

Course Exercises Guide

Administration of IBM Business Process Manager Advanced V8.5.7

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Exercises description

This course includes the following exercises:

- Installing IBM Business Process Manager Advanced
- Configuring the Process Center environment
- Administering Process Center
- Administering Process Portal
- Purging content in Process Center
- Configuring the Process Server environment
- IBM Process Server administration
- Purging content in Process Server
- Managing offline and online process servers
- Migrating process instances
- Advanced Process Server administration

In the exercise instructions, you can check off the line before each step as you complete it to track your progress.

Most exercises include required sections, which should always be completed. It might be necessary to complete these sections before you can start later exercises. If you have sufficient time and want an extra challenge, some exercises might also include optional sections that you can complete.



Important

Online course material updates might exist for this course. To check for updates, see the Instructor wiki at <http://ibm.biz/CloudEduCourses>.

Exercise 1. Installing IBM Business Process Manager Advanced

Estimated time

00:30

Overview

This exercise covers the silent installation of IBM Business Process Manager Advanced. You create a response file and use that response file to install the product.

Objectives

After completing this exercise, you should be able to:

- Create a response file for a silent installation
- Install IBM Business Process Manager Advanced
- View the installation log file
- Confirm the installation

Introduction

IBM Installation Manager is an installation management tool that installs and maintains Installation Manager-based software packages. You can use the Eclipse-based tool to install and modify packages, search for updates, uninstall, and rollback updates. Installation Manager makes it easier for you to download and install code for a number of IBM software packages.

IBM Installation Manager is used to install IBM Business Process Manager. IBM Business Process Manager is available in four configurations where each targets various enterprise needs. The following four configurations can be installed:

- Advanced
- Advanced: Process Server
- Standard
- Express

Before you install IBM Installation Manager, you must make several decisions. First, you must decide in which mode to run Installation Manager. The mode determines which user or user group can complete the installation. The choices are administrator, non-administrator, or group. Second, you must decide where the product files and runtime data are going to be located.

Requirements

To complete this exercise, you need the IBM Business Process Manager Advanced binary files for IBM Business Process Manager Advanced.

Exercise instructions

Part 1: General exercise information

This section provides general information about the exercises in this course. Review this section before starting the exercises.

User accounts

Type	User ID	Password
Operating system	localuser	passw0rd
Clients	db2inst1	passw0rd

An Ubuntu user ID was created for you. You use this ID to log on to the image.

- User ID: localuser
- Password: passw0rd (replace the o with a zero 0)

A DB2 administrator user ID was created for you for interacting with DB2.

- User ID: db2inst1
- Password: passw0rd (replace the o with a zero 0)



Information

The supplied course image is Ubuntu 14.04 LTS. The desktop uses Unity, which is different than the common Gnome desktop. Some hints on using Unity are at:

<http://www.howtogeek.com/113330/how-to-master-ubuntus-unity-desktop-8-things-you-need-to-know/>

Course labfiles

The exercises in this course use a set of lab files that might include scripts, applications, files, solution files, PI files, and others. The course lab files can be found in the following directory:

- /opt/labfiles for the Linux operating system

The exercises point you to the lab files as you need them.

**Stop**

Course updates and corrections

A course corrections document might be available for this course.



If you are taking the class with an instructor, the instructor can provide this document to you.

If you are taking the course in a self-paced environment, the course corrections document is provided with the other manuals.

To check whether a course corrections document exists for this course:

1. Go to the following URL: <http://ibm.biz/CloudEduCourses> .
2. On the web page, locate, and click the **Course Information** category.
3. Find your course in the list and click the link.
4. Click the **Attachments** tab to see whether a course corrections document exists with updated instructions.
5. To save the file to your computer, click the document link and follow the prompts.

Part 2: Installing IBM Business Process Manager Advanced

In this exercise, you install IBM Business Process Manager as a non-administrator, or non-root. You install IBM Business Process Manager Advanced silently by creating a response file and then running a command to use that response file to install the product.

By using response files, you can simplify the silent installation and reduce errors in the process. You set up your installation options once in a saved, sharable file that can be used on one or more workstations. The installation software provides sample response files for each supported operating system. You can use an unmodified sample response file for a silent installation by using default settings, or you can modify the response file to set particular values. The comments in the sample response files provide detailed instructions and information about setting the values.

**Optional**

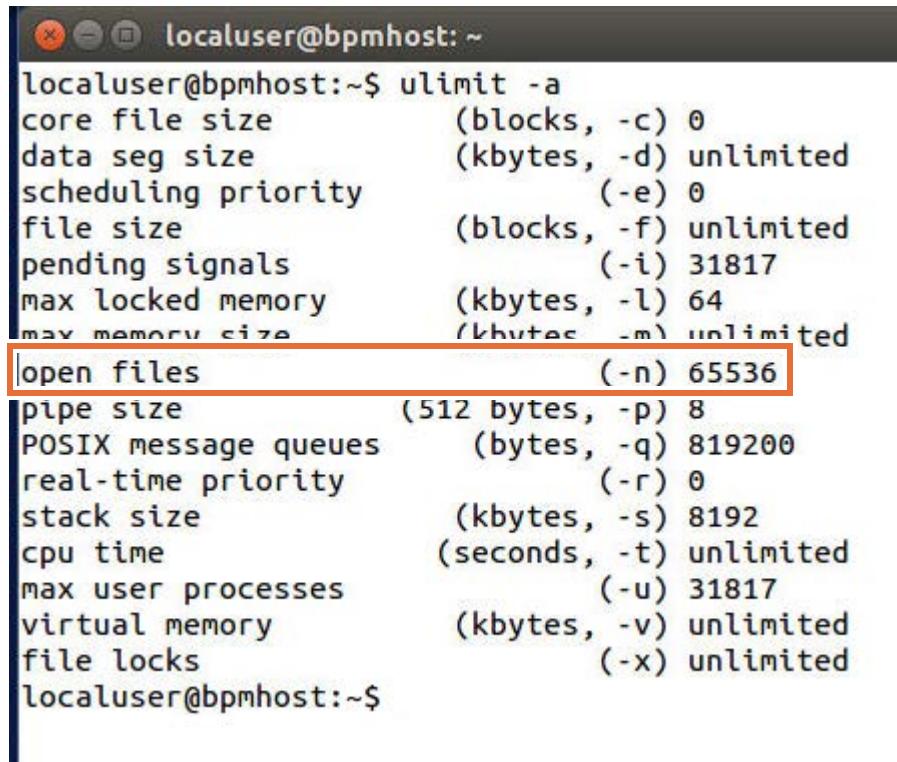
If you prefer to complete a GUI installation, Appendix A guides you through the installation process by using a GUI instead of a silent installation.

- ___ 1. Verify the resources.
 - ___ a. Open a terminal window. Click the **Terminal** icon in the toolbar, which is the left area of the image.



- ___ b. On Linux, you must set the level of ulimit open files for the installation. The ulimit open files values must be set to a minimum value of 65536. To verify the value, enter the following command:

```
ulimit -a
```

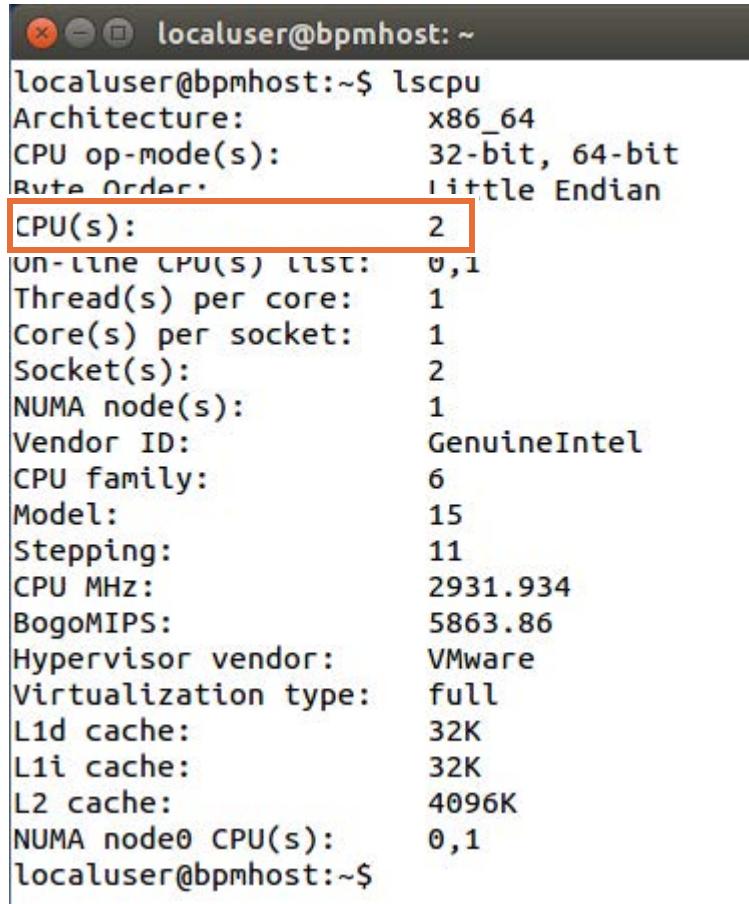


```
localuser@bpghost:~$ ulimit -a
core file size          (blocks, -c) 0
data seg size           (kbytes, -d) unlimited
scheduling priority     (-e) 0
file size               (blocks, -f) unlimited
pending signals          (-i) 31817
max locked memory       (kbytes, -l) 64
max memory size         (kbytes, -m) unlimited
open files              (-n) 65536
pipe size                (512 bytes, -p) 8
POSIX message queues    (bytes, -q) 819200
real-time priority       (-r) 0
stack size               (kbytes, -s) 8192
cpu time                 (seconds, -t) unlimited
max user processes        (-u) 31817
virtual memory            (kbytes, -v) unlimited
file locks                (-x) unlimited
localuser@bpghost:~$
```

You can see that open files is set to 65536.

- ___ c. Verify that the course image has two CPU cores. To see the number of CPU cores, enter the following command:

```
lscpu
```



```
localuser@bpghost: ~
localuser@bpghost:~$ lscpu
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                2
On-line CPU(s) list:  0,1
Thread(s) per core:   1
Core(s) per socket:   1
Socket(s):             2
NUMA node(s):          1
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 15
Stepping:               11
CPU MHz:               2931.934
BogoMIPS:              5863.86
Hypervisor vendor:    VMware
Virtualization type:  full
L1d cache:              32K
L1i cache:              32K
L2 cache:                4096K
NUMA node0 CPU(s):     0,1
localuser@bpghost:~$
```

You can see the value for CPU(s) is 2. It is important that Business Process Manager servers are installed on a modern server system with multiple processor cores.

- ___ 2. Create the response file for the custom silent installation.



Information

When installing the product, you have two installation options:

- Typical installation: The typical installation option is the simplest and quickest method for installing and configuring IBM Business Process Manager Advanced. Using the product launchpad, the typical installation installs the software, configures the deployment manager and managed node profiles, and configures a single cluster deployment environment that consists of a single node and single server.
- Custom installation: Using the custom installation option, you can install IBM Business Process Manager Advanced and change any installation or configuration options that the typical installation option does not provide. Custom installation gives you greater flexibility during

installation. With the custom installation, you can choose to install IBM Business Process Manager Advanced interactively or silently.

-
- ___ a. Change to the following directory:

```
/opt/software/BPM/responsefiles/BPM
```

- ___ b. List the contents of the directory to see the sample response files. Enter the following command to list the directory:

```
ls
```

```
localuser@bpghost: /opt/software/BPM/responsefiles/BPM
localuser@bpghost:/opt/software/BPM/responsefiles/BPM$ ls
bpmAdv_linux_response_group_64bit.xml    bpmAdv_linux_response_root_64bit.xml
bpmAdv_linux_response_nonroot_64bit.xml
localuser@bpghost:/opt/software/BPM/responsefiles/BPM$
```



Information

Sample response files are provided for installing as an administrator, non-administrator, or group. Because the course image is a Linux 64-bit Linux computer, you have response files for root, non-root, and group installations. To begin, you select the response file that most closely resembles the installation that you want to complete. It is a good idea to create a copy of the response file and edit the copy.

In this exercise, you complete the installation as a non-root user, so you modify the sample response file `bpmAdv_linux_response_nonroot_64bit.xml` in the next steps.

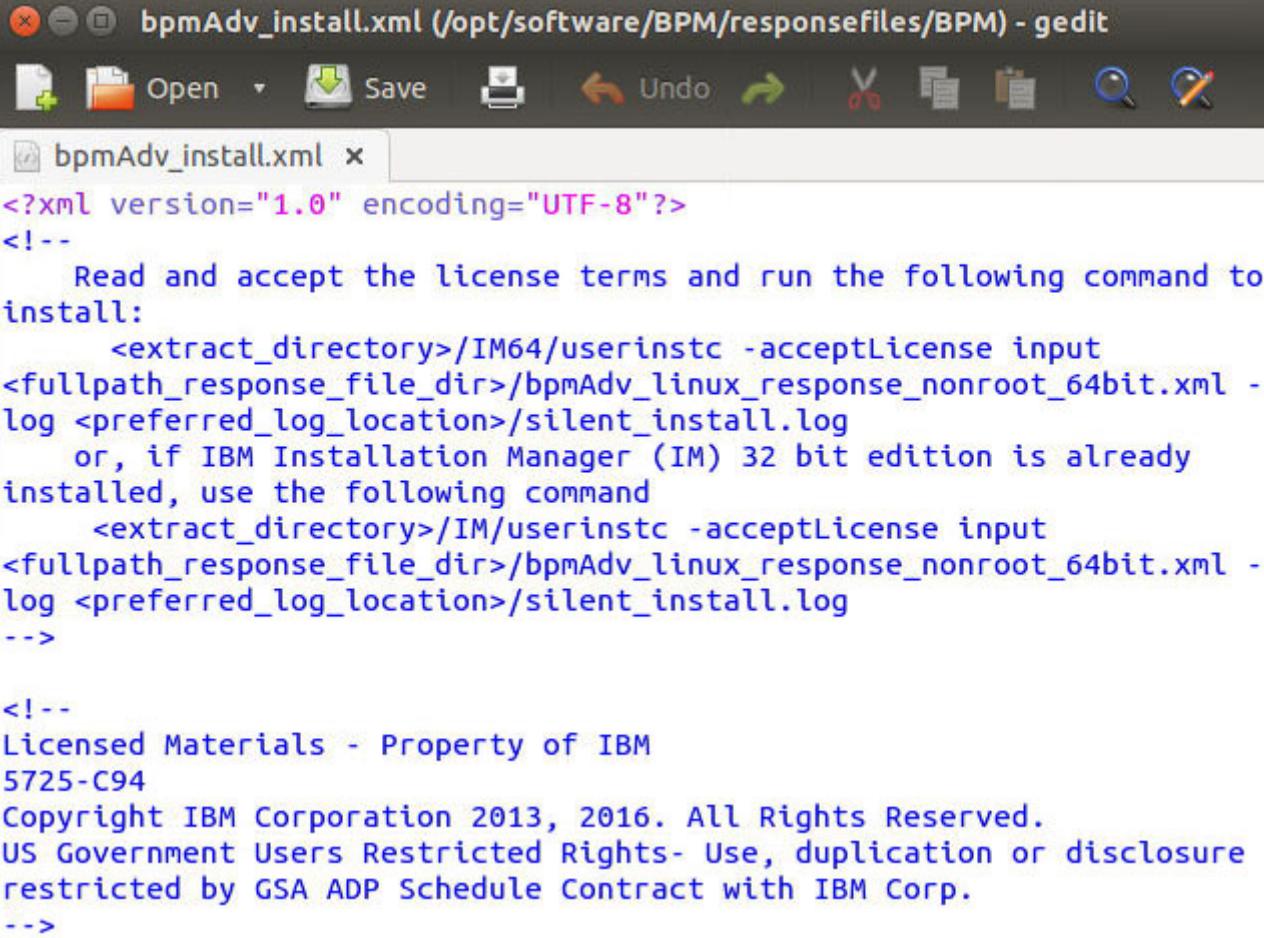
-
- ___ c. In this exercise, you complete the installation as a non-root user, localuser. Before you begin, create a copy of the `bpmAdv_linux_response_nonroot_64bit.xml` file and name the new file `bpmAdv_install.xml`. Enter the following command to copy the file:

```
cp bpmAdv_linux_response_nonroot_64bit.xml bpmAdv_install.xml
```

- ___ d. You can use an unmodified sample response file for a silent installation by using default settings, or you can modify the response file to set particular values. In this part of the exercise, you modify the response file.

Open the `bpmAdv_linux_response_nonroot_64bit.xml` file and examine the default settings. Open the file by using an editor such as vi or gedit. For example, enter the following command:

```
gedit bpmAdv_install.xml
```



The screenshot shows the gedit XML editor window with the file `bpmAdv_install.xml` open. The code in the editor is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
    Read and accept the license terms and run the following command to
install:
    <extract_directory>/IM64/userinstc -acceptLicense input
<fullpath_response_file_dir>/bpmAdv_linux_response_nonroot_64bit.xml -
log <preferred_log_location>/silent_install.log
    or, if IBM Installation Manager (IM) 32 bit edition is already
installed, use the following command
    <extract_directory>/IM/userinstc -acceptLicense input
<fullpath_response_file_dir>/bpmAdv_linux_response_nonroot_64bit.xml -
log <preferred_log_location>/silent_install.log
-->

<!--
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US Government Users Restricted Rights- Use, duplication or disclosure
restricted by GSA ADP Schedule Contract with IBM Corp.
-->
```



Hint

To use gedit, complete one of the following steps:

- Enter the command: `gedit <filename>`
 - Open the Files tool, change to the directory that contains the file, and double-click the file name
-
- e. Scroll through and examine the various settings in the response file. The comments in the sample response file provide detailed instructions and information about setting the values. The default values that are provided in the sample response file are for a basic installation. However, you should review the file and its comments, and modify the parameters as needed for your environment and the access level of your user ID.

- ___ f. Go to the **IBM Installation Repository Location** section.

```
<!-- ===== IBM Installation Repository Location
=====-->
<repository location='../../IM64/' temporary='true' />
<!-- ===== IBM Business Process Manager Advanced, WebSphere
Application Server ND =====-->
<repository location="../../repository/repos_64bit/" />
</server>
```

- ___ g. If you are not installing directly from the <extract_directory>/responsefiles/BPM/ directory, you must point to the location of your installation repository. Keep the default repository location for IBM Installation Manager, Business Process Manager Advanced, and WebSphere Application Server ND.
- ___ h. Go to the **IBM Installation Manager installLocation** section. The installLocation directory is where IBM Installation Manager is to be installed.

```
<!-- =====
This profile node defines where IBM Installation Manager (IM) is/or will be
installed.

Modify where IBM Installation Manager is/or will be installed by modifying the
installLocation values to specify the correct directory.

Replace '/home/nonadminuser' in the installLocation, with the home directory
location of the system user doing the installation.
```

Note :

- * If the Installation Manager is already installed, use the same Installation_root directory for the installLocation value.
- Existing Installation Manager will be upgraded if needed.

```
=====
<profile kind='self' installLocation='/home/nonadminuser/IBM/
InstallationManager/eclipse' id='IBM Installation Manager'>

</profile>
```

- ___ i. In the **installLocation** field, modify the default setting. Enter:

/opt/IBM/InstallationManager/eclipse

```
<profile kind='self' installLocation='/opt/IBM/InstallationManager/eclipse'
id='IBM Installation Manager'>
```

**Important**

It is important that you modify the default response file install locations. Do not install to /home. Make sure that you install to /opt. The /home partition has only 30 GB of disk space and it is not enough space for a BPM installation and configuration.

- __ j. Go to the Shared Resources Directory section.

```
<!-- =====
      Remove the comments, and modify the value to change the default location of t
eclipseCache, shared resources directory
      (only if no cache has been created yet).
      This tag will be ignored if the value is already defined during installation
other packages that are in the same group.
=====
<!--
<preference value="/home/nonadminuser/IBM/IMShared"
name="com.ibm.cic.common.core.preferences.eclipseCache" />
-->
```

- __ k. In the **preference value** field, remove comment by removing <!-- and -->. Then, modify and enter: /opt/IBM/IMShared

```
<preference value="/opt/IBM/IMShared"
name="com.ibm.cic.common.core.preferences.eclipseCache" />
```

- __ l. Go to the **IBM Business Process Manager Advanced installLocation** section. The installLocation directory is where IBM Installation Manager is to be installed

```
<!-- =====
      This profile node defines where IBM Business Process Manager Advanced is
installed
=====
```

Modify the installLocation values to specify the correct directory where IBM Business Process Manager Advanced is installed.

Replace '/home/nonadminuser' in the installLocation values, with the home directory location of the system user doing the installation.

If the specified profile node ID exists, you must also change the profile node ID.

```
<profile installLocation='/home/nonadminuser/ibm/BPM/v8.5' id='IBM WebSphere
Application Server Network Deployment V8.5'>
```

**Important**

It is important that you modify the default response file installation locations. Do not install to `/home`. Make sure that you install to `/opt`. The `/home` partition has only 30 GB of disk space and it is not enough space for an IBM BPM installation and configuration.

- ___ m. In the **installLocation** field, modify the default setting. Enter: `/opt/IBM/BPM`

```
=====
<profile installLocation='/opt/IBM/BPM' id='IBM WebSphere Application Server Network Deployment V8.5'>
```

**Important**

The IBM Business Process Manager installation location is changed from `/home/nonadminuser/ibm/BPM/v8.5` to `/opt/IBM/BPM`. Make sure to change lowercase **ibm** to uppercase **IBM** in the path: `/opt/IBM/BPM`.

The directory `/opt/ibm` exists on the course image. DB2 is installed on the course image to `/opt/ibm`. Root owns this directory. If you try to install the product to `/opt/ibm`, you get a permission denied error. It is important that you change the direction installation location for the product to `/opt/IBM`. localuser owns the directory `/opt` and you have permission to install to this directory.

- ___ n. Keep the default settings in the section that directs the IBM Installation Manager installer to install the IBM Installation Manager-based offerings.
- ___ o. Go to the end of this section and examine the following line:

```
<offering profile="IBM WebSphere Application Server Network Deployment V8.5" id="com.ibm.bpm.ADV.v85" features='AdvancedProcessCenter' />

<offering profile="IBM WebSphere Application Server Network Deployment V8.5" id="com.ibm.bpm.ADV.v85" features='AdvancedProcessCenter' />
```

You need to specify a particular feature to be installed. In this example, keep the default setting of `AdvancedProcessCenter`.

**Note**

The installation process installs IBM Process Center or IBM Process Server server components that are based on your selection.

- Process Center provides a repository for process assets, a runtime environment for testing and studying the performance of processes, and a console for administering access to assets and deploying processes to test, stage, or production environments.
- Process Server is a runtime environment for process applications and a data warehouse for collecting performance data from the applications. It includes administrative consoles for managing and maintaining the runtime environments and data warehouses.

In the features to be installed, the following features are options to install:

- *AdvancedProcessCenter*
- *AdvancedProcessServer.Production* to use the server in production
- *AdvancedProcessServer.NonProduction* to use the server only for test, staging, or development

Do not mix production and non-production servers in the same cell.

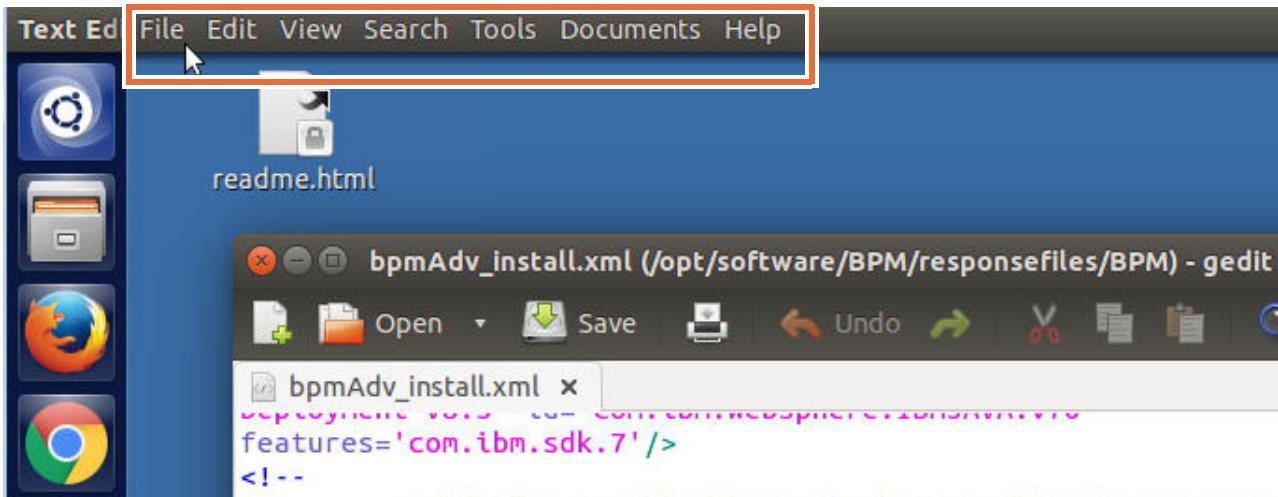
In this lab, only the Business Process Manager Advanced Process Center feature is selected to install. After installation, the Deployment Environment wizard is used to create a Process Center deployment environment. In later exercises, the BPMConfig command utility is used to create a Process Server production deployment environment.

-
- ___ p. Review all of the changes that you made. When completed, click **Save**.
 - ___ q. Close the gedit. Click **File > Quit**.

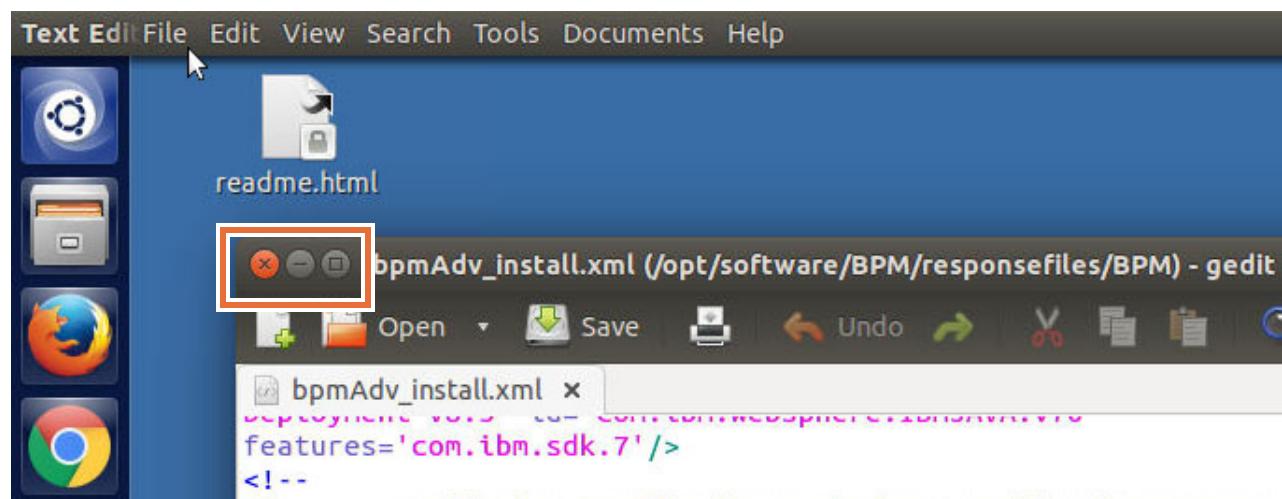


Information

The desktop for Ubuntu is the Unity desktop. Unity uses a global menu. Which means application menus are not located in the window for the application. They are on the top pane. When a window is the active window, that window does not have any menu items, but the application type is displayed in the black bar that spans the top of the desktop. You cannot see the menu for the application until you hover your mouse over the top pane. When you hover your mouse over the black bar, the menu items for the active window are displayed.



In the corner of the application, you have the close, minimize, and full screen options.



When you maximize the application window, the close, minimize, and full screen options also appear in the top pane.

- ___ 3. Install the product by using the response file.
 - ___ a. In the terminal window, go to the /opt/software/BPM/IM64 directory.

- ___ b. To install as a non-root user and use the tailored response file, enter the following command:

```
./userinstc -acceptLicense input
/opt/software/BPM/responsefiles/BPM/bpmAdv_install.xml -log
/opt/labfiles/silent_install.log
```



```
localuser@bpghost: /opt/software/BPM/IM64
localuser@bpghost:/opt/software/BPM/IM64$ ./userinstc -acceptLicense input /opt/
software/BPM/responsefiles/BPM/bpmAdv_install.xml -log /opt/labfiles/silent_inst
all.log
```

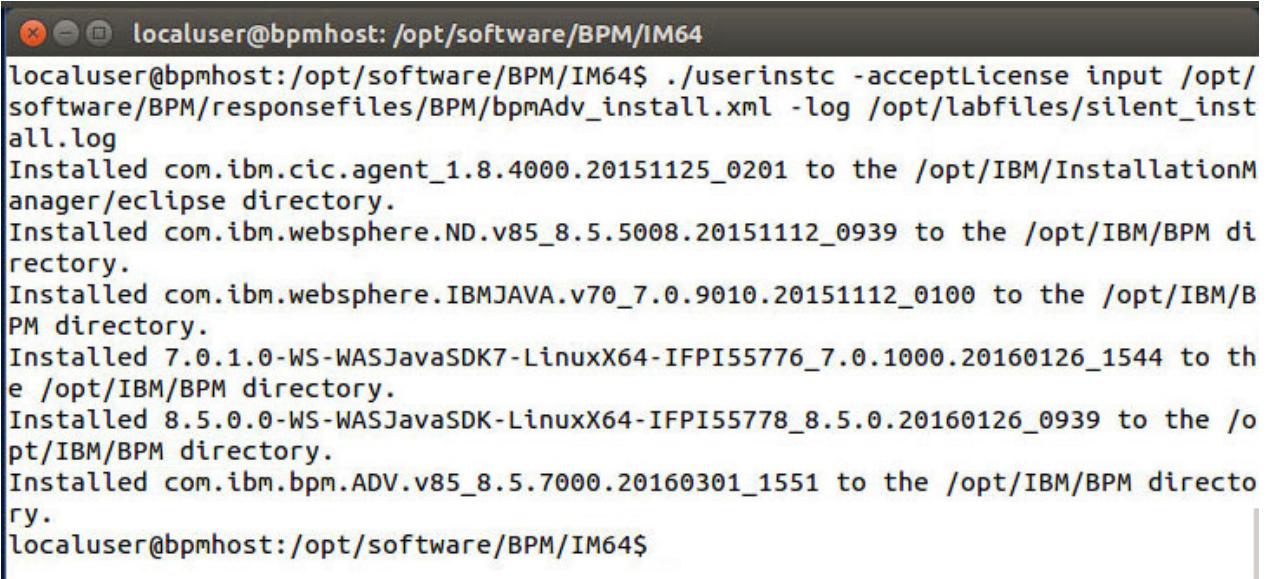


Note

Include the `-acceptLicense` option in your command when the package you install requires that you accept the licensing agreement.

Include the `-log` option in your command when you want to specify a log file that records the result of Installation Manager operations. The log file is an XML file.

- ___ c. Depending on the system resources, the installation takes about 10 minutes. During the installation, verify the progress with the messages that appear in the terminal window. When completed, you can see a listing of the packages that are installed and into which directories.



```
localuser@bpghost: /opt/software/BPM/IM64
localuser@bpghost:/opt/software/BPM/IM64$ ./userinstc -acceptLicense input /opt/
software/BPM/responsefiles/BPM/bpmAdv_install.xml -log /opt/labfiles/silent_inst
all.log
Installed com.ibm.cic.agent_1.8.4000.20151125_0201 to the /opt/IBM/InstallationM
anager/eclipse directory.
Installed com.ibm.websphere.ND.v85_8.5.5008.20151112_0939 to the /opt/IBM/BPM di
rectory.
Installed com.ibm.websphere.IBMJAVA.v70_7.0.9010.20151112_0100 to the /opt/IBM/B
PM directory.
Installed 7.0.1.0-WS-WASJavaSDK7-LinuxX64-IFPI55776_7.0.1000.20160126_1544 to th
e /opt/IBM/BPM directory.
Installed 8.5.0.0-WS-WASJavaSDK-LinuxX64-IFPI55778_8.5.0.20160126_0939 to the /o
pt/IBM/BPM directory.
Installed com.ibm.bpm.ADV.v85_8.5.7000.20160301_1551 to the /opt/IBM/BPM directo
ry.
localuser@bpghost:/opt/software/BPM/IM64$
```

Part 3: Confirming the installation

During installation, Installation Manager creates a session installation log file. This file is useful to either confirm a successful installation or check for installation problems.

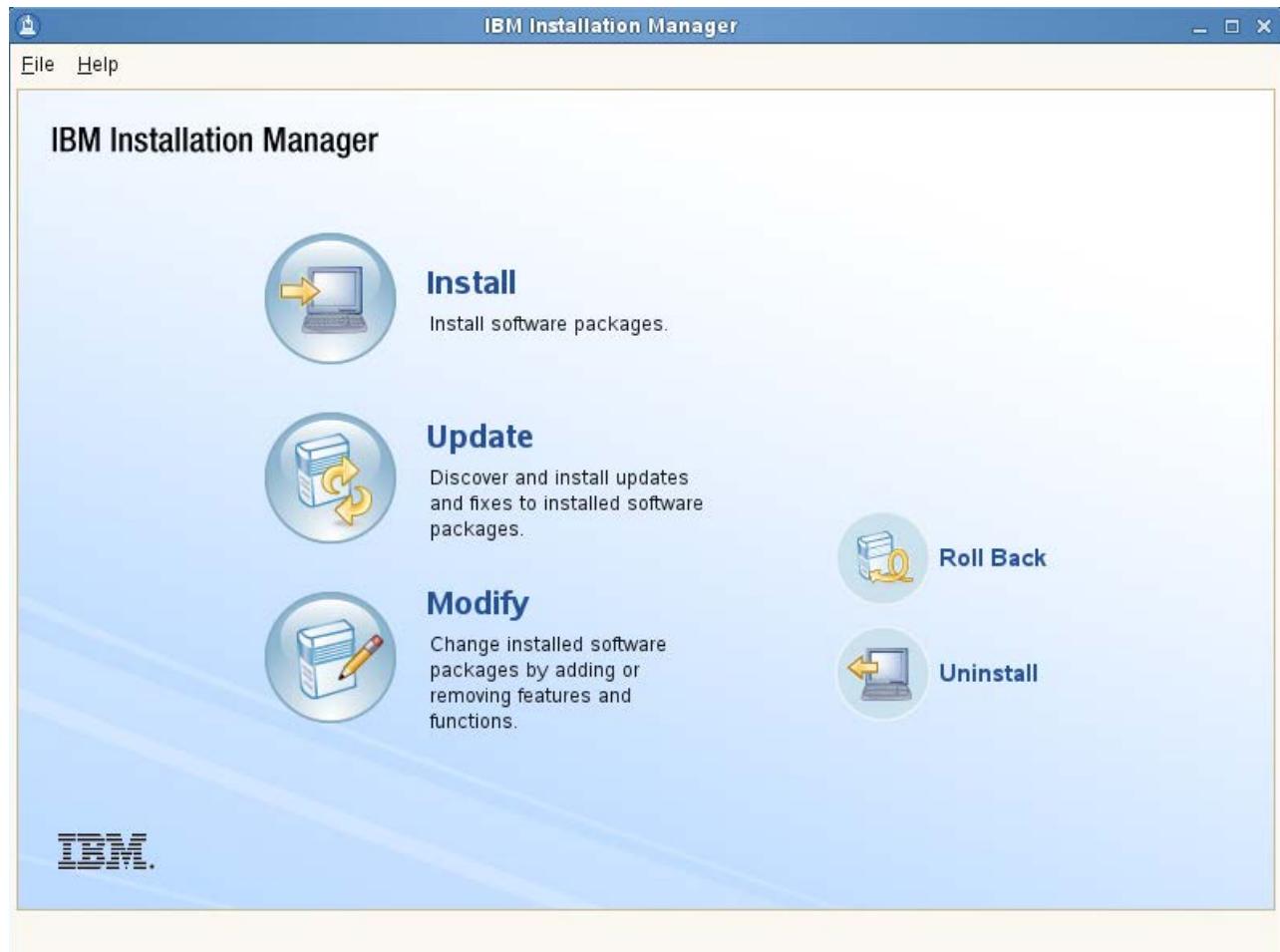


Information

You can find more details about the IBM Installation Manager in the IBM Knowledge Center at:

https://www.ibm.com/support/knowledgecenter/SSDV2W/im_family_welcome.html

- 1. Start the Installation Manager and verify the installed packages.
 - a. In the terminal window, go to the following directory:
`/opt/IBM/InstallationManager/eclipse`
 - b. To start the Installation Manager, enter the following command:
`./IBMMIM`
 - c. The IBM Installation Manager starts and shows the available wizards. Installation Manager contains a number of wizards to install and maintain various packages.



- __ d. Click **File > View Installed Packages.**

Installed Packages	Vendor	License
▼ IBM WebSphere Application Server Network		
▼ IBM WebSphere Application Server Network 8.5.0.0-WS-WASJavaSDK-LinuxX64-IFPI55	IBM	
▼ IBM WebSphere SDK Java Technology Edition 7.0.1.0-WS-WASJavaSDK7-LinuxX64-IFPI5	IBM	
IBM® Business Process Manager Advanced	IBM	

- __ e. Click **Close**.
__ 2. View the installation log file.
__ a. Click **File > View Log**.

- ___ b. The current session log file is listed.

The screenshot shows the 'Installation Log' window. On the left, there is a sidebar titled 'Log' with two entries: '20160712_2216.xml' and '20160712_2205.xml'. The main pane is titled 'Current session installation log' and contains a table with one row. The table has columns for 'Seve' (Severity) and 'Description'. The 'Description' column shows the path 'Log File: /home/localuser/var.ibm/InstallationManager/logs/20160712_2216.xml'. Below the table, there is a section titled 'Details' with the following information:

Date:	2016-07-12T22:16:52-04:00
Severity:	Note
Message:	Log File: /home/localuser/var.ibm/InstallationManager/logs/20160712_2216.xml
Exception Stack Trace:	The exception stack trace is not available.

- ___ c. Select the log file and click the **Open log file** icon.



- ___ d. The XML file opens in a browser window. Scan the page for any obvious error messages. Messages indicate “complete,” “install,” “post-install,” and other installation phases. These messages are indicators that the installation proceeded normally without errors. Feel free to view the other log files for any messages.
- ___ e. When completed, close the window.
- ___ f. Close the Installation Log window.
- ___ g. Exit IBM Installation Manager by clicking **File > Exit**.
- ___ 3. Verify the installed products and versions.
- ___ a. In the terminal window, go to the `/opt/IBM/BPM/bin` directory.

- ___ b. Enter the following command:

```
./versionInfo.sh
```

The version information utility should return IBM Business Process Manager Advanced version 8.5.5.7 and IBM WebSphere Application Server Network Deployment version 8.5.5.8.

Name	IBM Business Process Manager Advanced
Version	8.5.7.0
ID	BPMPC
Build Level	20160301-140232
Build Date	3/1/16
Package	com.ibm.bpm.ADV.v85_8.5.7000.20160301_1551
Architecture	x86-64 (64 bit)
Installed Features	Business Process Manager Advanced Process Center License
 Installed Product	
Name	IBM WebSphere Application Server Network Deployment
Version	8.5.5.8
ID	ND
Build Level	cf081545.03
Build Date	11/12/15
Package	com.ibm.websphere.ND.v85_8.5.5008.20151112_0939
Architecture	x86-64 (64 bit)
Installed Features	IBM 64-bit WebSphere SDK for Java WebSphere Application Server Full Profile EJBDeploy tool for pre-EJB 3.0 modules Embeddable EJB container Sample applications Stand-alone thin clients and resource adapters
 Installed Product	
Name	IBM WebSphere SDK Java Technology Edition (Optional)
Version	7.0.9.10
ID	IBMJAVA7
Build Level	cf081545.02
Build Date	11/12/15
Package	com.ibm.websphere.IBMJAVA.v70_7.0.9010.20151112_0100
Architecture	x86-64 (64 bit)
Installed Features	IBM WebSphere SDK for Java Technology Edition 7

- ___ c. In the terminal window, go to the /home/localuser/var/ibm/InstallationManager directory.

- ___ d. Examine the `installed.xml` file to see the installed offerings. To open the file in a browser, enter the following command:

```
firefox installed.xml&
```

IBM Installation Manager - Installed Offerings

IBM® Installation Manager Version 1.8.4 (1.8.4000.201)

Installation Directory:	/opt/IBM/InstallationManager/eclipse
Architecture:	64-bit
Shared Resource Directory:	/opt/IBM/IMShared
Package Group Name:	IBM WebSphere Application Server V8.5.5
Package Group Installation Directory:	/opt/IBM/BPM
Package Group Translations:	en
Package Group Architecture:	32-bit

- ___ e. In this file, you can see all the installed products. Scroll down to examine the IBM WebSphere Application Server V8.5 details.

IBM WebSphere Application Server V8.5	
Packages	Features
IBM® Business Process Manager Advanced Version 8.5.7.0 (8.5.7000.20160301_1551) Repository <code>/opt/software/BPM/repository/repos_64bit</code>	<ul style="list-style-type: none"> ◦ Business Process Manager Advanced Pro
IBM WebSphere SDK Java Technology Edition (Optional) Version 7.0.9.10_0001 (7.0.9010.20151112_0100) Repository <code>/opt/software/BPM/repository/repos_64bit</code>	
Fixes <ul style="list-style-type: none"> ◦ 7.0.1.0-WS-WASJavaSDK7-LinuxX64-IFPI55776 Version 7.0.1000.20160126_1544 (7.0.1000.20160126_1544) 	
IBM WebSphere Application Server Network Deployment Version 8.5.5.8 (8.5.5008.20151112_0939) Repository <code>/opt/software/BPM/repository/repos_64bit</code>	<ul style="list-style-type: none"> ◦ IBM 64-bit WebSphere SDK for Java ◦ EJBDeploy tool for pre-EJB 3.0 modules ◦ Embeddable EJB container ◦ Stand-alone thin clients and resource ada

You can see the details on the packages that are installed, including the version numbers. It also lists the feature that is installed for each package.

- ___ f. Close the browser when completed.
 ___ g. Exit the terminal window.

End of exercise

Exercise review and wrap-up

In this exercise, you customized a sample response file to install IBM Business Process Manager Advanced silently.

Exercise 2.Configuring the Process Center environment

Estimated time

01:30

Overview

This exercise covers the creation of a Process Center cell. A Process Center deployment manager and custom profiles are created. The custom profile is federated to the deployment manager cell and the configuration is verified.

Objectives

After completing this exercise, you should be able to:

- Create the Process Center deployment manager and a custom profile
- Federate the custom profile
- Edit the soap.client.props file
- Verify the database configuration
- Create the three required databases
- Create a Process Center deployment environment
- Verify the creation of the database tables

Introduction

Process Center is a runtime environment where Process Designer and IBM Integration Designer share assets, allowing the cooperative development of business processes in a highly interactive manner. Process Center includes a Process Center server and Performance Data Warehouse, allowing users who are working in the development environments to run processes and store performance data for testing and playback purposes.

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed

Exercise instructions

2.1. Creating the profiles for the deployment environment

After the product software is installed, the first step in creating your Process Center deployment environment is to create the deployment manager profile. The Process Center deployment manager acts as the central point of administration for all servers, clusters, and nodes in your cell.

In a Process Center deployment environment, you must create and configure databases, create custom profiles, federate the custom profiles to your deployment manager, create servers, and create clusters if you want workload management capabilities.

The first steps are to select which method to use to configure your profiles, databases, and network deployment environment. You can use either the BPMConfig utility or multiple tools to complete the profile and deployment environment setup.

A DB2 administrator user ID was created for you for interacting with DB2.

- User ID: db2inst1
- Password: passw0rd



Information

The screen captures in this exercise are Linux-based. However, most of the instructions are applicable across all WebSphere compatible operating systems.

Part 1: Creating the deployment manager profile

Profiles can be created manually by using the `manageprofiles` command, by using the Profile Management Tool interactive wizard, or by using the `BPMConfig` utility.

The Profile Management Tool is a graphical interface for profile creation and management. The Profile Management Tool is a tool in the WebSphere Customization Toolbox. The WebSphere Customization Toolbox includes tools for managing, configuring, and updating various parts of your WebSphere environment. The WebSphere Customization Toolbox embedded version is installed during the installation of WebSphere Application Server.

In this exercise, both the Profile Management Tool and `manageprofiles` command are used to create profiles. The `BPMConfig` command is used in an upcoming exercise.



Information

The WebSphere Customization Toolbox can be started in several ways:

- Immediately after installation
- Change to the `/opt/IBM/BPM/bin/ProfileManagement` directory and enter the following command:

```
./wct.sh
```

The 64-bit version of IBM Business Process Manager Advanced V8.0 and above includes the Profile Management Tool. In this exercise, you create profiles manually and by using the Profile Management Tool interactive wizard.

- 1. Examine the environment.
 - a. Open a terminal window.
 - b. Enter the following command to determine the host name:

```
hostname
```

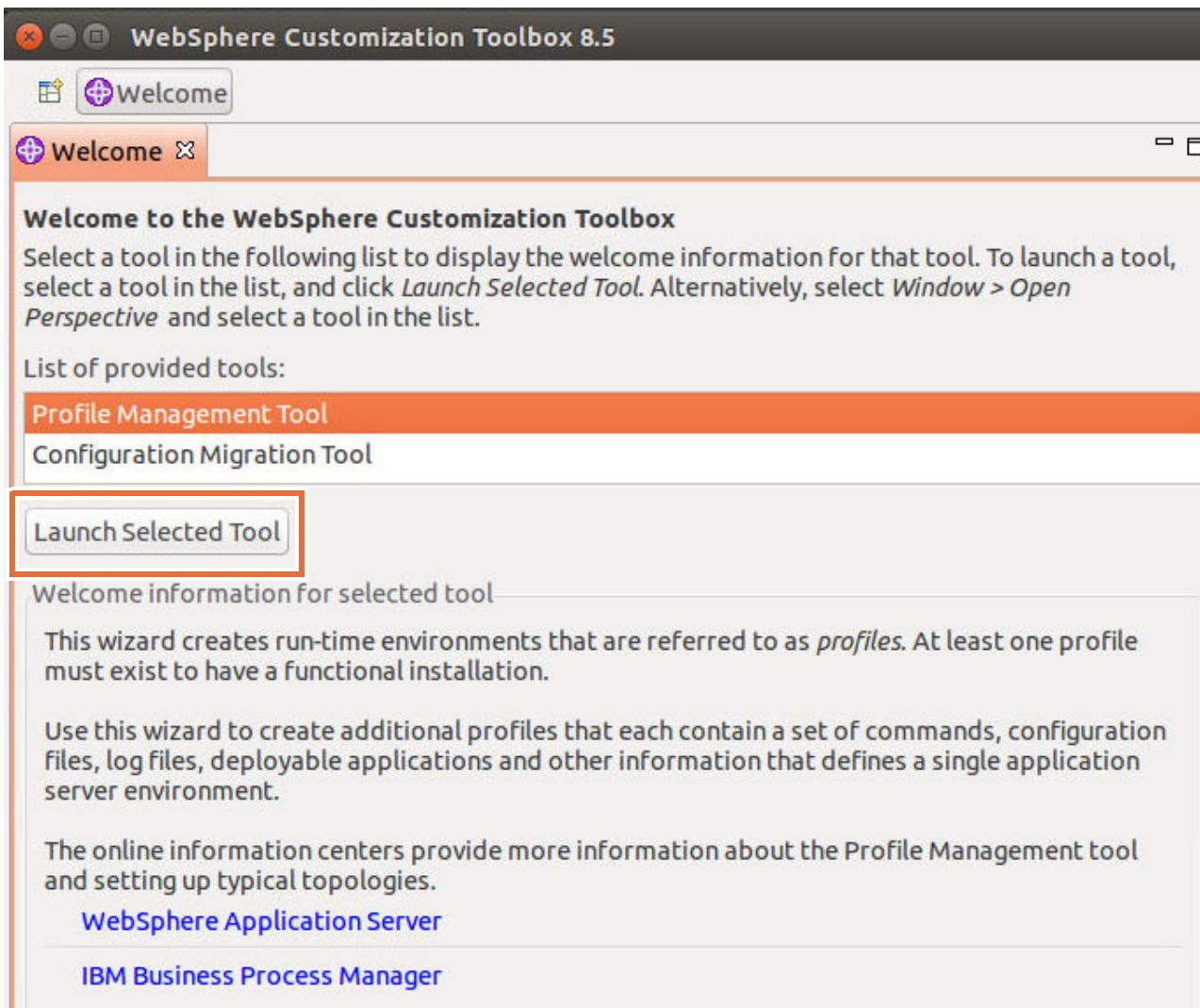
```
localuser@bpghost: ~
localuser@bpghost:~$ hostname
bpghost
localuser@bpghost:~$
```



Information

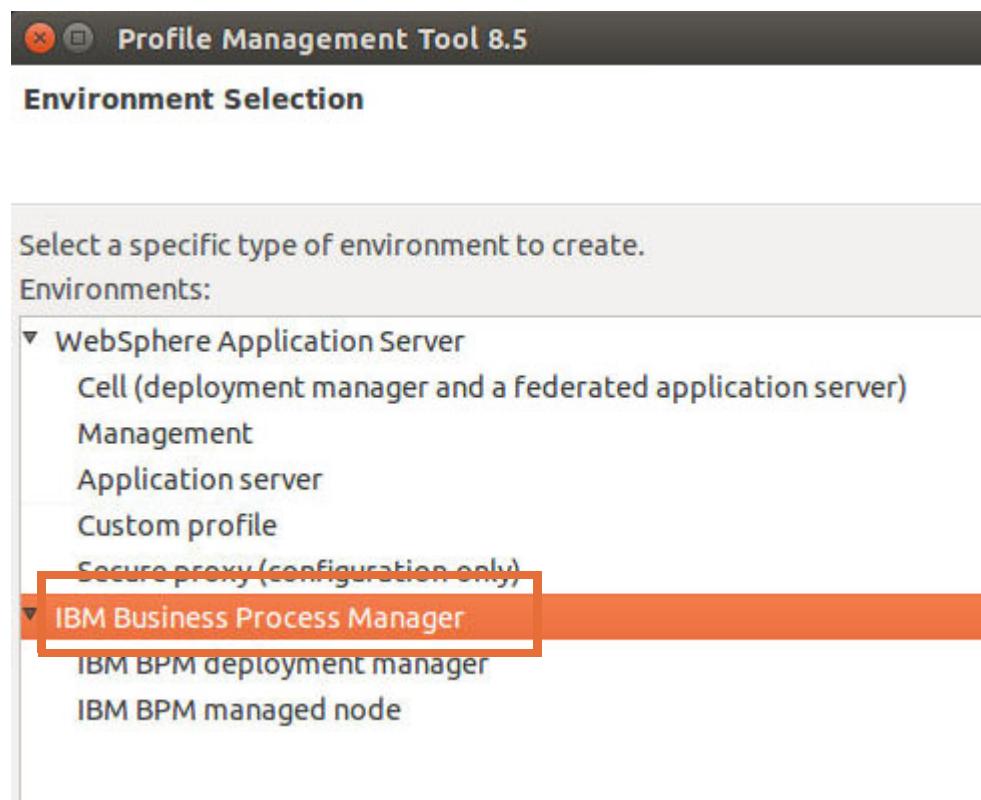
The form of the host name that is used (either short or long) is not important, as both work. The important thing is for you to be consistent when creating profiles. When ensuring that port numbers are unique, WebSphere considers `bpghost` and `bpghost.ibm.com` to be different workstations, and does not ensure that each has unique ports. This information is read from the hosts file.

- ___ 2. Create the deployment manager profile by using the Profile Management Tool.
 - ___ a. In a terminal window, change to the `/opt/IBM/BPM/bin/ProfileManagement` directory.
 - ___ b. Enter the following command to start the WebSphere Customization Toolbox:
`./wct.sh`
- ___ The WebSphere Customization Toolbox opens.
- ___ c. Select **Profile Management Tool** and click **Launch Selected Tool** to start the Profile Management Tool.



- ___ d. Click **Create**.

- __ e. In the Environment Selection pane, expand **IBM Business Process Manager**.





Information

Profiles provide a way to create multiple runtime environments on a system without installing the core product files again. When using the Profile Management Tool, several types of WebSphere Application Server profiles can be created, including the following profiles:

- **Cell (deployment manager and a federated application server)**

A cell creates two profiles: a management profile with a deployment manager and an application server profile. The application server is federated to the cell of the deployment manager.

- **Management**

A management profile provides the server and services for managing multiple application server environments. The administrative agent manages application servers on the same computer. The Network Deployment edition also includes a deployment manager for tightly coupled management and a job manager for loosely coupled management of topologies that are distributed over multiple computers. Each instance of the deployment manager defines a unique cell.

- **Application server**

An application server environment runs your enterprise applications. An application server is managed from its own administrative console and functions independently from all other application servers. A new instance of a stand-alone node with a single application server is created. Stand-alone nodes have only one application server.

- **Custom profile**

A custom profile contains an empty node, which does not contain an administrative console or servers. The typical use for a custom profile is to federate its node to a deployment manager. After federating the node, use the deployment manager to create a server or a cluster of servers within the node.

- **Secure proxy (configuration-only)**

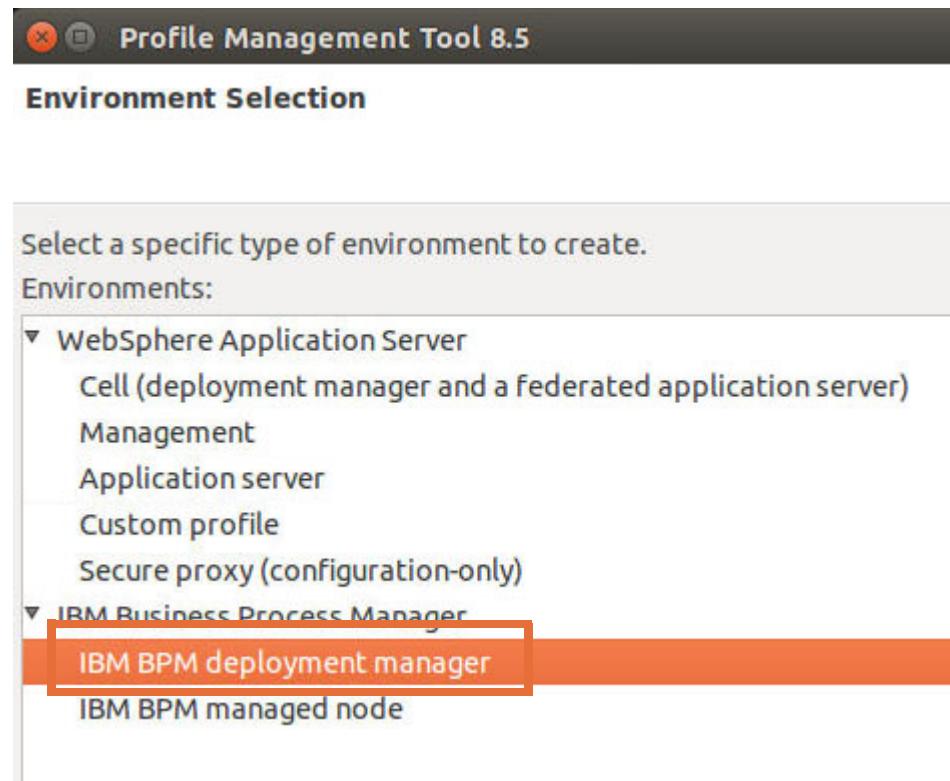
A secure proxy profile is for use with a DMZ secure proxy server. You cannot start the secure proxy server on the Network Deployment installation. This configuration-only profile is intended only to be used to configure the profile with the administrative console. After you configure the profile, you can export the profile configuration and then import it into the secure proxy profile in your DMZ.

Several types of IBM Business Process Manager Advanced profiles can be created, including:

- **Deployment manager**

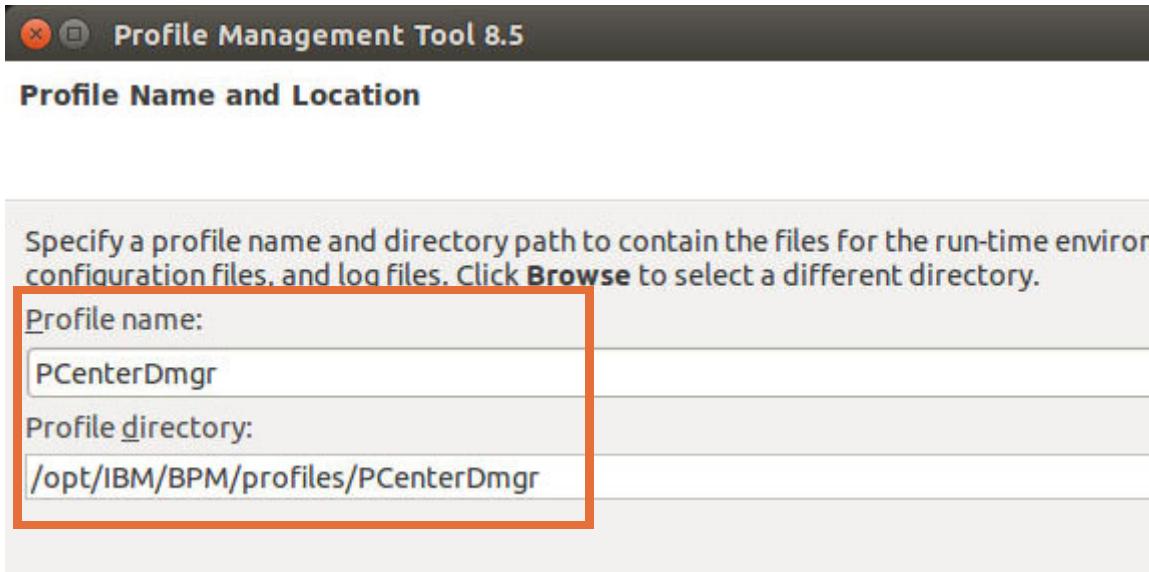
- **Managed node (a custom profile)**

- ___ f. In the Environment Selection pane, select **IBM BPM deployment manager** and click **Next**.



- ___ g. In the Profile Name and Location pane, make the following modifications:

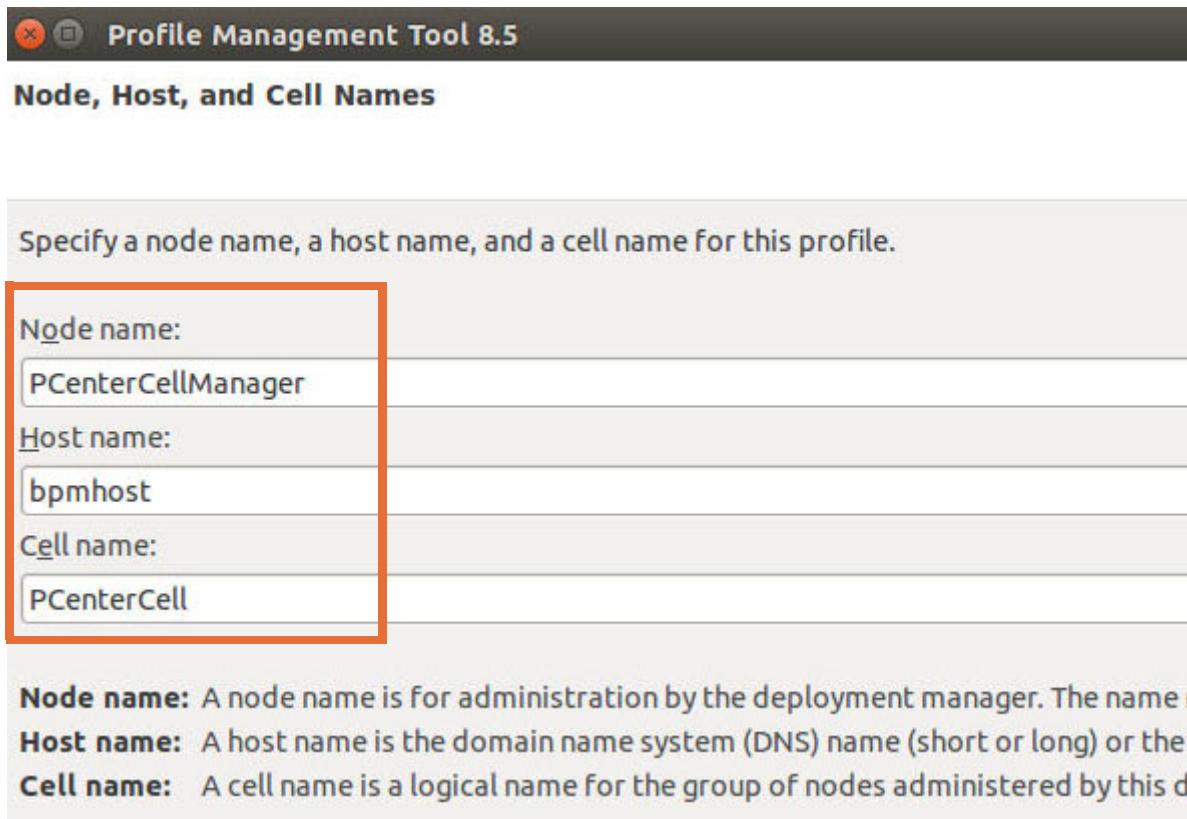
- **Profile name:** PCenterDmgr
- **Profile directory:** /opt/IBM/BPM/profiles/PCenterDmgr



- ___ h. Click **Next**.

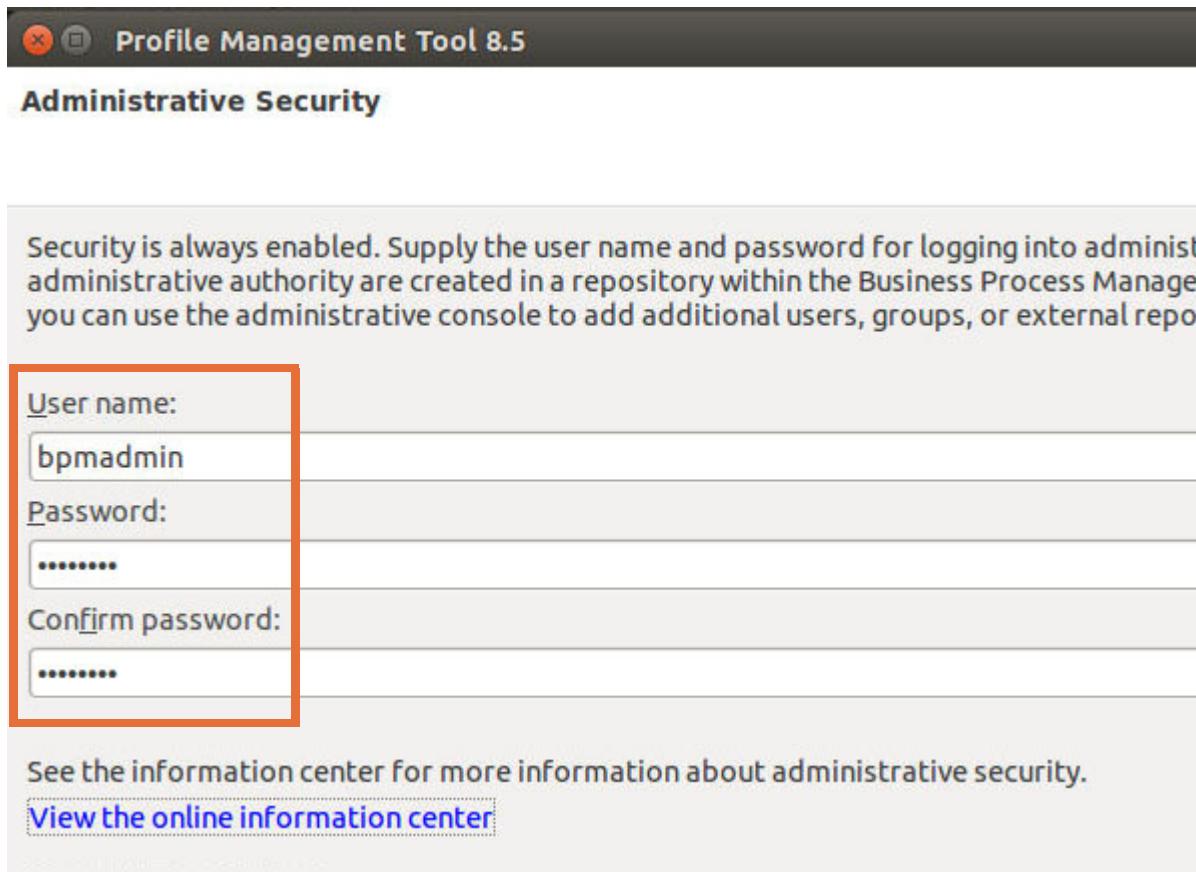
- ___ i. In the Node, Host, and Cell Names pane, verify, or enter the following values:

- **Node name:** PCenterCellManager
- **Host name:** bpmhost
- **Cell name:** PCenterCell



- ___ j. Click **Next**.
- ___ k. The Administrative Security pane specifies the initial user name and password that are used for administrative security. Enter the following values:
 - **User name:** bpmadmin
 - **Password:** passw0rd (replace the o with a zero 0)

- **Confirm password:** passw0rd (replace the o with a zero 0)



- __ l. Click **Next**.
- __ m. In the Security Certificate (Part 1) pane, accept the default selections. Click **Next**.
- __ n. In the Security Certificate (Part 2) pane, accept the default selections. Click **Next**.

- ___ o. In the Port Values Assignment pane, accept the default values. Note the port for the administrative console. Click **Next**.

The values in the following fields define the ports for the deployment manager and do not conflict with other installations. Another installation of IBM Business Process Manager or other programs run-time port conflicts, verify that each port value is unique.

Port Type (Default Value)	Selected Value
Administrative console port (Default 9060):	9060
Administrative console secure port (Default 9043):	9043
Bootstrap port (Default 9809):	9809
SOAP connector port (Default 8879):	8879
Administrative interprocess communication port (Default 9632):	9632
SAS SSL ServerAuth port (Default 9401):	9401
CSIV2 ServerAuth listener port (Default 9403):	9403
CSIV2 MultiAuth listener port (Default 9402):	9402
ORB listener port (Default 9100):	9100
Cell discovery port (Default 7277):	7277

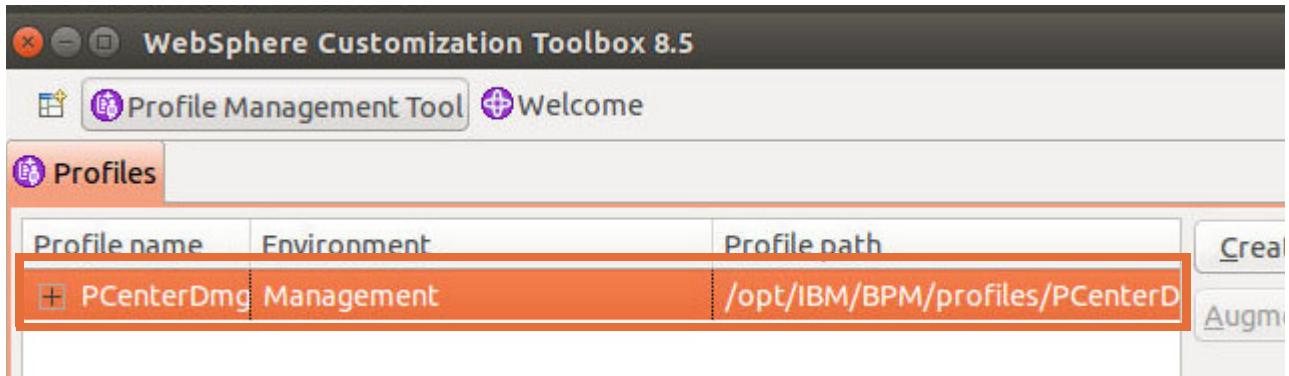


Information

The Profile Management Tool detects ports that other WebSphere products use and lists suggested port values that do not conflict with existing ones. If you have applications other than WebSphere products that use specific ports, verify that the ports do not conflict.

- ___ p. Review the Profile Creation Summary and click **Create**. Wait while the profile is created. The profile creation completes successfully in several minutes.
- ___ q. In the Profile Creation Complete pane, clear the **Launch the First steps console** check box. Click **Finish**.

- ___ r. The profile is listed in the Profile Management Tool.



- ___ s. Exit the Profile Management Tool by clicking **File > Exit**.
 ___ 3. Verify that the profile creation was successful by using the log files.

Information

Various log files are created during installation of Process Center, profile creation, augmentation, and deletion. The log files contain a series of record elements that document configuration actions. Examine the appropriate log files after one of the procedures is completed or if problems occur during these procedures.

- ___ a. In a terminal window, change to the `/opt/IBM/BPM/logs/manageprofiles` directory.
 ___ b. When creating a profile by using the Profile Management Tool or the `manageprofiles` command, a log file is generated containing needed details. The log file should be examined to verify that the profile is created successfully with no errors.

Open the `PCenterDmgr_create.log` file by using an editor such as vi or gedit.

Hint

To use gedit, complete one of the following steps:

- Enter the command: `gedit <filename>&`
- Open the File Browser, change to the directory that contains the file, and double-click the file name.

- ___ c. Examine the information in the log file. Note you can view the command line arguments that are used to create the profile in this log file. Scroll to the bottom of the log file and look for the return code that indicates `INSTCONFSUCCESS`.

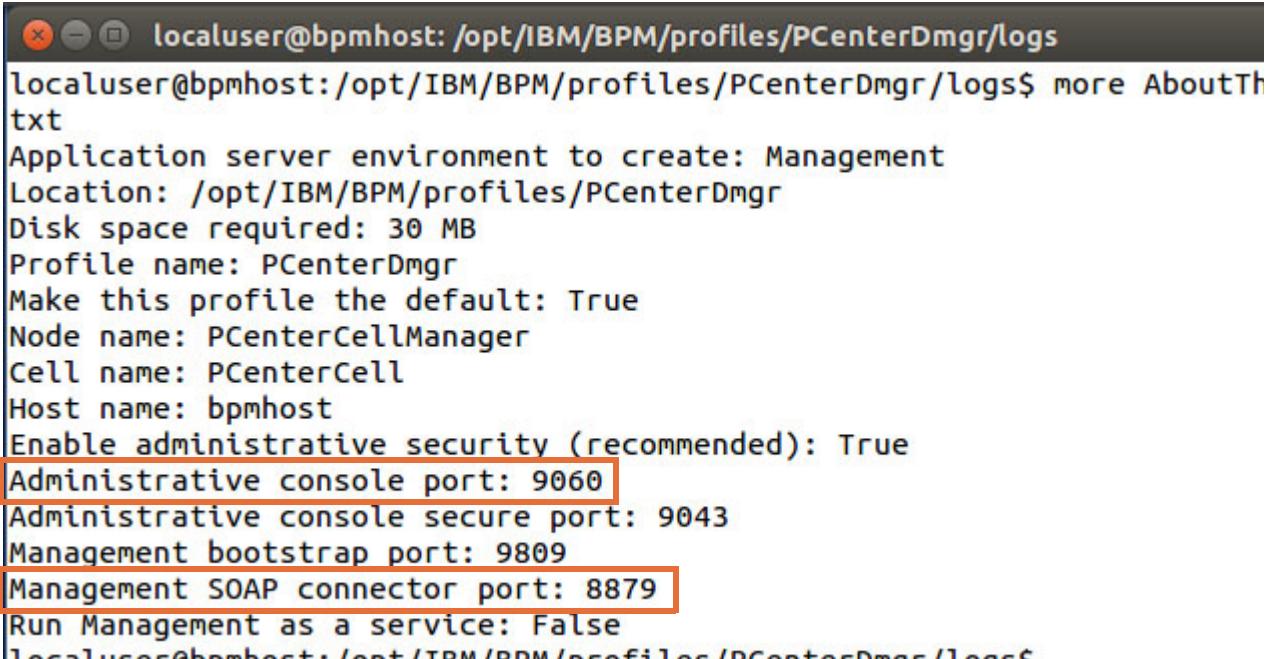
```

<record>
  <date>2013-08-13T02:46:28</date>
  <millis>1376419588790</millis>
  <sequence>9635</sequence>
  <logger>com.ibm.wsspi.profile.WSProfileCLI</logger>
  <level>INFO</level>
  <class>com.ibm.wsspi.profile.WSProfileCLI</class>
  <method>invokeWSProfile</method>
  <thread>1</thread>
  <message>Returning with return code: INSTCONFSUCCESS</message>
</record>
```

A log file has an indicator of success and failure for the procedure that is being completed. Indicators can include:

- **INSTCONFFAILED**: Total installation failure.
- **INSTCONFSUCCESS**: Successful installation.
- **INSTCONFPARTIALSUCCESS**: Installation errors occurred, but the installation is still usable. More information in other log files identifies the errors.

- ___ d. Close the log file when completed.
- ___ 4. Examine information about the profile.
- ___ a. Change to the `/opt/IBM/BPM/profiles/PCenterDmgr/logs` directory.
- ___ b. Open the `AboutThisProfile.txt` file. Examine the settings for this profile. You can see the ports that are used for the administrative console and the SOAP port. These ports are used later in the exercise.



```

localuser@bpminstance:/opt/IBM/BPM/profiles/PCenterDmgr/logs$ more AboutThisProfile.txt
Application server environment to create: Management
Location: /opt/IBM/BPM/profiles/PCenterDmgr
Disk space required: 30 MB
Profile name: PCenterDmgr
Make this profile the default: True
Node name: PCenterCellManager
Cell name: PCenterCell
Host name: bpminstance
Enable administrative security (recommended): True
Administrative console port: 9060
Administrative console secure port: 9043
Management bootstrap port: 9809
Management SOAP connector port: 8879
Run Management as a service: False
localuser@bpminstance:/opt/IBM/BPM/profiles/PCenterDmgr/logs$
```

- c. Make a note of the administrative console port here: _____
 - d. Make a note of the SOAP connector here: _____
 - e. Close the `AboutThisProfile.txt` file.
-



Information

You can also examine port information in the
`/opt/IBM/BPM/profiles/PCenterDmgr/properties/portdef.props` file.

Part 2: *Editing the SOAP client properties file*

If you edit the `soap.client.props` file for the deployment manager profile, you can disable the authentication prompt that you receive when using the batch files in the deployment manager `bin` directory (for example, the `stopManager.sh` file). Editing the SOAP client properties also prevents you from entering the user name and password at the command line when you use the batch files in the `bin` directory.

- 1. Edit the `soap.client.props` file.
 - a. In a terminal window, change to the
`/opt/IBM/BPM/profiles/PCenterDmgr/properties` directory.
 - b. Edit the `soap.client.props` file by using an editor such as vi.
-



Hint

You can also start the File Browser and change to the
`/opt/IBM/BPM/profiles/PCenterDmgr/properties` directory. Right-click the
`soap.client.props` file and click **Open with gedit**.

- c. Go to the `com.ibm.SOAP.authenticationTarget=BasicAuth` section.

___ d. In the `soap.client.props` file, enter the following information:

- In the `com.ibm.SOAP.loginUserId=` line, enter: `bpmadmin`
- In the `com.ibm.SOAP.loginPassword=` line, enter: `passw0rd`

```
*soap.client.props x
#####
#
#-----#
# SOAP Client Security Enablement
# - security enabled status ( false[default], true )
#-----#
com.ibm.SOAP.securityEnabled=false

#
#-----#
# - authenticationTarget      ( BasicAuth[default], KRB5. These are the
only supported selection
#                               on a pure client for JMX SOAP Connector
Client. )
#-----#
com.ibm.SOAP.authenticationTarget=BasicAuth

com.ibm.SOAP.loginUserId=bpmadmin
com.ibm.SOAP.loginPassword=passw0rd
```



Note

Editing the `soap.client.props` file in this manner is not suggested in a production environment. It shows security information to anyone who has access to the file system. If you choose to enter this information in a production environment, the `PropFilePasswordEncoder` command utility can be used to encode the password.

___ e. Save and close the file.

Part 3: Verifying the creation of the deployment manager

After you create the deployment manager profile, you can verify that the deployment manager server starts without error.

- ___ 1. Use the First steps console to verify and start the deployment manager.
 - ___ a. In the terminal window, change to the `/opt/IBM/BPM/profiles/PCenterDmgr/firststeps` directory.
 - ___ b. Enter the following command to start the First steps console:
`./firststeps.sh`

The First steps console opens and looks like the following screen capture:

The screenshot shows the 'First steps' section of the WebSphere Application Server interface. It includes links for 'Installation verification', 'Start the deployment manager', 'Administrative console', 'WebSphere Customization Toolbox', 'Information center for WebSphere Application Server', 'IBM Education Assistant for WebSphere software', and 'Exit'. The 'IBM' logo is visible in the top right corner.

- ___ c. Click **Installation verification** to run the verification tool. The installation verification tool starts the deployment manager and verifies that there are no errors in the deployment manager `SystemOut.log` file. It is fine if you see any warnings.
- ___ d. The tool takes a few minutes to run as it must first start the deployment manager. If you see errors or warning messages, it is safe to ignore them if the final message in the console indicates that the verification succeeded.

You see the following message in the First steps output window: The Installation Verification Tool verification succeeded.

```

First steps output - Installation verification

Start running the following command:/opt/IBM/BPM/profiles/PCenterDmgr/bin/startServer.sh dmgr -profileName
>CWUPO0001I: Running configuration action detectNewProducts.ant
>ADMU0116I: Tool information is being logged in file
>      /opt/IBM/BPM/profiles/PCenterDmgr/logs/dmgr/startServer.log
>ADMU0128I: Starting tool with the PCenterDmgr profile
>ADMU3100I: Reading configuration for server: dmgr
>ADMU3200I: Server launched. Waiting for initialization status.
>ADMU3000I: Server dmgr open for e-business; process id is 10035
Server port number is:9060
IVTL0010I: Connecting to the bpmhost WebSphere Application Server on port: 9060
IVTL0015I: WebSphere Application Server bpmhost is running on port: 9060 for profile PCenterDmgr
IVTL0035I: The Installation Verification Tool is scanning the /opt/IBM/BPM/profiles/PCenterDmgr/logs/dmgr/2016-05-19T15:40:11.948Z/00000001 WSKeyStore W CWPKI0041W: One or more key stores are using
[5/19/16 15:40:14:324 EDT] 00000001 ObjectGridCat W CWOBJ0051W: This profile is not augmented with
[5/19/16 15:40:30:097 EDT] 00000001 HostNameMap W HMGR0064W: Resolution of IP Addresses for host
[5/19/16 15:41:15:210 EDT] 00000001 TcpTransport W ADMD0025W: In process discovery, the 127.0.0.1
[5/19/16 16:05:48:123 EDT] 00000001 WSKeyStore W CWPKI0041W: One or more key stores are using
[5/19/16 16:05:48:656 EDT] 00000001 ObjectGridCat W CWOBJ0051W: This profile is not augmented with
[5/19/16 16:05:51:187 EDT] 00000001 HostNameMap W HMGR0064W: Resolution of IP Addresses for host
[5/19/16 16:06:05:116 EDT] 00000001 TcpTransport W ADMD0025W: In process discovery, the 127.0.0.1
IVTL0040I: 4 errors/warnings are detected in the /opt/IBM/BPM/profiles/PCenterDmgr/logs/dmgr/SystemOut.log
VTL0070I: The Installation Verification Tool verification succeeded.
IVTL0080I: The installation verification is complete.

```

- e. When installation verification is complete, close the First steps output - Installation verification window.
 - f. Click **Exit** to close the First steps window.
2. Verify that the deployment manager is running.
- a. In a terminal window, change to the /opt/IBM/BPM/profiles/PCenterDmgr/bin directory.
 - b. Enter the following command to verify that the deployment manager is running:

```
./serverStatus.sh -all
```

```

localuser@bpmhost:/opt/IBM/BPM/profiles/PCenterDmgr/bin$ ./serverStatus.sh -all
ADMU0116I: Tool information is being logged in file
      /opt/IBM/BPM/profiles/PCenterDmgr/logs/serverStatus.log
ADMU0128I: Starting tool with the PCenterDmgr profile
ADMU0503I: Retrieving server status for all servers
ADMU0505I: Servers found in configuration:
ADMU0506I: Server name: dmgr
ADMU0508I: The Deployment Manager "dmgr" is STARTED
localuser@bpmhost:/opt/IBM/BPM/profiles/PCenterDmgr/bin$
```

Notice the entry that indicates the deployment manager is started.

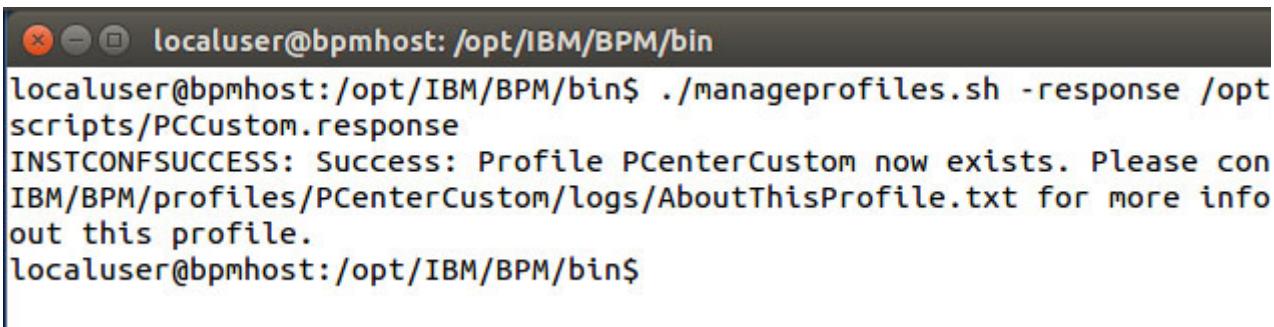
- c. Leave the terminal window open.

Part 4: Creating the custom node profile

This step creates a custom profile, PCenterCustom, which uses the manageprofiles command. After creation of the profile, the profile is federated by using command line tools. A custom profile is useful because it does not create any servers on the node. It creates only the configuration and the node agent.

- 1. Create a custom profile by using the manageprofiles command.
 - a. In a terminal window, change to the /opt/IBM/BPM/bin directory.
 - b. The PCCustom.response file was created and it contains the needed input parameters. It is in /opt/labfiles/scripts. To create the custom node profile by using a response file, enter the following command:

```
. ./manageprofiles.sh -response /opt/labfiles/scripts/PCCustom.response
```



```
localuser@bpminstance:/opt/IBM/BPM/bin$ ./manageprofiles.sh -response /opt/labfiles/scripts/PCCustom.response
INSTCONFSUCCESS: Success: Profile PCenterCustom now exists. Please consult IBM/BPM/profiles/PCenterCustom/logs/AboutThisProfile.txt for more info about this profile.
localuser@bpminstance:/opt/IBM/BPM/bin$
```

Wait until it is confirmed that the profile is created successfully. The profile creation takes several minutes to complete.



Information

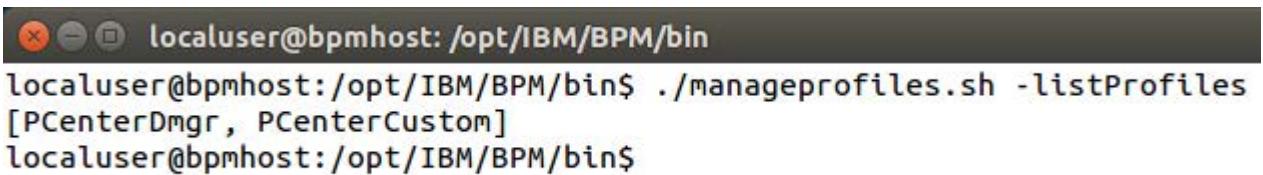
To create the custom profile by providing all parameters, enter the following command:

```
. ./manageprofiles.sh -create -profileName PCenterCustom -profilePath
/opt/IBM/BPM/profiles/PCenterCustom -templatePath
/opt/IBM/BPM/profileTemplates/BPM/BpmNode -cellName Cell101 -hostName
bpminstance -nodeName PCenterNode01
```

- 2. Verify the profile creation.

- a. Enter the following command to list the profiles in the repository:

```
. ./manageprofiles.sh -listProfiles
```



```
localuser@bpminstance:/opt/IBM/BPM/bin$ ./manageprofiles.sh -listProfiles
[PCenterDmgr, PCenterCustom]
localuser@bpminstance:/opt/IBM/BPM/bin$
```

Note the two Process Center profiles that were created as part of this exercise.

- ___ 3. Edit the `soap.client.props` file.
 - ___ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PCenterCustom/properties` directory.
 - ___ b. Edit the `soap.client.props` file by using an editor such as vi or gedit.
 - ___ c. Go to the `com.ibm.SOAP.authenticationTarget=BasicAuth` section.
 - ___ d. In the `soap.client.props` file, enter the following information:
 - In the `com.ibm.SOAP.loginUserId=` line, enter `bpmadmin`
 - In the `com.ibm.SOAP.loginPassword=` line, enter `passw0rd`

```
*soap.client.props x
#####
#-----#
# SOAP Client Security Enablement
# - security enabled status ( false[default], true )
#-----#
com.ibm.SOAP.securityEnabled=false

#-----#
# - authenticationTarget      ( BasicAuth[default], KRB5. These are
only supported selection
#                               on a pure client for JMX SOAP Connec
Client. )
#-----#
com.ibm.SOAP.authenticationTarget=BasicAuth

com.ibm.SOAP.loginUserId=bpmadmin
com.ibm.SOAP.loginPassword=passw0rd
```

- ___ e. Save and close the file.



Information

The custom profile is federated by using the `addNode` command. To federate the node, the deployment manager must be running. You can verify that the deployment manager is running by changing to the `/opt/IBM/BPM/profiles/PCenterDmgr/bin` directory and entering the following command:

```
./serverStatus.sh -all
```

The `addNode` command requires the host name of the workstation on which the deployment manager is running and the SOAP port of the deployment manager. SOAP is the default Java Management Extensions (JMX) connector type for the command.

Also, since administrative security is configured, the administrative user ID and password must be provided. All of the other arguments in the `addNode` command are optional.

- ___ 4. Federate the custom profile.
 - ___ a. In the terminal window, change to the /opt/IBM/BPM/profiles/PCenterCustom/bin directory.
 - ___ b. Enter the following command to federate the node to the deployment manager:
./addNode.sh bpmhost -user bpmadmin -password passw0rd



Information

To determine the ports that are configured during profile creation for the deployment manager, open the `portdef.props` file that is in `/opt/IBM/BPM/profiles/PCenterDmgr/properties`.

- ___ c. When the federation process completes, you see a message similar to the following message:

ADMU0003I: Node PCenterNode01 has been successfully federated.

The custom profile is federated to the deployment manager. A cell is configured that contains a deployment manager and one node.

Part 5: Verifying the configuration



Important

All exercises in this course were tested by using the Firefox web browser. The Ubuntu image also contains a Chrome web browser. You should always use the Firefox web browser for instructions in the exercises. Using the Chrome web browser might result in differences in the screen captures shown in the exercises.

-
- ___ 1. Start the deployment manager's administrative console.
 - ___ a. Open a Firefox web browser and go to the following website:

`http://bpmhost:9060/ibm/console`

Remember to use the administrative console port information noted in the `AboutThisProfile.txt` file.



Hint

To open Firefox, choose any of the following options:

- Click the Firefox icon in the toolbar.
- In a terminal window, enter: `firefox&`

-
- ___ b. In the Insecure Connection window, click **Advanced** to expand the option.



Your connection is not secure

The owner of **bpmhost** has configured their website improperly. To protect your information from being stolen, Firefox has not connected to this website.

[Learn more...](#)

[Go Back](#)

[Advanced](#)

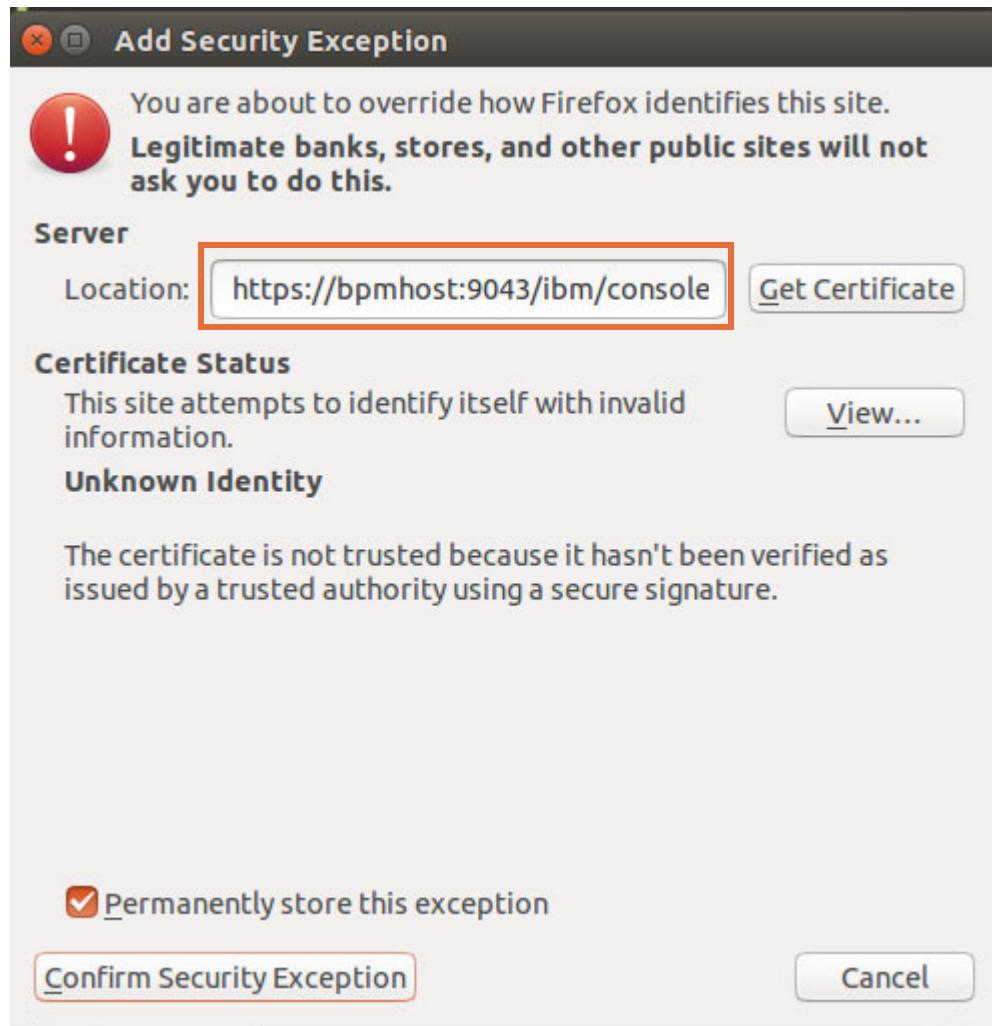


Report errors like this to help Mozilla identify misconfigured sites

- __ c. Click Add Exception.

The screenshot shows a Firefox browser window displaying a security warning. At the top left is a red padlock icon with a slash through it. To its right, the text "Your connection is not secure" is displayed in large, bold, dark blue font. Below this, a message states: "The owner of **bpmhost** has configured their website improperly. To protect your information from being stolen, Firefox has not connected to this website." A blue link "Learn more..." is present. Two buttons are at the bottom: a blue "Go Back" button and a white "Advanced" button. Below these buttons is a checkbox labeled "Report errors like this to help Mozilla identify misconfigured sites". A detailed error message box contains the following text:
bpmhost:9043 uses an invalid security certificate.
The certificate is not trusted because the issuer certificate is unknown.
The server might not be sending the appropriate intermediate certificates.
An additional root certificate may need to be imported.
Error code: SEC_ERROR_UNKNOWN_ISSUER
A red rectangular box highlights the "Add Exception..." button at the bottom of the error message box.

- ___ d. In the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following URL:
`https://bpmhost:9043/ibm/console`



- ___ e. Click **Confirm Security Exception**. The login page for the Integrated Solutions Console, which is also known as the administrative console, is now visible.



Hint

Since the administrative console is used multiple times throughout the exercises, it might be a good idea to create a bookmark to the URL.

- ___ f. In the login area, enter `bpmadmin` as the user ID and `passw0rd` as the password. Click **Login**.

**Note**

If asked to save the password, click **Never Remember Password for This Site**.

- __ 2. Verify the cell configuration.

- __ a. From the administrative console navigation pane, click **System administration > Nodes**. You see the two nodes listed.

Nodes

Use this page to manage nodes in the application server environment. A node corresponds to a physical computer with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking Add Node.

+ Preferences

Add Node	Remove Node	Force Delete	Synchronize	Full Resynchronize	Stop
Select	Name	Host Name	Version	Discovery Protocol	
You can administer the following resources:					
	PCenterCellManager	bpmhost	ND 8.5.5.8 BPMAv 8.5.7.0	TCP	
<input type="checkbox"/>	PCenterNode01	bpmhost	ND 8.5.5.8 BPMAv 8.5.7.0	TCP	
Total 2					

- __ 3. Configure automatic synchronization. To ensure that subsequent changes are synchronized with the node, complete the following one-time setup.

**Information**

By default, when changes are made to the master configuration from the administrative console, synchronization of these changes with the node agent is not automatic. Rather, the node agent relies on the file synchronization service properties (such as the synchronization interval) to retrieve changes to the configuration from the deployment manager. For this course, you configure automatic synchronization.

- __ a. Click **System administration > Console Preferences**.
- __ b. In the Console preferences section, select the option **Synchronize changes with Nodes**. This option specifies whether you want to force node synchronization at the time

that you save your changes to the master repository, rather than when node synchronization normally occurs.

Console preferences

Specify user preferences for the administrative console workspace.

- Turn on workspace automatic refresh
- No confirmation on workspace discard
- Use default scope
- Show the help portlet
- Enable command assistance notifications
- Log command assistance commands
- Synchronize changes with Nodes

[Bidirectional support options](#)

[Apply](#) [Reset](#)

- ___ c. Click **Apply**. You see the following message at the top of the window:
Your preferences have been changed.
___ 4. Log out of the administrative console and minimize the browser.



Note

After completing a new installation, it is a good practice to make a backup of the initial configuration. You can create a backup of the master configuration files by using the `backupConfig` command. You can later restore this configuration if necessary. For example, you can create the backup by entering the following command:

```
/opt/IBM/BPM/profiles/PCenterDmgr/bin/backupConfig.sh -nostop
```

The `-nostop` option tells the `backupConfig` command not to stop the servers.

2.2. Creating the Process Center deployment environment

Part 1: Creating the required databases

Process Center uses a number of database tables to store and track information. In this part of the exercise, you create the required Process Center databases.

You can create the required databases for IBM Business Process Manager before or after you create profiles but before you configure your network deployment environment. The databases can be manually created or created by using scripts that are installed during product installation.

For a Business Process Manager Advanced configuration, three databases are required.

- The Process Server database (default name is BPMDB)
- The Performance Data Warehouse database (default name is PDWDB)
- The Common database (default name is CMNDB)

By default, the Common database name is CMNDB. However, since both Process Center and Process Server environments are configured on the same computer and are using the same database product, the database names must be unique. In this exercise, the database names that are used begin with PC to identify the database names for the Process Center environment.



Information

For development environments and basic installations, you can use any of the database products that are supported for production environments, or you can use Derby. Derby is not intended for use in production environments. DB2 Enterprise Server Edition is installed on the course image and is used for the exercises.

- ___ 1. Verify the version of DB2 that is installed.
 - ___ a. Open a terminal window and enter the following command:
`su - db2inst1`
 - ___ b. When prompted for the password, enter: `passw0rd`



Information

The `su` command does a `su` (Set User) to `db2inst1`, which is the owner of the `db2` processes. The important point is the extra `-` (dash) between the `su` and the `db2inst1`. The dash causes the window to not only become user `db2inst1`, but also run the start scripts for the user. As a result, the window changes to the home directory of the user and has all the environment variables for the user defined.

- ___ c. Next, determine the current version and service level of the installed DB2 product. Enter the following command:

```
db2level
```

```
db2inst1@bpghost:~$ db2level
DB21085I This instance or install (instance name, where applicable:
"db2inst1") uses "64" bits and DB2 code release "SQL10053" with level
identifier "0604010E".
Informational tokens are "DB2 v10.5.0.3", "s140203", "IP23551", and Fix Pack
"3".
Product is installed at "/opt/ibm/db2/V10.5".

db2inst1@bpghost:~$
```

Upon completion, you see the following message in the command window:

Informational tokens are "DB2 v10.5.0.3", "s140203", "IP23551", and Fix Pack "3".

The message indicates that DB2 V10.5 Fix Pack 3 is installed.

- ___ d. Leave the DB2 command window open. You use it in the next step.
- ___ 2. Create the common database by using the scripts that are installed with the product. When the scripts are installed, they are placed in /opt/IBM/BPM/BPM/dbscripts.
- ___ a. In the DB2 command window, change to the /opt/IBM/BPM/BPM/dbscripts/DB2/Create directory.
 - ___ b. List the contents of the directory by entering the following command:
ls
 - ___ c. There are a number of different files in this directory. The createDatabase.sql file is used to create the required databases. The file must be updated to include the name of the database that you want to use and the user name that you want to use for the database.



Information

It is always a good idea to make a backup of the files that you are changing. You should never modify the original file.

-
- ___ 3. Modify the create database script.
- ___ a. Open another terminal window and change to the /opt/IBM/BPM/BPM/dbscripts/DB2/Create directory.

- ___ b. Create a copy of the `createDatabase.sql` file and name the copy `createDatabaseCMN.sql`. The Common database is created first and the name identifies the script for creating the Common database. Use the following command:

```
cp createDatabase.sql createDatabaseCMN.sql
```

- ___ c. List the contents of the directory. Verify that both files exist.
 ___ d. Open the `createDatabaseCMN.sql` file by using an editor such as vi or gedit.



Hint

To use gedit, complete one of the following steps:

- Enter the command: `gedit <filename>&`
- Open the Files tool, change to the directory that contains the file, and double-click the file name

- ___ e. In the file, replace each instance of the `@DB_NAME@` placeholder with the database name: `PCCMNDB`

There are four `@DB_NAME@` placeholder instances.

- ___ f. In the file, replace the instance of the `@DB_USER@` placeholder with the database user: `db2inst1`

There is one `@DB_USER@` placeholder instance.

- ___ g. Verify the changes that you made to the file. Save and close the file when completed.

