:

Enter the APM Server IP address/hostname or accept the default [192.168.1.102]: 192.168.1.102

The reports installation image was configured successfully. The reports packages are available in "/opt/ibm/ccm/depot":
[root@apm ccm]#
```

11. On VM LIN5, open a terminal window.

12. Transfer the configured reports package from the APM VM to the LIN5 VM using these commands. When prompted for a password provide the value **object00**.

```
cd /downloads/
cd Reports/
mkdir IM813
cd IM813
sftp apm.ibm.edu
cd /opt/ibm/ccm/depot
get ipm_monitoring_reports_8.1.3.zip
bye
```



The terminal window shows the user connecting via SFTP to the APM server at `apm.ibm.edu`. They change to the `/opt/ibm/ccm/depot` directory and retrieve the `ipm_monitoring_reports_8.1.3.zip` file. The transfer is completed successfully.

```
[root@lin5 ~]# cd /downloads/
[root@lin5 downloads]# cd Reports/
[root@lin5 Reports]# mkdir IM813
[root@lin5 Reports]# cd IM813
[root@lin5 IM813]# sftp apm.ibm.edu
Connecting to apm.ibm.edu...
root@apm.ibm.edu's password:
sftp> cd /opt/ibm/ccm/depot
sftp> get ipm_monitoring_reports_8.1.3.zip
Fetching /opt/ibm/ccm/depot/ipm_monitoring_reports_8.1.3.zip to ipm_monitoring_reports_8.1.3.zip
100% 8027KB 7.8MB/s 00:00
sftp> bye
[root@lin5 IM813]#
```

6 Reporting and 7-day comparison exercises

Exercise 3 Installing IBM Monitoring reports

13. Extract the report package using the `unzip` command.

The screenshot shows a terminal window titled "root@lin5:downloads/Reports/IM813". The user has run the command `unzip ipm_monitoring_reports_8.1.3.zip`. The output shows the contents of the zip file being extracted, including various JAR files and configuration scripts like `installReports.sh` and `report_packages.properties`.

```
[root@lin5 IM813]# unzip ipm_monitoring_reports_8.1.3.zip
Archive: ipm_monitoring_reports_8.1.3.zip
inflating: common/
creating: lib/
inflating: lib/zookeeper-3.4.6.jar
inflating: lib/ccm.jar
inflating: lib/log4j-1.2.17.jar
inflating: lib/JSON4J.jar
inflating: acs_client.jar
inflating: installReports.sh
inflating: nls_replace
creating: report_packages/
extracting: report_packages/KVN_reports.zip
creating: .config/
inflating: .config/reports.properties
```

14. Install the report package using the `./installReports.sh` command.

15. Enter 1 to select the package Monitoring Agent for WebSphere® Applications Reports.

16. Accept the default the installation path for Jazz™ for Service Management.

17. Accept the default user name (**smadmin**) for Jazz for Service Management user with administrator privileges, and provide a password of **object00**.

18. Enter the password of the Application Performance Management administrator, **object00**.

19. Enter the Tivoli Common Reporting IP address: **192.168.1.108**.

The screenshot shows the execution of the `./installReports.sh` script. It prompts the user to select packages (option 1), accept the default installation path, enter a password for the JazzSM administrator, and provide the TCR server IP address. The process continues until completion, ignoring a warning about too many arguments.

```
[root@lin5 IM813]# ./installReports.sh
The log files of reports installation are located in path: /tmp/apm_reports_installer.

The following reports are available for installation:
  1) Monitoring Agent for WebSphere Applications Reports

Type the numbers that correspond to the products that you want to install. Type "q" to quit selection.
If you want to enter more than one number, separate the numbers by using space or comma.

Type your selections here (For example: 1,2): 1
Enter the JazzSM installation path or accept the default [/opt/IBM/JazzSM]:
JazzSM found in the path "/opt/IBM/JazzSM".