```
-- create the database:  
create database PCCMNDB automatic storage yes using codeset UTF-8 territory  
US pagesize 32768;  
  
-- connect to the created database:  
connect to PCCMNDB;  
  
-- A user temporary tablespace is required to support stored procedures in  
BPM.  
CREATE USER TEMPORARY TABLESPACE USRTMPSPC1;  
  
-- The following grant is used for databases without enhanced security.  
-- For more information, review the Info Center for Enhancing Security for  
DB2.  
grant dbadm on database to user db2inst1;  
UPDATE DB CFG FOR PCCMNDB USING LOGFILSZ 16384 DEFERRED;  
UPDATE DB CFG FOR PCCMNDB USING LOGSECOND 64 DEFERRED;  
  
connect reset;
```

- ___ h. Exit this terminal window.

- ___ 4. Create the Common database.
 - ___ a. In the DB2 command window, enter the following command to create the database:
`db2 -tvf createDatabaseCMN.sql`
 - ___ b. Next, the database is created. Look for the following message: The CREATE DATABASE command completed successfully. After that, a connection is obtained, the database is updated, and the connection is reset.
 - ___ c. When the creation is complete, you see a message in the console that indicates the following information: The SQL command completed successfully.



Information

Running the script displays the following message that is safe to ignore: An authorization ID cannot grant a privilege or authority to itself. The script is expected to be run as another user. After the database is created, it contains a line that grants database admin rights to the db2inst1 user. By default, root does not have access rights to the db2 binary files, and the script is run as db2inst1. The user db2inst1 cannot grant access rights to itself. However, db2inst1 is the admin for this database and thus; it is safe to ignore this message.

- ___ 5. Create the remaining required databases.
 - ___ a. In the DB2 command window, change to the `/opt/labfiles/scripts` directory.
 - ___ b. List the contents of the directory by entering the following command:
`ls`
 - ___ c. Notice the `createDatabaseBPM.sql` and the `createDatabasePDW.sql` script files. These scripts are updated to create the PCBPMDB and PCPDWDB databases. Feel free to examine the files.
 - ___ d. Enter the following command to create the database:
`db2 -tvf createDatabaseBPM.sql`
 - ___ e. When the creation is complete, you see a message in the console that indicates the following information: The SQL command completed successfully.
 - ___ f. Enter the following command to create the database:
`db2 -tvf createDatabasePDW.sql`
 - ___ g. When the creation is complete, you see a message in the console that indicates the following information: The SQL command completed successfully.
- ___ 6. Verify the databases.
 - ___ a. To list the databases, enter the following command:
`db2 list database directory`
 The three required databases are listed.
 - ___ b. Exit the DB2 command window.

- ___ c. Exit the terminal window.

Part 2: Creating the Process Center deployment environment by using the deployment environment wizard

The layout of the Business Process Management cell topologies that are used for Process Center and Process Server cells follows the same general pattern. The primary difference between a Process Center cell and a Process Server cell is the use of the cell. A Process Server cell that is used as a production runtime environment might be expected to support a constant and high volume of traffic. A Process Center cell that is used as the master repository of the IBM BPM environment is expected to support a known set of developers and administrators. However, it might not have a significant number of users that are accessing it at any time. Therefore, it is the master repository and playback server, and must cope with many process applications.

A Process Center cell might differ in topology from the Process Server cells that are associated with it. In addition, Process Server cell topologies might differ from each other.

In this part of the exercise, you create the Process Center deployment environment by using the deployment environment wizard in the administrative console. The Process Center deployment environment is used to store, run, and administer process applications and toolkits that are developed in Process Designer and Integration Designer. You can create more than one deployment environment in the same cell by using the deployment environment wizard. However, you can create only one Process Center-based deployment environment in a single cell.

- ___ 1. Start the deployment manager's administrative console.
 - ___ a. Maximize the Firefox web browser and go to the following website:
`http://bpminst1:9060/ibm/console`
 - ___ b. In the login area, enter `bpmadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ 2. Create the deployment environment.
 - ___ a. From the administrative console, click **Servers > Deployment Environments**.



Information

A deployment environment is a logical concept. It is a collection of configured clusters, servers, and middleware that collaborate to provide an environment to host product components and process applications.

Through the administrative console on the deployment manager, you administer the deployment environments that are defined on the deployment manager. You can also create, delete, import, and export deployment environments from the administrative console.

- ___ b. Click **New**.

- __ c. On the Create a Deployment Environment pane, enter the following information:
- In the **Deployment environment name** field, enter: PCenter_DE
 - In the **Deployment environment administrator** field, enter: pcdeadmin
 - In the **Password** field, enter: passw0rd
 - In the **Confirm password** field, enter: passw0rd
 - Leave the **Context root** field blank.

Create a Deployment Environment

Enter the deployment environment name and the deployment environment administrator user name and password.

* Deployment environment name
PCenter_DE

* Deployment environment administrator user name
pcdeadmin

* Password

* Confirm password

Context root prefix

Virtual host
(none)



Information

The deployment environment administrator is the primary IBM BPM administrator. Deployment environment administrators have authorization in their assigned deployment environments. They have administrative access to Process Center and the Process Admin Console. This role also enables administration of Process Servers, Performance Data Warehouses, and internal users and groups.

It is suggested to use a different administrator for each deployment environment and also the cell administrator.

__ d. Enter the following information:

- For environment type, select **Advanced Process Center**.
- For the deployment environment cluster pattern, select **Single Cluster**.

Select	IBM BPM Deployment Environment Type	Description
<input type="radio"/>	Standard Process Center	Store, test, and administer process applications and toolkits that are authored in Process Designer.
<input type="radio"/>	Standard Process Server	Run processes and services in process applications that are deployed from the Standard Process Center.
<input checked="" type="radio"/>	Advanced Process Center	Store, test, and administer process applications and toolkits that are authored in Process Designer and IBM Integration Designer.
<input type="radio"/>	Advanced Process Server	Run processes, services, and SCA modules in process applications that are deployed from the Advanced Process Center, or run modules that are deployed directly.
<input type="radio"/>	Advanced-only Process Server	Run SCA modules only. You deploy these modules from the command line or the WebSphere administrative console. This server is the IBM BPM equivalent of IBM WebSphere Process Server.

Select a cluster pattern for the deployment environment.

Select	Deployment Environment Pattern	Description
<input type="radio"/>	Application, Remote Messaging, and Remote Support	Defines one cluster for application deployment, one remote cluster for the messaging infrastructure, and one remote cluster for the supporting applications
<input checked="" type="radio"/>	Single Cluster	Defines one application deployment target cluster, which includes the messaging infrastructure and supporting applications

Next **Cancel**

__ e. Click **Next**.

- ___ f. In Step 1: Select Nodes, select the **PCenterNode01** check box, and click **Next**.

Select Nodes

Tip: Select the nodes to use for the deployment environment. The *PCenter_DE* deployment environment has a Single Cluster pattern and, therefore, requires at least **one node**. For high-availability and failover environments, select two nodes. For scalability, select more than two nodes.

Select	Node	Version	Host
<input checked="" type="checkbox"/>	PCenterNode01	BPMAPC 8.5.7.0	bpmhost
Number of nodes required		1	
Number of nodes selected		1	

Select at least one node for a deployment environment. In a production topology, you are likely to have multiple managed nodes in the cell. The deployment environment wizard does not restrict the number of nodes you can select. In addition, you can add nodes to the deployment environment after it is generated if your capacity needs change.

- ___ g. In Step 2: Clusters, define the distribution of servers in the clusters. By default, one cluster member is assigned on each node for the function. Leave the default value of 1 to place one cluster member in the Application Deployment Target cluster. Click **Next**.

Define Clusters

Map each cluster to the listed nodes by indicating the number of cluster members per node.

Node	Version	Application Deployment Target
PCenterNode01	BPMAPC 8.5.7.0	1



Note

A production environment is based on the number of managed nodes in the cell and the resources available on the nodes. In a production environment, you can choose to create zero or more cluster members on each node in the topology. A 0 value for a node means that the node does not contribute to the selected function, which is based on features that you selected.

- __ h. In Step 3: Customize Cluster Name and Ports, Application Cluster section, enter the following information:
- In the **Cluster Name** field, enter: PCenter_DE.AppCluster
 - In the **Cluster Member Name** field, enter: PCenter_DE.AppCluster.member1
 - Leave the default, which is blank, for **Starting Port**.

Customize Cluster Name and Ports

Customize a cluster and its cluster members by entering names or port numbers. Starting ports in the have a difference of at least 20 between their port numbers.

Application Cluster

* Cluster Name

PCenter_DE.AppCluster

Node Name	Cluster Member Name	Starting Port
PCenterNode01	PCenter_DE.AppCluster.member1	

- __ i. Click **Next**.

__ j. In Step 4: Configure Databases, enter the following information:

- For **Select provider**, select **DB2**.
- In the **User name** field, enter: db2inst1
- In the **Password** field, enter: passw0rd
- In the **Confirm Password** field, enter: passw0rd
- In the **Server** field, enter: bpmhost
- In the **Port** field, enter: 50000
- Leave the **Create Tables** check box selected
- In the **Cell database Name** field, enter: PCCMNDB
- In the **Common database Name** field, enter: PCCMNDB
- In the **Process database Name** field, enter: PCBPMDB
- In the **Performance Data Warehouse database Name** field, enter: PCPDWDB

Configure Databases

Edit the database parameters for the data sources that are used by this deployment environment.

* Select provider
DB2

Shared parameters:

* User name db2inst1	* Password *****	* Confirm password *****
* Server bpmhost	* Port 50000	<input checked="" type="checkbox"/> Create Tables

Databases:

Cell database

* Name
PCCMNDB

Common database

* Name
PCCMNDB

Process database

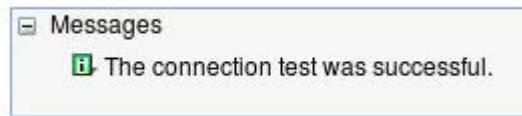
* Name
PCBPMDB

Performance Data Warehouse database

* Name
PCPDWDB

It is important that the databases that are specified in this pane exist. The deployment environment configuration never creates a database. Keep all remaining defaults.

__ k. Click **Test connection**. A message indicates 'The connection test was successful'.



__ l. Click **Next**.

- ___ m. In Step 5: Summary, review your options and click **Generate Deployment Environment**. The generation takes approximately 20 minutes to generate.
- ___ n. When the configuration ends, click **Save Changes**.
- ___ o. Click **OK**.
- ___ p. You are placed on the Deployment Environments pane. The PCenter_DE deployment environment is listed and in state Stopped.

Deployment Environments

Select the deployment environments to manage. You can manage deployment environment that are created using patterns.



The screenshot shows a table-based interface for managing deployment environments. At the top, there are buttons for 'Start', 'Stop', and 'New...'. Below the buttons is a toolbar with icons for creating, deleting, and filtering. The main table has columns: 'Select', 'Status', 'Deployment Environment Name', 'Features', 'Pattern', and 'Description'. A single row is visible for 'PCenter_DE', which is marked as 'Stopped' (indicated by a red X icon). The 'Features' column lists 'IBM BPM Advanced Process Center'. The 'Pattern' column is 'Single Cluster'. The 'Description' column is empty. At the bottom left of the table, it says 'Total 1'.

Select	Status	Deployment Environment Name	Features	Pattern	Description
<input type="checkbox"/>		PCenter_DE	IBM BPM Advanced Process Center	Single Cluster	

Total 1

- ___ 3. Stop the server processes. For Advanced deployment environments, the deployment manager and node agents must be restarted for the cell scoped configuration to take effect. This step is only required for the first deployment environment that you create.
 - ___ a. Click **System administration > Node agents**.
 - ___ b. Select the **nodeagent** check box on PCenterNode01 and click **Stop**. Wait for the node agent to stop.
 - ___ c. Log out of the administrative console and close the browser.
 - ___ d. Open a terminal window, and change to the `/opt/IBM/BPM/profiles/PCenterDmgr/bin` directory. The path is now for the deployment manager in the Process Center cell.
 - ___ e. Stop the deployment manager by entering the following command:
`./stopManager.sh`
 Wait for the message that indicates that the deployment manager is stopped.
- ___ 4. Start the server processes.
 - ___ a. Start the deployment manager by entering the following command:
`./startManager.sh`
 Wait for the message that indicates that the deployment manager is started.
 - ___ b. Change to the `/opt/IBM/BPM/profiles/PCenterCustom/bin` directory.
 - ___ c. Start the node agent by entering the following command:
`./startNode.sh`
 Wait for the message that indicates that the node agent is started.

Part 3: Verifying the database tables creation

- ___ 1. Verify that the database tables are created for the common database.
 - ___ a. Open a terminal window and enter the following command:
`su - db2inst1`
 - ___ b. Enter the password: `passw0rd`
 - ___ c. To list the databases, enter the following command:
`db2 list database directory`
 - ___ d. To connect to the Common database, enter the following command:
`db2 connect to PCCMNDB user db2inst1 using passw0rd`
 - ___ e. To verify that the tables were created, enter the following command:
`db2 list tables for schema db2inst1`
268 records are listed.
 - ___ f. To reset the connection, enter the following command:
`db2 connect reset`
- ___ 2. Verify that the database tables are created for the Process Server database.
 - ___ a. To connect to the Process Server database, enter the following command:
`db2 connect to PCBPMDB user db2inst1 using passw0rd`
 - ___ b. To verify that the tables were created, enter the following command:
`db2 list tables for schema db2inst1`
265 records are listed.
 - ___ c. To reset the connection, enter the following command:
`db2 connect reset`
- ___ 3. Verify that the database tables are created for the Performance Data Warehouse database.
 - ___ a. To connect to the Performance Data Warehouse database, enter the following command:
`db2 connect to PCPDWDB user db2inst1 using passw0rd`
 - ___ b. To verify that the tables were created, enter the following command:
`db2 list tables for schema db2inst1`
22 records are listed.
 - ___ c. To reset the connection, enter the following command:
`db2 connect reset`
 - ___ d. Exit the DB2 command window.
 - ___ e. Exit the terminal window.



Information

In the next exercise, you start the Process Center deployment environment and verify the configuration.

End of exercise

Exercise review and wrap-up

In this exercise, a Process Center network deployment profile was created and the deployment manager was started. A Process Center custom profile was created and federated by using command line tools. A single cluster deployment environment topology was created by using the deployment environment wizard in the administrative console. Finally, the Process Center required databases were created and tables were verified.

Exercise 3. Administering Process Center

Estimated time

01:15

Overview

This exercise examines a Process Center topology configuration and uses the Process Center Console to examine and deploy process applications.

Objectives

After completing this exercise, you should be able to:

- Administer the Process Center environment
- Administer the Process Center repository
- Use the Health Center to verify the deployment environment
- Export, delete, and import a process application
- Use the Process Center Console to deploy a snapshot
- Use Business Process Choreographer Explorer to start a process instance
- Use the Process Admin Console to examine process instance details and statistical information
- Use the Process Inspector to examine details for a process instance

Introduction

Process Center Console provides a convenient location to create and maintain high-level containers such as process applications and toolkits. Administrators who do not actively work in the Process Designer view can use the Process Center Console to provide a framework in which business process management analysts and developers can build their processes and underlying implementations. Another primary task for administrators is managing access to the Process Center repository by setting up the appropriate authorization for users and groups.

From the Process Center Console, you can:

- Create process applications and toolkits and grant other users access to those process applications and toolkits
- Create process models, services, and other assets within process applications
- Install process applications that are ready for testing or production on the process servers in those environments
- Manage running instances of process applications in configured environments

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Center profiles created
- The Process Center single cluster deployment environment created

Exercise instructions

Part 1: Starting the server and examining various settings

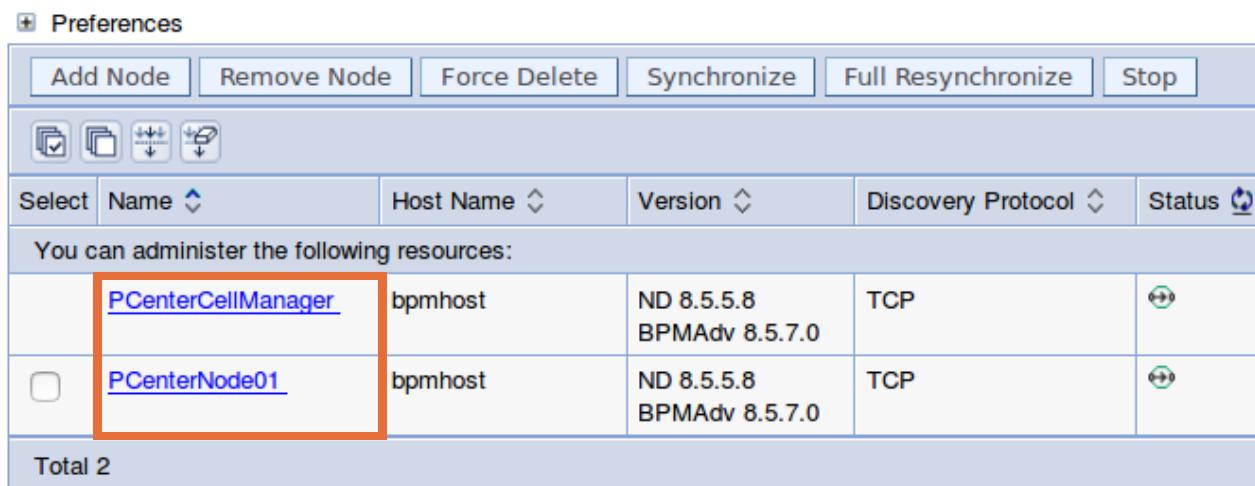
After modeling, designing, and implementing a business process solution, the next step in the business process application lifecycle is the deployment of the application to a runtime server. Process Center is the central repository in IBM Business Process Manager V8.5. The Process Center repository contains the artifacts of process applications and enables the sharing of processes and assets across process applications. It also provides governance and lifecycle management capabilities and plays an important role in the deployment of process applications. Process applications can also be versioned, enabling different levels of the same application to be maintained in the repository and deployed to process servers. Additionally, the Process Center repository also maintains a registry of all the process server environments.

Before you begin working with the Process Center environment, you must start the server processes. First, you must log in to the administrative console by using the deployment environment administrator credentials.

- 1. Start the deployment manager administrative console.
 - a. Open a Firefox web browser and go to the following URL:
`http://bpmhost:9060/ibm/console`
 - b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- 2. Examine the cell configuration.
 - a. From the administrative console, click **System administration > Nodes**. You see the two nodes in the cell listed.

Nodes

Use this page to manage nodes in the application server environment. A node corresponds to a physical computer system with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking **Add Node**.



Select	Name	Host Name	Version	Discovery Protocol	Status
<input checked="" type="checkbox"/>	PCenterCellManager	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
<input type="checkbox"/>	PCenterNode01	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	

Total 2

- __ b. Click **Servers > Deployment Environments**. One deployment environment is listed.

Deployment Environments

Select the deployment environments to manage. You can manage deployment environment that are created using patterns.

The screenshot shows a table titled "Deployment Environments" with the following columns: Select, Status, Deployment Environment Name, Features, Pattern, and Description. There is one row visible, representing a deployment environment named "PCenter_DE". The "Deployment Environment Name" cell contains the value "PCenter_DE" and is highlighted with a red border. The "Status" cell contains a red X icon, indicating the environment is stopped. The "Features" cell lists "IBM BPM Advanced Process Center". The "Pattern" cell lists "Single Cluster". The "Description" cell is empty. At the bottom left of the table, it says "Total 1".

Select	Status	Deployment Environment Name	Features	Pattern	Description
<input type="checkbox"/>		PCenter_DE	IBM BPM Advanced Process Center	Single Cluster	

Total 1

- __ c. The PCenter_DE deployment environment that is listed is based on the Single Cluster pattern, where one cluster is part of this topology. All components run in the same cluster.

The status of the PCenter_DE deployment environment is **Stopped** (red X).



Information

In the Application, Remote Messaging, and Remote Support topology, the messaging engine is in a cluster separate from the rest of the functions. Not only does this separation relieve the other clusters of the messaging workload, but it is also valuable because it limits the impact of specific failure scenarios.

- __ d. Click **PCenter_DE**.
- __ e. In the Cluster section, one cluster is listed which includes the following details:
- **PCenter_DE.AppCluster**: This cluster hosts the Process Center server, which includes the Process Center Console, Process Admin Console, and the Process Portal console. It also hosts the remaining components such as the Performance Data Warehouse, Business Space, and messaging engine for the topology. This cluster also hosts the support applications for the topology, which include the Business Process Choreographer Explorer and Performance Data Warehouse console.

The screenshot shows a table titled "Cluster" with the following columns: Cluster, Cluster Name, and Status. There is one row visible, representing a cluster named "Application, Messaging and Support". The "Cluster Name" cell contains the value "PCenter_DE.AppCluster" and is highlighted with a red border. The "Status" cell contains a red X icon, indicating the cluster is stopped. The "Cluster" cell contains the value "Application, Messaging and Support".

Cluster	Cluster Name	Status
Application, Messaging and Support	PCenter_DE.AppCluster	

- __ f. Under Additional Properties, click **Deployment Topology**.

- __ g. You can see that one node is added to the topology and the cluster has one member.

The screenshot shows the 'Add Nodes' configuration pane. At the top, there is a dropdown menu set to 'PCenterNode01' and a blue 'Add' button. Below this is a table with columns: Select, Node, Status, Version, Host, and Application Deployment Target. A row for 'PCenterNode01' is selected, indicated by a red border around the 'Node' column. The 'Host' column shows 'bpmhost'. The 'Application Deployment Target' column contains the value '1' and has a red border around it. A red 'X' icon is located at the bottom right of the table area.



Information

Since the deployment environment is already generated, the changes you make to the topology configuration are used to update the number of cluster members for the corresponding deployment environment clusters. If you use the Deployment Topology pane to add a node, then the deployment environment definition updates that one node. All clusters that the deployment environment manages include one more cluster member on that node.

- __ h. Click **Service integration > Buses**. You can see the bus that is created for the deployment environment.

Buses

A service integration bus supports applications using message-based and service-oriented architectures. A bus is a group of interconnected servers and clusters that have been added as members of the bus. Applications connect to a bus at one of the messaging engines associated with its bus members.

+ Preferences

The screenshot shows the 'Buses' configuration pane. At the top, there are 'New...' and 'Delete' buttons. Below this is a toolbar with icons for creating, deleting, and managing resources. A table with columns: Select, Name, Description, and Security follows. A row for 'BPM.PCenter_DE.Bus' is selected, indicated by a red border around the 'Name' column. The 'Description' column shows 'BPM Bus' and the 'Security' column shows 'Enabled'. A red 'X' icon is located at the bottom right of the table area.

- __ 3. Start the deployment environment.

**Note****For IBM BPM on Cloud users**

You do not need to start the Process Center. It is already running in your cloud environment.

Starting and stopping a deployment environment calls a stop or start operation on all the clusters in the deployment environment at the same time. If the deployment environment contains multiple clusters that depend on one another, you can start and stop the individual clusters in the deployment environment.

- __ a. Click **Servers > Deployment Environments**.
 - __ b. Select the **PCenter_DE** check box, and click **Start**. Wait a few moments for the deployment environment to start before proceeding. If after a few minutes the status is still **Partial Start**, the console must be refreshed. Click any page in the console to refresh. Go back to the Deployment Environments pane to verify that the deployment environment is started.
-

**Hint**

Tail the `SystemOut.log` file for the cluster member, `PCenter_DE.AppCluster`, to monitor the output as the process starts. To tail the log file, enter the following command:

```
tail -f SystemOut.log
```

The file is in

```
/opt/IBM/BPM/profiles/PCenterCustom/logs/PCenter_DE.AppCluster.member1.
```

__ 4. Verify the configuration.

- __ a. Click **Servers > Clusters > WebSphere application server clusters**. Verify that the cluster is in state Started.

WebSphere application server clusters

Use this page to change the configuration settings for a cluster. A server cluster consists of a group of application servers. If one of the member servers fails, requests will be routed to other members of the cluster. Learn more about this task in a [guided activity](#). A guided activity provides a list of task steps and more general information about the topic.

Preferences

The screenshot shows a user interface for managing WebSphere application server clusters. At the top, there is a toolbar with buttons for New..., Delete, Start, Stop, Ripplestart, and ImmediateStop. Below the toolbar is a toolbar with icons for selecting, deleting, and sorting. A search bar labeled 'Select' and a dropdown labeled 'Name' are followed by a status filter labeled 'Status'. A message says 'You can administer the following resources:'. Below this, a table lists a single cluster: 'PCenter_DE.AppCluster' with a checked checkbox and a green plus sign icon. The total count is 'Total 1'.

- __ b. Click **PCenter_DE.AppCluster**.

- __ c. Under Cluster messaging, click **Messaging engines**. Verify that the messaging engine for the deployment environment is in the Started state.

The screenshot shows a user interface for managing cluster messaging engines. At the top, there is a toolbar with Start and Stop buttons. Below the toolbar is a toolbar with icons for selecting, deleting, and sorting. A search bar labeled 'Select' and a dropdown labeled 'Name' are followed by a description dropdown and a status filter. A message says 'You can administer the following resources:'. Below this, a table lists a single messaging engine: 'PCenter_DE.AppCluster.000-BPM.PCenter_DE.Bus' with a checked checkbox and a green plus sign icon. The total count is 'Total 1'.

- __ d. Click **Servers > Server Types > WebSphere application servers**. Verify that the server is in the Started state. From this pane, you can see the name that is created for each cluster member in the Deployment Topology. During deployment environment configuration, you can customize cluster names or cluster member names for the cluster type. You can also modify cluster short names and cluster member short names.

The screenshot shows a user interface for managing WebSphere application servers. At the top, there is a toolbar with a search bar labeled 'Select' and a dropdown labeled 'Name'. Below the toolbar is a toolbar with icons for selecting, deleting, and sorting. A search bar labeled 'Select' and a dropdown labeled 'Name' are followed by Node, Host Name, Version, Cluster Name, and Status dropdowns. A message says 'You can administer the following resources:'. Below this, a table lists a single server: 'PCenter_DE.AppCluster.member1' with a checked checkbox and a green plus sign icon. The total count is 'Total 1'.

- __ e. Click **PCenter_DE.AppCluster.member1**.
- __ f. Scroll to the Communications section and expand **Ports**. The PCenter_DE.AppCluster_member1 TCP/IP ports are listed.
- __ g. Look for the default host port for the server, which is listed as `WC_defaulthost`.

Ports

Port Name	Port
BOOTSTRAP_ADDRESS	9810
SOAP_CONNECTOR_ADDRESS	8880
ORB_LISTENER_ADDRESS	9101
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	9404
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	9405
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	9406
WC_adminhost	9061
WC_defaulthost	9080
DCS_UNICAST_ADDRESS	9354
WC_adminhost_secure	9044
WC_defaulthost_secure	9443
SIP_DEFAULTHOST	5060
SIP_DEFAULTHOST_SECURE	5061
OVERLAY_UDP_LISTENER_ADDRESS	11007
OVERLAY_TCP_LISTENER_ADDRESS	11008
IPC_CONNECTOR_ADDRESS	9633
SIB_ENDPOINT_ADDRESS	7276
SIB_ENDPOINT_SECURE_ADDRESS	7286

- __ h. Make a note of the WC_defaulthost port here: _____

- __ i. Click **Applications > Application Types > WebSphere enterprise applications**. Verify all the applications are in the Started state.

Name	Application Status
an administrator the following resources:	
AppScheduler	
BPCExplorer_PCenter_DE.AppCluster	
BPEContainer_PCenter_DE.AppCluster	
BPMAdministrationWidgets_PCenter_DE.AppCluster	
BSpaceEAR_PCenter_DE.AppCluster	
BSpaceForms_PCenter_DE.AppCluster	
BSpaceHelp_PCenter_DE.AppCluster	
Business.Rules.Manager_PCenter_DE.AppCluster	
BusinessRules_PCenter_DE.AppCluster	
HTM_PredefinedTaskMsg_V8000_PCenter_DE.AppCluster	
HTM_PredefinedTasks_V8000_PCenter_DE.AppCluster	
HumanTaskManagementWidgets_PCenter_DE.AppCluster	

- __ j. Scroll through the list of installed applications to examine the application names. These tools are found in a Process Center configuration:
- **IBM_BPM_Portal**: You can use it to complete tasks that result from running artifacts that Process Designer generates. In addition, if you have the associated permission, you can use Process Portal to start and stop BPMN processes. You can also manage and run tasks for each BPMN process, and view the performance of individuals, teams, and BPMN processes.
 - **IBM_BPM_ProcessAdmin**: Provides the Process Admin Console where you can manage the configuration of process servers across the set of runtime environments. In addition to managing these process server instances, the Process Admin Console also manages deployed processes and users.
 - **IBM_BPM_Repository**: Provides the Process Center Console that you use to maintain the repository. The Process Center Console provides the tools that you use to complete administrative tasks on the Process Center.



Information

These applications are also deployed and used in an IBM Process Server configuration.

- __ k. Click **IBM_BPM_Portal_PCenter_DE.AppCluster**.

- ___ I. Under Web Module Properties, click **Context Root for Web Modules**. You can see the context root that is used to access the Process Portal application.

[**Enterprise Applications > IBM_BPM_Portal_PCenter_DE.AppCluster > Context Root For Web Mo**](#)

Context Root For Web Modules

Configure values for context roots in web modules.

Web module	URI	Context Root
Process Portal Support	process-portal-support.war,WEB-INF/web.xml	/portal
Heritage Process Portal	process-portal.war,WEB-INF/web.xml	/HeritagePortal



Information

The Process Portal that is available in IBM BPM V8.5.7 looks different from Heritage Process Portal in IBM BPM V8.5.6.

In V8.5.7, Process Portal was redesigned so that you can complete your work more effectively on any device. In addition, you can now create, update, and delete saved searches directly in Process Portal.

- ___ m. Click **Enterprise Applications** in the breadcrumb trail at the top of the page.
- ___ n. Click **IBM_BPM_ProcessAdmin_PCenter_DE.AppCluster**.
- ___ o. Under Web Module Properties, click **Context Root for Web Modules**. You can see the context root that is used to access this application. This context root is for the Process Admin Console application.

[**Enterprise Applications > IBM_BPM_ProcessAdmin_PCenter_DE.AppCluster > Context Root For Web Modules**](#)

Context Root For Web Modules

Configure values for context roots in web modules.

Web module	URI	Context Root
BPM Process Admin Console	ProcessAdmin.war,WEB-INF/web.xml	/ProcessAdmin

- ___ p. Click **Enterprise Application** in the breadcrumb trail at the top of the page.
- ___ q. Click **IBM_BPM_Repository_PCenter_DE.AppCluster**.

- ___ r. Under Web Module Properties, click **Context Root for Web Modules**. You can see the context root that is used to access this application.

[Enterprise Applications > IBM BPM Repository PCenter DE.AppCluster > Context Root For Web Modules](#)

Context Root For Web Modules

Configure values for context roots in web modules.

Web module	URI	Context Root
Repository	repository.war,WEB-INF/web.xml	/ProcessCenter
BPM PROCESS CENTER INTERNAL API	process-center-internal.war,WEB-INF/web.xml	/ProcessCenterInternal

- ___ 5. Examine security information.

- ___ a. Click **Security > Global security**. Examine the security settings. Under User account repository, you can see that Federated repositories is configured and uses the default file-based repository.

User account repository

Realm name
defaultWIMFileBasedRealm

Current realm definition
Federated repositories

Available realm definitions

Federated repositories Configure... Set as current

- ___ b. Click **Users and Groups > Manage Users** to see the users that are listed.

Search for Users

Search by * Search for * Maximum results
User ID * 100

Search

2 users matched the search criteria.

Select	User ID	First name	Last name	E-mail	Unique Name
<input type="checkbox"/>	bpmadmin	bpmadmin	bpmadmin		uid=bpmadmin,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	pcdeadmin	pcdeadmin	pcdeadmin		uid=pcdeadmin,o=defaultWIMFileBasedRealm

Page 1 of 1 Total: 2

The user bpmadmin is the cell administrative user that is created during profile creation. The user pcdeadmin is the administrative user for managing the deployment environment. This user is created during the deployment environment configuration.



Information

When logged in as the cell administrator (bpmadmin), you can click **Users and Groups > Administrative user roles**. From this pane, you can see the users and the security roles to which they are mapped by default.

Administrative user roles

Use this page to add, update or to remove administrative roles to groups. Assigning administrative roles to groups enables them to administer application servers through the administrative console or through wsadmin scripting. The administrative authorizer run time must be notified when groups are added to or removed from an administrative user group. Click Refresh all to notify the administrative authorizer after the changes have been saved and synchronized.

Logout Add... Remove Refresh all			
Select	User ▾	Role(s) ▾	Login Status ▾
	bpmadmin	Primary administrative user name	Active
<input type="checkbox"/>	bpmadmin	Administrator	Active
<input type="checkbox"/>	pcdeadmin	Operator, Deployer, Administrator	Not Active
Total 3			

The two main roles include the following roles:

- **bpmadmin**: Is the cell administrator, which is the primary administrator.
- **pcdeadmin**: Is the deployment environment administrator, the role DeAdmin, which requires Operator, Deployer, and Administrator security role mapping.

-
- ___ c. Click **Servers > Deployment Environments > PCenter_DE**.
 - ___ d. Under Related Items, click **Authentication Aliases**. This action shows a list of roles and alias mappings. You can see that the alias for each role is `BPMAdminAlias_PCenter_DE`.

Note the role of DeAdmin. This role maps to an authentication alias that contains the deployment environment administrator user, which is the primary administrator at the IBM Business Process Manager level.

[Deployment Environments](#) > [PCenter DE](#) > **Business Integration Security**

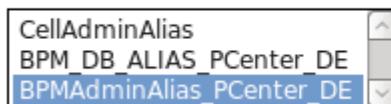
Use this page to secure your application server and your business integration applications. The table lists the authentication credentials that you need to set to secure your business integration application:

Authentication Alias

Role	Alias
BPCUser	BPMAdminAlias_PCenter_DE
BPMAdminJobUser	BPMAdminAlias_PCenter_DE
BPMAuthor	BPMAdminAlias_PCenter_DE
BPMUser	BPMAdminAlias_PCenter_DE
BPMWebserviceUser	BPMAdminAlias_PCenter_DE
DeAdmin	BPMAdminAlias_PCenter_DE
EmbeddedECMTechicalUser	BPMAdminAlias_PCenter_DE
EventManagerUser	BPMAdminAlias_PCenter_DE
MMAdmin	BPMAdminAlias_PCenter_DE
PerformanceDWUser	BPMAdminAlias_PCenter_DE
ProcessCenterUser	BPMAdminAlias_PCenter_DE
ProcessServerUser	BPMAdminAlias_PCenter_DE

- __ e. Scroll to the bottom of the pane and note that you can specify multiple aliases for the roles. Three options are defined.

You can sepcify multiple aliases for role SystemLaneUser. Hold the CTRL key to select multiple items.



- __ f. Click **Global security**.

- __ g. Under Authentication, click **Java Authentication and Authorization Service > J2C authentication data**. You can see that the BPMAdminAlias_PCenter_DE alias is defined with the user ID pcdeadmin. The CellAdminAlias alias is also defined as bpmadmin.

Select	Alias	User ID	Description
You can administer the following resources:			
<input type="checkbox"/>	BPMAdminAlias_PCenter_DE	pcdeadmin	
<input type="checkbox"/>	BPM_DB_ALIAS_PCenter_DE	db2inst1	
<input type="checkbox"/>	CellAdminAlias	bpmadmin	BPM Cell Administrator Alias
Total 3			

- __ 6. Use the Health Center to check the status of the configured components in the deployment environment.
 __ a. Click **Servers > Deployment Environments > PCenter_DE**.

- ___ b. Under Additional Properties, click **Health Center**. The Health Center page opens with details of the configured components. In the Status column, examine the status of the components. You can see that there are components with a status that indicates there are no detected problems.

[Deployment Environments > PCenter_DE > Health Center](#)

Use this page to evaluate the health of your IBM BPM server and identify potential problems. The table below lists the IBM BPM components and provides their status.

Status	Component	Scope
	CellDatabase	Cell=PCenterCell
	CellSecurity	Cell=PCenterCell
	RestGateway	Cluster=PCenter_DE.AppCluster
	ProcessServer	Cluster=PCenter_DE.AppCluster
	ProcessCenter	Cluster=PCenter_DE.AppCluster
	BusinessSpace	Cluster=PCenter_DE.AppCluster
	ProcessPortal	Cluster=PCenter_DE.AppCluster
	EmbeddedECM	Cluster=PCenter_DE.AppCluster
	CMIS	Cluster=PCenter_DE.AppCluster
	BusinessEvents	Cluster=PCenter_DE.AppCluster
	ArtifactLoader	Cluster=PCenter_DE.AppCluster
	WbiSession	Cluster=PCenter_DE.AppCluster
	SCA	Cluster=PCenter_DE.AppCluster
	BPC	Cluster=PCenter_DE.AppCluster
	FailedEventManager	Cluster=PCenter_DE.AppCluster
	EventSequencing	Cluster=PCenter_DE.AppCluster
	Relationships	Cluster=PCenter_DE.AppCluster
	AppScheduler	Cluster=PCenter_DE.AppCluster
	BusinessRules	Cluster=PCenter_DE.AppCluster



Information

The Health Center pane contains a table that lists the configured components in the deployment environment and indicates the status of each component. Each component name has a hyperlink that you can click to open a details pane where you can view detailed health information for a selected component and investigate possible problems.

The Status column includes an icon that you can use to examine the status of components and resources. A status of a green box with a check mark indicates no detected problems for a component or resource. The red circle with an X indicates a possible problem with a component or resource.

In determining the status of the configured components in the deployment environment, the following checks are automatically performed:

- The associated resources for every component are checked to determine whether they are usable. For example, each database for a component is checked to determine whether it was created and a connection can be established.
- The security configuration is checked to determine whether the essential requirements are met.
- IBM Process Server, Process Center, and Performance Data Warehouse are checked to determine whether they are usable. Several runtime checks are performed, such as whether the associated applications and message engines are started.

-
- ___ c. In the Component column, click **ProcessCenter**, which has a status that indicates there are no problems. You can see the details for this component, which includes two applications. For applications, a column for Installed and Started shows the status for each one. In this example, both applications are installed and started. If there are any exception messages for these applications, they are listed in that column.

[**Deployment Environments > PCenter_DE > Health Center > ProcessCenter**](#)

Use this page to view detailed health information for a selected component and investigate possible problems.

Configuration

General Properties

Component

ProcessCenter

Description

Process Center includes a repository for all processes, services, and other assets created in the IBM Business Process Manager authoring environments, Process Designer and Integration Designer.

Application Name	Installed	Started	Exception Messages
IBM_BPM_Repository_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
IBM_BPM_WebPD_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

- ___ d. Click **Back**.

- ___ e. In the Component column, click **ProcessServer**, which has a status that indicates there might be problems. You can see the resources that are associated with this component include applications and a data source. The data source indicates that it is created but there might be a connection error.

[Deployment Environments](#) > [PCenter_DE](#) > [Health Center](#) > [ProcessServer](#)

Use this page to view detailed health information for a selected component and investigate possible problems.

Configuration																									
General Properties																									
Component <input type="text" value="ProcessServer"/>																									
Description <div style="border: 1px solid black; padding: 5px;"> Process Server provides a single BPM runtime environment that can support a range of business processes, service orchestration, and integration capabilities. </div>																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d9e1f2;">Application Name</th> <th style="background-color: #d9e1f2;">Installed</th> <th style="background-color: #d9e1f2;">Started</th> <th style="background-color: #d9e1f2;">Exception Messages</th> </tr> </thead> <tbody> <tr> <td>IBM_BPM_ProcessAdmin_PCenter_DE.AppCluster</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>IBM_BPM_ProcessInspector_PCenter_DE.AppCluster</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>IBM_BPM_Teamworks_PCenter_DE.AppCluster</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>IBM_BPM_WebAPI_PCenter_DE.AppCluster</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>IBM_BPM_Help_PCenter_DE.AppCluster</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td></td> </tr> </tbody> </table>		Application Name	Installed	Started	Exception Messages	IBM_BPM_ProcessAdmin_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		IBM_BPM_ProcessInspector_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		IBM_BPM_Teamworks_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		IBM_BPM_WebAPI_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		IBM_BPM_Help_PCenter_DE.AppCluster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
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- ___ f. Click **Back**.
- ___ g. Feel free to examine the other component details in the Health Center.
- ___ h. When completed, log out of the administrative console.

Part 2: Starting the Process Center Console

The Process Center Console is a tool that is intended for administrators and developers who must manage the lifecycle of application components from development and testing to production. Administrators and developers can create, export, clone, activate, or archive snapshots of process applications or toolkits and grant access.



Note

For IBM BPM on Cloud users

The Process Center perspective is the same when the Process Center is on the cloud.

There are a number of ways to access the Process Center Console.

- If you are primarily an **administrator** and do not actively work on the application development, you can view the Process Center Console by using the web portal.
 - If you are a **business analyst** and work on the creation of business process definitions and associated assets, you can view the Process Center Console from inside IBM Process Designer.
 - If you work as a **developer** on the Advanced Integration service assets of the process application, you can view the Process Center Console in a separate perspective in IBM Integration Designer.
- 1. Start the Process Center Console.
- a. In the Firefox web browser, go to the Process Center Console at the following URL:
<http://bpmhost:9080/ProcessCenter>



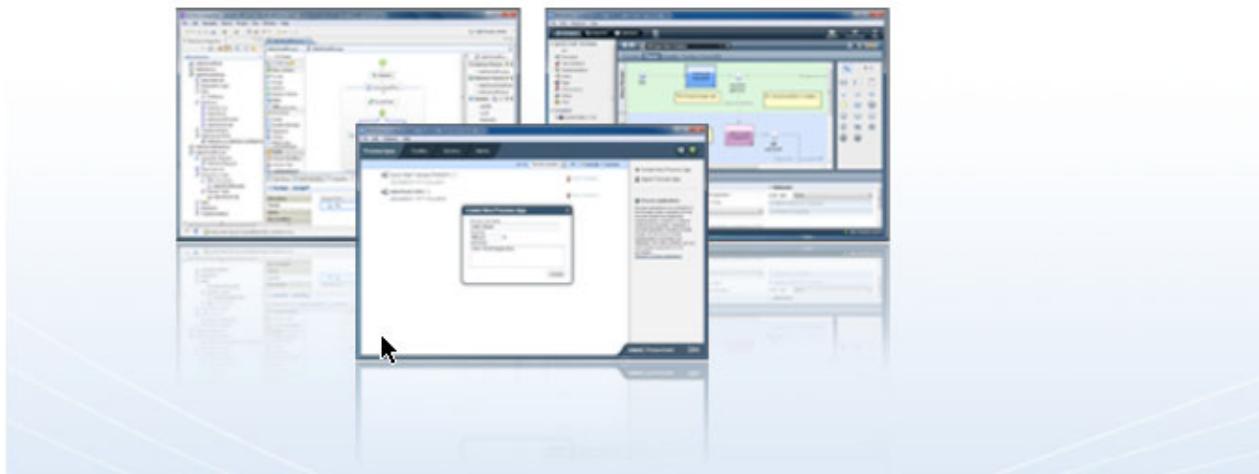
Hint

It is a good idea to create a bookmark for the URL.

- b. In the Insecure Connection window, click **Advanced** to expand the option.
- c. Click **Add Exception**.
- d. In the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following URL:
<https://bpmhost:9043/ProcessCenter>
- e. Click **Confirm Security Exception**. The login page for the Process Center Console is now visible.
- f. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- g. After a few moments, the Getting Started with IBM Process Center 8.5.7.0 welcome page opens. From the Getting Started page, you can obtain information about how to

complete various tasks, get product information, view online help topics, and connect to the community wiki and forms. Feel free to explore any of these areas.

Getting Started with IBM Process Center 8.5.7.0



What do you want to do?

- Create a process
- Participate in a process
- Administer a process
- Measure and improve a process
- Administer the Process Center repository



What do you want to know?

- Business process management overview
- Reference information
- What's new?



Information

There is an area to download the IBM Process Designer package from Process Center. You can use IBM Process Designer for the development of business processes. Typically, BPMN assets are within IBM Process Designer. IBM Process Designer is available only on Windows.

- ___ h. Close the Getting Started with IBM Process Center 8.5.7.0 welcome page, by clicking the X at the upper-right corner of the window. If you do not see the X, enlarge your browser window.

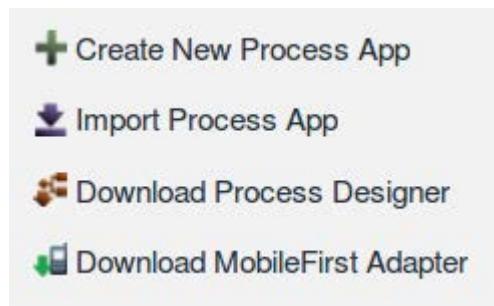
**Hint**

You can go back to the Getting Started page at any time by clicking **Launch Getting Started** in the Process Center Console right navigation pane.

- ___ 2. Explore the Process Center Console.
 - ___ a. When you close the Getting Started welcome page, you see a list of process applications that are available within Process Center. The Process Center repository is the default view.

Process Application	Last updated
Procurement Sample (STPPS1)	5/24/16 by pdeadmin
Hiring Sample Advanced (HSAV1)	5/24/16 by pdeadmin
Hiring Sample (HSS)	5/24/16 by pdeadmin
Process Portal (SYSRP)	5/24/16 by pdeadmin
Heritage Process Portal (TWP)	5/24/16 by pdeadmin

- ___ b. On the right, you can see the action menu where you can download Process Designer and create a process application. You can also import a process application into the repository.



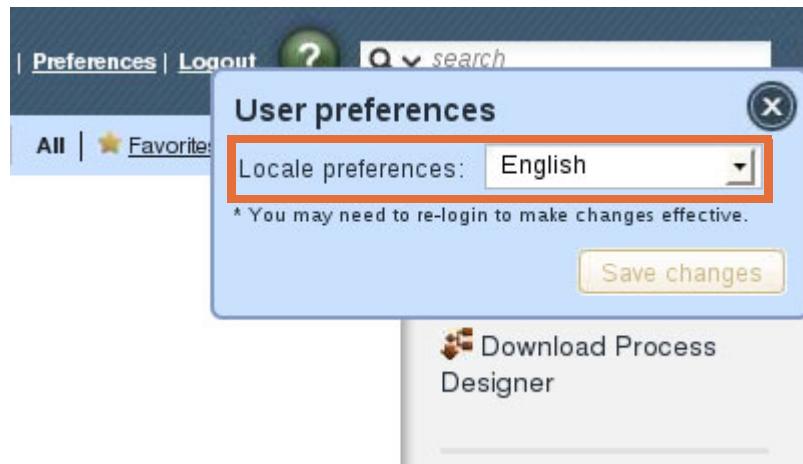
- ___ c. There are a number of tabs across the top for Process Apps, Toolkits, Servers, and Admin. Each tab takes you to a specific page, each with different functions.

Process Application	Last updated	Administrator
Procurement Sample (STPPS1)	5/24/16	pcodeadmin
Hiring Sample Advanced (HSAV1)	5/24/16	pcodeadmin
Hiring Sample (HSS)	5/24/16	pcodeadmin
Process Portal (SYSRP)	5/24/16	pcodeadmin
Heritage Process Portal (TWP)	5/24/16	pcodeadmin

The tabs contain the following information:

- **Process Apps:** Contains a list of all the process applications in the Process Center repository. Ordinarily, a process application includes process models, also called business process definitions (BPDs), the services to handle implementation of activities and integration with other systems, and any other items that are required to run the processes. Process applications can be deployed to Process Server.
 - **Toolkits:** Can be used to share library items across process applications. Process applications contain toolkits, and are the deployment mechanism for process applications. A toolkit can have a dependency on another toolkit.
 - **Servers:** Contains a list of Process Server configurations that are connected to the Process Center repository. From this tab, you can install snapshots to connected Process Servers. You can then view the running snapshots on each process server.
 - **Admin:** Where an administrator can complete administrative tasks such as granting access to the Process Center repository, and importing or exporting log files.
- ___ d. In the upper corner of the console window, click **Preferences**. You can use these preferences to change the local language of your administration console. Some of the

supported languages in this virtual environment include English, French, Italian, German, Spanish, and Russian.



When you change the local language of the console, you must log out and log in again for the language to take effect. Do not change the local language of your console.

- ___ e. Click the X icon to close the preferences window.
- ___ f. Click **Hiring Sample (HSS)**. You can now examine the process application. There is a current version along with a snapshot of the process application.

		Snapshots	History	Manage	Governance
Sort Snapshots By:					
<input checked="" type="radio"/>	Current	Last changed on 5/24/16 by pdeadmin			
<input type="radio"/>	Responsive Hiring Sample v8570 (RHSV8_1) (New)	Created on 5/24/16 by pdeadmin Not Yet Installed to Process Server			

Snapshots capture and save the items in a process application at a specific point in time. Snapshots are analogous to versions of the process application. Snapshots can be exported to an external file and cloned, deployed, deactivated, or archived. The current version of an application that is not yet saved as a snapshot, and unlike snapshots is editable, is called the tip. You can see that there is one snapshot for this application.

Tabs are available for snapshots, history, manage, and governance. From the **History** tab, you can see the history of tasks that are completed on the process application. From the **Manage** tab, you can manage access to the process application.

- ___ g. From this pane, you can view installed, deployed, and archived snapshots for the process application.



- ___ h. Click **History** to see the history details of the process application.

Responsive Hiring Sample v8570 snapshot was modified in Main by pcdeadmin on 5/24/16 at 4:37:53 PM
 Responsive Hiring Sample v8570 snapshot was modified in Main by pcdeadmin on 5/24/16 at 4:37:53 PM
 Responsive Hiring Sample v8570 snapshot was modified in Main by pcdeadmin on 5/24/16 at 4:37:53 PM
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 Hiring Sample process app modified by pcdeadmin on 5/24/16 at 4:37:53 PM
Main track was created by pcdeadmin on 5/24/16 at 4:37:53 PM
 Hiring Sample process app created by pcdeadmin on 5/24/16 at 4:37:52 PM

- ___ i. Click **Manage** to see which users and groups have access to this process application. The group `tw_admins` has both write and admin access. Members of the group `tw_admins` have full access to all interfaces, assets, servers, and security. You can use F11 to open your browser in the full screen mode and see the entire area for Manage Access to Process Library.



Information

If you log in to the Process Center Console by using the cell administrator, `bpmadmin`, you see more access permissions.

The user `pcdeadmin` has write and admin access. Two groups, `tw_admins` and `tw_authors`, also have write and admin access. Members of the group `tw_admins` have full access to all interfaces, assets, servers, and security. Members of the group `tw_authors` have access to the Designer and other interfaces in Process Designer, including the Process Center console. From the Process Center console, members of this group can create process applications and toolkits and control access to projects.

The best way to manage access to the Process Center repository is by using groups. For example, the easiest way to manage access to the Process Center repository is to add preexisting groups of users from your external provider to `tw_authors`. `tw_authors` is an IBM BPM group whose members have access to the repository by default. Then, when changes are required, you can add or remove

individual users from the groups that exist in your external security provider. This practice ensures that the security maintenance you complete in your external provider does not require more work in IBM BPM.

Hiring Sample (HSS) ★ Snapshots History Manage Governance

Process App Name:
Hiring Sample

Acronym:
HSS

Description:
Hiring Sample

Manage Access to Process Library

Add Users Add Groups

Read	Write	Admin	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	tw_admins
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	tw_authors
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	pcdeadmin (pcdeadmin)

Manage Access to Process Library

[Add Users](#)

[Add Groups](#)

Read

Write

Admin

<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	tw_admins
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	tw_authors
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	pcdeadmin (pcdeadmin)



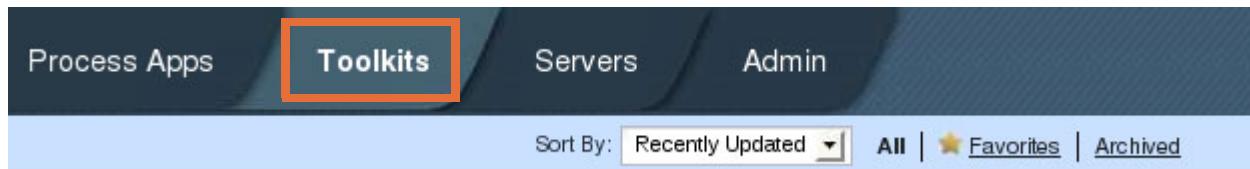
Information

When you manage access to the Process Library, you can give users and groups different access levels.

- **Read:** Users with read access can view the process application or toolkit in the Process Center console, and view all library items included in the process application or toolkit in the Designer view. However, with read access, edits are not allowed.
- **Write:** Users with write access can view the process application or toolkit in the Process Center Console. They can also create, edit, or delete library items in the process application or toolkit in the Designer view. Users with write access can also create and edit snapshots of the process application or toolkit in either the Process Center console or the Designer view.
- **Admin:** Users with admin access have all the capabilities included with write access. In addition, users with admin access can complete the following actions in the Process Center Console: edit process application or toolkit settings; create, edit, or archive tracks; archive snapshots; and modify user access to the process application or toolkit.

— 3. Examine the **Toolkits** tab.

— a. In the Process Center perspective, click the **Toolkits** tab.



Information

Toolkits can be enabled for IBM Process Designer so that users can share library items across process applications. The Process Center perspective establishes and maintains relationships between toolkits, process applications, and SCA services. You can complete tasks such as:

- Create a process application or toolkit
- Associate SCA services with a process application or toolkit
- Import process application and toolkit artifacts into the IBM Integration Designer
- Publish process applications and toolkits to the Process Center

- ___ b. Several toolkits are listed under the **Toolkits** tab.

The screenshot shows the SAP Process Center interface with the 'Toolkits' tab selected. The tabs at the top are 'Process Apps', 'Toolkits' (which is highlighted in blue), 'Servers', and 'Admin'. Below the tabs, there is a 'Sort By:' dropdown set to 'Recently'. The main area displays a list of toolkits, each with a small icon, the toolkit name, a star rating, and a question mark icon. Each entry also includes a timestamp indicating when it was last updated and the name of the user who updated it.

Toolkit Name	Last Updated	Updated By
Responsive Portal Components (SYRPC)	5/24/16	pcodeadmin
SAP Guided Workflow (SGW)	5/24/16	pcodeadmin
System Governance (TWSYSG)	5/24/16	pcodeadmin
Dashboards (SYSD)	5/24/16	pcodeadmin
Content Management (SYSCM)	5/24/16	pcodeadmin
Responsive Coaches (SYSRC)	5/24/16	pcodeadmin
Coaches (deprecated) (SYSC)	5/24/16	pcodeadmin
System Data (TWSYS)	5/24/16	pcodeadmin

During installation, a number of system toolkits are imported into the Process Center repository. These system toolkits provide resources that you can use as you build your process applications.

The System Data toolkit gives you access to assets that all business process management projects require, such as standard variable types and standard charts for reports. Each process application and toolkit that you create automatically includes a System Data toolkit dependency.

The Process Center repository also provides system toolkits that you can use for more specialized purposes. The System Governance toolkit (TWSYSG) provides resources to support control over the installation of process applications. Add the System Content Management (SYSCM) toolkit to your dependencies to gain access to Enterprise Content Management types and services. Add a dependency on the System Coaches (SYSC) toolkit so that you can add stock coach views to your coach. You cannot edit or change the library items in any system toolkit, but you can open the toolkit and view the items within it.

___ 4. Examine the **Servers** tab.

- ___ a. In the Process Center perspective, click the **Servers** tab. This tab shows all the Process Servers that are connected to Process Center. The display is blank because there are no connected Process Servers. However, the Process Center cell includes a Process Server, which is not listed under the **Servers** tab. Therefore, you can run and test process applications directly in Process Center.



Information

A key role for administrators is to deploy applications to Process Servers that Process Center manages.

There are two types of runtime Process Servers:

- **Online or connected:** An online runtime Process Server that is configured during IBM Business Process Manager installation is automatically discovered and displayed in the Process Center Console.
- **Offline:** An offline server is a runtime Process Server that is not connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications.

It is suggested that you connect the various test Process Servers directly to Process Center to enable automated deployment.

Do not connect production Process Servers directly to the Process Center. Administrators can still use the Process Center Console to manage deployment to disconnected Process Servers. In this case, rather than directly deploying to the server, the Process Center Console creates a deployment package. This deployment package must then be transferred to the directory structure of the target offline Process Server and deployed locally.

___ 5. Examine the **Admin** tab.

- ___ a. In the Process Center perspective, click the **Admin** tab. You use the **Admin** tab to manage users. There are two groups added, with `tw_admins` being the only group with admin access.

The screenshot shows the 'Admin' tab interface. At the top, there are two buttons: 'Manage Users' (highlighted in green) and 'Import and Export Log'. Below the buttons, the word 'Admin' is displayed. Underneath, there is a table with two rows. The first row contains a green checkmark icon and the text 'tw_admins'. The second row contains a grey circle icon and the text 'tw_authors'.

Part 3: Administering a process application

Process Center is a superset of Process Server. When a developer creates processes in Process Designer, the developer can play the process, which means those components run in the Process Center environment. In fact, Process Center is your unit test environment. You can then connect your Process Center environment to other test environments for integration, quality assurance, and performance testing.

A key role for administrators is to deploy applications to Process Servers that Process Center manages. In this part of the exercise, you deploy a Procurement Sample snapshot to the Process Center unit test environment.

The Procurement Sample describes how to use Business Process Choreographer and IBM Process Portal to run the sample process on the Process Center environment. Process Center is the central repository to store, access, and manage process artifacts that are held together in a single project that is called a process application.

- ___ 1. Administer a process application by using the Process Center Console.
 - ___ a. Click the **Process Apps** tab.
 - ___ b. You see a list of process applications that are available within the Process Center repository. Click **Procurement Sample (STPPS1)**.

The screenshot shows the Process Center Console interface. At the top, there is a dark blue header bar with four tabs: 'Process Apps' (which is highlighted in white), 'Toolkits', 'Servers', and 'Admin'. Below the header, there is a light blue main area containing a list of process applications. Each application entry includes a small icon, the application name, a star rating, and a 'Last updated' timestamp. The first application, 'Procurement Sample (STPPS1)', has a red rectangular box drawn around it, indicating it is the target for step 1b.

Application	Last updated
Procurement Sample (STPPS1) ★	on 5/24/16 by pdeadmin
Hiring Sample Advanced (HSAV1) ★	on 5/24/16 by pdeadmin
Hiring Sample (HSS) ★ ⓘ	on 5/24/16 by pdeadmin
Process Portal (SYSRP) ★ ⓘ	on 5/24/16 by pdeadmin
Heritage Process Portal (TWP) ★	on 5/24/16 by pdeadmin

- ___ c. You can now examine the process application. There is a current version along with snapshot of the process application, and both have the following note: Not Yet Deployed to Process Center Server.

The screenshot shows the Procurement Sample (STPPS1) application page. At the top, there are tabs for 'Schemas', 'Solutions', 'Stereotypes', 'Process', 'Data', and 'Script'. Below these are 'Schemas' and 'Solutions' sections. Under 'Solutions', there are two items: 'Procurement Sample (STPPS1)' and 'Procurement Sample v8570 (PSV8570) (New)'. Each solution item has a status bar with the note 'Not Yet Deployed to Process Center Server' highlighted by a red box. The 'Procurement Sample v8570 (PSV8570)' item also includes the note 'Not Yet Installed to Process Server'.

- ___ d. The snapshot Procurement Sample has a menu with the following options to manipulate or work with the process application. Click the drop-down arrow to examine the available options.

The screenshot shows the Procurement Sample (STPPS1) application page with the 'Procurement Sample v8570 (PSV8570)' snapshot selected. A context menu is open, displaying the following options: Status, Edit, Clone, Deactivate, Archive, and Generate Migration Policy. The 'Generate Migration Policy' option is highlighted with a red box.

- **Status:** Is used to designate a status of new, rejected, validated, or released for the snapshot.
 - **Edit:** Is used to edit the snapshot name and description.
 - **Clone:** Is used to duplicate the process application with a new name.
 - **Activate:** If you want to display library items within a particular snapshot in IBM Portal, you must activate the snapshot that contains the version of the items you want to show.
 - **Archive:** Archives an application and hides it from the normal view.
 - **Generate Migration Policy:** Is used to create a migration policy for a snapshot and how to handle orphaned tokens.
- ___ e. The following options are also available to the right of the snapshot name:

- **Export:** Exports a process application to a .twx file.
- **Install:** Is used to install a process application to a connected server. The connected server is a server that is listed on the **Server** tab.
- **Open in Designer:** Opens the snapshot in Process Designer.

The screenshot shows the Process Center interface with two applications listed:

- Current**: Last changed on 5/24/16 by pcodeadmin, Not Yet Deployed to Process Center Server.
- Procurement Sample v8570 (PSV8570) (New)**: Created on 5/24/16 by pcodeadmin, Not Yet Deployed to Process Center Server, Not Yet Installed to Process Server.

On the right side of the second application's row, there are three buttons: **Export**, **Install**, and **Open in Designer**. The **Export** button is highlighted with a red border.

Information

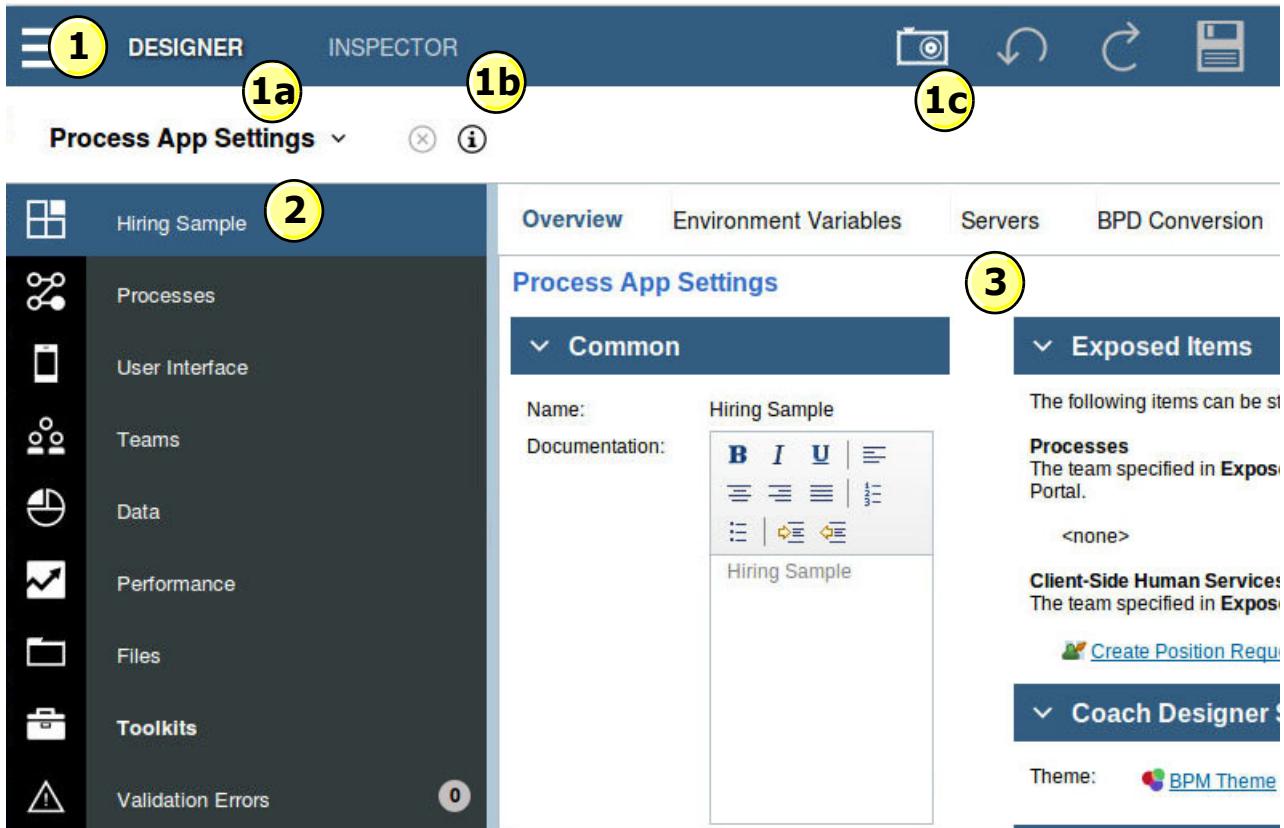
There are two tools that developers can use to create process assets. It is important to distinguish between the two tools because of the similar design and names. The tools are the web Process Designer and desktop Process Designer.

- The web Process Designer is a browser-based tool that uses your desktop browser and where process application can be created. The web Process Designer is cross-browser compatible, meaning the designer runs on multiple operating systems.
- The desktop Process Designer is an eclipse-based tool that is used to implement services in your library along with some configuration options that are not found in the web Process Designer. This tool is downloaded and installed on a Windows based host only.

The main difference between the two editors is that developers create and edit BPDs, services, and heritage user interfaces in the desktop Process Designer. Developers create and edit processes and responsive user interfaces in the web Process Designer.

Process Designer maintains its business process definition (BPD) artifacts in the centralized Process Center repository. Both the web and desktop versions of the Process Designer use the Process Center repository. To create, view, edit, or inspect a BPD in Process Designer, you must first start the Process Center repository.

When the web-based Process Designer opens, you can see the Process App Settings for the specific app that you selected to open. In this example, the Hiring Sample app is opened in the web-based Process Designer.



1. **Main toolbar:** Provides access to Designer (1a), Inspector (1b), and Process Center (1c). The main toolbar is also where you save all open editors, take a snapshot, and view help.
2. **Process library:** Provides access to the library items for the current process application.
3. **Workspace:** Main workspace area that consists of:
 - **Main canvas:** The area in which you can graphically model your process. Each business process definition (BPD) automatically includes a start event and an end event. Two default lanes are included for user and system tasks.
 - **Palette:** When you develop the process diagram in the Designer in IBM Web Process Designer, the tools and components are available from the palette.
 - **Validation Errors:** Indicates the validation errors in the process.
 - **Properties:** Opens the IBM Business Process Manager Help System.

- __ f. Click **History** to examine the history of the process application.

Procurement Sample v8570 snapshot was modified in Main by pcdeadmin on 5/24/16 at 4:38:11 PM
 Procurement Sample v8570 snapshot was modified in Main by pcdeadmin on 5/24/16 at 4:38:11 PM
 Procurement Sample v8570 snapshot was modified in Main by pcdeadmin on 5/24/16 at 4:38:11 PM
 Procurement Sample v8570 snapshot was created in Main by pcdeadmin on 5/24/16 at 4:38:11 PM
 Procurement Sample process app modified by pcdeadmin on 5/24/16 at 4:38:11 PM
Main track was created by pcdeadmin on 5/24/16 at 4:38:11 PM
 Procurement Sample process app created by pcdeadmin on 5/24/16 at 4:38:11 PM

- __ g. Click **Manage** to examine the users and groups that have permissions on this process application. The tw_admins and tw_authors groups, and pcdeadmin, have both write and admin permissions.

Process App Name:
 Procurement Sample

Acronym:
 STPPS1

Description:

Manage Access to Process Library

[Add Users](#)

[Add Groups](#)

Read	Write	Admin	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	tw_admins
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	tw_authors
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	pcdeadmin (pcdeadmin)

___ 4. Deploy the Procurement Sample snapshot to the Process Center server.

___ a. Click **Snapshots**.



___ b. Click the drop-down list for **Procurement Sample v8570** and select **Activate**.

Last changed on 5/24/16 by pcdeadmin
Not Yet Deployed to Process Center Server

Procurement Sample v8570 (PSV8570) (New)

- Status
- Edit
- Clone
- Activate** (Selected)
- Archive
- Generate Migration Policy

___ c. The status icon rotates while the process application is deployed.

Last changed on 5/24/16 by pcdeadmin
Not Yet Deployed to Process Center Server

Procurement Sample v8570 (PSV8570) (New)

Created on 5/24/16 by pcdeadmin
Not Yet Deployed to Process Center Server
Not Yet Installed to Process Server

- ___ d. After a few minutes, the process application is deployed. The entry for Procurement Sample v8570 no longer indicates that it is not yet deployed to Process Center Server.

Procurement Sample (STPPS1)

Snapshots History Manage

Last changed on 5/24/16 by pcodeadmin
Not Yet Deployed to Process Center Server

Procurement Sample v8570 (PSV8570) (New)
Created on 5/24/16 by pcodeadmin
Not Yet Installed to Process Server

- ___ e. Click **Deployed** from the Sort Snapshots menu. The current snapshot that is deployed is listed on this page.

Procurement Sample (STPPS1)

Snapshots History

Procurement Sample v8570 (PSV8570) (New)
Created on 5/24/16 by pcodeadmin
Not Yet Installed to Process Server

In a later exercise, you install this process application to the Process Server cell.

Part 4: Exporting a process application

A .twx file is used to import a previously exported process application. The .twx file format is used to store the content of a process application in a file. The .twx file can be transferred to other systems for subsequent importing.

- ___ 1. Export a Process App.
- ___ a. In the Process Center perspective, click the **Process Apps** tab.

- __ b. Click **Hiring Sample (HSS)**.

The screenshot shows a navigation bar with tabs: Process Apps, Toolkits, Servers, and Admin. Below the bar is a list of process samples. The 'Hiring Sample (HSS)' entry is highlighted with a red box. Each entry includes a small icon, the sample name, a star rating, and a note indicating it was last updated on 5/24/16 by 'podeadmin'.

- Procurement Sample (STPPS1) ★
- Last updated on 5/24/16 by podeadmin
- Hiring Sample Advanced (HSAV1) ★
- Last updated on 5/24/16 by podeadmin
- Hiring Sample (HSS) ★**
- Last updated on 5/24/16 by podeadmin
- Process Portal (SYSRP) ★
- Last updated on 5/24/16 by podeadmin
- Heritage Process Portal (TWP) ★
- Last updated on 5/24/16 by podeadmin

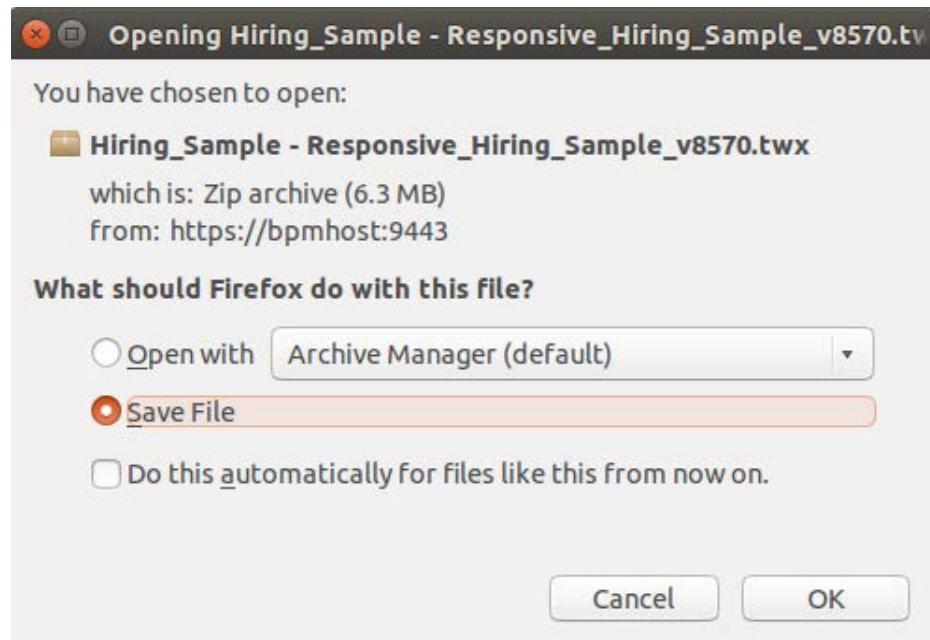
- __ c. Click **Export** next to Responsive Hiring Sample v8570.
 __ d. In the Export Process App window, keep the default settings and click **Export**.

The screenshot shows a dialog box titled 'Export Process App'. It contains a list of export file types with radio buttons. The 'IBM BPM export (.twx)' option is selected. At the bottom right is a large 'Export' button, which is also highlighted with a red box.

Select an export file type.

- IBM BPM export (.twx)
- IBM BPM Installation Package (.zip)
- BPMN 2.0 export (.zip)
- SAP Solution Manager
- MobileFirst adapter

- __ e. In the browser window, click **Save File** and click **OK**.



- __ f. In the Download window, keep all the default settings. The process app is exported and is in the /localuser/Downloads directory. It can be shared with another development environment where it can be imported. Click **Save**.

Part 5: Deleting the exported process application

Deletion of a process application is a three-step process. First, all snapshots must be archived. Then, the process application must be archived. Finally, the archived process application can be successfully deleted.

- __ 1. Archive the snapshot.
__ a. Click the **Process Apps** tab.

- __ b. Click **Hiring Sample (HSS)**.

The screenshot shows the 'Process Apps' tab selected in the top navigation bar. Below it is a list of process samples:

- Procurement Sample (STPPS1) [star]
- Last updated on 5/24/16 by pdeadmin
- Hiring Sample Advanced (HSAV1) [star]
- Last updated on 5/24/16 by pdeadmin
- Hiring Sample (HSS) [star]** [info icon] (highlighted)
- Last updated on 5/24/16 by pdeadmin
- Process Portal (SYSRP) [star] [info icon]
- Last updated on 5/24/16 by pdeadmin
- Heritage Process Portal (TWP) [star]
- Last updated on 5/24/16 by pdeadmin

- __ c. Click the drop-down arrow for **Responsive Hiring Sample v8570** and select **Archive**.

The screenshot shows the 'Hiring Sample (HSS)' snapshot details page. At the top, there are tabs: 'Schemas', 'Snapshots' (which is selected and highlighted in green), 'History', and 'Manage'. Below the tabs, there are two sections:

- Current**: Last changed on 5/24/16 by pdeadmin.
- Responsive Hiring Sample v8570 (RHSV8_1) (New)**: Created on 5/24/16 by pdeadmin. Not Yet Installed to Process Server. To the right of this section is a dropdown menu with the following options:
 - Status
 - Edit
 - Clone
 - Activate
 - Archive** (highlighted)
 - Generate Migration Policy

- __ d. Click **Archive** in the Archive Snapshot window to confirm the archive. When the snapshot is archived, it is removed from the current view.

- ___ e. Verify that the archived snapshot is listed in the Archived list by clicking **Archived**.

Hiring Sample (HSS) ★ Snapshots History Manage

Responsive Hiring Sample v8570 (RHSV8_1) (New)
Created on 5/24/16 by pcdeadmin
Not Yet Installed to Process Server

- ___ 2. Archive the process application.

- ___ a. Click **Manage**.

Hiring Sample (HSS) ★ Snapshots History Manage Governance

- ___ b. From the menu on the right, click **Archive Process App**.

Archive Process App
View Archived Tracks

- ___ c. Click **Archive** in the Archive Process App window.

- ___ d. Click the **Process Apps** tab. Verify that Hiring Sample (HSS) is not listed. The process application is not listed here because it is archived and is now listed under the Archived view.

Process Apps Toolkits Servers Admin

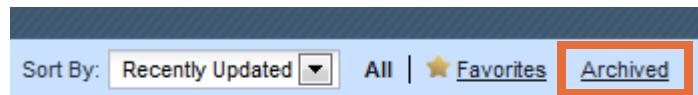
Procurement Sample (STPPS1) ★
Last updated on 5/24/16 by pcdeadmin

Hiring Sample Advanced (HSAV1) ★
Last updated on 5/24/16 by pcdeadmin

Process Portal (SYSRP) ★ ?
Last updated on 5/24/16 by pcdeadmin

Heritage Process Portal (TWP) ★
Last updated on 5/24/16 by pcdeadmin

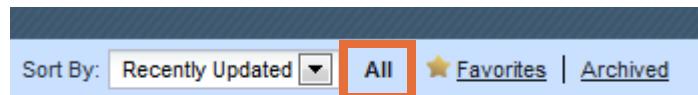
- ___ e. Click **Archived**.



- ___ f. On the Archived page, you see Hiring Sample (HSS). Click **Delete** to permanently delete the archived snapshot.

Hiring Sample (HSS)
Last updated on 11/12/14 by pcodeadmin

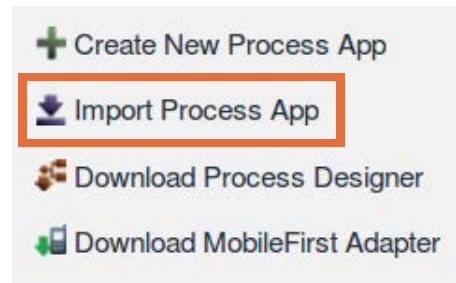
- ___ g. Click **Delete** to confirm the deletion.
 ___ h. Click **All** to view the current available process applications in the Process Center repository. Verify that the process application is deleted.



Part 6: Importing the process application

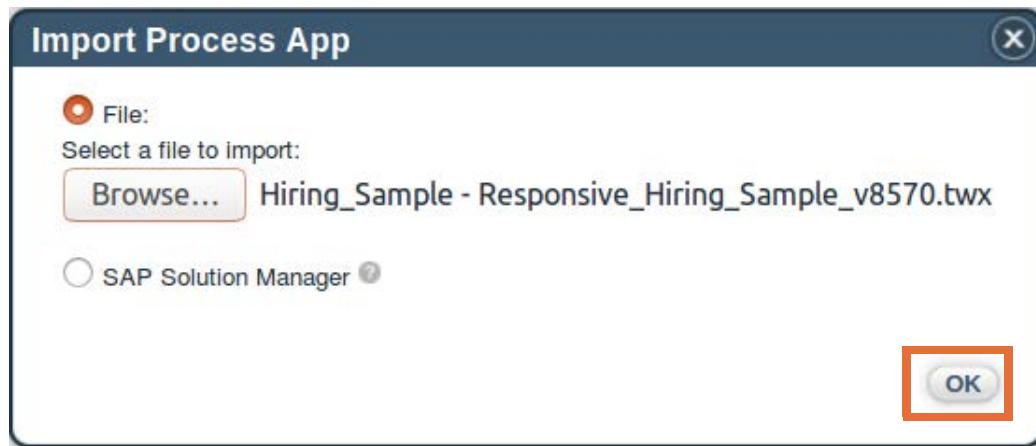
You exported the Hiring Sample process app and then deleted it from the environment. In this part of the exercise, you import it back to the environment.

- ___ 1. Import a Process App.
 ___ a. In the Process Center perspective, click **Process Apps**.
 ___ b. From the menu on the right, click **Import Process App**.



- ___ c. In the Import Process App window, browse to `/localuser/Downloads` and select **Hiring_Sample -Responsive_Hiring_Sample_v8570.twx**. The file is the same file that you exported earlier. If you do not see this file, go back to the section where you exported the process application and review the steps. Click **Open**.

- __ d. Click **OK** in the Import Process App window.



- __ e. In the Import Process App window, click **Import** to import the process application.



- ___ f. The import is successful if the Hiring Sample (HSS) process application is listed in the view. Verify that the process application is listed.

The screenshot shows the Process Center Console interface. At the top, there is a navigation bar with four tabs: 'Process Apps' (which is highlighted in blue), 'Toolkits', 'Servers', and 'Admin'. Below the navigation bar, a list of process applications is shown in a table-like format. Each row contains an icon, the application name, a star rating, and a 'Last updated' timestamp. The first row, 'Hiring Sample (HSS)', has a red rectangular box drawn around it, indicating it is the target for verification.

	Hiring Sample (HSS)	☆ ⓘ
	Procurement Sample (STPPS1)	☆
	Hiring Sample Advanced (HSAV1)	☆
	Process Portal (SYSRP)	☆ ⓘ
	Heritage Process Portal (TWP)	☆

- ___ g. Log out of the Process Center Console.

Part 7: Examining the process application deployment

- ___ 1. Start the deployment manager administrative console.
 - ___ a. In the Firefox web browser, go to the following URL:
`http://bpmhost:9060/ibm/console`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ 2. Examine the process application.
 - ___ a. Click **Applications > Application Types > WebSphere enterprise applications**.
 - ___ b. Look through the list of applications. The `STPPS1-PSV8570-Procurement_Sample_BPELProcess_ModuleApp` process application

is listed and in the Started state. You must scroll to page 2 of the list to view the application.

Enterprise Applications

Use this page to manage installed applications. A single application can be deployed onto multiple servers.

Preferences

Select	Name	Application State
<input type="checkbox"/>	IBM_BPM_Process_Portal_Notification_PCenter_DE.AppCluster	
<input type="checkbox"/>	IBM_BPM_Repository_PCenter_DE.AppCluster	
<input type="checkbox"/>	IBM_BPM_ResponsivePortal_PCenter_DE.AppCluster	
<input type="checkbox"/>	IBM_BPM_Teamworks_PCenter_DE.AppCluster	
<input type="checkbox"/>	IBM_BPM_WebAPI_PCenter_DE.AppCluster	
<input type="checkbox"/>	IBM_BPM_WebPD_PCenter_DE.AppCluster	
<input type="checkbox"/>	PageBuilder2_PCenter_DE.AppCluster	
<input type="checkbox"/>	REST Services Gateway_Dmgr	
<input type="checkbox"/>	REST Services Gateway_PCenter_DE.AppCluster	
<input type="checkbox"/>	RemoteAL61_PCenter_DE.AppCluster	
<input type="checkbox"/>	STPPS1-PSV8570-Procurement_Sample_BPELProcess_ModuleApp	
<input type="checkbox"/>	TaskContainer_PCenter_DE.AppCluster	

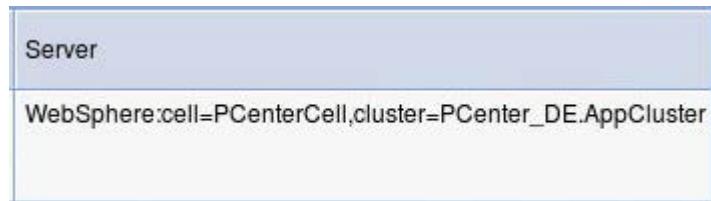


Information

A tip is used to indicate the process application most recently published based on the content in the Process Center repository.

-
- ___ c. Click **STPPS1-PSV8570-Procurement_Sample_BPELProcess_ModuleApp**.
 - ___ d. Under Web Module Properties, click **Context Root for Web Modules**. You can see the context root that is used to access this application.
 - ___ e. Click **STPPS1-PSV8570-Procurement_Sample_BPELProcess_ModuleApp** in the breadcrumb trail at the top of the page.

- ___ f. Under Modules, click **Manage Modules**. You can see that this module is deployed to the PCenter_DE.AppCluster cluster.



- ___ 3. Examine the SCA module.

- ___ a. Click **Applications > SCA modules**. The Procurement_Sample_BPELProcess_Module is listed. The version information for the snapshot is also listed.

Module	Version	Application
You can administer the following resources:		
BFMIF_PCenter_DE.AppCluster		BPEContainer_PCenter_DE.AppCluster
HTMIF_PCenter_DE.AppCluster		TaskContainer_PCenter_DE.AppCluster
HTM_PredefinedTaskMsg_V8000 (PCenter_DE.AppCluster)		HTM_PredefinedTaskMsg_V8000_PCenter_DE.AppCluster
HTM_PredefinedTasks_V8000 (PCenter_DE.AppCluster)		HTM_PredefinedTasks_V8000_PCenter_DE.AppCluster
Procurement_Sample_BPELProcess_Module	PSV8570	STPPS1-PSV8570- Procurement_Sample_BPELProcess_ModuleApp

- ___ b. Click **Procurement_Sample_BPELProcess_Module**.
- ___ c. Examine the General Properties for the module.
- ___ d. Under Additional Properties, click **Business processes**. There is one business process, ReplenishmentBPEL, in the Started state.

[SCA modules > Procurement_Sample_BPELProcess_Module > Business processes](#)

This panel is used to start and stop business processes. Generally, configuration changes take effect after you restart the server, but this panel updates both the configuration and the status of the business process on each running server without the need for the servers to be restarted. Each server and cluster that has this business process installed must be running.

[+ Preferences](#)

Start	Stop		
Select	Name	Valid from time	Status
You can administer the following resources:			
<input type="checkbox"/>	ReplenishmentBPEL	Thursday, May 26, 2016 5:06:00 PM EDT	Started
Total 1			

- ___ e. Click **Procurement_Sample_BPELProcess_Module** in the breadcrumb trail at the top of the page.
- ___ f. Under Additional Properties, click **Human tasks**. There is one business process, **Replenishment_InvocationTask**, and it is in the **Started** state.

[SCA modules > Procurement_Sample_BPELProcess_Module > Human tasks](#)

This panel is used to start and stop human tasks, which are defined as part of a business process. Generally, configuration changes take effect after you restart the server, but this panel updates both the configuration and the status of the task on each running server without requiring the servers to be restarted. Each server and cluster which has this task installed must be running.

The screenshot shows the 'Human tasks' administration page. At the top, there are 'Start' and 'Stop' buttons. Below them are filter buttons for selecting, naming, and filtering by valid time and namespace. A table lists a single task: 'Replenish_InvocationTask' with a status of 'Started'. The entire row for this task is highlighted with a red border. At the bottom, it says 'Total 1'.

Select	Name	Valid from time	Namespace	Status
<input type="checkbox"/>	Replenish_InvocationTask	Thursday, May 26, 2016 5:05:56 PM EDT	http://Procurement_Sample_BPELProcess_Module	Started

- ___ g. Click **Procurement_Sample_BPELProcess_Module** in the breadcrumb trail at the top of the page.
- ___ h. Under Related Items, click **Deployment targets**. This page indicates that the module is deployed to PCenter_DE.AppCluster and the application status is **Started**.

[SCA modules > Procurement_Sample_BPELProcess_Module > Target specific application status](#)

Use this page to view a mapping of a deployed object, such as an application or module, into a target server or cluster environment. This page displays the status of the enterprise application or module on each server or cluster.

The screenshot shows the 'Target specific application status' administration page. At the top, there are buttons for 'Enable Auto Start' and 'Disable Auto Start'. Below them are filter buttons for selecting, targeting, and filtering by node and version. A table lists a single deployment target: 'PCenter_DE.AppCluster' with an application status of 'Started'. The entire row for this target is highlighted with a red border. At the bottom, it says 'Total 1'.

Select	Target	Node	Version	Auto Start	Application Status
<input type="checkbox"/>	PCenter_DE.AppCluster	Not applicable	Not applicable	Yes	

- ___ i. Log out of the administrative console.

Part 8: Exploring the Process Admin Console

The Process Admin Console provides configuration and management tools for the Process Servers in your configuration. You can use the Process Admin Console to view status information for process instances and applications, manage process instances for process applications, and view and manage snapshots of installed process applications.

- ___ 1. Start the Process Admin Console.
 - ___ a. In the Firefox web browser, go to the following URL:

<http://bpmhost:9080/ProcessAdmin>



Hint

It is a good idea to create a bookmark to the Process Admin Console URL.

-
- ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ c. From the Process Admin Console, you can complete various administrative tasks, including managing user accounts and installed applications, and monitoring performance. The Process Admin Console opens and looks like the following screen capture:

The Process Admin console provides configuration and management tools for the Process Servers in your IBM Business Process Manager environment.

The Process Admin console enables you to manage IBM BPM users, as well as the queues and caches for particular servers. The console also provides tools to help you configure the process applications installed on the servers in your runtime environments.

To work with the Process Admin console:

- Use this Server Admin page to perform server administration tasks and view status information for process instances and applications.
- Use the Process Inspector page to view and manage process instances for process applications.
- Use the Installed Apps page to view and manage snapshots of installed process applications.

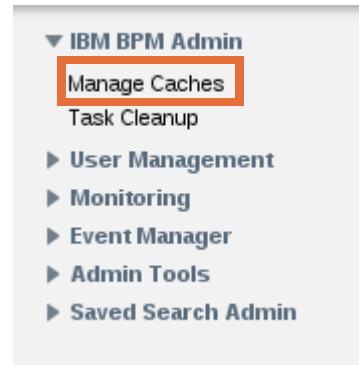
- ___ d. On the right, you can obtain a quick process summary. Currently, there are no process instances in any state.

Active	Completed	Failed	Suspended	Terminated
-	-	-	-	-

Process Applications

- [Heritage Process Portal \(TWP\)](#)
- [Process Portal \(SYSPR\)](#)
- [Hiring Sample \(HSS\)](#)
- [Hiring Sample Advanced \(HSAP1\)](#)
- [Procurement Sample \(STPPS1\)](#)

- __ 2. Explore the Process Admin Console.
- __ a. In the left navigation pane, click **IBM BPM Admin** to expand the entry. For performance reasons, IBM Business Process Manager caches some information about the Process Server. The Process Server caches and databases normally run efficiently and without issues. However, in some cases particular problems come up that require you to use the utilities that are covered in this section.
- __ b. Click **Manage Caches**.



Information

To reduce the amount of space IBM Business Process Manager uses, you can use the **Task Cleanup** utility to delete tasks from the IBM BPM task database.

- __ c. Examine the cache information. As part of Process Server maintenance, you might want to reset server caches or delete processes from the server databases.

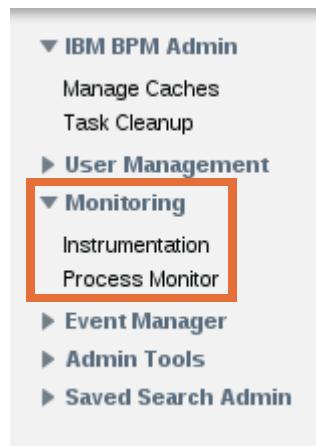
IBM BPM Admin > Manage Caches

Name	Description	CA	UCA	UCP	Last A.	Status
E@GroupInfoCache	Stores UserGroup objects by GroupName and GroupId	3,758	0	0%	5:46 PM	ON
GroupCache	Caches group information and list of groups with information.	0	0	Inf	7:00 PM	ON
E@GroupMembers	Stores group members (User IDs and Group IDs)	1	1	100%	2:31 PM	ON
ProfileCache	Caches user profile information	18	1	5.56%	6:30 PM	ON
Runtime TWClass Cache	Caches all business objects for use by the runtime engines	-	-	-	-	ON

Refresh View

- __ d. Click **Refresh View**. You can see that the cache statistics are updated.
- __ e. In the left navigation pane, click **Monitoring** to expand the entry. As part of maintenance, you might want to monitor and analyze Process Server performance and view available logs to determine the source of performance or other problems. As Process Server runs, it is constantly collecting operational statistics about the execution

of the server as a whole. This information can then be examined to determine where time and resources are being spent during execution.



- f. Click **Instrumentation**. The Process Admin Console includes an Instrumentation monitor to help identify performance bottlenecks in Process Server and to capture instrumentation data that you can use to further analyze any performance issues. Examine the statistical information. You can see at the top of the window it lists the cluster member that the information is based on.

Monitoring > Instrumentation

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Start Logging
Refresh Reset Save Automatically refresh every Never



Information

You can click **Start logging** to begin logging statistical information to a log file to examine later. The Instrumentation monitor displays the path and file to which the data is saved. The file is created and stored on the host of the IBM Business Process Manager server that you are currently monitoring.

You can click **Save** to save the instrumentation data for further analysis. When you save the data, it is placed into an XML file that is downloaded to the local computer.

- g. In the left navigation pane, click **Monitoring > Process Monitor**. With Process Monitor, you can view the processes and services that are running on Process Server and also stop any problematic processes or services. At the top of the window, you can see the current cluster member listed.

The **Summary** tab shows you how many active services and processes are currently using processor resources. This tab also shows which services and processes are most expensive and includes the total time, total number of instances, and total number of

steps that are needed to run them. On the **Summary** tab, no active processes are currently running.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary	Processes	Services	Refresh	Back	
Active Processes Currently Executing	0				
Active Services Currently Executing	0				
Most Expensive Services					
Process App	Service Name	Total Time		Total Step	
No data available					
Most Expensive Processes					
Process App	Process Name	Total Time		Total Step	
No data available					
Most Expensive Service Steps					
Process App	Service Name	Sub-Service Name	Step Name	Total Time	Total Step
No data available					



Information

To identify performance issues with your process application, view the performance data available in the Process Monitor page of the Process Admin Console. Identify process applications that have bottlenecks, drill into the process application to identify the steps that are expensive, and learn how long it takes to run services.

In a network deployment environment, the Process Monitor is server-specific. The monitor data is only kept in memory, and it is specific to the Java virtual machine (JVM) process. To ensure that you are looking at Process Monitor for the correct server, connect directly to the IBM BPM server http or https port, instead of connecting to an http server that might route you to any one of the underlying IBM BPM servers.

- ___ h. Click the **Processes** tab. The **Processes** tab shows active processes currently running, not currently running, and completed processes. Currently, there are no active processes.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

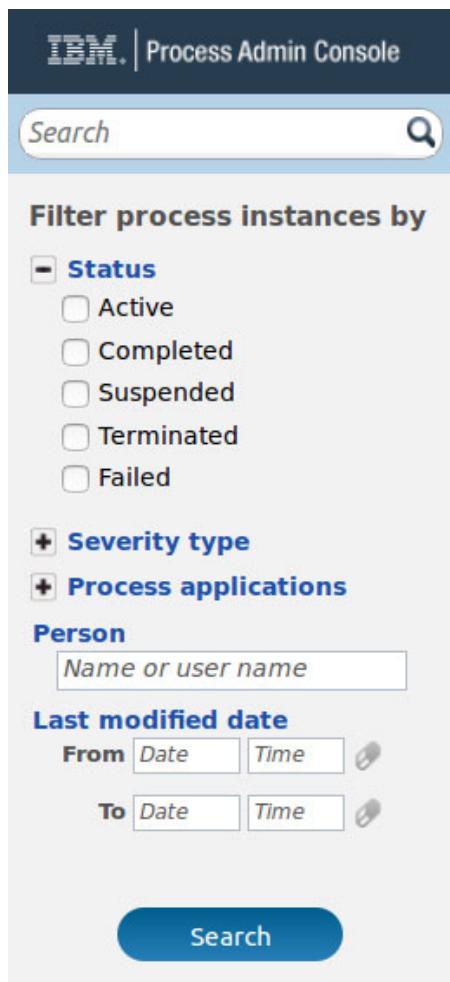
Process App	Process Name	Enter Time▼	Duration
There are no active processes that are currently executing			

Process App	Process Name	Last Enter Time▼	Last Duration	Total Duration
There are no active processes that aren't currently executing				

Process App	Process Name	Last Enter Time▼	Last Duration	Total Duration
There are no completed processes				

- ___ i. In the Process Admin perspective, click the **Process Inspector** tab. The Process Inspector is an administrative tool that you can use to investigate and resolve runtime problems with process instances.

From the **Process Inspector** tab, you can view status of process instances and applications. The Process Inspector opens in another tab in the browser.



The screenshot shows the left pane of the Process Inspector. It includes a search bar at the top with a magnifying glass icon. Below it is a section titled "Filter process instances by" with three expandable categories: "Status" (with options Active, Completed, Suspended, Terminated, Failed), "Severity type" (expanded), and "Process applications" (expanded). Under "Severity type", there is a "Person" section with a text input field labeled "Name or user name". Below that is a "Last modified date" section with "From" and "To" fields, each with date and time inputs and calendar icons. At the bottom is a large blue "Search" button.

Welcome to the Process Inspector

Use the Process Inspector to view the task, activity, and data details for process instances.

Start by filtering the search so that it shows only the process instances you are interested in, and then click **Search**. In the results area, select one or more instances. You can narrow the results by applying more filters and click **Refresh**.

If you select one process instance, you can see the details for that instance. The tasks and activities areas show the actions that you can perform. The details pane displays data for that instance.

If you select multiple process instances, you can see the combined details for all selected instances. The tasks and activities areas show the actions available on all of the selected process instances.

[Learn More about Process Inspector...](#)

The Process Inspector consists of three panes:

- **Search pane:** In the search pane, you define the criteria that are used to search for process instances. The pane returns the process instances that contain the provided text within the instance name or process application acronym. The search pane is on the left.
- **Results pane:** The results pane displays one of two things. If you did not yet search for process instances, the results pane displays a welcome message. If you did a search, the results pane displays a list of process instances and cases that fulfill the search criteria. The list displays the first 20 instances automatically. If there are more than 20 instances, you can scroll to the bottom of the list and the next 20 instances load automatically. The results pane is in the center.
- **Details pane:** The details pane displays information about what you selected. If you select multiple process instances in the results pane, the details pane displays how many instances you selected and how many have a particular status. If there are actions that you can do on all of the instances, the details pane displays those actions. If you select a single instance in the results pane, the details pane displays the information for that instance. The details pane is on the right.



Information

The Process Inspector feature can be started from inside the Process Admin Console. Process Inspector is a tool that can be used to view and manage process instances that are running on a specific process server. You can use the Process Inspector to search for process instances on a process server by specifying different filtering criteria such as status, process application name, person, date range, or search for specific text.

- ___ j. Close the **Process Inspector** tab.
- ___ k. In the Process Admin perspective, click the **Installed Apps** tab.
- ___ l. The Procurement_Sample is listed on the Active page and shows 0 (zero) instances of the Procurement Sample.

The screenshot shows the IBM Process Admin Console interface. The top navigation bar has tabs for 'Process Admin Console', 'Server Admin', 'Process Inspector', and 'Installed Apps'. The 'Installed Apps' tab is highlighted. Below the navigation bar, there is a search bar labeled 'Sort Snapshots By:'. Underneath, a list of applications is shown with their names in blue underlined links. The first item is 'Procurement Sample (STPPS1) - Procurement Sample v8570', which has a small icon next to it and is followed by the text 'ReplenishmentBPD - 0 instances'.

- ___ m. Click **All** from the snapshot menu. You can see a number of snapshots listed.

The screenshot shows the same IBM Process Admin Console interface as the previous one, but with the 'All' option selected in the snapshot menu. This results in a longer list of applications. The visible items include 'Heritage Process Portal (TWP) - 8.5.7.0', 'Hiring Sample (HSS) - Responsive Hiring Sample v8570', 'Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample v8570', 'Process Portal (SYSRP) - 8.5.7.0', and 'Procurement Sample (STPPS1) - Procurement Sample v8570'. Each item has a small icon and its instance count (e.g., 'Standard HR Open New Position - 0 instances').

- ___ 3. Explore User Management.
 - ___ a. In the Process Admin perspective, click the **Server Admin** tab. In the left navigation pane, click **User Management > User Management**.
 - ___ b. In the **Retrieve Profile** field, enter * and click **Retrieve**.

User Management > Maintain User Settings

Retrieve Profile

*

File Registry Users

bpmaadmin
pcdeadmin

User Details

User Name	<input type="text"/>
Full Name	<input type="text"/>
Password	<input type="password"/>
Confirm Password	<input type="password"/>

The * retrieves and lists all of the users in the security repository. You can also type the first character of the user name to get a listing of users that begin with that character.

- ___ c. In the left navigation pane, click **User Management > Group Management**.
- ___ d. In the **Select Group to Modify** field, enter the following characters:

%%

User Management > Group Management

Select Group to Modify: %%

New Group	Remove
Debug	
tw_admins	
tw_allusers	
tw_allusers_managers	
tw_authors	
tw_managers	
tw_portal_admins	
tw_process_owners	
twem	

The double percent lists all of the groups in the security repository. You can also type the first 2 characters of the group name to get a listing of groups that begin with the 2 characters.

- ___ e. Click the group name **tw_admins**. On the right, it displays the members of the group, which includes bpmadmin and pcdeadmin.

User Management > Group Management

The screenshot shows the 'User Management > Group Management' page. At the top left, there is a search bar labeled 'Select Group to Modify: %6%' and a progress bar indicating 96% completion. Below this, a table lists various groups under 'New Group'. The 'tw_admins' group is highlighted with a green background. To the right of the list is a panel for the selected group, titled 'tw_admins'. It shows the 'Team Manager Group (deprecated)' section with a note 'No Team Manager Group'. Below this are 'Add Users' and 'Add Groups' buttons, and a list of users: bpmadmin (bpmadmin) and pcdeadmin (pcdeadmin), each with a remove button next to it.

- ___ f. Continue to explore the Process Admin Console. When you are completed with this task, log out of the Process Admin Console.

Part 9: Interacting with the process application by using Business Process Choreographer Explorer

- 1. Start the Business Process Choreographer Explorer application.

 - a. In the Firefox web browser, go to the following URL:
`http://bpmhost:9080/bpc`
 - b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

- 2. Explore the ReplenishmentBPEL business process.

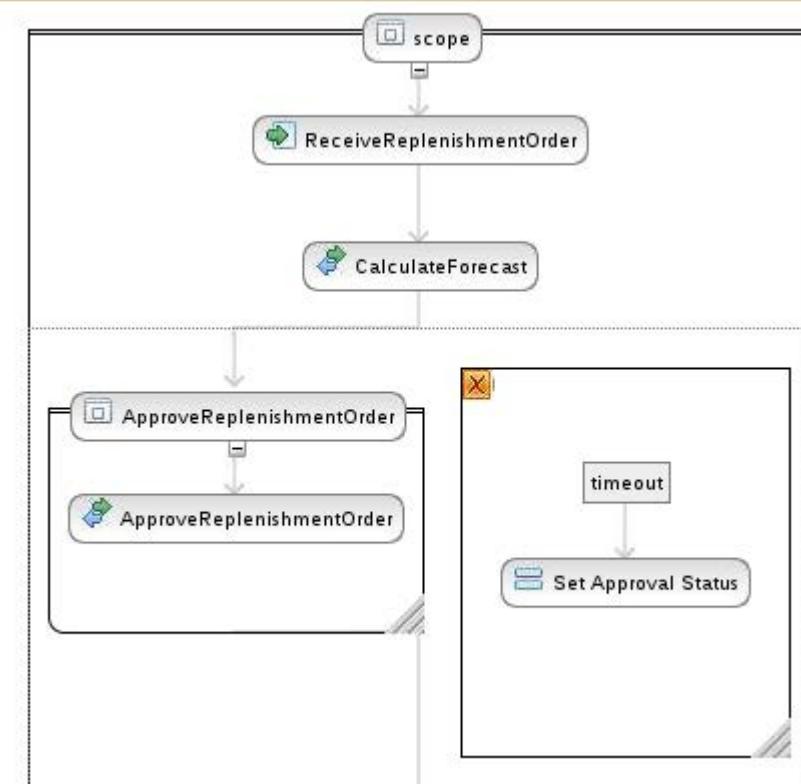
 - a. Under Process Templates, click **Currently Valid**. One process template is listed, the ReplenishmentBPEL template from the Procurement Sample v855 snapshot.

Currently Valid Process Templates

Use this page to view process templates on which you can work. [\[i\]](#)

	Start Instance	Instances	View Structure	Refresh	
<input type="checkbox"/>	Process Template Name	Valid From	Process App	Snapshot	Long P
<input checked="" type="checkbox"/>	ReplenishmentBPEL	5/26/2016 5:06:00 PM EDT	Procurement Sample	Procurement Sample v8570	yes
Items found: 1 Items selected: 0			Page 1 of 1	Items per page: 20 ▾	

- b. Select the **ReplenishmentBPEL** check box and click **View Structure**. The Process Structure View page opens, showing details and a graphical image of the process template. Examine the structure. The first activity is the `ReceiveReplenishmentOrder` activity, then `CalculateForecast`. After the first two activities are finished, the `ApproveReplenishmentOrder` activity is started.



- ___ c. At the top of the page, click **View Process Template Details**. The Process Template page shows the **Details** tab, which contains information about the template.

Process Template Description

Process Template Name ReplenishmentBPEL

Description

Documentation

	Details	Operations	Process Instances	Custom Properties	Query Properties
Process Template ID	_PT:90010154.eee4128a.feffff80.ec860046			Process App	Procurement Sample
Namespace	http://Procurement_Sample_BPELProcess_Module			Process App Acronym	STPPS1
Application Name	STPPS1-PSV8570-Procurement_Sample_BPELProcess_ModuleApp			Snapshot	Procurement Sample v
Administrators	Nobody			Snapshot ID	2064.305
Created	5/26/2016 5:06:45 PM EDT				8764-4c1
Valid From	5/26/2016 5:06:00 PM EDT				854a-ad098214
State	Started			Track	Main
Delete on Completion	only if successful				
Long Running	yes				
Compensation Defined	no				
Continue on Error	no				
Autonomy	Peer				

- ___ d. On the right, you can see the details of the process app and snapshot information.

Process App	Procurement Sample
Process App Acronym	STPPS1
Snapshot	Procurement Sample v8570
Snapshot ID	2064.3053758b-8764-4c1c-854a-ad0982143313
Track	Main

- ___ 3. Start an instance of the process.

- ___ a. Click **Start Instance**.

__ b. Enter the following values:

- **Process Name:** Replenish_Test_111
- **orderID:** OID_111
- **partNumber:** PN_111

Process Input Message

Use this page to provide the input that is needed to start an instance of a process. [\[i\]](#)

Submit

Process Template Name	ReplenishmentBPEL																		
Process Description																			
Operation	startReplenishmentOrder																		
Process Name	Replenish_Test_111																		
Process Input Message	<table border="1"> <thead> <tr> <th colspan="3">Form View*</th> </tr> <tr> <th>input1</th> <th>orderID</th> <td>OID_111</td> </tr> </thead> <tbody> <tr> <td></td> <td>partNumber</td> <td>PN_111</td> </tr> <tr> <td></td> <td>quantity</td> <td></td> </tr> <tr> <td></td> <td>orderAmount</td> <td></td> </tr> <tr> <td></td> <td>approved</td> <td>- Add</td> </tr> </tbody> </table>	Form View*			input1	orderID	OID_111		partNumber	PN_111		quantity			orderAmount			approved	- Add
Form View*																			
input1	orderID	OID_111																	
	partNumber	PN_111																	
	quantity																		
	orderAmount																		
	approved	- Add																	

__ c. Click **Submit**.

__ d. Select the **ReplenishmentBPEL** check box and click **Instances**.

__ e. You can see the `Replenish_Test_111` process instance that is running. Scroll to the right to examine the snapshot information.

Migrate	Terminate	Delete	Suspend	Resume	Restart	Compensate	Claim Ownership	Work
<input type="checkbox"/> Process Instance Name	<input type="checkbox"/> Process Template Name	<input type="checkbox"/> Valid From	<input type="checkbox"/> Process App					
<input type="checkbox"/> Replenish_Test_111	<input type="checkbox"/> ReplenishmentBPEL	<input type="checkbox"/> 5/26/2016 5:06:00 PM EDT	<input type="checkbox"/> Procurement S					
Items found: 1	Items selected: 0	Page 1 of 1						Items per page: 20 ▾

__ 4. Explore the process instance.

__ a. Click **Replenish_Test_111**. On the **Details** tab, you can see that the starter of the instance is pcdeadmin, the deployment environment administrator.

- ___ b. Click the **Activities** tab. There are two activities in the **Finished** state; and one activity, the **ApproveReplenishmentOrder** activity, is running.

Process Description

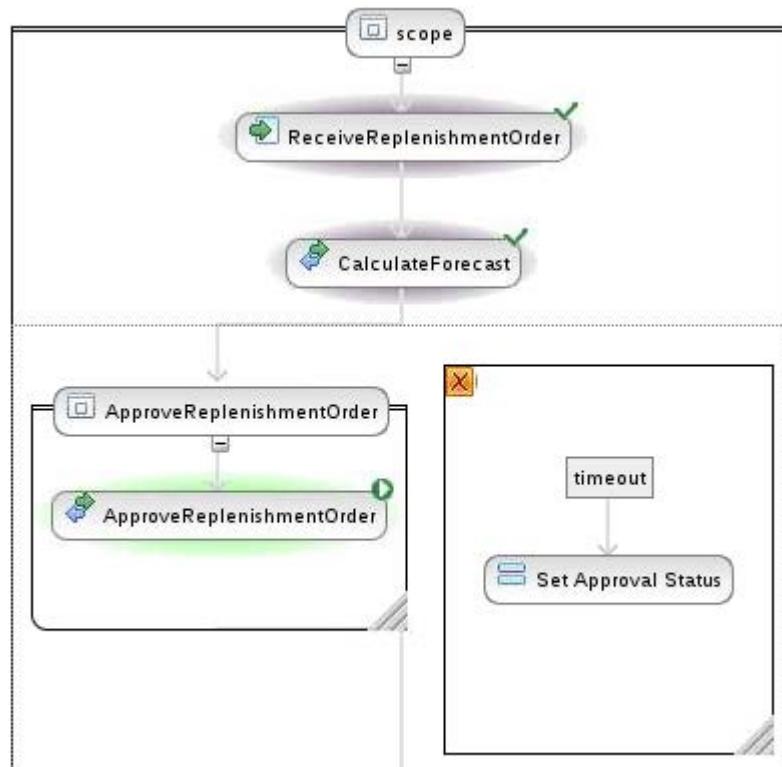
Process Instance Name	Replenish_Test_111
Description	
State	Running

Activities

Activity Name	State	Skip requested	Kind	Owner
ReceiveReplenishmentOrder	Finished	no	Receive	
CalculateForecast	Finished	no	Invoke	
ApproveReplenishmentOrder	Running	no	Invoke	

Items found: 3 Page 1 of 1 Items per page: 20

- ___ c. Under Process Instances on the left navigation pane, click **Started By Me**.
- ___ d. Select the **Replenish_Test_111** check box and click **View Process State**. The graphical view is updated to show that the **ReceiveReplenishmentOrder** and **CalculateForecast** activities are completed, as the green check mark indicates. The running activity is the **ApproveReplenishmentOrder**, as the green circle with the white run icon indicates.



- ___ 5. Log out of the Business Process Choreographer Explorer.

Part 10: Examining updated statistical information by using the Process Admin Console

- ___ 1. Start the Process Admin Console.
 - ___ a. In the Firefox web browser, go to the following URL:
`http://bpminsthost:9080/ProcessAdmin`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ 2. Examine the statistics by using the Process Admin Console.
 - ___ a. You are placed on the Process Admin perspective on the **Server Admin** tab. In the left navigation pane, click **IBM BPM Admin > Manage Caches**.
 - ___ b. Scroll to the bottom and click **Refresh View**. The cache statistics are updated based on the process instance.
 - ___ c. In the left navigation pane, click **Monitoring > Instrumentation**. Examine the statistical information. A new BPD instance is started and the name is ReplenishmentBPD.

Monitoring > Instrumentation

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Start Logging	Refresh	Reset	Save	Automatically refresh every	Never	↻
----------------------	----------------	--------------	-------------	-----------------------------	--------------	----------

Name	Count/Value	In Process	Average Duration (ms)	Moving Average Duration (ms)
⊕ BPD				
⊕ Instances				
BPD Instances Completed	0			
BPD Instances Failed	0			
BPD Instances Resumed	0			
⊕ BPD Instances Started	1			
BPD name is ReplenishmentBPD	1			
BPD Instances Terminated	0			
⊕ Cache				
⊕ Connectors				
⊕ Webservices				

- ___ d. Scroll through the list and examine the remaining statistical information.

- ___ e. In the left navigation pane, click **Monitoring > Process Monitor**. On the **Summary** tab, you can see the details about your processes.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary **Processes** **Services**

Active Processes Currently Executing	0
Active Services Currently Executing	0

Most Expensive Services

Process App	Service Name	Total Time
No data available		

Most Expensive Processes

Process App	Process Name	Total Time
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)	0:

Most Expensive Service Steps

Process App	Service Name	Sub-Service Name	Step Name	Total Time
No data available				

Most Expensive Process Steps

Process App	Process Name	Sub-Process Name	Step Name	Total Time
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		ApproveReplenishmentOrder	0:00:02.83
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		Start	0:00:00.60

**Note**

Depending on how quickly you progress in the exercise, your details might look different from the prior screen capture. The ReplenishmentBPD (3) process might be overdue. In which case, the name and details appear in red.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary **Processes** **Services**

Active Processes Currently Executing	0
Active Services Currently Executing	0

Most Expensive Services

Process App	Service Name	Total
No data available		

Most Expensive Processes

Process App	Process Name	Total
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)	

Most Expensive Service Steps

Process App	Service Name	Sub-Service Name	Step Name	Total Time
No data available				

Most Expensive Process Steps

Process App	Process Name	Sub-Process Name	Step Name	Total Time
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		ApproveReplenishmentOrder	0:00:21
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		Start	0:00:00

- ___ f. Click the **Processes** tab. An entry for the Procurement Sample is listed with details about the active process.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary	Processes	Services	Refresh	Ba
Active Processes Currently Executing				
Process App	Process Name	Enter Time	Duration	
There are no active processes that are currently executing				
Active Processes Not Currently Executing				
Process App	Process Name	Last Enter Time	Last Duration	Total Duration
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)	May 31, 2016 4:06:39 PM	0:00:01.384	0:00:01.384
Completed Processes				
Process App	Process Name	Last Enter Time	Last Duration	Total Duration
There are no completed processes				

- ___ g. Under Active Processes Not Currently Executing, click the process name, **ReplenishmentBPD (3)**. Here you can see more details about the process.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary **Processes** Services

Process "ReplenishmentBPD" Details

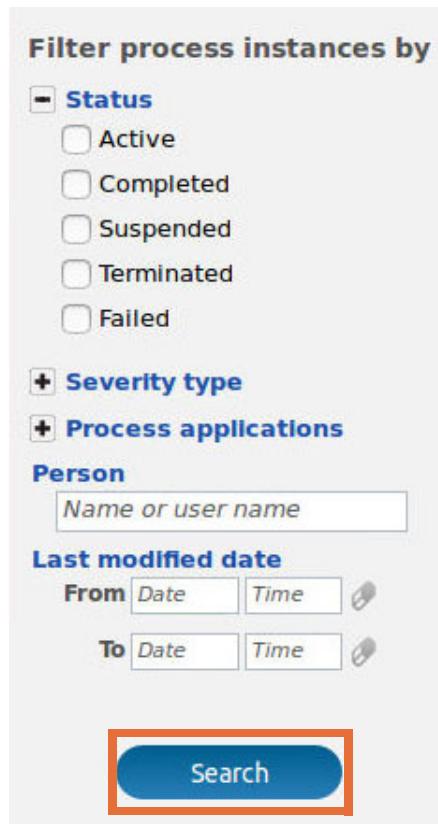
BPD Name	ReplenishmentBPD
Process App	Procurement Sample (Procurement Sample v8570)
Instance ID	3
Last Enter Time	Jul 20, 2016 1:06:20 PM
Last Duration	0:00:03.559
Total Duration	0:00:03.559
State	Active Not Currently Executing
Total Steps Completed	2

Completed Steps

Process App	Sub-Process Name	Step Name	Last Enter Time
Procurement Sample (Procurement Sample v8570)		ApproveReplenishmentOrder [Activity]	Jul 20, 2016 1:06:20 PM
Procurement Sample (Procurement Sample v8570)		Start [Event]	Jul 20, 2016 1:06:20 PM

- ___ h. In the Process Admin perspective, click the **Process Inspector** tab.

- __ i. In the Search pane on the left, click **Search**.



- __ j. In the Results pane, you can see that there is one instance that is listed, ReplenishmentBPD:3. Click **ReplenishmentBPD:3** to highlight it.

The screenshot shows the results of a search. At the top, there are buttons for 'Select shown instances', 'Select all instances', and 'Clear selection'. To the right, it says 'Showing 1 of 1 instances' and 'Sort by: Date of last action'. Below this, a single process instance is listed: 'ReplenishmentBPD:3' with a status icon, followed by 'ReplenishmentBPD', 'Last modified Jul 14, 2016 Due Jul 15, 2016'. This entire row is highlighted with a red rectangle.

- ___ k. In the Details pane on the right, you can see the details for the instance. It lists the snapshot, Procurement Sample v8570. You can also see that there is one task that is assigned. To see the details, click **Tasks**.

The screenshot shows the 'ReplenishmentBPD:3' process instance details. At the top, there's a tree view with nodes: ReplenishmentBPD, Procurement Sample, and Procurement Sample v8570. Below the tree, instance details are listed: Instance ID: 3, Status: Active, Start time: May 31, 2016 4:06 PM (37 minutes ago), Last action: May 31, 2016 4:06 PM (37 minutes ago), and Due date: Jun 1, 2016 4:06 PM (23 hours from now). A sidebar on the left contains actions: Edit data, Refresh, Modify due date, Suspend, Terminate, Tasks (1) (which is highlighted with a red box), and Data.

ReplenishmentBPD:3

- ReplenishmentBPD
- Procurement Sample
- Procurement Sample v8570

Instance ID: 3

Status: Active

Start time: May 31, 2016 4:06 PM (37 minutes ago)

Last action: May 31, 2016 4:06 PM (37 minutes ago)

Due date: Jun 1, 2016 4:06 PM (23 hours from now)

Actions

- Edit data
- Refresh
- Modify due date
- Suspend
- Terminate
- Tasks (1)**
- Data

- I. There is one task, ApproveReplenishmentOrder, which is assigned to all users, indicating that any user can claim this task. The task is also due to be completed in 23 minutes.

ReplenishmentBPD:3

- ↳ ReplenishmentBPD
- ↳ Procurement Sample
- Procurement Sample v8570

Instance ID: 3

Status: Active

Start time: May 31, 2016 4:06 PM (37 minutes ago)

Last action: May 31, 2016 4:06 PM (37 minutes ago)

Due date: Jun 1, 2016 4:06 PM (23 hours from now)

Actions

- Edit data
- Refresh
- Modify due date
- Suspend
- Terminate

Tasks (1) (Active | Completed | All)

<input checked="" type="checkbox"/>	ApproveReplenishmentOrder
-------------------------------------	---------------------------

The task is assigned to All Users. It is due 23 minutes from now.

Data



Note

Your due time might be different from the screen capture.



Information

When you click a process instance in the Process Inspector, specific details are shown in a separate pane on the right, the Details pane. You can view detailed information about one specific process instance or view a summary of information about an entire group that you select. The process instance details pane shows various information about the process instance you selected. They include process instance status such as Active and all actions that are possible on the process instance such as Refresh, Modify due date, Set user authentication, Suspend, Resume, Terminate, and Delete. They also include open and completed tasks, date, and time information such as the starting time or when the item is due.

- m. Click **ApproveReplenishmentOrder** in the Details pane.

- n. Information about the task is shown. Assignees of the task are all users. From this area, you can escalate, suspend, skip, and edit task data.

Status: Received
Assignee: All Users
Due date: May 31, 2016 5:06 PM (11 minutes from now)
Priority: Normal

Actions

- Edit data
- Modify due date
- Modify priority
- Assign to user
- Skip

Data

As an administrator, you have a number of actions that are associated with this task. Not all actions are available, those listed are based on the task. The following actions are associated with a task:

- **Run:** Runs the task.
 - **Debug:** Debugs the task.
 - **Return to team:** Removes the assignment to the user from the task and returns the task back to the team.
 - **Edit data:** Directly edit data changes, or run a service or a script.
 - **Modify due date:** Changes the due date for the task.
 - **Modify priority:** Changes the priority to the level that you specify.
 - **Assign to user:** Reassign a task activity or modify the priority level.
 - **Skip:** Skips the task to send the process instance to the next step in its flow.
- o. Close the **Process Inspector** tab.
- p. Continue to explore the Process Admin Console. When you are done with this task, log out.
- q. Close the browser window.

End of exercise

Exercise review and wrap-up

This exercise examined a Process Center configuration that includes a remote message deployment environment topology. The Process Center Console was used to explore and import a process application.

Exercise 4. Administering Process Portal

Estimated time

00:45

Overview

This exercise examines the features of Process Portal.

Objectives

After completing this exercise, you should be able to:

- Explore Process Portal capabilities
- Use Process Portal to claim a task
- Work with tasks
- Explore the Process Performance dashboard
- Explore the Team Performance dashboard

Introduction

The Process Portal Console is a web-based interface that you use to work on your assigned tasks and collaborate with others to complete your work efficiently. In addition, if you have the associated permission, you can work with process instances, or use dashboards to view and act on the performance of individuals, teams, and processes.

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Center profiles created
- The Process Center single cluster deployment environment created

Exercise instructions

Part 1: Exploring Process Portal

Process Portal is the user interface environment that allows users to interact with and gain visibility over business processes. It is provided as a ready-to-use, default web application that has rich collaboration features too. Process Portal is the suggested environment from which you interact with processes.

Traditionally, Process Portal is used to run and test the business process applications in the various test and quality assurance environments. Process Portal includes features for monitoring and managing all aspects of the business processes.

— 1. Start the Process Portal console.

— a. Open a Firefox web browser and go to the following URL:

`http://bpmhost:9080/portal`

— b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Continue**.

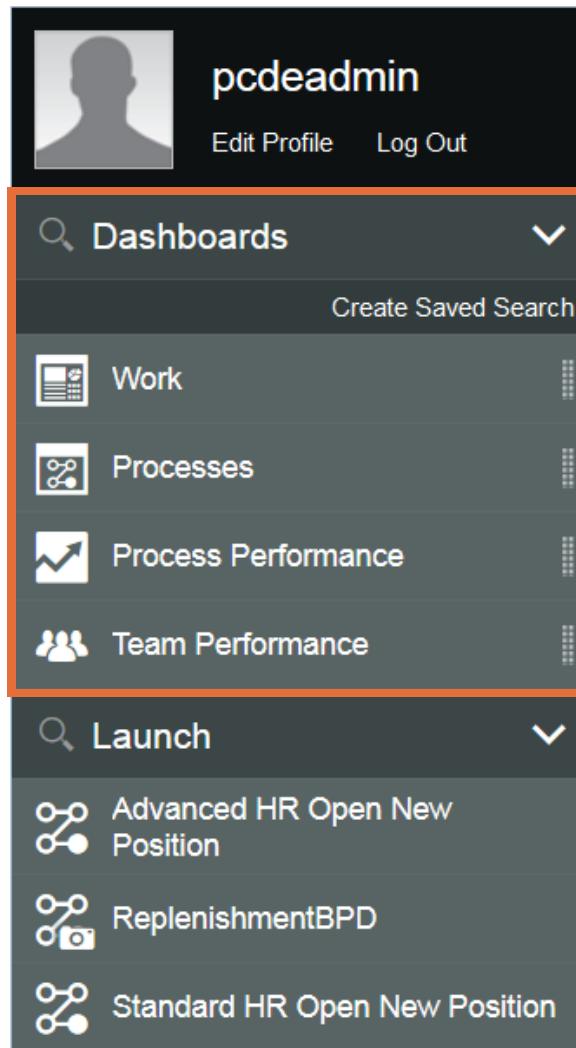
The screenshot shows the 'Sign in to BPM' login interface. It features a dark blue header with the text 'Sign in to BPM'. Below the header are two input fields: 'Username' and 'Password', each with a white input box. To the right of the 'Password' field is a 'Continue' button with a right-pointing arrow icon. At the bottom of the page, there is a copyright notice: 'Licensed Materials - Property of IBM. © Copyright 2008, 2016 IBM Corporation. IBM, the IBM logo, and WebSphere are trademarks of IBM Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies.' The IBM logo is also present at the bottom left.

__ 2. Explore Process Portal.

- __ a. When you log in, the default home page for Process Portal appears.

The screenshot shows the Process Portal home page. On the left is a navigation sidebar with the user profile 'pcdeadmin' at the top, followed by sections for Dashboards, Work, Processes, Process Performance, Team Performance, and Launch. Under Launch, there are three items: 'Advanced HR Open New Position', 'ReplenishmentBPD', and 'Standard HR Open New Position'. To the right of the sidebar is a main content area. At the top of this area is a search bar with the placeholder 'Enter search text...'. Below the search bar is a list of tasks. The first task is 'Task: ApproveReplenishmentOrder' associated with 'ReplenishmentBPD:3', 'All Users', and a due date of 'Jul 19, 2016 1:34 PM'. There is also a small yellow progress bar icon next to the task title.

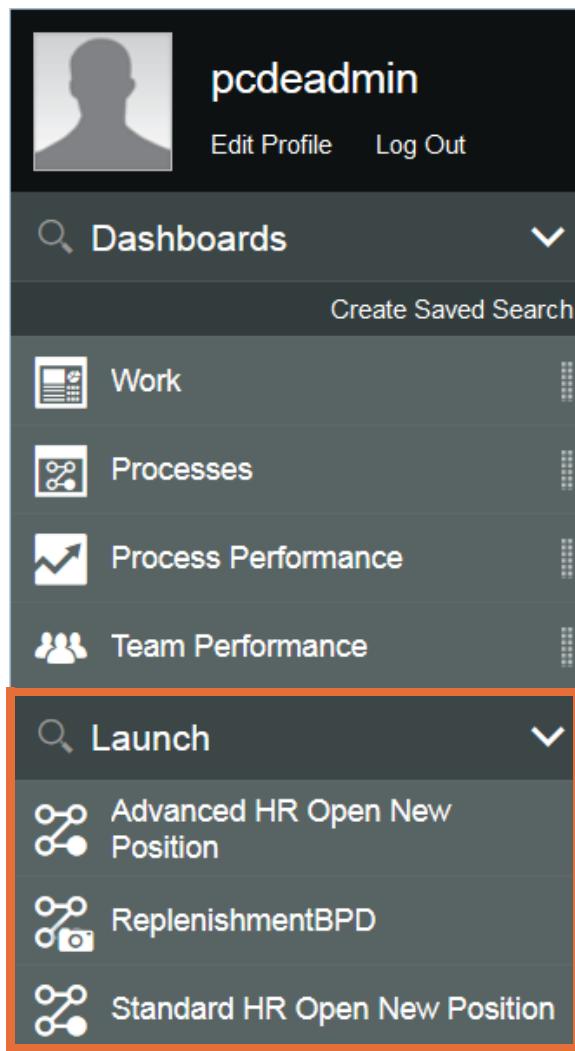
- ___ b. You can see the main menu on the left, which includes various dashboards, each with different functions.



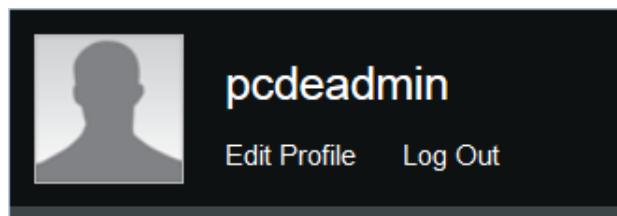
A dashboard uses charts and graphs to help you visualize status data for one or more business processes. To analyze and manage the work on your business processes, you can use the ready-to-use dashboards that Process Portal includes or the company-specific dashboards that your installation might provide. The dashboards contain the following information:

- **Work:** Contains the Task List for the currently logged-in user, which includes claimed and available tasks.
- **Processes:** The Processes dashboard shows lists of active and completed process instances. You can enter search filters to reduce the number of instances in the list. To see more information about an instance, click the instance name.
- **Process Performance:** The Process Performance dashboard shows the status of the active instances of particular processes in your organization. You can act on individual process instances to resolve issues, such as bottlenecks. You must be a member of the process owner team to access this dashboard.

- **Team Performance:** Team Performance dashboard shows the status of the tasks for teams for which you are the designated team manager. You can manage the work load for the team and individual. You must be a member of a team of managers to access this dashboard.
- c. The Launch section of the Dashboards is shown here, where you have a list of business processes that you can launch.



- d. In the upper corner of the console window, you see the name of the currently logged-in user and you can edit your profile.



- e. On the right, you see the Work dashboard for Process Portal. The Work dashboard contains both the tasks that you claimed to work on and the tasks that are available for you to claim. You can open a task to claim it and complete the work that is needed.

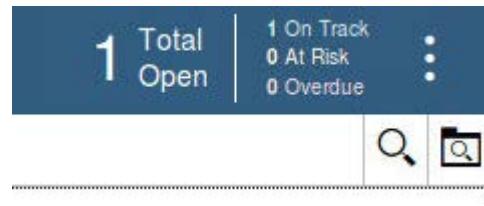
The task `ApproveReplenishmentOrder` is listed in the Work dashboard. Depending on when you log in to Process Portal, the task might be due today or overdue. If the task is due today, the task has the low priority icon.

The screenshot shows the 'Work' dashboard. At the top right, there's a 'Work' button with three dots. Below it is a search bar with placeholder text 'Enter search text...'. A task card is displayed, featuring a blue document icon. The task title is 'Task: ApproveReplenishmentOrder'. Below the title, it says 'ReplenishmentBPD:3', 'All Users', and 'Due: Jul 19, 2016 1:34 PM'. To the left of the task title is a small yellow square containing a green triangle pointing right and a red square containing a black flag.

- ___ f. The **Main Menu** icon in the toolbar toggles between showing the left navigation main menu and hiding the menu.

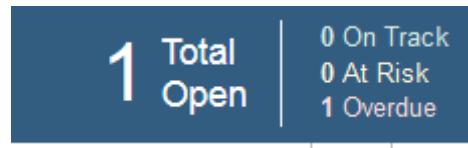
This screenshot is similar to the previous one, showing the 'Work' dashboard. However, the 'Main Menu' icon (three horizontal lines) in the top-left corner is highlighted with a red box. The rest of the interface, including the task card, is identical to the first screenshot.

- ___ g. On the right, you can see the details on the tasks such as total open, on track, at risk, and overdue.



Note

Depending on when you complete this lab, you might see your task that is listed as overdue.



- __ h. Under the name Work, click the ellipses (...). Then, from the menu, click **Table View**.

A screenshot of the Work dashboard. At the top right, there is a context menu with three options: "Open in a New Window", "Table View", and "Edit Columns". The "Table View" option is highlighted with a red box. The dashboard itself shows a single task entry: "Task: ApproveReplenishmentBPD:3" for "All Users" due on "Jul 19, 2016 1:34 PM". There is also a search bar at the top left.

- __ i. The view changes to a tabular display where you can see all of the information. The Work dashboard comes with a pre-set list of columns. You can see the columns that are set by default. Scroll to the right to see each of the columns.

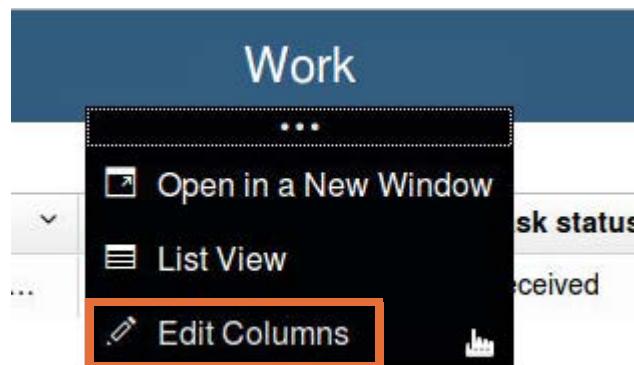
A screenshot of the Work dashboard in Table View mode. It displays a single task entry in a grid format with the following columns: Name, Instance name, Task status, and Priority. The task details are: Name - "Task: ApproveReplenishmentBPD:3", Instance name - "ReplenishmentBPD:3", Task status - "Received", and Priority - "Medium".

	Name	Instance name	Task status	Priority
	Task: ApproveReplenishmentBPD:3	ReplenishmentBPD:3	Received	Medium

Information

Table View and List View are always available, and you can toggle back and forth between these two views. Your last view choice is used when you open another saved search or dashboard. The only exception to this is on small screens such as a mobile device. A List View might still be shown if there are too many columns in the Table View.

- __ j. You can add or remove columns from the dashboard, based on your needs. To edit the dashboard, click the ellipses (...). Then, click **Edit Columns**.



- __ k. Scroll through the list of available columns. You can see the columns that appear are selected. Add **Instance status** to the list. Select the **Instance status** check box and click **OK**.

Available columns

<input type="checkbox"/> Instance due date
<input type="checkbox"/> Instance ID
<input type="checkbox"/> Instance modified date
<input checked="" type="checkbox"/> Instance name
<input checked="" type="checkbox"/> Instance status
<input type="checkbox"/> Location
<input checked="" type="checkbox"/> Name
<input type="checkbox"/> Order ID
<input type="checkbox"/> Owner
<input checked="" type="checkbox"/> Priority
<input type="checkbox"/> Process App acronym
<input type="checkbox"/> Process definition name

[Clear columns](#)

[Cancel](#) OK

- __ I. You can see that the instance status column is added. Click the drop-down next to **Instance status**. You can see that for a column, you can sort in ascending or descending order, and move the column left or right in the dashboard view.

**Hint**

You can also click and hold the column name, then drag it left or right. Releasing the mouse where you want to place the column in the dashboard.

- __ m. Go back to the List View. Click the ellipses (...). Then, from the menu, click **List View**.

Part 2: Using Process Portal to claim a task

The Work page contains a list of the tasks that you own, which include tasks that are assigned to your team that you can claim.

- __ 1. Claim the task by using Process Portal.
- __ a. The task `ApproveReplenishmentOrder` is listed on the Work dashboard. Click the task icon, or paper, to expand the task details.

Enter search text...

Task: ApproveReplenishmentOrder
ReplenishmentBPD:3
All Users
Due: Jul 19, 2016 1:34 PM

___ b. You can now see complete details on the task such as the following details:

- Business data that is relevant to this task such as the Order ID in this example
- Task details that include status and priority
- Options to view additional information about the task such as view instance, modify instance, and more

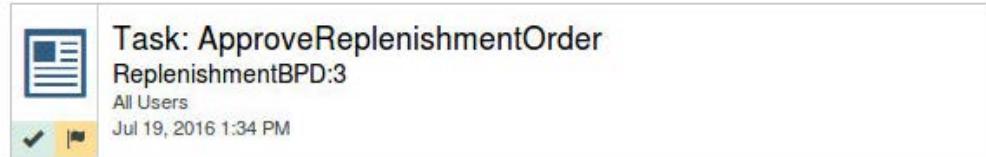
The screenshot shows a task detail page. At the top, there is a header with a blue icon, the task name 'Task: ApproveReplenishmentOrder', the process name 'ReplenishmentBPD:3', and user information 'All Users' and 'Due: Jul 19, 2016 1:34 PM'. Below the header, there are two small icons: a green play button and a yellow flag. The main content area starts with 'Order ID: OID_111'. Underneath it, the 'Task status: Received' and 'Priority: Medium' are displayed. A vertical sidebar on the left contains four options: 'View Instance', 'Modify Instance', 'Audit History', and 'View Process Diagram'. To the right of the sidebar, there is a large blue rectangular area with the letter 'M' in white.

___ c. To work on the task, click **Task: ApproveReplenishmentOrder**.

This screenshot is similar to the previous one, showing the task detail page for 'ApproveReplenishmentOrder'. The task name is highlighted with a red rectangular box. The rest of the interface, including the header, order ID, task status, priority, sidebar options, and the large blue area, is identical to the first screenshot.

- ___ d. A window opens that indicates when you open the task, the task is assigned to you.
Click **Claim Task**.

Claim Task



This task is still unclaimed. When you open this task, it will be assigned to you.

Don't show me this message again

- ___ e. When you run a task in Process Portal, the task opens a coach. The form for the coach ApproveReplenishmentOrder opens. The information in the coach includes the order ID, part number, quantity, and order amount. Verify that the **Approved** check box is selected.

Task: ApproveReplenish...
Approve for Replenish Order

Order ID
OID_111

Part number
PN_111

Quantity
500

Order amount
25,000.00

Approved

Comment

Okay



Information

Coaches are the web-based interfaces where process participants do the work that is required to complete each task. When a developer builds human services, the developer usually includes coaches, which provide the interfaces for user interaction.

Coaches can include information about the task or process and various controls, such as lists, edit boxes, check boxes, and radio buttons that you use to provide your own input into the process.

- ___ f. Click **Okay**. The task is no longer visible in the Work dashboard and there are no open tasks.

- ___ g. Log out of the Process Portal. Click **Log Out**.
- ___ 2. Verify the changes in the Process Admin Console.
 - ___ a. In the browser, enter the following URL:
`http://bpmhost:9080/ProcessAdmin`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ c. Click **Monitoring > Process Monitor**.
 - ___ d. On the **Summary** tab, examine the information. You see that there are no active processes or service. Your most expensive service is `ApproveReplenishmentOrder`, and you can see the total time and total steps.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary Processes Services

Active Processes Currently Executing	0
Active Services Currently Executing	0

Most Expensive Services

Process App	Service Name
Dashboards (8.5.7.0)	Default Instance List Service
Dashboards (8.5.7.0)	Dashboards Localized Messages Loader
Procurement Sample (Procurement Sample v8570)	ApproveReplenishmentOrder CSHS
Dashboards (8.5.7.0)	Default Data Label Autocompletion Service
Procurement Sample (Procurement Sample v8570)	ApproveReplenishmentOrder CSHS

Most Expensive Processes

- ___ e. Scroll down to the next area. Here you can see that the most expensive process is ReplenishmentBPD, and the instance ID is also listed. The total time displays the service execution time. Your time might differ from the following screen capture:

Most Expensive Processes					
Process App	Process Name		Total Time	Total Step	
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		0:00:25.343		

Most Expensive Service Steps					
Process App	Service Name	Sub-Service Name	Step Name	Total Time	Total Step
Dashboards (8.5.7.0)	Default Instance List Service		Retrieve instance list	0:00:00.677	
Dashboards (8.5.7.0)	Dashboards Localized Messages Loader		Initialize Localized Messages	0:00:00.596	
Dashboards (8.5.7.0)	Default Data Label Autocompletion Service		Default Results	0:00:00.202	

Most Expensive Process Steps					
Process App	Process Name	Sub-Process Name	Step Name	Total Time	Total Step
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		ApproveReplenishmentOrder	0:00:22.246	
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)		Start	0:00:01.138	

- ___ f. Click the **Processes** tab. You can see one completed process.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Summary **Processes** Services

Active Processes Currently Executing

Process App	Process Name	Enter Time
There are no active processes that are currently executing		

Active Processes Not Currently Executing

Process App	Process Name	Last Enter Time	Last Duration
There are no active processes that aren't currently executing			

Completed Processes

Process App	Process Name	Last Enter Time	Last Duration
Procurement Sample (Procurement Sample v8570)	ReplenishmentBPD (3)	Jul 19, 2016 1:02:03 PM	0:00:00.905

- g. Click the Process Name **ReplenishmentBPD (3)** and examine the details. You can see that the process is completed and there were a total of seven steps.

Monitoring > Process Monitor

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

[Summary](#) [Processes](#) [Services](#)

Process "ReplenishmentBPD" Details

BPD Name	ReplenishmentBPD
Process App	Procurement Sample (Procurement Sample v8570)
Instance ID	3
Last Enter Time	Jul 19, 2016 1:02:03 PM
Last Duration	0:00:00.905
Total Duration	0:00:25.343
State	Completed
Total Steps Completed	7

Completed Steps

Process App	Sub-Process Name	Step Name	Last Enter Time	Total Dura
Procurement Sample (Procurement Sample v8570)		End [Event]	Jul 19, 2016 1:02:03 PM	0:0
Procurement Sample (Procurement Sample v8570)		ApproveReplenishmentOrder [Activity]	Jul 19, 2016 1:02:03 PM	0:0
Procurement Sample (Procurement Sample v8570)		Start [Event]	Jul 19, 2016 12:33:51 PM	0:0

Active Services Currently Executing

Process App	Service Name	Last Enter Time
There are no active services that are currently executing		

- ___ h. In the navigation area, click **Monitoring > Instrumentation**. In the BPD Instances Completed area, it lists the number of BPD instances that completed successfully on the current server. You can see one instance that is completed, and the BPD name is ReplenishmentBPD.

Monitoring > Instrumentation

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

<input type="button" value="Start Logging"/>	<input type="button" value="Refresh"/>	<input type="button" value="Reset"/>	<input type="button" value="Save"/>	Automatically refresh every	<input type="button" value="Never"/>	<input type="button" value=""/>
--	--	--------------------------------------	-------------------------------------	-----------------------------	--------------------------------------	---------------------------------

Name	Count/Value	In Process	Average Duration (ms)	Moving Average Duration (ms)	Total (ms)
BPD					
Instances					
BPD Instances Completed	1				
BPD name is ReplenishmentBPD	1				
BPD Instances Failed	0				
BPD Instances Resumed	0				
BPD Instances Started	1				
BPD name is ReplenishmentBPD	1				
BPD Instances Terminated	0				
Cache					

- ___ i. Scroll through the list to examine the rest of the instrumentation data. Stop at the Process Applications area. Here it lists the information for each process application. You can see the details for the ProcurementSample process application. Your statistics might differ from the screen capture.

Process Applications						
Service Requests	12	0	832.92	832.92	9,9	
Process Application is Dashboards	8	0	196.25	196.25	1,5	
Process Application is Process Portal	2	0	533.00	533.00	1,0	
Process Application is Procurement Sample	2	0	3,679.50	3,679.50	7,3	

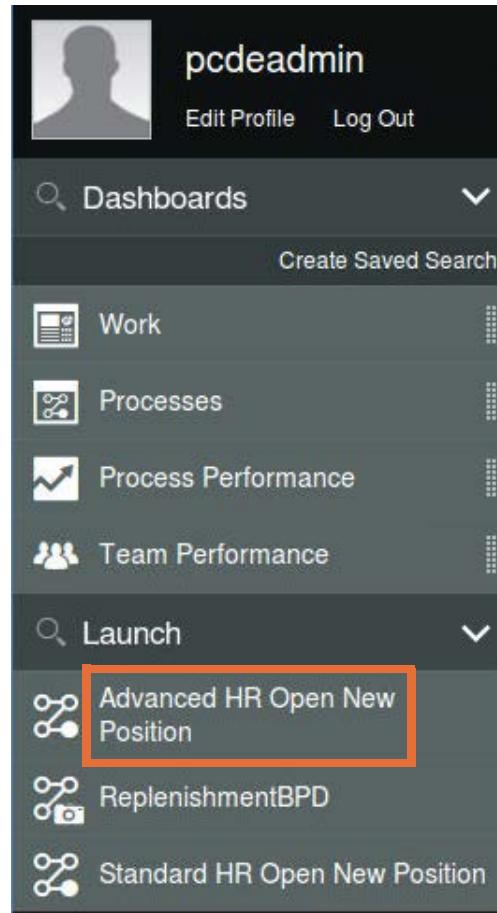
- ___ j. Log out of the Process Admin Console.

Part 3: Launching a process

Since there are a number of default business processes already configured in the environment, you use these processes to create instances.

- ___ 1. Log in to the Process Portal console.

- ___ a. Open a Firefox web browser and go to the following URL:
`http://bpminst:9080/portal`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Continue**.
- ___ 2. Work with the Advanced HR Open New Position business process to create a process instance.
- ___ a. From the navigation menu on the left, under Launch, click **Advanced HR Open New Position**.



Information

If you want exposed library items within particular snapshots to display in Process Portal while those items are being developed in (and reside on) the Process Center server, you need to activate the snapshot. You need to activate the snapshot that contains the version of the items that you want to display. For example, if you are developing a BPD and you want to start the BPD in Process Portal, you need to activate the snapshot that contains the version of the BPD that you want to start.

Activating the version of the BPD you want to use enables you to start and run the BPD on Process Portal for testing and other purposes. However, exposed BPDs and data from the current working version, the tip, are always available. Activation is required only when you want to access a

snapshot version of an item or data that resides on the Process Center server. In this case, you are working with the tip since you did not activate a snapshot for Advanced HR Open New Position.

- ___ b. A task opens in the Work dashboard with default settings for submitting a job requisition. You can keep all of the default settings for this requisition.

The screenshot shows a 'Job requisition data' form. At the top right, it says 'Step: Submit job requisition'. The form has two main sections: 'Request data' on the left and 'Position data' on the right. Under 'Request data', there are fields for Employment type (Contract), Department (Finance), Hiring manager (Tom Miller), and Number of employees required (1). Under 'Position data', there are fields for Position type (New), Location (Chicago), Job title (Head of Product Dev), and Planned starting date (7/26/2016).

Request data		Position data	
* Employment type	Contract	* Position type	New
* Department	Finance	* Location	Chicago
Hiring manager	Tom Miller	Job title	Head of Product Dev
Number of employees required	1	* Planned starting d	7/26/2016

- ___ c. Scroll to the bottom of the page and click **Next**.
- ___ d. On the final page, click **Submit**. In the Work dashboard, you can now see the task Step: Approve / reject requisition.
3. Examine the process instance.
- ___ a. Since you are logged in as pcdeadmin, the deployment environment admin, you have access to everything in Portal. Typically, if you submit the request, you do not have the ability to approve or reject the requisition. However, in this case, you can claim the task. Click the task icon, or paper, to expand the task details.



Step: Approve / reject requisition

Advanced Employee Requisition NG (List) for Tom Miller (4)

General Managers

Due: Jul 19, 2016 3:34 PM

__ b. Click View Process Diagram.

 Step: Approve / reject requisition
Advanced Employee Requisition NG (List) for Tom Miller (4)
General Managers
Due: Jul 19, 2016 3:34 PM

▶ | □

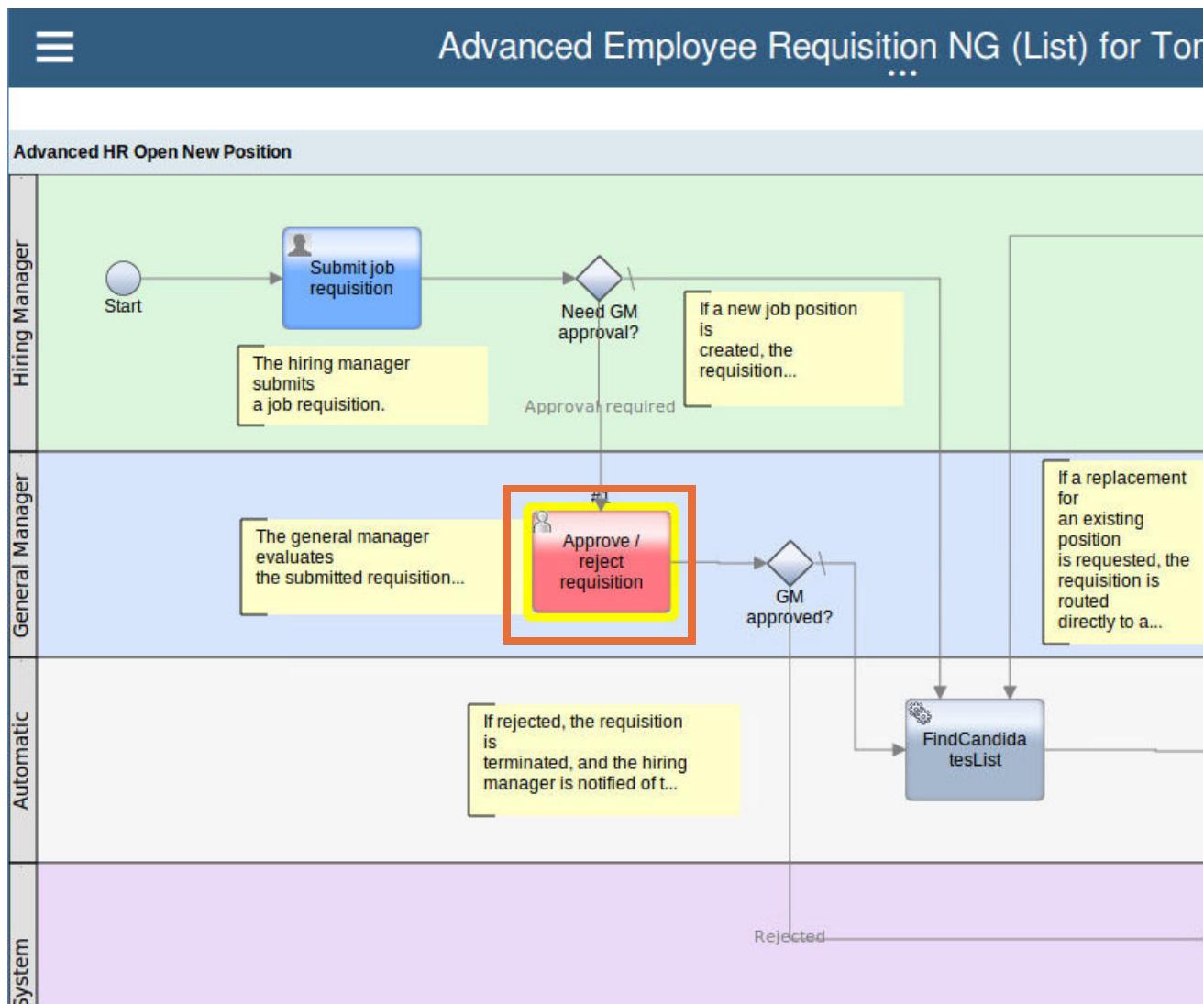
Department: Finance **Employment Status:** Contract **Hiring Manager:** Tom Miller **Location:**

Task status: Received **Priority:** Medium

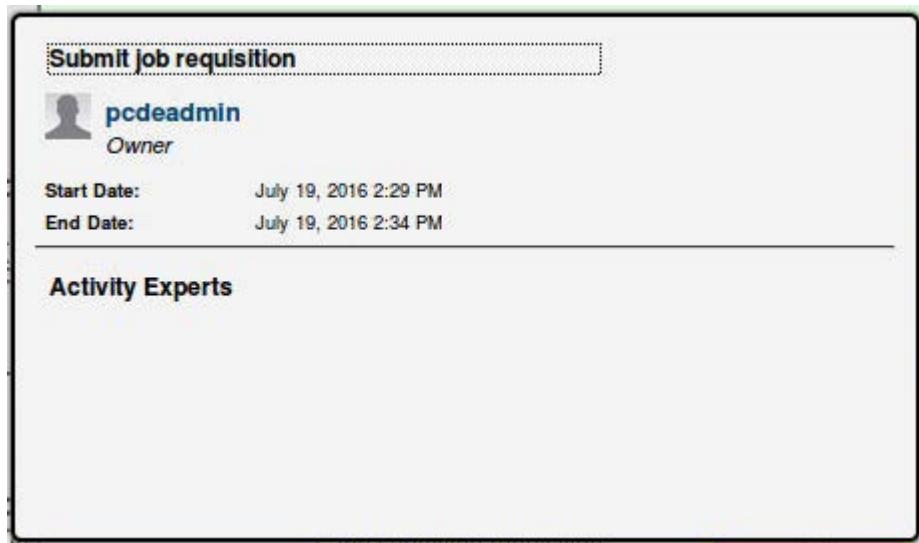
View Instance	View Process Diagram
Modify Instance	
Audit History	

- c. A graphical diagram of the process appears. This page shows the overall status of the tasks in the open instances. Based on the information in the status indicators, you can identify which tasks are causing bottlenecks. You can identify instances that need attention, see the tasks in linked processes, and go to an instance by selecting the entry for the instance in the list.

In the diagram, you can see a yellow box with highlighting around the **Approve/reject requisition** activity. This highlighting indicates that this activity is active. From the diagram, you can see that this activity is the second activity in the process, and this activity is done by people in the General Manager swimlane.



- ___ d. Based on this diagram, you can see that the Submit Job Requisition activity already occurred. Click the **Subject Job Requisition** activity box to see more details about the activity. You can see who completed the activity, the owner, pcdeadmin. You can also see when the activity started and ended.



- ___ e. Under the name at the top, click the ellipses (...). Then, from the menu click **Close** to close the Process Diagram.

- ___ f. Click **View Instance**. You are placed on the Processes Dashboard. All instances include the business data, tasks, and a summary of the progress of the instance on the right. Some instances can also include documents that are created and used throughout the lifetime of the instance, and activities that require action or observation by authorized users.

The screenshot shows a process instance titled "Advanced Employee Requisition NG" for user "Tom Miller". The interface is divided into sections: "Data" (Department: Finance, Location: Chicago, Employment Status: Contract, Requisition Number: 1141, Hiring Manager: Tom Miller), "Tasks" (Step: Approve / reject requisition), and a summary section showing four tasks assigned to Tom Miller.

Advanced Employee Requisition NG
...
Advanced Employee Requisition NG (List) for Tom Miller (4)
Data
Department: Finance Employment Status: Contract Hiring Manager: Tom Miller
Location: Chicago Requisition Number: 1141
Tasks
Step: Approve / reject requisition

- __ g. On the right, click **Stream**. The Stream shows the activity on the process instance, such as who claimed a task or who completed a task. It also includes the comments that are posted about the instance or the tasks that belong to it.

The screenshot shows the Stream view for a process instance. At the top, there is a summary card with the following details:

- Created:** Jul 19, 2016 2:29 PM
- Due:** Jul 21, 2016 2:29 PM

A red box highlights the **Stream** button, which is located below the due date information. Below the summary card, there is a text input field and a toolbar with **Attachment**, **Link**, and **Post** buttons. The main area displays three activity items:

- Step: Approve / reject requisition**: task was created (currently assigned to **General Managers**)
July 19, 2016 2:34 PM
- pcdeadmin** completed the **Step: Submit job requisition** task.
Show audit trail
July 19, 2016 2:34 PM
- Step: Submit job requisition** task was claimed (currently assigned to **pcdeadmin**)
July 19, 2016 2:29 PM

- __ h. Under the name at the top, click the ellipses (...). Then, from the menu click **Close** to close the instance view.
- __ 4. Work with process instances.
- __ a. In the Work dashboard, click **Launch**.

- ___ b. You can see that the task is available to anyone in the role General Managers. To work on the task, click **Claim Task**.

Claim Task



This task is still unclaimed. When you open this task, it will be assigned to you.

Don't show me this message again

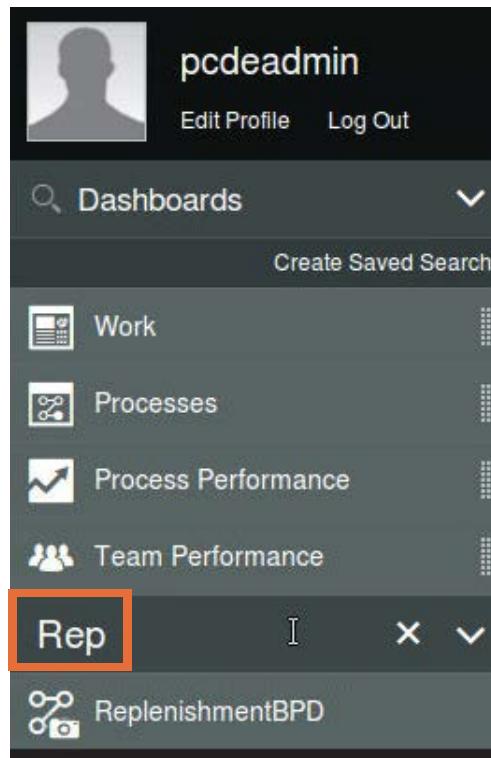
Cancel Claim Task

- ___ c. Details appear about this task that indicate to approve or reject the requisition. Currently, do not complete the task. Click the ellipses (...) at the top, and click **Close**.
- ___ d. This action takes you to the Work dashboard and you can see that there is a total of one open task. Although you are working on this task, you can complete other activities with Portal at the same time. Process Portal gives you the ability to track multiple process instances in one place.

Click the task icon, or paper, to close the task details.

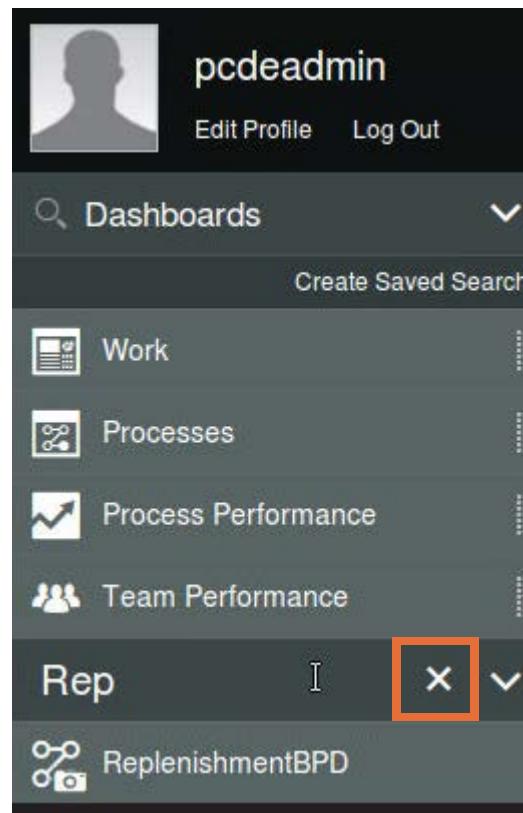
- ___ 5. Start an instance of ReplenishmentBPD.

- ___ 6. You can search for a name of a process if needed. Using the search function is useful in an environment that has many processes available to launch. In navigation on the left, in the Launch field, click the search icon (the magnifying glass). Then, search for ReplenishmentBPD. In the field, enter: Rep



- ___ e. The search filter lists those processes that start with Rep. Click **ReplenishmentBPD**. This action starts a task for the process.

- ___ 7. Start another process instance.
 - ___ a. In the search area of the Launch section, remove the search filter. To remove the filter, click the X.



- ___ b. Click **Advanced HR Open New Position**.
- ___ c. Under the name at the top, click the ellipses (...). Then, from the menu, click **Close**.

- ___ d. On the dashboard, you have a total of three open tasks.

The screenshot shows the 'Work' dashboard with a search bar at the top. Below it, there are three task cards:

- Step: Approve / reject requisition**
Advanced Employee Requisition NG (List) for Tom Miller (4)
Due: Jul 19, 2016 3:34 PM
- Task: ApproveReplenishmentOrder**
ReplenishmentBPD:5
All Users
Due: Jul 19, 2016 4:04 PM
- Step: Submit job requisition**
Advanced Employee Requisition NG (List) for Roland Peisl (6)
Due: Jul 19, 2016 4:06 PM

Part 4: Working with the dashboards

IBM Business Process Manager provides built-in dashboards for visibility. The dashboards include:

- **Work:** Contains the Task List for the currently logged-in user, which includes claimed and available tasks.
- **Processes:** The Processes dashboard shows lists of active and completed process instances. You can enter search filters to reduce the number of instances in the list. To see more information about an instance, click the instance name.
- **Process Performance:** The Process Performance dashboard allows authorized users to monitor the process activity, identify at-risk or overdue processes, and take appropriate actions to correct those situations.
- **Team Performance:** Team Performance dashboard shows you how you can visualize the activities that are associated with managed team members.

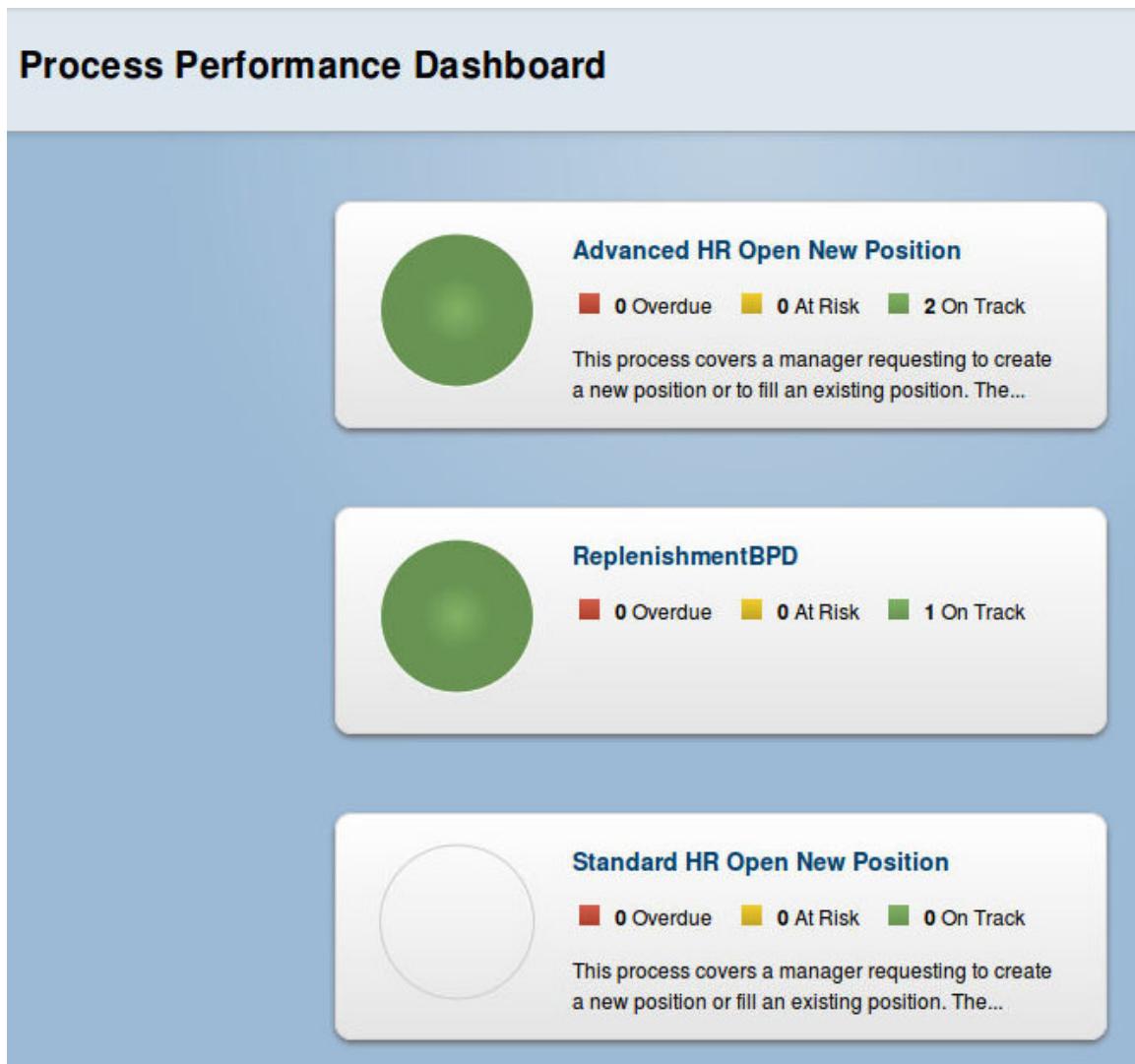
In this part of the exercise, you examine the Process Performance and Team Performance dashboards.

- ___ 1. Examine the Process Performance dashboard.

- ___ a. In the navigation on the left, under dashboards, click **Process Performance**.

You see the general process performance page, where you can see the processes that you are authorized to monitor. You can see the three processes that have already installed in your IBM BPM environment. The overview page shows a pie chart for each process and gives you an immediate sense of whether processes are on track, at risk, or overdue. Notice that there are two on track instances for Advanced HR Open New Position and one on track for ReplenishmentBPD. Since they are on track, the pie chart

is all green. However, since you did not create any instances for Standard HR Open New Position, the pie chart is empty.



- b. Click Advanced HR Open New Position.



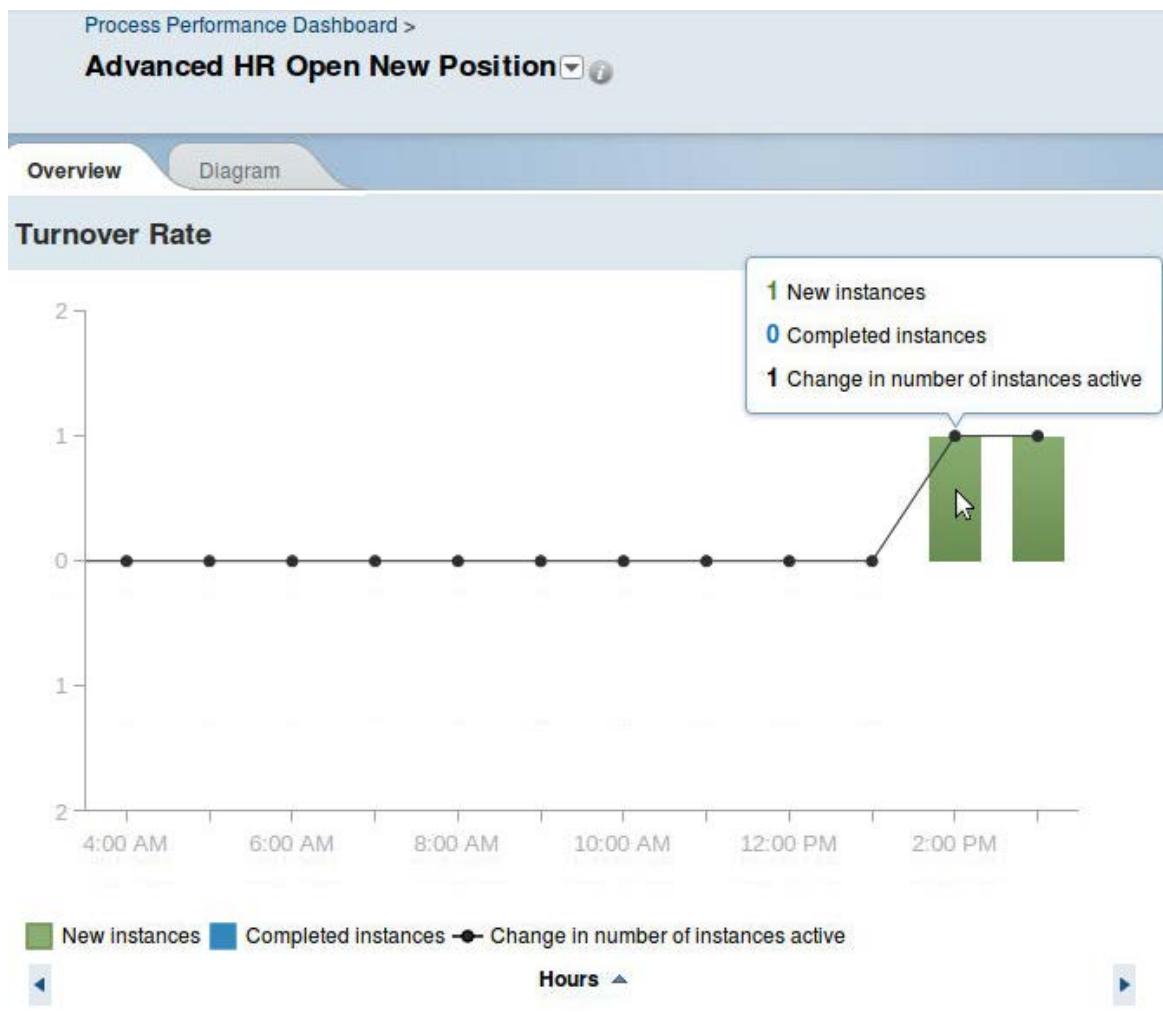
- ___ c. You can see the detailed process performance metrics for the process. You can see the tasks on track, open, and completed.

The screenshot shows the 'Process Performance Dashboard' for the 'Advanced HR Open New Position' process. At the top, there's a navigation bar with 'Process Performance Dashboard >' and the process name. Below it is a header with tabs for 'Overview' (selected) and 'Diagram'. A sub-header 'Quick Stats' is present. The main area features a large green circle icon with a dot, labeled '2 On Track'. To its right is a large blue number '2' and '0m 0s' below it. Below these are the labels 'Instances in Progress' and 'Average Instance Duration'. A section titled 'Turnover Rate' follows, showing a line graph starting at zero and jumping to 1.0, with two bars indicating the count for each step.

The page includes:

- **Quick Stats:** Provides high-level information about the overall health of this process.
- **Turnover Rate:** Provides an indication of how rapidly instances are created and completed.
- **Instances in Progress:** Provides a quick view of the running instances of the process.
- **Average Duration:** Provides consolidated information for the tasks of all instances.

- ___ d. Hover your mouse over the graphics in the Turnover Rate to see statistics on the process.



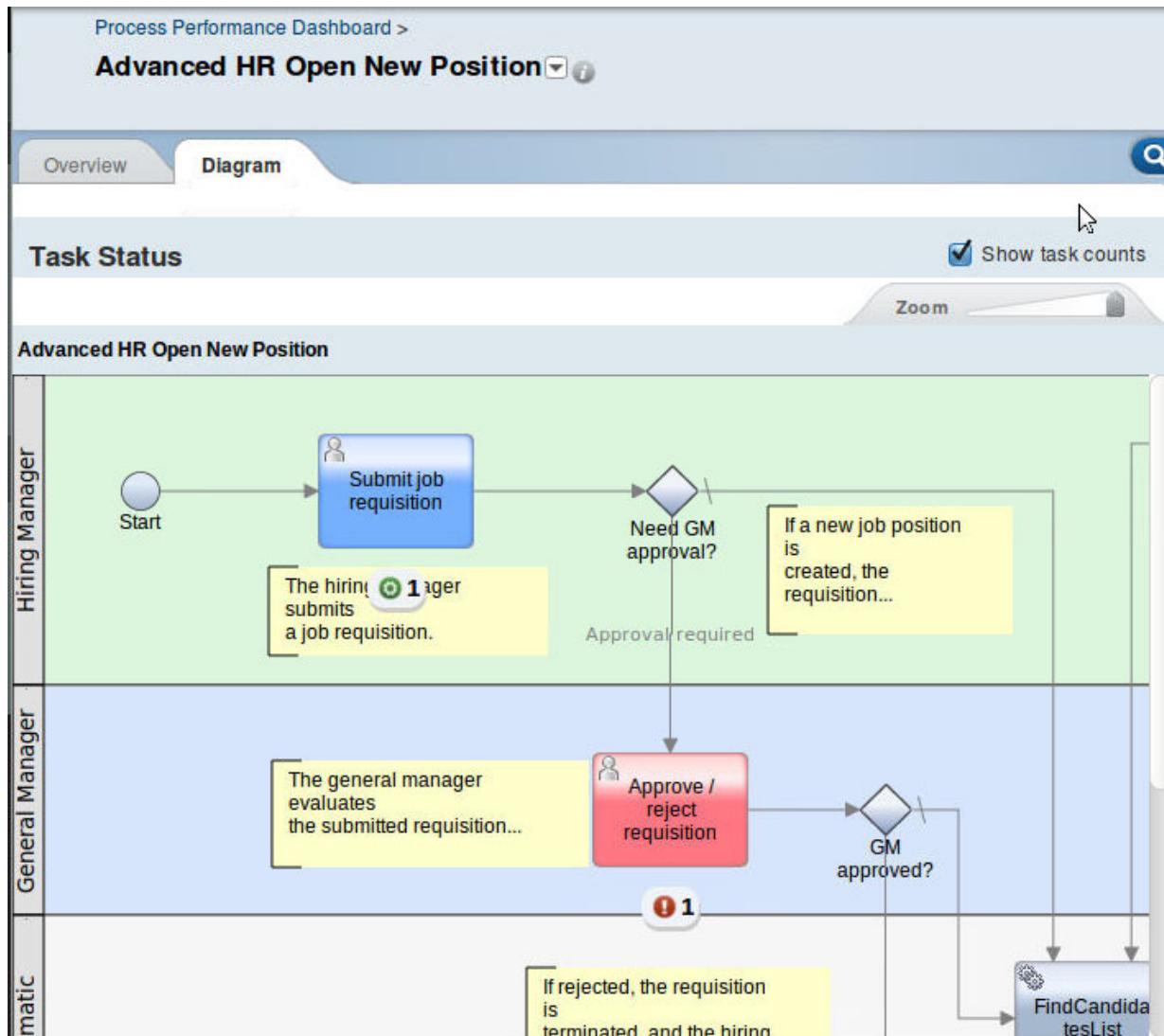
- ___ e. Scroll to the Average Duration section. If you did not complete an instance from end-to-end, then this chart does not load and instead, it gives you a message that indicates that there are no closed instances. If you do have completed instances, this diagram shows how long each activity takes on average, and how frequently that activity is executed throughout the various process instances.

Average Duration

The chart cannot be loaded at this time, for example, because there are no closed instances.

- __ f. Click the **Diagram** tab. The dashboard shows the process diagram and information about its tasks. From here, you are not looking at a specific instance; you are looking at the behavior of the process overall, in statistical terms.

You know that there are two instances of this process currently running. This diagram breaks things down further. Under the activity boxes for **Submit job requisition** and **Approve/reject requisition**, a circle and the number 1 is shown. A green circle indicates that the task is on time and a red circle indicates that the task is overdue. Your circle colors might differ from the screen capture.



- ___ g. Under the **Approve/reject requisition** box, click the 1. On the right, the **Instance in Process** list is filtered to only show instances at this step.

Instances in Progress



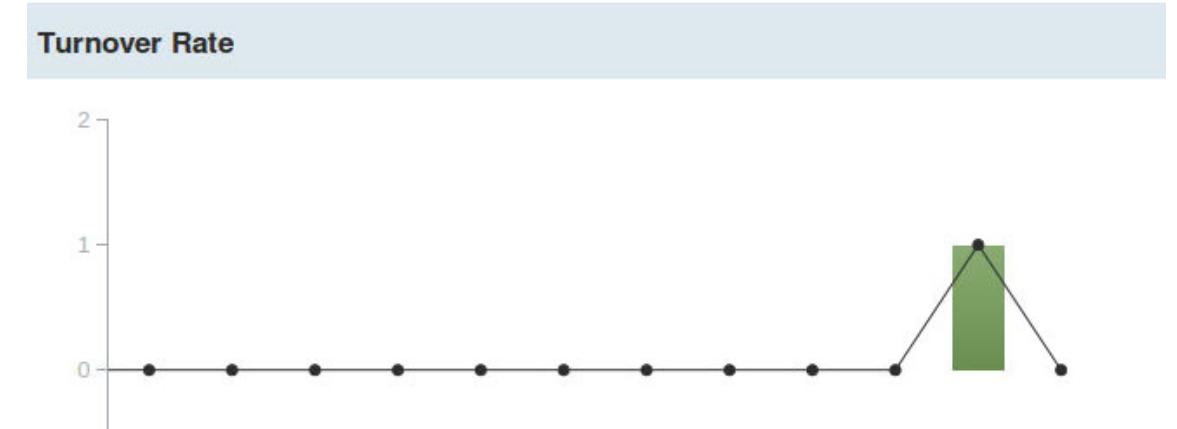
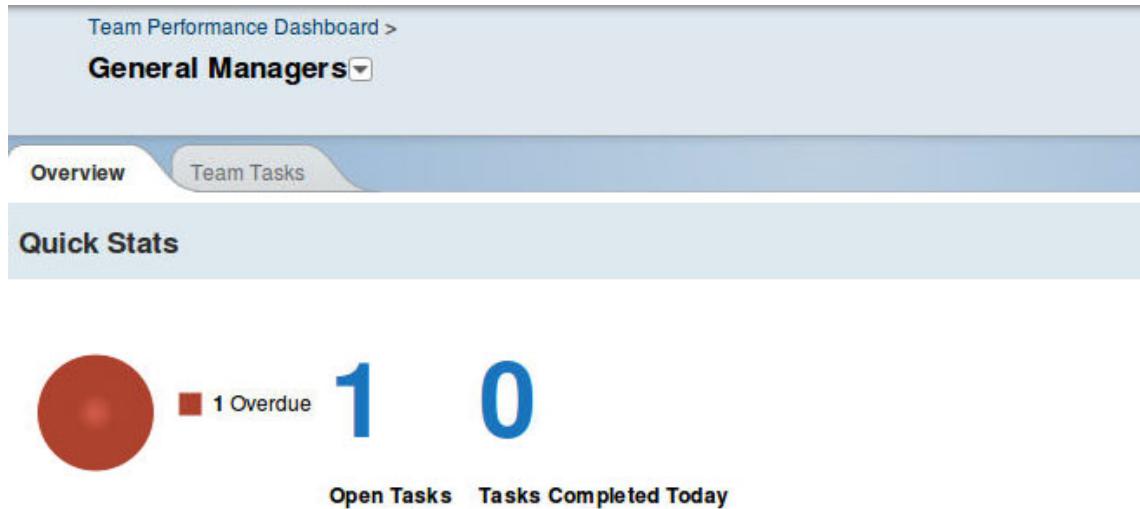
- ___ 2. Examine the Team Performance dashboard.

- ___ a. In the navigation on the left, click the **Team Performance** dashboard. The dashboard main page is displayed. The Team Performance dashboard main page is displayed. The dashboard has a similar appearance to the Process Performance dashboard. However, the Team Performance dashboard provides information specific to a team.

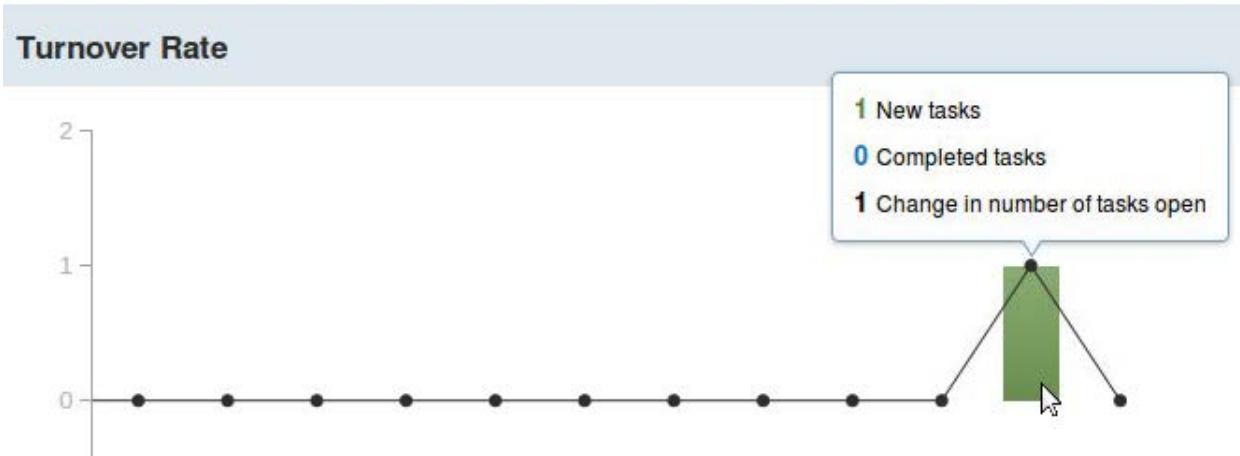
The page gives you an immediate sense of whether the teams are working effectively enough or falling behind schedule. You can see that several teams are listed. For example, All Users, General Managers, Hiring Managers, and more. These are the teams that are defined by the three processes that are installed in the environment. The user ID, pcdeadmin, is configured to be able to view the performance of each of these teams.



- ___ b. Click **General Managers**. This action gives you the ability to drill down and inspect the performance of the General Managers team. You can see the tasks on track, open, and completed.



- ___ c. Click the graphical box in the Turnover Rate section. A window opens showing the statistics for the tasks.



- ___ d. On the right, you can see Roster section. The roster shows the team members' status. You can see completed work, assigned work, and other details.

Roster

Individual counts are total counts for all teams.

	bpmadmin
	Assigned Tasks: 0 Tasks Completed To:
	pcdeadmin
	Assigned Tasks: 2 Tasks Completed To:

- ___ e. Click the **Team Tasks** tab. From here, you can further explore and examine the status of various tasks that are assigned to your team.

Team Performance Dashboard >
General Managers ▾

Overview **Team Tasks** []

Open Tasks ⚙

Older (0) ▾ Overdue (1)

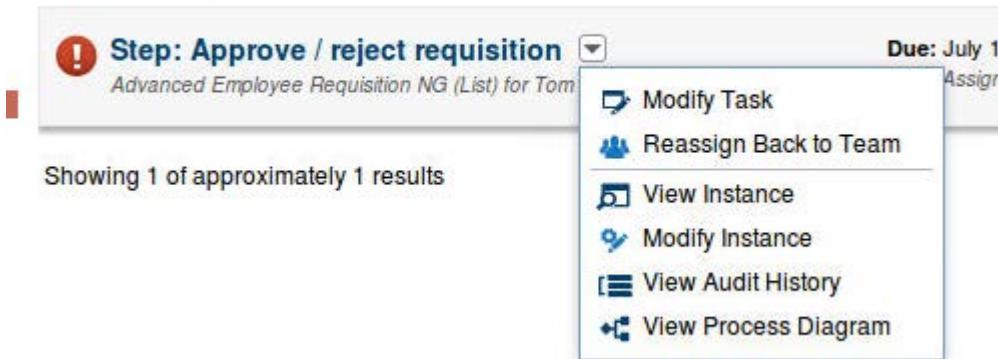
This week
M [] W T F S S

Step: Approve / reject requisition ▾
Advanced Employee Requisition NG (List) for Tom Miller (4)
Due: July 19, 2016 3:34 PM
Assigned to pcdeadmin

Showing 1 of approximately 1 results

- ___ f. Click the drop-down arrow next to **Step: Approve / reject requisition**.

▼ Overdue (1)



From this menu, you can complete the following tasks:

- **Modify Task:** To modify the task, such as assign it to a different user
 - **Reassign Back To Team:** To reassign the task and unclaim the task
 - **View Instance:** To view the instance diagram in a graphical format
 - **Modify Instance:** To modify the instance, such as assign it to a different user
 - **View Audit History:** To audit business data for process instances
 - **View Process Diagram:** To view the process diagram in a graphical format
- ___ g. Click **Modify Task**.
- ___ h. From the modify pane, you can change aspects of the task such as prior, due date, and task assignment. In this pane, make the following changes:
- For Priority, select **High**

- For **Due Date**, set the date to one day in the future

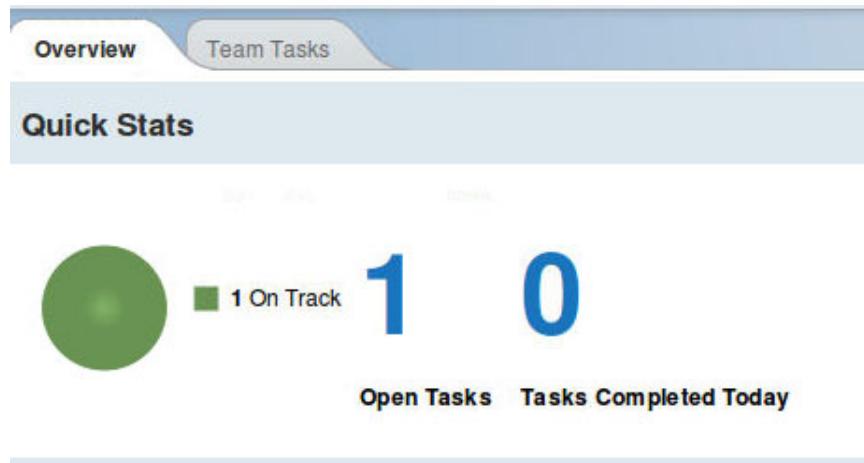
The screenshot shows a modal dialog titled "Modify Task: Step: Approve / reject requisition". The dialog has a yellow priority flag icon in the top right corner. Inside, there's a message: "Escalate or modify the settings for the task." Below it, a "Priority" section shows "High" with a dropdown arrow. The "Due Date" section shows "7/20/2016" and "3:34 PM" with dropdown arrows. Under "Task Assignment", there are two radio buttons: "Team" (selected) and "Individual". A large empty text input field is below. At the bottom right is a blue "Save" button.

- i. Click **Save**.
- j. You can see that the priority flag and due date are modified. The priority flag is yellow, which indicates high priority.

▼ **Due Tomorrow (1)**



- ___ k. Click the **Overview** tab and examine the updated information.



- ___ 3. Complete an instance.
- ___ a. On the navigation on the left, click **Work** to go to the Work dashboard.
 - ___ b. To work on the task, click **Task: ApproveReplenishmentOrder**.
 - ___ c. A window opens that indicates that when you open the task, the task is assigned to you. Click **Claim Task**.
 - ___ d. A coach opens with details on the task. At the bottom of the page, click **Okay**. The task is no longer visible in the Work dashboard and there are no open tasks.
 - ___ e. On the navigation on the left, click **Process Performance**. On the dashboard, you can see for ReplenishmentBPD, there are no tasks in any state. However, you still have two tasks for Advanced Hr Open New Position.
 - ___ f. Log out of Process Portal.
- ___ 4. Examine the process application in the Process Center Console.
- ___ a. In the browser, enter the following URL:
`http://bpmhost:9080/ProcessCenter`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `was1edu` as the password. Click **Login**.
 - ___ c. In the Process Apps pane, click **Procurement Sample (STPPS1)**.
 - ___ d. In an earlier exercise, you did activate a snapshot for the process application Procurement Sample. However, exposed BPDs and data from the current working version, the tip, are always available. Click the drop-down next to current, the tip, and select **Undeploy**. You can see the status changes to indicate it is not yet deployed to Process Center Server.
 - ___ e. Log out of the Process Center Console.

Part 5: Completing the process instances

- ___ 1. Verify the changes in the Process Admin Console.
- ___ a. In the browser, enter the following URL:

<http://bpmhost:9080/ProcessAdmin>

- ___ b. In the login area, enter `pcdeadmin` as the user ID and `was1edu` as the password. Click **Login**.
- ___ c. Click **Monitoring > Instrumentation**. You can see that there are instances in various states.

Monitoring > Instrumentation

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

[Start Logging](#)

[Refresh](#)

[Reset](#)

[Save](#)

Automatically refresh every

Never



Name	Count/Value	In Process	Average Duration (ms)	Max Duration (ms)
(+) BPD				
(+) Instances				
(+) BPD Instances Completed	2			
BPD name is ReplenishmentBPD	2			
BPD Instances Failed	0			
BPD Instances Resumed	0			
(+) BPD Instances Started	4			
BPD name is Advanced HR Open New Position	2			
BPD name is ReplenishmentBPD	2			
BPD Instances Terminated	0			

- ___ 2. Work with Process Inspector to terminal the started instances.
 - ___ a. In the toolbar at the top, click **Process Inspector**.
 - ___ b. In the navigation on the left, click **Search**. You can see that there are two instances started and two completed. The check mark next to the instance name indicates it is completed.

[ReplenishmentBPD:5](#) [ReplenishmentBPD](#)
Last modified Jul 21, 2016 Due Jul 20, 2016

[Advanced Employee Requisition NG \(List\) for Roland Pelsl \(6\)](#) [Advanced HR Open New Position](#)

Last modified Jul 19, 2016 Due Jul 21, 2016

[Advanced Employee Requisition NG \(List\) for Tom Miller \(4\)](#) [Advanced HR Open New Position](#)

Last modified Jul 19, 2016 Due Jul 21, 2016

[ReplenishmentBPD:3](#) [ReplenishmentBPD](#)
Last modified Jul 19, 2016 Due Jul 20, 2016

- ___ c. Click **Advanced Employee Requisition NG (List) for Roland Pelsi (6)**.
- ___ d. On the right, you can see that there is one task. You can see that the tip is used for this instance. Under Actions, click **Terminate**.

Advanced Employee Requisition NG (List) for Roland Pelsi (6)

- Advanced HR Open New Position
- Hiring Sample Advanced
- Tip

Instance ID: 6
Status: **Active**
Start time: Jul 28, 2016 4:56 PM (28 minutes ago)
Last action: Jul 28, 2016 4:56 PM (28 minutes ago)
Due date: Jul 30, 2016 4:56 PM (2 days from now)

Actions

- Edit data
- Refresh
- Modify due date
- Suspend
- Terminate

Tasks (1)

Data

- ___ e. In the Confirm Terminate Action window, click **Yes**.
- ___ f. Next, click **Delete**.
- ___ g. In the Confirm Delete Action window, click **Yes**.
- ___ h. Repeat the prior steps for **Advanced Employee Requisition NG (List) for Tom Miller (4)**.
- ___ i. On the left, click **Refresh**. You should now see the two completed process instances for ReplenishmentBPD.
- ___ j. Close the **Process Inspector** tab.

- ___ k. On the Monitoring > Instrumentation page, click **Refresh**. You can see the number of instances terminated is now two, for Advanced HR Open New Position.

Monitoring > Instrumentation

Server: cell=PCenterCell,node=PCenterNode01,process=PCenter_DE.AppCluster.member1

Automatically refresh every

Never

▼

Name	Count/Value	In Process	Average Du (ms)
⊕ BPD			
⊕ Instances			
⊕ BPD Instances Completed	2		
BPD name is ReplenishmentBPD	2		
BPD Instances Failed	0		
BPD Instances Resumed	0		
⊕ BPD Instances Started	4		
BPD name is Advanced HR Open New Position	2		
BPD name is ReplenishmentBPD	2		
⊕ BPD Instances Terminated	2		
BPD name is Advanced HR Open New Position	2		

- ___ l. Log out of the Process Admin Console.

- ___ m. Close the browser window.

End of exercise

Exercise review and wrap-up

This exercise examined Process Portal. Process Portal is used to explore and interact with a number of processes.

Exercise 5. Purging content in Process Center

Estimated time

01:30

Overview

This exercise examines the various methods that are available to purge data that is no longer needed in the Business Process Manager environment.

Objectives

After completing this exercise, you should be able to:

- Archive and delete process applications
- Manage and delete snapshots, both named and unnamed
- Configure an automated method for deleting unnamed snapshots
- Use the Process Admin Console to monitor the environment
- Use Process Portal to monitor process applications
- Purge data in the Process Center environment

Introduction

IBM Business Process Manager runs in a stateful environment where it accumulates data over time. As with any stateful environment, it is essential to its ongoing health to have a strategy for purging some of that state occasionally. If data grows without bounds, it can lead to disk space issues and to performance issues as database queries take ever longer. You must have a strategy for purging data that is no longer needed in your environment. There are various methods available for purging data in both the IBM Business Process Manager Standard and IBM Business Process Manager Advanced environments.

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Center single cluster deployment environment created

Exercise instructions

Part 1: Managing snapshots

Snapshots record the state of library items within a process application or track at a specific point in time. You can create snapshots in the Process Center Console or in the Process Designer view. Snapshot management, such as installing, exporting, and archiving, is done in the Process Center Console.

When a process application or toolkit is edited by using Process Designer, a special version or snapshot of it called Current (or tip, historically) is changed. At any point in time, you can take a new snapshot and give that snapshot a name. A named snapshot is a snapshot that has a version number or other identifier. Named snapshots are deployable to a server, but other than Current versions, are not editable.

Every time a developer saves artifacts in Process Designer an unnamed snapshot is created in the database. An unnamed snapshot is a snapshot that has no version number or other identifier, which is helpful for you to see the history, but comes at a price due to the database growth. Unnamed snapshots are created on the Process Center server so that hundreds of unnamed snapshots can quickly accumulate, and the database is likely to grow rapidly. During a few months of development, there can be tens of thousands of snapshots, mostly unnamed, created in the repository. Because overall Process Center performance can be highly related to the size of the repository database tables, it is desirable to be able to reduce the size as part of ongoing maintenance.

You can delete unnamed snapshots if your Process Center server performance is slowly degrading. One way to delete only unnamed snapshots is to export the named snapshot into a .twx file, and then reimport that snapshot into a fresh or different Process Center repository. Unnamed snapshots are not exported. However, the export does not delete the unnamed snapshots from the initial repository. In Business Process Manager, you can configure Process Center to automatically delete unnamed snapshots that you no longer need to keep on the server. To enable the feature to automatically delete unnamed snapshots, you add a set of configuration options in the `100Custom.xml` file.

As a good practice, developers regularly create named snapshots for applications and toolkits on Process Center. To help with performance, you can delete snapshots that are no longer needed. Deleting snapshots is a two-step process. The named snapshots must first be archived to delete them. Individual named snapshots can be archived instead of archiving the entire project and all of its snapshots. You can archive from the Snapshots page of the process application or toolkit in the Process Center Console by using the drop-down for each snapshot. Again, archiving does not delete the snapshot from the repository. It merely marks it and hides it. To truly help the performance of the database, you can delete the archived snapshot.

The `BPMSSnapshotCleanup wsadmin` command is used to delete both named and unnamed snapshots by using a scripted method. Remember, the named snapshots must first be archived to delete them.

In this part of the exercise, you examine the various methods for purging both named and unnamed snapshots from the Process Center repository. To examine these concepts, you must first create a couple of snapshots of process applications.

**Important**

In this exercise, you enter many commands in the wsadmin command line environment. To help, a text file is included on the course image, which contains all of the commands that are used in this exercise. You can copy the commands from the file, and paste them into the wsadmin command line environment. The file is `exercise-commands.txt` in `/opt/labfiles/scripts/samples/`.

- 1. Create snapshots by using the Process Center Console.
 - a. Open a web browser and go to the Process Center Console at the following URL:
`http://bpmhost:9080/ProcessCenter`
 - b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - c. On the **Process Apps** tab, click **Hiring Sample (HSS)**.
 - d. Click **Create New Snapshot**.
 - e. In the Create New Snapshot window, enter `Responsive Hiring Sample v2` for the name. Click **Create**.
 - f. Create another snapshot. Click **Create New Snapshot** and enter `Responsive Hiring Sample v3` for the name. Click **Create**.
 - g. You can now see multiple snapshots for the Hiring Sample process application. The Hiring Sample is a BPD process application that was created in Process Designer.

Process Application	Created On	Created By	Status
Hiring Sample (HSS)	5/26/16	pcdeadmin	Current
Responsive Hiring Sample v3 (RHSV3)	6/23/16	pcdeadmin	(New) Not Yet Installed to Process Server
Responsive Hiring Sample v2 (RHSV2)	6/23/16	pcdeadmin	(New) Not Yet Installed to Process Server
Responsive Hiring Sample v8570 (RHSV8_1)	5/26/16	pcdeadmin	(New) Not Yet Installed to Process Server

- ___ h. Click the **Process Apps** tab.
 - ___ i. Click **Procurement Sample (STPPS1)**.
 - ___ j. Create two new snapshots, called: Procurement Sample v2 and Procurement Sample v3
- ___ 2. Activate the snapshots. Remember, If you want exposed library items within particular snapshots to display in Process Portal while those items are being developed in (and reside on) the Process Center server, you need to activate the snapshot.
- ___ a. Click the **Process Apps** tab.
 - ___ b. Click **Hiring Sample (HSS)**.
 - ___ c. You can activate snapshots to receive and process requests. If you want exposed library items within particular snapshots to display in Process Portal while those items are being developed in (and are stored on) the Process Center Server, you need to activate the snapshot. Activate the snapshot that contains the version of the items that you want to display. When you activate a snapshot on the Process Center server, it is considered deployed on that server. Exposed BPDs and data from the current working version (tip) are always available. Activation is required only when you want to access a snapshot version of an item or data that is stored on the Process Center Server.
Click the drop-down menu for **Responsive Hiring Sample v2** and select **Activate**.
 - ___ d. Click the drop-down menu for **Responsive Hiring Sample v3** and select **Activate**.
 - ___ e. Click the **Process Apps** tab.
 - ___ f. Click **Procurement Sample (STPPS1)**.
 - ___ g. Click the drop-down menu for **Procurement Sample v2** and select **Activate**.

- h. Click the drop-down menu for **Procurement Sample v3** and select **Activate**. You can see two snapshots that are deployed to the Process Center Server, snapshots v2 and v3.

Snapshot	Created on	By	Status
Current	5/24/16	pcdeadmin	Not Yet Deployed to Process Center Server
Procurement Sample v3 (PSV3)	6/23/16	pcdeadmin	Not Yet Installed to Process Server
Procurement Sample v2 (PSV2)	6/23/16	pcdeadmin	Not Yet Installed to Process Server
Procurement Sample v8570 (PSV8570)			

The Procurement Sample demonstrates the integration between a BPEL process and a BPD. It is a BPEL process application that has advanced content from Integration Designer but also contains artifacts from Process Designer. In this case, you have Advanced content in Process Center.

For every process application or toolkit in Process Center that contains a module or library, either directly or inherited through a toolkit, a business-level application (BLA) is created for the current snapshot. A BLA is also created for every named snapshot of process applications that contain advanced content. Within those BLAs, every module or library produces an EAR that is an asset within it. These BLAs are created on demand, either when doing a playback from Process Designer or when publishing to Process Center from Integration Designer, and remain until the process application or toolkit is deactivated. You need to have a strategy for deleting the business-level applications and EARs created in the Process Center environment. As you create toolkits with advanced content, use those toolkits from process applications, and snapshot the toolkits and process applications, this advanced content can quickly accumulate. As the advanced content accumulates, it affects server start time, memory consumption, and general performance.



Information

If you have other snapshots that are deployed and you activate more snapshots, you see that a yellow warning triangle appears next to each of the snapshots. If you hover your mouse over the triangle, you can see the details.

Procurement Sample (STPPS1) ★ Snapshots History

Current Last changed on 7/18/16 by pcdeadmin
Not Yet Installed to Process Server

Procurement Sample v3 (PSV3) (New)
Created on 7/21/16 by pcdeadmin
Not Yet Installed to Process Server

Procurement Sample v2 (PSV2) (New)
Created on 7/21/16 by pcdeadmin
Not Yet Installed to Process Server

Procurement Sample v8570 (PSV8570) (New)
Created on 7/18/16 by pcdeadmin
Not Yet Installed to Process Server

-
- ___ i. Click **Deployed** in the **Sort Snapshots** menu. The snapshots that are deployed are listed on this page. It might take a few minutes to complete the deployment.
 - ___ j. Log out of the Process Center Console.
- ___ 3. Examine the applications by using the administrative console.
- ___ a. In the web browser, go to the following URL:
`http://bpmhost:9060/ibm/console`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

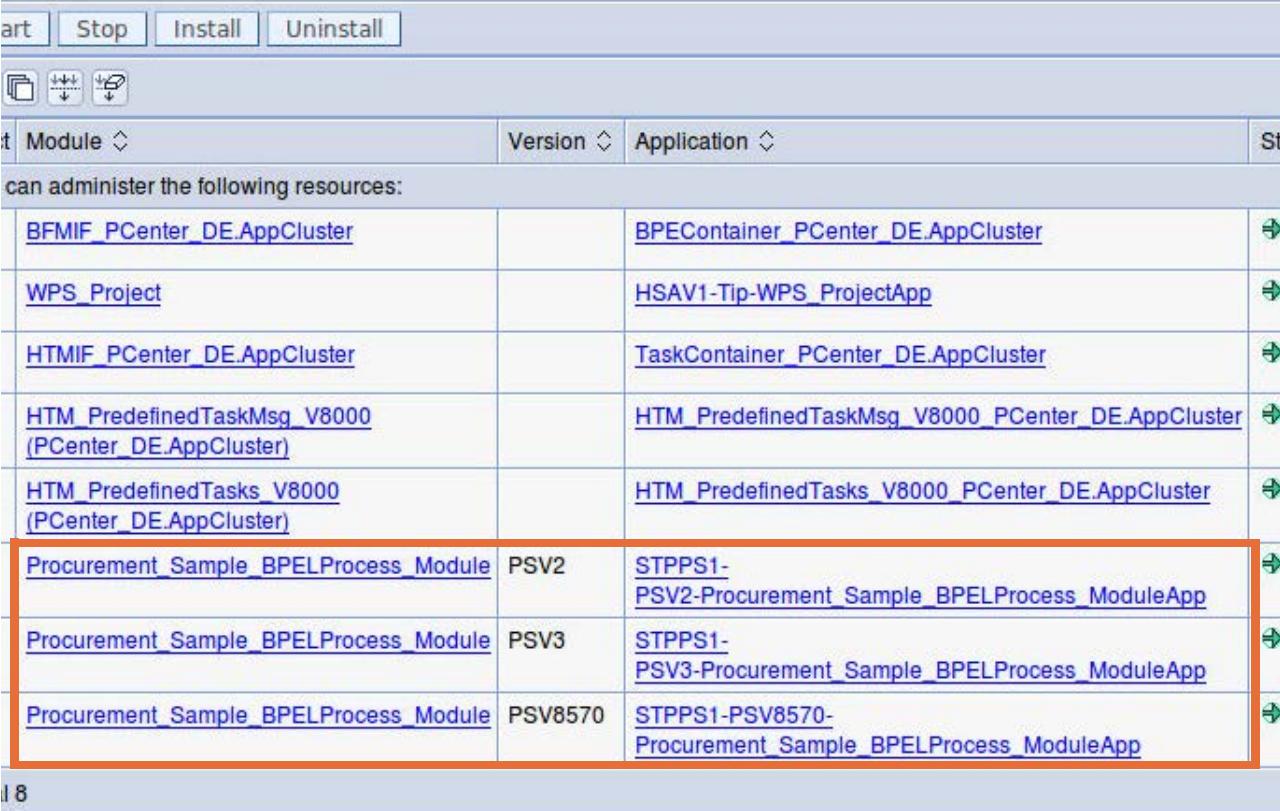
- ___ c. Click **Applications > SCA modules**. You can see the Procurement_Sample_BPELProcess_Module SCA modules that are installed and the associated applications are as follows:

- Version 1 is STPPS1-PSV8570-Procurement-Sample_BPELProcess_ModuleApp
- Version 2 is STPPS1-PSV2-Procurement-Sample_BPELProcess_ModuleApp
- Version 3 is STPPS1-PSV3-Procurement-Sample_BPELProcess_ModuleApp

modules

This page shows all installed Service Component Architecture (SCA) modules and their associated applications. SCA modules encapsulate services, so you can make changes to services without affecting users of the service. To use the SCA module services you start the associated application.

preferences



Module	Version	Application	Actions
can administer the following resources:			
BFMIF_PCenter_DE.AppCluster		BPEContainer_PCenter_DE.AppCluster	
WPS_Project		HSAV1-Tip-WPS_ProjectApp	
HTMIF_PCenter_DE.AppCluster		TaskContainer_PCenter_DE.AppCluster	
HTM_PredefinedTaskMsg_V8000 (PCenter_DE.AppCluster)		HTM_PredefinedTaskMsg_V8000_PCenter_DE.AppCluster	
HTM_PredefinedTasks_V8000 (PCenter_DE.AppCluster)		HTM_PredefinedTasks_V8000_PCenter_DE.AppCluster	
Procurement_Sample_BPELProcess_Module	PSV2	STPPS1- PSV2-Procurement_Sample_BPELProcess_ModuleApp	
Procurement_Sample_BPELProcess_Module	PSV3	STPPS1- PSV3-Procurement_Sample_BPELProcess_ModuleApp	
Procurement_Sample_BPELProcess_Module	PSV8570	STPPS1-PSV8570- Procurement_Sample_BPELProcess_ModuleApp	

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STPPS1-PSV8570-Procurement-Sample_BPELProcess_ModuleApp was deployed in an earlier exercise.

- ___ d. Click **Applications > Application Types > Business-level applications**. Click to go to page 2 to see the Procurement Sample applications listed.
- ___ e. Log out of the administrative console.
- ___ 4. Archive snapshots by using the Process Center Console.
- ___ a. In the web browser, go to the following URL:
`http://bpmhost:9080/ProcessCenter`
- ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ c. Click **Hiring Sample (HSS)**.

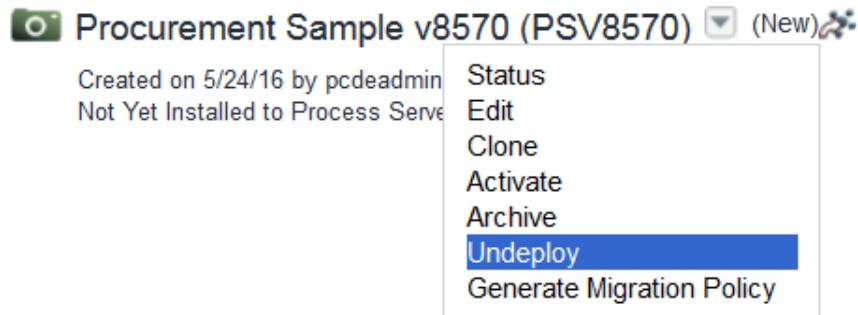
- ___ d. You can archive individual named snapshots instead of archiving the entire project and all of its snapshots. Again, the archive does not delete the snapshot; it merely marks it and hides it from the default view.

Since you have multiple snapshots for the Hiring Sample application, it is a good idea to examine whether all the snapshots are needed. If the snapshots are no longer needed, you can delete the snapshots to remove them from the repository. The Responsive Hiring Sample v2 can be considered obsolete. The snapshot is older than the current snapshot v3 and is no longer needed, so you can now archive it. Click the drop-down menu for **Responsive Hiring Sample v2** and select **Archive**.

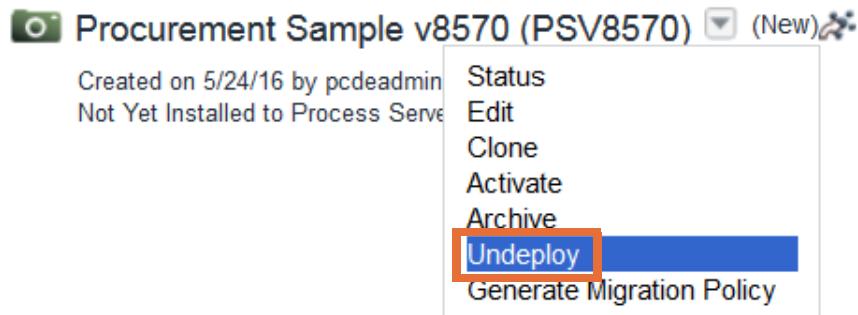
- ___ e. Select **Archive** in the Archive Snapshot “Responsive Hiring Sample v2” dialog box to confirm the archive.
- ___ f. When the snapshot is archived, it is removed from the current view. To view the archived snapshot, select **Archived** from the **Sort Snapshots** menu.

- ___ g. Click the **Process Apps** tab.
- ___ h. Click **Procurement Sample (STPPS1)**. Remember, the Procurement Sample process application contains Advanced content, for example SCA modules and BPEL processes.
- ___ i. You typically need the business-level applications only for the current snapshot of a process application. Here you have two named snapshots that are deployed. To remove the Advanced content and the associated business-level applications, you need to undeploy the snapshot. To undeploy a snapshot that contains Advanced content, you click the drop-down menu and select **Undeploy**. If the process application uses BPEL processes, the associated process instance data is cleaned up from the database before the snapshot is undeployed.

To delete named snapshots that contain Advanced content, you must first deactivate the snapshot. Deactivating allows all existing instances to complete processing, but no new requests are processed. Click the drop-down menu for **Procurement Sample V8570**. You can see from the options that this snapshot is not already deactivated. After you deactivate the snapshot, you see the option to Undeploy the snapshot in the drop-down menu.



- ___ j. Click **Undeploy**. The undeploy process also removes the business-level application. Wait until the process application completes the undeploy process.



- ___ k. Click the drop-down menu for **Procurement Sample V8570** and select **Archive**.
- ___ l. Select **Archive** in the Archive Snapshot "Procurement Sample v8570" window to confirm the archive.
- ___ m. Click the drop-down menu for **Procurement Sample v2** and select **Archive**. Click **Archive** in the Archive Snapshot "Procurement Sample v2" window to confirm the archive. In this example, archival of the process application causes the snapshot to be deactivated and undeployed. It removes the business-level application and archives the snapshot. Since the snapshot is on the Process Center server, the archival causes the uninstallation of BPEL and causes any instances to be deleted. If you have running business-level applications on a Process Server, you might need to complete more actions. Wait until the archive process completes.

- ___ n. Click **Deployed** in the Sort Snapshots menu. Only the Procurement Sample v3 snapshot is deployed.

Procurement Sample v3 (PSV3) (New)

Created on 6/23/16 by pcdeadmin
Not Yet Installed to Process Server

- ___ o. Click **Archived** in the Sort Snapshots menu to verify the archived snapshots, which include Procurement Sample V8570 and Procurement Sample v2.

Procurement Sample v2 (PSV2) (New)

Created on 6/23/16 by pcdeadmin
Not Yet Installed to Process Server

Procurement Sample v8570 (PSV8570) (New)

Created on 5/24/16 by pcdeadmin
Not Yet Installed to Process Server



Information

There is no command line method for archiving snapshots. You can archive snapshots by using the Process Center Console only.

To deactivate a running process application snapshot on the Process Center server or a Process Server, you can also use the `BPMDeactivate` command. You must be sure to run this command on the node that contains the application cluster member that handles Process Server or Process Center applications.

To undeploy a process application snapshot from a server, you can use the `BPMUndeploy` command. It is available only if the snapshot contains Advanced Integration services and has a corresponding business-level application (BLA) deployed on the server. Undeploying the snapshot removes any Service Component Architecture (SCA) modules, monitor models, and business-level applications that are associated with the snapshot. When you enter the `BPMUndeploy` command on the Process Center server, all active BPEL instances that are associated with the advanced content that is being undeployed is removed. Again, you must be sure to run this command on the node

that contains the application cluster member that handles Process Server or Process Center applications.

- ___ p. Log out of the Process Center Console.
- ___ 5. Examine the business-level applications by using the administrative console.
- ___ a. In the web browser, go to the following URL:
`http://bpminst01:9060/ibm/console`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ c. Click **Applications > SCA modules**. You can see that only one module is listed for the Procurement Sample.

SCA modules

This page shows all installed Service Component Architecture (SCA) modules and their associated applications. SCA module services, so you can make changes to services without affecting users of the service. To use the SCA module services you start the associated application.

[+] Preferences



The screenshot shows a table with columns: Select, Module, Version, Application. The last row, which corresponds to the highlighted item in the list below, has its entire row highlighted with a red box. The table also includes a header row with sorting icons and a note at the top: "You can administer the following resources:".

Select	Module	Version	Application
You can administer the following resources:			
<input type="checkbox"/>	BFMIF_PCenter_DE.AppCluster		BPEContainer_PCenter_DE.AppCluster
<input type="checkbox"/>	WPS_Project		HSAV1-Tip-WPS_ProjectApp
<input type="checkbox"/>	HTMIF_PCenter_DE.AppCluster		TaskContainer_PCenter_DE.AppCluster
<input type="checkbox"/>	HTM_PredefinedTaskMsg_V8000 (PCenter_DE.AppCluster)		HTM_PredefinedTaskMsg_V8000_PCenter_DE.AppCluster
<input type="checkbox"/>	HTM_PredefinedTasks_V8000 (PCenter_DE.AppCluster)		HTM_PredefinedTasks_V8000_PCenter_DE.AppCluster
<input type="checkbox"/>	Procurement_Sample_BPELProcess_Module	PSV3	STPPS1- PSV3-Procurement_Sample_BPELProcess_ModuleApp
Total 6			

- ___ d. Click **Procurement_Sample_BPELProcess_Module**.

- ___ e. Examine the General Properties for the module. Under Additional Properties, click **Business processes**. There is one business process, ReplenishmentBPEL, in the Started state.

[**SCA modules > Procurement_Sample_BPELProcess_Module > Business processes**](#)

This panel is used to start and stop business processes. Generally, configuration changes take effect after you restart the server, but this panel updates both the configuration and the status of the business processes on each running server without the need for the servers to be restarted. Each server and cluster that has this business process installed must be running.

+ Preferences

		Start	Stop
Select	Name	Valid from time	Status
You can administer the following resources:			
<input type="checkbox"/>	ReplenishmentBPEL	Thursday, June 23, 2016 1:16:08 PM EDT	Started
Total 1			

- ___ f. Click **Procurement_Sample_BPELProcess_Module** in the breadcrumb trail at the top of the page.
- ___ g. Under Additional Properties, click **Human tasks**. There is one business process, Replenishment_InvocationTask, and it is in the Started state.

[**modules > Procurement_Sample_BPELProcess_Module > Human tasks**](#)

This panel is used to start and stop human tasks, which are defined as part of a business process. Generally, configuration changes take effect after you restart the server, but this panel updates both the configuration and the status of the task on each running server without requiring the servers to be restarted. Each server and cluster that has this task installed must be running.

references

		Start	Stop	
Select	Name	Valid from time	Namespace	Status
You can administer the following resources:				
<input type="checkbox"/>	Replenish_InvocationTask	Thursday, June 23, 2016 1:16:07 PM EDT	http://Procurement_Sample_BPELProcess_Module	Started
Total 1				

- ___ h. Click **Procurement_Sample_BPELProcess_Module** in the breadcrumb trail at the top of the page.

- ___ i. Under Related Items, click **Deployment targets**. This page indicates that the module is deployed to PCenter_DE.AppCluster and the application status is Started.

SCA modules > Procurement Sample BPELProcess Module > Target specific application status

Use this page to view a mapping of a deployed object, such as an application or module, into a target server or cluster environment. This page displays the status of the enterprise application or module on each server or cluster.

Select	Target	Node	Version	Auto Start	Application Status
<input type="checkbox"/>	PCenter DE.AppCluster	Not applicable	Not applicable	Yes	

Total 1

- ___ j. Click **Applications > Application Types > Business-level applications**. Click to go to page 2 to see only the STPPS1-PSV3 application listed.
 ___ k. Log out of the administrative console.

Part 2: Working with process applications

To have a number of instances that are running, you use both Business Process Choreographer Explorer and Process Portal to start a few tasks. The instances are also used to create data that you can monitor by using the Process Admin Console in a later section of this exercise.

- ___ 1. Work with the process application by using Business Process Choreographer Explorer. Since this application contains a BPEL process, you can use the Business Process Choreographer Explorer or Business Space to interact with the application.
- ___ a. Start the Business Process Choreographer Explorer application. In the web browser, go to the following URL:
`http://bpmhost:9080/bpc`
- ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ c. Under Process Templates, click **Currently Valid**. A couple of process templates are listed. You can see the ReplenishmentBPEL template from the Procurement Sample v3 snapshot.
- ___ d. Click **ReplenishmentBPEL**. On the right, you can see the details of the process app and snapshot information.
- ___ e. Click **Start Instance**.
- ___ f. Enter the following values:
- **Process Name:** Replenish_Test_222
 - **orderId:** OID_222

- **partNumber:** PN_222
 - **orderAmount:** 222
- Click **Submit**.
- ___ g. Select the **ReplenishmentBPEL** check box and click **Instances**.
- ___ h. You can see the `Replenish_Test_222` process instance that is running. Scroll to the right to examine the snapshot information.

- ___ i. Click **Replenish_Test_222**. On the **Details** tab, you can see that the starter of the instance is `pcdeadmin`, the deployment environment administrator.
- ___ j. Click the **Activities** tab. There are two activities in the `Finished` state and one activity, the `ApproveReplenishmentOrder` activity, is running.
- ___ k. Click **Currently Valid**.
- ___ l. Select the **ReplenishmentBPEL** check box and click **Start Instance**.
- ___ m. Enter the following values:
- **Process Name:** `Replenish_Test_333`
 - **orderID:** `OID_333`
 - **partNumber:** `PN_333`
 - **orderAmount:** 333
- Click **Submit**.
- ___ n. Log out of Business Process Choreographer Explorer.
- ___ 2. Work with the Hiring Sample process application by using Process Portal.
- ___ a. Start the Process Portal console. In the web browser, go to the following URL:
`http://bpmhost:9080/ProcessPortal`
- ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ c. When you log in, you see the Work dashboard for Process Portal. There are two tasks for `ApproveReplenishmentOrder` due today. On the navigation on the left, click **Standard HR Open New Position**.
- ___ d. The “Task: Submit requisition” window opens in the Work area. Enter the following details:

- **Employment type:** Full-time
 - **Department:** Finance
 - **Planned starting date:** Select a date one week in the future (for example, if today is May 22, select May 29)
 - **Location:** Atlanta
 - **Position type:** New (scroll to the right to see the field)
- ___ e. Under Qualifications, click **Next**.
- ___ f. Scroll to the bottom and click **Submit**.
- ___ g. On the navigation on the left, click **Standard HR Open New Position**.
- ___ h. The “Task: Submit requisition” window opens in the Work area. Select any details from the drop-down menus as you did in the prior step. Make sure that you select a planned starting date one week in the future.
- ___ i. Under Qualifications, click **Next**.
- ___ j. Scroll to the bottom and click **Submit**.
- ___ 3. Explore the Team Performance dashboard.
- ___ a. In the navigation on the left, click **Team Performance**. From here, you see a summary dashboard for all the teams available in the deployment environment.
- ___ b. View the statistics under GeneralManagers. You can see that there are no overdue or at risk tasks, but two tasks are on track.



- ___ c. Click **GeneralManagers** to see the detailed dashboard for the team. You are placed on the **Overview** tab where you get quick statistics on the tasks. You can see the tasks on track, open, and completed. You can also see the roster and assigned tasks.
- ___ d. Click the graphical box in the Turnover Rate section. A window opens showing the statistics for the tasks.
- ___ e. Click the **Team Tasks** tab. You can see and manage all the tasks that are assigned to the team, or already claimed by individuals of the team. You can also go back and forth in time, and select to focus on tasks due on certain days.

- ___ f. As a process runs, the history and state of that process is written to the database used by IBM for internal and operational purposes. It is that data that is used to populate the Process Performance dashboard. On the navigation on the left, click **Process Performance**. From here, you can get details on the performance of the ReplenishmentBPD and Standard HR Open New Position processes. Both have tasks that are on track.
 - ___ g. Click **ReplenishmentBPD** to get details on statistics and instances in progress.
 - ___ h. Log out of Process Portal. Minimize the browser window.
-



Information

You can use Process Portal to monitor your environment in various ways, and there are also other monitoring tools you can use. Process Portal should be used when you want to monitor the following items:

- Visibility with actions into in-flight task and process instances
 - Instance and task completion alerts
 - Process instance critical path analysis
 - Social features for processes and tasks
 - Simple SQL historical reports against the Performance Data Warehouse database that is embedded in coaches or dashboards
-

Part 3: Deleting snapshots in the environment

You can delete specific unnamed snapshots or archived snapshots by using the `BPMSnapshotCleanup` command. Deleting these snapshots that are not used or needed is good for performance for several reasons. You might want to delete unneeded snapshots to reduce the size of the Process Center database. If you have many projects in development, you are likely to find that the Process Center database is growing rapidly. One action that you can take is to remove unnamed snapshots and reduce database bloat. You can also delete archived snapshots for the same purpose.

You might also want to delete unnamed snapshots if your Process Center server performance is slowly degrading. Having hundreds or thousands of unnamed snapshots on the server might contribute to worsening performance. Delete snapshots that are not used or needed.

In many situations, it is a good idea to purge unneeded snapshots on a regular schedule. To avoid performance degradation or timeouts in Process Designer, run the `BPMSnapshotCleanup` command when no operations are running on the Process Center and no connections are open between the Process Designer and the Process Center.

Also, if you try to delete too many snapshots in a single run of the command, it might lead to connector timeout errors or “database transaction log full” errors. While settings for the command can be increased to accommodate larger batches of deletions, experimentation with smaller batches should be attempted first.

- ___ 1. Delete snapshots by using the `BPMSnapshotCleanup` command.
 - ___ a. Open a terminal window and change to the
`/opt/IBM/BPM/profiles/PCenterCustom/logs/PCenter_DE.AppCluster.member1`
 directory.
 - ___ b. Tail the `SystemOut.log` file to observe the output in the file. While you observe the log file, you can see the details about the changes made. Tail the file by using the following command:
`tail -f SystemOut.log`
 - ___ c. Open another terminal window and change to the
`/opt/IBM/BPM/profiles/PCenterDmgr/bin` directory.

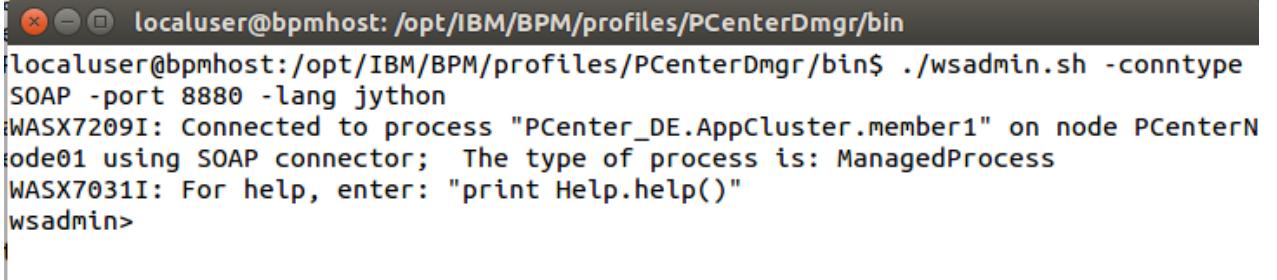


Hint

To open another terminal window, right-click the terminal window icon, and click **New Terminal**.

- ___ d. Enter wsadmin interactive mode by using the Jython scripting language; enter the following command:

```
./wsadmin.sh -conntype SOAP -port 8880 -lang jython
```



```
localuser@bpghost: /opt/IBM/BPM/profiles/PCenterDmgr/bin
localuser@bpghost:/opt/IBM/BPM/profiles/PCenterDmgr/bin$ ./wsadmin.sh -conntype
SOAP -port 8880 -lang jython
WASX7209I: Connected to process "PCenter_DE.AppCluster.member1" on node PCenterN
ode01 using SOAP connector; The type of process is: ManagedProcess
WASX7031I: For help, enter: "print Help.help()"
wsadmin>
```

In a network deployment environment, you use the port that is configured for the application cluster member, PCenter_DE.AppCluster.member1, that runs the Process Center applications.

- ___ e. List all process applications and toolkits on a Process Center server by entering the following command:

```
print AdminTask.BPMListProcessApplications()
```

When you list the process applications, you see the name, acronym, description, and toolkit information on each process application. Note the acronym HSS for Hiring Sample and STPPS1 for Procurement Sample.



Hint

You can add the Jython print statement before the command when you want to see formatted output.

- ___ f. Determine whether the snapshots exist for a process application by using the BPMShowProcessApplication command. Show information about the Hiring Sample process application and get a list of the snapshots by entering the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
```

The output shows a list of snapshots that show the name, acronym, state, number of running instances, capability, and other details about each snapshot. Examine the output to find the acronym name for the snapshots. You can see that the state for RHSV8_1 is inactive, RHSV2 is archived, and RHSV3 is active. Notice that the capability for the snapshots in the Hiring Sample is for the Standard runtime.

- ___ g. To see details about a particular snapshot, RHSV2, which is archived, enter the following command:

```
print AdminTask.BPMShowSnapshot('[-containerAcronym HSS
-containerSnapshotAcronym RHSV2 -containerTrackAcronym Main]')
```

The BPMShowSnapshot command helps you determine the status of the snapshot, such as whether it is the default snapshot and whether it is active with running instances. The output shows details about the snapshot, which include any dependencies.

- ___ h. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- ___ i. The `BPMSSnapshotCleanup` command can be used to delete unnamed and archived snapshots or a process application on a Process Center server. However, you cannot delete the first snapshot of a process application. The first snapshot contains original information about the snapshot that is displayed in the history pane in Process Designer.



Information

You can delete unnamed snapshots and archived snapshots by using the same `BPMSSnapshotCleanup` command with different optional parameters. You can also delete snapshots in batches for better performance. Optional parameters include the following parameters:

- `containerTrackAcronym`: Identifies the acronym of the track that contains the snapshots to be deleted. Basically, where are the snapshots to be deleted.
- `containerSnapshotAcronyms`: Identifies the acronyms for the set of archived snapshots to be deleted. If you use this parameter, you cannot specify other parameters.
- `keptNumber`: Provides an integer to identify the number of unnamed snapshots to keep when a snapshot cleanup is run. The most recent snapshots are kept, and the tip snapshot is not counted. If `keptNumber` is greater than or equal to the total number of unnamed snapshots, no snapshots are deleted. If `keptNumber` is equal to zero, all the unnamed snapshots are deleted except the tip.
- `createdBeforeLocal`: Specifies a local time value in string format for filtering unnamed snapshots by the date they were created. Unnamed snapshots are deleted if they are created before the specified time.
- `createdAfterLocal`: Specifies a local time value in string format for filtering unnamed snapshots by the date they were created. Unnamed snapshots that are created after the specified time are deleted.
- `createdBeforeSnapshotAcronym`: Specifies the acronym of a named snapshot. Unnamed snapshots are deleted if they are created before the specified snapshot.
- `deleteArchivedSnapshot`: Optional parameter that specifies whether the archived named snapshot is deleted with the snapshots that are identified by other parameters. The value is set to true to delete both archived and unnamed snapshots in one command.

You must set at least one of the optional parameters such as `containerSnapshotAcronyms`, `keptNumber`, `createdBeforeLocal`, `createdAfterLocal`, or `createdBeforeSnapshotAcronym` as the filter for the `BPMSSnapshotCleanup` command.

To delete unnamed snapshots, enter the following command:

```
print AdminTask.BPMSSnapshotCleanup( '[ -containerAcronym HSS
-containertTrackAcronym Main -keptNumber 10 ]' )
```

The output indicates the `BPMSSnapshotCleanup` command that is passed and indicates to refer to the `SystemOut.log` file.

- ___ j. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file. Since there are no unnamed snapshots, the log indicates it cannot find any snapshot that the parameters specify, and no snapshots are deleted. You can also search the log file by using the phrase “`snapshotCleanup Entering`” to see specific output.
- ___ k. To delete a specified archived snapshot but not its dependencies, enter the following command:

```
print AdminTask.BPMSSnapshotCleanup( '[ -containerAcronym HSS
-containerTrackAcronym Main -containerSnapshotAcronyms RHSV2
-ignoreDependency true ]' )
```

The output indicates the `BPMSSnapshotCleanup` command that is passed and indicates to refer to the `SystemOut.log` file.

- ___ l. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file. The output indicates that the total number of snapshots to be deleted is one in the transaction. It also lists specific details about the snapshot, such as the process application name. You can also search the log file by using the phrases `snapshotCleanup Entering` or `BPMSSnapshotCleanup` to see specific output.
- ___ m. Show information about the Hiring Sample Advanced process application, and get a list of the snapshots by entering the following command:

```
print AdminTask.BPMSShowProcessApplication( '[ -containerAcronym HSS ]' )
```

The output indicates that there are now only two snapshots, one inactive and one active, and two running instances (tip).

- ___ n. Show information about the Procurement Sample process application and get a list of the snapshots by entering the following command:

```
print AdminTask.BPMSShowProcessApplication( '[ -containerAcronym STPPS1 ]' )
```

The output shows a list of snapshots that shows the name, acronym, state, number of running instances, capability, and other details about each snapshot. You can see that the state for Procurement Sample PSV8570 and v2 is archived, and v3 is active with two running instances. Notice that the capabilities for the snapshots in the Hiring Sample are for the Advanced runtime.

- ___ o. Earlier, you used two commands to delete unnamed and archived snapshots. However, this process can also be done by using a single command. To delete both unnamed and archived snapshots together, you can use the following command:

```
print AdminTask.BPMSSnapshotCleanup( '[ -containerAcronym STPPS1
-containerTrackAcronym Main -keptNumber 0 -deleteArchivedSnapshot true ]' )
```

The `keptNumber` value of 0 indicates to delete all unnamed snapshots except the tip. After running this command, observe the snapshot cleanup log entries in the `SystemOut.log` file. The output shows that one snapshot is deleted and identifies the snapshots from the Procurement Sample process application, Procurement Sample v2. Snapshot PSV8570 is still there as you cannot delete the first snapshot in the branch.

- p. Show information about the Procurement Sample process application and get a list of the snapshots by entering the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym STPPS1]')
```

The output no longer lists Procurement Sample v2.

- q. Press Ctrl+c at the tail of the `SystemOut.log` file and exit the terminal window.

- r. Exit out of wsadmin.

- 2. Delete unnamed snapshots by using an automated method.

You can configure Process Center to automatically delete unnamed snapshots that you no longer need to keep on the server. With a certain set of configuration options in the `100Custom.xml` file, you can automatically delete unnamed snapshots. You add a number of lines about the behavior of the snapshot cleanup process. The automated method of deleting unnamed snapshots is introduced in the 8.5.0.1 fix pack.

- a. To modify a Process Server configuration, you update the `100Custom.xml` file for the server. First, create a backup of the file. Change to the `/opt/IBM/BPM/profiles/PCenterDmgr/config/cells/PCenterCell/nodes/PCenterNode01/servers/PCenter_DE.AppCluster.member1/process-center/config` directory.



Information

Changes to the environment are made in the `100Custom.xml` file, which is the last file read. Changes in the `100Custom.xml` file override any of the settings in the other files.

The `100Custom.xml` file is replicated within each node folder. However, you do not have to modify these files. Only the files within the deployment manager profile require modification because the deployment manager synchronizes the `100Custom.xml` configuration file from the deployment manager profile to the affected nodes.

It is always a good idea to make a backup of the files that you are changing. However, when backing up these files, you must always either save the copies in a directory that is not in or under the `.../config` directory, or change the file extension of the copies from `.xml` to something else.

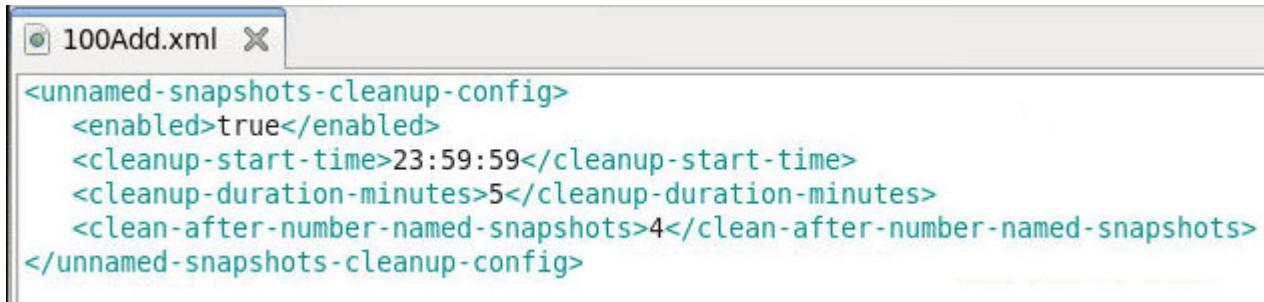
All of the files in the `.../config` directory that end in `.xml` are loaded when you start or restart the product. The XML files are loaded in a sequence where files that start with a letter of the alphabet are loaded before ones that start with numbers, which are loaded in numeric order. So any copies of XML configuration files that keep the `.xml` extension can cause unexpected behavior.

- b. List the contents of the directory and verify that the `100Custom.xml` file is there.
- c. Create a copy of the `100Custom.xml` file and name the copy `100Custom.bak`. Use the following command:

```
cp 100Custom.xml 100Custom.bak
```

- d. List the contents of the directory. Verify that both files exist.
- e. Open the `100Custom.xml` file. Use an editor such as vi or gedit.

- ___ f. Open another terminal window and change to the /opt/labfiles/ProcessCenter directory.
- ___ g. Open the 100Add.xml file. Use an editor such as vi or gedit. This file contains the entries that must be added to the 100Custom.xml file.



```
<unnamed-snapshots-cleanup-config>
<enabled>true</enabled>
<cleanup-start-time>23:59:59</cleanup-start-time>
<cleanup-duration-minutes>5</cleanup-duration-minutes>
<clean-after-number-named-snapshots>4</clean-after-number-named-snapshots>
</unnamed-snapshots-cleanup-config>
```

The entries in the file that are used include the following settings:

- **enabled**: Indicates whether to turn on the automatic deletion feature. The default setting is false.
- **cleanup-start-time**: Indicates the time of day when you want the automated snapshot deletion to run. Local computer time is used and the default time is midnight.
- **cleanup-duration-minutes**: Indicates the number of minutes that you want the process to run. The default duration is 5 minutes.
- **clean-after-number-named-snapshots**: Defines which snapshots you want to delete. The default setting is 4, which means that only unnamed snapshots that are older than the four most recent named snapshots are deleted.
- ___ h. Copy the entire text and paste it into the 100Custom.xml file. Paste the content after the --> and before the </properties> tag. The information that you paste into the file must be within the properties element.

```

        <keyname>soaprequester</keyname>
        </private-key>
        store type
        <keystore-type>JKS</keystore-type>
        <certificate>C:\ibm\kf\rtc\deploy2\AppServer\profiles
\StandAloneProfile\etc\ws-security\samples\client.cert</certificate>
        Also contains server1 cert
        </webservice-security>
    </server>
-->
<unnamed-snapshots-cleanup-config>
<enabled>true</enabled>
<cleanup-start-time>23:59:59</cleanup-start-time>
<cleanup-duration-minutes>5</cleanup-duration-minutes>
<clean-after-number-named-snapshots>4</clean-after-number-named-snapshots>
</unnamed-snapshots-cleanup-config>
</properties>
```

- ___ i. Save the configuration file. Close the configuration file when complete.
- ___ j. Exit the 100Add.xml file.

- ___ k. Exit the `100Custom.xml` configuration file. If using gedit to edit the file, remove any backup files created. A backup file has a ~ after the file name.
 - ___ l. You can see the results from the automated deletion process in the `SystemOut.log` file for `AppClustermember1`. However, since this process is to run at midnight, you can observe the output later. This section of the exercise was to show you how to configure the automated deletion method only.
-



Information

There are few points to keep in mind when using the automated method to delete unnamed snapshots. Automatic deletion:

- Never removes named snapshots. The process removes only unnamed snapshots.
 - Randomly chooses which process applications and toolkits to work on. Because of this random choice, you must specify a duration that is long enough to process all the active projects in your Process Center environment.
 - Removes unnamed snapshots in chunks of 100 to limit database contention. If the duration time expires before all the unnamed snapshots are removed, automatic deletion might not remove all the unnamed snapshots between two named snapshots.
 - Runs only when the server is up and running. If the server is down when the configured start time occurs, automatic deletion will not run until the next time the deletion feature is configured to start.
 - Makes intensive use of the database; therefore, you should run the process when other demands on the system are low. Running it during times of heavy use slows the response time for people that are using the system.
-

Part 4: Stopping the Process Center environment

It is important that you stop the Process Center environment. This environment is used in a later exercise. To help with system performance, the Process Center environment is stopped until it is used again.

- ___ 1. Start the deployment manager administrative console.
 - ___ a. Open a web browser and go to the following URL:
`http://bpminst1:9060/ibm/console`
 - ___ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ 2. Stop the deployment environment.
 - ___ a. From the administrative console, click **Servers > Deployment Environments**.
 - ___ b. Select the **PCenter_DE** check box, and click **Stop**. Wait a few moments for the deployment environment to stop before proceeding.
 - ___ c. Log out of the administrative console.
 - ___ d. Close the browser window.
- ___ 3. Stop the server processes.
 - ___ a. Open a terminal window and change to the `/opt/IBM/BPM/profiles/PCenterCustom/bin` directory
 - ___ b. Enter the following command to stop the node agent:
`./stopNode.sh`
Wait for the message that indicates that the node agent is stopped.
 - ___ c. Change to the `/opt/IBM/BPM/profiles/PCenterDmgr/bin` directory.
 - ___ d. Enter the following command to stop the deployment manager:
`./stopManager.sh`
Wait for the message that indicates that the deployment manager is stopped.
 - ___ e. Exit the terminal window.



Attention

Since the entire course configuration is on one computer, the Process Center processes are stopped to save system resources. Stop any processes in the Process Center cell that are still running.

End of exercise

Exercise review and wrap-up

This exercise examined the various methods of purging data in the Process Center environment.

Exercise 6. Configuring the Process Server environment

Estimated time

01:30

Overview

This exercise covers the creation of a Process Server cell. A Process Server production three cluster topology is created by using the IBM Business Process Manager Advanced Configuration Editor and the BPMConfig utility. The IBM Business Process Manager Advanced Configuration Editor is used to graphically modify a properties file. The BPMConfig utility is used to create profiles, the required databases and tables, and the three cluster deployment environment for a production environment.

Objectives

After completing this exercise, you should be able to:

- Use the IBM Business Process Manager Advanced Configuration Editor to create a deployment environment
- Customize a sample deployment environment properties file
- Generate a deployment environment by using the BPMConfig utility
- Start the deployment environment by using the BPMConfig utility
- Use the Health Center to verify the deployment environment
- Explore the deployment environment

Introduction

Process Server provides a single Business Process Manager runtime environment that can support a range of business processes, service orchestration, and integration capabilities.

You can use Process Server to run processes as you build them. Process Server runs processes and services that authors build by using the Authoring Environments. Process Server handles access to external applications for the process application, the coaches (the graphical user interfaces for process participants), and the business logic. Every process component is loaded and run in Process Server at run time.

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed

Exercise instructions

6.1. Creating the Process Server deployment environment

You can use the IBM BPM Configuration editor, an editor that is a browser-based interface, to modify a properties file that is used to create a typical network deployment environment. In this editor, you can graphically edit the configuration properties file that was exported from your source environment and then create a deployment environment that is based on the modified file. You can also start by using a sample properties file that contains all of the values that are used in the configuration of your deployment environment.

During configuration, you create the deployment environment, the required database tables, a new deployment manager profile, and custom profiles for managed nodes.

You can use the BPMConfig command to create the needed profiles separate from creating the deployment environment. It can also be used to extend a network deployment environment, for example, by adding more nodes to the environment.

In this exercise, the IBM BPM Configuration editor is used to modify a sample properties file. Then, the BPMConfig command is used to create the deployment manager, a custom node profile, and the Process Server deployment environment. During this process, database scripts are generated, which you must run to create the tables for the required databases.

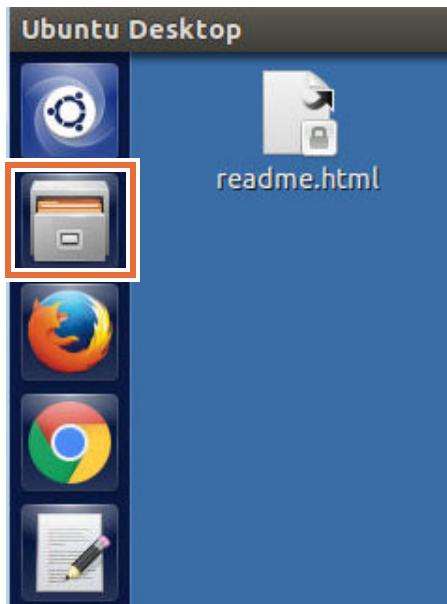
The BPMConfig utility is the suggested approach for building production environments in IBM Business Process Manager V8.5.7.

Part 1: Configuring and starting the IBM Configuration editor

The IBM BPM Configuration editor provides an easy way to graphically edit configuration properties files. Every IBM BPM installation provides a number of sample properties files that you can use as a starting point to create the different topologies that the product supports. The properties file contains all of the values that are used in the configuration of your deployment environment. Sample properties files are provided for you to copy and customize to configure your own environments. The properties file contains name-value pairs of configuration settings for IBM Business Process Manager deployment manager and managed node profiles and databases. The properties file provides input to the BPMConfig script, which runs during the configuration process to create the deployment environment and generate database scripts for creating the product databases.

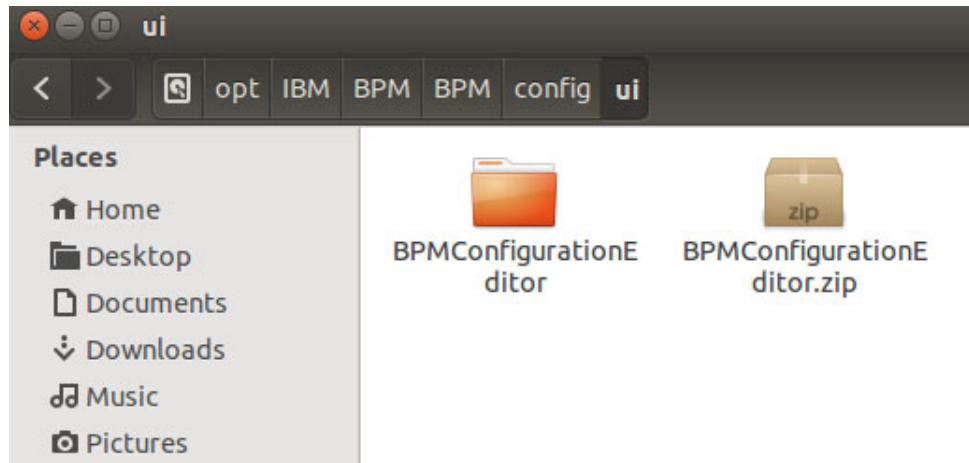
In this part of the exercise, IBM BPM Configuration editor is configured and started.

- ___ 1. Install the IBM BPM Configuration editor.
 - ___ a. Open Files (click the **Files** icon) and click **Computer**.



- ___ b. Change to the `/opt/IBM/BPM/BPM/config/ui` directory.

- ___ c. Right-click **BPMConfigurationEditor.zip** and click **Extract Here**. You now have the BPMConfigurationEditor directory.



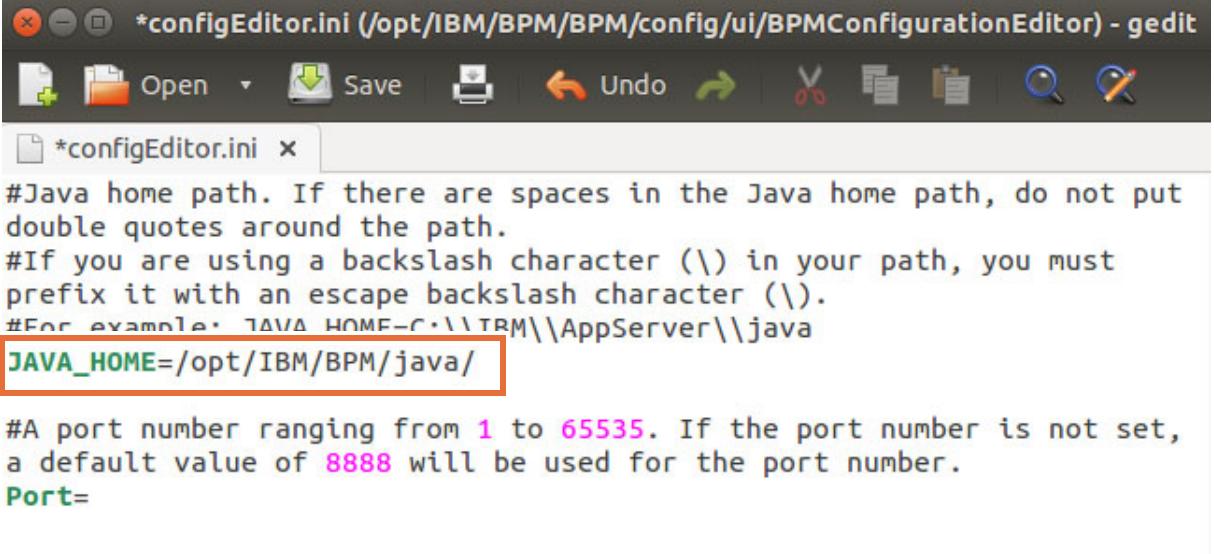
- ___ d. Close the File window.
- ___ e. Open a terminal window and change to the /opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor directory.
- ___ f. List the contents of the directory to see the sample properties files. Enter the following command to list the directory:

```
ls
```

```
localuser@bpghost: /opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor
localuser@bpghost:~$ cd /opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor/
localuser@bpghost:/opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor$ ls
bin          configEditor.bat configEditor.sh licenses share
configEditor configEditor.ini lib           public validation
localuser@bpghost:/opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor$
```

- ___ g. To configure the IBM BPMConfiguration editor, you must set the JAVA_HOME location in the configuration file. Open the configEditor.ini file by using an editor such as vi or gedit.

- __ h. Enter /opt/IBM/BPM/java/ for the JAVA_HOME location.



```
#Java home path. If there are spaces in the Java home path, do not put
double quotes around the path.
#If you are using a backslash character (\) in your path, you must
prefix it with an escape backslash character (\).
#For example: JAVA_HOME=C:\\IBM\\AppServer\\java
JAVA_HOME=/opt/IBM/BPM/java/

#A port number ranging from 1 to 65535. If the port number is not set,
a default value of 8888 will be used for the port number.
Port=
```

- __ i. Keep the port value default, which is 8888 if the value is not set in the file. Save and close the file when completed.



Information

You can optionally change the port that the editor uses. If you do not change the port, the default port 8888 is used. However, if you run the `configEditor` command and port 8888 is already being used by a different process, you receive the error message: `Error: listen EADDRINUSE`. If you receive the error, you can either stop the process that is already using port 8888, or you can specify a new port number in the `configEditor.ini` file (such as port 9999).

- __ 2. Examine the properties file.

- __ a. In the terminal window, change to the `/opt/IBM/BPM/BPM/samples/config/advanced` directory.

- ___ b. List the contents of the directory to see the sample properties files. Enter the following command to list the directory:

```
ls
```

```
localuser@bpghost:/opt/IBM/BPM/BPM/samples/config/advanced$ ls
Advanced-PC-SingleCluster-DB2.properties
Advanced-PC-SingleCluster-DB2zOS.properties
Advanced-PC-SingleCluster-Oracle.properties
Advanced-PC-SingleCluster-SQLServer.properties
Advanced-PC-SingleCluster-SQLServer-WinAuth.properties
Advanced-PC-ThreeClusters-DB2.properties
Advanced-PC-ThreeClusters-DB2zOS.properties
Advanced-PC-ThreeClusters-Oracle.properties
Advanced-PC-ThreeClusters-SQLServer.properties
Advanced-PC-ThreeClusters-SQLServer-WinAuth.properties
Advanced-PS-SingleCluster-DB2.properties
Advanced-PS-SingleCluster-DB2zOS.properties
Advanced-PS-SingleCluster-Oracle.properties
Advanced-PS-SingleCluster-SQLServer.properties
Advanced-PS-SingleCluster-SQLServer-WinAuth.properties
Advanced-PS-ThreeClusters-DB2.properties
Advanced-PS-ThreeClusters-DB2zOS.properties
Advanced-PS-ThreeClusters-Oracle.properties
Advanced-PS-ThreeClusters-SQLServer.properties
Advanced-PS-ThreeClusters-SQLServer-WinAuth.properties
localuser@bpghost:/opt/IBM/BPM/BPM/samples/config/advanced$
```



Information

Sample properties files are provided for configuring both Process Center and Process Server environments for both single and three-cluster configurations. To begin, you select the sample that most closely resembles the environment that you want to configure. Make sure for the exercise that you select the PS, Process Server, properties file.

- ___ c. Copy the `Advanced-PS-ThreeClusters-DB2.properties` file to the `/usr/labfiles/scripts` directory. Enter the following command to copy the file:
- ```
cp Advanced-PS-ThreeClusters-DB2.properties /opt/labfiles/scripts/
```
- \_\_\_ d. Change to the `/opt/labfiles/scripts` directory.
- \_\_\_ e. Open the `Advanced-PS-ThreeClusters-DB2.properties` file and examine the default settings. Open the file by using an editor such as `vi` or `gedit`.

The file is organized into sections that relate to the different types of environment characteristics. Most entries have default values, which you can modify to suit your

configuration. You can also see that a number of entries do not have values that are provided. If you do not provide a value for the property, that property is not configured.

```
Advanced-PS-ThreeClusters-DB2.properties x
#####
Deployment environment properties: De1
#####
bpm.de.name=De1
The type of product configuration: Express, Standard, Advanced, or
AdvancedOnly.
bpm.de.type=Advanced
The type of deployment environment: Process Center or Process Server.
bpm.de.environment=Process Server
Options: 'true' or 'false'. If false is specified, the database
schemas are created when the deployment environment is created. If true
is specified, the database schemas must be created manually using the
generated scripts, and the bootstrapProcessServerData script must be
run manually. When using DB2 for z/OS, the option must be set to true.
bpm.de.deferSchemaCreation=true
The context root prefix for all web modules in this environment. If
set, the context root prefix must start with a forward slash character
(/).
bpm.de.contextRootPrefix=
The virtualHost for all web modules in this environment. If a value
is not set for virtualHost, the default value 'default_host' is used.
bpm.de.virtualHost=
The environment name of the IBM Process Server. The environment name
is the name by which this Process Server environment will be known to
a Process Center user. When the Process Center connects with multiple
Process Servers, the psServerName of each Process Server should be
unique.
bpm.de.psServerName=De1ProcessServer
The purpose of this Process Server environment: Development, Test,
Staging, or Production.
bpm.de.psPurpose=Production
```

- \_\_\_ f. Examine the various default settings in the properties file. You can manually modify the values in the properties file that are appropriate for the production Process Server deployment environment, or you can use the IBM BPM Configuration editor. In this exercise, you use the IBM BPM Configuration editor.
  - \_\_\_ g. Continue to examine the various sections in the properties file. When completed, close the properties file.
- \_\_\_ 3. Start the IBM BPM Configuration editor.
- \_\_\_ a. In the terminal window, change to the /opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor directory.
  - \_\_\_ b. Change the mode bits on the files to make them executable. Enter the following command:
- ```
chmod 755 configEditor*
```

- ___ c. List the contents of the directory to see the mode bits on the files. Enter the following command:

```
ls -l
```

```
localuser@bpghost:/opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor
localuser@bpghost:/opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor$ chmod 755 configEditor*
localuser@bpghost:/opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor$ ls -l
total 40
drwxr-xr-x 2 localuser localuser 4096 Feb 25 10:03 bin
drwxr-xr-x 2 localuser localuser 4096 Feb 25 10:03 configEditor
-rwxr-xr-x 1 localuser localuser 901 Feb 25 10:03 configEditor.bat
-rwxr-xr-x 1 localuser localuser 440 Jun 3 12:47 configEditor.ini
-rwxr-xr-x 1 localuser localuser 890 Feb 25 10:03 configEditor.sh
drwxr-xr-x 5 localuser localuser 4096 Feb 25 10:03 lib
drwxr-xr-x 4 localuser localuser 4096 Feb 25 10:03 licenses
drwxr-xr-x 5 localuser localuser 4096 Feb 25 10:03 public
drwxr-xr-x 3 localuser localuser 4096 Feb 25 10:03 share
drwxr-xr-x 3 localuser localuser 4096 Feb 25 10:03 validation
localuser@bpghost:/opt/IBM/BPM/BPM/config/ui/BPMConfigurationEditor$
```

- ___ d. To start the IBM BPM Configuration editor, enter the following command:

```
./configEditor.sh &
```

- ___ e. The IBM BPM Configuration editor opens in a browser window and looks like the following screen capture:

IBM BPM Configuration Editor

Edit configuration properties for IBM Business Process Manager

The IBM BPM Configuration editor provides an intuitive interface for configuring your deployment environment. You can graphically edit a configuration properties file -- either a sample file or a file that has been exported from IBM BPM. After you have edited the properties file, you can use the BPMConfig command and modified properties to update your deployment environment or update an existing deployment environment.

Before you begin

1. Install the new version of IBM BPM on each machine in your cell.
2. Ensure that the following information is readily available:
 - The host name of each host in your new deployment environment
 - The WebSphere administrative passwords for your IBM BPM configuration
 - The host name for the database server that you will use
 - The database administrator names and passwords for each database
 - The host name and properties of the LDAP server (if referenced in the properties file)
3. If you want to add a new property, add it to the configuration properties file before you open the file in the editor.

Launch the IBM BPM Configuration editor

1. Click **Browse** to select a configuration properties file. You can select a sample configuration properties file that has been exported using the BPMConfig command.



2. Click **Open Editor** to launch the editor and configure the environment.



Information

The IBM BPM Configuration editor is a web-based application. You can also access the web application by using the following URL:

`http://bpminst1:8888/ibm/bpm/ConfigEditor`

When you start the IBM BPM Configuration editor, a log file is created to log events while running the editor. In the IBM BPM Configuration editor directory, the log file `BPMConfigEditor.log` is created. You can examine the log file to check the port number that is used by the editor or see whether there are errors during execution of the editor.

- ___ f. In the Launch the IBM BPM Configuration editor section, click **Browse** in step 1.

IBM BPM Configuration Editor

Edit configuration properties for IBM Business Process Manager 8.5.7.0

The IBM BPM Configuration editor provides an intuitive interface for configuring your deployment environment. Using the configuration editor, you can graphically edit a configuration properties file -- either a sample file or a file that has been exported from any supported version of IBM BPM. After you have edited the properties file, you can use the BPMConfig command and modified properties file to create a new deployment environment or update an existing deployment environment.

Before you begin

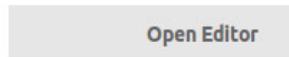
1. Install the new version of IBM BPM on each machine in your cell.
2. Ensure that the following information is readily available:
 - The host name of each host in your new deployment environment
 - The WebSphere administrative passwords for your IBM BPM configuration
 - The host name for the database server that you will use
 - The database administrator names and passwords for each database
 - The host name and properties of the LDAP server (if referenced in the properties file)
3. If you want to add a new property, add it to the configuration properties file before you open the file in the IBM BPM Configuration editor.

Launch the IBM BPM Configuration editor

1. Click **Browse** to select a configuration properties file. You can select a sample configuration properties file or a properties file that has been exported using the BPMConfig command.



2. Click **Open Editor** to launch the editor and configure the environment.



- ___ g. Browse to the /opt/labfiles/scripts directory and select the Advanced-PS-ThreeClusters-DB2.properties file. Click **Open**.
- ___ h. In step 2, click **Open Editor**.

- ___ i. The editor opens with the values for various entries in the properties file. The editor looks like the following window:

PSCell1		Topology		Security		Performance		System	
De1	CellDB	Dmgr host : Port number		Aliases		Bus			
	SharedDb	Dmgr							
	ProcessServ...	Host name : Port number		Host name : Port number					
	PerformanceDb	Node1		Node2					
	AppCluster [Application]		AppClusterMember1 2		AppClusterMember2 2				
	MECluster [Messaging]		MEClusterMember1 2		MEClusterMember2 2				
	SupCluster [Support]		SupClusterMember1 2		SupClusterMember2 2				



Information

The editor includes various tabs that you use to configure numerous components and settings. Some properties were automatically modified when you opened the sample properties file, and others require manual input. Components that are incorrectly configured are shaded gray. Properties that have missing or invalid values are surrounded with a red border and are flagged with a red exclamation mark icon. At the bottom of the editor is the Validation messages section, where you can correct incomplete or incorrect properties by clicking the messages in this table.

Part 2: Updating the properties for the Deployment Environment creation

In this part of the exercise, the `Advanced-PS-ThreeClusters-DB2.properties` file is customized to create a three-cluster Process Server deployment environment configuration. You use the IBM BPM Configuration editor to modify the values in the properties file that are appropriate for the production Process Server deployment environment.

- 1. Edit the configuration properties file by using the IBM BPM Configuration editor.
- a. In the editor, you are placed on the **Topology** tab. The **Topology** tab is where you edit the properties of all available components, such as cells, nodes, and deployment environments. The various properties are the default values listed in the sample properties file. You edit each of these properties to create a deployment environment that is tailored for your specific environment.

You can hover your mouse over any of the components to examine the details for that specific component. For example, hover your mouse over the **Aliases** component to see the details.

0 Process Server

The screenshot shows the IBM BPM Configuration editor interface. At the top, there are tabs for Security, Performance, Summary, and Save. The Save tab has a blue background. Below the tabs, there are several configuration sections. One section is titled "Configure the Topology" and contains a tooltip with the following text:

Configure the Topology

In the IBM BPM Configuration editor, the configuration properties are grouped into environments.

The tooltip also includes the following text:

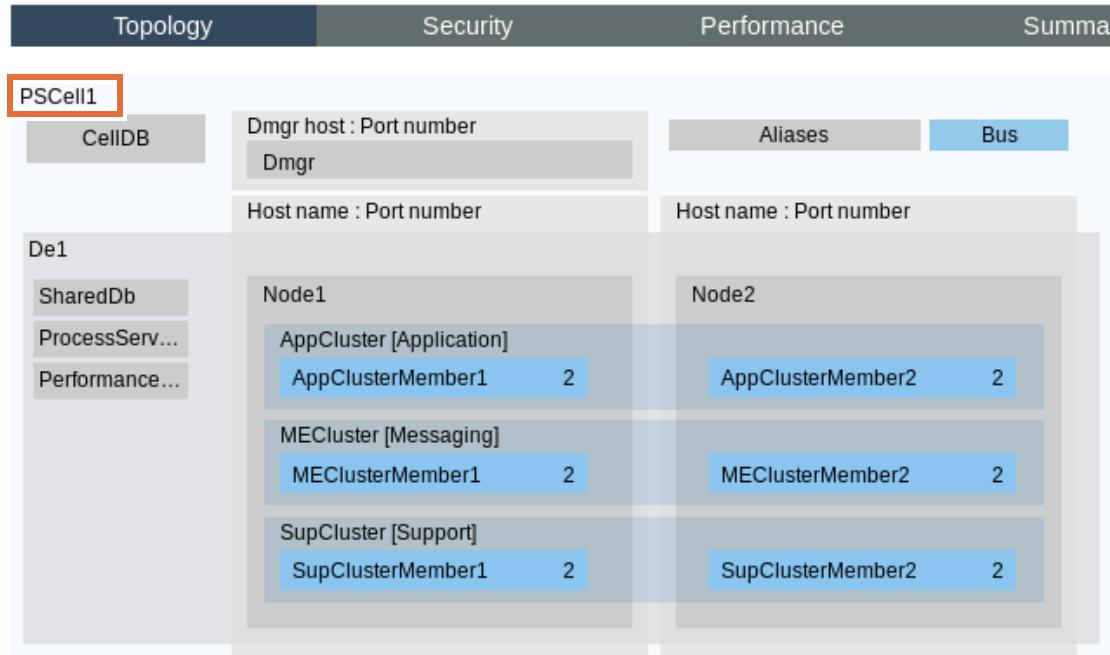
The authentication alias mappings. Click to map the deployment environment administrator alias, database administrator alias, and other aliases to users and passwords.

Below the tooltip, there is more text:

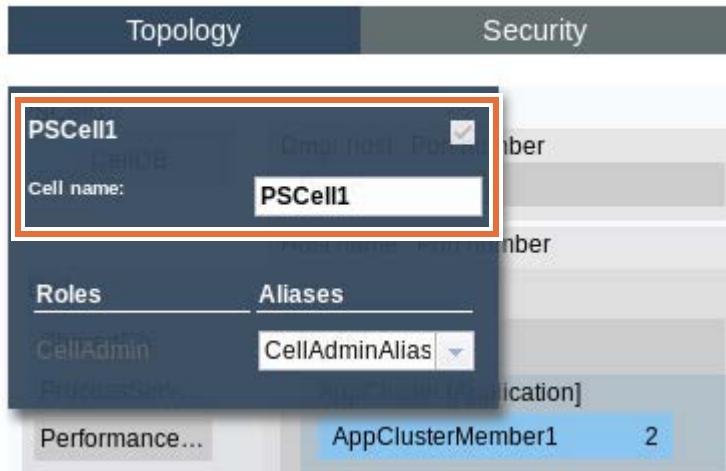
environments.

Some properties have been set, they can be modified and others require manual input.

- __ b. To edit a component, click the component to open it and edit the properties. Click the default cell name **PSCell1**.

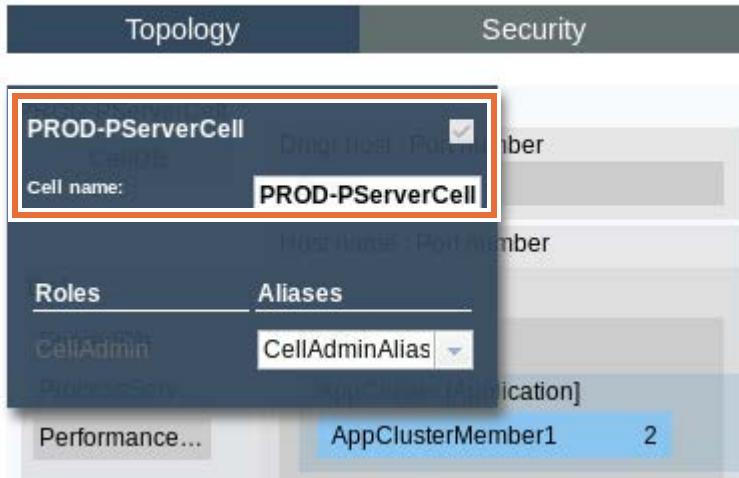


- __ c. The window opens, showing the default settings for the cell name that are found in the sample properties file. You can edit these settings with values specific to your environment.

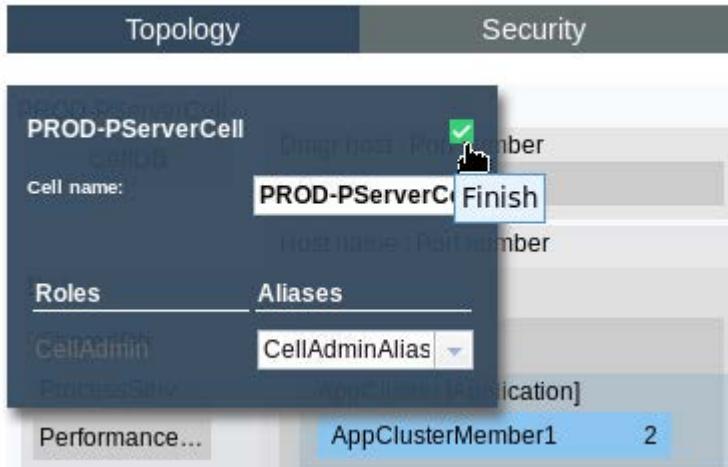


- __ d. For **Cell name**, enter: PROD-PServerCell

You can see that the cell name property is updated.



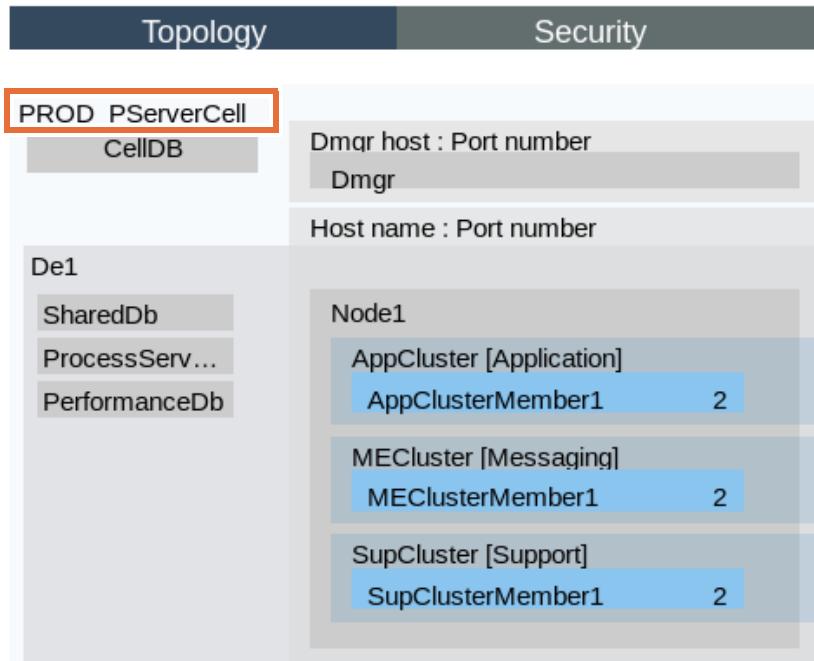
- e. Select the **Finish** check box next to the cell name to finish editing the properties, and close the cell editor.



Information

Changes that are made in the editor are automatically saved in memory. After making all the changes to the configuration file, the changes in memory can be saved to a file in the file system.

- ___ f. When you return to the main editor view, you can see that the cell name is updated. Below the cell name is the database properties section.

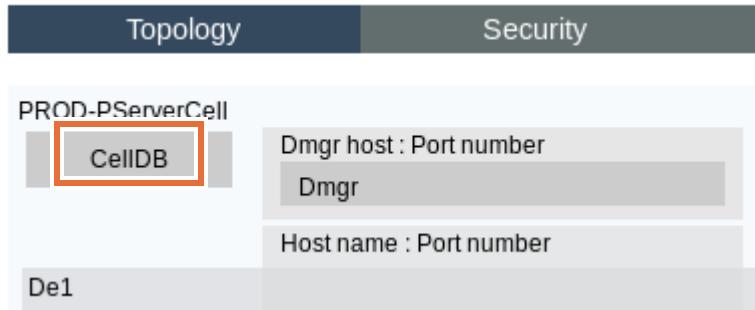


This section defines the databases to be used for the deployment environment, database-specific properties, and the authentication alias for the database. By default, the sample properties file contains properties for setting up four databases:

- **CellDB:** Identified by the keyword `CellOnlyDb`, is the database at the cell level. The `CellOnlyDb` schema contains the database objects for the application scheduler, mediations, relationship manager, and enterprise service bus logger mediation components. This value is only for Advanced and AdvancedOnly deployment environment types and must be created only for the first deployment environment that you create in the cell.
- **CMNDB:** Identified by the keyword `SharedDB`. The Business Process Choreographer, Failed Event Manager, messaging engine, Business Space, and Embedded Enterprise Content Manager components use this database.
- **BPMDB:** Identified by the keyword `ProcessServerDb`. The Process Server and Embedded Enterprise Content Manager components use this database.
- **PDWDB:** Identified by the keyword `PerformanceDb`. The Performance Data Warehouse component uses this database.

The CellDB is a shared database, which one or more deployment environments that are created in the cell use. Each deployment environment typically has three databases, but by default, four are set up in the properties file. If you want to reduce this number, you can modify the file to use three databases, combining the CellDB and CMNDB.

__ g. Click **CellDB** to edit the cell database properties.



Information

The CellOnlyDb is a shared database that one or more deployment environments that are created in this cell use. Each deployment environment would typically have three databases (CMNDB, BPMDB, and PDWDB). For more flexibility and performance needs, you use more databases instead of using just three databases.

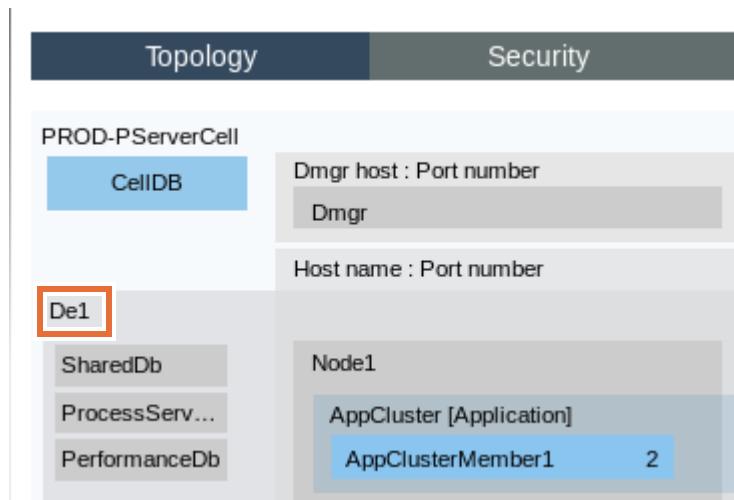
__ h. Modify the following entries:

- In the **Database** field, enter: PSCELLDB
- In the **Host** field, enter: bpmhost
- In the **Port** field, verify that the port is 50000
- In the **Schema name** field, enter: db2inst1

Roles	Permissions	User Alias
DbUser	Access database	BPM_DB_ALIAS
DbUserXAR	Perform XA recovery	BPM_DB_ALIAS

Keep all remaining defaults. Select the **Finish** check box.

- ___ i. Click the deployment environment name **De1** to edit the deployment environment basic properties section.



- ___ j. This section contains the properties that relate to the overall deployment environment, including the deployment environment name, product configuration, and deployment environment type. It also contains a setting, which determines whether database tables should be created during the creation of the deployment environment.

For this environment, a production Process Server deployment environment is created. The database tables are not created during the configuration, and the production cell is not connected to the Process Center cell. To configure this environment, modify the following entries:

- In the **Name** field, enter: PServer_DE
- In the **Server name** field, enter: PROD-ProcessServer
- In the **Offline** field, select true
- In the **Host name** field, enter: bpmhost
- Keep all remaining defaults

SharedDb	ProcessServerDb	PerformanceDb
Host name : Port number		
Name:	PServer_DE	
Defer schema creation:	true	
Type:	Advanced	
Environment:	Process Server	
Context root prefix:	MECluster1 (MeCommerce)	
Virtual host:	MECluster1Member1	

Process Center Connectivity		
Server name:	PROD-ProcessServer	
Purpose:	Production	
Offline:	true	
PC transport protocol:	https	
Host name:	bpmhost	
PC context root:	The required property does not have a value - specify a context root	



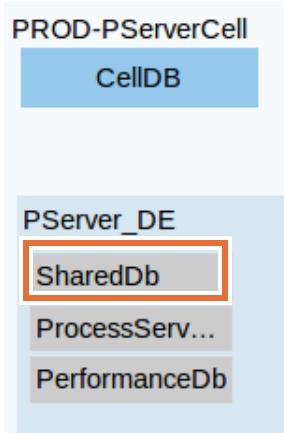
Information

The Defer schema creation property indicates when the database tables, schemas, and procedures are created. The items can be created when the BPMConfig command is run, or they can be created independently. If this value is set to **true**, only the SQL files are generated. Then, you must manually create the database tables, schemas, and procedures.

To have the database tables, schemas, and procedures that are created as part of BPMConfig execution, change this value to **false**. If this value is set to **false**, ensure that the databases are created before running the BPMConfig command.

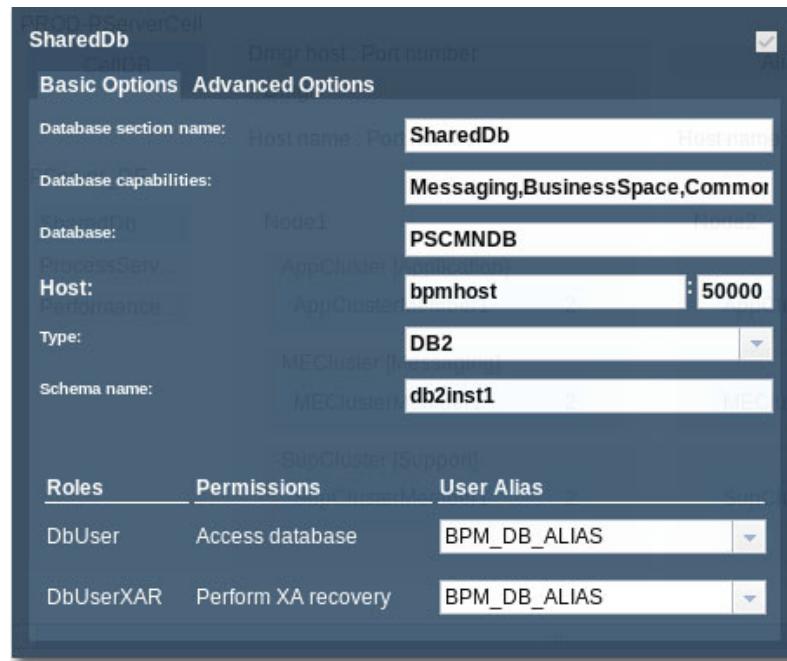
-
- __ k. Select the **Finish** check box.

- __ l. Click the **SharedDb** property.



- __ m. Modify the following entries:

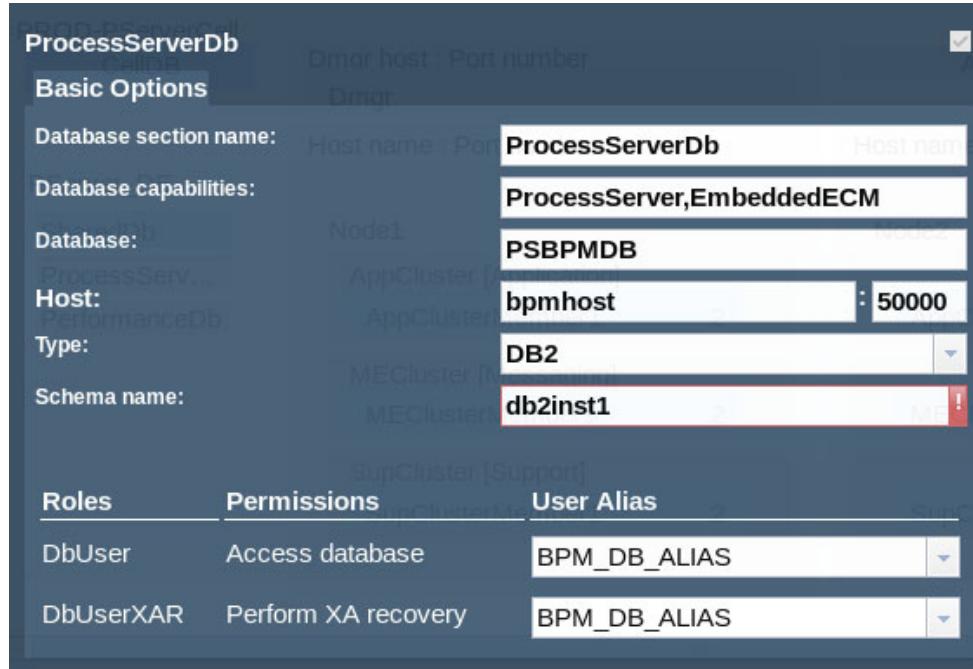
- In the **Database** field, enter: PSCMNDB
- In the **Host** field, enter: bpmhost
- In the **Port** field, verify that the port is 50000
- In the **Schema name** field, enter: db2inst1



Keep all remaining defaults. Select the **Finish** check box.

___ n. Click the **ProcessServerDb** property and modify the following entries:

- In the **Database** field, enter: PSBPMDB
- In the **Host** field, enter: bpmhost
- In the **Port** field, verify that the port is 50000
- In the **Schema name** field, enter: db2inst1

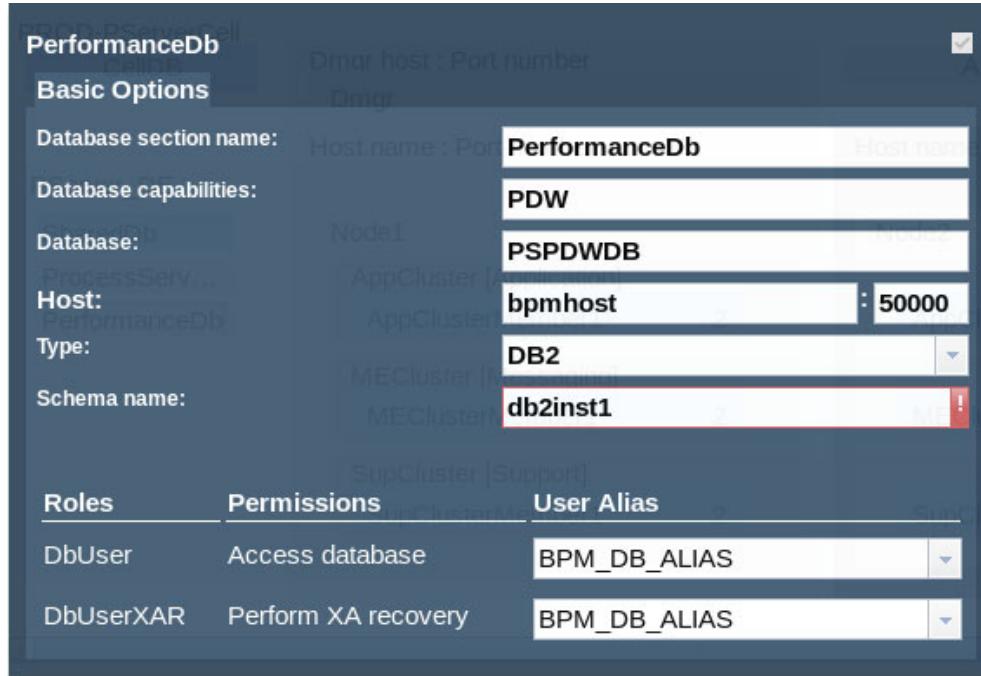


For now, ignore the red box around the schema name field. When you set the authentication alias information later, this validation message goes away.

___ o. Select the **Finish** check box.

___ p. Click the **PerformanceDb** property and modify the following entries:

- In the **Database** field, enter: PSPDWDB
- In the **Host** field, enter: bpmhost
- In the **Port** field, verify that the port is 50000
- In the **Schema name** field, enter: db2inst1



For now, ignore the red box around the schema name field. When you set the authentication alias information later, this validation message goes away.

- ___ q. Select the **Finish** check box.
- ___ 2. Edit the properties for the deployment manager and nodes.
- ___ a. Click the deployment manager name **Dmgr** to edit the deployment manager properties. This section contains the properties that are related to the deployment manager node, including deployment manager profile name, installation location for the product, deployment manager host name, and SOAP port.

___ b. Modify the following entries:

- In the **Node name** field, enter: PServerDmgr
- In the **Host** field, enter: bpmhost
- In the **Profile name** field, enter: PServerDmgr
- In the **Profile path** field, enter: /opt/IBM/BPM/profiles/PServerDmgr
- In the **Installation path** field, enter: /opt/IBM/BPM

Node name:	PServerDmgr
Host:	bpmhost
Profile name:	PServerDmgr
Profile path:	/opt/IBM/BPM/profiles/PServerDmgr
Installation path:	/opt/IBM/BPM

Select the **Finish** check box.

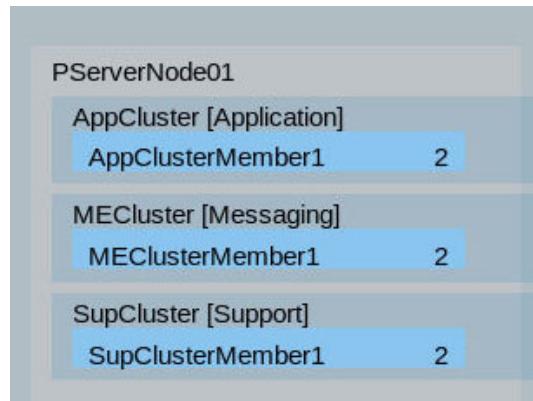
- ___ c. Click the node name **Node1** to edit the node properties. This section contains properties that are related to the managed node in a deployment environment, including the name, the installation location for the product, the node profile name, and host name.
- ___ d. Modify the following entries:

- In the **Node name** field, enter: PServerNode01
- In the **Host** field, enter: bpmhost
- In the **Profile name** field, enter: PServerNode01
- In the **Profile path** field, enter: /opt/IBM/BPM/profiles/PServerNode01
- In the **Installation path** field, enter: /opt/IBM/BPM

Node name:	PServerNode01
Host name:	bpmhost
Profile name:	PServerNode01
Profile path:	/opt/IBM/BPM/profiles/PServerNode01
Installation path:	/opt/IBM/BPM

Select the **Finish** check box.

- __ e. Next, you look at the cluster properties section. This section describes the cluster members for each cluster and the cluster that each corresponds to. Notice the default names of the cluster members and the default cluster names. For example, AppClusterMember1 is a member of the AppCluster cluster. Keep all the default settings.



- __ 3. Edit the properties for the authentication aliases.
- __ a. Click **Aliases** to edit the authentication alias mappings. Modify the following entries:
- In the **CellAdminAlias User** field, enter: bpmadmin
 - In the **CellAdminAlias Password** and **Confirm password** fields, enter: passw0rd
 - In the **DEAdminAlias User** field, enter: psdeadmin
 - In the **DEAdminAlias Password** and **Confirm password** fields, enter: passw0rd
 - In the **ProcessCenterUserAlias User** field, enter: pcdeadmin
 - In the **ProcessCenterUserAlias Password** and **Confirm password** fields, enter: passw0rd
 - In the **BPM_DB_ALIAS User** field, enter: db2inst1
 - In the **BPM_DB_ALIAS Password** and **Confirm password** fields, enter: passw0rd

Authentication Aliases		Host/Port number	Aliases	Comments	
Alias	User	Host/Port number	Host name	Port	Confirm password
CellAdminAlias	bpmadmin
DeAdminAlias	psdeadmin
ProcessCenterUserAlias	pcdeadmin
BPM_DB_ALIAS	db2inst1



Information

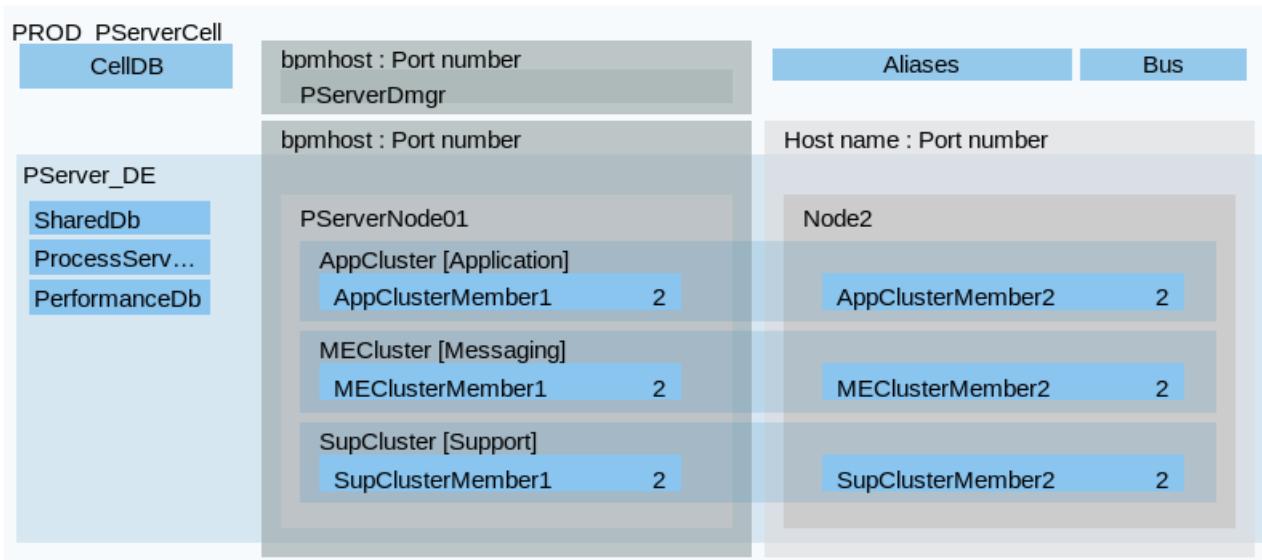
In the **CellAdminAlias** field, you define the cell administrator authentication information.

In the **DeAdminAlias** field, you define the authentication alias information for the deployment environment administrator.

In the **ProcessCenterUserAlias** field, you define the authentication alias for connecting to the Process Center environment. The Process Server is being configured as offline, but in case it might be needed in the future, the alias is defined now. Here you defined the deployment environment administrator for the Process Center deployment environment.

In the **BPM_DB_ALIAS** field, you define the authentication alias for the database administrator. The number of aliases depends on the database type you are configuring. For example, in DB2, you can use the same authentication for all the databases that are being configured and only one authentication alias is required. For Oracle databases, the isolation is based on the user name, and a greater number of aliases is required.

- ___ b. Select the **Finish** check box.
- ___ c. Your topology information looks like the following screen capture.

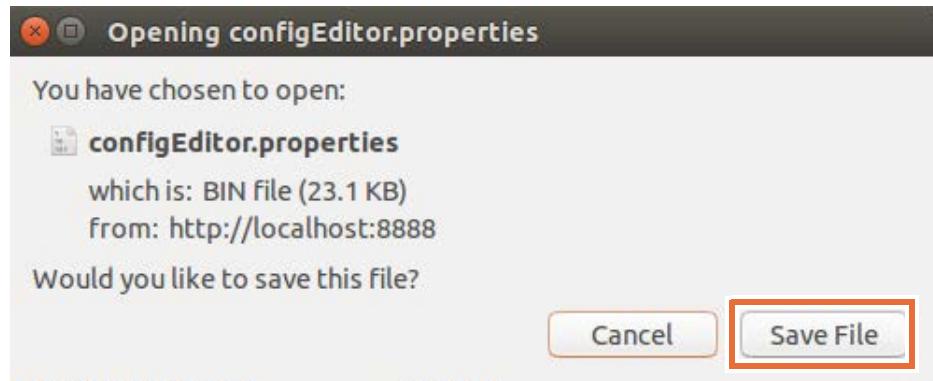


Notice that the database properties now appear in blue since the authentication alias properties were set.

Do not enter any information for a second node. You use one node for the configuration. Later, a second node is added to the deployment environment.

- ___ d. Click the **Summary** tab.
- ___ e. Review all of the changes that you made. When completed, click **Save**.
- ___ f. In the IBM BPM Configuration Editor window, a message indicates that one or more properties failed validation. Click **OK** to save the properties file.

- ___ g. Click **Save File**. You can see that the file name is configEditor.properties.



- ___ h. Browse to /opt/labfiles/scripts and save the file with the name Advanced-PS.properties.
 ___ i. Click **Save**.
 ___ j. Close the browser window. If prompted, close all tabs.

Part 3: Examining and updating the properties file

In this part of the exercise, you examine and update the properties file.

- ___ 1. Examine and update the properties file.
 - ___ a. In the terminal window, change to the /opt/labfiles/scripts directory.
 - ___ b. Open the Advanced-PS.properties file and examine the default settings. Open the file by using an editor such as vi or gedit.
 - ___ c. Scroll through and examine the various settings in the properties file. Notice that the password for each authentication alias is encoded.

```
#####
# Deployment environment administrator authentication alias, it cannot have
the same user name as the authentication alias of the cell administrator #
#####
bpm.de.authenticationAlias.1.name=DeAdminAlias
bpm.de.authenticationAlias.1.user=psdeadmin
bpm.de.authenticationAlias.1.password={xor}KD4sbjo7Kg==

#####
# Process Center authentication alias (used by online Process Server
environments to connect to Process Center) #
#####
bpm.de.authenticationAlias.2.name=ProcessCenterUserAlias
bpm.de.authenticationAlias.2.user=pcdeadmin
bpm.de.authenticationAlias.2.password={xor}KD4sbjo7Kg==
```

- ___ d. Scroll to the Node properties: Node2 section. This section is for creating a second node. Since only one node is needed now, comment these entries so they are read, not executed. To comment, enter # before each line.

```
#####
# Node properties: Node2 #
#####
#bpm.de.node.2.name=Node2
# The installation location of the BPM product. If you want to use a
backslash character (\) in your properties file, you must use an escape
backslash before it, for example bpm.de.node.1.installPath=c:\\IBM\\BPM85.
#bpm.de.node.2.installPath=C:/IBM/bpm85
# The name of the node profile.
#bpm.de.node.2.profileName=Node2Profile
```

- ___ e. Scroll to the Cluster member properties sections. Notice there are three sections for creating a second cluster member in each of these clusters. Since only one cluster member is needed now, comment these entries so they are read, not executed. To comment, enter # before each line. Do this step for the AppClusterMember2, MEClusterMember2, and SupClusterMember2.

```
#####
# Cluster member properties: AppClusterMember2 #
#####
#bpm.de.node.2.clusterMember.1.name=AppClusterMember2
# The cluster this cluster member belongs to. This value should correspond
#e name of a cluster defined in this file.
#bpm.de.node.2.clusterMember.1.cluster=AppCluster
# The proportion of requests that are sent to this cluster member
#bpm.de.node.2.clusterMember.1.weight=2

#####
# Cluster member properties: MEClusterMember2 #
#####
#bpm.de.node.2.clusterMember.2.name=MEClusterMember2
# The cluster this cluster member belongs to. This value should correspond
#e name of a cluster defined in this file.
#bpm.de.node.2.clusterMember.2.cluster=MECluster
# The proportion of requests that are sent to this cluster member
#bpm.de.node.2.clusterMember.2.weight=2

#####
# Cluster member properties: SupClusterMember2 #
#####
#bpm.de.node.2.clusterMember.3.name=SupClusterMember2
# The cluster this cluster member belongs to. This value should correspond
#e name of a cluster defined in this file.
#bpm.de.node.2.clusterMember.3.cluster=SupCluster
# The proportion of requests that are sent to this cluster member
#bpm.de.node.2.clusterMember.3.weight=2
```

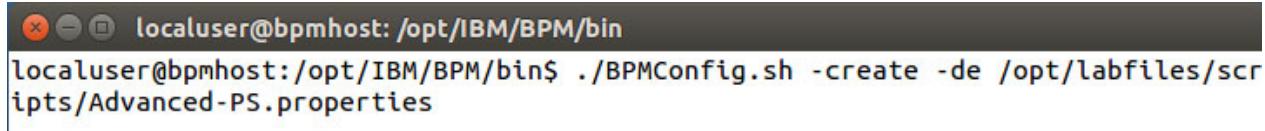
- ___ f. Review the changes that you made to the file. Save and close the file when completed.

Part 4: Creating the Deployment Environment

Before you run the BPMConfig command to create the deployment environment, you must install the database software and create all of the users that you specify in the properties file. IBM DB2 10.5.0.3 is installed, and the DB2 required users were created as part of the image creation.

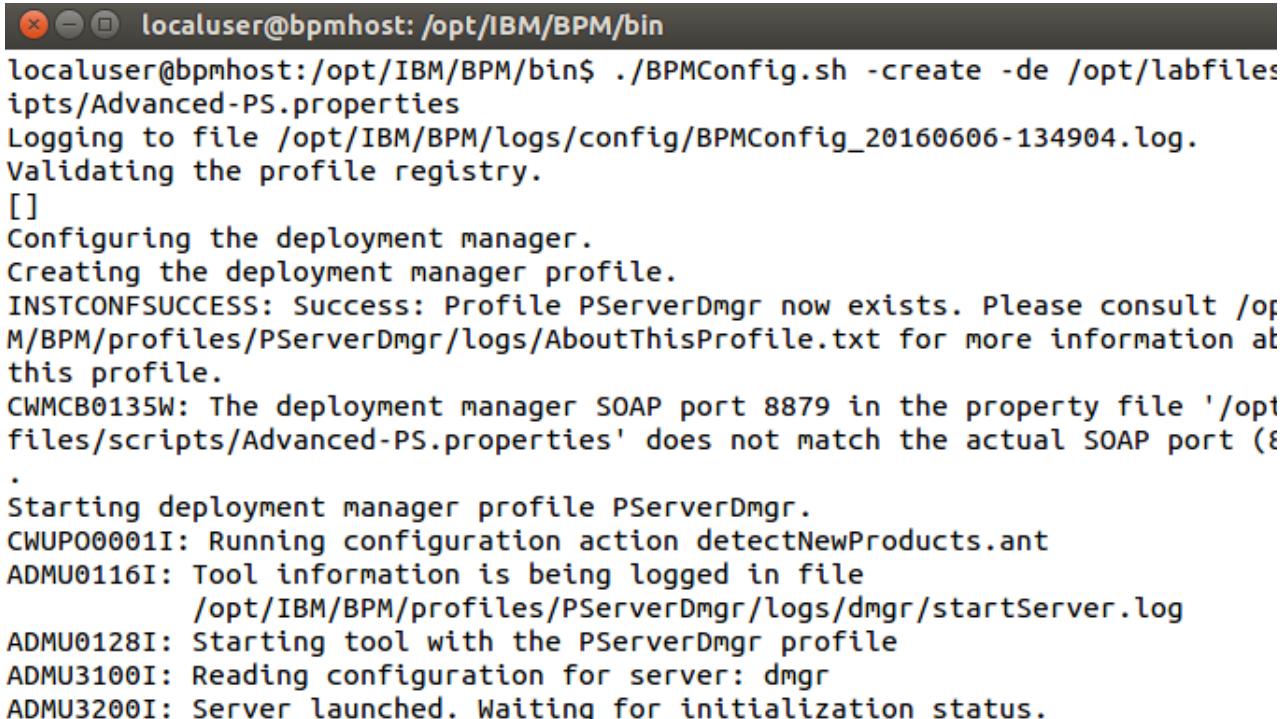
- 1. Create the deployment environment.
 - a. In the terminal window, change to the /opt/IBM/BPM/bin directory.
 - b. To create the deployment environment by using the properties file, enter the following command:

```
./BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties
```



```
localuser@bpminstance:/opt/IBM/BPM/bin$ ./BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties
```

- c. The command takes about 20 minutes to complete. During this time, you can watch the output in the terminal window. You can see that the first part is to create the deployment manager profile and start the deployment manager. In the properties file, a default value of SOAP port 8879 was defined. However, when the deployment manager is configured, a unique port is generated of 8881.



```
localuser@bpminstance:/opt/IBM/BPM/bin$ ./BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties
Logging to file /opt/IBM/BPM/logs/config/BPMConfig_20160606-134904.log.
Validating the profile registry.
[]
Configuring the deployment manager.
Creating the deployment manager profile.
INSTCONFSUCCESS: Success: Profile PServerDmgr now exists. Please consult /opt/IBM/BPM/profiles/PServerDmgr/logs/AboutThisProfile.txt for more information at this profile.
CWMCB0135W: The deployment manager SOAP port 8879 in the property file '/opt/files/scripts/Advanced-PS.properties' does not match the actual SOAP port (8881).
Starting deployment manager profile PServerDmgr.
CWUPO0001I: Running configuration action detectNewProducts.ant
ADMU0116I: Tool information is being logged in file
          /opt/IBM/BPM/profiles/PServerDmgr/logs/dmgr/startServer.log
ADMU0128I: Starting tool with the PServerDmgr profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
```

- __ d. Next, the managed node PServerNode01 is created. Note the INSTCONFSUCCESS message that indicates the profile PServerNode01 now exists.

```
.properties
Logging to file /opt/IBM/BPM/logs/config/BPMConfig_20141204-163436.log.
Validating the profile registry.
[]
Configuring the deployment manager.
Creating the deployment manager profile.
INSTCONFSUCCESS: Success: Profile PServerDmgr now exists. Please consult /opt/IB
M/BPM/profiles/PServerDmgr/logs/AboutThisProfile.txt for more information about
this profile.
CWMCB0135W: The deployment manager SOAP port 8879 in the property file '/usr/lab
files/scripts/Advanced-PS.properties' does not match the actual SOAP port (8881)

Starting deployment manager profile PServerDmgr.
ADMU0116I: Tool information is being logged in file
    /opt/IBM/BPM/profiles/PServerDmgr/logs/dmgr/startServer.log
ADMU0128I: Starting tool with the PServerDmgr profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 11990
Configuring managed node profiles.
Creating the managed node PServerNode01 profile.
INSTCONFSUCCESS: Success: Profile PServerNode01 now exists. Please consult /opt/
IBM/BPM/profile/PServerNode01/logs/AboutThisProfile.txt for more information abo
ut this profile.
```

- __ e. The node is then federated to the cell. After the successful federation of the node, the database scripts are created for the deployment environment. You can see the output for creating the clusters, data sources, and security information.

Finally, after the deployment is created and the environment is synchronized, the deployment manager is stopped. The last entry that you can see is the message: "BPMConfig completed successfully."

```
localuser@bpghost: /opt/IBM/BPM/bin
The HTTP and HTTPS ports are added to the virtual hosts list.
Creating cluster members.
Configuring the REST services end points.
Saving configuration changes...
Synchronizing node PServerNode01.
ADMU0116I: Tool information is being logged in file
            /opt/IBM/BPM/profiles/PServerNode01/logs/syncNode.log
ADMU0128I: Starting tool with the PServerNode01 profile
ADMU0401I: Begin syncNode operation for node PServerNode01 with Deployment
            Manager bpghost: 8881
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0402I: The configuration for node PServerNode01 has been synchronized wi
            Deployment Manager bpghost: 8881
Stopping deployment manager profile PServerDmgr.
ADMU0116I: Tool information is being logged in file
            /opt/IBM/BPM/profiles/PServerDmgr/logs/dmgr/stopServer.log
ADMU0128I: Starting tool with the PServerDmgr profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server dmgr stop completed.

The 'BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties'
and completed successfully.
localuser@bpghost:/opt/IBM/BPM/bin$
```

Part 5: Verifying the configuration

- ___ 1. Verify the configuration.
 - ___ a. Enter the following command to list the profiles in the repository:
`./manageprofiles.sh -listProfiles`

```
localuser@bpghost: /opt/IBM/BPM/bin
localuser@bpghost:/opt/IBM/BPM/bin$ ./manageprofiles.sh -listProfiles
[PCenterDmgr, PCenterCustom, PServerDmgr, PServerNode01]
localuser@bpghost:/opt/IBM/BPM/bin$
```

Note the two Process Center profiles that were created in an earlier exercise and the two Process Server profiles that are created as part of this exercise.

- ___ b. Change to the `/opt/IBM/BPM/logs/config` directory.
- ___ c. Open the `BPMConfig_<date_timestamp>.log` file. Messages that are related to the running of the BPMConfig command are recorded in this file. Examine the details of the log. Scroll to the end and you can see the message: "BPMConfig completed successfully." Close the file when completed.
- ___ d. Change to the `/opt/IBM/BPM/profiles/PServerDmgr/logs` directory.
- ___ e. Open the `AboutThisProfile.txt` file. You can also enter the `more` command to see the file contents. Examine the settings for this profile. You can see the ports that are used for the administrative console and the SOAP port. These ports are used later in the exercise.

```
localuser@bpghost: /opt/IBM/BPM/profiles/PServerDmgr/logs
localuser@bpghost:/opt/IBM/BPM/profiles/PServerDmgr/logs$ more AboutThisProfile.txt
Application server environment to create: Management
Location: /opt/IBM/BPM/profiles/PServerDmgr
Disk space required: 30 MB
Profile name: PServerDmgr
Make this profile the default: False
Node name: PServerDmgr
Cell name: PROD-PServerCell
Host name: bpghost
Enable administrative security (recommended): True
Administrative console port: 9062
Administrative console secure port: 9045
Management bootstrap port: 9811
Management SOAP connector port: 8881
Run Management as a service: False
localuser@bpghost:/opt/IBM/BPM/profiles/PServerDmgr/logs$
```

- ___ 2. Edit the `soap.client.props` file for the deployment manager.
 - ___ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerDmgr/properties` directory.

- ___ b. Edit the `soap.client.props` file by using an editor such as vi.
 - ___ c. Go to the `com.ibm.SOAP.authenticationTarget=BasicAuth` section.
 - ___ d. In the `soap.client.props` file, enter the following information:

```
com.ibm.SOAP.loginUserId=bpmadmin  
com.ibm.SOAP.loginPassword=passw0rd
```
 - ___ e. Save and close the file.
- ___ 3. Edit the `soap.client.props` file for the node.
- ___ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerNode01/properties` directory.
 - ___ b. Edit the `soap.client.props` file by using an editor such as vi.
 - ___ c. Go to the `com.ibm.SOAP.authenticationTarget=BasicAuth` section.
 - ___ d. In the `soap.client.props` file, enter the following information:

```
com.ibm.SOAP.loginUserId=bpmadmin  
com.ibm.SOAP.loginPassword=passw0rd
```
 - ___ e. Save and close the file.

Part 6: Creating the databases and tables

Before you create a deployment environment, you must create all the databases manually that are specified in the properties file. The BPMConfig command does not create the databases. It creates the schema and tables only.

There are three required databases in a Process Server deployment environment.

- The Process Server database (default name is BPMDB)
- The Performance Data Warehouse database (default name is PDWDB)
- The common database (default name is CMNDB)

For an Advanced deployment environment, two types of common databases that are created are called cell-scoped and deployment environment-level.

By default, the common database name is CMNDB. However, since both Process Center and Process Server environments are configured on the same computer and are using the same database product, the database names must be unique. In this exercise, the database scripts are modified to include the PS prefix that is based on the information you provided in the response file.

___ 1. Create the cell level database.

___ a. In the terminal window, su to the user db2inst1 by using the following command:

```
su - db2inst1
```

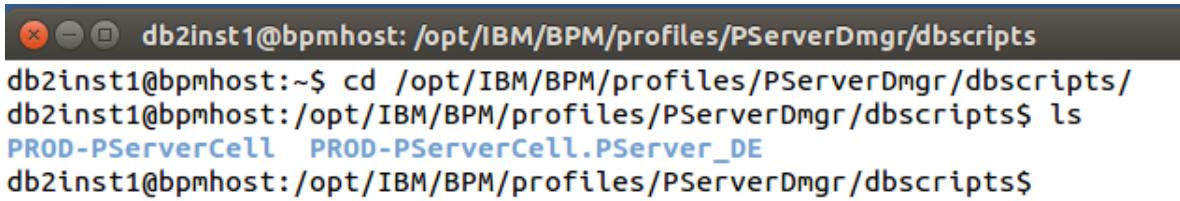
___ b. Enter the password: passw0rd

___ c. Change to the /opt/IBM/BPM/profiles/PServerDmgr/dbscripts directory.

___ d. List the contents of the directory. The BPMConfig utility creates two subdirectories that contain the generated database scripts for the cell and the deployment environment.

- **PROD-PServerCell**: Contains the cell scoped database scripts

- **PROD-PServerCell.PServer_DE**: Contains the deployment environment scoped databases scripts



```
db2inst1@bpminst1:~$ cd /opt/IBM/BPM/profiles/PServerDmgr/dbscripts/
db2inst1@bpminst1:/opt/IBM/BPM/profiles/PServerDmgr/dbscripts$ ls
PROD-PServerCell PROD-PServerCell.PServer_DE
db2inst1@bpminst1:/opt/IBM/BPM/profiles/PServerDmgr/dbscripts$
```

___ e. Change to the

/opt/IBM/BPM/profiles/PServerDmgr/dbscripts/PROD-PServerCell/DB2/PSCELLDB directory.

___ f. To create the cell level database, enter the following command:

```
./createDatabase.sh
```

Next, the database is created. Look for the following message: The CREATE DATABASE command completed successfully.



Information

Running the script shows the following message that is safe to ignore: An authorization ID cannot grant a privilege or authority to itself. This message is displayed because the script is expected to be run as another user. After the database is created, it contains a line that grants database admin rights to the db2inst1 user. By default, root does not have access rights to the DB2 binary files and the script is run as db2inst1. The user db2inst1 cannot grant access rights to itself. However, db2inst1 is the admin for this database, and thus, it is safe to ignore this message.

- ___ g. To connect to the database, enter the following command:

```
db2 connect to PSCELLDB user db2inst1 using passw0rd
```

- ___ h. To create the schema and tables, enter the following command:

```
db2 -tvf createSchema_Advanced.sql
```

When the creation is complete, you see a number of messages in the console that indicate the following information: The SQL command completed successfully.

- ___ i. Verify the number of tables that are created by entering the following command:

```
db2 list tables for schema db2inst1
```

38 records are listed.

- ___ j. To reset the connection, enter the following command:

```
db2 connect reset
```

- ___ 2. Create the common database.

- ___ a. In the DB2 terminal window, change to the

```
/opt/IBM/BPM/profiles/PServerDmgr/dbscripts/PROD-PServerCell.PServer_DE/DB2/PSCMND directory.
```

- ___ b. To create the common database, enter the following command:

```
./createDatabase.sh
```

Next, the database is created. Look for the following message: The CREATE DATABASE command completed successfully.

- ___ c. To connect to the database, enter the following command:

```
db2 connect to PSCMND user db2inst1 using passw0rd
```

- ___ d. To create the schema and tables, enter the following commands (two separate commands):

```
db2 -tvf createSchema_Advanced.sql
```

```
db2 -tvf createSchema_Messaging.sql
```

When the creation is complete, you see a number of messages in the console that indicate the following information: The SQL command completed successfully.

- ___ e. Verify the number of tables that are created by entering the following command:

```
db2 list tables for schema db2inst1
```

239 records are listed.

- ___ f. To reset the connection, enter the following command:

```
db2 connect reset
```

- ___ 3. Create the Process Server database.

- ___ a. In the terminal window, change to the

```
/opt/IBM/BPM/profiles/PServerDmgr/dbscripts/PROD-PServerCell.PServer_DE/D  
B2/PSBPMDB directory.
```

- ___ b. To create the Process Server database, enter the following command:

```
./createDatabase.sh
```

Next, the database is created. Look for the following message: The CREATE DATABASE command completed successfully.

- ___ c. To connect to the database, enter the following command:

```
db2 connect to PSBPMDB user db2inst1 using passw0rd
```

- ___ d. To create the schema and tables, enter the following commands (two separate commands):

```
db2 -tvf createSchema_Advanced.sql
```

```
db2 -tdGO -vf createProcedure_Advanced.sql
```

The option on the second command is -tdGO where all are characters. When the creation is complete, you see a number of messages in the console that indicate the following information: The SQL command completed successfully.

- ___ e. Verify the number of tables that are created by entering the following command:

```
db2 list tables for schema db2inst1
```

265 records are listed.

- ___ f. To reset the connection, enter the following command:

```
db2 connect reset
```

- ___ 4. Create the Performance Data Warehouse database.

- ___ a. In the terminal window, change to the

```
/opt/IBM/BPM/profiles/PServerDmgr/dbscripts/PROD-PServerCell.PServer_DE/D  
B2/PSPDWDB directory.
```

- ___ b. To create the Performance Data Warehouse database, enter the following command:

```
./createDatabase.sh
```

Next, the database is created. Look for the following message: The CREATE DATABASE command completed successfully.

- ___ c. Verify that the database is created successfully.

- ___ d. To connect to the database, enter the following command:
`db2 connect to PSPDWDB user db2inst1 using passw0rd`
- ___ e. To create the schema and tables, enter the following command:
`db2 -tvf createSchema_Advanced.sql`
- ___ f. Verify the number of tables that are created by entering the following command:
`db2 list tables for schema db2inst1`
22 records are listed.

- ___ g. To reset the connection, enter the following command:

```
db2 connect reset
```

___ 5. Verify the databases.

- ___ a. To list the databases, enter the following command:

```
db2 list database directory
```

There are now a total of seven databases. The three databases for the Process Center cell are listed, and the four databases for the Process Server cell are listed.

- ___ b. Exit the DB2 command window.

Part 7: Working with the deployment environment

The deployment environment, databases, and database tables are now created but still do not have the required data in the various databases. The databases must be populated with the required data manually by running the `bootstrapProcessServerData` script before the servers in the deployment environment are started.

The bootstrap process completes two key activities:

- Imports Toolkits: A number of toolkits, such as the System and Coaches toolkits, are added to the database that the various process applications use.
- Imports Resource Bundle Groups: The process portal application that users would use supports multiple languages (depending on what is chosen during the installation process). The resource bundles representing the various locales are imported to the database.

If you created the database tables when you created the deployment environment, either by setting the parameter `bpm.de.deferSchemaCreation` to false for the `BPMConfig` command, or by enabling Create Tables in the Deployment Environment wizard, there is no need to run the `bootstrapProcessServerData` command.

If you are creating an Advanced network deployment environment, you must run the command after a server or cluster of servers is created. For a cluster, you must specify the cluster name. You must run this command before the first server is started. You do not need to rerun the command if you add another cluster member.

- ___ 1. Bootstrap the database.
 - ___ a. In the terminal window, change to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
 - ___ b. Enter the following command:

```
./bootstrapProcessServerData.sh -clusterName AppCluster
```

The command takes a few minutes to run. When completed, look for the following message:

```
'BootstrapProcessServerData admin command completed.....'
```

- ___ 2. Start the environment by using the `BPMConfig` utility.
 - ___ a. In the terminal window, change to the `/opt/IBM/BPM/bin` directory.
 - ___ b. To start the deployment environment, enter the following command:

```
./BPMConfig.sh -start /opt/labfiles/scripts/Advanced-PS.properties
```

The command takes a few minutes to run. You can see that the deployment manager and node agent are started. To see if the cluster members are started successfully, you need to check the log files of the cluster members. However, you check the status by using the administrative console in the next section.



Information

After you install IBM Business Process Manager Advanced and configure a deployment environment, you can also use the Quick Start console. By using the Quick Start console, you can start and stop the deployment environment, access the product documentation, or access the administrative consoles that are related to the deployment environment.

A version of the Quick Start console is available for each deployment environment in your installation, and can be used to manage that deployment environment. Options on each console are displayed dynamically, depending on features you install and the availability of elements on each operating system. Options might include starting or stopping the server or deployment manager, accessing the administrative console, and accessing the product documentation.

___ 3. Start the deployment manager administrative console.

___ a. Open a web browser and go to the following URL:

`http://bpmhost:9062/ibm/console`

Remember to use the administrative console port information noted in the `AboutThisProfile.txt` file.

___ b. In the Insecure Connection window, click **Advanced** to expand the option.



Your connection is not secure

The owner of **bpmhost** has configured their website improperly. To protect your information from being stolen, Firefox has not connected to this website.

[Learn more...](#)

[Go Back](#)

[Advanced](#)



Report errors like this to help Mozilla identify misconfigured sites

___ c. Click **Add Exception**.

___ d. On the **Add Security Exception** window, the location is the secure port for the deployment manager. Verify that the location is the following URL:

`https://bpmhost:9045/ibm/console`

___ e. Click **Confirm Security Exception**. The login page for the Integrated Solutions Console, which is also known as the administrative console, is now visible.

**Hint**

Since the administrative console is used multiple times throughout the exercises, it might be a good idea to create a bookmark to the URL.

- ___ f. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ 4. Examine the cell configuration.
- ___ a. From the administrative console navigation pane, click **System administration > Nodes**. You see two nodes that are listed.

The screenshot shows the 'Nodes' page of the administrative console. At the top, there are buttons for 'Add Node', 'Remove Node', 'Force Delete', 'Synchronize', 'Full Resynchronize', and 'Stop'. Below these are icons for selecting, adding, removing, and deleting nodes. A search bar allows filtering by 'Name', 'Host Name', 'Version', 'Discovery Protocol', and 'Status'. A message says 'You can administer the following resources:'. Two nodes are listed in a table:

Name	Host Name	Version	Discovery Protocol	Status
PServerDmgr	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
PServerNode01	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	

Total 2

- ___ b. Click **System administration > Node agents**. There is one node agent on the PServerNode01 node in the Started state.

The screenshot shows the 'Node agents' page of the administrative console. At the top, there are buttons for 'Stop', 'Restart', and 'Restart all Servers on Node'. Below these are icons for selecting, adding, removing, and deleting node agents. A search bar allows filtering by 'Name', 'Node', 'Host Name', 'Version', and 'Status'. A message says 'You can administer the following resources:'. One node agent is listed in a table:

Name	Node	Host Name	Version	Status
nodeagent	PServerNode01	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	

Total 1

- ___ c. Click **Servers > Clusters > WebSphere application server clusters**. There are three clusters in the Started state.

New...	Delete	Start	Stop	Ripplestart	ImmediateStop
Select	Name	Status			
You can administer the following resources:					
<input type="checkbox"/>	AppCluster				
<input type="checkbox"/>	MECluster				
<input type="checkbox"/>	SupCluster				
Total 3					

- ___ d. Click **Servers > Deployment Environments**. You can see the PServer_DE deployment environment, which is based on the Application, Remote Messaging, and Remote Support pattern, in the Started state.

Start	Stop	New...			
Select	Status	Deployment Environment Name	Features	Pattern	Description
<input type="checkbox"/>		PServer_DE	IBM BPM Advanced Process Server	Application, Remote Messaging, and Remote Support	
Total 1					

- ___ e. Click **PServer_DE**.

- ___ f. In the messages area, click the **deferred configuration steps** link.

Messages

Complete the configuration for the deployment environment by following the [deferred configuration steps](#).

- ___ g. The details indicate more configuration steps that must be completed. The steps include running the database scripts and running the `bootstrapProcessServerData` utility. Each of these steps was completed earlier in this exercise. Click **Configuration Done**.

The screenshot shows a configuration dialog box. At the top left, there is a 'Configuration' tab. Below it, a horizontal bar contains two buttons: 'Configuration Done' (which is highlighted with a red border) and another button that is mostly obscured by a light blue shadow. Underneath this bar, the word 'Instructions' is written in blue. A numbered list follows:

1. Locate the database scripts in the directory **/opt/IBM/BPM/profiles /PServerDmgr/dbscripts/PROD-PServerCell** (Note: The scripts might be generated ONLY after the deployment environment is generated). Run the scripts on the database host to initialize your database(s). For more information, please visit [IBM Business Process Manager Documentation](#).
2. Locate the database scripts in the directory **/opt/IBM/BPM/profiles /PServerDmgr/dbscripts/PROD-PServerCell.PServer_DE** (Note: The scripts might be generated ONLY after the deployment environment is generated). Run the scripts on the database host to initialize your database(s). For more information, please visit [IBM Business Process Manager Documentation](#).
3. Run the `bootstrapProcessServerData` utility from the command line. The utility is found in the Deployment manager profile directory **/opt/IBM/BPM/profiles /PServerDmgr/bin**. For more information, enter the search string `bootstrapProcessServerData` in the [IBM Business Process Manager Documentation](#).

At the bottom left of the dialog box is a 'Close' button.

- ___ h. Save the changes.
___ i. A message indicates that this configuration is completed. Click **Close**.

- ___ j. You are placed on the PServer_DE pane where it lists the clusters that are part of the deployment environment. Under Additional Properties, click **Deployment Topology**. You can see that there is one node in the deployment environment and one member of each cluster.

Add Nodes

The screenshot shows a user interface titled 'Add Nodes'. At the top, there is a dropdown menu set to 'PServerNode01' and a blue 'Add' button. Below this is a table with columns: Select, Node, Status, Version, Host, Application Deployment Target, Messaging Infrastructure, and Supporting Infrastructure. A single row is present, showing 'PServerNode01' as the node, 'BPMAPC 8.5.7.0' as the status, 'bpmhost' as the host, and '1' in all other columns. There are also green arrows pointing right next to the 'Status' and 'Host' columns. At the bottom of the table, there is a 'Cluster Status' section with three green arrows pointing right.

Select	Node	Status	Version	Host	Application Deployment Target	Messaging Infrastructure	Supporting Infrastructure
<input type="checkbox"/>	PServerNode01		BPMAPC 8.5.7.0	bpmhost	<input type="text" value="1"/>	<input type="text" value="1"/>	<input type="text" value="1"/>
Cluster Status							

- ___ k. Click **PServer_DE** in the breadcrumb trail.
- ___ l. Under Related Items, click **Authentication Aliases**. Here you can see all the security roles and aliases defined that are created as part of the deployment environment configuration.
- ___ m. Click **Service integration > Buses**. One bus, BPM.PServer_DE.Bus, is part of the deployment environment.
- ___ n. Click **BPM.PServer_DE.Bus**.
- ___ o. Under Topology, click **Messaging engines**. There is one messaging engine in the Started state.

- ___ 5. Use the Health Center to check the status of the configured components in the deployment environment.
 - ___ a. Click **Servers > Deployment Environments > PServer_DE > Health Center**. The Health Center page opens with details of the configured components. In the Status column, examine the status of the components. You can see that there are components with a status that indicates that there are no detected problems.

Status	Component	Scope
	CellDatabase	Cell=PROD-PServerCell
	CellSecurity	Cell=PROD-PServerCell
	RestGateway	Cluster=AppCluster
	ProcessServer	Cluster=AppCluster
	BusinessSpace	Cluster=AppCluster
	ProcessPortal	Cluster=AppCluster
	EmbeddedECM	Cluster=AppCluster
	CMIS	Cluster=AppCluster
	BusinessEvents	Cluster=AppCluster
	ArtifactLoader	Cluster=AppCluster
	WbiSession	Cluster=AppCluster
	SCA	Cluster=AppCluster
	BPC	Cluster=AppCluster
	FailedEventManager	Cluster=AppCluster
	EventSequencing	Cluster=AppCluster
	Relationships	Cluster=AppCluster
	AppScheduler	Cluster=AppCluster
	BusinessRules	Cluster=AppCluster

- ___ b. In the Component column, click **ProcessServer**, which has a status that indicates there are no problems. You can see the details for this component, which includes four applications. For applications, a column for Installed and Started shows the status for each of these components. In this example, both applications are installed and started. If there are any exception messages for these applications, they would be listed in that column.
- ___ c. Click **Back**.
- ___ d. Feel free to examine the other component details in the Health Center.
- ___ 6. Determine server port numbers for the cluster members. The port numbers are used in later exercises.
 - ___ a. Click **Servers > Server Types > WebSphere application servers**.
 - ___ b. Click **AppClusterMember1**.
 - ___ c. In the Communications section, expand **Ports**. This pane gives you a listing of the ports for the server.

- ___ d. Look for the default host port for the server, which is listed as **WC_defaulthost**.
- ___ e. Make a note of the port number for WC_defaulthost here: _____
- ___ f. Click **WebSphere application servers** in the breadcrumb trail.
- ___ g. Click **SupClusterMember1**.
- ___ h. In the Communications section, expand **Ports**. This pane gives you a listing of the ports for the server.
- ___ i. Look for the default host port for the server, which is listed as **WC_defaulthost**.
- ___ j. Make a note of the port number for WC_defaulthost here: _____



Information

To edit the ports, click the **Ports** link, or click **Details**.

- ___ 7. Examine security information.
 - ___ a. Click **Security > Global security**. Examine the security settings. Under User account repository, you can see that the Federated repository is configured and uses the default file-based repository.

User account repository

Realm name	defaultWIMFileBasedRealm		
Current realm definition	Federated repositories		
Available realm definitions	Federated repositories	Configure...	Set as current

- ___ b. Click **Users and Groups > Manage Users**. You see the users that are listed.

Search for Users

Search by	* Search for	* Maximum results
User ID	*	100
Search		

2 users matched the search criteria.

Select	User ID	First name	Last name	E-mail	Unique Name
<input type="checkbox"/>	bpmadmin	bpmadmin	bpmadmin		uid=bpmadmin,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	psdeadmin	psdeadmin	psdeadmin		uid=psdeadmin,o=defaultWIMFileBasedRealm

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The user bpmadmin is the cell administrative user that is created during profile creation. The user psdeadmin is the administrative user for managing the deployment environment. This user is created during the deployment environment configuration.

- ___ 8. Configure automatic synchronization. To ensure that subsequent changes are synchronized with the node, complete the following one-time setup.



Information

By default, when changes are made to the master configuration from the administrative console, synchronization of these changes with the node agent is not automatic. Rather, the node agent relies on the file synchronization service properties (such as the synchronization interval) to retrieve changes to the configuration from the deployment manager. For this course, you configure automatic synchronization.

- ___ a. Click **System administration > Console Preferences**.
- ___ b. In the Console preferences, select the **Synchronize changes with Nodes** option. This option specifies whether you want to force node synchronization at the time that you save your changes to the master repository, rather than when node synchronization normally occurs.

Console preferences

Specify user preferences for the administrative console workspace.

- Turn on workspace automatic refresh
- No confirmation on workspace discard
- Use default scope
- Show the help portlet
- Enable command assistance notifications
- Log command assistance commands
- Synchronize changes with Nodes

Bidirectional support options

[Apply](#) [Reset](#)

- ___ c. Click **Apply**. You see the following message at the top of the window:
Your preferences have been changed.
- ___ d. Log out of the administrative console and close the browser.

**Note**

After completing a new installation, it is a good practice to make a backup of the initial configuration. You can create a backup of the master configuration files by using the `backupConfig` command. You can later restore this configuration if necessary. For example, you can create the backup by entering the following command:

```
/opt/IBM/BPM/profiles/PServerDmgr/bin/backupConfig.sh -nostop
```

The `-nostop` option tells the `backupConfig` command not to stop the servers.

End of exercise

Exercise review and wrap-up

In this exercise, a Process Server three-cluster deployment environment topology was created by using the BPMConfig utility and product response files. Also, a deployment manager and custom profile were created by using the BPMConfig command utility. The Process Server required databases were created by using generated scripts, and the tables were verified. Finally, the deployment environment was started and the configuration was verified.

Exercise 7. IBM Process Server administration

Estimated time

01:15

Overview

This exercise examines how to install and administer applications on Process Server. You use the Business Process Choreographer Explorer to interact with business processes that are deployed to the server.

Objectives

After completing this exercise, you should be able to:

- Use the administrative console to start and stop clusters
- Use the administrative console and wsadmin to install a business process application
- Work with the administrative console to manage applications
- Use the Business Process Choreographer Explorer to work with process instances
- Use the serviceDeploy command to create an enterprise archive (EAR) file
- Use the Failed Event Manager to query and manage failed events

Introduction

This exercise provides an opportunity to administer Process Server. You learn the following skills during this lab:

- Manage applications by working with the administrative console
- Install a process application by using the administrative console and command line
- Work with business process instances by interacting with the Business Process Choreographer Explorer
- Work with the Failed Event Manager integration application
- Configure the cleanup service and cleanup jobs

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Server three-cluster deployment environment created

Exercise instructions

Part 1: Verifying the Business Process Choreographer resources

In this part of the exercise, you examine some of the resources that were configured when you installed the Business Process Choreographer in the application cluster. When you configure the Business Process Choreographer, a number of components are created and deployed in the application cluster, including:

- **Business process container:** Supports process execution
- **Human task container:** Supports human task execution

Several enterprise applications provide the functions of the Business Process Choreographer in the application target cluster:

- **BPEContainer:** The business process container application (also called the Business Flow Manager)
- **TaskContainer:** The human task container application (also called the Human Task Manager)
- **HTM_PredefinedTaskMsg** and **HTM_PredefinedTasks:** Applications that are used to provide built-in human task support for Business Space human task widgets

-
- ___ 1. Start the administrative console for the deployment manager.
 - ___ a. Open a web browser.
 - ___ b. Start the administrative console for the deployment manager by using the following URL:

`http://bpminst01:9062/ibm/console`



Hint

You can also use the bookmark that you created in an earlier exercise.

-
- ___ c. In the login area, enter `bpminst01` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ 2. Verify the configuration.
 - ___ a. Click **Servers > Clusters > WebSphere application server clusters > AppCluster > Business Process Choreographer > Business Process Choreographer Containers**.
 - ___ b. Notice the message that indicates the Business Flow Manager and Human Task Manager are currently installed.

Messages

[i] The Business Flow Manager is currently installed. Restart the server for any changes to take effect.
[i] The Human Task Manager is currently installed. Restart the server for any changes to take effect.

-
- ___ c. Examine the settings on the configuration page.

- __ d. In the Additional Properties section, click **Business Flow Manager**.
- __ e. Examine the settings on the **Configuration** tab.

The screenshot shows the 'Configuration' tab of the Business Flow Manager settings. It includes fields for 'Retry limit' (set to 5), 'Retention queue message limit' (set to 20), 'Retention queue' (set to jms/BPERetQueue), and 'Hold queue' (set to jms/BPEHldQueue). A 'State Observers' section contains three unchecked checkboxes: 'Enable Common Event Infrastructure logging', 'Enable audit logging', and 'Enable Federation Server Indexing'. Below this is a section titled 'Business Process Navigation Performance' with a checked checkbox for 'Enable advanced performance optimizations'. Under 'Work Manager Based Navigation', there is a 'Message Pool Size' section with a selected radio button for 'Use work manager thread pool size * 10'.

Configuration Runtime

Retry limit
5

Retention queue message limit
20

Retention queue
jms/BPERetQueue

Hold queue
jms/BPEHldQueue

State Observers

Enable Common Event Infrastructure logging

Enable audit logging

Enable Federation Server Indexing

▼ **Business Process Navigation Performance**

Enable advanced performance optimizations

Work Manager Based Navigation

Message Pool Size

Use work manager thread pool size * 10

- __ f. In the Related Items section, click **Human Task Manager**.

- __ g. Examine the settings on the **Configuration** tab.

The screenshot shows the Configuration tab selected in the top navigation bar. Below it, the Runtime tab is also visible. The main content area is titled "E-Mail Service". It contains several input fields with the following values:

- E-mail session JNDI name: [empty]
- Sender e-mail address: taskmanager.emailservice@htm.companydomain
- Escalation URL prefix: [empty]
- Task URL prefix: [empty]
- Administrator URL prefix: https://bpmhost:9446/bpc
- Process Explorer URL prefix: https://bpmhost:9446/bpc

Below this is a section titled "State Observers" which contains three checkboxes:

- Enable Common Event Infrastructure logging
- Enable audit logging
- Enable task history

- __ 3. View the installed applications.
- __ a. Click **Applications > Application Types > WebSphere enterprise applications**.
- __ b. Notice the enterprise applications that are installed. The applications provide the required functions for the Business Process Choreographer in the application cluster. Verify the installation of `BPEContainer`, `HTM_PredefinedTaskMsg`, `HTM_PredefinedTasks`, and `TaskContainer`. These enterprise applications all have the suffix `_AppCluster`. Scroll to page 2 to see all of the applications.

Name	Application Status
an administer the following resources:	
AppScheduler	
BPCExplorer_SupCluster	
BPEContainer_AppCluster	
BPMAutomationWidgets_AppCluster	
BSpaceEAR_AppCluster	
BSpaceForms_AppCluster	
BSpaceHelp_AppCluster	
Business.Rules.Manager_AppCluster	
BusinessRules_AppCluster	
HTM_PredefinedTaskMsg_V8000_AppCluster	
HTM_PredefinedTasks_V8000_AppCluster	
HumanTaskManagementWidgets_AppCluster	
IBM_BPM_DocumentStore_AppCluster	
IBM_BPM_Help_AppCluster	
IBM_BPM_PerformanceDW_SupCluster	
IBM_BPM_Portal_AppCluster	
IBM_BPM_ProcessAdmin_AppCluster	

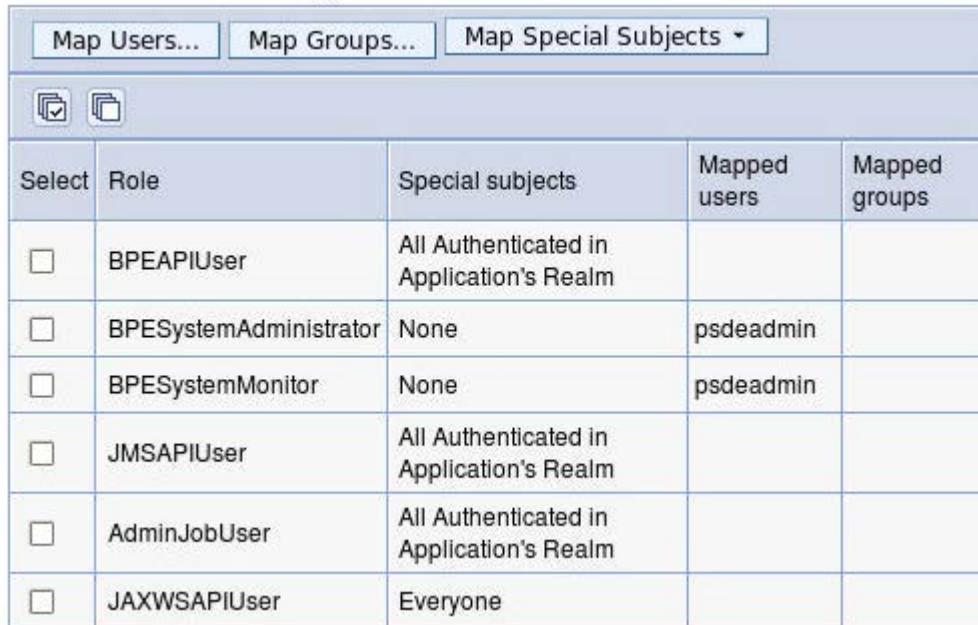
- ___ c. From the list of installed applications, click **BPEContainer_AppCluster**. Be sure to click the link. Do not select the check box. The BPE Container application is the business process engine that runs business processes.
- ___ d. Click **Manage Modules** under Modules.

- ___ e. View the details of the various modules. You can see that each of the modules is mapped to both the AppCluster and the web server, IHS1.

Module	URI	Module Type	Server
<u>BFMIF_AppClusterEJB</u>	b.jar,META-INF/ejb-jar.xml	EJB Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster
<u>ProcessContainer</u>	bpecontainer.jar,META-INF/ejb-jar.xml	EJB Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster
<u>bpejaxwsjms.jar</u>	bpejaxwsjms.jar,META-INF/ejb-jar.xml	EJB Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster
<u>bpejaxwsjmsrouter.jar</u>	bpejaxwsjmsrouter.jar,META-INF/ejb-jar.xml	EJB Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster
<u>BFMIF_AppClusterWeb</u>	b.war,WEB-INF/web.xml	Web Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster
<u>BFMRESTAPI</u>	bfmrestapi.war,WEB-INF/web.xml	Web Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster
<u>BFMJAXWSAPI</u>	bfmjaxws.war,WEB-INF/web.xml	Web Module	WebSphere:cell=PROD- PServerCell,node=ihsnode01,server=IHS1 WebSphere:cell=PROD- PServerCell,cluster=AppCluster

- ___ f. Click the **BPEContainer_AppCluster** link at the top of the page in the breadcrumb trail.
 ___ g. In the Detail Properties section, click **Security role to user/group mapping**.

- ___ h. On the “Security role to user/group mapping” page, you see information about the various roles.



The screenshot shows a user interface for managing security roles. At the top, there are three buttons: 'Map Users...', 'Map Groups...', and 'Map Special Subjects'. Below these buttons is a toolbar with two icons: a checkmark and a trash can. The main area is a table with the following columns: 'Select', 'Role', 'Special subjects', 'Mapped users', and 'Mapped groups'. The table contains the following data:

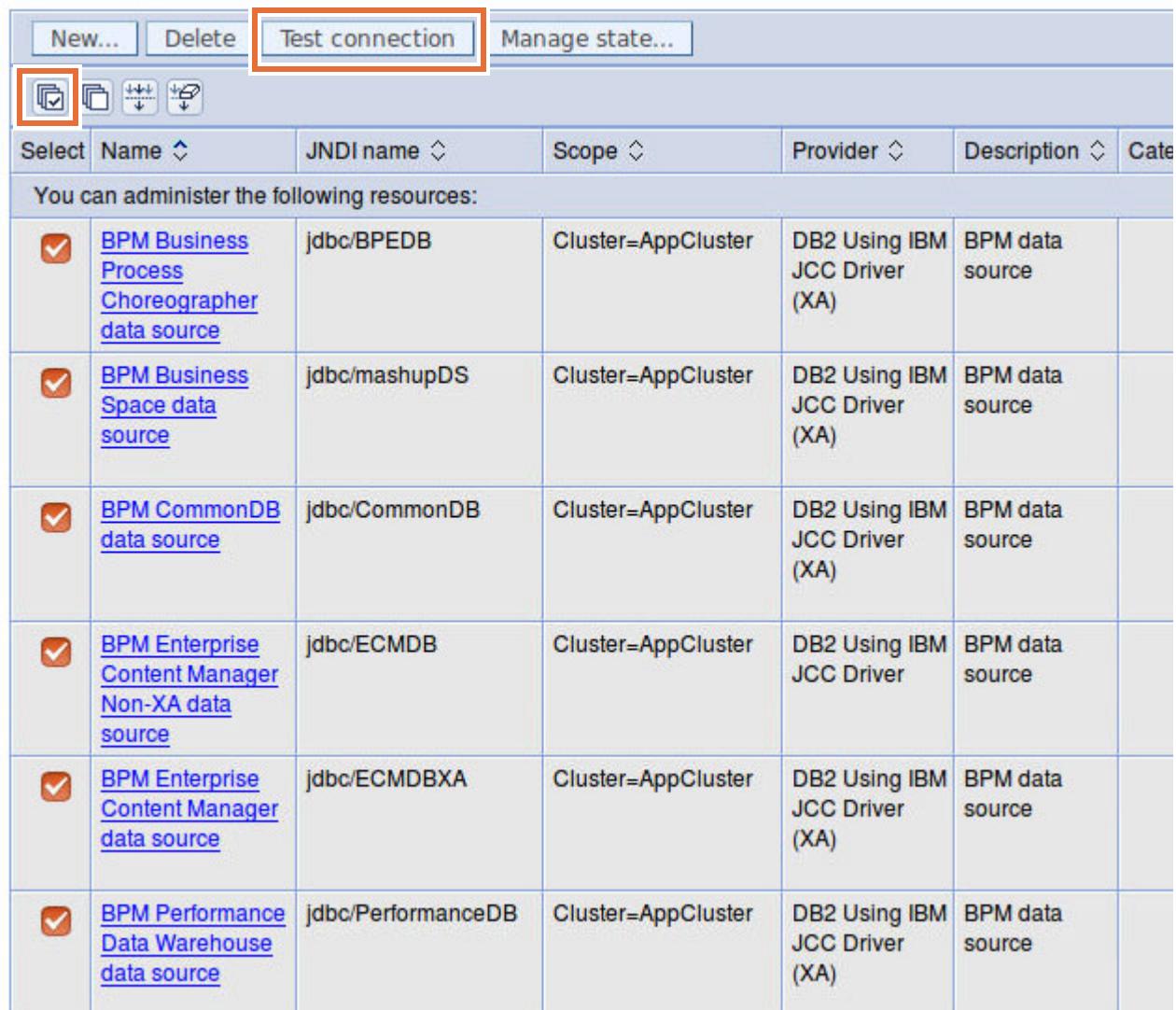
Select	Role	Special subjects	Mapped users	Mapped groups
<input type="checkbox"/>	BPEAPIUser	All Authenticated in Application's Realm		
<input type="checkbox"/>	BPESystemAdministrator	None	psdeadmin	
<input type="checkbox"/>	BPESystemMonitor	None	psdeadmin	
<input type="checkbox"/>	JMSAPIUser	All Authenticated in Application's Realm		
<input type="checkbox"/>	AdminJobUser	All Authenticated in Application's Realm		
<input type="checkbox"/>	JAXWSAPIUser	Everyone		

- ___ i. Click the **BPEContainer_AppCluster** link at the top of the page in the breadcrumb trail.
- ___ j. Under Enterprise Java Bean Properties, click **Message Driven Bean listener bindings**.
- ___ k. On the “Message-Driven Bean listener bindings” page, you see information that is related to the BPEContainer application. Each message-driven bean must bind to a listener port name or to an activation specification JNDI name. Bindings specify JNDI names for the referential and referenced artifacts in an application.
- ___ 4. The BPEContainer can start long-running business processes. For these business processes, the current state of the business process is persisted to a database. View the JDBC resources.
- ___ a. Click **Resources > JDBC > Data sources**.
- ___ b. In the scope area, set the cluster scope. From the menu, select **Cluster=AppCluster**.

- ___ c. You see the data source BPM Business Process Choreographer data source. Note the JNDI name of jdbc/BPEDB.

Name ◊	JNDI name ◊	Scope ◊	Provider ◊	Description ◊	Category ◊
an administer the following resources:					
<u>BPM Business Process Choreographer data source</u>	jdbc/BPEDB	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<u>BPM Business Space data source</u>	jdbc/mashupDS	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<u>BPM CommonDB data source</u>	jdbc/CommonDB	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<u>BPM Enterprise Content Manager Non-XA data source</u>	jdbc/ECMDB	Cluster=AppCluster	DB2 Using IBM JCC Driver	BPM data source	
<u>BPM Enterprise Content Manager data source</u>	jdbc/ECMDBXA	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	

- ___ d. Test the connection for the data source. Click the select all icon to select all the data sources, and click **Test connection**.



The screenshot shows a table of JDBC data sources. The first column contains a checkbox for selecting multiple rows. The second column lists the names of the data sources. The third column shows their JNDI names. The fourth column indicates the cluster scope. The fifth column shows the provider. The sixth column describes the data source type. The last two columns are partially visible.

Select	Name	JNDI name	Scope	Provider	Description	Category
You can administer the following resources:						
<input checked="" type="checkbox"/>	BPM Business Process Choreographer data source	jdbc/BPEDB	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<input checked="" type="checkbox"/>	BPM Business Space data source	jdbc/mashupDS	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<input checked="" type="checkbox"/>	BPM CommonDB data source	jdbc/CommonDB	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<input checked="" type="checkbox"/>	BPM Enterprise Content Manager Non-XA data source	jdbc/ECMDB	Cluster=AppCluster	DB2 Using IBM JCC Driver	BPM data source	
<input checked="" type="checkbox"/>	BPM Enterprise Content Manager data source	jdbc/ECMDBXA	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
<input checked="" type="checkbox"/>	BPM Performance Data Warehouse data source	jdbc/PerformanceDB	Cluster=AppCluster	DB2 Using IBM JCC Driver (XA)	BPM data source	

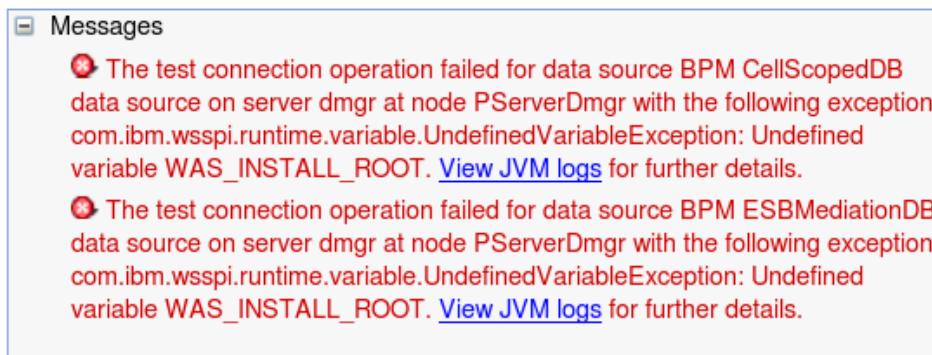
The status message indicates that the test was successful.

- ___ e. Click the **BPM Business Process Choreographer data source** link. Review the settings of the Business Process Choreographer data source. Note the authentication aliases in the Security settings area and the database details at the bottom of the pane.
- ___ 5. Examine more JDBC data sources.
- ___ a. Click the **Data sources** link at the top of the page in the breadcrumb trail.
- ___ b. In the scope area, set the cluster scope. From the menu, select **Cluster=MECluster**.

- ___ c. You see the BPM Messaging data source.

Select	Name ▾	JNDI name ▾	Scope ▾	Provider ▾	Description ▾	Category ▾
You can administer the following resources:						
<input type="checkbox"/>	<u>BPM Messaging data source</u>	jdbc/SharedDb	Cluster=MECluster	DB2 Using IBM JCC Driver (XA)	BPM data source	
Total 1						

- ___ d. Test the connection for the data source. Select the **BPM Messaging data source** check box and click **Test connection**. The status message indicates that the test was successful.
- ___ e. Click **BPM Messaging data source**. On the Data sources pane, you can see the settings for the data source. Note the authentication aliases in the Security settings area and the database details at the bottom of the pane.
- ___ f. Click the **Data sources** link at the top of the page in the breadcrumb trail.
- ___ g. In the scope area, set the cluster scope. From the menu, click **Cluster=SupCluster**.
- ___ h. You see the data sources listed. Click the select all icon to select all the data sources, and click **Test connection**. The status message indicates that the test was successful.
- ___ i. In the scope area, set the cell scope. From the menu, click **CELL=PROD-PServerCell**.
- ___ j. You see the data sources listed. Click the select all icon to select all the data sources, and click **Test connection**. The status message indicates that the test failed, indicating that the exception is an undefined variable. However, it is safe to ignore this message.



Information

In a network deployment environment, testing a connection to the cell-level `jdbc/WPSDB` data source can fail, with the error message `UndefinedVariableException: Undefined Variable`.

If you attempt to test the data source connection, for example in the administrative console, you might get a message that indicates the test connection operation failed. This message does not necessarily indicate a problem with accessing the data source at run time. You can ensure that the locations of your JDBC driver files are accessible to every client that must use the data source, and

configure the variable with the full path of that location. You can disregard the test connection error unless you are also experiencing trouble with connecting to the data store at run time.

___ 6. Examine the JMS resources.

- ___ a. Click **Resources > JMS > JMS providers**.
- ___ b. In the scope area, set the cluster scope. From the menu, select **Cluster=AppCluster**.
- ___ c. Click **Default messaging provider**.

JMS providers

A JMS provider enables messaging based on the Java Message Service (JMS). It provides J2EE connection factories to create connections for JMS destinations.

Scope: Cell=**PROD-PServerCell**, Cluster=**AppCluster**

- Show scope selection drop-down list with the all scopes option

Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, [see the scope settings help](#).

Cluster=AppCluster

Preferences

<input type="button" value="New"/> <input type="button" value="Delete"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Select	Name	Description	Scope
You can administer the following resources:			
	Default messaging provider	Default messaging provider	Cluster=AppCluster
	WebSphere MQ messaging provider	WebSphere MQ messaging provider	Cluster=AppCluster
Total 2			

___ d. In the Additional Properties section, click **Queues**. You see several queue destinations defined.

Many destinations are named `BPE*Queue` or `BFM*Queue` (where * is a wildcard). All of the BPE container queue destinations are configured by using scripts during the configuration of the Business Process Choreographer containers. There are also some other queues that do not have the BPE or BPM prefix.

___ 7. Examine the scheduler.

- ___ a. Click **Resources > Asynchronous beans > Work managers**.
- ___ b. In the scope area, set the cluster scope. From the menu, select **Cluster=AppCluster**.
- ___ c. Notice the `BPESchedulerWorkManager`. The work manager contains a pool of threads that are bound into the JNDI interface.

- ___ d. Click **BPESchedulerWorkManager** and examine the settings.
- ___ 8. Verify the installation of the Human Task Manager.
- ___ a. Click **Applications > Application Types > WebSphere enterprise applications**.
 - ___ b. From the list of installed applications, click **TaskContainer_AppCluster**. Be sure to click the link. Do not select the check box. The Task Container application is the Business Process Choreographer engine that runs human tasks.
 - ___ c. In the Detail Properties section, click **Security role to user/group mapping**.
 - ___ d. On the “Security role to user/group mapping” pane, you see information about the various roles.

The screenshot shows a table titled "Security role to user/group mapping". The table has columns for "Select", "Role", "Special subjects", "Mapped users", and "Mapped groups". There are eight rows, each representing a different security role:

Select	Role	Special subjects	Mapped users	Mapped groups
<input type="checkbox"/>	TaskAPIUser	All Authenticated in Application's Realm		
<input type="checkbox"/>	TaskSystemAdministrator	None	psdeadmin	
<input type="checkbox"/>	TaskSystemMonitor	None	psdeadmin	
<input type="checkbox"/>	EscalationUser	All Authenticated in Application's Realm		
<input type="checkbox"/>	AdminJobUser	All Authenticated in Application's Realm		
<input type="checkbox"/>	JAXWSAPIUser	Everyone		
<input type="checkbox"/>	BusinessCategorySystemAdministrator	None	psdeadmin	
<input type="checkbox"/>	WorkBasketSystemAdministrator	None	psdeadmin	

- ___ e. Click the **TaskContainer_AppCluster** link at the top of the page in the breadcrumb trail.
- ___ f. Under Enterprise Java Bean Properties, click **Message Driven Bean listener bindings**.
- ___ g. On the “Message-Driven Bean listener bindings” page, you see information that is related to the TaskContainer application.

Part 2: Installing the Account Verification scenario applications

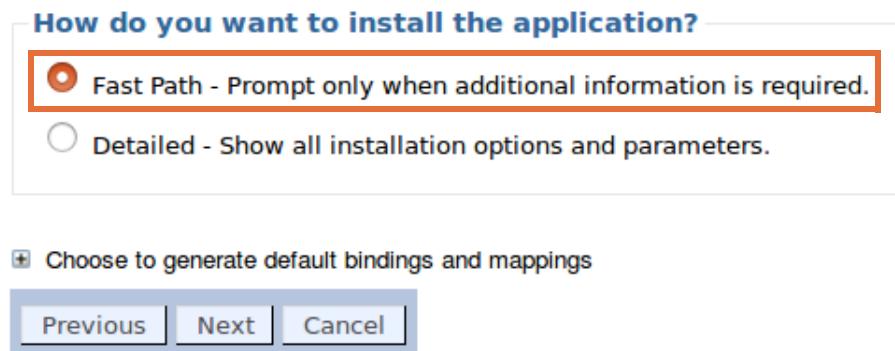
The Account Verification scenario consists of eight applications that must be installed on the server:

- AccountOpeningUIEAR.ear
- AccountProcessingUIEAR.ear
- CreditScoreServiceApp.ear
- FoundationModuleApp.ear
- FoundationServicesApp.ear
- HumanTaskServicesApp.ear
- IneligibleMediationServiceApp.ear
- RouterMediationServiceApp.ear

The FoundationModule application is installed through the administrative console, while the other applications are installed by using a Jython script.

The IneligibleMediationServiceApp and RouterMediationServiceApp are mediation modules that can be deployed to both Process Server and WebSphere Enterprise Service Bus. In this exercise, they are deployed to Process Server.

- ___ 1. Install the FoundationModule application by using the administrative console.
 - ___ a. Click **Applications > Application Types > WebSphere enterprise applications**.
 - ___ b. Click **Install**.
 - ___ c. The Preparing for the application installation pane is displayed. Select **Local file system** and click **Browse**.
 - ___ d. Change to the /opt/labfiles/Admin directory and select the FoundationModuleApp.ear file. Click **Open**. The **Local file system** field now contains the path of the EAR file. Click **Next**.
 - ___ e. Keep the default **Fast Path** for application installation.



- ___ f. Click **Next** to continue.
- ___ g. The next pane shows Step 1: Select installation options. Scroll down the page, and click **Next**, keeping all of the default settings.

**Note**

You can complete each step in the installation process by clicking **Next** to go to the next step, or you can go directly to a step by clicking the link.

- __ h. In the Step 2: Map modules to servers pane, verify the mappings that are listed in the **Server** column. Verify that the foundation module is mapped to **WebSphere:cell=PROD-PServerCell,cluster=AppCluster**.
- __ i. Click **Next**.
- __ j. On the summary pane, click **Finish** to start the installation of the FoundationModule application.
- __ k. Look for the message that indicates that the application was installed successfully.

CWSCA3017I: Installation task "Resource Task for SCA Messaging Binding and EIS Binding" is running.

CWSCA3017I: Installation task "Resource Task for SCA Messaging Binding and JMS Binding" is running.

CWSCA3017I: Installation task "SIBus Destination Resource Task for SCA Asynchronous Invocations" is running.

CWSCA3017I: Installation task "EJB NamespaceBinding Resource Task for SCALimportBinding" is running.

CWSCA3017I: Installation task "SIBus Destination Resource Task for SCA SOAP/JMS Invocations" is running.

CWSCA3017I: Installation task "Deployment Task for JaxWslimportBinding and JaxWsExportBinding" is running.

CWSCA3014I: Resources for the SCA application "FoundationModuleApp" have been configured successfully.

ADMA5113I: Activation plan created successfully.

ADMA5011I: The cleanup of the temp directory for application FoundationModuleApp is complete.

ADMA5013I: Application FoundationModuleApp installed successfully.

Application FoundationModuleApp installed successfully.

To start the application, first save changes to the master configuration.

Changes have been made to your local configuration. You can:

- [Save](#) directly to the master configuration.
- [Review](#) changes before saving or discarding.

To work with installed applications, click the "Manage Applications" link.

[**Manage Applications**](#)

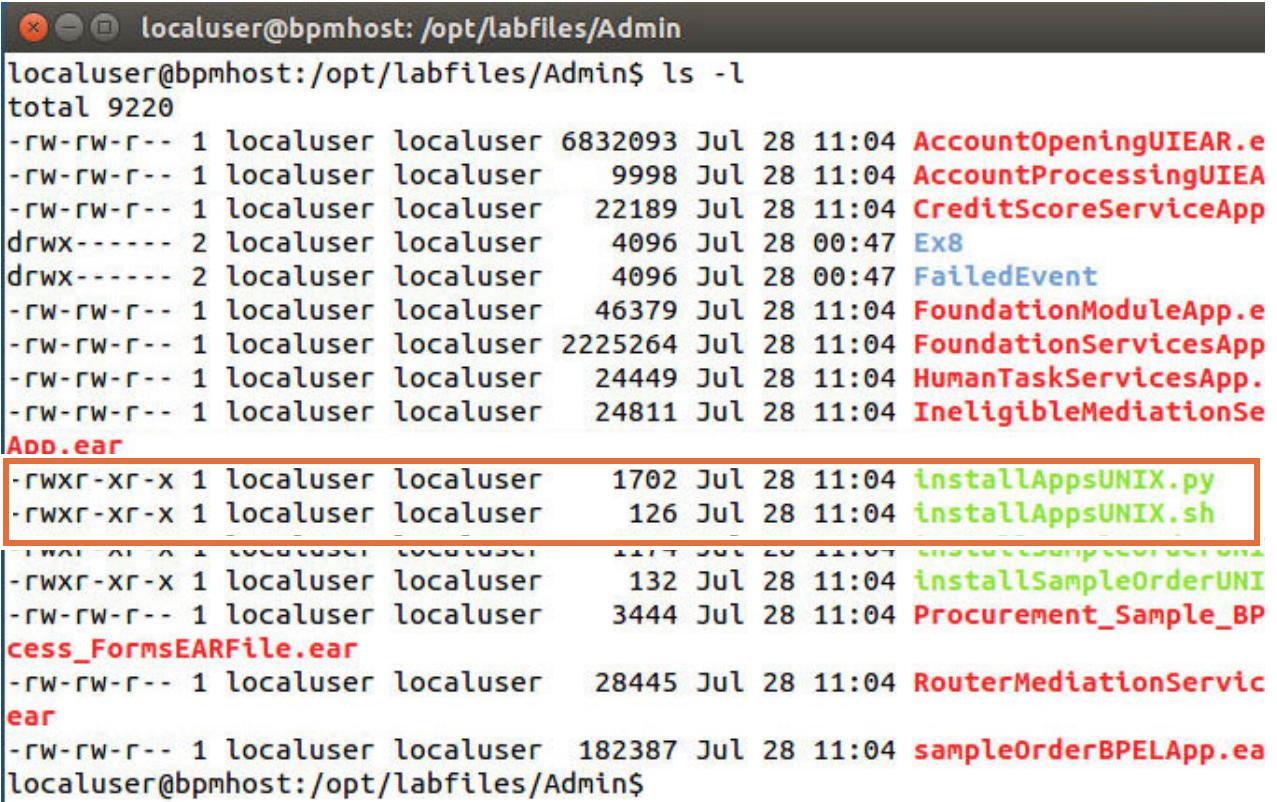
- __ l. Save the changes to the master configuration.

**Note**

If you receive error messages such as **The system is unable to generate synchronization request** and **The configuration synchronization complete for cell**, errors occurred, it

is safe to ignore them. You can verify that the node is synchronized by clicking **System administration > Nodes** and verifying that the node is synchronized.

- ___ m. Minimize the administrative console browser window.
- ___ 2. Install the remaining applications by using scripting.
 - ___ a. Open a terminal window and change to the `/opt/labfiles/Admin` directory.
 - ___ b. Verify that the `installAppsUNIX.sh` script has execute permissions. If not, enter the `chmod +x` command on the `installAppsUNIX.sh` script.



```
localuser@bpghost:/opt/labfiles/Admin$ ls -l
total 9220
-rw-rw-r-- 1 localuser localuser 6832093 Jul 28 11:04 AccountOpeningUIEAR.e
-rw-rw-r-- 1 localuser localuser    9998 Jul 28 11:04 AccountProcessingUIEA
-rw-rw-r-- 1 localuser localuser   22189 Jul 28 11:04 CreditScoreServiceApp
drwx----- 2 localuser localuser    4096 Jul 28 00:47 Ex8
drwx----- 2 localuser localuser    4096 Jul 28 00:47 FailedEvent
-rw-rw-r-- 1 localuser localuser   46379 Jul 28 11:04 FoundationModuleApp.e
-rw-rw-r-- 1 localuser localuser  2225264 Jul 28 11:04 FoundationServicesApp
-rw-rw-r-- 1 localuser localuser   24449 Jul 28 11:04 HumanTaskServicesApp.
-rw-rw-r-- 1 localuser localuser   24811 Jul 28 11:04 IneligibleMediationSe
Add.ear
-rwxr-xr-x 1 localuser localuser    1702 Jul 28 11:04 installAppsUNIX.py
-rwxr-xr-x 1 localuser localuser     126 Jul 28 11:04 installAppsUNIX.sh
-rwxr-xr-x 1 localuser localuser     100 Jul 28 11:04 installSampleOrderUNI
-rw-rw-r-- 1 localuser localuser   132 Jul 28 11:04 installSampleOrderUNI
-rw-rw-r-- 1 localuser localuser   3444 Jul 28 11:04 Procurement_Sample_BP
cess_FormsEARFile.ear
-rw-rw-r-- 1 localuser localuser  28445 Jul 28 11:04 RouterMediationServic
ear
-rw-rw-r-- 1 localuser localuser 182387 Jul 28 11:04 sampleOrderBPELApp.ea
localuser@bpghost:/opt/labfiles/Admin$
```

- ___ c. Enter the following command to run the script:

```
./installAppsUNIX.sh
```

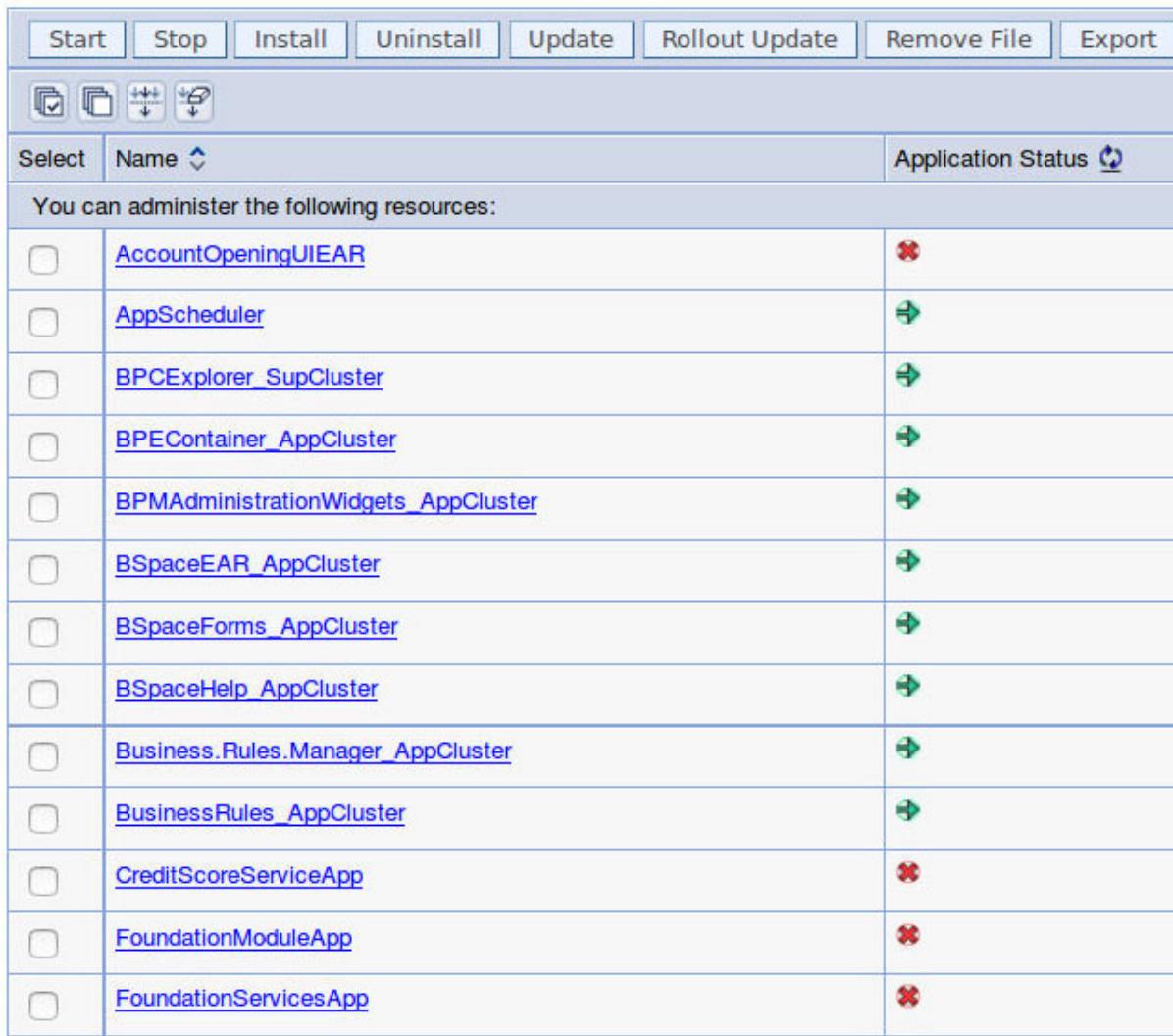
- ___ d. Monitor the output in the terminal window. Wait for the script-based installation to complete. Console messages indicate the successful installation of the applications.