Enter the JazzSM Administrator user or accept the default [smadmin]:
Enter the password of JazzSM Administrator:
Provided password is correct.
Enter password of APM Administrator:
Provided password is correct.

./installReports.sh: line 75: [: too many arguments
Enter the TCR server IP address/hostname or accept the default [192.168.1.108]
Creating TDW DataSource for WAREHOUS database.
Installing report packages.
  1) Monitoring Agent for WebSphere Applications Reports installed successfully.

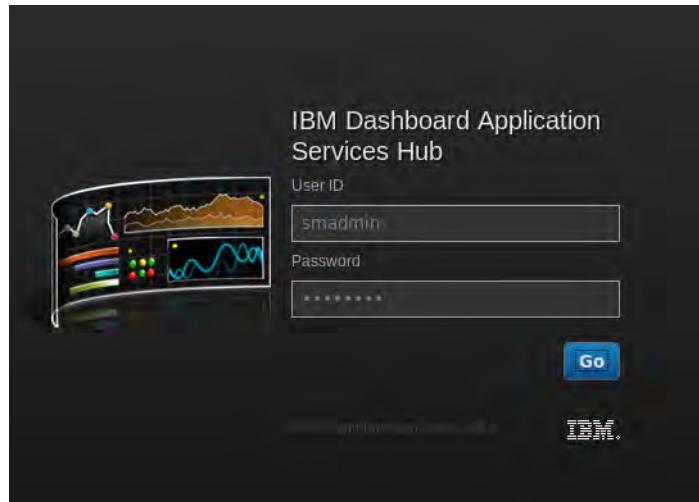
Configuring APM server for reporting feature.