```
localuser@bpghost: /opt/labfiles/Admin
inding" is running.
CWSCA3017I: Installation task "Resource Task for SCA Messaging Binding and
inding" is running.
CWSCA3017I: Installation task "SIBus Destination Resource Task for SCA Asy
ous Invocations" is running.
CWSCA3017I: Installation task "EJB NamespaceBinding Resource Task for SCAI
inding" is running.
CWSCA3017I: Installation task "SIBus Destination Resource Task for SCA SOAF
Invocations" is running.
CWSCA3017I: Installation task "Deployment Task for JaxWsImportBinding and :x
portBinding" is running.
CWSCA3014I: Resources for the SCA application "RouterMediationServiceApp" ha
een configured successfully.
ADMA5113I: Activation plan created successfully.
ADMA5011I: The cleanup of the temp directory for application RouterMediati
ceApp is complete.

ADMA5013I: Application RouterMediationServiceApp installed successfully.
SUCCESS: FoundationServicesApp has been successfully installed.
SUCCESS: AccountProcessingUIEAR has been successfully installed.
SUCCESS: IneligibleMediationServiceApp has been successfully installed.
SUCCESS: CreditScoreServiceApp has been successfully installed.
SUCCESS: HumanTaskServicesApp has been successfully installed.
SUCCESS: RouterMediationServiceApp has been successfully installed.
```

- ___ e. Exit the terminal window.
- ___ 3. Before testing the Account Verification scenario, the applications must be started.
- ___ a. Maximize the administrative console browser window.

- ___ b. Click **Applications > Application Types > WebSphere enterprise applications**. A number of applications are installed and the status is stopped.



The screenshot shows a software interface for managing applications. At the top, there is a toolbar with buttons for Start, Stop, Install, Uninstall, Update, Rollout Update, Remove File, and Export. Below the toolbar is a header row with columns for Select, Name, and Application Status. The Application Status column contains icons: a red X for stopped applications and a green plus sign for running ones. The main area displays a list of applications with their names in blue under the 'Name' column. Most applications listed are stopped, indicated by the red X icon in the 'Application Status' column.

Select	Name	Application Status
You can administer the following resources:		
<input type="checkbox"/>	AccountOpeningUIEAR	✗
<input type="checkbox"/>	AppScheduler	✚
<input type="checkbox"/>	BPCExplorer_SupCluster	✚
<input type="checkbox"/>	BPEContainer_AppCluster	✚
<input type="checkbox"/>	BPMAdministrationWidgets_AppCluster	✚
<input type="checkbox"/>	BSpaceEAR_AppCluster	✚
<input type="checkbox"/>	BSpaceForms_AppCluster	✚
<input type="checkbox"/>	BSpaceHelp_AppCluster	✚
<input type="checkbox"/>	Business.Rules.Manager_AppCluster	✚
<input type="checkbox"/>	BusinessRules_AppCluster	✚
<input type="checkbox"/>	CreditScoreServiceApp	✗
<input type="checkbox"/>	FoundationModuleApp	✗
<input type="checkbox"/>	FoundationServicesApp	✗



Note

The screen capture shows only a few applications. It does not show a complete listing of all applications installed.

-
- ___ 4. Restart the AppCluster.
- ___ a. Click **Servers > Clusters > WebSphere application server clusters**.
- ___ b. Restart the application cluster by selecting the **AppCluster** check box and clicking **Ripplestart**.



Information

If your servers are stopped, select the Start option. The Start option starts the server process of each member of the cluster by calling the node agent for each server to start the servers. If a call to a node agent for a server fails, the server does not start.

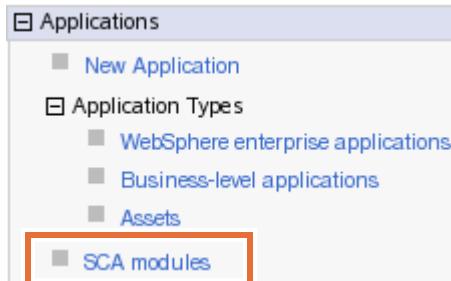
If your servers are running, select the Ripplestart option. Ripplestart combines stopping and starting operations. It first stops and then restarts each member of the cluster in sequence, and ensures that at least one server in the cluster is online to handle requests. Do not run a ripplestart on multiple clusters simultaneously. If you plan on using Ripplestart to start clusters, do so on one cluster at a time.

- ___ 5. Verify that the applications are running.
 - ___ a. Click **Applications > Application Types > WebSphere enterprise applications**. All applications are in a started state.

Part 3: Explore the FoundationModule business process application and business process container

The FoundationModule application installed an SCA module that includes a business process called AccountVerification. Explore the newly installed application.

- ___ 1. Explore the SCA modules.
 - ___ a. In the navigation pane, click **Applications > SCA modules**.



This pane lists installed Service Component Architecture (SCA) modules and their associated applications. You can start and stop modules, browse, or change the properties of an item.

- __ b. Click **FoundationModule** to view details on this module.

The screenshot shows the 'Configuration' screen for the 'FoundationModule'. The left pane contains 'General Properties' with fields for Module (FoundationModule), Application name (FoundationModuleApp), Version (empty), Cell ID (empty), Description (empty), SCA runtime support (Native), and Business Object parsing mode (Eager). The right pane contains 'Module components' with links for Imports and Exports, and 'Additional Properties' with links for Module properties, Business processes, and Human tasks. Below these are 'Related Items' links for SCA system bus, SCA application bus, SCA system bus destinations, Business Integration Security, Owning enterprise application, and Deployment targets.

The Additional Properties section provides easy access to the business processes and human tasks of this module. Clicking these links displays the same view that is shown in a previous part of this exercise. From there, you can start or stop a business process or human task, which effectively starts or stops the corresponding template. When the process or task template is stopped, no new business process or human task instance can be created. A later part of this exercise demonstrates how to work with process and task instances by using the Business Process Choreographer Explorer.

The Module properties link displays the list of promoted properties of a mediation module. The property promotion feature can be used in WebSphere Enterprise Service Bus mediation modules to mark certain properties of a mediation flow as changeable at run time. These promoted properties can then be changed from this link.

- __ c. In the Additional Properties section, click **Business processes**. The pane displays the single business process named AccountVerification. From this pane, the business

process, or template, can be started and stopped. The business process is in the started state.

SCA modules > FoundationModule > Business processes

This panel is used to start and stop business processes. Generally, configuration changes take effect after you restart the server, but this panel updates both the configuration and the status of the business process on each running server without the need for the servers to be restarted. Each server and cluster that has this business process installed must be running.

The screenshot shows the 'Business processes' panel with the following interface elements:

- Buttons:** Start, Stop.
- Icons:** Filter, Refresh, Sort, Undo, Redo.
- Table Headers:** Select, Name (dropdown), Valid from time (dropdown), Status (dropdown).
- Text:** You can administer the following resources:
- Data Row:** AccountVerification (checkbox checked), Friday, January 8, 2010 2:14:25 AM EST, Started.
- Total:** Total 1.

- ___ d. In the breadcrumb trail, click **FoundationModule** to get back to the previous view.
- ___ e. In the Additional Properties section, click **Human tasks**. From this pane, you can start or stop a task template.

SCA modules > FoundationModule > Human tasks

This panel is used to start and stop human tasks, which are defined as part of a business process. Generally, configuration changes take effect after you restart the server, but this panel updates both the configuration and the status of the task on each running server without requiring the servers to be restarted. Each server and cluster which has this task installed must be running.

The screenshot shows the 'Human tasks' panel with the following interface elements:

- Buttons:** Start, Stop.
- Icons:** Filter, Refresh, Sort, Undo, Redo.
- Table Headers:** Select, Name (dropdown), Valid from time (dropdown), Namespace (dropdown), Status (dropdown).
- Text:** You can administer the following resources:
- Data Row:** CreateApplication (checkbox checked), Monday, June 6, 2016 5:39:22 PM EDT, http://FoundationModule/htm, Started.
- Total:** Total 1.

- ___ f. In the breadcrumb trail, click **FoundationModule**.

- g. In the Module components section, expand both **Imports** and **Exports** to view the available imports and exports of the FoundationModule SCA module.

The screenshot shows the 'Configuration' interface. On the left, under 'General Properties', there are fields for 'Module' (FoundationModule), 'Application name' (FoundationModuleApp), 'Version' (empty), and 'Cell ID' (empty). On the right, under 'Module components', there is a tree view. The 'Imports' node is expanded, showing several items: CreditRiskAssessmentImport, CreditScoreServiceImport, FinalApplicationReview, GenerateDecline, MaptoIneligible, RecordIneligibleApplication, and RequestMoreDocumentation. The 'Exports' node is also expanded, showing AccountVerificationExport. A red box highlights the 'Module components' section and its expanded 'Imports' and 'Exports' nodes.



Information

Imports and exports in SCA modules are used for intermodule or external communication. An import or export contains interface and binding definitions.

- h. Under Imports, expand **CreditScoreServiceImport > Interfaces [WSDL]** and **CreditScoreServiceImport > Binding** to view the interface and binding definitions for the CreditScoreServiceImport import.

Module components

The screenshot shows the 'Module components' tree view. The 'Imports' node is expanded, showing CreditRiskAssessmentImport, CreditScoreServiceImport, FinalApplicationReview, GenerateDecline, MaptoIneligible, RecordIneligibleApplication, and RequestMoreDocumentation. The 'CreditScoreServiceImport' node is selected and expanded. It has two children: 'Interfaces[WSDL]' and 'Binding'. The 'Interfaces[WSDL]' node is expanded, showing a link to 'CreditScoreService'. The 'Binding' node is also expanded, showing a link to 'JAX-Web service [CreditScoreServiceExport1_CreditScoreServiceHttpService/CreditScoreService]'. A red box highlights the 'CreditScoreServiceImport' node and its expanded 'Interfaces[WSDL]' and 'Binding' nodes.

The link in the Interfaces section depicts the Web Services Description Language (WSDL) interface that is defined for this import. Feel free to click the **CreditScoreService** interface to display its WSDL content in read-only mode.

- __ i. Click the **JAX-Web service [CreditScoreServiceServiceExport1_CreditScoreServiceHttpService/]** link to examine the binding details.

General Properties

Service	CreditScoreServiceExport1_CreditScoreServiceHttpService
Port	CreditScoreServiceExport_CreditScoreServiceHttpPort
Target endpoint address	http://localhost:9080/CreditScoreServiceWeb/sca/CreditScoreServiceExport

The Binding section provides a link to the binding configuration. In this case, the CreditScoreService import uses a Web Service Binding. You can change this binding configuration in Process Server at run time. Binding at run time allows modification of endpoint URLs in web service bindings or SCA targets of SCA bindings without redeploying the application.

Note the CreditScoreService port has a target endpoint address for localhost:9080. However, this module is deployed to the AppCluster, where AppClusterMember1 has a port of 9082. The target endpoint address must be modified to the port of the AppCluster member. If the port is not updated, it results in a failed event.

- __ j. Next to the Target endpoint address field, click **Edit**.
- __ k. Enter the following endpoint address:

http://localhost:9082/CreditScoreServiceWeb/sca/CreditScoreServiceExport

[SCA modules > FoundationModule > CreditScoreServiceExport1_CreditScoreServiceHttpService > Edit enc](#)

The attributes of the selected Web service import binding.

Configuration

General Properties

* Target endpoint address
http://localhost:9082/CreditScoreServiceWeb/sca/CreditScoreServiceExport

Apply **OK** **Reset** **Cancel**

Click **OK**.

- __ l. Save the changes.



Information

If you update the target endpoint address, the binding is changed for the selected module. The change takes effect after the start or restart of the SCA module. If the module is redeployed, the configuration changes you made do not replace the original binding.

After you update bindings, the development and runtime are no longer synchronized. To ensure that the changes you make to bindings remain with the module across deployments, a developer uses IBM Integration Designer to change the source code for the module.

-
- ___ m. Click **FoundationModule** in the breadcrumb trail to go back to the SCA module pane.
 - ___ n. Expand **Imports > FinalApplicationReview > Binding** to display the binding definition.

Module components

- [Imports](#)
 - ⊕ [RequestMoreDocumentation](#)
 - ⊕ [RecordIneligibleApplication](#)
 - ⊖ [Interfaces\[WSDL\]](#)
 - [RecordIneligibleApplication](#)
 - ⊖ [Binding](#)
 - [SCA \[FoundationServices/RecordIneligibleApplicationExport\]](#)
- ⊕ [MaptoIneligible](#)
- ⊕ [CreditRiskAssessmentImport](#)
- [FinalApplicationReview](#)
 - ⊖ [Interfaces\[WSDL\]](#)
 - ⊖ [Binding](#)
 - [SCA \[HumanTaskServices/FinalApplicationReviewExport\]](#)
- ⊖
- ⊕ [GenerateDecline](#)
- [Exports](#)
 - ⊕ [AccountVerificationExport](#)

- ___ o. Click **SCA [HumanTaskServices/FinalApplicationReviewExport]** to display the binding configuration.

The screenshot shows the 'General Properties' dialog box for an SCA binding. It has two main sections: 'Import' and 'Target'.
Import: Shows 'Module' set to 'FoundationModule', 'Version' as an empty field, and 'Cell ID' as an empty field. Under 'Import interfaces', it lists 'FinalApplicationReview' under 'WSDL'.
Target: Shows 'Module' set to 'HumanTaskServices' and 'Export' set to 'FinalApplicationReviewExport'. Under 'Export interfaces', it lists 'FinalApplicationReview' under 'WSDL'. Both the Import and Target sections have scroll bars.



Information

SCA bindings can be easily reconfigured to point to a different export in a different module by selecting them from the **Module** and **Export** menus. However, when reconfiguring the binding, the new target export must expose the same interface as the original target export.

- ___ p. Log out of the administrative console.

Part 4: Testing the business process with the Business Process Choreographer Explorer

The Business Process Choreographer Explorer, another important application, was installed when the business process container was installed and configured. Both business users in a test environment and process application system administrators in a test or production environment use Business Process Choreographer Explorer. From the Business Process Choreographer Explorer, it is possible to start, control, and interact with business processes.

- 1. Access the Business Process Choreographer Explorer.
 - a. Open another web browser and enter the following URL:

`http://bpmhost:9083/bpc`

The Business Process Choreographer Explorer application is deployed to the SupCluster. The port number is for SupClusterMember1 running in the SupCluster. This port was examined in the previous exercise.

- b. In the Insecure Connection window, click **Advanced** to expand the option.
- c. Click **Add Exception**.
- d. Click **Confirm Security Exception**. The Business Process Choreographer Explorer login page is now visible.



Hint

Since the Business Process Choreographer Explorer is used throughout the exercises, it might be a good idea to create a bookmark to the URL.

- e. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- f. Under Process Templates, click **Currently Valid**. There is one process template listed. The template was installed and started when the FoundationModule SCA module was installed.

Currently Valid Process Templates

Use this page to view process templates on which you can work.

<input type="checkbox"/> Process Template Name	<input type="checkbox"/> Valid From	<input type="checkbox"/> Process App	<input type="checkbox"/> Snapshot	<input type="checkbox"/> Long Running	<input type="checkbox"/> Start
AccountVerification	1/8/2010 2:14:25 AM EST			yes	

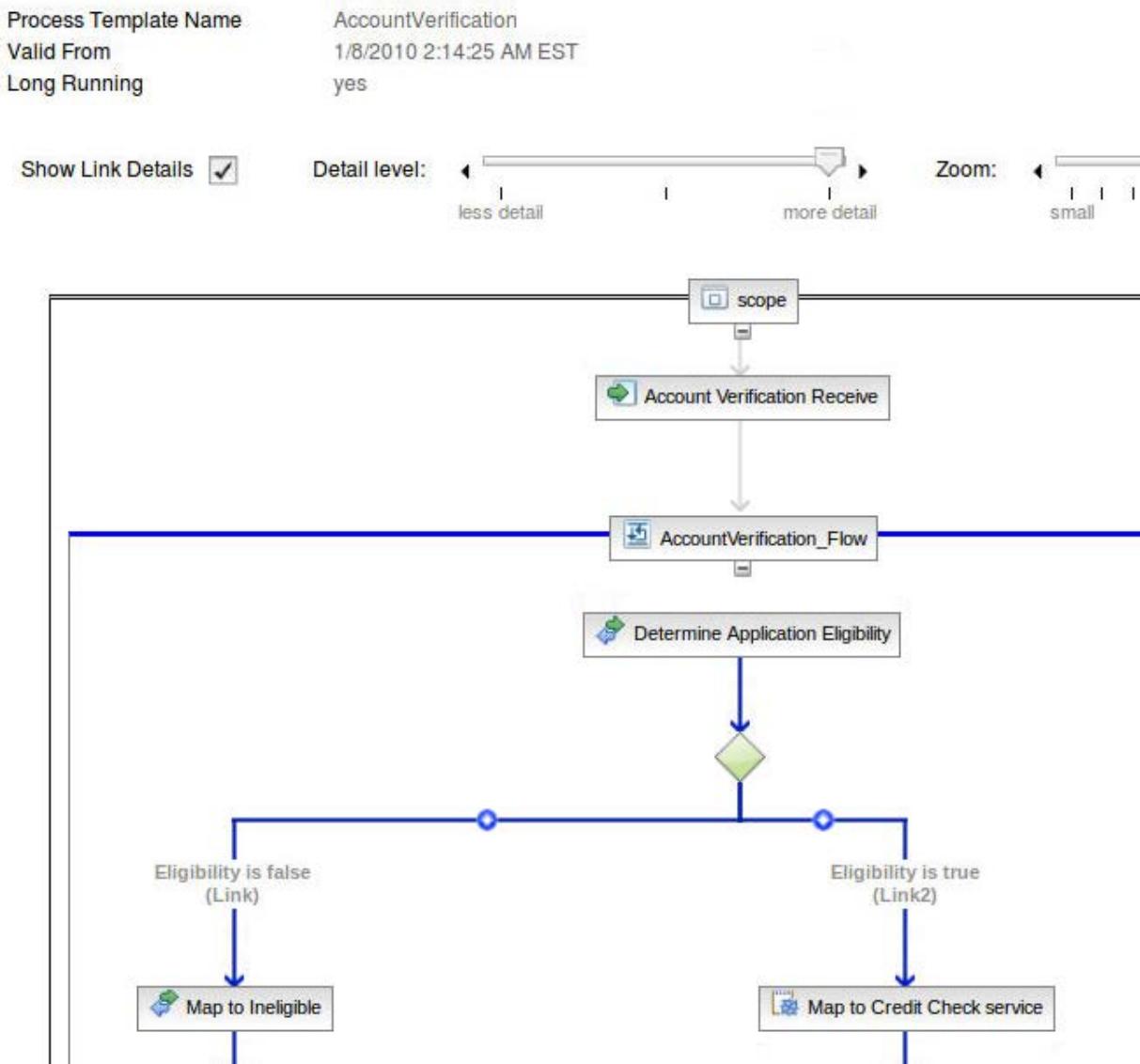
Items found: 1 Items selected: 0 Page 1 of 1 Items per page: 20

The AccountVerification process is deployed with the FoundationModule SCA module. This BPEL process is used for testing in the next steps of this exercise.

2. Explore the AccountVerification business process.
- a. The figure in the screen capture shows the process as it was created in IBM Integration Designer. Integration Designer has facilities to assemble business processes and export them in a form consumable by Process Server.

You can view the structure of a process by selecting the **AccountVerification** process check box and clicking **View Structure**. The Process Structure View page opens, showing details and a graphical image of the process template.

The following graphic shows the structure of the process.



The “account verification” scenario that is used in the exercises is primarily composed of a business process that is designed to automate the processing of customer accounts. The purpose of this scenario is to process existing customer accounts by transferring and validating them through a new process. This scenario might be used in a real-world situation, when the data is moved from an old system to a system that includes IBM Business Process Manager.

- ___ b. This BPEL process has three basic paths.
- 1) Eligible applications for customers that are deemed to be a low credit risk are automatically approved.
 - 2) Eligible applications for customers that are deemed to be a medium credit risk also require supplemental documentation and manual approval or denial.
 - 3) Eligible applications for customers that are deemed to be a high credit risk require supplemental documentation and manual approval or denial.

A predefined test case (with corresponding test data) is used to test each path through the process.

- An application for customer **IBM** is used to test the low credit risk path (path 1 in the preceding paragraph).
- An application for customer **ACME** is used to test the medium credit risk path (path 3 in the preceding paragraph).
- An application for customer **TestCo** is used to test the high credit risk path (path 2 in the preceding paragraph).



Important

The only available test cases are for the following names: **IBM**, **ACME**, and **TestCo**. Do not deviate from these test cases, or you can receive unpredictable results.

- c. Click **View Process Template Details** to view the process template details. The Process Template page shows the **Details** tab, which contains information about the template.

Process Template ID	_PT:90010156.231e1d60.feffff80.78bd0002
Namespace	http://FoundationModule/AccountVerification
Application Name	FoundationModuleApp
Administrators	Everybody
Created	7/25/2016 1:33:11 PM EDT
Valid From	1/8/2010 2:14:25 AM EST
State	Started
Delete on Completion	only if successful
Long Running	yes
Compensation Defined	no
Continue on Error	no
Autonomy	Peer

Notice that Long Running has a value of yes, which means it is a long-running or a macroflow process. Since this process is long-running, all activities in the process span multiple transactions. Either a JMS message or a work-manager-based implementation triggers each transaction. The process template, the state of the process instance, and its activity instances are persisted in the database, PSBPEDB.

The Delete on Completion option is set to “only if successful” which means the process instance for this template is automatically deleted upon successful completion.

- 3. Start an instance of the AccountVerification process.
— a. Click **Start Instance**.

___ b. Enter the following values:

- **Process Name:** Process1 (If it is left blank, the container automatically generates this value)
- **companyName:** IBM

The screenshot shows the configuration interface for a process template named 'AccountVerification'. The 'Operation' section includes a 'Process Name' field containing 'Process1', which is highlighted with a red box. The 'Form View*' section displays an input table with columns for 'Input' and 'Value'. The 'Input' column lists fields: accountNumber, applicationDate, applicationDecision, comments, companyName, contactFirstName, and contactLastName. The 'Value' column contains their respective values. The 'companyName' row has 'IBM' in the 'Value' column, also highlighted with a red box.

Input	Value
accountNumber	
applicationDate	
applicationDecision	- Add
comments	
companyName	IBM
contactFirstName	
contactLastName	

___ c. Click **Submit**.

Because IBM generates a low risk application in this scenario, the process runs the activities quickly. This path runs quickly, so there is no time for you to examine any running process instances. You can examine the `SystemOut.log` file to see the output that the activities of that path produce.

```
[7/26/16 14:20:16:953 EDT] 000002bf SystemOut      0 [Java] Determine Applicant E
ligibility - begins
[7/26/16 14:20:16:956 EDT] 000002bf SystemOut      0 [Java] Determine Applicant E
ligibility - ends
```



Note

The `SystemOut.log` file can be found in the `/opt/IBM/BPM/profiles/PServerNode01/logs/AppClusterMember1` directory.

- ___ 4. Start another instance of the AccountVerification process.
- ___ a. Select the **AccountVerification** check box and click **Start Instance**.
- ___ b. Enter the following values:
- **Process Name:** ACME (If it is left blank, the container automatically generates this value)
 - **companyName:** ACME

Submit

Process Template Name	AccountVerification																
Process Description	Account verification for %\InputCriterionParameters\Input\ac																
<hr/>																	
Operation	InputCriterion																
Process Name	<input type="text" value="ACME"/>																
Process Input Message																	
<div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> Form View* <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #f2f2f2;">Input</th> <th style="background-color: #f2f2f2;"></th> </tr> </thead> <tbody> <tr> <td>accountNumber</td> <td><input type="text"/></td> </tr> <tr> <td>applicationDate</td> <td><input type="text"/></td> </tr> <tr> <td>applicationDecision</td> <td style="text-align: right;">- <input type="button" value="Add"/></td> </tr> <tr> <td>comments</td> <td><input type="text"/></td> </tr> <tr> <td>companyName</td> <td><input type="text" value="ACME"/></td> </tr> <tr> <td>contactFirstName</td> <td><input type="text"/></td> </tr> <tr> <td>contactLastName</td> <td><input type="text"/></td> </tr> </tbody> </table> </div>		Input		accountNumber	<input type="text"/>	applicationDate	<input type="text"/>	applicationDecision	- <input type="button" value="Add"/>	comments	<input type="text"/>	companyName	<input type="text" value="ACME"/>	contactFirstName	<input type="text"/>	contactLastName	<input type="text"/>
Input																	
accountNumber	<input type="text"/>																
applicationDate	<input type="text"/>																
applicationDecision	- <input type="button" value="Add"/>																
comments	<input type="text"/>																
companyName	<input type="text" value="ACME"/>																
contactFirstName	<input type="text"/>																
contactLastName	<input type="text"/>																

- ___ c. Click **Submit**.

Because ACME generates a medium risk eligible application in this scenario, the process runs the activities quickly. You can examine the `SystemOut.log` file to see the output that the activities of that path produce.

- __ d. Select the **AccountVerification** process templates check box and click **Instances**.

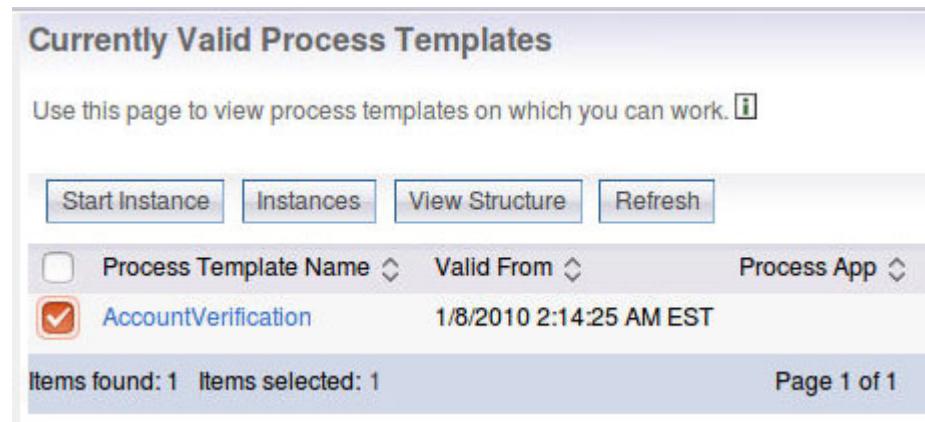
Currently Valid Process Templates

Use this page to view process templates on which you can work. 

[Start Instance](#) [Instances](#) [View Structure](#) [Refresh](#)

Process Template Name	Valid From	Process App
<input checked="" type="checkbox"/> AccountVerification	1/8/2010 2:14:25 AM EST	

Items found: 1 Items selected: 1 Page 1 of 1



- __ e. You can see that there is one running instance for the AccountVerification process.

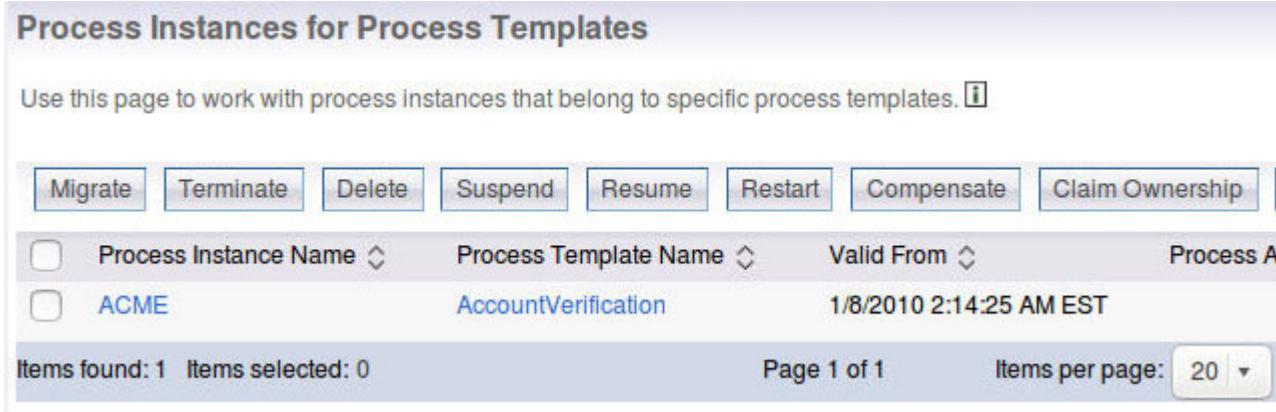
Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates. 

[Migrate](#) [Terminate](#) [Delete](#) [Suspend](#) [Resume](#) [Restart](#) [Compensate](#) [Claim Ownership](#)

Process Instance Name	Process Template Name	Valid From	Process A
<input type="checkbox"/> ACME	AccountVerification	1/8/2010 2:14:25 AM EST	

Items found: 1 Items selected: 0 Page 1 of 1 Items per page: 20 



- ___ f. Click **ACME** in the Process Instance Name column to view the details of this process instance.

Process Instance

Use this page to view information about a process instance and, optionally, to work on the process instance. 

[Terminate](#) [Suspend](#) [Work Items](#) [Create Work Items](#) [View Process State](#) [Tasks](#) [Activities](#)

Process Description

Process Instance Name	ACME
Description	Account verification for \InputCriterionParameters\Input/accountNumber ACME
State	Running

Details

Details	Template Details	Process Input Message	Activities	Waiting Operations	Related Processes
Process Instance ID	_PI:90030156.28b0b30c.feffff80.b6fb03e7				
Process Template Name	AccountVerification				
Starter	psdeadmin				
Administrators	Everybody				
Readers	Nobody				
Created	7/26/2016 3:31:24 PM EDT				
Started	7/26/2016 3:31:24 PM EDT				
Resumes					
Parent Name					
Top-Level Name	ACME				

g. Click the **Activities** tab.

Process Instance

Use this page to view information about a process instance and, optionally, to work on the process instance. [i](#)

Terminate Suspend Work Items Create Work Items View Process State Tasks Activities

Process Description

Process Instance Name	ACME
Description	Account verification for \InputCriterionParameters\Input/accountNumber ACME
State	Running

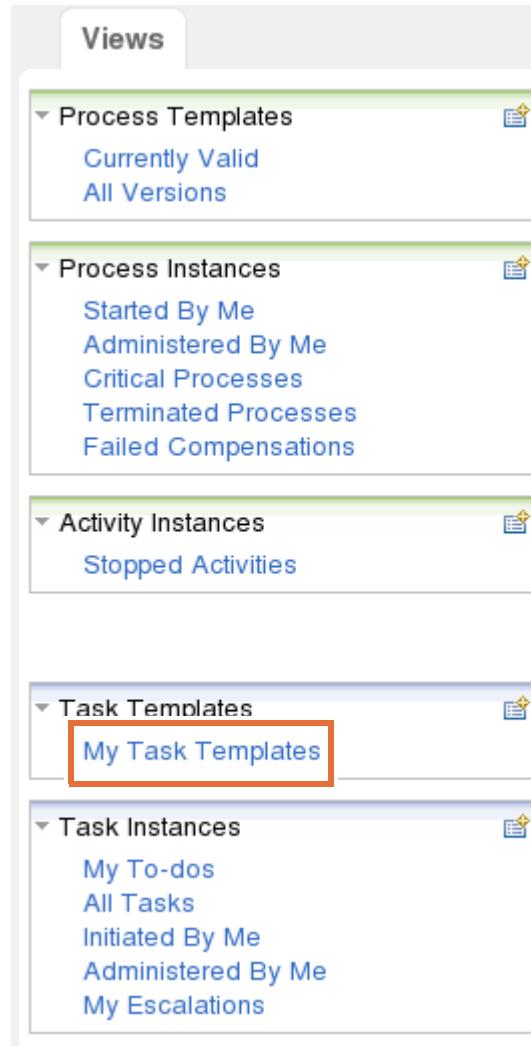
Details Template Details Process Input Message **Activities** Waiting Operations Related Processes

Activity Name	State	Skip requested	Kind	Owner
Receive	Finished	no	Receive	
Invoke	Finished	no	Invoke	
DataMap	Finished	no	Script	
Invoke3	Finished	no	Invoke	
Invoke4	Finished	no	Invoke	
Invoke6	Running	no	Invoke	

Items found: 6 Page 1 of 1 Items per page: 20 ▾

The **Activities** tab displays all of the process activities, including their states and types. By inspecting this view, an administrator can tell where the process halted or which activities resulted in failure. In this particular case, you can see that most activities ran successfully and are now in the finished state. Notice that there is one activity this is running as part of this execution path. The AccountVerification process currently runs the RequestMoreDocumentation activity. Because this activity starts a human task, the process remains in the running state and waits for the RequestMoreDocumentation activity to complete. Activities that are in the inactive state have yet to participate in the process execution.

- __ h. Click **My Task Templates** under Task Templates in the navigation pane.



- __ i. Select the check boxes for all task templates.

My Task Templates

Use this page to view task templates on which you can work. [i](#)

Start Instance	Create Instance	Instances	Refresh
<input checked="" type="checkbox"/>	Task Template Name ◊	Valid From ◊	Namespace ◊
<input checked="" type="checkbox"/>	Approval	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	CreateApplication	7/25/2016 1:31:37 PM EDT	http://FoundationModule/htm
<input checked="" type="checkbox"/>	Final Application Review	7/25/2016 1:37:02 PM EDT	http://HumanTaskServices
<input checked="" type="checkbox"/>	Widget Message	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	Inquiry	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	Request More Documentation	7/25/2016 1:37:02 PM EDT	http://HumanTaskServices
<input checked="" type="checkbox"/>	Review	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	To-do	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined

Items found: 8 Items selected: 8 [Page 1 of 1](#) [Items per page:](#)

- __ j. Click **Instances** to display the instances for all selected task templates. There is one instance in the Ready state.

Task Instances

Use this page to work with task instances. [i](#)

Terminate	Delete	Suspend	Resume	Start	Restart	Work Items
<input type="checkbox"/>	Priority ◊	Task Name ◊	State ◊	Kind ◊	Owner ◊	Origin ◊
<input type="checkbox"/>	5	Final Application Review	Ready	To-do Task	psdean	

Items found: 1 Items selected: 0 [Page 1 of 1](#)

When you submit an application by using `companyName` **ACME**, the application flows through the process to Final Application Review.

- __ k. Click **Final Application Review**.
- __ l. You can see the details on the task template. At the top of the page, click **Work on**.
- __ m. On the page, examine the settings in the form and click **Complete**. The task moves to a Finished state, which ends the instance.
- __ n. Under Process Templates, click **Currently Valid**.
- __ o. Select the **AccountVerification** check box and click **Instances**. You can see that there are no running instances for the process template.

- ___ 5. Start a third instance of the AccountVerification process.
- ___ a. Under Process Templates, click **Currently Valid**.
- ___ b. Select the **AccountVerification** check box and click **Start Instance**.
- ___ c. Enter the following values:
- **Process Name:** TestCo (If it is left blank, the container automatically generates this value)
 - **companyName:** TestCo
- ___ d. Click **Submit**.
- Because TestCo generates a high risk eligible application in this scenario, there are more activities. Within this path, there are several human tasks where process execution halts until user input is provided. Halted process execution provides the opportunity to examine the running instances.
- ___ e. Select the **AccountVerification** check box and click **Instances**. You now see one running instance for the AccountVerification process.
- ___ f. Click **TestCo** in the Process Instance Name column to view the details of this process instance.
- ___ g. Click the **Activities** tab.

Process Instance

Use this page to view information about a process instance and, optionally, to work on the process instance. [\[i\]](#)

[Terminate](#) [Suspend](#) [Work Items](#) [Create Work Items](#) [View Process State](#) [Tasks](#) [Activities](#)

Process Description

Process Instance Name	TestCo
Description	Account verification for \InputCriterionParameters\Input/accountNumber TestCo
State	Running

Activities

Details	Template Details	Process Input Message	Activities	Waiting Operations	Related Processes
Activity Name ◊	State ◊	Skip requested ◊	Kind ◊	Owner ◊	
Receive	Finished	no	Receive		
Invoke	Finished	no	Invoke		
DataMap	Finished	no	Script		
Invoke3	Finished	no	Invoke		
Invoke4	Finished	no	Invoke		
Invoke5	Running	no	Invoke		
Invoke6	Inactive	no	Invoke		

Items found: 7 Page 1 of 1 Items per page: ▾

Recall that the **Activities** tab displays all of the process activities. In this particular case, you can see that most activities ran successfully and are now in the finished state. Notice that some activities are running or inactive. The AccountVerification process currently runs the RequestMoreDocumentation activity. Because this activity starts a human task, the process remains in the running state and waits for the RequestMoreDocumentation activity to complete. Activities that are in the inactive state have yet to participate in the process execution.

- ___ h. Click **Currently Valid** in the navigation pane under Process Templates.
- ___ i. Select the **AccountVerification** process template check box and click **Instances**.
- ___ j. Select the **TestCo** process instance check box and click **Suspend**.

Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates. [\[?\]](#)

Migrate	Terminate	Delete	Suspend	Resume	Restart	Compensate	Claim Ownership
<input type="checkbox"/>	Process Instance Name	Process Template Name	Valid From	Process /			
<input checked="" type="checkbox"/> TestCo	AccountVerification	1/8/2010 2:14:25 AM EST					
Items found: 1 Items selected: 1				Page 1 of 1	Items per page: 20 ▾		

- ___ k. In the Suspend Process Instance dialog box, select **Suspend process for**, and enter 30 in the **seconds** field. Click **Submit**.

Suspend Process Instance

Use this dialog to suspend a process instance.

Suspend

Suspend process until:

Date: Time:
(yyyy-mm-dd) (hh:mm:ss)

Suspend process for:

days hours minutes seconds

Submit **Cancel**



Information

A long-running top-level process instance might be suspended and resumed later. Suspending and resuming can be helpful when certain maintenance or setup work must be completed first (for example, configuring access to another system or fixing a problem that caused the process to fail). When the requirements for the process are met, the process instance can be resumed.

The process might be suspended until it is explicitly resumed, or it might be suspended until a certain date or for a certain time. On the specified date or after the time period passes, the instance is automatically resumed.

A process can also be suspended by using the Business Process Choreographer API.

- __ I. Verify that the process state is set to **Suspended** and wait for 30 seconds.

Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates.

Migrate	Terminate	Delete	Suspend	Resume	Restart	Compensate	Claim Ownership	Work Items	Create Work Items
<input type="checkbox"/>									
Process Instance Name	Process Template Name	Valid From	Process App	Snapshot	State				
TestCo	AccountVerification	1/8/2010 2:14:25 AM EST			Suspended				

Items found: 1 Items selected: 0 Page 1 of 1 Items per page: 20

- __ m. After 30 seconds, click **Refresh**. You might want to scroll to the right to see the Refresh option.
- __ n. The process instance is resumed and its state is changed from **Suspended** to **Running**.
- __ o. Click **Currently Valid** in the navigation pane under Process Templates.
- __ p. Select the **AccountVerification** process template check box and click **Instances**.
- __ q. Select the check boxes for the instance and click **Terminate**.

Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates.

Migrate	Terminate	Delete	Suspend	Resume	Restart	Compensate
<input type="checkbox"/>	<input style="outline: 2px solid red; border: 1px solid red;" type="checkbox"/>	<input type="checkbox"/>				
Process Instance Name	Process Template Name	Valid From				
<input checked="" type="checkbox"/> TestCo	AccountVerification	1/8/2010 2:14:25 A				

Items found: 1 Items selected: 1 Page 1 of 1 Items per page: 20

- __ r. The state is now terminated. Select the check boxes for the instance and click **Delete**.

Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates. 

<input type="button" value="Migrate"/>	<input type="button" value="Terminate"/>	<input checked="" type="button" value="Delete"/>	<input type="button" value="Suspend"/>	<input type="button" value="Resume"/>	<input type="button" value="Restart"/>	<input type="button" value="Compensate"/>
<input type="checkbox"/>	Process Instance Name ◊		Process Template Name ◊		Valid From ◊	
<input checked="" type="checkbox"/>	TestCo		AccountVerification		1/8/2010 2:14:25 A	
Items found: 1 Items selected: 1			Page 1 of 1			Items per

The running process instance was terminated and deleted.

However, there is still a running human task instance for the RequestMoreDocumentation activity. This task instance also must be terminated and deleted.

- __ s. Click **My Task Templates** under Task Templates in the navigation pane.
 __ t. Select the check boxes for all task templates.

My Task Templates

Use this page to view task templates on which you can work. 

<input type="button" value="Start Instance"/>	<input type="button" value="Create Instance"/>	<input type="button" value="Instances"/>	<input type="button" value="Refresh"/>
<input checked="" type="checkbox"/>	Task Template Name ◊	Valid From ◊	Namespace ◊
<input checked="" type="checkbox"/>	Approval	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	CreateApplication	7/25/2016 1:31:37 PM EDT	http://FoundationModule/htm
<input checked="" type="checkbox"/>	Final Application Review	7/25/2016 1:37:02 PM EDT	http://HumanTaskServices
<input checked="" type="checkbox"/>	Widget Message	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	Inquiry	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	Request More Documentation	7/25/2016 1:37:02 PM EDT	http://HumanTaskServices
<input checked="" type="checkbox"/>	Review	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
<input checked="" type="checkbox"/>	To-do	2/1/2012 8:00:00 PM EST	http://com.ibm.htm.predefined
Items found: 8 Items selected: 8			Page 1 of 1
			Items per

- __ u. Click **Instances** to display the instances for all selected task templates. There is one instance in the Ready state.

The screenshot shows the 'Task Instances' page with the following details:

- Buttons:** Terminate, Delete, Suspend, Resume, Start, Restart, Work Items, Create Work Items, Refresh.
- Filter Headers:** Priority, Task Name, State, Kind, Owner, Originator, Escalated.
- Data Row:** Priority: 5, Task Name: RequestMoreDocumentation, State: Ready, Kind: To-do Task, Owner: psdeadmin, Originator: no.
- Page Metrics:** Items found: 1, Items selected: 0, Page 1 of 1, Items per page: 20.

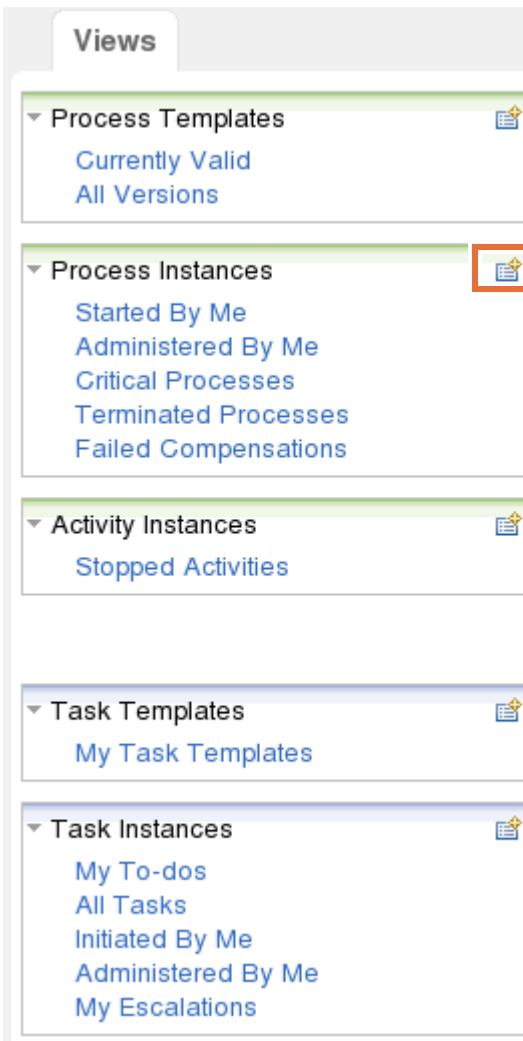
A red box highlights the 'RequestMoreDocumentation' task name in the data row.

- __ v. Select the **RequestMoreDocumentation** instance check box and click **Terminate**.
__ w. Select the **RequestMoreDocumentation** instance check box and click **Delete**.

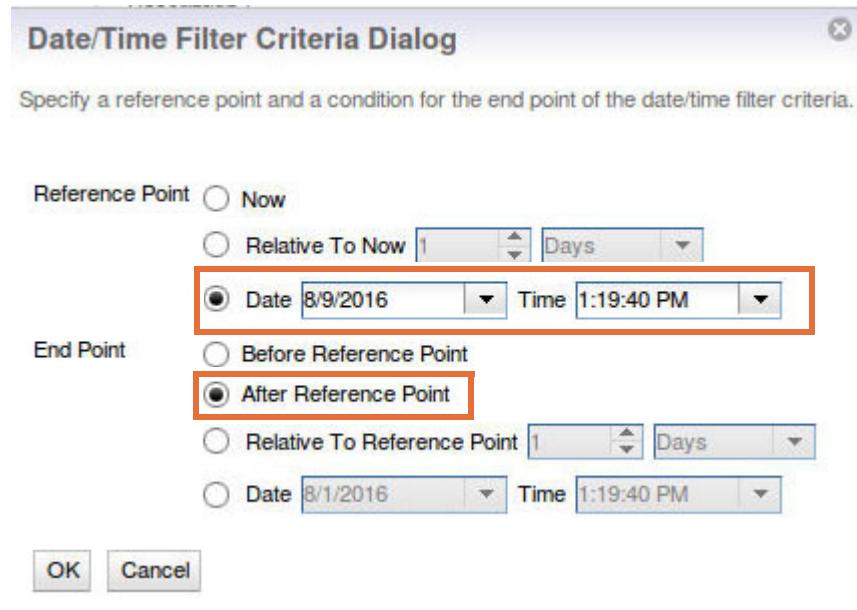
You successfully cleared all process and task instances from the server.

Part 5: Personalizing the view of the Business Process Choreographer Explorer

- 1. The navigation pane in the default Business Process Choreographer Explorer contains a set of predefined links to predefined views. You can add your own personalized views to your navigation pane; for example, to monitor the progress of specific processes.
- a. In the Process Instances navigation pane, click the **New search** icon.



- __ b. Create a personalized view in the Business Process Choreographer Explorer that lists all running processes. In the Search Process Instances area, enter the following information about the **Search Properties** tab:
- **View Name:** Running Processes
 - **Query Table:** Select **Do not use query tables**
 - **State:** Select **Running**
 - Click **Set for Started**
 - o In the window, select **Date** in the Reference Point section (you can select the date and time that are displayed in the field).
 - o In the End Point section, select **After Reference Point**.
 - o Click **OK**.



- ___ c. The Search For Process Instances And Define Personalized Views page looks like the following screen capture.

View Name Description

Query Table

State	<input type="button" value="Compensated"/> <input type="button" value="Compensation Failed"/> <input type="button" value="Failed"/> <input type="button" value="Failing"/> <input type="button" value="Finished"/> <input style="background-color: #FFCCBC; color: black; font-weight: bold; border: 1px solid #FFCCBC; border-radius: 5px; padding: 2px 10px; margin-bottom: 5px;" type="button" value="Running"/> <input type="button" value="Suspended"/> <input type="button" value="Terminated"/> <input type="button" value="Terminating"/>
Name	<input type="text"/>
ID	<input type="text"/>
Started	Reference Point <input type="text" value="8/9/2016 1:19:40 PM"/> <input type="button" value="Modify"/> <input type="button" value="Clear"/>
Completed	<input type="button" value="Set"/>

- ___ d. Click **Check and Save** at the top of the window.

- ___ e. After the search is saved, the search property is now listed under the Process Instances area in the navigation pane.

The screenshot shows the 'Views' section of the IBM Process Server interface. It contains several expandable categories:

- Process Templates**: Contains links for 'Currently Valid' and 'All Versions'.
- Process Instances**: Contains links for 'Started By Me', 'Administered By Me', 'Critical Processes', 'Terminated Processes', and 'Failed Compensations'. The 'Running Processes' link is highlighted with a red box.
- Activity Instances**: Contains a link for 'Stopped Activities'.
- Task Templates**: Contains a link for 'My Task Templates'.
- Task Instances**: Contains links for 'My To-dos', 'All Tasks', 'Initiated By Me', and 'Administered By Me'.

- ___ f. Click **Running Processes**. Notice that there is no process instance in the **Running** state. However, you can use this view in the remaining labs to easily display any running process instances.



Information

Any user can create personalized views. These personalized views are visible only for the user who created the view. After creation, the personalized view can be edited. Click the **Predefined View** icon.



The following menu, with a different set of options, opens:



These icons from left to right can delete, modify, copy, and reposition the view in the navigation tree.

- ___ 2. Log out of the Business Process Choreographer Explorer.
- ___ 3. Minimize the browser.

Part 6: Using the serviceDeploy command (optional)

The `serviceDeploy` command creates an enterprise archive (EAR) file from the input files that contain the component descriptions and Java code that make up the application. The command builds an EAR file from a `.jar` or `.zip` file that contains service components and Java artifacts. In this part of the exercise, the `serviceDeploy` command is used to create the `HelloWorldWithBO.ear` file, which is then installed on the server by using `wsadmin` command line scripting. This application has a GUI from which failed events can be submitted. Failed events are viewed by using the administrative console.

- ___ 1. Create an enterprise application by using the `serviceDeploy` command.
 - ___ a. Open a terminal window and change to the `/opt/labfiles/Admin/FailedEvent` directory.
 - ___ b. The `serviceDeploy` command creates the EAR file in the directory from which the command is run. Enter the following command to create the EAR file:

```
/opt/IBM/BPM/bin/serviceDeploy.sh HelloWorldWithBO.jar -freeform  
-ignoreErrors -cleanStagingModules
```



Information

The `serviceDeploy` command can be run with a number of different parameters. This example used the following parameters:

- **-freeform:** An optional parameter that specifies that the Java Platform, Enterprise Edition subdirectory in the service JAR file is treated as a free-form project.
- **-ignoreErrors:** An optional parameter that specifies that the `serviceDeploy` command builds an EAR file regardless of errors that occur while building or validating the application. By default, the `serviceDeploy` command does not generate an EAR file if there are errors with an application.
- **-cleanStagingModules:** An optional parameter that specifies whether to delete staging modules within an input EAR file before deployment. By default, the `serviceDeploy` command imports an existing staging module and its contents.
- **-help:** Provides the help information and a listing of the command options and descriptions.

For more information about the parameters and details, see the IBM Knowledge Center.

Wait for the `serviceDeploy` command to complete and generate the `HelloWorldWithBO` application EAR file. The command runs for a few minutes. The

process is complete when the message Deployment has completed is shown in the terminal window.



Information

If you receive warnings that indicate an import is never used, it is safe to ignore the warnings. The warning indicates that the application was created in a prior version of WebSphere Integration Developer. The EAR file is generated and deploys successfully in IBM Business Process Manager Advanced V8.5.

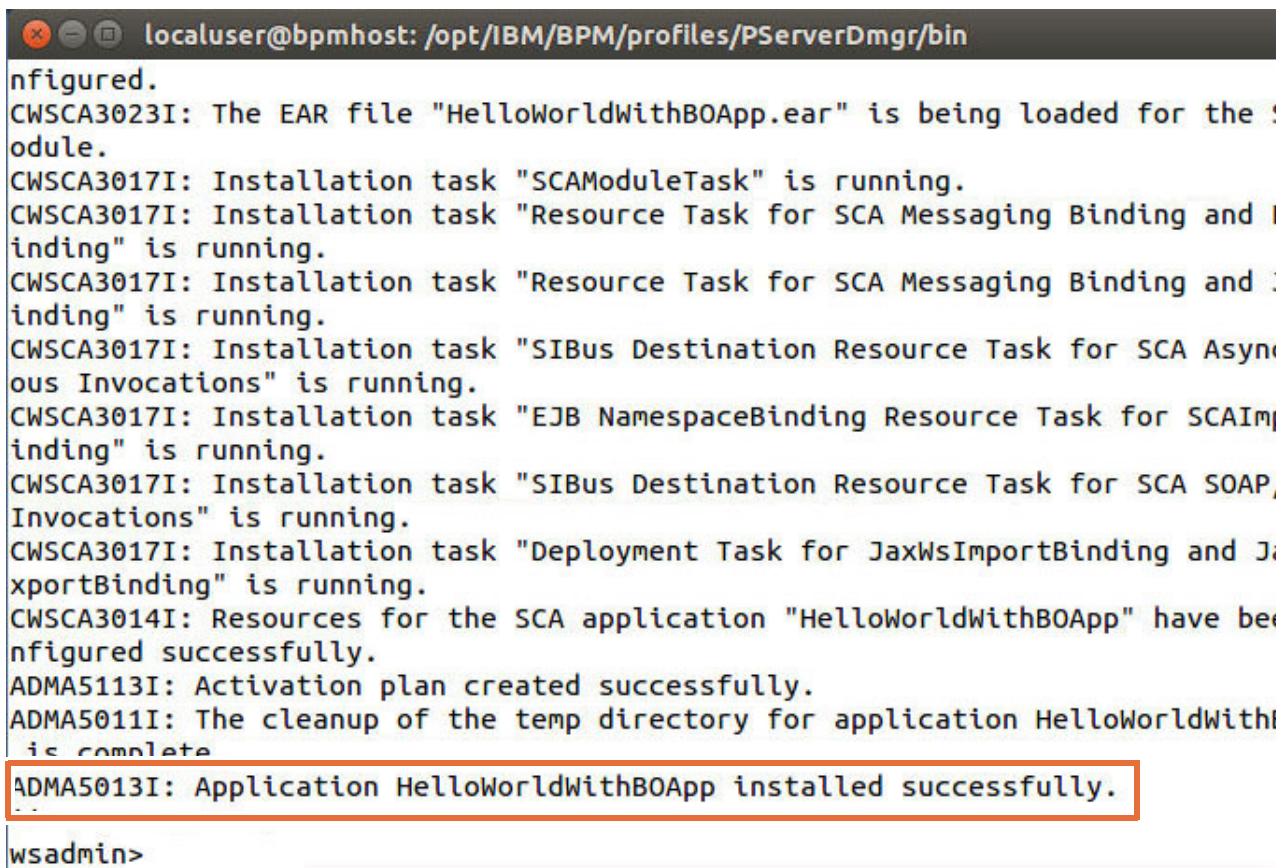
- ___ c. Verify that the `HelloWorldWithBOApp.ear` file is in the `FailedEvent` directory. Enter the following command:

```
ls -l
```

```
localuser@bpmhost: /opt/labfiles/Admin/FailedEvent
localuser@bpmhost:/opt/labfiles/Admin/FailedEvent$ ls -l
total 36
-rw-rw-r-- 1 localuser localuser 20971 Jul 26 16:54 HelloWorldWithBOApp.ear
-rw----- 1 localuser localuser 11793 May 18 22:12 HelloWorldWithBO.jar
localuser@bpmhost:/opt/labfiles/Admin/FailedEvent$
```

Part 7: Deploying the HelloWorld application (optional)

- ___ 1. Install the application by using wsadmin command line scripting.
 - ___ a. In a terminal window, change to the /opt/IBM/BPM/profiles/PServerDmgr/bin directory.
 - ___ b. Enter the following command to start wsadmin:
`./wsadmin.sh -lang jython`
 - ___ c. At the wsadmin prompt, enter the following command to install the application:
`AdminApp.install('/opt/labfiles/Admin/FailedEvent/HelloWorldWithBOApp.ear
' , '[-cell PROD-PServerCell -node PServerNode01 -cluster AppCluster]')`
 - ___ d. Wait for following message, which indicates that the installation completed successfully:
`Application HelloWorldWithBOApp installed successfully.`



```

localuser@bpminstance: /opt/IBM/BPM/profiles/PServerDmgr/bin
configured.
CWSKA3023I: The EAR file "HelloWorldWithBOApp.ear" is being loaded for the module.
CWSKA3017I: Installation task "SCAModuleTask" is running.
CWSKA3017I: Installation task "Resource Task for SCA Messaging Binding and Binding" is running.
CWSKA3017I: Installation task "Resource Task for SCA Messaging Binding and Binding" is running.
CWSKA3017I: Installation task "SIBus Destination Resource Task for SCA Asynchronous Invocations" is running.
CWSKA3017I: Installation task "EJB NamespaceBinding Resource Task for SCA Importing" is running.
CWSKA3017I: Installation task "SIBus Destination Resource Task for SCA SOAP, Invocations" is running.
CWSKA3017I: Installation task "Deployment Task for JaxWsImportBinding and JaxExportBinding" is running.
CWSKA3014I: Resources for the SCA application "HelloWorldWithBOApp" have been configured successfully.
ADMA5113I: Activation plan created successfully.
ADMA5011I: The cleanup of the temp directory for application HelloWorldWithBOApp is complete.
ADMA5013I: Application HelloWorldWithBOApp installed successfully.
wsadmin>

```

- ___ e. Enter the following command to save the changes to the master configuration:
`AdminConfig.save()`
- ___ f. Exit the wsadmin command line scripting utility by using the following command:
`quit`
- ___ 2. Start the HelloWorldAppWithBOApp application by using the administrative console.
 - ___ a. Maximize the web browser and go to the following URL:

`http://bpmhost:9062/ibm/console`

- ___ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ c. Click **Applications > Application Types > WebSphere enterprise applications**.
 - ___ d. Select the **HelloWorldWithBOApp** check box and click **Start**. Wait for the application to successfully start.
- ___ 3. Explore the application.
- ___ a. Click **HelloWorldWithBOApp**.
 - ___ b. In the Web Module Properties section, click **Context Root For Web Modules**. Note the context root for interacting with the application.

[**Enterprise Applications > HelloWorldWithBOApp > Context Root For Web Modules**](#)

Context Root For Web Modules

Context root defined in the deployment descriptor can be edited.

Web module	URI	Context Root
HelloWorldWithBOWeb	HelloWorldWithBOWeb.war,WEB-INF/web.xml	HelloWorldWithBOWeb



Information

You can also see the context root for the web module in the deployment descriptor. Click **HelloWorldWithBOApp > View Deployment Descriptor** in the Detail Properties section. You can also get more information about properties such as the target application status, start behavior, and a few other properties.

- ___ c. Click **Applications > SCA modules > HelloWorldWithBO**. Review the general properties for the module.

<u>General Properties</u>	
Module	Module components
<input type="text" value="HelloWorldWithBO"/>	<input type="button" value="Imports"/> <input type="button" value="Exports"/>
Application name	<u>Additional Properties</u>
<input type="text" value="HelloWorldWithBOApp"/>	<ul style="list-style-type: none"> <input type="button" value="Module properties"/> <input type="button" value="Business processes"/> <input type="button" value="Human tasks"/>
Version	<u>Related Items</u>
<input type="text"/>	<ul style="list-style-type: none"> <input type="button" value="SCA system bus"/> <input type="button" value="SCA application bus"/> <input type="button" value="SCA system bus destinations"/> <input type="button" value="Business Integration Security"/> <input type="button" value="Owning enterprise application"/> <input type="button" value="Deployment targets"/>
Cell ID	
<input type="text"/>	
Description	
<input type="text"/>	

SCA runtime support

Continue to explore any additional properties.

- ___ d. Keep the administrative console open.

Part 8: Working with the Failed Event Manager (optional)

Administrators and other authorized users can use the Failed Event Manager to manage failed events. The Failed Event Manager is a web-based client for working with and resubmitting failed invocations. You can query for failed events by using various criteria such as date, last successful or failed event, exception text, or a combination of these factors.

- ___ 1. Start the HelloWorldWithBOApp client to submit failed events by using the GUI.

- ___ a. In the web browser, open a new tab and enter the following URL:

`http://bpmhost:9082>HelloWorldWithBOWeb`

Recovery Scenarios

HelloWorld With Simple Parameter

[Scenario1](#)

HelloWorld With Single BO Parameter

[Scenario2](#)

HelloWorld With Multiple Parameters

[Scenario3](#)

HelloWorld With Three Parameters

[Scenario4](#)

Test all the scenarios

[Test All Scenarios](#)

- b. Click **Scenario1** and wait until you see the Test.jsp page.

Recovery Scenario1 - HelloWorld With Simple Parameter

Message from SCA: 1266353677387

[Back to index](#)



Note

The HelloWorldWithBOApp application consists of two Java components, where one component starts the other asynchronously. The component that is started throws a RuntimeException, as shown in the figure, and as a result, a failed event is generated.

```
public void innerMethod(String someString) {
    // TODO Auto-generated method stub
    System.out.println("Inside implementation of inner Interface");
    throw new java.lang.RuntimeException("Throwing exception from inner component");
}
```

- 2. Access the Failed Event Manager to display the failed event.

- __ a. Go to the administrative console tab.
- __ b. Click **Servers > Deployment Environment > PServer_DE > Failed Event Manager**.
- __ c. Verify that the Recovery system is enabled. Notice the number of **Total failed events**.

[Deployment Environments > Failed Event Manager](#)

The failed event manager is used to query and manage failed events.

The screenshot shows the "About your failed event manager" section of the Failed Event Manager. It includes a status message "The Recovery sub-system is enabled.", a counter for "Total failed events" (1), and system information: IBM WebSphere Application Server Network Deployment, 8.5.5.8, Build Number: cf081545.03, and Build Date: 11/12/15. A note at the bottom states "Licensed Material - Property of IBM 5724-I08, 5724-I63, 5724-H88, 5724-H89".

[Documentation](#)

For complete failed event manager documentation, as well as general IBM Business Process Manager documentation, visit the [IBM Business Process Manager Information Center](#). Documentation for WebSphere Application Server is available in the [WebSphere Application Server Information Center](#).

- __ d. Click the **Get all failed events** link under Failed events on this server.
- __ e. One event is listed. When examining failed events, look for the module, operation, and failure time. This event is from the HelloWorldWithBO module. Click the **Event ID** link for the failed event.

The screenshot shows the "Search results" section of the Failed Event Manager. It displays a single failed event with the following details:

Select	Event ID	Event type	Module	Component	Operation	Failure time
<input checked="" type="checkbox"/>	A833ADBD0304FOOF	SCA	HelloWorldWithBO	(component)hello..	innerMethod	2013-01-29 03:12..

Total 1

- ___ f. View the failed event details, which include the specific properties for the event. The interaction type is invokeAsync, or asynchronous invocation. Scroll to the SCA-specific properties area to view the **Exception text**.

SCA specific properties

Session ID	127.0.0.2;HelloWorldWithBO;hello/HelloWorldService;sayHello;1266353670706;1432573263
Source module	HelloWorldWithBO
Source component	hello/HelloWorldService
Correlation id	127.0.0.2;HelloWorldWithBO;innerInterface;hello/InnerInterface;innerMethod;1266353671531;801648584
Resubmit expiration time (example: February 17, 2010 4:06 PM)	
Resubmit destination	sca/HelloWorldWithBO
Interaction type	invokeAsync
Exception text	<pre>com.ibm.websphere.sca.ServiceRuntimeException: Fail to invoke [hello.InnerInterfaceImpl.public void hello.InnerInterfaceImpl.innerMethod(java.lang.String)] for component [HelloWorldWithBO]hello/InnerInterface]: caused by: java.lang.RuntimeException: Throwing exception from inner component com.ibm.ws.sca.internal.java.handler.JavaImplementationHandler.invokeSync(JavaImplementationHar com.ibm.ws.sca.internal.java.handler.JavaImplementationHandler.processMessage(JavaImplementation com.ibm.ws.sca.internal.message.impl.MessageDispatcherImpl.processMessage(MessageDispatcherImp com.ibm.ws.sca.internal.message.impl.ManagedMessageImpl.process(ManagedMessageImpl.java:946) com.ibm.ws.sca.internal.async.impl.AbstractAsyncInboundHandler.processMessage(AbstractAsyncInbu</pre>

- ___ g. Click **Edit business data** at the top of the pane.
 ___ h. Click the Parameter name `arg0` to view the parameter values.

[Failed Event Manager](#) > [Search results](#) > [5B89CFB9C5B5B9E1_500023](#) > [Business data editor](#)

Use this page to view and edit business data parameters.

Business data editor		
Parameter name	Parameter value	Parameter type
arg0	hello there	java.lang.String
Total 1		

- __ i. You can view the parameter name and type, and you change the payload of a failed event before resubmitting it from this pane.

[Failed Event Manager](#) > [Search results](#) > [5B89CFB9C5B5B9E1_500023](#) > [Business data editor](#)

Use this page to set a new value on a simple parameter.

Business data parameter

Parameter name

arg0

Parameter type

java.lang.String

Parameter value

hello there

[Apply](#)

[OK](#)

[Reset](#)

[Cancel](#)



Note

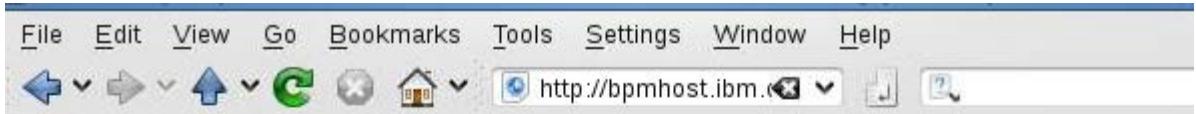
In this particular case, if you resubmit the event with a modified parameter value, the Java component produces a RuntimeException regardless of the actual message content. This application is just a sample application that is designed to generate failed events.

Optional: For testing purposes, you can resubmit the failed event. To resubmit, complete the following steps:

- Change the Parameter value to **goodbye there**.
- Click **OK**.
- A message indicates that the parameter is set to “goodbye there”. Click **Resubmit** to resubmit the event.
- A message indicates that the failed event was submitted successfully.
- Click **Refresh** and note the new failed event from the updated parameter value.

- __ j. Click **Cancel**.

- __ k. Return to the HelloWorld client window. Click **Back to index**.



Recovery Scenario1 - HelloWorld With Simple Parameter

Message from SCA: 1359447165513

[Back to index](#)

- __ l. Continue to submit failed events by using the other scenarios that the HelloWorld GUI provides. Explore the other failed events by using the Failed Event Manager.
- __ m. When you are finished exploring the failed events, close the HelloWorld client browser.
- __ n. Log out of the administrative console and close the browser window.

End of exercise

Exercise review and wrap-up

In this exercise, you installed a business scenario. This business scenario consists of multiple SCA applications. The scenario was administered by using the administrative console. You also worked with the Business Process Choreographer Explorer to test the business processes you installed. An EAR file was deployed to the server by using wsadmin command line scripting. The application was used to submit failed events to the server, and you learned how to modify a failed event.

Exercise 8. Purging content in Process Server

Estimated time

01:30

Overview

This exercise examines the various methods that are available to purge data that is no longer needed in the Business Process Manager Process Server environment.

Objectives

After completing this exercise, you should be able to:

- Purge data in the Process Server environment
- Delete BPMN and BPEL instances in the Process Server environment
- Delete snapshots in the Process Server environment
- Configure the business process choreography cleanup service and cleanup jobs

Introduction

IBM Business Process Manager runs in a stateful environment where it accumulates data over time. As with any stateful environment, it is essential to its ongoing health to have a strategy for purging some of that state occasionally. If data grows without bounds, it can lead to disk space issues and performance issues because database queries take ever longer. You must have a strategy for purging data that is no longer needed in your environment. There are various methods available for purging data in both the IBM Business Process Manager Standard and IBM Business Process Manager Advanced environments.

Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Center single cluster deployment environment created
- The Process Server three-cluster deployment environment created

Exercise instructions

8.1. Purging data in the production environment

The Process Server is where you install process application snapshots to and where you run processes within them. What you need to think about primarily in the Process Server, in terms of accumulating content, is how to delete these installed snapshots, and how to delete processes after they complete or terminate. You can and typically do install multiple snapshots of the same process application to a Process Server. Over time, these snapshots can accumulate, and it becomes prudent to delete the ones that are no longer used.

In this part of the exercise, you work with the production Process Server environment and explore the various methods for purging data in the environment.

Part 1: Purging BPD process instances

There are two types of instances in Process Server that you must also consider, user or human task instances and process instances, which is true for both BPD and BPEL processes. Both task and process instances are recorded in the database even after the task and process are completed. It is important to think about occasionally purging older instances. When you delete process instances, task instances are also deleted. You can also delete BPEL human task instances independently of their processes, but this option is not the case for BPD user tasks.

When an instance completes and all of its associated tasks are closed, future work is not possible with the instance. You cannot restart it, assign it to someone, or edit old work. When a user logs in to Process Portal, various tables are queried to gather data on the active tasks for that user. The operation involves full table scans, so that even if only 35% of the data is relevant, it is going to take a while to pull the tasks needed for the user. If the other 65% is deleted, there is less data to scan. If you do not delete old completed instances, you can experience slow performance on Process Portal and a potentially unusable state. Ignoring increases in database size causes an increase in backup time and disk space.

In this part of the exercise, you examine how to purge BPD instances in the environment. The offline package, the Hiring Sample, is installed to the Process Server and used to work with and purge instances and snapshots.

**Important**

In this exercise, you enter many commands in the wsadmin command line environment. To help, a text file is included on the course image, which contains all of the commands that are used in this exercise. You can copy the commands from the file, and paste them into the wsadmin command line environment. The file is `exercise-commands.txt` in the `/usr/labfiles/scripts/samples/` directory.

- ___ 1. Deploy the offline packages to the environment.
 - ___ a. Open a terminal window and change to the `/opt/IBM/BPM/profiles/PServerNode01/logs/AppClusterMember1` directory.
 - ___ b. Tail the `SystemOut.log` file to observe the output in the file. While you observe the log file, you can see the details about the changes made. Tail the file by using the following command:
`tail -f SystemOut.log`
 - ___ c. Open another terminal window and change to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
 - ___ d. Enter wsadmin interactive mode by using the Jython scripting language; enter the following command:
`./wsadmin.sh -conntype SOAP -port 8884 -lang jython`

In a network deployment environment, you use the port that is configured for the application cluster member, `AppClusterMember1`. You must indicate the port for one of the cluster members that run the Process Server applications or where the applications are deployed. Make sure that the output indicates that you connected to process `AppClusterMember1`.

- ___ e. Install the Hiring Sample BPD process application snapshot from Process Center to the offline Process Server environment. Enter the following command:

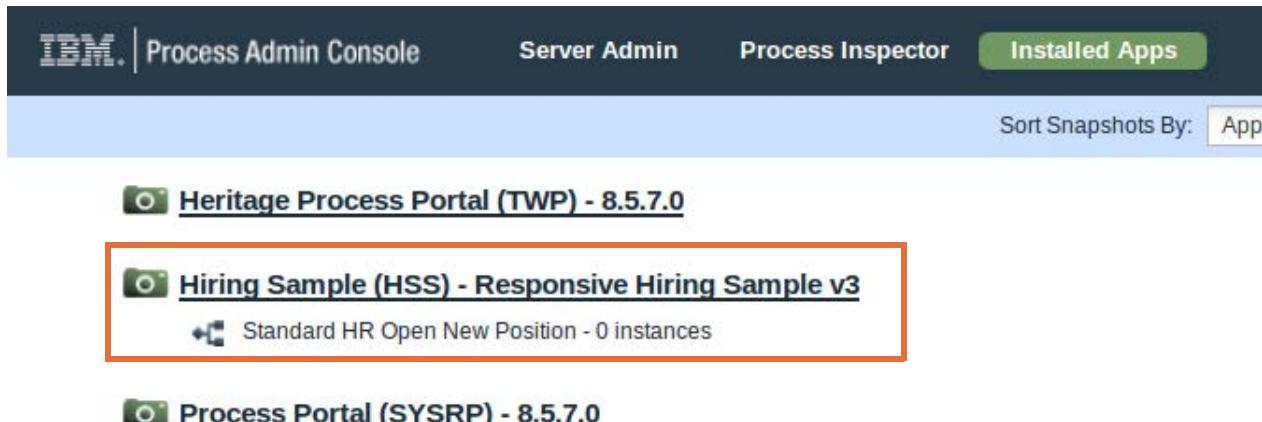
```
AdminTask.BPMInstallOfflinePackage ('[-inputFile  
/opt/labfiles/Admin/Ex8/Responsive_Hiring_Sample_v3-PROD-ProcessServer.zip]')
```

```
wsadmin>AdminTask.BPMInstallOfflinePackage ('[-inputFile /opt/labfiles/Admin/Ex8/  
Responsive_Hiring_Sample_v3-PROD-ProcessServer.zip]')  
'BPMInstallOfflinePackage passed.'  
wsadmin>
```

Look for the message: “`BPMInstallOfflinePackaged passed.`”

- ___ f. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- ___ g. Keep both terminal windows open. Do not exit out of wsadmin as you use this window again.
- ___ 2. Examine the application by using the Process Admin Console.

- __ a. In a web browser, go to the following URL:
`http://bpghost:9082/ProcessAdmin`
- __ b. In the Insecure Connection window, click **Advanced** to expand the option.
- __ c. Click **Add Exception**.
- __ d. In the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following URL:
`https://bpghost:9445/ProcessAdmin`
- __ e. Click **Confirm Security Exception**. The login page for the Integrated Solutions Console, which is also known as the administrative console, is now visible.
- __ f. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- __ g. In the toolbar, click **Installed Apps**. The Hiring Sample (HSS) is listed with zero instances. You can see the acronym of HSS defined.



The screenshot shows the IBM Process Admin Console interface. At the top, there is a navigation bar with tabs: 'IBM' (selected), 'Process Admin Console', 'Server Admin', 'Process Inspector', and 'Installed Apps'. The 'Installed Apps' tab is highlighted with a green background. Below the navigation bar, there is a search bar labeled 'Sort Snapshots By:' with a dropdown menu showing 'App'. The main content area displays a list of installed applications. The first item is 'Heritage Process Portal (TWP) - 8.5.7.0'. The second item, 'Hiring Sample (HSS) - Responsive Hiring Sample v3', is highlighted with a red border. Below it, there is a small icon with a plus sign and the text 'Standard HR Open New Position - 0 instances'. The third item is 'Process Portal (SYSRP) - 8.5.7.0'.

- __ h. In the toolbar, click **Server Admin**.

- ___ i. Click **Monitoring > Instrumentation**. There are currently no BPD instances in any state.

Monitoring > Instrumentation

Server: cell=PROD-PServerCell,node=PServerNode01,process=AppClusterMember1

Start Logging	Refresh	Reset	Save	Automatically refresh every	Never	
----------------------	----------------	--------------	-------------	-----------------------------	--------------	--

Name	Count/Value	In Process	Average Duration (ms)
BPD			
Instances			
BPD Instances Completed	0		
BPD Instances Failed	0		
BPD Instances Resumed	0		
BPD Instances Started	0		
BPD Instances Terminated	0		

- ___ j. Log out of the Process Admin Console.
- ___ 3. Work with the Hiring Sample BPD.
- ___ a. Start the Process Portal console. In the web browser, go to the following URL:
<http://bpmhost:9082/portal>
The port that is defined is for the application cluster member, AppClusterMember1 in the Process Server environment.
- ___ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- ___ c. On the left, click **Standard HR Open New Position**.
- ___ d. The Task: Create position request window opens in the Work area. Enter any values for the fields. Make sure to select a date one week in the future (for example, if today is May 22, select May 29).
- ___ e. Scroll to the bottom. Under Qualifications, click **Next**.
- ___ f. Scroll to the bottom. Under Qualifications, click **Submit**.

- __ g. Click the **Task: GM Approval** task under Work.

The screenshot shows the 'Work' pane with a search bar at the top. Below the search bar, a task card is displayed for 'Task: GM Approval'. The task card includes the task name, a brief description ('Standard Employee Requisition for Tom Miller (Standard HR Open New Position)'), the assignee ('GeneralManagers'), and the due date ('Due: Jun 14, 2016 6:05 PM'). Two small icons are located below the task name: a blue square with a white document icon and a yellow square with a white play/pause icon.

- __ h. Click **Claim Task** to claim the task.
__ i. Under Approval, select **Approved** and click **Submit**.

The screenshot shows an 'Approval' dialog box. It contains a question 'Approved?' followed by two radio buttons: one for 'Approved' (which is selected and highlighted with a red box) and one for 'Rejected'. Below the radio buttons is a text area labeled 'GM comment' with a blank input field. At the bottom is a large blue 'Submit' button highlighted with a red box.

- __ j. You can see that there is one open task as noted in the upper right on the toolbar. Click the **Task: Find job candidates** task under Work.
__ k. Click **Claim Task** to claim the task.
__ l. Scroll to the bottom. Under Qualifications, click **Add candidates**.
__ m. Scroll to the bottom and click **Submit**.
__ n. On the Work pane, you can see the Open Tasks. Currently, there are no open tasks.

The screenshot shows a summary card in the Work pane. It displays '0 Total Open' tasks. To the right of the count, there are three status indicators: '0 On Track', '0 At Risk', and '0 Overdue'. At the bottom right of the card are three vertical dots and two search icons (magnifying glass and folder).

- __ o. From the navigation menu on the left, click **Processes**.

- ___ p. On the right, click **Completed**. Here you can see the completed tasks for the process application.

The screenshot shows the 'Process Instances' page. At the top, there is a search bar with a magnifying glass icon and a placeholder 'Type a search filter'. To the right of the search bar are a delete button (an 'X') and a help button (a question mark). Below the search bar, there is a circular icon with a gear and arrows. To its right, the text 'Standard Employee Requisition for Tom Miller (Standard HR Open New Position)' is displayed in blue, followed by 'Created: June 17, 2016 12:56 PM'. Below this, under a section titled 'Tasks' (with a downward arrow icon), there is a table listing three completed tasks:

Task	Completed
Task: Find job candidates	Completed: Jun 17, 2016
Task: GM Approval	Completed: Jun 17, 2016
Task: Create position request	Completed: Jun 17, 2016

- ___ q. Click **Standard Employee Requisition for Tom Miller (Standard HR Open New Position)**. You can see the details on the process.
- ___ r. Under Tasks, click **Completed**. You can see the tasks in the process that completed.
- ___ 4. Work with the Hiring Sample BPD creating an open task.
- ___ a. Click the **Main Menu** icon in the toolbar.
 - ___ b. From the navigation menu, click **Standard HR Open New Position**.
 - ___ c. The Task: Submit requisition window opens in the Work area. Enter any values for the fields. Make sure to select a date one week in the future (for example, if today is May 22, select May 29).
 - ___ d. Scroll to the bottom. Under Qualifications, click **Next**.
 - ___ e. Scroll to the bottom. Under Qualifications, click **Submit**.

- ___ f. You are placed on the Process Instances pane. Click **Active** to see the list of active instances.

The screenshot shows a search bar at the top with a magnifying glass icon and a placeholder 'Type a search filter'. Below the search bar, there is a list of process instances. The first instance is highlighted and titled 'Standard Employee Requisition for Tom Miller (Standard HR Open New Position)'. Below the title, it says 'Created: June 17, 2016 1:11 PM'. A circular icon with a green and grey gradient is to the left of the title.

Showing 1 out of 1 results

- ___ g. Log out of Process Portal.
 ___ 5. Verify the instances.
 ___ a. First, you verify the instance by using the Process Admin Console. In the web browser, go to the following URL:
`http://bpmhost:9082/ProcessAdmin`
 ___ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 ___ c. On the toolbar, click **Installed Apps**. The Hiring Sample (HSS) is listed and shows one instance.

The screenshot shows the Process Admin Console interface. At the top, there is a navigation bar with tabs: 'IBM | Process Admin Console' (highlighted in blue), 'Server Admin', and 'Process Inspector'. Below the navigation bar, there is a button labeled 'Sort Snapshots'. The main content area displays a list of applications under the heading 'Installed Apps'. The first application listed is 'Heritage Process Portal (TWP) - 8.5.7.0'. Below it is 'Hiring Sample (HSS) - Responsive Hiring Sample v3', which is highlighted with a red border. To the right of this highlighted application, it says 'Standard HR Open New Position - 1 instances'. The third application listed is 'Process Portal (SYSPR) - 8.5.7.0'.

- ___ d. Click the **Process Inspector** tab to examine the details.

- __ e. On the left, click **Search**.
- __ f. You can see that there is one active instance, or open task, and one completed instance.

The screenshot shows a search results page with the following details:

- Select shown instances | Select all instances | Clear selection**
- Showing 2**
- Sort by: Date of**
- Standard Employee Requisition for Tom Miller (Standard HR Open New Position)** (Active)
 - Last modified Jun 17, 2016 Due Jun 17, 2016
- Standard Employee Requisition for Tom Miller (Standard HR Open New Position)** (Completed)
 - Last modified Jun 17, 2016 Due Jun 17, 2016

- __ g. Select the entry with the check mark next to it. You can see the details on the right. You can see that the status is Completed. Click **Tasks** to expand the section and see the details.

The screenshot shows the details for the completed process instance:

Standard Employee Requisition for Tom Miller (Standard HR Open New Position)

- Standard HR Open New Position**
- Hiring Sample**
- Responsive Hiring Sample v3**

Instance ID: 3
Status: Completed
Start time: Jun 17, 2016 12:56 PM (2 hours ago)
Last action: Jun 17, 2016 1:00 PM (2 hours ago)
Due date: Jun 17, 2016 4:56 PM (2 hours from now)

Actions

- Refresh
- Delete

Tasks (3) (Active | Completed | All)

- Find position candidates**
The task was closed by psdeadmin (psdeadmin).
- Review new position request**
The task was closed by psdeadmin (psdeadmin).
- Submit position request**
The task was closed by psdeadmin (psdeadmin).

Data

- __ h. In the workspace, click the first instance listed. You can see the details on the right. You can see that the status is Active. Click **Tasks** to expand the section and see the details.
- __ i. Close the **Process Inspector** tab and go back to the Process Admin Console.
- __ j. On the toolbar, click **Server Admin**.

- __ k. Click **Monitoring > Instrumentation**. Notice the instances in the various states.

Monitoring > Instrumentation

Server: cell=PROD-PServerCell,node=PServerNode01,process=AppClusterMember1

<input type="button" value="Start Logging"/>	<input type="button" value="Refresh"/>	<input type="button" value="Reset"/>	<input type="button" value="Save"/>	Automatically refresh every	<input type="button" value="Never"/>	<input type="button" value=""/>
--	--	--------------------------------------	-------------------------------------	-----------------------------	--------------------------------------	---------------------------------

Name	Count/Value	In Process	Average Duration (ms)
(+) BPD			
(+) Instances			
(+) BPD Instances Completed	1		
BPD name is Standard HR Open New Position	1		
BPD Instances Failed	0		
BPD Instances Resumed	0		
(+) BPD Instances Started	2		
BPD name is Standard HR Open New Position	2		
BPD Instances Terminated	0		

- __ l. Minimize the Process Admin Console.

- __ m. Next, go to the wsadmin terminal window and verify the instance. Determine whether the snapshots and running instances exist for a process application by using the `BPMShowProcessApplication` command. Show information about the Hiring Sample process application and get a list of the snapshots by entering the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
```

```
wsadmin>print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
Name: Hiring Sample
```

```
Acronym: HSS
```

```
Description:
```

```
Toolkit: false
```

```
Tracks:
```

```
List of Snapshots:
```

```
Name: Responsive Hiring Sample v3
```

```
Acronym: RHSV3
```

```
Created On: 2016-06-17 12:50:24.993
```

```
Created By: User.1
```

```
Is Default: true
```

```
State: State[Active]
```

```
Capability: Capability[Standard]
```

```
No of running instances: 1
```

The output shows the snapshot details, which include the running instance. It does not show instances in any other state. However, from the Process Admin Console you can see one completed task instance. You can also see that the capability is for the Standard runtime.

- ___ n. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- ___ 6. To delete BPD process instances and their associated task instances, you can use the `BPMProcessInstancesCleanup` command. When a BPD instance completes, the record of that BPD instance is not deleted from the database. By using this command, you can identify either the specific instances to delete, or the date range within which any completed instances are deleted. You also identify whether to delete completed, canceled, failed, or all types of instances.
- ___ a. To delete the BPD instance and its associated tasks, enter the following command:

```
AdminTask.BPMProcessInstancesCleanup( [-containerAcronym HSS  
-containerSnapshotAcronym RHSV3 -instanceStatus COMPLETED] )
```

```
wsadmin>AdminTask.BPMProcessInstancesCleanup(['-containerAcronym HSS -contai  
nbsp;nSnapshotAcronym RHSV3 -instanceStatus COMPLETED'])  
'The BPMProcessInstancesCleanup command passed.'  
wsadmin>
```

Wait for the message that indicates “The `BPMProcessInstancesCleanup` command passed.”



Information

You can delete BPD instances and task data only with the `BPMProcessInstancesCleanup` command. You cannot delete BPEL instances with this command. This command is enhanced in V8.5.0.1 to include more parameters to specify the maximum duration time and maximum number of instances to delete. This enhancement makes it a candidate to run in a regularly scheduled cron job so you can limit the impact on the system and limit the work.

There are a couple of parameters for the command, which include the following parameters:

- **instanceStatus**: A required parameter that identifies the status or process instances to clean up. You can indicate COMPLETED, FAILED, CANCELED, and ALL. You cannot delete an instance that is running. This parameter is a required parameter.
- **maximumDuration**: An optional parameter that specifies the maximum deletion time in minutes. If the cleanup takes longer than the time specified here, the current transaction slice for the current cleanup job is completed, and then the current cleanup job is stopped. The default is 0 (that is, no limit) if not specified.
- **transactionSlice**: An optional parameter that specifies the number of instances in the transaction for the delete operation. The default value is 1 if not specified. You should check the `SystemOut.log` file for exceptions if the cleanup service adjusted your `transactionSlice`. Adjusting the number of instances to be deleted in a transaction can improve the cleanup operation time.

When you purge process instances by using the `BPMProcessInstancesCleanup` command, it purges process instances in the state of COMPLETED, FAILED, or CANCELED task instances, any attachments, and any dynamic groups that are associated with the instances.

In addition to the `BPMProcessInstancesCleanup` command, you can use the `LSW_BPD_INSTANCE_DELETE` stored procedure to delete runtime data from the database that is associated with a completed BPD instance. Run the query during an off period or maintenance window. When thousands of instances and data are purged, this process might cause a strain on the `LSW_TASK` and `LSW_BPD_INSTANCE` tables, which are core product tables. Running a cleanup job outside of normal business hours is a good practice.

-
- ___ b. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file. You can see details on the number of instances before and after deletion and the status of the command. You can also see the default values for both `maximumDuration` and `transactionSlice` that are used for the command.

```
localuser@bpmhost: /opt/IBM/BPM/profiles/PServerNode01/logs/AppClusterMember1
[6/17/16 15:06:38:383 EDT] 00000ce1 Log I PAL: About to start the BPMProcessInstancesCleanup with parameters: -containerAcronym Hiring Sample -containerSnapshotAcronym RHSV3 -instanceStatus COMPLETED -maximumduration 0 -transactionSlice 1
[6/17/16 15:06:38:388 EDT] 00000ce1 Log I PAL: Number of qualifying instances before deletion: 1
[6/17/16 15:06:39:657 EDT] 00000ce1 Log I PAL: A deletion job is running. Progress: Deleted 1 instance(s).
[6/17/16 15:06:39:665 EDT] 00000ce1 Log I PAL: Every instance has been deleted. The deletion job finished.
[6/17/16 15:06:39:746 EDT] 00000ce1 Log I PAL: Successfully ran the BPMProcessInstancesCleanup command with parameters: -containerAcronym Hiring Sample -containerSnapshotAcronym RHSV3 -instanceStatus COMPLETED -maximumduration 0 -transactionSlice 1
[6/17/16 15:06:39:761 EDT] 00000ce1 Log I PAL: Number of qualifying instances before deletion: 1
[6/17/16 15:06:39:796 EDT] 00000ce1 Log I PAL: Number of qualifying instances after deletion: 0
[6/17/16 15:06:39:806 EDT] 00000ce1 CommandService I PALAdminCommands otherProcessesInstancesCleanup Exiting
[6/17/16 15:06:47:398 EDT] 00000101 ProcessIndexB I CWLLG0757I: The purge process was completed successfully. 3 tasks and 1 instances were successfully removed from the search index.
```

- ___ c. Maximize the Process Admin Console.
- ___ d. Click **Process Inspector**.
- ___ e. On the left, click **Search**. You can see that the open task is still there, but the completed task is purged.



- ___ f. Close the Process Inspector tab and go back to the Process Admin Console.
- ___ g. Log out of the Process Admin Console. Minimize the browser window.