Installation completed.
[root@lin5 IM813]#
```

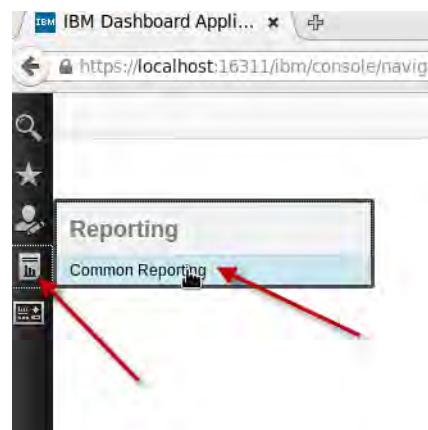


Hint: You can ignore the too many arguments message.

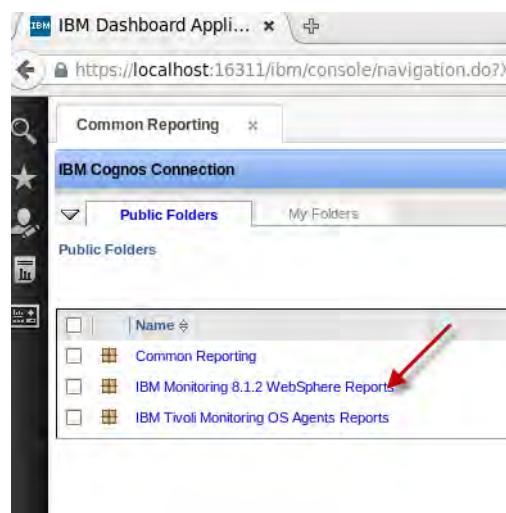
20. On the LIN5 VM, open a Firefox browser and log in to the Dashboard Application Services Hub as **smadmin** and a password of **object00**.



5) Click **Reporting > Common Reporting**.



21. Select **IBM Monitoring 8.1.2 WebSphere Reports**.



22. Select DB Connection Pools.

The screenshot shows the 'IBM Cognos Connection' interface with the 'Public Folders' tab selected. Under 'Public Folders > IBM Monitoring 8.1.2 WebSphere Reports', the 'DB Connection Pools' report is highlighted with a red arrow pointing to it.

23. Provide these values for the report:

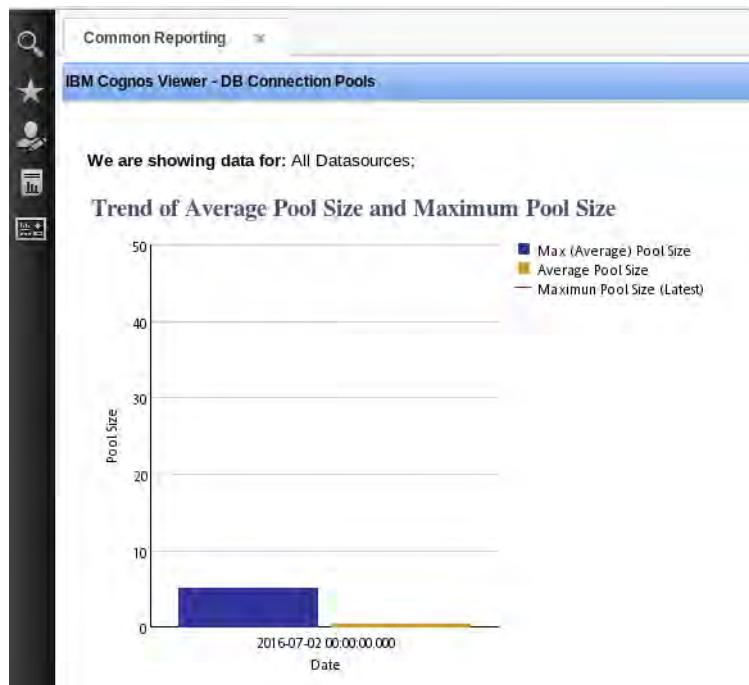
- Select desired date range: Today
- Summarization Type: Hourly
- Application Server: lin1Node01server1:lin1:KYNS

The screenshot shows the 'Common Reporting' interface with the 'Date Range' section and 'Summarization selection' section highlighted with red arrows.

- Date Range:** Set to 'Today' (Start Date: Jul 2, 2016, 12:00 AM; End Date: Jul 2, 2016, 11:59 PM)
- Summarization selection:** Set to 'Hourly'
- Resource selection:** Set to 'Application Server' (selected value: 'lin1Node01server1:lin1:KYNS')

24. Click **Finish**.

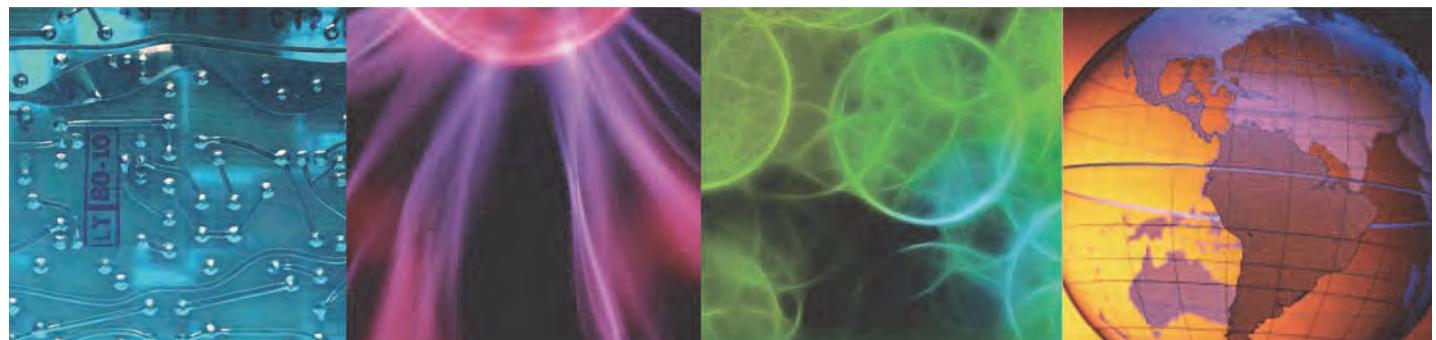
25. Review the report.



26. Explore the various drill down features of this report.

27. Explore other reports as time permits.

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