Part 2: Purging BPD process snapshots

You typically install multiple snapshots of the same process application to a Process Server. Over time, these snapshots can accumulate, and it becomes prudent to delete the ones that are no longer used. You can remove snapshots from Process Server by using the `BPMDeleteSnapshot` command. However, before you can delete a snapshot, the following preconditions must exist:

- The snapshot must exist.
- The snapshot must be inactive.
- The snapshot must have no running instances.
- The snapshot must not be deployed.
- In IBM BPM Advanced, any business-level applications that are related to the snapshot must be uninstalled before you can delete the snapshot.

In this part of the exercise, you examine how to delete BPD snapshots by using the Hiring Sample process application.

- ___ 1. Purge snapshots in the environment by using the command line.
 - ___ a. The first step is to determine whether the snapshot exists for the process application by using the `BPMShowProcessApplication` command. Enter the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
```

```
wsadmin>AdminTask.BPMProcessInstancesCleanup('[-containerAcronym HSS -conta
snapshotAcronym RHSV3 -instanceStatus COMPLETED]')
'The BPMProcessInstancesCleanup command passed.'
```

```
wsadmin>
```

```
wsadmin>print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
Name: Hiring Sample
Acronym: HSS
Description:
Toolkit: false
Tracks:
```

List of Snapshots:

```
Name: Responsive Hiring Sample v3
Acronym: RHSV3
Created On: 2016-06-17 12:50:24.993
Created By: User.1
Is Default: true
State: State[Active]
Capability: Capability[Standard]
No of running instances: 1
```

The output shows a list of snapshots and details, which includes the running instances. The state indicates that the snapshot is active. You can also see the value for Is Default is true.

- ___ b. Enter the following command to determine the status of a specific snapshot:

```
print AdminTask.BPMShowSnapshot( '[ -containerAcronym HSS
    -containerSnapshotAcronym RHSV3 ]' )
```

```
wsadmin>print AdminTask.BPMShowSnapshot('[-containerAcronym HSS -containerSnapshotAcronym RHSV3]')
```

```
Name: Responsive Hiring Sample v3
Acronym: RHSV3
Created On: 2016-06-17 12:50:24.993
Created By: User.1
Is Default: true
State: State[Active]
Capability: Capability[Standard]
Theme: BPM Theme
No of running instances: 1
```

Dependency:

```
Toolkit Acronym: TWSYS
Toolkit Name: System Data
Toolkit Track Acronym: Main
Toolkit Track Name: Main
Snapshot Name: 8.5.7.0
Snapshot Acronym: 8.5.7.0
Created On: 2016-06-06 15:07:24.93
Created By: User.9
```

Dependency:

```
Toolkit Acronym: SYSRC
Toolkit Name: Responsive Coaches
Toolkit Track Acronym: Main
Toolkit Track Name: Main
Snapshot Name: 8.5.7.0
Snapshot Acronym: 8.5.7.0
Created On: 2016-06-06 15:07:42.175
Created By: User.9
```

The output shows the snapshot details, which indicate that the snapshot is active. The value for Is Default is true.

- ___ c. Next, deactivate the snapshot. You need to deactivate a snapshot if you want to stop it or undeploy it from a Process Server. Enter the following command to deactivate the snapshot:

```
print AdminTask.BPMDeactivate( '[ -containerAcronym HSS
    -containerSnapshotAcronym RHSV3 ]' )
```

Notice the error message that you get.

```
wsadmin>print AdminTask.BPMDeactivate('[-containerAcronym HSS -containerSnapshotAcronym RHSV3 -force]')
WASX7015E: Exception running command: "AdminTask.BPMDeactivate('[-containerAcronym HSS -containerSnapshotAcronym RHSV3]')"; exception information:
java.lang.Exception: java.lang.Exception: Could not deactivate the default hot RHSV3 in the project with acronym: 'HSS'. Please read IBM info center, force' option to do the further action.
```



Information

On a process server, the first snapshot you install is considered the default version. As a result, the items within it run when an event or other trigger that applies to more than one version of a process or service is received. When you install subsequent snapshots, you can use the **Make Default Version** option in Process Admin Console to ensure the snapshot that you want to run is the default.

To deactivate a default version of the snapshot, first designate another snapshot as the default version. The `-force` parameter is an optional parameter that specifies that you want to deactivate the default snapshot of a process application. Default snapshots are not deactivated unless you include the force parameter.

In this exercise, you use the `-force` parameter when deactivating and deleting the default snapshot for learning purposes.

- d. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file. You can see the details of the exception.

- e. Next, deactivate the snapshot and use the `-force` parameter. Enter the following command to deactivate the snapshot:

```
print AdminTask.BPMDeactivate('[-containerAcronym HSS -containerSnapshotAcronym RHSV3 -force]')
```

Deactivating a snapshot allows all existing instances to complete processing, but no new requests are processed. The output indicates “BPMDeactivate passed.”

- f. Enter the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
```

The output shows the state now as Inactive but with one instance still running.

```
wsadmin>print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
Name: Hiring Sample
Acronym: HSS
Description:
Toolkit: false
Tracks:

List of Snapshots:
Name: Responsive Hiring Sample v3
Acronym: RHSV3
Created On: 2016-06-17 12:50:24.993
Created By: User.1
Is Default: true
State: State[Inactive]
Capability: Capability[Standard]
No of running instances: 1
```

- ___ g. Finally, you can delete the snapshot. Enter the following command to delete a process application snapshot and any dependencies:

```
print AdminTask.BPMDeleteSnapshot('[-containerAcronym HSS
-containerSnapshotAcronyms RHSV3]')
```

```
wsadmin>print AdminTask.BPMDeleteSnapshot('[-containerAcronym HSS -containerSnapshotAcronyms RHSV3]')
WASX7015E: Exception running command: "AdminTask.BPMDeleteSnapshot('[-containerAcronym HSS -containerSnapshotAcronyms RHSV3]')"; exception information:
java.lang.Exception: java.lang.Exception: Could not delete the default snapshot RHSV3 in the project with acronym: 'HSS'. Please read IBM info center, use e' option to do the further action.
```

However, you cannot delete a snapshot with running instances, nor can you delete the default snapshot. In this case, you get an error message.

- ___ h. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- ___ 2. Claim the task.
- ___ a. Maximize the browser window.
 - ___ b. Start the Process Portal console. In the web browser, go to the following URL:
`http://bpmhost:9082/portal`
 - ___ c. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ d. Select the **Task: GM Approval** task under Work.
 - ___ e. Click **Claim Task** to claim the task.
 - ___ f. Under Approval, select **Approved** and click **Submit**.

- ___ g. Click the **Task: Find job candidates** under Work.
 - ___ h. Click **Add candidates**.
 - ___ i. Click **Submit**.
 - ___ j. Log out of the Process Portal console.
- ___ 3. Delete the snapshot.

- ___ a. Switch back to the wsadmin window. Enter the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
```

The output shows the state now as Inactive with no running instances.

```
wsadmin>
wsadmin>print AdminTask.BPMShowProcessApplication('[-containerAcronym HSS]')
Name: Hiring Sample
Acronym: HSS
Description:
Toolkit: false
Tracks:

      List of Snapshots:
          Name: Responsive Hiring Sample v3
          Acronym: RHSV3
          Created On: 2016-06-17 12:50:24.993
          Created By: User.1
          Is Default: true
          State: State[Inactive]
          Capability: Capability[Standard]
          No of running instances: 0
```

- ___ b. Finally, you can delete the snapshot. Enter the following command to delete a process application snapshot and any dependencies:

```
print AdminTask.BPMDeleteSnapshot('[-containerAcronym HSS
-containerSnapshotAcronyms RHSV3 -force]')
```

When you delete a snapshot, any related BPD instances that have a status of Terminated, Completed, or Failed are also deleted. The `-force` option is used as you are deleting the default snapshot.

- ___ c. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
 - ___ d. Maximize the browser window. Start the Process Admin Console. In the web browser, go to the following URL:
- `http://bpmhost:9082/ProcessAdmin`
- ___ e. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
 - ___ f. In the Process Admin Console, click **Installed Apps**. You can see that the application is not installed.

- __ g. On the toolbar, click **Server Admin**.
- __ h. Click **Monitoring > Instrumentation**. Notice the instances in the various states. You can also see the Instances Completed is now two.
- __ i. Log out of the Process Admin Console.
- __ j. Minimize the browser.

Part 3: Purging BPEL process instances and snapshots

It is important to remember that if a process application contains any advanced content, such as a module or library from Integration Designer, a business-level application with EARs is created for this process application. Conceptually, the BPM content is installed into a Process Server after which the IBM BPM Advanced content is deployed, which amounts to generating and installing the BLA and constituent EARs.

In this part of the exercise, you examine how to purge both BPEL instances and snapshots in the environment. The offline package, the Procurement Sample (BPEL), is installed to the Process Server and is used to work with and purge instances. Remember, this sample is an example of a BPEL process that invokes a BPD.

- ___ 1. Deploy the offline packages to the environment.
 - ___ a. In the wsadmin terminal window, install the Procurement Sample BPEL process application snapshot from Process Center to the offline Process Server environment. Enter the following command:

```
AdminTask.BPMInstallOfflinePackage('[-inputFile
/opt/labfiles/Admin/Ex8/Procurement_Sample_v3-PROD-ProcessServer.zip]')
```

 Wait for the message that the “BPMInstallOfflinePackage passed.”
 - ___ b. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file. Wait until the installation completes.



Information

If you are using a SOAP connection, the command can take longer to complete than the specified SOAP timeout value. Although the command continues to run until it is finished, you might see the exception `java.net.SocketTimeoutException: Read timed out`. To prevent this exception, set a higher value for the `com.ibm.SOAP.requestTimeout` property in the `<profile_root>/properties/soap.client.props` file.

To verify that the process application snapshot is installed, look for the following entries in the `SystemOut.log` file output:

- The snapshot with the ID was installed successfully
- `processServerOfflineDeploy Exiting`

-
- ___ c. Keep both terminal windows open. Do not exit out of wsadmin as you use this window again.
 - ___ 2. Examine the application by using the administrative console.
 - ___ a. Maximize the web browser and go to the following URL:
`http://bpminstancehost:9062/ibm/console`
 - ___ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

- ___ c. Click **Applications > SCA modules**. You can see the Procurement_Sample_BPELProcess_Module SCA module that is installed and the associated application is as follows:
- Version 3 is STPPS1-PSV3-Procurement-Sample_BPELProcess_ModuleApp

Module ◇	Version ◇	Application ◇
You can administer the following resources:		
BFMIF_AppCluster		BPEContainer_AppCluster
CreditCheckMediationService		CreditCheckMediationServiceApp
CustomerMediationService		CustomerMediationServiceApp
FoundationModule		FoundationModuleApp
FoundationServices		FoundationServicesApp
HTMIF_AppCluster		TaskContainer_AppCluster
HTM_PredefinedTaskMsg_V8000 (AppCluster)		HTM_PredefinedTaskMsg_V8000_AppCluster
HTM_PredefinedTasks_V8000 (AppCluster)		HTM_PredefinedTasks_V8000_AppCluster
HelloWorldWithBO		HelloWorldWithBOApp
HumanTaskServices		HumanTaskServicesApp
IneligibleMediationService		IneligibleMediationServiceApp
RouterMediationService		RouterMediationServiceApp
Procurement_Sample_BPELProcess_Module	PSV3	STPPS1-PSV3-Procurement_Sample_BPELProcess_Module

- ___ d. Click **Applications > Application Types > Business-level applications**. Click to go to page 2 to see the STPPS1-PSV3 listed.
- ___ e. Log out of the administrative console.
- ___ 3. Examine the application by using the Process Admin Console.
- ___ a. Start the Process Admin Console. In the web browser, go to the following URL:
<http://bpmhost:9082/ProcessAdmin>
- ___ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

- ___ c. On the toolbar, click **Installed Apps**. The Procurement Sample (STPPS1) is listed with zero instances.

The screenshot shows the IBM Process Admin Console interface. The top navigation bar includes tabs for 'Process Admin Console', 'Server Admin', 'Process Inspector', and 'Installed Apps'. The 'Installed Apps' tab is currently active. Below the tabs, there is a search bar labeled 'Sort Snapshots By: Application Name'. The main content area displays a list of installed applications. The first two items are standard portals. The third item, 'Procurement Sample (STPPS1) - Procurement Sample v3', is highlighted with a red rectangular border. Underneath this highlighted item, there is a sub-section with a blue icon and the text 'ReplenishmentBPD - 0 instances'.

- ___ d. Log out of the Process Admin Console.
- ___ 4. Work with the Procurement Sample.
- ___ a. Start the Business Process Choreographer Explorer. In the web browser, go to the following URL:
- http://bpmhost:9083/bpc
- ___ b. In the login area, enter psdeadmin as the user ID and passw0rd as the password. Click **Login**.
- ___ c. Click **Currently Valid**.
- ___ d. Select the **ReplenishmentBPEL** check box and click **Start Instance**.

The screenshot shows the 'Currently Valid Process Templates' page. At the top, there is a header with the title 'Currently Valid Process Templates' and a note: 'Use this page to view process templates on which you can work.' Below the header are four buttons: 'Start Instance' (highlighted with a red box), 'Instances', 'View Structure', and 'Refresh'. The main content area displays a table of process templates. The first row has empty checkboxes. The second row, for 'AccountVerification', has an empty checkbox. The third row, for 'ReplenishmentBPEL', has a checked checkbox (highlighted with a red box) and is the only one with data visible. The table columns are 'Process Template Name', 'Valid From', and 'Process App'. At the bottom of the page, there is a footer with the text 'Items found: 2 Items selected: 1' and 'Page 1 of 1'.

- ___ e. Enter the following values:
- **Process Name:** Replenish_Test_111
 - **orderID:** OID_111
 - **partNumber:** PN_111
 - **quantity:** 111
- Click **Submit**.

- ___ f. Select the **ReplenishmentBPEL** check box and click **Start Instance**.
- ___ g. Enter the following values:
- **Process Name:** Replenish_Test_222
 - **orderID:** OID_222
 - **partNumber:** PN_222
 - **quantity:** 222
- Click **Submit**.
- ___ h. Select the **ReplenishmentBPEL** check box and click **Instances**. You can see instances that are running.

Process Instances for Process Templates

Use this page to work with process instances that belong to specific process templates. [\[i\]](#)

<input type="checkbox"/>	Process Instance Name	Process Template Name	Valid From	Process App
<input type="checkbox"/>	Replenish_Test_222	ReplenishmentBPEL	6/17/2016 4:13:07 PM EDT	Procurement Sample
<input type="checkbox"/>	Replenish_Test_111	ReplenishmentBPEL	6/17/2016 4:13:07 PM EDT	Procurement Sample

Items found: 2 Items selected: 0 Page 1 of 1 Items per page: 20

- ___ i. Log out of Business Process Choreographer Explorer.
- ___ j. In the web browser, go to the following URL:
<http://bpmhost:9082/ProcessAdmin>
- ___ k. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password.
 Click **Login**.
- ___ l. On the toolbar, click **Installed Apps**. Now the Procurement Sample (STPPS1) is listed with two instances. You can see the acronym of STPPS1 defined.

IBM. | Process Admin Console Server Admin Process Inspector **Installed**

Sort Snapshots By: [\[Apply\]](#)

[Heritage Process Portal \(TWP\) - 8.5.7.0](#)

[Process Portal \(SYSRP\) - 8.5.7.0](#)

[Procurement Sample \(STPPS1\) - Procurement Sample v3](#)
 ← ReplenishmentBPD - 2 instances

- ___ m. On the toolbar, click **Process Inspector**.

- ___ n. In the left, click **Search**. You can see the two open instances.

The screenshot shows the Process Inspector interface with two instances listed:

- ReplenishmentBPD:6** - Last modified Jun 17, 2016 Due Jun 18, 2016
- ReplenishmentBPD:5** - Last modified Jun 17, 2016 Due Jun 18, 2016

- ___ o. Select the first instance in the list and examine the details on the right. You can see that the instance is active.
- ___ p. Click **Tasks** to expand to see the task that is due.
- ___ q. Close the Process Inspector tab. Go to the **Process Admin Console** tab.
- ___ r. On the toolbar, click **Server Admin**.
- ___ s. Click **Monitoring > Instrumentation**. Notice the instances in the various states. The number of instances started increased by two. Also, there is a count value of two instances for the ReplenishmentBPD.

Monitoring > Instrumentation

Server: cell=PROD-PServerCell,node=PServerNode01,process=AppClusterMember1

Start Logging	Refresh	Reset	Save	Automatically refresh every	Never	▼
----------------------	----------------	--------------	-------------	-----------------------------	--------------	----------

Name	Count/Value	In Process	Average Duration (ms)	M A D (n)
(+) BPD				
(+) Instances				
(-) BPD Instances Completed	2			
BPD name is Standard HR Open New Position	2			
BPD Instances Failed	0			
BPD Instances Resumed	0			
(-) BPD Instances Started	4			
BPD name is ReplenishmentBPD	2			
BPD name is Standard HR Open New Position	2			
BPD Instances Terminated	0			

- ___ t. Log out of the Process Admin Console.
 - ___ u. Minimize the browser window.
- ___ 5. Verify the instances.
- ___ a. Go to the wsadmin terminal window and verify the instance. Determine whether the snapshots and running instances exist for a process application by using the `BPMShowProcessApplication` command. Show information about the Procurement Sample process application and get a list of the snapshots by entering the following command:

```
print AdminTask.BPMShowProcessApplication('[-containerAcronym STPPS1]')
```

```
wsadmin>print AdminTask.BPMShowProcessApplication('[-containerAcronym STPPS1]
Name: Procurement Sample
Acronym: STPPS1
Description:
Toolkit: false
Tracks:
```

```
List of Snapshots:
Name: Procurement Sample v3
Acronym: PSV3
Created On: 2016-06-17 16:12:11.826
Created By: User.1
Is Default: true
State: State[Active]
Capability: Capability[Advanced]
No of running instances: 2
```

The output shows the snapshot details that include the running instances, the snapshot is active, and it is the default snapshot. The capability is for the Advanced runtime.

- ___ b. Enter the following command to determine the status of a specific snapshot.

```
print AdminTask.BPMShowSnapshot( '[ -containerAcronym STPPS1
                                     -containerSnapshotAcronym PSV3 ]' )
```

```
Name: Procurement Sample v3
Acronym: PSV3
Created On: 2016-06-17 16:12:11.826
Created By: User.1
Is Default: true
State: State[Active]
Capability: Capability[Advanced]
Theme: BPM Theme
No of running instances: 2
```

Dependency:

```
Toolkit Acronym: TWSYS
Toolkit Name: System Data
Toolkit Track Acronym: Main
Toolkit Track Name: Main
Snapshot Name: 8.5.7.0
Snapshot Acronym: 8.5.7.0
Created On: 2016-06-06 15:07:24.93
Created By: User.9
```

The output shows the snapshot details, which indicate that the snapshot is active.

- ___ c. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- ___ 6. Delete a snapshot. Before you can delete a snapshot that contains BPEL, you must complete a few steps. You must first look to see whether there are running instances. Then, you deactivate the running process application snapshot.
- ___ a. From previous commands, you know that there are two running instances for this process application. Next, you need to deactivate a snapshot if you want to stop it, or undeploy it, from a Process Server. Enter the following command to deactivate the snapshot:
- ```
print AdminTask.BPMDeactivate('[-containerAcronym STPPS1
 -containerSnapshotAcronym PSV3 -force]')
```
- Deactivating a snapshot allows all existing instances to complete processing, but no new requests are processed. You can see the “`BPMDeactivate passed`” message. Again, the `-force` option is used since this snapshot is the default snapshot.
- \_\_\_ b. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.

- \_\_\_ c. Again, enter the following command to determine the status of a specific snapshot.

```
print AdminTask.BPMShowSnapshot('[-containerAcronym STPPS1
 -containerSnapshotAcronym PSV3]')
```

```
Name: Procurement Sample v3
Acronym: PSV3
Created On: 2016-06-17 16:12:11.826
Created By: User.1
Is Default: true
State: State[Inactive]
Capability: Capability[Advanced]
Theme: BPM Theme
No of running instances: 2
```

```
Dependency:
Toolkit Acronym: TWSYS
Toolkit Name: System Data
Toolkit Track Acronym: Main
Toolkit Track Name: Main
Snapshot Name: 8.5.7.0
Snapshot Acronym: 8.5.7.0
Created On: 2016-06-06 15:07:24.93
Created By: User.9
```

Now the output shows that the snapshot is inactive but there are still two running instances.

- \_\_\_ 7. Since the goal in this part of the exercise is to remove a process application, you must complete a few steps. To remove or uninstall an application that contains BPEL, you must verify that no instances exist in any state for the application. To ensure that no new instances are created, you first stop the BPEL template. This task puts the process template into the stopped state, and no more instances are created from the template. Existing process instances continue running until completion in an orderly way.



### Information

Process templates define BPEL processes and task templates define human tasks within an application. When an application that contains process or task templates is deployed and started, the templates are put into the started state. You can use the administrative console or the administrative commands to stop and start process and task templates.

- \_\_\_ a. Maximize the browser.  
 \_\_\_ b. The easiest way to stop the template is by using the administrative console. In the web browser, go to the following URL:

<http://bpmhost:9062/ibm/console>

- \_\_\_ c. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ d. Click **Applications > SCA modules**.
  - \_\_\_ e. Select the **Procurement\_Sample\_BPELProcess\_module** check box and click **Stop**. Wait for the module to stop.
  - \_\_\_ f. Log out of the administrative console.
- \_\_\_ 8. Before you can delete a BPEL process application, you need to undeploy the application. Before you can undeploy the application, you must verify that there are no instances in any state present. You cannot use the `BPMProcessInstancesCleanup` command to delete BPEL process instances and their associated task instances. There are numerous methods for deleting BPEL processes and tasks. Since this sample is an example of a BPEL process that calls a BPD, you use the Process Admin Console to interact with the process application.
- \_\_\_ a. In the web browser, go to the following URL:  
`http://bpmhost:9082/ProcessAdmin`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `password` as the password. Click **Login**.
  - \_\_\_ c. In the toolbar, click **Process Inspector**.
  - \_\_\_ d. On the left, click **Search**. The processes that are active are listed.
  - \_\_\_ e. Click **ReplenishmentBPD:6**. On the right, information about the snapshot is shown.

The screenshot shows the 'Process Inspector' view in the IBM BPM Process Admin Console. On the left, a tree view lists processes: 'ReplenishmentBPD' (selected), 'Procurement Sample', and 'Procurement Sample v3'. On the right, detailed information for 'ReplenishmentBPD:6' is displayed:

- Instance ID:** 6
- Status:** Active
- Start time:** Jun 17, 2016 4:51 PM (27 minutes ago)
- Last action:** Jun 17, 2016 4:51 PM (27 minutes ago)
- Due date:** Jun 18, 2016 4:51 PM (24 hours from now)

Below this, a sidebar titled 'Actions' lists the following options:

- Edit data
- Refresh
- Modify due date
- Suspend
- Terminate

At the bottom of the sidebar, there are links for 'Tasks (1)' and 'Data'.

- \_\_\_ f. Terminate the process. Click **Terminate** and click **Yes** in the confirm window. You can now see that the status is Terminated.
  - \_\_\_ g. Repeat the previous steps to terminate **ReplenishmentBPD:5**.
  - \_\_\_ h. Log out of the Process Admin Console and minimize the browser window.
- \_\_\_ 9. Now that there are no running instances, you can undeploy and delete the snapshot.

- \_\_\_ a. Enter the following command to determine the number of instances that are running:

```
print AdminTask.BPMShowSnapshot('[-containerAcronym STPPS1
-containerSnapshotAcronym PSV3]')
```

Now the output shows that the snapshot is inactive and there are no running instances.

- \_\_\_ b. Next, you must stop the deactivated snapshot. Enter the following command to stop the snapshot:

```
print AdminTask.BPMStop('[-containerAcronym STPPS1
-containerSnapshotAcronym PSV3]')
```

You can see that the snapshot is now stopped as the message indicates “BPMStop passed.”

- \_\_\_ c. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- \_\_\_ d. Enter the following command to undeploy a specific snapshot.

```
print AdminTask.BPMUndeploy('[-containerAcronym STPPS1
-containerSnapshotAcronym PSV3]')
```

You can see that the snapshot is now undeployed. Undeploying the snapshot removes any SCA modules and business-level applications (BLAs) associated with the snapshot.

- \_\_\_ e. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file.
- \_\_\_ f. Enter the following command to determine the state of the snapshot:

```
print AdminTask.BPMShowSnapshot('[-containerAcronym STPPS1
-containerSnapshotAcronym PSV3]')
```

Now the output shows that the snapshot is undeployed.

```
wsadmin>print AdminTask.BPMShowSnapshot('[-containerAcronym STPPS1 -containerSnapshotAcronym PSV3]')

Name: Procurement Sample v3
Acronym: PSV3
Created On: 2016-06-17 16:12:11.826
Created By: User.1
Is Default: true
State: State[Undeployed]
Capability: Capability[Advanced]
Theme: BPM Theme
No of running instances: 0

Dependency:
 Toolkit Acronym: TWSYS
 Toolkit Name: System Data
 Toolkit Track Acronym: Main
 Toolkit Track Name: Main
 Snapshot Name: 8.5.7.0
 Snapshot Acronym: 8.5.7.0
 Created On: 2016-06-06 15:07:24.93
 Created By: User.9
```

- \_\_\_ g. Enter the following command to delete a specific snapshot.

```
print AdminTask.BPMDeleteSnapshot('[-containerAcronym STPPS1
-containerSnapshotAcronyms PSV3 -force]')
```

You can see that the snapshot is now deleted. When you delete a snapshot, any related BPD instances that have a status of terminated, completed, or failed are also deleted. You must use the `-force` option since this snapshot is the default snapshot. Wait for the message that the “`BPMDeleteSnapshot` passed.”

- h. Examine the output in the terminal window where you ran the tail command. Notice the details in the `SystemOut.log` file. You can see the instance IDs that were deleted, the number of instances that are deleted in the transaction, and the snapshot details.

```
[6/17/16 17:54:22:847 EDT] 00000ce1 CommandService I PALAdminCommands snapshotDelete Entering
[6/17/16 17:54:23:401 EDT] 00000ce1 SnapshotDelete I BPD Instance with ID: 6 was deleted successfully

[6/17/16 17:54:23:440 EDT] 00000ce1 SnapshotDelete I BPD Instance with ID: 5 was deleted successfully

[6/17/16 17:54:24:330 EDT] 00000ce1 SnapshotDelete I [BPMDeleteSnapshot] -- Deleted the BPD instances for the process application Procurement Sample with status 'COMPLETED', 'FAILED' or 'TERMINATED':
BPD Instance ID: 6
BPD Instance ID: 5
[BPMDeleteSnapshot] -- There is/are 2 BPD instance(s) in total that has/have been deleted within this transaction.
[BPMDeleteSnapshot] -- The following snapshot for the process application Procurement Sample was deleted:
[ID: Snapshot.24f8e4a4-2ab2-4b6c-ab6a-b39a3199def3 | Name: Procurement Sample v3]

[6/17/16 17:54:32:895 EDT] 00000101 ProcessIndexB I CWLLG0757I: The purge process was completed successfully. 2 tasks and 2 instances were successfully removed from the search index.
```

- i. When completed, stop the tail and exit the terminal window.
- j. Exit out of wsadmin and exit the terminal window.
10. Verify the deletion by using the administrative console.
- a. Maximize the web browser.
- b. In the web browser, go to the following URL:  
`http://bpmhost:9082/ProcessAdmin`
- c. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- d. On the toolbar, click **Server Admin**.

- \_\_\_ e. Click **Monitoring > Instrumentation**. Notice the instances in the various states. You can see that out of the four instances that were started, two were completed and two were terminated.

### Monitoring > Instrumentation

Server: cell=PROD-PServerCell,node=PServerNode01,process=AppClusterMember1

|                                              |                                        |                                      |                                     |                             |                                    |                                  |
|----------------------------------------------|----------------------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|----------------------------------|
| <input type="button" value="Start Logging"/> | <input type="button" value="Refresh"/> | <input type="button" value="Reset"/> | <input type="button" value="Save"/> | Automatically refresh every | <input type="text" value="Never"/> | <input type="button" value="▼"/> |
|----------------------------------------------|----------------------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|----------------------------------|

| Name                                      | Count/Value | In Process | Average (ms) |
|-------------------------------------------|-------------|------------|--------------|
| (+) BPD                                   |             |            |              |
| (-) Instances                             |             |            |              |
| (+) BPD Instances Completed               | 2           |            |              |
| BPD name is Standard HR Open New Position | 2           |            |              |
| BPD Instances Failed                      | 0           |            |              |
| BPD Instances Resumed                     | 0           |            |              |
| (+) BPD Instances Started                 | 4           |            |              |
| BPD name is ReplenishmentBPD              | 2           |            |              |
| BPD name is Standard HR Open New Position | 2           |            |              |
| (-) BPD Instances Terminated              | 2           |            |              |
| BPD name is ReplenishmentBPD              | 2           |            |              |
| Cache                                     |             |            |              |
| (+) Connectors                            |             |            |              |

- \_\_\_ f. Logout of the Process Admin Console.
- \_\_\_ g. In the web browser, go to the following URL:  
<http://bpmhost:9062/ibm/console>
- \_\_\_ h. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ i. Click **Applications > SCA modules**. You can see that the `Procurement_Sample_BPELProcess_Module` SCA module is no longer listed.
- \_\_\_ j. Click **Applications > Application Types > Business-level applications**. Click to go to page 2, and you can see that `STPPS1-PSV3` is no longer listed.
- \_\_\_ k. Keep the administrative console open as you use it again in the next step.

## 8.2. Configuring the cleanup service

### Part 1: Configuring the cleanup service

In this part of the exercise, the cleanup service is configured by using the administrative console. The cleanup service is used to schedule jobs that periodically delete objects from the database, including process and task instances that are based on a particular state.

When configuring the cleanup service, there are separate services for the Business Flow Manager and for the Human Task Manager.

- \_\_\_ 1. Configure the cleanup service.
  - \_\_\_ a. Click **Servers > Clusters > WebSphere application server clusters > AppCluster**.
  - \_\_\_ b. Under Business Process Manager, expand **Business Process Choreographer** and click **Business Flow Manager**.
  - \_\_\_ c. A message is displayed, indicating that the Business Flow Manager is already installed. Under Additional Properties, click **Cleanup Service Settings**.

The screenshot shows the 'Additional Properties' section of the configuration interface. It includes three main sections: 'Containers', 'Related Items', and 'Additional Properties'. The 'Additional Properties' section contains four items: 'REST Service Endpoint', 'Cleanup Service Settings' (which is highlighted with a red box), and 'Custom properties'. The 'Cleanup Service Settings' item is the target of step c) in the list below.

- Containers**
- Related Items**
- Additional Properties**
  - REST Service Endpoint
  - Cleanup Service Settings**
  - Custom properties

- \_\_\_ d. Since these changes are immediate and do not require a server restart, click the **Runtime** tab.
- \_\_\_ e. In the Cleanup Service Settings area, select the **Save runtime changes to configuration** option.

- \_\_\_ f. In the Cleanup Service Settings area, select the **Enable cleanup service** option. This option enables the cleanup service to run on one of the cluster members in the AppCluster.

**Cleanup Service Settings**

|                                                            |
|------------------------------------------------------------|
| <input checked="" type="checkbox"/> Enable cleanup service |
| Frequency (CRON Calendar)<br>0 0 23 * * ?                  |
| Maximum duration (in minutes)<br>120                       |
| Transaction slice (instances per transaction)<br>10        |



### Information

In the Cleanup Service Settings area, there are a number of fields with default settings.

- **Frequency:** Specifies the time and frequency when the cleanup service runs. It uses a crontab format string to define the time, which includes <seconds><minute><hour><day of the month><day of the year><day of the week>. The default time is every night at 11 p.m.
- **Maximum duration:** Specifies the maximum time the cleanup service is allowed to run. The default time is 120 minutes.
- **Transaction slice:** Specifies the number of instances that are deleted in each database transaction. The default is 10.

- \_\_\_ g. In the **Frequency** field, change the time close to your current time. The time indicates when the cleanup service runs. For example, if it is 3:45 p.m., set the field to 4 p.m.  
Enter: 0 0 16 \* \* ?

**Cleanup Service Settings**

|                                                            |
|------------------------------------------------------------|
| <input checked="" type="checkbox"/> Enable cleanup service |
| Frequency (CRON Calendar)<br>0 0 16 * * ?                  |
| Maximum duration (in minutes)<br>120                       |
| Transaction slice (instances per transaction)<br>10        |

**Note**

Try to set the time as close as possible to your current time so the service runs shortly and you can verify the output in the `SystemOut.log` file. If you set the time to a later time, perhaps 11 p.m., remember to view the `SystemOut.log` file to see the details of the cleanup service.

By setting the **Frequency** field close to your current time, you can verify that the cleanup service is running and removing the correct entries. By setting it for 15 minutes in the future, you have time to complete the configuration steps and terminate a number of instances the cleanup service deletes.

- \_\_\_ h. Keep all remaining defaults.
- \_\_\_ 2. Create a cleanup job.
  - \_\_\_ a. In the Cleanup Service Jobs area, click **Add**.

**Cleanup Service Jobs**

|        | <b>Add</b>   | <b>Delete</b> |           |        |                         |  |  |
|--------|--------------|---------------|-----------|--------|-------------------------|--|--|
| Select | Order Number | Cleanup Job   | Templates | States | Duration until deletion |  |  |
| None   |              |               |           |        |                         |  |  |

- \_\_\_ b. In the General Properties area, enter the following information:
  - In the **Order Number** field, keep the default 0 (zero, which identifies the order in which the job runs, starting with zero)
  - In the **Cleanup Job** field, enter: `BPC terminated instances`
  - In the **Templates** field, enter: `*` (which means all templates)

**General Properties**

|                                                                      |
|----------------------------------------------------------------------|
| Order Number<br><input type="text" value="0"/>                       |
| Cleanup Job<br><input type="text" value="BPC terminated instances"/> |
| Templates<br><input type="text" value="*"/>                          |

- \_\_\_ c. In the Cleanup States area, clear **Finished** and select **Terminated**.

**Cleanup States**

Restrict cleanup to instances in the following states:

FINISHED

TERMINATED

FAILED



### Information

Cleanup states can include a combination of states. For the Business Flow Manager cleanup states, possible values include Finished, Terminated, and Failed. For the Human Task Manager cleanup states, possible values include Finished, Terminated, Failed, Inactive, and Expired.

- \_\_\_ d. In the Duration Until Deletion area, change the **Minutes** field to **5** and **Hours** field to **0** (zero). This setting indicates the amount of time a process instance must be in the cleanup state before it can be deleted.

**Duration Until Deletion**

|         |   |
|---------|---|
| Minutes | 5 |
| Hours   | 0 |
| Days    | 0 |
| Months  | 0 |
| Years   | 0 |

- \_\_\_ e. Click **OK**. The cleanup job is added to configuration.

**Cleanup Service Jobs**

| Add | Delete | Select                   | Order Number | Cleanup Job              | Templates | States     | Duration until deletion |
|-----|--------|--------------------------|--------------|--------------------------|-----------|------------|-------------------------|
|     |        | <input type="checkbox"/> | 0            | BPC terminated instances | *         | TERMINATED | 5minutes                |

- \_\_\_ f. Review the settings and click **OK**.
  - \_\_\_ g. Save the changes to the master configuration.
- 

**Note**

To configure the cleanup service and cleanup jobs for the Human Task Manager, follow the same steps as shown previously. In the exercises, you do not configure the cleanup service and cleanup jobs for the Human Task Manager. However, feel free to configure the service for testing by using the steps that are shown previously.

---

- \_\_\_ h. Click **OK**.
- \_\_\_ i. Log out of the administrative console.

## Part 2: Verifying the configuration of the cleanup service

To verify the configuration of the cleanup service, create a process instance by using Business Process Choreographer Explorer. After the instance is in a running state, terminate the instance. The cleanup job was configured to clean up any instances in the terminated state.

- \_\_\_ 1. Access the Business Process Choreographer Explorer.
  - \_\_\_ a. In the web browser, go to the following URL:  
`http://bpmhost:9083/bpc`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 2. Start an instance of the AccountVerification process.
  - \_\_\_ a. Click **Currently Valid**.
  - \_\_\_ b. Select the **AccountVerification** process check box and click **Start Instance**.
  - \_\_\_ c. Enter the following values:
    - **Process Name:** Process1 (If it is left blank, the container automatically generates its value)
    - **companyName:** TestCo
  - \_\_\_ d. Click **Submit**.
  - \_\_\_ e. Select the **AccountVerification** process template check box and click **Instances**.
  - \_\_\_ f. One process is in the running state. Select the check box for the process and click **Terminate**. The process instance is now in the Terminated state.
  - \_\_\_ g. Click **My Task Templates**.
  - \_\_\_ h. Select the **RequestMoreDocumentation** process template check box and click **Instances**. There is one instance in the ready state.
  - \_\_\_ i. Minimize the browser window.
- \_\_\_ 3. After the cleanup service runs, or after the time indicated in the cleanup service, examine the output in the log file.
  - \_\_\_ a. Open a terminal window and change to the `/opt/IBM/BPM/profiles/PServerNode01/logs/AppClusterMember1` directory.
  - \_\_\_ b. Open the `SystemOut.log` file. Use an editor such as vi or open with gedit.



### Hint

You can also tail the `SystemOut.log` file.

- \_\_\_ c. Look for the messages for CleanupWork.

```
CleanupWork I CWWBF0118I: The cleanup service started.
CleanupWork I CWWBF0120I: The cleanup service is running cleanup job BPC terminated
instances. Progress: deleted instances 2 in 0 seconds; failed deletion attempts 0.
CleanupWork I CWWBF0120I: The cleanup service is running cleanup job BPC terminated
instances. Progress: deleted instances 2 in 0 seconds; failed deletion attempts 0.
CleanupWork I CWWBF0117I: The cleanup job BPC terminated instances finished. It
deleted 2 instances in 0 seconds.
CleanupWork I CWWBF0119I: The cleanup service finished. It deleted 2 instances in 0 s
```

- \_\_\_ 4. Examine the process in Business Process Choreographer Explorer.

- \_\_\_ a. Maximize the browser window.
- \_\_\_ b. Click **Currently Valid**.
- \_\_\_ c. Select the **AccountVerification** and **AccountTracking** process templates check boxes and click **Instances**. There are no instances of the templates.
- \_\_\_ d. Click **My Task Templates**.
- \_\_\_ e. Select the **RequestMoreDocumentation** process template check box and click **Instances**. There is still one instance in the ready state.
- \_\_\_ f. Select the instance and click **Terminate**.
- \_\_\_ g. Select the instance and click **Delete**.
- \_\_\_ h. Log out of Business Process Choreographer Explorer.

## Part 3: Stopping the Process Server environment

It is important that you stop the Process Server environment. This environment is used in a later exercise. To help with system performance, the Process Server environment is stopped until it is used again.

- \_\_\_ 1. Start the deployment manager administrative console.
  - \_\_\_ a. In a web browser, go to the following URL:  
`http://bpminst01:9062/ibm/console`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 2. Stop the deployment environment.
  - \_\_\_ a. Click **Servers > Clusters > WebSphere application server clusters**.
  - \_\_\_ b. Select the check box for each of the clusters and click **Stop**. Wait a few moments for the clusters to stop before proceeding.
  - \_\_\_ c. Log out of the administrative console.
  - \_\_\_ d. Close the browser window.
- \_\_\_ 3. Stop the server processes.
  - \_\_\_ a. Open a terminal window and change to the `/opt/IBM/BPM/profiles/PServerNode01/bin` directory
  - \_\_\_ b. Enter the following command to stop the node agent:  
`./stopNode.sh`  
Wait for the message that indicates that the node agent is stopped.
  - \_\_\_ c. Change to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
  - \_\_\_ d. Enter the following command to stop the deployment manager:  
`./stopManager.sh`  
Wait for the message that indicates that the deployment manager is stopped.
  - \_\_\_ e. Exit the terminal window.



### Attention

Since the entire course configuration is on one computer, the Process Server processes are stopped to save system resources. Stop any processes in the Process Server cell that are still running.

---

## End of exercise

## Exercise review and wrap-up

The exercise examined various methods available to purge data in the Process Server production environment in IBM Business Process Manager.

# Exercise 9. Managing offline and online process servers

## Estimated time

01:30

## Overview

This exercise examines the differences between an offline Process Server and an online Process Server and how to deploy process applications to each of these environments. You also modify the configuration for an offline Process Server and move it to an online Process Server. Process applications are also deployed to the Process Server.

## Objectives

After completing this exercise, you should be able to:

- Create an offline server by using the Process Center Console
- Deploy a snapshot to an offline Process Server
- Change the configuration of an offline Process Server to an online Process Server
- Configure SSL communication in the network deployment environments
- Manage an online Process Server
- Deploy a snapshot to an online Process Server
- Deploy an installation package to Process Server

## Introduction

There are two types of runtime for a Process Server:

- Online or connected: An online Process Server runtime that is configured during installation and is automatically discovered and displayed in the web-based Process Center Console.
- Offline: An offline server is a Process Server runtime that is not connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications. However, the method for deploying process application snapshots to an offline Process Server differs from the method for deploying process application snapshots to an online Process Server.

## Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed

- The Process Center profiles created
- The Process Center deployment environment created
- The Process Server profiles created
- The Process Server deployment environment created

## Exercise instructions

### 9.1. Working with an offline Process Server

An offline server is a Process Server runtime that is not connected to a Process Center. Offline servers can still be used when deploying snapshots of process applications. However, the method for deploying process application snapshots to an offline Process Server differs from the method that is used for an online Process Server.



#### Important

In this exercise, you enter many commands in the wsadmin command line environment. To help, a text file is included on the course image, which contains all of the commands that are used in this exercise. You can copy the commands from the file, and paste them into the wsadmin command line environment. The file is `exercise-commands.txt` in `/opt/labfiles/scripts/samples/`.

#### Part 1: Starting the Process Center environment



#### Hint

In the previous exercise, you stopped the deployment manager and node agent processes that are running in the Process Server cell. Both the Process Center cell and the Process Server cell are configured on the same computer. However, all server processes have unique port numbers that are assigned to them. Since the entire course configuration is on one computer, the Process Server processes are stopped to save system resources.

- \_\_\_ 1. Start the Process Center cell environment.
  - \_\_\_ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PCenterDmgr/bin` directory. The path is now for the deployment manager in the Process Center cell.
  - \_\_\_ b. Start the deployment manager by entering the following command:  
`./startManager.sh`  
Wait for the message that indicates that the deployment manager is started.
  - \_\_\_ c. Change to the `/opt/IBM/BPM/profiles/PCenterCustom/bin` directory. The path is now for the node agent in the Process Center cell.
  - \_\_\_ d. Start the node agent by entering the following command:  
`./startNode.sh`  
Wait for the message that indicates that the node agent is started. Note each of the cluster members is in a stopped state.
- \_\_\_ 2. Start the deployment manager administrative console.

- \_\_\_ a. Open a web browser and go to the following URL:  
`http://bpminst01:9060/ibm/console`
- \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 3. Start the deployment environment.
  - \_\_\_ a. Click **Servers > Clusters > WebSphere application server clusters**.
  - \_\_\_ b. Select the **PCenter\_DE.AppCluster** check box, and click **Start**. Wait a few moments for the cluster to start before proceeding. If after a few minutes the status is still `Partial Start`, the console must be refreshed. Click any page in the console to refresh.



### Information

Instead of starting the cluster, you can also start the deployment environment. The deployment environment starts all clusters in the environment. To start the deployment environment:

- Click **Servers > Deployment Environments**.
- Select the **PCenter\_DE** check box, and click **Start**.

- \_\_\_ 4. Examine the port numbers for AppClusterMember1.
  - \_\_\_ a. Click **Servers > Server Types > WebSphere application servers > PCenter\_DE.AppCluster.member1**.
  - \_\_\_ b. Under Communications, click the box next to **Ports** to expand and get a list of ports. The **SOAP\_CONNECTOR\_ADDRESS** for the server is **8880**. You use this port when connecting to the server for creating and extracting installation packages.
  - \_\_\_ c. Log out of the administrative console.

## **Part 2: Configuring an offline Process Server**

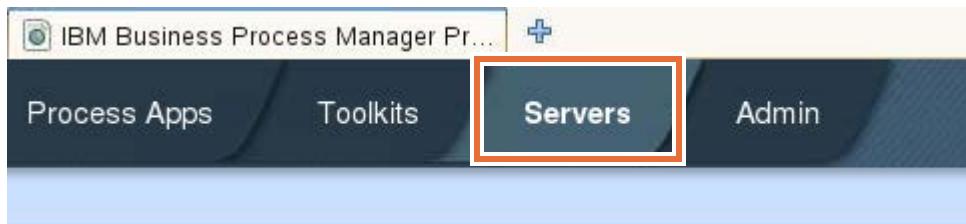
From the Process Center Console, you can manage configured Process Servers in their environment. A Process Server provides a single runtime and execution environment that can support a range of business processes, service orchestration, and integration capabilities for deployed and released process application snapshots.

The two types of runtime for a Process Server are online (or connected), and offline. It is suggested that you connect the various test Process Servers directly to the Process Center to enable automated deployment.

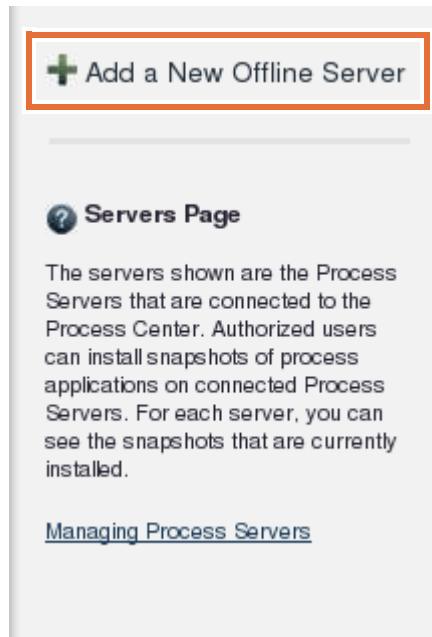
Do not connect production Process Servers directly to the Process Center. Administrators can still use the Process Center Console to manage deployment to disconnected Process Servers. In this case, rather than directly deploying to the server, the Process Center Console creates a deployment package. This deployment package must then be transferred to the directory structure of the target offline Process Server and deployed locally. Often, company security policies prevent administrators from communicating directly between a development environment and a production

environment. Offline servers provide companies a workaround that allows them to function even if they cannot communicate directly with the production environment.

- \_\_\_ 1. Start the Process Center Console by using the web portal.
  - \_\_\_ a. In the web browser, go to the Process Center Console at the following URL:  
`http://bpmhost:9080/ProcessCenter`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. If you see the “Getting Started with IBM Process Center 8.5.7” welcome page, close it by clicking the **X** at the upper-right corner of the window.
- \_\_\_ 2. Create an offline Process Server.
  - \_\_\_ a. In the Process Center perspective, click the **Servers** tab. This tab shows all the Process Servers that are connected to Process Center. The pane is blank because there are no connected Process Servers.

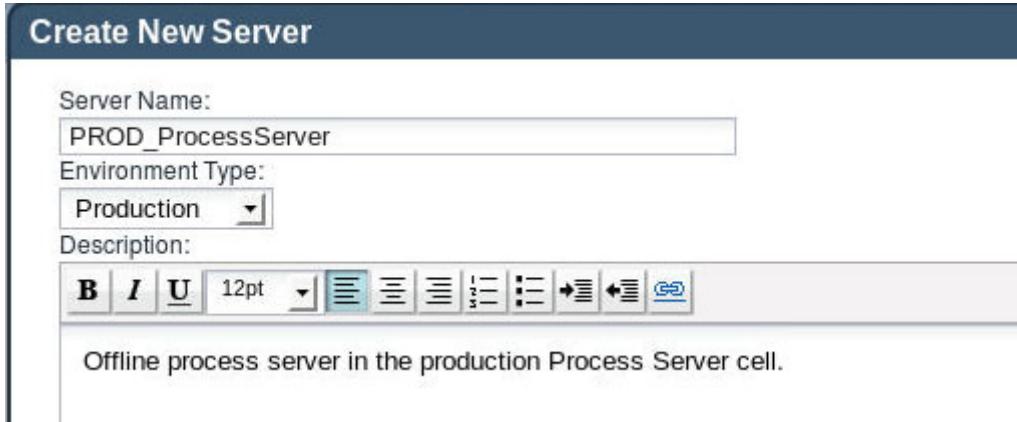


- \_\_\_ b. On the right, click **Add a New Offline Server**.



\_\_ c. In the Create New Server window, enter the following items:

- For **Server Name**, enter: PROD\_ProcessServer
- For **Environment Type**, select **Production**
- Feel free to enter a description for the environment

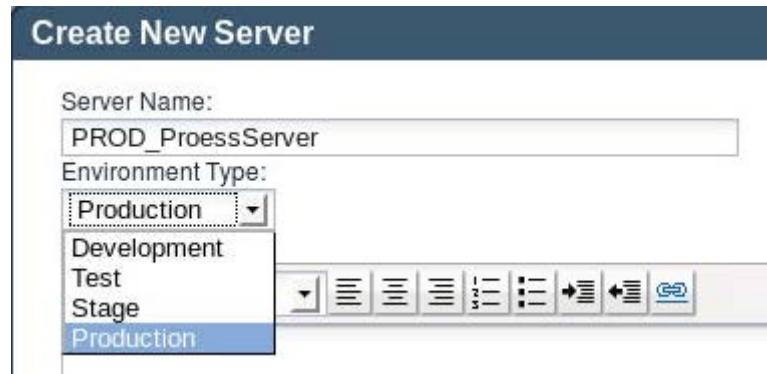


\_\_ d. Click **Create**.

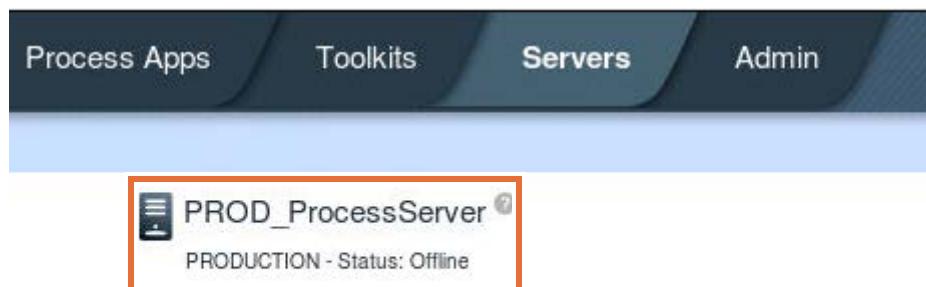


### Information

A typical IBM Business Process Manager topology includes four environment types that support the development, staging, and eventual installation of process applications. From the environment type option, you can select any of these types as listed in the following screen capture.



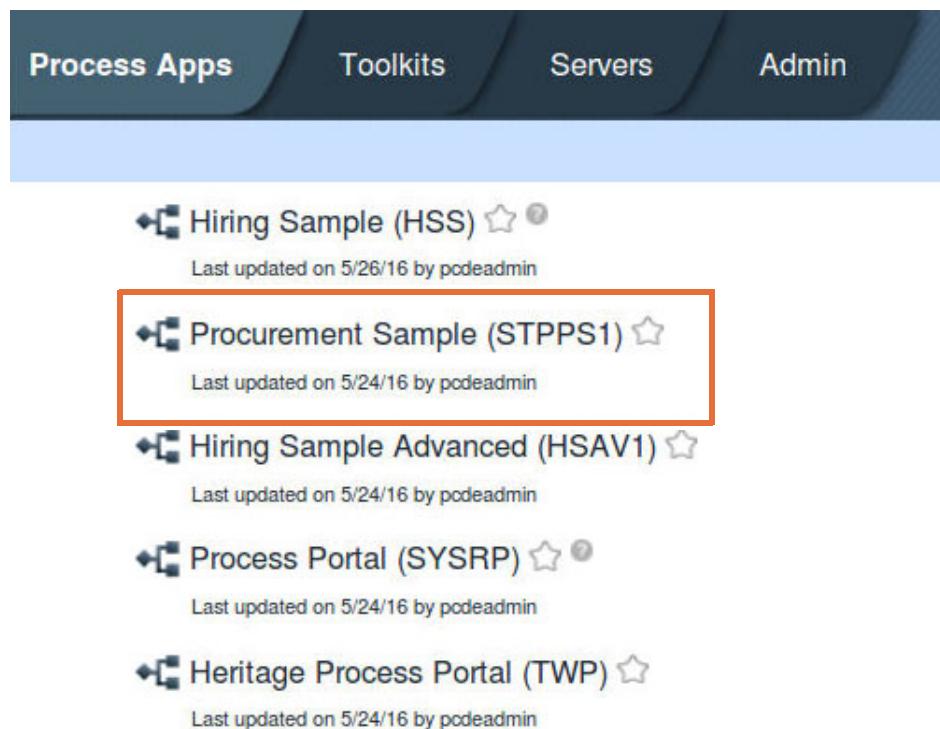
- \_\_\_ e. The server is now listed on the **Servers** tab. You can see the details and status of the server.



### **Part 3: Deploying a snapshot to an offline Process Server**

You can deploy process application snapshots to an offline server that is running but is not connected to Process Center, or online. In this situation, you create a deployment package for a particular snapshot on the Process Center server, transfer the package to the offline Process Server, and then run the package. The deployment package deploys all library items (including toolkit dependencies) from the selected snapshot to the offline Process Server.

- \_\_\_ 1. Create the installation package.
- \_\_\_ a. In the Process Center perspective, click the **Process Apps** tab. You see the list of Process Apps. Note the acronym name for Procurement Sample, which is STPPS1. You use the acronym name shortly when using the command line mode.



- \_\_ b. Click **Procurement Sample**. From here, you see the list of snapshots.
- \_\_ c. Click **Create New Snapshot** on the right.
- \_\_ d. For Snapshot Name, enter **Procurement Sample v4** and click **Create**. You now have multiple snapshots, which include the v4 snapshot.

**Procurement Sample (STPPS1)** ★ **Snapshots** History

**Current**

Last changed on 5/24/16 by pdeadmin  
Not Yet Deployed to Process Center Server

|                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------|
| <b>Procurement Sample v4 (PSV4) (New)</b>                                                                          |
| Created on 6/28/16 by pdeadmin<br>Not Yet Deployed to Process Center Server<br>Not Yet Installed to Process Server |

|                                                                       |
|-----------------------------------------------------------------------|
| <b>Procurement Sample v8570 (PSV8570) (New)</b>                       |
| Created on 5/24/16 by pdeadmin<br>Not Yet Installed to Process Server |

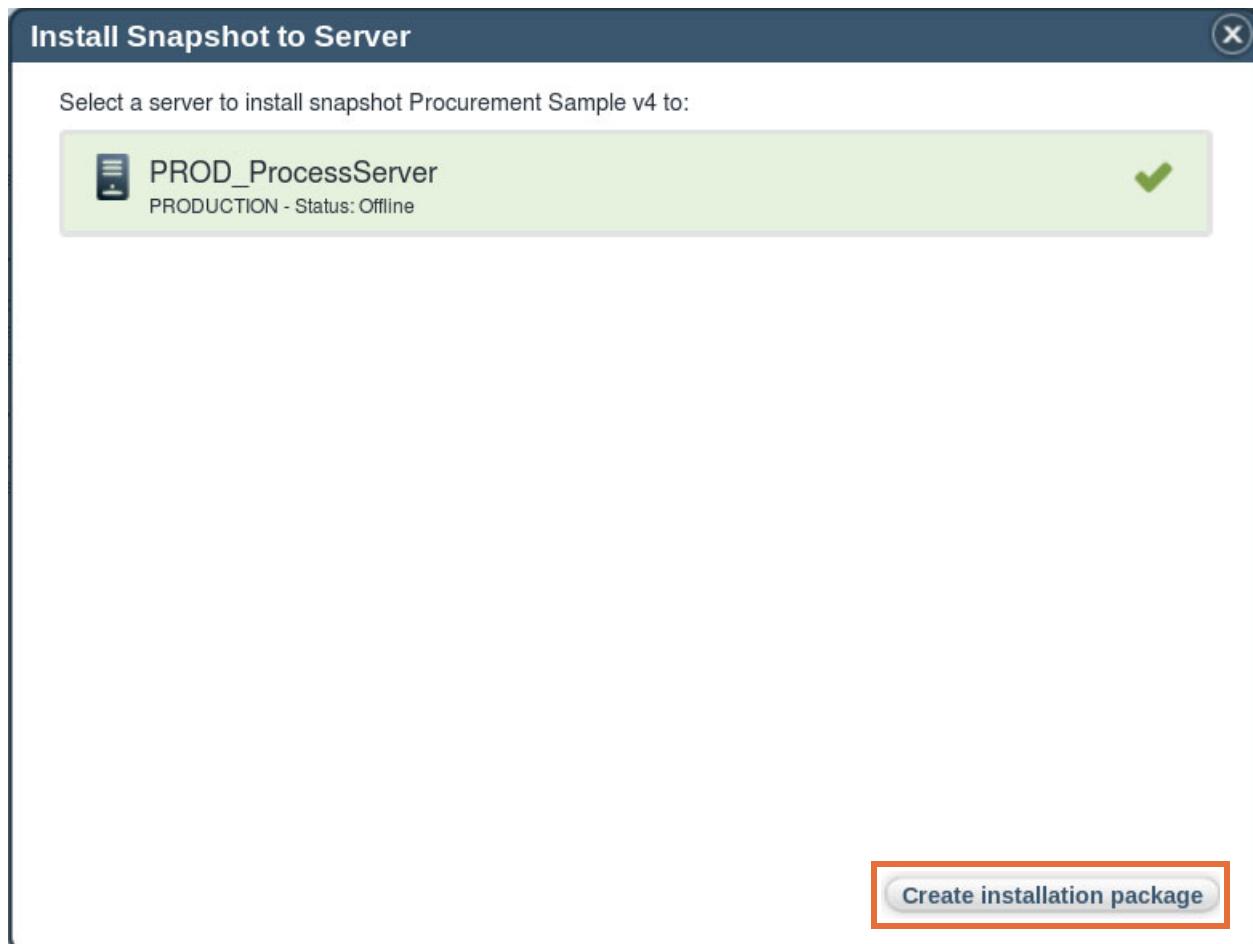
- \_\_ e. To the right of the Procurement Sample v4 (PSV4) snapshot, click **Install**.
- \_\_ f. Select the offline server, **PROD\_ProcessServer**.

**Install Snapshot to Server**

Select a server to install snapshot Procurement Sample v85 to:

|                                                           |
|-----------------------------------------------------------|
| <b>PROD_ProcessServer</b><br>PRODUCTION - Status: Offline |
|-----------------------------------------------------------|

- \_\_ g. The server is now selected as noted by a check mark to the right. Click **Create installation package**.



- \_\_ h. During this time, you see the message "Installation in progress".

Procurement Sample (STPPS1) ★ Snapshots History

Current

Last changed on 5/24/16 by podeadmin  
Not Yet Deployed to Process Center Server

Procurement Sample v4 (PSV4) (New)

Created on 6/28/16 by podeadmin  
Not Yet Deployed to Process Center Server

PROD\_ProcessServer - Installation in progress

Procurement Sample v8570 (PSV8570) (New)

Created on 5/24/16 by podeadmin  
Not Yet Installed to Process Server

- \_\_ i. When completed, the status message “Installation package Available: PROD\_ProcessServer” is displayed.

The screenshot shows the 'Process Apps' interface with the 'Servers' tab selected. Under the 'Procurement Sample (STPPS1)' section, the 'Current' tab is active. It displays information about the schema: 'Last changed on 7/28/16 by pcdeadmin' and 'Not Yet Deployed to Process Center Server'. Below this, there are two entries: 'Procurement Sample v4 (PSV4)' and 'Procurement Sample v3 (PSV3)'. The 'PSV4' entry is highlighted with a red box. It shows 'Created on 8/1/16 by pcdeadmin', 'Not Yet Deployed to Process Center Server', and 'Installation Package Available: PROD\_ProcessServer'. The 'PSV3' entry is labeled '(New)'.



### Information

You can create an offline package by using the Process Center Console or by using the `BPMCreateOffLinePackage` command. To create an offline package by using the command line, enter the following command:

```
$AdminTask BPMCreateOfflinePackage {-containerAcronym STPPS1
 -containerSnapshotAcronym PSV4 -containerTrackAcronym Main -serverName
 PROD_ProcessServer}
```

- \_\_ j. Click **Server Details** to the right of the server name to see information about the snapshots that are deployed to the server.

The screenshot shows the 'Server Details' view for 'PROD\_ProcessServer'. At the top, it says 'PROD\_ProcessServer'. Below that, it shows the 'Procurement Sample (STPPS1)' schema with a status message: 'Last updated on 7/28/16 by pcdeadmin' and 'Current Snapshots Deployed:'. Underneath, it lists 'Procurement Sample v4'.

- \_\_ k. Minimize the Process Center Console browser.

- \_\_\_ 2. You created the installation package for a process application. The next step is to extract the installation package.
- 



## Information

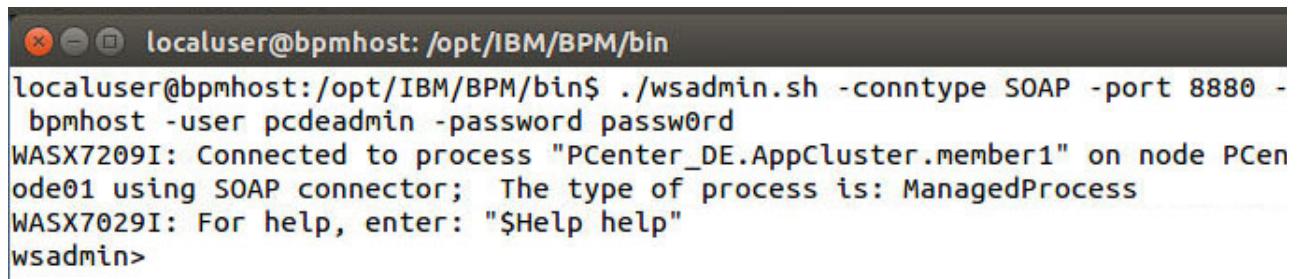
The Process Center Console can be used to create the offline installation package for a process application snapshot. You can also use the command line interface to create the installation package. Three common commands pertain to offline deployments, which include the following commands:

- **BPMCreateOfflinePackage**: Creates an installation package for a process application snapshot on the Process Center server. If you want to install a snapshot on an offline Process Server, use this command in connected mode from a Process Center server to create an installation package of a snapshot. This package is stored in the database.
  - **BPMExtractOfflinePackage**: Extracts the process application snapshot installation package from Process Center.
  - **BPMInstallOfflinePackage**: Installs a process application snapshot from a Process Center to an offline Process Server that is not currently connected to the Process Center. Use this command in connected mode from Process Server to install a process application snapshot installation package on Process Server. The installation package must already be created and extracted on the server. After this command is complete, the installed snapshot is active. You can also use the `installProcessAppPackage` command to complete this task.
- 

- \_\_\_ a. In a terminal window, change to the `/opt/IBM/BPM/bin` directory.
- \_\_\_ b. When using the command line interface to view, create, extract, and install packages, you must run the commands on the node that contains the application cluster member that handles Process Server applications. You must connect to the **PCenter\_DE.AppCluster.member1** cluster member by using the SOAP port you obtained earlier in the exercise. Do not run the commands from the deployment manager.

Enter the following command to enter wsadmin interactive mode and establish a SOAP connection to Process Center:

```
./wsadmin.sh -conntype SOAP -port 8880 -host bpmhost -user pcdeadmin
-password passw0rd
```



A terminal window titled "localuser@bpmhost: /opt/IBM/BPM/bin". The session shows the execution of the wsadmin command with the specified parameters. The output indicates a successful connection to the "PCenter\_DE.AppCluster.member1" cluster member on node PCnode01 using the SOAP connector.

```
localuser@bpmhost:/opt/IBM/BPM/bin$./wsadmin.sh -conntype SOAP -port 8880 -
bpmhost -user pcdeadmin -password passw0rd
WASX7209I: Connected to process "PCenter_DE.AppCluster.member1" on node PCen
ode01 using SOAP connector; The type of process is: ManagedProcess
WASX7029I: For help, enter: "$Help help"
wsadmin>
```

A message indicates that you are connected to the **PCenter\_DE.AppCluster.member1** cluster member.

- \_\_\_ c. You must obtain information about the snapshot before extracting the package. Enter the following command to get the needed information about the process application:

```
$AdminTask BPMShowProcessApplication {-containerAcronym STPPS1}
```

- \_\_\_ d. In the output, you can see the following information:

- **Name:** Procurement Sample
- **Acronym:** STPPS1
- **Track Name:** Main
- **Track Acronym:** Main
- **Snapshot Name:** Procurement Sample v4
- **Snapshot Acronym:** PSV4
- **State:** State[Undeployed]

Information is listed about the other snapshots.

- \_\_\_ e. Next, extract the package. When entering the command, you must provide a number of pieces of information about the snapshot that you just obtained. You also must indicate a file to which the package is extracted.

Enter the following command to extract the package to a compressed file:

```
$AdminTask BPMEExtractOfflinePackage {-containerAcronym STPPS1
-containnerSnapshotAcronym PSV4 -containerTrackAcronym Main -serverName
PROD_ProcessServer -outputFile /opt/labfiles/ProcessCenter/STPPS1.zip}
```

The output indicates `BPMEExtractOfflinePackage` passed.

- \_\_\_ f. Exit wsadmin by entering the following command:

```
quit
```

- \_\_\_ g. In the terminal window, change to the `/usr/labfiles/ProcessCenter` directory. Verify that the compressed file is listed in the directory. You do not install the process application now. The Process Server environment is not running. You install the application later in this exercise.

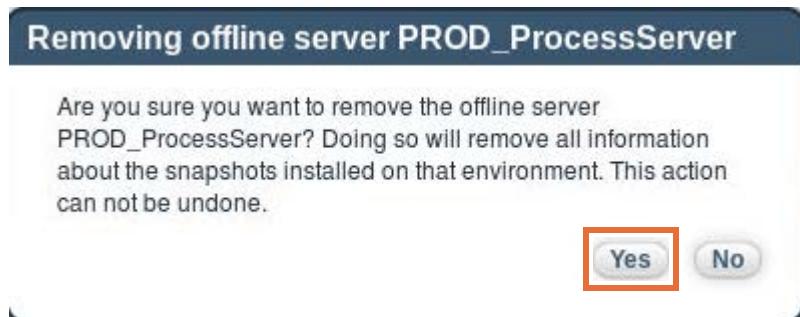
## **Part 4: Deleting the offline server**

If you have an offline server and you plan to change the configuration to an online server, you must first delete the offline server from the Process Center repository.

- \_\_\_ 1. Delete the offline server.

- \_\_\_ a. Maximize the Process Center Console browser.
- \_\_\_ b. Click the **Servers** tab.
- \_\_\_ c. Click **Remove Offline Server** to the right of the server name.

- \_\_ d. Click **Yes** when prompted if you want to remove the offline server.



- \_\_ e. The server is removed from the server listing.  
\_\_ f. Log out of the Process Center Console browser.

## 9.2. Working with an online process server

After you install and configure IBM Business Process Manager, you might want to customize your configuration. For example, you can change the Process Server from an offline server to a Process Center connected server, and vice versa. You can also customize settings, set up an extra security provider, set up user accounts, and change and encrypt passwords.

IBM Business Process Manager uses some configuration files that are read during the Process Server and Process Center start. These files contain XML content and are readable and editable in a text or XML editor. Changes can be made to these configuration files to move an offline Process Server to an online Process Server.

In IBM Business Process Manager V8.5.7, you use the administrative console to customize the Process Server settings that are used to connect to Process Center. By using the administrative console, you no longer need to manually edit the configuration files.

### **Part 1: Configuring the server as an online server**

- 1. Determine the port number for the Process Center server.
  - a. Open a terminal window and go to the `/opt/IBM/BPM/profiles/PCenterCustom/config/cells/PCenterCell/nodes/PCenterNode01` directory.
  - b. Open the `serverindex.xml` file by using an editor, such as gedit or vi.
  - c. Search for the endPoint name `BOOTSTRAP_ADDRESS` in the `specialEndpoints` section for the server. From here, you can determine the host for the server. The host is `bpmhost`.

```

<specialEndpoints xmi:id="NamedEndPoint_1378737071747">
 <endPointName="BOOTSTRAP_ADDRESS">
 <endPoint xmi:id="EndPoint_1378737071747" host="bpmhost" port="9810"/>
 </endPointName>
<specialEndpoints xmi:id="NamedEndPoint_1378737071748">
 <endPointName="SOAP_CONNECTOR_ADDRESS">
 <endPoint xmi:id="EndPoint_1378737071748" host="bpmhost" port="8880"/>
 </endPointName>
<specialEndpoints xmi:id="NamedEndPoint_1378737071749">
 <endPointName="ORB_LISTENER_ADDRESS">
 <endPoint xmi:id="EndPoint_1378737071749" host="bpmhost" port="9101"/>
 </endPointName>
</specialEndpoints>

```

- \_\_ d. Scroll down in the file and look for the endPoint name `WC_defaulthost_secure`. From here, you can determine the port number to be used for a connection to the Process Center server. The port is 9443.

```

<----->
<specialEndpoints xmi:id="NamedEndPoint_1378737071753"
endPointName="WC_adminhost">
 <endPoint xmi:id="EndPoint_1378737071753" host="*" port="9061"/>
</specialEndpoints>
<specialEndpoints xmi:id="NamedEndPoint_1378737071754"
endPointName="WC_defaulthost">
 <endPoint xmi:id="EndPoint_1378737071754" host="*" port="9080"/>
</specialEndpoints>
<specialEndpoints xmi:id="NamedEndPoint_1378737071755"
endPointName="DCS_UNICAST_ADDRESS">
 <endPoint xmi:id="EndPoint_1378737071755" host="*" port="9354"/>
</specialEndpoints>
<specialEndpoints xmi:id="NamedEndPoint_1378737071756"
endPointName="WC_adminhost_secure">
 <endPoint xmi:id="EndPoint_1378737071756" host="*" port="9044"/>
</specialEndpoints>
<specialEndpoints xmi:id="NamedEndPoint_1378737071757"
endPointName="WC_defaulthost_secure">
 <endPoint xmi:id="EndPoint_1378737071757" host="*" port="9443"/>
</specialEndpoints>
----->

```



### Information

For a secure connection, use the `WC_defaulthost_secure` port number.

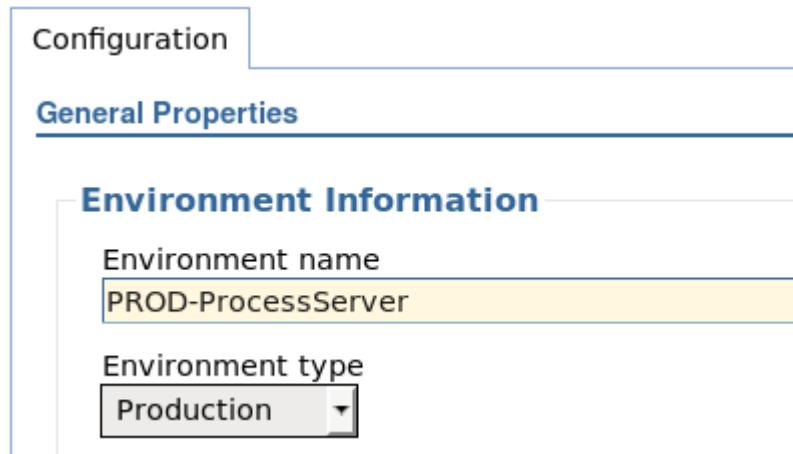
- 
- \_\_ e. Close the `serverindex.xml` file.
  - \_\_ 2. Start the Process Server cell environment.
    - \_\_ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
    - \_\_ b. Start the deployment manager by entering the following command:  
`./startManager.sh`  
 Wait for the message that indicates that the deployment manager is started.
  - \_\_ 3. Start the deployment manager administrative console.
    - \_\_ a. Open a web browser and go to the following URL:  
`http://bpminstallhost:9062/ibm/console`
- 



### Hint

You can also use the bookmark to the URL that you created in an earlier exercise.

- \_\_ b. In the login area, enter `bpmadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_ 4. Customize the Process Server settings by using the administrative console.
  - \_\_ a. Maximize the administrative console window.
  - \_\_ b. Click **Servers > Deployment Environments > PServer\_DE**.
  - \_\_ c. Under Additional Properties, click **Process Server Settings**.
  - \_\_ d. Under Environment Information, verify that the environment name is **PROD-Process Server** and the type is **Production**.



\_\_\_ e. Under Process Center Connection Information, make the following changes:

- Clear the **Use server offline** check box
- For **Protocol**, verify that **https://** is selected
- For **Host name or virtual host in a load-balanced environment**, enter: **bpmhost**
- For **Port**, enter: **9443**
- Leave **Context root prefix** empty
- For **User name**, enter: **pcdeadmin**
- For **Password** and **Confirm password**, enter: **passw0rd**

#### **Process Center Connection Information**

|                                                                                                           |
|-----------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Use server offline                                                               |
| <b>* Protocol</b><br><input type="text" value="https://"/>                                                |
| <b>* Host name or virtual host in a load-balanced environment</b><br><input type="text" value="bpmhost"/> |
| <b>Port</b><br><input type="text" value="9443"/>                                                          |
| <b>Context root prefix</b><br><input type="text"/>                                                        |
| <b>* User name</b><br><input type="text" value="pcdeadmin"/>                                              |
| <b>* Password</b><br><input type="password" value="*****"/>                                               |
| <b>* Confirm password</b><br><input type="password" value="*****"/>                                       |



#### **Information**

The port number that is entered is the WC\_defaulthost\_secure port for the server PCenter\_DE.AppCluster.member in the Process Center cell.

- 
- \_\_\_ f. Click **OK**.
  - \_\_\_ g. Save the changes.
  - \_\_\_ 5. Examine the authentication alias.
  - \_\_\_ a. In the breadcrumb trail, click **PServer\_DE**.

- \_\_\_ b. Under Related Items, click **Authentication Aliases**. You can see the ProcessCenterUser is updated with the Process Center alias that was created.

#### Authentication Alias

| Role                    | Alias                                           |
|-------------------------|-------------------------------------------------|
| BPCUser                 | DeAdminAlias                                    |
| BPMAdminJobUser         | DeAdminAlias                                    |
| BPMAuthor               | DeAdminAlias                                    |
| BPMUser                 | DeAdminAlias                                    |
| BPMWebserviceUser       | DeAdminAlias                                    |
| DeAdmin                 | DeAdminAlias                                    |
| EmbeddedECMTechicalUser | DeAdminAlias                                    |
| EventManagerUser        | DeAdminAlias                                    |
| MMAdmin                 | DeAdminAlias                                    |
| PerformanceDWUser       | DeAdminAlias                                    |
| ProcessCenterUser       | ProcessCenterUserAuthenticationAlias_PServer_DE |
| ProcessServerUser       | DeAdminAlias                                    |

- \_\_\_ c. Click **Security > Global security**.

- \_\_\_ d. Under Authentication, click **Java Authentication and Authorization > J2C authentication data**. You can see the authentication alias details that were created.

| Select                                      | Alias                                                           | User ID   | Description                                                                                                                                                                       |
|---------------------------------------------|-----------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| You can administer the following resources: |                                                                 |           |                                                                                                                                                                                   |
| <input type="checkbox"/>                    | <a href="#">BPM_DB_ALIAS</a>                                    | db2inst1  |                                                                                                                                                                                   |
| <input type="checkbox"/>                    | <a href="#">CellAdminAlias</a>                                  | bpmadmin  | BPM Cell Administrator Alias                                                                                                                                                      |
| <input type="checkbox"/>                    | <a href="#">DeAdminAlias</a>                                    | psdeadmin |                                                                                                                                                                                   |
| <input type="checkbox"/>                    | <a href="#">ProcessCenterUserAuthenticationAlias_PServer_DE</a> | pcdeadmin | This alias ONLY for ProcessCenterUser role. Don't assign it to other roles. Created by Online/Offlin ProcessServer settings. The creation time is: Mon Dec 15 20:53:54 EST 2014 . |

- \_\_\_ e. Keep the administrative console window.

## **Part 2: Configuring Secure Sockets Layer (SSL) communication in the network deployment environments**

In IBM Business Process Manager V8.5.5, HTTPS is set as the default for communication between the Process Center and the Process Server in both typical and custom installations. Typical installation uses HTTPS in both directions by default. Custom installation uses HTTPS by default for the connection from Process Center to Process Server. The connection between Process Server and Process Center uses the **bpm.de.psProcessCenterTransportProtocol** setting in the BPMConfig properties file, which is set to HTTPS in the sample properties file.

You can configure your environment to use insecure HTTP. However, it is suggested that you use the default HTTPS for communication the Process Center and the Process Server. To make the communication between the Process Center and the Process Server work with HTTPS in a network deployment environment, you must configure SSL.

In this part of the exercise, you configure SSL communication in both the Process Center and Process Server network deployment environments.

- \_\_\_ 1. Configure SSL in the Process Server network deployment environment. To configure SSL, you must import the Process Center root SSL certificate into Process Server.
  - \_\_\_ a. Click **Security > SSL certificate and key management**.
  - \_\_\_ b. Under Related Items, click **Key stores and certificates**.
  - \_\_\_ c. Click **Cell DefaultTrustStore**. This file includes all of the signer certificates within the cell.

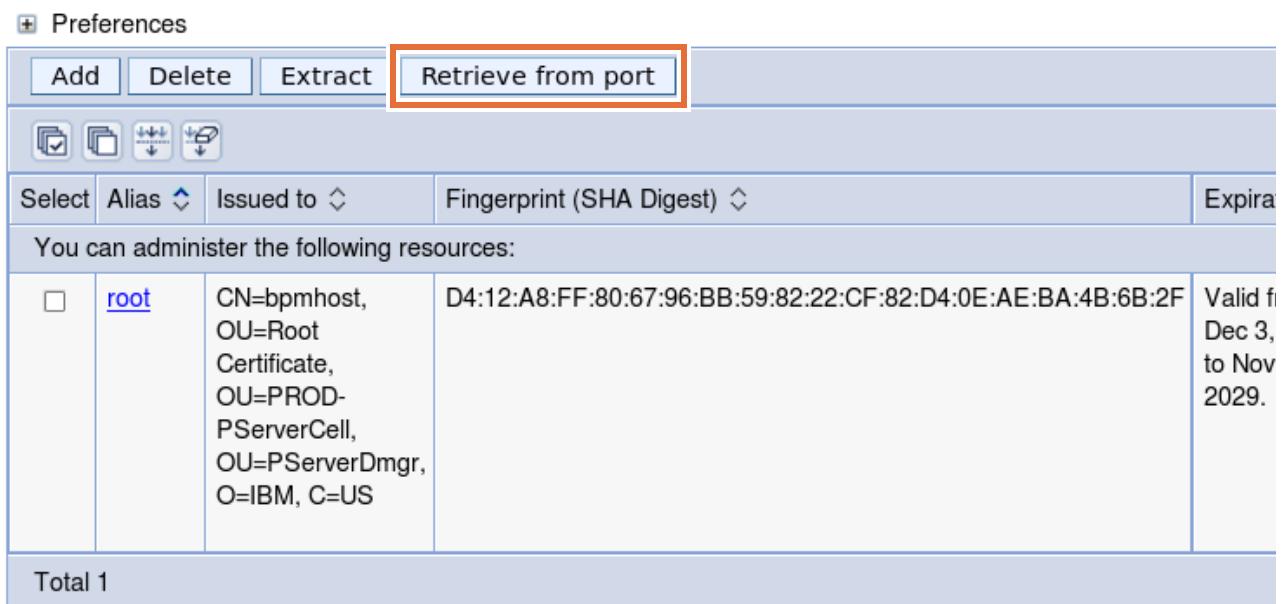
- \_\_\_ d. Under Additional Properties, click **Signer certificates**. From here, you can manage signer certificates in keystores. Signer certificates are used by Java Secure Socket Extensions (JSSE) to validate certificates that the remote side of the connection sends during a Secure Sockets Layer (SSL) handshake. If a signer does not exist in the truststore that can validate the certificate that is sent, the handshake fails and generates an unknown certificate error.

Notice there is a root signer certificate in the cell default truststore. Specifically, this certificate is the cell root signer certificate (not the personal certificate), and is the signer for all of node certificates in the cell. Notice that it has a 15-year life span.

- \_\_\_ e. From the Signer certificates pane, click **Retrieve from port**. From here, you retrieve a signer certificate from a remote SSL port. The system connects to the specified remote SSL host and port and receives the signer during the handshake by using an SSL configuration.

[SSL certificate and key management](#) > [Key stores and certificates](#) > [CellDefaultTrustStore](#) > [Signer certificates](#)

Manages signer certificates in key stores.



The screenshot shows a user interface for managing signer certificates. At the top, there are buttons for Add, Delete, Extract, and Retrieve from port. The 'Retrieve from port' button is highlighted with a red box. Below these buttons are several icons for file operations like copy, move, and delete. A search bar allows filtering by Select, Alias, Issued to, Fingerprint (SHA Digest), and Expiration date. A message below the search bar says 'You can administer the following resources:'. A table lists one resource: a certificate named 'root' with the alias 'root'. The details show the certificate's subject (CN=bpmhost, OU=Root Certificate, OU=PROD-PServerCell, OU=PServerDmgr, O=IBM, C=US) and its SHA-256 fingerprint (D4:12:A8:FF:80:67:96:BB:59:82:22:CF:82:D4:0E:AE:BA:4B:6B:2F). The certificate is valid from December 3, 2018, to November 20, 2029. At the bottom, a summary shows 'Total 1' resource.

| Select                   | Alias                | Issued to                                                                                            | Fingerprint (SHA Digest)                                    | Expiration                               |
|--------------------------|----------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------|
| <input type="checkbox"/> | <a href="#">root</a> | CN=bpmhost,<br>OU=Root<br>Certificate,<br>OU=PROD-<br>PServerCell,<br>OU=PServerDmgr,<br>O=IBM, C=US | D4:12:A8:FF:80:67:96:BB:59:82:22:CF:82:D4:0E:AE:BA:4B:6B:2F | Valid from Dec 3, 2018, to Nov 20, 2029. |

Total 1

- \_\_\_ f. To retrieve a signer certificate from a specific port, you enter the host and port, select an SSL configuration from the list, and enter an alias to identify the signer certificate. Under General Properties, make the following changes:

- For **Host**, enter: bpmhost
- For **Port**, enter: 9043
- For **Alias**, enter: ProcessCenterSSL

**General Properties**

---

|                                                                                                                                                                                         |                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <p>* <b>Host</b><br/>bpmhost</p> <p>* <b>Port</b><br/>9043</p> <p>SSL configuration for outbound connection<br/>CellDefaultSSLSettings ▾</p> <p>* <b>Alias</b><br/>ProcessCenterSSL</p> | <p>Retrieve signer information</p> |
| <input type="button" value="Apply"/> <input type="button" value="OK"/> <input type="button" value="Reset"/> <input type="button" value="Cancel"/>                                       |                                    |



### Information

For host, you enter the host name to which you connect when attempting to retrieve the signer certificate from the SSL port.

For port, you enter the SSL port to which you connect when attempting to retrieve the signer certificate. In this case, it is the secure port number that is associated with the deployment manager.

- \_\_ g. Click **Retrieve signer information**. Information about the signer certificate is displayed, such as the serial number of the certificate, whom the certificate is issued to and by, the certificate fingerprint, and the expiration information for the certificate.

### Retrieved signer information

#### Serial number

20019933859005

#### Issued to

CN=bpmhost, OU=Root Certificate,  
OU=PCenterCell, OU=PCenterCellManager,  
O=IBM, C=US

#### Issued by

CN=bpmhost, OU=Root Certificate,  
OU=PCenterCell, OU=PCenterCellManager,  
O=IBM, C=US

#### Fingerprint (SHA digest)

A5:60:1F:FC:07:D9:B2:EB:AD:72:13:B7:21:F2:1F:15:73:39:74:C8

#### Validity period

Nov 6, 2029

- \_\_ h. Click **Apply**. The certificate is now stored in the keystore.  
\_\_ i. Save the changes.

- \_\_\_ j. On the Signer certificates pane, you can see the new certificate.

[SSL certificate and key management](#) > [Key stores and certificates](#) > [CellDefaultTrustStore](#) > [Signer certificates](#)

Manages signer certificates in key stores.

Preferences

| Add                                         | Delete                            | Extract                                                                             | Retrieve from port                                    |
|---------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------|
|                                             |                                   |                                                                                     |                                                       |
| Select                                      | Alias ▾                           | Issued to ▾                                                                         | Fingerprint (SHA Digest) ▾                            |
| You can administer the following resources: |                                   |                                                                                     |                                                       |
| <input type="checkbox"/>                    | <a href="#">processcentersssl</a> | CN=bpmhost, OU=Root Certificate, OU=PCenterCell, OU=PCenterCellManager, O=IBM, C=US | A5:60:1F:FC:07:D9:B2:EB:AD:72:13:B7:21:F2:1F:15:73:3  |
| <input type="checkbox"/>                    | <a href="#">root</a>              | CN=bpmhost, OU=Root Certificate, OU=PROD-PServerCell, OU=PServerDmgr, O=IBM, C=US   | D4:12:A8:FF:80:67:96:BB:59:82:22:CF:82:D4:0E:AE:BA:4E |
| Total 2                                     |                                   |                                                                                     |                                                       |

- \_\_\_ k. Log out of the administrative console.
- \_\_\_ 2. Configure SSL in the Process Center network deployment environment. To configure SSL, you must import the Process Server root SSL certificate into Process Center.
- \_\_\_ a. Open a web browser and go to the following URL:  
`http://bpmhost:9060/ibm/console`
- \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ c. Click **Security > SSL certificate and key management > Key stores and certificates > Cell DefaultTrustStore**.
- \_\_\_ d. Under Additional Properties, click **Signer certificates**.
- \_\_\_ e. From the Signer certificates pane, click **Retrieve from port**.

\_\_ f. Under General Properties, make the following changes:

- For **Host**, enter: bpmhost
- For **Port**, enter: 9045
- For **Alias**, enter: ProcessServerSSL

**General Properties**

---

\* Host  
bpmhost

\* Port  
9045

SSL configuration for outbound connection  
CellDefaultSSLSettings ▾

\* Alias  
ProcessServerSSL

**Retrieve signer information**

**Apply** **OK** **Reset** **Cancel**

\_\_ g. Click **Retrieve signer information** and examine the details.

### Retrieved signer information

#### Serial number

1930158826711

#### Issued to

CN=bpmhost, OU=Root Certificate, OU=PROD-  
PServerCell, OU=PServerDmgr, O=IBM, C=US

#### Issued by

CN=bpmhost, OU=Root Certificate, OU=PROD-  
PServerCell, OU=PServerDmgr, O=IBM, C=US

#### Fingerprint (SHA digest)

D4:12:A8:FF:80:67:96:BB:59:82:22:CF:82:D4:0E:AE:BA:4B:6B:2F

#### Validity period

Nov 29, 2029

\_\_ h. Click **Apply**.

\_\_ i. Save the changes.

- \_\_ j. On the Signer certificates pane, you can see the new certificate.

[SSL certificate and key management](#) > [Key stores and certificates](#) > [CellDefaultTrustStore](#) > [Signer certificates](#)

Manages signer certificates in key stores.

Preferences

| Add                                         | Delete                           | Extract                                                                             | Retrieve from port                                          |
|---------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|
|                                             |                                  |                                                                                     |                                                             |
| Select                                      | Alias                            | Issued to                                                                           | Fingerprint (SHA Digest)                                    |
| You can administer the following resources: |                                  |                                                                                     |                                                             |
| <input type="checkbox"/>                    | <a href="#">processserverssl</a> | CN=bpmhost, OU=Root Certificate, OU=PROD-PServerCell, OU=PServerDmgr, O=IBM, C=US   | D4:12:A8:FF:80:67:96:BB:59:82:22:CF:82:D4:0E:AE:BA:4B:6B:2F |
| <input type="checkbox"/>                    | <a href="#">root</a>             | CN=bpmhost, OU=Root Certificate, OU=PCenterCell, OU=PCenterCellManager, O=IBM, C=US | A5:60:1F:FC:07:D9:B2:EB:AD:72:13:B7:21:F2:1F:15:73:39:74:C8 |
| Total 2                                     |                                  |                                                                                     |                                                             |

- \_\_ 3. Stop the Process Center environment.
- \_\_ a. Click **Servers > Deployment Environments**.
  - \_\_ b. Select the **PCenter\_DE** check box and click **Stop**.
  - \_\_ c. Click **System administration > Node agents**.
  - \_\_ d. Select the **nodeagent** check box and click **Stop**.
  - \_\_ e. Log out of the administrative console and close the browser window.
- \_\_ 4. Make sure that the Process Server connects to the Process Center by using SSL for online deployment. For this step, you must set the `deploySnapshotUsingHttps` property to true. You must enter the following commands in both the Process Center and the Process Server environments.
- \_\_ a. In the terminal window, go to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
  - \_\_ b. Stop the deployment manager. Enter the following command to stop the deployment manager:  
`./stopManager.sh`  
Wait for the message that indicates that the deployment manager is stopped.
  - \_\_ c. Enter wsadmin in editor mode in Jython by using the following command:  
`./wsadmin.sh -conntype NONE -lang jython`

- \_\_\_ d. Get the configuration details by using the following command:

```
ps=AdminConfig.getid("/Cell:/ServerCluster:AppCluster/BPMClusterConfigExtension:/BPMProcessServer:/BPMServerSecurity:/")
```

- \_\_\_ e. Examine the variable by using the following command:

```
print AdminConfig.show(ps)
```

```
wsadmin>ps=AdminConfig.getid("/Cell:/ServerCluster:AppCluster/BPMClusterConfigExtension:/BPMProcessServer:/BPMServerSecurity:/")
wsadmin>print AdminConfig.show(ps)
[deploySnapshotUsingHttps false]
[externalUserQueryLimit 100]
[ldapOptions []]
[securityGroups (cells/PROD-PServerCell/clusters/AppCluster|cluster-bpm.xml#serverSecurityGroups_1469815936154)]
[securityUsers (cells/PROD-PServerCell/clusters/AppCluster|cluster-bpm.xml#serverSecurityUsers_1469815936154)]
[wildcardProcessingOptimized false]
wsadmin>
```

You can see that the `deploySnapshotUsingHttps` property is set to the default value of `false`. You must set this property to `true` to use SSL for online deployment.

- \_\_\_ f. Modify the setting by entering the following command:

```
AdminConfig.modify(ps, [['deploySnapshotUsingHttps', 'true']])
```

- \_\_\_ g. Verify that the change is made by using the following command:

```
print AdminConfig.show(ps)
```

```
wsadmin>AdminConfig.modify(ps, [['deploySnapshotUsingHttps', 'true']])
''
wsadmin>print AdminConfig.show(ps)
[deploySnapshotUsingHttps true]
[externalUserQueryLimit 100]
[ldapOptions []]
[securityGroups (cells/PROD-PServerCell/clusters/AppCluster|cluster-bpm.xml#serverSecurityGroups_1469815936154)]
[securityUsers (cells/PROD-PServerCell/clusters/AppCluster|cluster-bpm.xml#serverSecurityUsers_1469815936154)]
[wildcardProcessingOptimized false]
wsadmin>
```

You can see that the `deploySnapshotUsingHttps` property is set to the value of `true`.

- \_\_\_ h. Save the changes by entering the following command:

```
AdminConfig.save()
```

- \_\_\_ i. Exit wsadmin by entering the following command:

```
exit
```

- \_\_\_ 5. Repeat the previous steps for the Process Center environment.
- \_\_\_ a. In the terminal window, go to the /opt/IBM/BPM/profiles/PCenterDmgr/bin directory.
- \_\_\_ b. Stop the deployment manager. Enter the following command to stop the deployment manager:

```
./stopManager.sh
```

Wait for the message that indicates that the deployment manager is stopped.

- \_\_\_ c. Enter wsadmin in editor mode in Jython by using the following command:
- \_\_\_ d. Get the configuration details by using the following command:

```
ps=AdminConfig.getid("/Cell:/ServerCluster:PCenter_DE.AppCluster/BPMClusterConfigExtension:/BPMPProcessCenter:/BPMSServerSecurity:/")
```

- \_\_\_ e. Examine the variable by using the following command:

```
print AdminConfig.show(ps)
```

```
wsadmin>ps=AdminConfig.getid("/Cell:/ServerCluster:PCenter_DE.AppCluster/BPMClusterConfigExtension:/BPMPProcessCenter:/BPMSServerSecurity:/")
wsadmin>print AdminConfig.show(ps)
[deploySnapshotUsingHttps false]
[ldapOptions []]
[securityGroups (cells/PCenterCell/clusters/PCenter_DE.AppCluster|cluster-bl#BPMSServerSecurityGroups_1469731265849)]
[securityUsers (cells/PCenterCell/clusters/PCenter_DE.AppCluster|cluster-bp#BPMSServerSecurityUsers_1469731265849)]
[wildcardProcessingOptimized false]
wsadmin>
```

You can see that the `deploySnapshotUsingHttps` property is set to the default value of `false`. You must set this property to `true` to use SSL for online deployment.

- \_\_\_ f. Modify the setting by entering the following command:

```
AdminConfig.modify(ps, [['deploySnapshotUsingHttps' , 'true']])
```

- \_\_\_ g. Verify that the change is made by using the following command:

```
print AdminConfig.show(ps)

wsadmin>AdminConfig.modify(ps, [['deploySnapshotUsingHttps', 'true']])
''

wsadmin>print AdminConfig.show(ps)
[deploySnapshotUsingHttps true]
[LDAPUserQueryCacheTime 100]
[ldapOptions []]
[securityGroups (cells/PCenterCell/clusters/PCenter_DE.AppCluster|cluster-b
l#BPMSServerSecurityGroups_1469731265849)]
[securityUsers (cells/PCenterCell/clusters/PCenter_DE.AppCluster|cluster-bp
#BPMSServerSecurityUsers_1469731265849)]
[wildcardProcessingOptimized false]
wsadmin>
```

You can see that the `deploySnapshotUsingHttps` property is set to the value of `true`.

- \_\_\_ h. Save the changes by entering the following command:

```
AdminConfig.save()
```

- \_\_\_ i. Exit wsadmin by entering the following command:

```
exit
```

### **Part 3: Verifying the configuration for an online server**

- \_\_\_ 1. Start the Process Center environment.

- \_\_\_ a. In the terminal window, start the deployment manager. Enter the following command to start the deployment manager:

```
./startManager.sh
```

Wait for the message that indicates that the deployment manager is started.

- \_\_\_ b. In the terminal window, go to the `/opt/IBM/BPM/profiles/PCenterCustom/bin` directory.

- \_\_\_ c. Start the node agent by entering the following command:

```
./startNode.sh
```

Wait for the message that indicates that the node agent is started.

- \_\_\_ d. Start the deployment manager administrative console. Open a web browser and go to the following URL:

```
http://bpmhost:9060/ibm/console
```

- \_\_\_ e. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

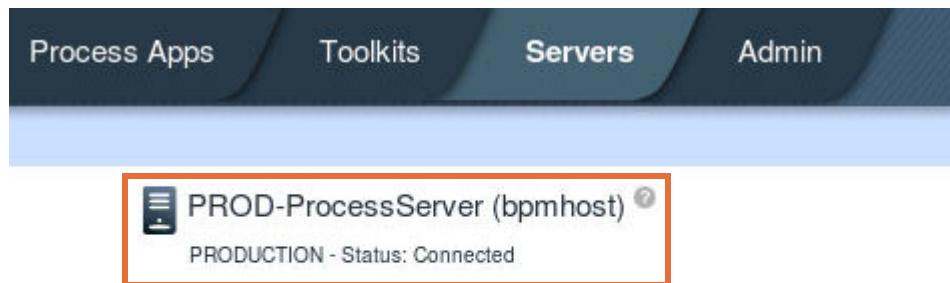
- \_\_\_ f. Click **Servers > Deployment Environments**.

- \_\_\_ g. Select the **PCenter\_DE** check box and click **Start**.

- \_\_\_ h. Log out of the administrative console. Minimize the browser window.

- \_\_\_ 2. Start the Process Server environment.
    - \_\_\_ a. In the terminal window, start the deployment manager. Go to the /opt/IBM/BPM/profiles/PServerDmgr/bin directory.
    - \_\_\_ b. Enter the following command to start the deployment manager:  
`./startManager.sh`  
Wait for the message that indicates that the deployment manager is started.
  - \_\_\_ c. In the terminal window, go to the /opt/IBM/BPM/bin directory.
  - \_\_\_ d. Start the deployment environment by entering the following command:  
`./BPMConfig.sh -start /opt/labfiles/scripts/Advanced-PS.properties`
  - \_\_\_ e. If prompted to add the signer to the truststore now, click **y**.
  - \_\_\_ f. Go to the next step to tail the log file for the AppClusterMember1 server.
- \_\_\_ 3. Verify the configuration.
    - \_\_\_ a. Open another terminal window and go to the /opt/IBM/BPM/profiles/PServerNode01/logs/AppClusterMember1 directory.
    - \_\_\_ b. Tail the SystemOut.log file by entering the following command:  
`tail -f SystemOut.log`  
It is a good idea to observe the log file while you start the cluster to verify the configuration.
    - \_\_\_ c. Observe the output in the terminal window from the SystemOut.log file. You can see a number of messages about binding to Process Center.
- \_\_\_ 4. Start the Process Center Console and examine the online Process Server.
    - \_\_\_ a. Open a web browser and go to the Process Center Console at the following URL:  
`http://bpminstance:9080/ProcessCenter`
    - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

- \_\_\_ c. In the Process Center perspective, click the **Servers** tab. The server is now connected to the Process Center repository as an online server.



## **Part 4: Installing an application to the online server**

In this part of the exercise, you install a process application to the online Process Server.

- \_\_\_ 1. Install a process application.
  - \_\_\_ a. Click the **Process Apps** tab.
  - \_\_\_ b. Click **Hiring Sample Advanced (HSAV1)**. From here, you see the list of snapshots.
  - \_\_\_ c. To the right of the Hiring Sample Advanced v8570 snapshot, click **Install**.

iced Hiring Sample v8570 (AHSV857) (New)  
on 7/28/16 by pcodeadmin  
Deployed to Process Center Server  
Installed to Process Server

- \_\_\_ d. Select the online server, **PROD-ProcessServer**.

Select a server to install snapshot Hiring Sample Advanced v8550 to:

PROD-ProcessServer (bpmhost)  
PRODUCTION - Status: Connected

- \_\_ e. The server is now selected as noted by the check mark to the right. Click **Install**.

Select a server to install snapshot Hiring Sample Advanced v8550 to:

|                              |                                |  |
|------------------------------|--------------------------------|--|
| PROD-ProcessServer (bpmhost) | PRODUCTION - Status: Connected |  |
|------------------------------|--------------------------------|--|

**Install**

- \_\_ f. During this time, you see the message "Installation in progress."

Current

Last changed on 7/28/16 by pcdeadmin

|                                               |                          |
|-----------------------------------------------|--------------------------|
| Advanced Hiring Sample v8570 (AHSV857)  (New) | Installation in progress |
|-----------------------------------------------|--------------------------|

Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server

PROD-ProcessServer(bpmhost) · Installation in progress

[Installation details](#)



### Hint

It is a good idea to tail the log file for the server in the Process Center environment. Go to the /opt/IBM/BPM/profiles/PCenterCustom/logs/PCenter\_DE.AppCluster.member1 directory. Tail the SystemOut.log file by entering the following command:

```
tail -f SystemOut.log
```

Observe the output in the terminal window from the SystemOut.log file.

- \_\_\_ g. When completed, the status indicates that the process application is installed in the PROD-ProcessServer.

The screenshot shows the Process Center interface with the following details:

- Current**: Last changed on 7/28/16 by pcdeadmin
- Advanced Hiring Sample v8570 (AHSV857)**: (New)
  - Created on 7/28/16 by pcdeadmin
  - Not Yet Deployed to Process Center Server
  - Currently Installed:
    - PROD-ProcessServer(bpmhost) - 0 instances**
    - [Installation details](#)

- \_\_\_ h. Click **Installation details** to see the details on installing the snapshot.

The screenshot shows the 'Installation details' section for the 'Advanced Hiring Sample v8570 (AHSV857)' application, expanded to show the following steps:

- Starting the installation of process application Hiring Sample Advanced(HSAV1), snapshot Advanced Hiring Sample v8570(AHSV857) to server PROD-ProcessServer as user pcdeadmin.
- Running the governance process Default Installation Requested.
- Assembling artifacts and sending them to the server PROD-ProcessServer.
  - Server PROD-ProcessServer is at version 8.5.7.0.
  - Communicating with server PROD-ProcessServer at address https://bpmhost:9445/teamworks as user psdeadmin.
    - The reason for the communication is to retrieve the deployment address.
  - Communicating with server PROD-ProcessServer at address https://bpmhost:9445/ProcessServerInternal/onlinedeployment?deploy=true as user psdeadmin.
    - The reason for the communication is to send the deployment package and initiate deployment on the process server.
- The process server received a request to install process application Hiring Sample Advanced(HSAV1), snapshot Advanced Hiring Sample v8570(AHSV857) from the Process Center.
- Starting the installation of process application Hiring Sample Advanced(HSAV1), snapshot Advanced Hiring Sample v8570(AHSV857) as user psdeadmin.
- Installing the library items and assets for the process application and referenced toolkits.
  - Installing process application Hiring Sample Advanced(HSAV1), snapshot Advanced Hiring Sample v8570(AHSV857).
- Running installation services.
  - Running installation service for toolkit Coaches(SYSC), snapshot 8.5.7.0(8.5.7.0).
  - Running installation service for process application Hiring Sample Advanced(HSAV1), snapshot Advanced Hiring Sample v8570(AHSV857).
- Migrating global data.
- Migrating process instances.
- Sending tracking definitions to the Performance Data Warehouse server.

- \_\_ i. Click **Server Details** to the right of the server name to see information about the snapshots that are deployed to the server. The Hiring Sample is listed.

**PROD-ProcessServer (bpmhost)**

- Responsive Coaches (SYSRC)**  
Last updated on 7/28/16 by pcdeadmin  
Current Snapshots Deployed:  
8.5.7.0 - 0 instances
- Process Portal (SYSRP)**  
Last updated on 7/28/16 by pcdeadmin  
Current Snapshots Deployed:  
8.5.7.0 - 0 instances
- Hiring Sample Advanced (HSAV1)** (highlighted)  
Last updated on 7/28/16 by pcdeadmin  
Current Snapshots Deployed:  
Advanced Hiring Sample v8570 - 0 instances
- Coaches (SYSC)**  
Last updated on 7/28/16 by pcdeadmin  
Current Snapshots Deployed:  
8.5.7.0 - 0 instances

- \_\_ j. Log out of the Process Center Console.
- \_\_ 2. Verify the installation.
- \_\_ a. Start the deployment manager administrative console in the Process Server cell. In the browser by entering the following URL:  
`http://bpmhost:9062/ibm/console`
- \_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_ c. Click **Applications > Application Types > WebSphere enterprise applications**.

- \_\_\_ d. Verify that the process application is listed. The Hiring Sample Advanced process application is also started during the deployment. If the application status indicates a stopped status, click the application status refresh icon.

| Name                                                   | Application Status |
|--------------------------------------------------------|--------------------|
| an administer the following resources:                 |                    |
| <a href="#">AccountOpeningUIEAR</a>                    |                    |
| <a href="#">AppScheduler</a>                           |                    |
| <a href="#">BPCEexplorer_SupCluster</a>                |                    |
| <a href="#">BPEContainer_AppCluster</a>                |                    |
| <a href="#">BPMAdministrationWidgets_AppCluster</a>    |                    |
| <a href="#">BSpaceEAR_AppCluster</a>                   |                    |
| <a href="#">BSpaceForms_AppCluster</a>                 |                    |
| <a href="#">BSpaceHelp_AppCluster</a>                  |                    |
| <a href="#">Business.Rules.Manager_AppCluster</a>      |                    |
| <a href="#">BusinessRules_AppCluster</a>               |                    |
| <a href="#">CreditScoreServiceApp</a>                  |                    |
| <a href="#">FoundationModuleApp</a>                    |                    |
| <a href="#">FoundationServicesApp</a>                  |                    |
| <a href="#">HSAV1-AHSV857-WPS_ProjectApp</a>           |                    |
| <a href="#">HTM_PredefinedTaskMsg_V8000_AppCluster</a> |                    |
| <a href="#">HTM_PredefinedTasks_V8000_AppCluster</a>   |                    |
| <a href="#">HelloWorldWithBOApp</a>                    |                    |



### Hint

If you do not see the application, log out of the administrative console and log back in, which might help the console to refresh. Also, examine the terminal window where you ran the tail of the `SystemOut.log` file to verify that the process application is deployed.

- 
- \_\_\_ 3. Examine the port numbers for AppClusterMember1.
- \_\_\_ a. Click **Servers > Server Types > WebSphere application servers > AppClusterMember1**.
- \_\_\_ b. Under Communications, click the box next to **Ports** to expand and get a list of ports. The **SOAP\_CONNECTOR\_ADDRESS** for the server is **8884**.

- \_\_\_ c. Log out of the administrative console and minimize the browser.
- \_\_\_ 4. Deploy the offline package. Earlier in the exercise, you created an offline package for an offline server. To deploy an offline package, you must manually install the package to Process Server.
  - \_\_\_ a. In a terminal window, change to the /opt/IBM/BPM/bin directory.
  - \_\_\_ b. In a network deployment environment, you must run this command on the node that contains the application cluster member that handles Process Server applications. Do not run this command from the deployment manager profile.

Enter the following command to enter wsadmin interactive mode and establish a SOAP connection to Process Server:

```
./wsadmin.sh -conntype SOAP -port 8884 -host bpmhost -user psdeadmin
-password passw0rd
```

```
localuser@bpmhost:/opt/IBM/BPM/bin$./wsadmin.sh -conntype SOAP -port 8884 -
bpmhost -user psdeadmin -password passw0rd
A retry of the request may need to occur if the socket times out while waiting
for a prompt response. If the retry is required, note that the prompt will be
redisplayed if (y) is entered, which indicates the signer has already been
added to the trust store.
WASX7209I: Connected to process "AppClusterMember1" on node PServerNode01 using
SOAP connector; The type of process is: ManagedProcess
WASX7029I: For help, enter: "$Help help"
wsadmin>
```

- \_\_\_ c. Click *y* to add the signer certificate.
- \_\_\_ d. Enter the following command to install the offline package:
 

```
$AdminTask BPMInstallOfflinePackage {-inputFile
/usr/labfiles/ProcessCenter/STPPS1.zip}
```
- \_\_\_ e. When completed, a message indicates the BPMInstallOfflinePackage passed.

```
wsadmin>$AdminTask BPMInstallOfflinePackage {-inputFile /opt/labfiles/ProcessCenter/STPPS1.zip}
BPMInstallOfflinePackage passed.
wsadmin>
```



## Information

If you are using a SOAP connection, the command can take longer to complete than the specified SOAP timeout value. Although the command continues to run until it is finished, you might see the exception `java.net.SocketTimeoutException: Read timed out`. It is OK to ignore this message now.

To prevent the exception, `java.net.SocketTimeoutException: Read timed out`, set a higher value for the **com.ibm.SOAP.requestTimeout** property in the `soap.client.props` file. The file is in the `/opt/IBM/BPM/profiles/PServerNode01/properties` directory.

```

soap.client.props X

of a Kerberos
Service Principal Name (SPN) of the target
server.
example: the service name is WAS for the SPN
WAS/<hostname>@krbRealm)
#-----
com.ibm.SOAP.krb5Service=

#-----
SOAP Request Timeout
#
- timeout (specified in seconds [default 180], 0 implies no timeout)
#
#-----
com.ibm.SOAP.requestTimeout=180

```

- \_\_\_ f. Exit wsadmin by entering the following command:  
quit
- \_\_\_ 5. Verify the installation of the offline package.
  - \_\_\_ a. Maximize the deployment manager administrative console.
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. Click **Applications > Application Types > WebSphere enterprise applications**.

- \_\_\_ d. Verify that the process application is listed and in state started. Go to page 2. The Procurement Sample process application is also started during the deployment. If the application status indicates a stopped status, click the application status refresh icon.

| Name                                                                 | Application Status |
|----------------------------------------------------------------------|--------------------|
| <b>In administer the following resources:</b>                        |                    |
| <a href="#">IBM_BPM_DocStoreAdmin_SupCluster</a>                     | ↻                  |
| <a href="#">IBM_BPM_DocumentStore_AppCluster</a>                     | ↻                  |
| <a href="#">IBM_BPM_Help_AppCluster</a>                              | ↻                  |
| <a href="#">IBM_BPM_PerformanceDW_SupCluster</a>                     | ↻                  |
| <a href="#">IBM_BPM_Portal_AppCluster</a>                            | ↻                  |
| <a href="#">IBM_BPM_ProcessAdmin_AppCluster</a>                      | ↻                  |
| <a href="#">IBM_BPM_ProcessInspector_AppCluster</a>                  | ↻                  |
| <a href="#">IBM_BPM_Process_Portal_Notification_AppCluster</a>       | ↻                  |
| <a href="#">IBM_BPM_ResponsivePortal_AppCluster</a>                  | ↻                  |
| <a href="#">IBM_BPM_Teamworks_AppCluster</a>                         | ↻                  |
| <a href="#">IBM_BPM_WebAPI_AppCluster</a>                            | ↻                  |
| <a href="#">IneligibleMediationServiceApp</a>                        | ↻                  |
| <a href="#">PageBuilder2_AppCluster</a>                              | ↻                  |
| <a href="#">REST Services Gateway Dmgr</a>                           | ↻                  |
| <a href="#">REST Services Gateway_AppCluster</a>                     | ↻                  |
| <a href="#">RemoteAL61_AppCluster</a>                                | ↻                  |
| <a href="#">RouterMediationServiceApp</a>                            | ↻                  |
| <a href="#">STPPS1-PSV4-Procurement_Sample_BPELProcess_ModuleApp</a> | ↻                  |

- \_\_\_ e. Log out of the administrative console.

## End of exercise

## Exercise review and wrap-up

The first part of the exercise examined how to configure an offline server and create installation packages for an offline server. Next, the offline Process Server was configured as an online server. A snapshot was deployed to the online server. Finally, the offline package that you created earlier in the exercise was deployed to the running Process Server.

# Exercise 10. Migrating process instances

## Estimated time

00:45

## Overview

This exercise examines how to migrate process instances when deploying new snapshots to the online Process Server environment.

## Objectives

After completing this exercise, you should be able to:

- Create snapshots
- Deploy snapshots to an online Process Server environment
- Migrate snapshots
- Create a migration policy for orphaned tokens

## Introduction

Over time processes need to be refined, modified, and changed, which leads to the need to deploy new versions of the process applications that encapsulate the new business processes. This presents challenges for businesses in dealing with long-running processes and deciding how to handle processes that are using the previous process application version.

In IBM BPM, you have various options for managing the migration of running process instances. You can leave, migrate, or delete the instances. Migrating a process is the most complicated of the three options because it requires an understanding of the impact of the process change.

## Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Center profiles created
- The Process Center deployment environment created
- The Process Server profiles created
- The Process Server deployment environment created

# Exercise instructions

## Part 1: *Migrating process instances*

When a snapshot of a process application is installed on a server, instances of that process that use that snapshots are likely to be started. An instance is an active process. When you install a new snapshot, you must decide how to handle the data from the previous snapshot and the instances that are still running from that previous snapshot.

There are two ways to migrate process instances:

- While the snapshot is being installing by selecting the Migrate option
- After a snapshot is installed by using the Migrate Inflight Data option

In this part of the exercise, you migrate process instances by using both methods.



### Important

Both the Process Center and Process Server environments must be running for this exercise.

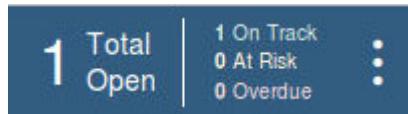
- \_\_\_ 1. Start the Process Center Console in the Process Center environment.
  - \_\_\_ a. In the Firefox web browser, go to the Process Center Console at the following URL:  
`http://bpmhost:9080/ProcessCenter`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 2. Examine a process application.
  - \_\_\_ a. On the **Process Apps** tab, click **Hiring Sample Advanced (HSV1)**. From here, you see the list of snapshots. The status indicates that the process application is installed in the PROD-ProcessServer, but there are no instances.

**Current**    
Last changed on 7/28/16 by pcdeadmin

**Advanced Hiring Sample v8570 (AHSV857)**   (New)  
Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:  
PROD-ProcessServer(bpmhost) - 0 instances  
▶ Installation details

- \_\_\_ b. Log out of the Process Center Console.
- \_\_\_ 3. Start an instance by using Process Portal in the Process Server environment.
  - \_\_\_ a. In the Firefox web browser, go to the following URL:  
`http://bpmhost:9082/portal`

- \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Continue**.
- \_\_\_ c. On the navigation on the left, click **Advanced HR Open New Position**.
- \_\_\_ d. Scroll to the bottom. Under Qualifications, click **Next**.
- \_\_\_ e. Scroll to the bottom. Under Qualifications, click **Submit**. You can see that there is one open task.

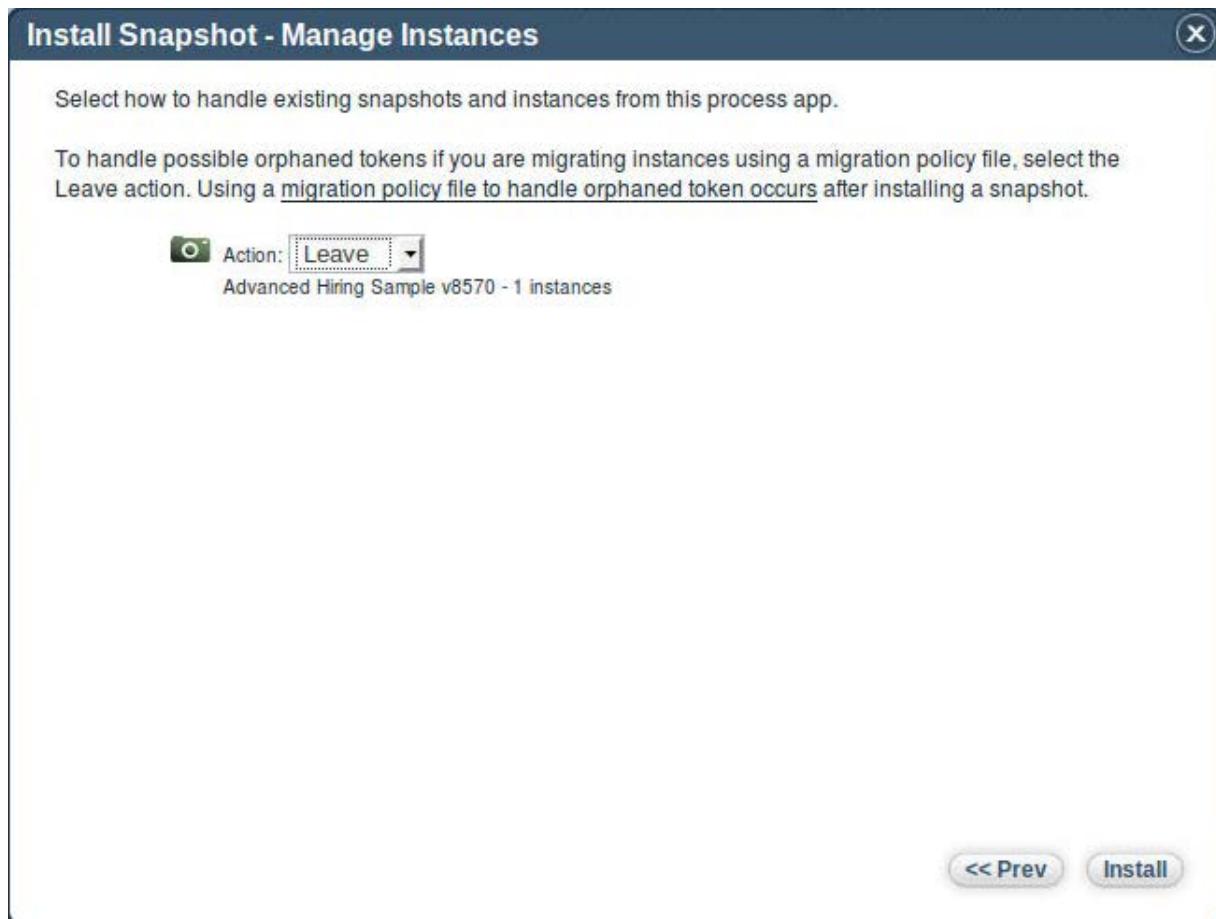


- \_\_\_ f. Log out of Process Portal.
- \_\_\_ 4. Verify the instance by using the Process Center Console.
- \_\_\_ a. In the Firefox web browser, go to the Process Center Console at the following URL:  
`http://bpmhost:9080/ProcessCenter`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. On the **Process Apps** tab, click **Hiring Sample Advanced (HSAV1)**. You can see that there is one instance.

A screenshot of the Process Center Console. The top navigation bar shows 'Hiring Sample Advanced (HSAV1)'. Below it, there are tabs for 'Snapshots' and 'History'. The main content area shows the 'Current' instance. It displays the name 'Hiring Sample Advanced (HSAV1)', the creation date 'Created on 7/28/16 by pcdeadmin', and the status 'Not Yet Deployed to Process Center Server'. It also shows 'Currently Installed:' with a box around 'PROD-ProcessServer(bpmhost) - 1 instances'. A link 'Installation details' is visible below this.

- \_\_\_ 5. Create a snapshot and migrate the instance by using the Migrate option.
- \_\_\_ a. On the right, click **Create New Snapshot**.
  - \_\_\_ b. In the Create New Snapshot window, enter `Advanced Hiring Sample V2` for the name. Click **Create**.
  - \_\_\_ c. To the right of the Advanced Hiring Sample V2 snapshot, click **Install**.
  - \_\_\_ d. Select the online server, **PROD-ProcessServer**.
  - \_\_\_ e. The server is now selected as noted by the check mark to the right. Click **OK**.

- \_\_\_ f. Since there are existing instances for the process application, you are prompted to manage the instances. You can also see the instances listed that you must manage.



You have three action options for migrating instances:

- **Leave:** The instances that are currently running continue to completion by using the previously installed snapshot. New instances use the new snapshot.
- **Migrate:** The instances that are currently running are migrated to the new snapshot that you are installing. Use this option if you want to manipulate the data or use a policy file to manage orphaned tokens.
- **Delete:** The instances that are currently running are deleted. Nothing is migrated to the new snapshot. The delete option is not available in the Production environment.



### Information

It is important that you test your migration process. Verify the results of instance migration in a test environment before you install the new snapshot on a production server. It is a risky oversight to test a new version by creating instances, but to fail to test for migrated instances.

- g. In the drop-down next to **Action**, select **Migrate**. The Migrate option indicates that currently running instances are migrated to the new snapshot that you are deploying. Wherever the running instances are in the flow of the process, the new version is implemented for the next item or step.

**Install Snapshot - Manage Instances** X

Select how to handle existing snapshots and instances from this process app.

To handle possible orphaned tokens if you are migrating instances using a migration policy file, select the Leave action. Using a [migration policy file to handle orphaned token](#) occurs after installing a snapshot.

Action: **Migrate** ▼

Advanced Hiring Sample v8570 - 1 instances

[<< Prev](#) [Install](#)

- h. Click **Install**.

- \_\_ i. During the installation of the snapshot, you can see the status, which indicates 'Installation in progress'.

**Hiring Sample Advanced (HSAV1)**

**Current**

Last changed on 7/28/16 by pcdeadmin

**Advanced Hiring Sample V2 (AHSV2) (New)**

Created on 8/4/16 by pcdeadmin  
Not Yet Deployed to Process Center Server

**PROD-ProcessServer(bpmhost) - Installation in progress**

[Installation details](#)

**Advanced Hiring Sample v8570 (AHSV857) (New)**

Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

**PROD-ProcessServer(bpmhost) - 1 instances**

[Installation details](#)

- \_\_ j. When the migration is completed, you can see that the instance is now listed under the snapshot Advanced Hiring Sample V2.

**Hiring Sample Advanced (HSAV1)**

**Current**

Last changed on 7/28/16 by pcdeadmin

**Advanced Hiring Sample V2 (AHSV2) (New)**

Created on 8/4/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

**PROD-ProcessServer(bpmhost) - 1 instances**

[Installation details](#)

**Advanced Hiring Sample v8570 (AHSV857) (New)**

Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

**PROD-ProcessServer(bpmhost) - 0 instances**

[Installation details](#)

- \_\_\_ k. Log out of the Process Center Console.
- \_\_\_ 6. Start another instance by using Process Portal in the Process Server environment.
- \_\_\_ a. In the Firefox web browser, go to the following URL:  
`http://bpmhost:9082/portal`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Continue**.
  - \_\_\_ c. On the navigation on the left, click **Advanced HR Open New Position**.
  - \_\_\_ d. Scroll to the bottom. Under Qualifications, click **Next**.
  - \_\_\_ e. Scroll to the bottom. Under Qualifications, click **Submit**. You can see that there are two open tasks.
  - \_\_\_ f. Log out of Process Portal.
- \_\_\_ 7. Verify the instance by using the Process Center Console.
- \_\_\_ a. In the Firefox web browser, go to the Process Center Console at the following URL:  
`http://bpmhost:9080/ProcessCenter`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. On the **Process Apps** tab, click **Hiring Sample Advanced (HSAV1)**. You can see that there are two instances.

**Hiring Sample Advanced (HSAV1)** ★ Snapshots History

Current

Last changed on 7/28/16 by pcdeadmin

---

**Advanced Hiring Sample V2 (AHSV2)** (New)

Created on 8/4/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

PROD-ProcessServer(bpmhost) - 2 instances  
▶ [Installation details](#)

---

**Advanced Hiring Sample v8570 (AHSV857)** (New)

Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

PROD-ProcessServer(bpmhost) - 0 instances  
▶ [Installation details](#)

- \_\_\_ 8. Create another snapshot.
  - \_\_\_ a. On the right, click **Create New Snapshot**.
  - \_\_\_ b. In the Create New Snapshot window, enter **Advanced Hiring Sample V3** for the name. Click **Create**.
  - \_\_\_ c. To the right of the Advanced Hiring Sample V3 snapshot, click **Install**.
  - \_\_\_ d. Select the online server, **PROD-ProcessServer**.
  - \_\_\_ e. The server is now selected as noted by the check mark to the right. Click **OK**.
  - \_\_\_ f. In the drop-down next to **Action**, select **Leave**. The Leave option indicates that active instances continue to run by using the old V2 snapshot.
  - \_\_\_ g. Click **Install**. When completed, you can see that the V3 snapshot is installed and the V2 snapshot has two instances.

The screenshot shows the Process Center Console interface. At the top, there's a navigation bar with tabs for 'Hiring Sample Advanced (HSAV1)', 'Schemas' (highlighted in green), 'History', and other options. Below the navigation bar, there's a toolbar with icons for 'Current' (selected), 'Deploy', 'Edit', and 'Delete'. A message says 'Last changed on 7/28/16 by pcdeadmin'. The main content area displays three snapshots:

- Advanced Hiring Sample V3 (AHSV3)** (New)
  - Created on 8/4/16 by pcdeadmin
  - Not Yet Deployed to Process Center Server
  - Currently Installed:
    - PROD-ProcessServer(bpmhost) - 0 instances
    - [Installation details](#)
- Advanced Hiring Sample V2 (AHSV2)** (New)
  - Created on 8/4/16 by pcdeadmin
  - Not Yet Deployed to Process Center Server
  - Currently Installed:
    - PROD-ProcessServer(bpmhost) - 2 instances
    - [Installation details](#)
- Advanced Hiring Sample v8570 (AHSV857)** (New)
  - Created on 7/28/16 by pcdeadmin
  - Not Yet Deployed to Process Center Server
  - Currently Installed:
    - PROD-ProcessServer(bpmhost) - 0 instances
    - [Installation details](#)

- \_\_\_ h. Log out of the Process Center Console.
- \_\_\_ 9. Examine the snapshots and instances by using Process Admin Console in the Process Server environment.

- \_\_ a. In the Firefox web browser, go to the following URL:  
`http://bpmhost:9082/ProcessAdmin`
- \_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Continue**.
- \_\_ c. Click **Installed Apps**. You can see the list of snapshots of process applications that are installed on the current Process Server. In each process application snapshot, only the processes that are exposed are shown. For each process, you can see the number of instances currently running. You can see Advanced Hiring Sample V2 with two instances and V3 with no instances.

The screenshot shows the Process Admin Console interface. At the top, there are tabs: Process Admin Console, Server Admin, Process Inspector, and **Installed Apps**. Below the tabs, there is a search bar labeled "Sort Snapshots By:" with a dropdown menu showing "Application". The main content area displays three process snapshots:

- Heritage Process Portal (TWP) - 8.5.7.0**
- Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample V2**
  - Advanced HR Open New Position - 2 instances
- Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample V3**
  - Advanced HR Open New Position - 0 instances
- Process Portal (SYSRP) - 8.5.7.0**

- \_\_ 10. Change the default version for the snapshot.



### Information

On a Process Server, the first snapshot you install is considered the default version. The default snapshot is used when no snapshot ID is provided when starting a BPD or service.

On a Process Server environment, the default snapshot is the one set as the default and there is only one default per process. You can use the **Make Default Version** option in the Process Admin Console to ensure the snapshot that you want to run is the default.

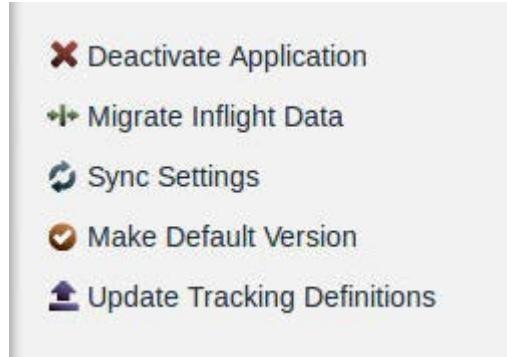
On a Process Center server environment, the default snapshot is the tip of the default track and there is only one default track per process. Instances that are started against the default snapshot are considered tip instances.

- \_\_ a. On a process server, the first snapshot you install is considered the default version. This means that the items in it run when an event or other trigger that applies to more than one version of a process or service is received.

Scroll to the right of the Hiring Sample Advanced process application and note that V2 is Active and the default version. V3 is active. When you install new snapshots, you can make the new snapshot the default version.

| Console                                                             | Server Admin | Process Inspector | Installed Apps | Logged in                                                    |
|---------------------------------------------------------------------|--------------|-------------------|----------------|--------------------------------------------------------------|
|                                                                     |              |                   |                | Sort Snapshots By: Application Name ▾ All   Active   Default |
| <a href="#">Process Portal (TWP) - 8.5.7.0</a>                      |              |                   |                | Active, Default                                              |
| <a href="#">Sample Advanced (HSAV1) - Advanced Hiring Sample V2</a> |              |                   |                | Active, Default                                              |
| ed HR Open New Position - 2 instances                               |              |                   |                |                                                              |
| <a href="#">Sample Advanced (HSAV1) - Advanced Hiring Sample V3</a> |              |                   |                | Active                                                       |
| ed HR Open New Position - 0 instances                               |              |                   |                |                                                              |
| <a href="#">Portal (SYSRP) - 8.5.7.0</a>                            |              |                   |                | Active, Default                                              |
| <a href="#">Plant Sample (STPPS1) - Procurement Sample v4</a>       |              |                   |                | Active, Default                                              |
| shmentBPD - 0 instances                                             |              |                   |                |                                                              |

- \_\_\_ b. Click **Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample V3**.
- \_\_\_ c. On the right, click **Make Default Version**.



- \_\_\_ d. In the Make Installed App Default Version window, click **OK**.
  - \_\_\_ e. In the toolbar, click **Installed Apps**. You can see that V2 is active and now V3 is active and the default.
  - \_\_\_ f. Log out of the Process Admin Console.
11. Start another instance by using Process Portal in the Process Server environment.
- \_\_\_ a. In the Firefox web browser, go to the following URL:  
`http://bpmhost:9082/portal`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Continue**.
  - \_\_\_ c. On the navigation on the left, click **Advanced HR Open New Position**.
  - \_\_\_ d. Scroll to the bottom. Under Qualifications, click **Next**.

- \_\_\_ e. Scroll to the bottom. Under Qualifications, click **Submit**. You can see that there are two open tasks.
  - \_\_\_ f. Log out of Process Portal.
- \_\_\_ 12. Verify the instance by using the Process Center Console.
- \_\_\_ a. In the Firefox web browser, go to the Process Center Console at the following URL:  
`http://bpmhost:9080/ProcessCenter`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ a. On the **Process Apps** tab, click **Hiring Sample Advanced (HSAV1)**. You can see that there are two instances for V2 and one instance for V3, which is the default snapshot.

**Hiring Sample Advanced (HSAV1)** ★ Snapshots History

● Current ● ●

Last changed on 7/28/16 by pcdeadmin

---

● Advanced Hiring Sample V3 (AHSV3) ● (New)

Created on 8/8/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

PROD-ProcessServer(bpmhost) - 1 instances  
► [Installation details](#)

---

● Advanced Hiring Sample V2 (AHSV2) ● (New)

Created on 8/8/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

PROD-ProcessServer(bpmhost) - 2 instances  
► [Installation details](#)

---

● Advanced Hiring Sample v8570 (AHSV857) ● (New)

Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:

PROD-ProcessServer(bpmhost) - 0 instances  
► [Installation details](#)

## Part 2: Creating a migration policy for orphaned tokens

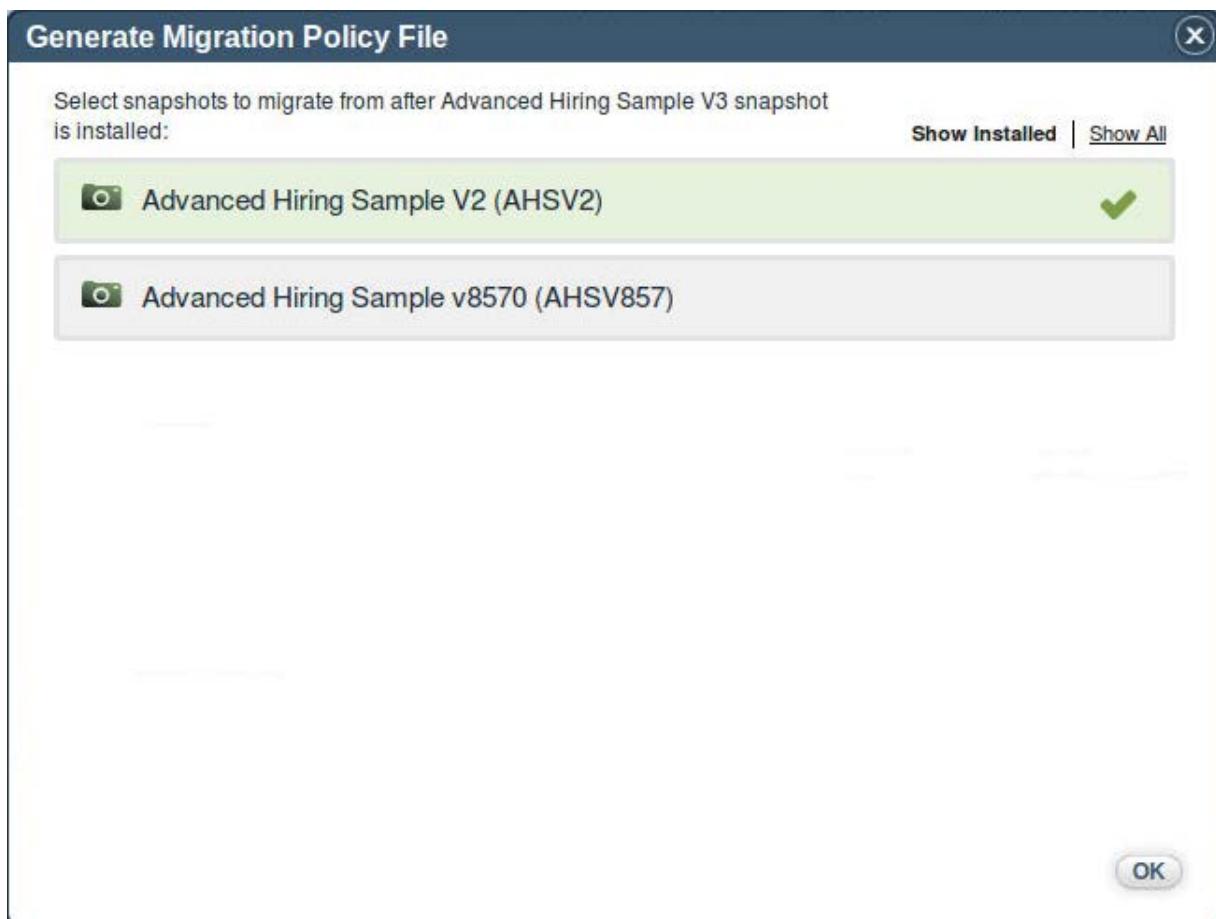
A token becomes orphaned when its associated activity is removed from a business process definition (BPD) of a migrated snapshot. You need to decide what to do with potential orphaned tokens or risk that the process instances will not complete.

You can use a policy file, a REST API, or Process Inspector to manage orphaned tokens. The easiest way to identify and manage orphaned tokens is to generate a policy file and use it to specify whether each potential orphaned token should be moved or deleted during instance migration.

If you migrate the snapshot instance without using a policy file, orphaned tokens might be created. In this case, you can use the REST API client to delete or move these orphaned tokens. You can also use the web Process Inspector to delete orphaned tokens.

In this part of the exercise, you generate a policy file to proactively compare snapshots before instance migration to identify the potential locations of orphaned tokens and specify whether each orphaned token should be deleted or moved.

- \_\_\_ 1. Generate a migration policy file for managing orphaned tokens.
  - \_\_\_ a. Click the drop-down next to **Advanced Hiring Sample V3** and select **Generate Migration Policy File**. This action sets the target of the migration.
  - \_\_\_ b. In the Generate Migration Policy File pane, select the snapshot that you want to migrate from. In this case, select **Advanced Hiring Sample V2 (AHSV2)**.



- \_\_\_ c. Click **OK**.

- \_\_ d. You can see that the migration policy is available for Advanced Hiring Sample V3.

**Hiring Sample Advanced (HSV1)**

**Current**

Last changed on 7/28/16 by pcdeadmin

---

**Advanced Hiring Sample V3 (AHSV3) (New)**

Created on 8/5/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
► [Migration Policy Available](#):  
Currently Installed:  
PROD-ProcessServer(bpmhost) - 0 instances  
► [Installation details](#)

**Advanced Hiring Sample V2 (AHSV2) (New)**

Created on 8/5/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:  
PROD-ProcessServer(bpmhost) - 2 instances  
► [Installation details](#)

**Advanced Hiring Sample v8570 (AHSV857) (New)**

Created on 7/28/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
Currently Installed:  
PROD-ProcessServer(bpmhost) - 0 instances  
► [Installation details](#)

- \_\_ e. Under Advanced Hiring Sample V3, click **Migration Policy Available** to see the details. The policy is for snapshots in Advanced Hiring Sample V2. In this example, you are migrating snapshot V2 to snapshot V3. However, the migration policy file is in snapshot V3 but is named snapshot V2.

**Advanced Hiring Sample V3 (AHSV3) (New)**

Created on 8/5/16 by pcdeadmin  
Not Yet Deployed to Process Center Server  
▼ [Migration Policy Available](#):  
    **Advanced Hiring Sample V2 (AHSV2)**

Currently Installed:  
PROD-ProcessServer(bpmhost) - 0 instances  
► [Installation details](#)

- \_\_\_ f. Next to the migration policy name, click **Edit**. The editor opens for the XML policy file.



- \_\_\_ g. The upper section of the file displays the diagram for the process or subprocess that you select for the lower section. The steps in the diagram that might potentially have an orphaned token are listed in the lower section. For each step, you set whether orphaned tokens that occur at that step should be removed or deleted. You can see that this policy does not have any orphaned tokens.

If you change the file, you must save the changes. However, since no changes are required, you can close the file. On the right, click **Close**.



## Information

If you have an orphaned token and choose to move the token, the upper part of the editor splits into left and right sections. You use the diagram in the right section to select the step to move the orphaned token to. For example, you have a subprocess that might generate an orphaned token. You select to move these orphaned tokens. In the right diagram, you browse until you see the step that you want the token to move to and select it.

You can lessen the risk that your instance will not complete by carefully managing tokens that are associated with actions that have been deleted.

- \_\_\_ h. Next to the migration policy name, click **Export**.
- \_\_\_ i. In the Opening window, select **Save File** and click **OK**.
- \_\_\_ j. Browse to `/opt/labfiles/ProcessServer`. Note the file name `HSAV1_AHSV3_AHSV2_MigrationPolicy.xml` and click **Save**.
- \_\_\_ k. Log out of the Process Center Console.
- \_\_\_ 2. Migrate the instances by using the Migrate Inflight Data option.
- \_\_\_ a. In the Firefox web browser, go to the Process Admin Console in the Process Server environment at the following URL:  
`http://bpmhost:9082/ProcessAdmin`
- \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

- \_\_\_ c. In the toolbar, click **Installed Apps**. The Hiring Sample (HSS) is listed with zero instances. There are multiple snapshots for Hiring Sample Advanced. You can see two instances for V2 and one instance for V3.

**Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample V2**

Advanced HR Open New Position - 2 instances

**Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample V3**

Advanced HR Open New Position - 1 instances

- \_\_\_ d. Click **Hiring Sample Advanced (HSAV1) - Advanced Hiring Sample V3**.
- \_\_\_ e. On the right, click **Migrate Inflight Data**.
- \_\_\_ f. In the Migrate Inflight Data From Snapshot window, select **Advanced Hiring Sample V2**.
- \_\_\_ g. Next to the Policy file field, click **Browse**.
- \_\_\_ h. Browse to /opt/labfiles/ProcessServer, select HSAV1\_AHSV3\_AHSV2\_MigrationPolicy.xml, and click **Open**. The policy file is listed and validated.

**Migrate Inflight Data From Snapshot**

Select snapshot to migrate data from:

**Advanced Hiring Sample V2**   
created on 8/5/16

? Policy file: **HSAV1\_AHSV3\_AHSV2\_MigrationPolicy.XI**

*The orphan token policy has been validated successfully.*

**Migrate**

- \_\_\_ i. Click **Migrate**.
- \_\_\_ j. When completed, the Process Instance Migration Summary is displayed. If the migration does not produce any orphaned tokens, the file is used but no error tokens are generated. You can see that two instances were successfully migrated. When completed, click **Close**.



## Information

Remember that orphan tokens result from migration of in-flight instances to a new BPD snapshot. They are pointers that are associated with an activity that is no longer a part of the BPD. You can only delete or move a token that is a leaf node in the execution tree; any parent orphaned tokens are handled implicitly. For example, suppose an activity that is implemented as a subprocess is deleted in a new snapshot. Deleting an orphaned token in the subprocess also deletes the orphaned token on the parent activity.

For a parallel gateway, both branches must complete to complete the process successfully. Therefore, if you choose to delete an orphaned token on one branch of a parallel gateway, the process by using the parallel gateway will never be able to complete.

When you move a token, you are deleting it from one activity and creating a copy of it attached to a different activity. This behavior creates a limitation if you are using multiple instances of nested business objects. For example, if you have an activity that has three tokens that are associated with it and you move those tokens to a second activity, only one token is created on the second activity.

You should schedule a blackout period and manage orphaned tokens to aid the process of migrating instances.

- \_\_\_ k. In the toolbar, click **Installed Apps**. You can see that there are three instances for V3 and V2 is no longer listed.
- \_\_\_ l. Log out of the Process Admin Console.

### **Part 3: Migrating BPEL process instances**

When you deploy a new version of a BPEL process, you might want the latest process version to apply to both new process instances and to process instances that already started. When a new version of a BPEL process is deployed, you can base new process instances on this process version if you start them in Business Process Choreographer Explorer from the corresponding template. However, existing process instances, which are based on a previous version of the process continue to run with this version until they reach an end state. You can migrate these existing process instances to a different process version. However, you do not need to migrate all of the instances to the same version.

To migrate running BPEL process instances to a new version of the process, you can use either an administrative script to migrate process instances in bulk or Business Process Choreographer Explorer to migrate specific instances.

In this part of the exercise, you use Business Process Choreographer Explorer to migrate instances.

- \_\_\_ 1. Verify the instance by using the Process Center Console.
  - \_\_\_ a. In the Firefox web browser, go to the Process Center Console at the following URL:  
`http://bpminst01:9080/ProcessCenter`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. On the **Process Apps** tab, click **Procurement Sample (STPPS1)**. You can see that there are multiple snapshots. Procurement Sample v3 is not yet installed to Process Server and v4 is installed in the production environment.
  - \_\_\_ d. Log out of the Process Center Console.
- \_\_\_ 2. Start an instance by using the Business Process Choreographer Explorer.
  - \_\_\_ a. Go to the Business Process Choreographer Explorer at the following URL:  
`http://bpminst01:9083/bpc`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. Under Process Templates, click **Currently Valid**.
  - \_\_\_ d. Select the **ReplenishmentBPEL** check box and click **Start Instance**.
  - \_\_\_ e. Enter the following values:
    - **Process Name:** Replenish\_Test\_111 (If it is left blank, the container automatically generates this value)
    - **OrderAmount:** 111
  - \_\_\_ f. Click **Submit**.

- \_\_\_ g. Select the **ReplenishmentBPEL** check box and click **Instances**. You can see it's running against v4.

| Migrate                             | Terminate             | Delete                | Suspend                  | Resume             | Restart               | Compensate | Claim Ownership | Work Items | Create Work Item |
|-------------------------------------|-----------------------|-----------------------|--------------------------|--------------------|-----------------------|------------|-----------------|------------|------------------|
| <input type="checkbox"/>            | Process Instance Name | Process Template Name | Valid From               | Process App        | Snapshot              |            |                 |            |                  |
| <input checked="" type="checkbox"/> | Replenish_Test_111    | ReplenishmentBPEL     | 8/2/2016 12:24:46 PM EDT | Procurement Sample | Procurement Sample v4 |            |                 |            |                  |

Items found: 1 Items selected: 0      Page 1 of 1      Items per page: 20

- \_\_\_ h. Select the **ReplenishmentBPEL** check box and click **Suspend**.
- \_\_\_ i. Select **Suspend** and click **Submit**. The state is now suspended.
- \_\_\_ j. Log out of the Business Process Explorer.
- \_\_\_ 3. Verify the instance by using the Process Center Console.
- \_\_\_ a. In the Firefox web browser, go to the Process Center Console at the following URL:  
<http://bpmhost:9080/ProcessCenter>
- \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ c. On the **Process Apps** tab, click **Procurement Sample (STPPS1)**. You can see that there is one instance for v4.

| Procurement Sample (STPPS1)                                                                                                                                                                                                           | Snapshots |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Current</b><br>Last changed on 7/28/16 by pcdeadmin<br>Not Yet Deployed to Process Center Server                                                                                                                                   |           |
| <b>Procurement Sample v4 (PSV4)</b> (New)<br>Created on 8/1/16 by pcdeadmin<br>Not Yet Deployed to Process Center Server<br>Currently Installed:<br>PROD-ProcessServer(bpmhost) - 1 instances<br><a href="#">Installation details</a> |           |
| <b>Procurement Sample v3 (PSV3)</b> (New)<br>Created on 7/29/16 by pcdeadmin<br>Not Yet Installed to Process Server                                                                                                                   |           |

- \_\_\_ 4. Create another snapshot and generate the migration policy for orphaned tokens.
- \_\_\_ a. On the right, click **Create New Snapshot**.

- \_\_\_ b. In the Create New Snapshot window, enter `Procurement Sample v5` for the name. Click **Create**.
- \_\_\_ 5. Install the Procurement Sample v5 snapshot.
  - \_\_\_ a. To the right of the Procurement Sample v5 snapshot, click **Install**.
  - \_\_\_ b. Select the online server, **PROD-ProcessServer**.
  - \_\_\_ c. The server is now selected as noted by the check mark to the right. Click **OK**.
  - \_\_\_ d. In the drop-down next to **Action**, select **Leave**.
  - \_\_\_ e. Click **Install**.
  - \_\_\_ f. Log out of the Process Center Console.
- \_\_\_ 6. Migrate an instance by using the Business Process Choreographer Explorer.
  - \_\_\_ a. Go to the Business Process Choreographer Explorer at the following URL:  
`http://bpminstancehost:9083/bpc`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
  - \_\_\_ c. Under Process Instances, click **Administered By Me**.
  - \_\_\_ d. Select the **ReplenishmentBPEL** check box and click **Instances**.
  - \_\_\_ e. Select the **Replenish\_Test\_111** check box and click **Migrate**.

**Process Instances for Process Templates**

Use this page to work with process instances that belong to specific process templates. [\[i\]](#)

| <a href="#">Migrate</a>                                                     | <a href="#">Terminate</a>               | <a href="#">Delete</a>       | <a href="#">Suspend</a>            | <a href="#">Resume</a>                | <a href="#">Restart</a>              | <a href="#">Compensate</a> | <a href="#">Claim Ownership</a> | <a href="#">Work Items</a> | <a href="#">Create Work Items</a> | <a href="#">View</a> |  |
|-----------------------------------------------------------------------------|-----------------------------------------|------------------------------|------------------------------------|---------------------------------------|--------------------------------------|----------------------------|---------------------------------|----------------------------|-----------------------------------|----------------------|--|
| <input checked="" type="checkbox"/> <a href="#">Process Instance Name</a> ▾ | <a href="#">Process Template Name</a> ▾ | <a href="#">Valid From</a> ▾ | <a href="#">Process App</a> ▾      | <a href="#">Snapshot</a> ▾            |                                      |                            |                                 |                            |                                   |                      |  |
| <input checked="" type="checkbox"/> <a href="#">Replenish_Test_111</a>      | <a href="#">ReplenishmentBPEL</a>       | 8/2/2016 12:24:46 PM EDT     | <a href="#">Procurement Sample</a> | <a href="#">Procurement Sample v4</a> |                                      |                            |                                 |                            |                                   |                      |  |
| <a href="#">Items found: 1</a> <a href="#">Items selected: 1</a>            |                                         | <a href="#">Page 1 of 1</a>  |                                    |                                       | <a href="#">Items per page: 20 ▾</a> |                            |                                 |                            |                                   |                      |  |

- \_\_\_ f. Click **Migrate**.

| Migration Target |                   |
|------------------|-------------------|
| Migration Target | ReplenishmentBPEL |

| Details of the selected process template |                                                      |
|------------------------------------------|------------------------------------------------------|
| Process Template Name                    | ReplenishmentBPEL                                    |
| Description                              | ReplenishmentBPEL                                    |
| Documentation                            | (None)                                               |
| Valid From                               | 8/8/2016 1:46:56 PM EDT                              |
| Process Template ID                      | _PT:90010156.6b43d7f3.firebaseio.com:f45200cb        |
| Namespace                                | http://Procurement_Sample_BPELProcess_Module         |
| Application Name                         | STPPS1-PSV5-Procurement_Sample_BPELProcess_ModuleApp |
| Administrators                           | Nobody                                               |
| Process App                              | Procurement Sample                                   |
| Process App Acronym                      | STPPS1                                               |
| Snapshot                                 | Procurement Sample v5                                |
| Snapshot ID                              | 2064.0a5efb96-04da-40d6-a853-57a613781bea            |

- \_\_\_ g. Click **Replenish\_Test\_111**.
- \_\_\_ h. Click the **Template Details** tab. You can see that the snapshot is migrated to Procurement Sample v5.
- \_\_\_ i. Click **Resume**.
- \_\_\_ j. Log out of the Business Process Choreographer Explorer.

## Part 4: Examining the instance migration performance settings

You can improve the performance of migrating process instances by adjusting configuration options for migrating instances.

Performance depends on the number of instances in the process, the number of tasks in those instances, and the size of the execution context. To improve the performance of migrating instances from one snapshot to another snapshot, you can configure the migration process. The configuration options determine which tasks to migrate, set the number of threads in the pool, and whether to defer updating the execution context of the tasks. The `99Local.xml` file contains the default values for these configuration options.

In this part of the exercise, you examine the instance migration performance settings.

- \_\_\_ 1. Examine the `99Local.xml` file.
  - \_\_\_ a. Open a terminal window and go to the `/opt/IBM/BPM/profiles/PServerDmgr/config/cells/PROD-PServerCell/clusters/AppCluster/process-server/config/systems` directory.
  - \_\_\_ b. Open the `99Local.xml` file by using an editor, such as gedit or vi.
  - \_\_\_ c. Locate the `<instance-migration>` tag.

```
<instance-migration>
 <thread-pool-size>5</thread-pool-size>
 <migrate-tasks>skip-closed</migrate-tasks>
 <defer-ec>false</defer-ec>
</instance-migration>
```



### Information

The `99Local.xml` file contains the following default settings:

- **thread-pool-size**: The default size for the thread pool is 5.
- **migrate-tasks**: The default setting is skip-closed which indicates to migrate all tasks except closed task. The other options include all, to migrate all tasks, and none, to migrate no tasks.
- **defer-ec**: The default setting is false. To ensure that corrupted execution contexts are detected during migration, leave the setting to false in the development environment. If necessary to improve performance, you can change the value to true in the production environment.

To modify the default settings, make the changes in the `100Custom.xml` file.

Before you make any changes for instance-migration, in your test environment, test how long the migration takes with 100 instances. From that result, estimate the time that the whole migration requires. Adjust the migration configuration options and retest until you get the performance that you need.

In the production environment, use what you learned in the test environment and what you learned from previous migrations to set the migration configuration options for the production environment.

For example, to override the defaults, set a thread pool size of 10 and delete all tasks, use the following settings in the 100Custom.xml file:

```
<server>
 <instance-migration merge="mergeChildren">
 <thread-pool-size merge="replace">10</threads-pool-size>
 <migrate-tasks merge="replace">all</migrate-tasks>
 </instance-migration>
</server/>
```

---

- \_\_\_ d. Close the file when completed.

## **Part 5: Stopping the Process Server environment**

- \_\_\_ 1. Start the deployment manager administrative console.
  - \_\_\_ a. In a web browser, go to the following URL:  
`http://bpminst01:9062/ibm/console`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 2. Stop the server processes.
  - \_\_\_ a. From the administrative console, click **Servers > Deployment Environments**.
  - \_\_\_ b. Select the check box next to the PServer\_DE deployment environment and click **Stop**.
  - \_\_\_ c. Click **System administration > Node agents**.
  - \_\_\_ d. Select the check box next to the node agent and click **Stop**.
  - \_\_\_ e. Log out of the administrative console.

## **Part 6: Stopping the Process Center environment**

- \_\_\_ 1. Start the deployment manager administrative console.
  - \_\_\_ a. In a web browser, go to the following URL:  
`http://bpminst01:9060/ibm/console`
  - \_\_\_ b. In the login area, enter `pcdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 2. Stop the deployment environment.
  - \_\_\_ a. From the administrative console, click **Servers > Deployment Environments**.
  - \_\_\_ b. Select the check box next to the PCenter\_DE deployment environment and click **Stop**. Wait a few moments for the deployment environment to stop before proceeding.
  - \_\_\_ c. Log out of the administrative console.
  - \_\_\_ d. Close the browser window.
- \_\_\_ 3. Stop the server processes.
  - \_\_\_ a. In a terminal window, go to the `/opt/IBM/BPM/profiles/PCenterCustom/bin` directory.
  - \_\_\_ b. Enter the following command to stop the node agent:  
`./stopNode.sh`  
 Wait for the message that indicates that the node agent is stopped.
  - \_\_\_ c. Go to the `/opt/IBM/BPM/profiles/PCenterDmgr/bin` directory.
  - \_\_\_ d. Enter the following command to stop the deployment manager:  
`./stopManager.sh`  
 Wait for the message that indicates that the deployment manager is stopped.

- \_\_ e. Exit any open terminal windows.

**Attention**

Since the entire course configuration is on one computer, the Process Center processes are stopped to save system resources. Stop any processes in the Process Center cell that are still running.

---

**End of exercise**

## Exercise review and wrap-up

The exercise examined how to migrate process instances when deploying new snapshots in the online Process Server environment.

# Exercise 11. Advanced Process Server administration

## Estimated time

01:00

## Overview

This exercise covers more Process Server administration tasks. First, an extra Process Server node and cluster member are created in the MECluster by using the BPMConfig command. Then, a messaging engine policy is created for the BPM.PServer\_DE.Bus and a preferred server is defined. Finally, transaction log file failover and recovery function are configured for each of the configured clusters.

## Objectives

After completing this exercise, you should be able to:

- Add a member to the messaging cluster
- Create messaging engine policies
- Verify the configuration of the messaging cluster and the start behavior of the messaging engines
- Configure transaction and recovery log high availability

## Introduction

Upon completion of this exercise, the messaging engine cluster you create consists of two Process Server server instances.

## Requirements

To complete this exercise, you must have:

- IBM Business Process Manager Advanced installed
- The Process Server deployment environment created

## Exercise instructions

### 11.1. Adding a node and a member to the messaging cluster

After you create your network deployment environment, you might want to extend that environment. You can extend your environment to create profiles or to add more nodes.

In this exercise, you add a second node, PServerNode02, to the cell and a second member to the messaging cluster, MEClusterMember2. After adding the second cluster member, you configure messaging engine policies that determine which server runs the messaging engine.

Adding a second member after the cluster is created is not mandatory. You can create all required cluster members during the initial configuration. However, if you encounter configuration issues, it is easier to troubleshoot a single cluster member and resolve the issues before adding more members.



#### Information

When running this exercise on Linux, you must look for a few things if you are having problems. The first time that you restart all of the servers after the policy is created, it takes several minutes for the messaging engine to activate on the applicable server instance. You see the status in the log for the first server in the cluster. It takes some time before you see stopping and joined. Afterward, it always starts on the correct instance. Because of this function, it is suggested that you start the cluster twice, stop it, delete the `SystemOut.log` files for both members, and start the cluster a third time.

After deleting the logs and restarting the servers, wait several minutes before you search the logs. You can see the started state for the two messaging engines on the second cluster member.

The ["Creating messaging engine policies \(optional\)"](#) part of this lab is considered optional. Many of the labs are lengthy, and you might require more time. Therefore, a number of parts are considered optional.

---

#### ***Part 1: Extending the deployment environment***

After you create a deployment environment by using the BPMConfig utility, you can run a command later to extend the deployment environment. For example, you can create profiles or add more nodes. In this part of the exercise, you use the BPMConfig utility to create a second node and a second cluster member. When extending the environment, you edit your deployment environment configuration properties file `Advanced-PS.properties` adding details on the new nodes or cluster members. If you do not already have a customized configuration properties file based on the existing deployment environment that you want to extend, locate the sample configuration file that most closely reflects your environment.

Before you can use the BPMConfig utility to extend your deployment environment, you must meet the following requirements:

- Install the product on the computer where you want to extend the deployment environment.
  - Create the deployment environment by running the BPMConfig command.
  - The deployment manager must be running.
- \_\_\_ 1. Verify that the deployment manager is running.
- \_\_\_ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
- \_\_\_ b. Enter the following command:  
`./serverStatus.sh -all`
- \_\_\_ c. If the deployment manager is not running, start it by using the following command:  
`./startManager.sh`
- \_\_\_ 2. Start the deployment manager's administrative console.
- \_\_\_ a. Open a web browser and go to the following website:  
`http://bpmhost:9062/ibm/console`
- \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.
- \_\_\_ 3. Verify that the clusters are stopped.
- \_\_\_ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerNode01/bin` directory.
- \_\_\_ b. Enter the following command:  
`./serverStatus.sh -all`
- \_\_\_ c. For any server in the started state, stop the server.
- \_\_\_ 4. Modify the properties file to add a second node and cluster member to the remote messaging engine cluster.
- \_\_\_ a. Go to the `/opt/labfiles/scripts` directory.
- \_\_\_ b. Create a copy of the properties file by using the following command:  
`cp Advanced-PS.properties Advanced-PS-inital.properties`
- \_\_\_ c. Open the `Advanced-PS.properties` file by using an editor such as vi or gedit.
- \_\_\_ d. Examine the various properties that are in the file. Scroll to the Node properties: PServerNode01 section. After this section, you see information about the cluster members. Go to the Cluster member properties: MEClusterMember1 section. You can see that these sections are commented out from an earlier exercise.
- \_\_\_ e. Go to the Node properties: Node2 section. You can see that the entries are commented out.
- \_\_\_ f. Open another terminal window and change to the `/opt/labfiles/ProcessServer` directory.

- \_\_ g. Open the `AddUpdate.xml` file. Use an editor such as vi or gedit. This file contains the entries that must be added to the `Advanced-PS.properties` properties file.

```
*AddUpdate.xml x
#####
Node properties: PServerNode02
#####
bpm.de.node.2.name=PServerNode02
If the host name is the same as deployment manager, this node will be created in environments that span multiple hosts.
bpm.de.node.2.hostname=bpmhost
The installation location of the BPM product. If you want to use a backslash character, escape backslash before it, for example
bpm.de.node.2.installPath=/opt/IBM/BPM
The name of the node profile.
bpm.de.node.2.profileName=PServerNode02
bpm.de.node.2.profilePath=/opt/IBM/BPM/profiles/PServerNode02
To override the default port assignments for this profile, specify a starting port
bpm.de.node.2.initialPortAssignment=

#####
Cluster member properties: MEClusterMember2
#####
bpm.de.node.2.clusterMember.2.name=MEClusterMember2
The cluster this cluster member belongs to. This value should correspond to the
bpm.de.node.2.clusterMember.2.cluster=MECluster
The proportion of requests that are sent to this cluster member
bpm.de.node.2.clusterMember.2.weight=2
bpm.de.node.2.clusterMember.2.initialPortAssignment=
```

The entries in the `AddUpdate.xml` file are the properties that are updated to create a second node and MECluster member. The Node properties: PServerNode02 section includes the specific properties to create PServerNode02 indicating the host name, node name, profile name, and profile path.

The Cluster member properties: MEClusterMember2 section includes the specific properties to create a second cluster member, MEClusterMember2, to the MECluster.

- \_\_\_ h. Copy the Node properties: PServer Node02 section and paste it into the Advanced-PS.properties properties file. Paste the content over the current Node2 section. When completed, your configuration file should look like the following screen capture:

```
#####
Node properties: PServerNode02
#####
bpm.de.node.2.name=PServerNode02
If the host name is the same as deployment manager, this node will be created in environments that span multiple hosts.
bpm.de.node.2.hostname=bpmhost
The installation location of the BPM product. If you want to use a backslash as an escape backslash before it, for example
bpm.de.node.2.installPath=/opt/IBM/BPM
The name of the node profile.
bpm.de.node.2.profilePath=/opt/IBM/BPM/profiles/PServerNode02
To override the default port assignments for this profile, specify a starting port.
bpm.de.node.2.initialPortAssignment=
```

```
#####
Cluster member properties: AppClusterMember2
#####
bpm.de.node.2.clusterMember.1.name=AppClusterMember2
The cluster that this cluster member belongs to. This value should correspond to the cluster defined in the deployment manager.
bpm.de.node.2.clusterMember.1.cluster=AppCluster
The proportion of requests that are sent to this cluster member.
bpm.de.node.2.clusterMember.1.weight=2
```

- \_\_\_ i. In the Advanced-PS.properties properties file, go to the Cluster member properties: MEClusterMember2 section. You can see that the entries are commented out.

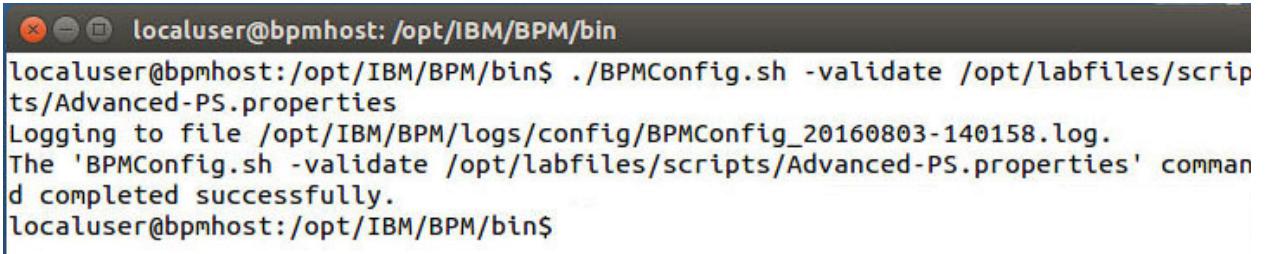
- \_\_\_ j. Copy the Cluster member properties: MEClusterMember2 section and paste it into the Advanced-PS.properties properties file. Paste the content over the current MEClusterMember2 section. When completed, your configuration file should look like the following screen capture:

```
#####
Cluster member properties: AppClusterMember2
#####
bpm.de.node.2.clusterMember.1.name=AppClusterMember2
The cluster that this cluster member belongs to. This value should correspond to the
bpm.de.node.2.clusterMember.1.cluster=AppCluster
The proportion of requests that are sent to this cluster member.
bpm.de.node.2.clusterMember.1.weight=2

#####
Cluster member properties: MEClusterMember2
#####
bpm.de.node.2.clusterMember.2.name=MEClusterMember2
The cluster this cluster member belongs to. This value should correspond to the
bpm.de.node.2.clusterMember.2.cluster=MECluster
The proportion of requests that are sent to this cluster member
bpm.de.node.2.clusterMember.2.weight=2
bpm.de.node.2.clusterMember.2.initialPortAssignment=
```

- \_\_\_ k. Review your changes to the file. Save and close the file when completed.
- \_\_\_ l. Exit the AddUpdate.xml file. Close the terminal window.
- \_\_\_ 5. Validate and update the properties files.
- \_\_\_ a. Go to the /opt/IBM/BPM/bin directory.
- \_\_\_ b. Before you use the properties file, it is a good idea to validate the entries in the file. To validate the file, enter the following command:

```
./BPMConfig.sh -validate /opt/labfiles/scripts/Advanced-PS.properties
```



```
localuser@bpmhost:/opt/IBM/BPM/bin$./BPMConfig.sh -validate /opt/labfiles/scripts/Advanced-PS.properties
Logging to file /opt/IBM/BPM/logs/config/BPMConfig_20160803-140158.log.
The 'BPMConfig.sh -validate /opt/labfiles/scripts/Advanced-PS.properties' command completed successfully.
localuser@bpmhost:/opt/IBM/BPM/bin$
```

- \_\_\_ c. The output is placed in a log file with the name BPMConfig\_<date\_timestamp>.log. Your output log file has a different name that is associated with it based on the date and time stamp.
- \_\_\_ d. Open the BPMConfig\_<date\_timestamp>.log file by using an editor such as vi or gedit. Messages that are related to the running of the BPMConfig command are recorded in this file. Examine the details of the log.
- \_\_\_ e. Go to the bottom of the file and scroll backwards looking for any exceptions. You should see a validation error on an empty property field for PServerNode02. You can ignore this validation error.

Using the validation option, you can validate a properties file and see whether all properties are correctly configured.

- \_\_\_ f. When completed, close the log file.
- \_\_\_ 6. Create the extended deployment environment.
  - \_\_\_ a. To extend the deployment environment by using the properties file, enter the following command:  
`./BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties`
  - \_\_\_ b. The command takes about 10 minutes to complete. During this time, you can watch the output in the terminal window. You can see that the first part is to validate the profile registry and then create a deployment manager profile. Since the deployment manager exists, it does not create the profile. Next, the command looks to create PServerNode01, which exists, and it does not create the node. Finally, it comes to the new entries for creating PServerNode02.

```
localuser@bpghost:/opt/IBM/BPM/bin$./BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties
Logging to file /opt/IBM/BPM/logs/config/BPMConfig_20160803-140522.log.
Validating the profile registry.
[]
Configuring the deployment manager.
CWMCB0135W: The deployment manager SOAP port 8879 in the property file '/opt/labfiles/scripts/Advanced-PS.properties' does not match the actual SOAP port (8881).
.
The deployment manager profile already exists at /opt/IBM/BPM/profiles/PServerDmgr.
Configuring managed node profiles.
A managed node profile already exists at /opt/IBM/BPM/profiles/PServerNode01.
Creating the managed node PServerNode02 profile.
```

- \_\_\_ c. You can verify that the managed node PServerNode02 is created. Note the INSTCONFSUCCESS message that indicates the profile PServerNode02 now exists.

```
localuser@bpghost:/opt/IBM/BPM/bin$./BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties
Logging to file /opt/IBM/BPM/logs/config/BPMConfig_20160803-140522.log.
Validating the profile registry.
[]
Configuring the deployment manager.
CWMCB0135W: The deployment manager SOAP port 8879 in the property file '/opt/labfiles/scripts/Advanced-PS.properties' does not match the actual SOAP port (8881).
.
The deployment manager profile already exists at /opt/IBM/BPM/profiles/PServerDmgr.
Configuring managed node profiles.
A managed node profile already exists at /opt/IBM/BPM/profiles/PServerNode01.
Creating the managed node PServerNode02 profile.
INSTCONFSUCCESS: Success: Profile PServerNode02 now exists. Please consult /opt/IBM/BPM/profiles/PServerNode02/logs/AboutThisProfile.txt for more information about this profile.
```

- \_\_\_ d. The node is then federated to the cell. After the successful federation of the node, the cluster member is created.

```
localuser@bpghost: /opt/IBM/BPM/bin
ADMU0012I: Creating Node Agent configuration for node: PServerNode02
ADMU0014I: Adding node PServerNode02 configuration to cell: PROD-PServerCell
ADMU0016I: Synchronizing configuration between node and cell.

ADMU0300I: The node PServerNode02 was successfully added to the
PROD-PServerCell cell.

ADMU0306I: Note:
ADMU0302I: Any cell-level documents from the standalone PROD-PServerCell
configuration have not been migrated to the new cell.
ADMU0307I: You might want to:
ADMU0303I: Update the configuration on the PROD-PServerCell Deployment Manager
with values from the old cell-level documents.

ADMU0306I: Note:
ADMU0304I: Because -includeapps was not specified, applications installed on
the standalone node were not installed on the new cell.
ADMU0307I: You might want to:
ADMU0305I: Install applications onto the PROD-PServerCell cell using wsadmin
$AdminApp or the Administrative Console.

ADMU0003I: Node PServerNode02 has been successfully federated.
The deployment environment PServer_DE already exists. Additional updates will be
performed only if needed.
```

- \_\_\_ e. Next, the node is synchronized with the deployment manager. If the new node is on the same computer as the deployment manager node, then the new node is automatically synchronized with the deployment manager node.

Finally, the deployment manager is stopped. The last entry that you can see is the BPMConfig completed successfully message.

```
localuser@bpghost: /opt/IBM/BPM/bin
Creating cluster members.
Configuring the REST services end points.
Saving configuration changes...
Synchronizing node PServerNode01.
ADMU0116I: Tool information is being logged in file
 /opt/IBM/BPM/profiles/PServerNode01/logs/syncNode.log
ADMU0128I: Starting tool with the PServerNode01 profile
ADMU0401I: Begin syncNode operation for node PServerNode01 with Deployment
 Manager bpmhost: 8881
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0402I: The configuration for node PServerNode01 has been synchronized with
 Deployment Manager bpmhost: 8881
Synchronizing node PServerNode02.
ADMU0116I: Tool information is being logged in file
 /opt/IBM/BPM/profiles/PServerNode02/logs/syncNode.log
ADMU0128I: Starting tool with the PServerNode02 profile
ADMU0401I: Begin syncNode operation for node PServerNode02 with Deployment
 Manager bpmhost: 8881
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0402I: The configuration for node PServerNode02 has been synchronized with
 Deployment Manager bpmhost: 8881
Stopping deployment manager profile PServerDmgr.
ADMU0116I: Tool information is being logged in file
 /opt/IBM/BPM/profiles/PServerDmgr/logs/dmgr/stopServer.log
ADMU0128I: Starting tool with the PServerDmgr profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server dmgr stop completed.

The 'BPMConfig.sh -create -de /opt/labfiles/scripts/Advanced-PS.properties' command completed successfully.
localuser@bpghost:/opt/IBM/BPM/bin$
```

## **Part 2: Verifying the extended deployment environment**

- \_\_ 1. Verify the configuration.
- \_\_ a. Enter the following command to list the profiles in the repository:

```
./manageprofiles.sh -listProfiles
```

```
localuser@bpghost: /opt/IBM/BPM/bin
localuser@bpghost:/opt/IBM/BPM/bin$./manageprofiles.sh -listProfiles
[PCenterCustom, PCenterDmgr, PServerDmgr, PServerNode01, PServerNode02]
localuser@bpghost:/opt/IBM/BPM/bin$
```

Note the two Process Center profiles that were created in an earlier exercise and the three Process Server profiles.

- \_\_ b. Change to the /opt/IBM/BPM/logs/config directory.

- \_\_\_ c. Open the `BPMConfig_<date_timestamp>.log` file. Messages that are related to the running of the `BPMConfig` command are recorded in this file. Examine the details of the log. Scroll to the end, and you can verify the message: `BPMConfig completed successfully.` Close the file when completed.
- \_\_\_ 2. Edit the `soap.client.props` file for the node.
  - \_\_\_ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerNode02/properties` directory.
  - \_\_\_ b. Edit the `soap.client.props` file by using an editor such as `vi`.
  - \_\_\_ c. Go to the `com.ibm.SOAP.authenticationTarget=BasicAuth` section.
  - \_\_\_ d. In the `soap.client.props` file, enter the following information:

```
com.ibm.SOAP.loginUserId=bpmadmin
com.ibm.SOAP.loginPassword=passw0rd
```
  - \_\_\_ e. Save and close the file.
- \_\_\_ 3. Start the deployment manager cell environment.
  - \_\_\_ a. In a terminal window, change to the `/opt/IBM/BPM/profiles/PServerDmgr/bin` directory.
  - \_\_\_ b. Start the deployment manager by entering the following command:  
`./startManager.sh`  
Wait for the message that indicates that the deployment manager is started.
- \_\_\_ 4. Start the deployment manager administrative console.
  - \_\_\_ a. Open a web browser and go to the following URL:  
`http://bpmhost:9062/ibm/console`
  - \_\_\_ b. In the login area, enter `psdeadmin` as the user ID and `passw0rd` as the password. Click **Login**.

\_\_\_ 5. Examine the cell configuration.

- \_\_\_ a. From the administrative console, click **System administration > Nodes**. You can see that the nodes in the cell are listed in the pane.

### Nodes

Use this page to manage nodes in the application server environment. A node corresponds to a physical computer with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking Add Node.

Preferences

Add Node	Remove Node	Force Delete	Synchronize	Full Resynchronize	Stop
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Select</b> Name ◊ Host Name ◊ Version ◊ Discovery Protocol ◊					
You can administer the following resources:					
	<a href="#">PServerDmgr</a>	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
<input type="checkbox"/>	<a href="#">PServerNode01</a>	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
<input type="checkbox"/>	<a href="#">PServerNode02</a>	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
Total 3					

- \_\_\_ b. Click **System administration > Node agents**. There are two node agents. Both node agents are stopped.

### Node agents

Use this page to manage node agents and application servers on the node that a node agent manages. The node agent process serves as an intermediary between the application servers on the node and the deployment manager. The node agent process runs on every node and is specialized to perform node-specific administration functions, such as server process monitoring, configuration synchronization, file transfer, and request routing.

Preferences

Stop	Restart	Restart all Servers on Node			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>Select</b> Name ◊ Node ◊ Host Name ◊ Version ◊ Status ◊					
You can administer the following resources:					
<input type="checkbox"/>	<a href="#">nodeagent</a>	PServerNode01	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	
<input type="checkbox"/>	<a href="#">nodeagent</a>	PServerNode02	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	
Total 2					

- \_\_\_ c. Minimize the administrative console.

- \_\_\_ d. In a terminal window, change to the /opt/IBM/BPM/profiles/PServerNode02/bin directory.

- \_\_\_ e. Start the node agent by entering the following command:

```
./startNode.sh
```

Wait for the message that indicates that the node agent is started. Notice that each of the cluster members is in a stopped state.

- \_\_\_ f. Go to the /opt/IBM/BPM/profiles/PServerNode01/bin directory.

- \_\_\_ g. Start the node agent by entering the following command:

```
./startNode.sh
```

Wait for the message that indicates that the node agent is started. Notice that each of the cluster members is in a stopped state.

- \_\_\_ h. Maximize the administrative console and refresh the Node agents pane. Both node agents should now be running.

### **Node agents**

Use this page to manage node agents and application servers on the node that a node agent manages. The node agent process serves as an intermediary between the application servers on the node and the deployment manager. The node agent process runs on every node and is specialized to perform node-specific administration functions, such as server process monitoring, configuration synchronization, file transfer, and request routing.

#### Preferences

<input type="button" value="Stop"/> <input type="button" value="Restart"/> <input type="button" value="Restart all Servers on Node"/>					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Select	Name	Node	Host Name	Version	Status
<b>You can administer the following resources:</b>					
<input type="checkbox"/>	<a href="#">nodeagent</a>	PServerNode01	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	
<input type="checkbox"/>	<a href="#">nodeagent</a>	PServerNode02	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	
<b>Total 2</b>					

- \_\_ i. Click **System administration > Nodes**. Verify that PServerNode02 is synchronized.

### Nodes

Use this page to manage nodes in the application server environment. A node corresponds to a physical computer system with a distinct IP host address. The following table lists the managed and unmanaged nodes in this cell. The first node is the deployment manager. Add new nodes to the cell and to this list by clicking Add Node.

Preferences

<input type="button" value="Add Node"/> <input type="button" value="Remove Node"/> <input type="button" value="Force Delete"/> <input type="button" value="Synchronize"/> <input type="button" value="Full Resynchronize"/> <input type="button" value="Stop"/>					
<b>You can administer the following resources:</b>					
	<a href="#">PServerDmgr</a>	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
<input type="checkbox"/>	<a href="#">PServerNode01</a>	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
<input type="checkbox"/>	<a href="#">PServerNode02</a>	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	TCP	
Total 3					



### Hint

In the course exercises, one workstation is used for the configuration. If you add multiple nodes, make sure to verify that your data sources are working properly. Verify that the new node can access the database. If the data sources do not pass the test connection, verify the scope level and environment variable settings.

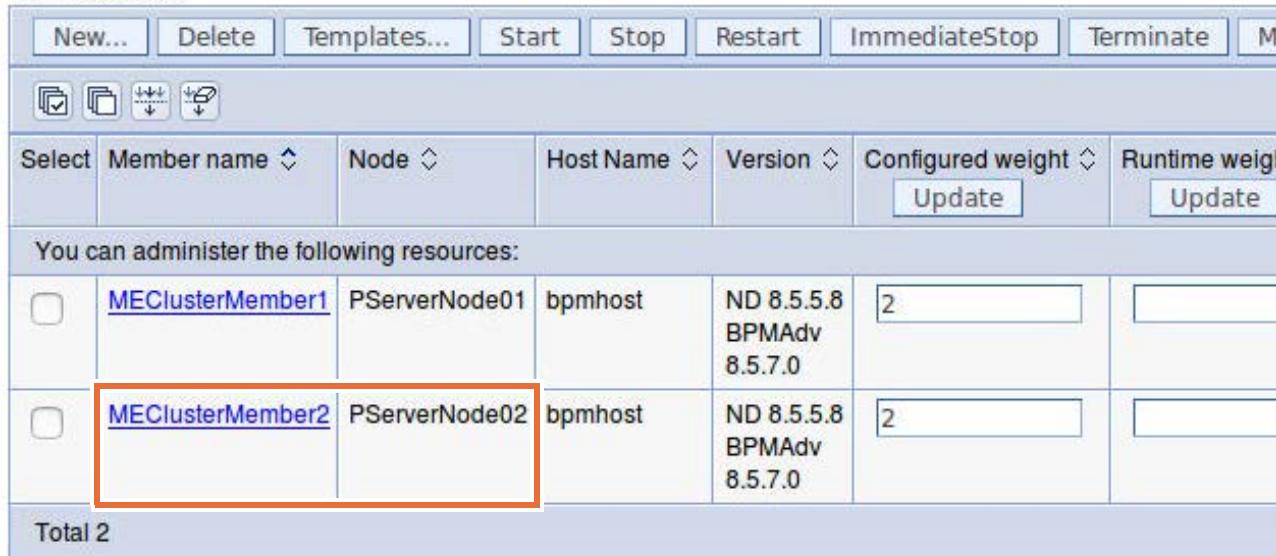
- \_\_ j. Click **Servers > Clusters > WebSphere application server clusters > MECluster**.

- \_\_\_ k. In the Additional Properties section, click **Cluster members**. Verify that there are two cluster members, MEClusterMember1 and MEClusterMember2.

#### [WebSphere application server clusters > MECluster > Cluster members](#)

Use this page to view and manage the application servers (cluster members) that belong to the cluster. You can also change the weight of any of the cluster members. Learn more about this task in a [guided activity](#). A guided activity of task steps and more general information about the topic. The configuration of new cluster members is based on a configuration template that is stored as part of the cluster data. This template is based on the first cluster member and create all subsequent cluster members. Modifications to the configuration of an individual cluster member has no effect on the cluster member template.

Preferences



You can administer the following resources:						
Select	Member name	Node	Host Name	Version	Configured weight	Runtime weight
<input type="checkbox"/>	MEClusterMember1	PServerNode01	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	<input type="text" value="2"/>	<input type="text"/>
<input type="checkbox"/>	MEClusterMember2	PServerNode02	bpmhost	ND 8.5.5.8 BPMAdv 8.5.7.0	<input type="text" value="2"/>	<input type="text"/>
Total 2						

- \_\_\_ 6. Start the MECluster and verify the messaging engine.

- \_\_\_ a. On the Cluster members pane, click the select all icon and click **Start**. Wait and continue after the servers are started.



#### Hint

Tail the `SystemOut.log` file for the cluster members to monitor the output as the processes start. To tail the log file, enter the following command:

```
tail -f SystemOut.log
```

The file for MEClusterMember1 is in:

```
/opt/IBM/BPM/profiles/PServerNode01/logs/MEClusterMember1
```

The file for MEClusterMember2 is in:

```
/opt/IBM/BPM/profiles/PServerNode02/logs/MEClusterMember2
```

- \_\_\_ b. Click **Service integration > Buses > BPM.PServer\_DE.Bus**.

- \_\_\_ c. Under Topology, click **Messaging engines**. The messaging engine is in a started state.

**Buses > BPM.PServer DE.Bus > Messaging engines**

A messaging engine is a component, running inside a server, that manages messaging resources for a bus member. Applications are connected to a messaging engine when they access a service integration bus.

+ Preferences

The screenshot shows a user interface for managing messaging engines. At the top, there are 'Start' and 'Stop' buttons. Below them is a toolbar with icons for creating, deleting, and modifying resources. A table header row includes columns for 'Select', 'Name', 'Description', and 'Status'. Underneath the table, a message says 'You can administer the following resources:'. A single row in the table lists 'MECluster.000-BPM.PServer\_DE.Bus' with a status of 'Started' indicated by a green circle with a white plus sign. At the bottom left, it says 'Total 1'.

- \_\_\_ d. Minimize the administrative console.

7. Export the updated deployment environment properties.

- \_\_\_ a. In a terminal window, change to the /opt/labfiles/scripts directory.

- \_\_\_ b. Create a directory named updated by using the following command:

```
mkdir updated
```

- \_\_\_ c. Go to the /opt/IBM/BPM/bin directory.

- \_\_\_ d. Run the export command:

```
./BPMConfig.sh -export -profile PServerDmgr -de PServer_DE -outputDir
/opt/labfiles/scripts/updated/
```

The terminal window shows the command being run and its output. The command is: ./BPMConfig.sh -export -profile PServerDmgr -de PServer\_DE -outputDir /opt/labfiles/scripts/updated/. The output indicates that the command completed successfully, logging to /opt/IBM/BPM/logs/config/BPMConfig\_20160802-140251.log.

```
localuser@bpminstance:/opt/IBM/BPM/bin$./BPMConfig.sh -export -profile PServerDmgr -de PServer_DE -outputDir /opt/labfiles/scripts/updated/
Logging to file /opt/IBM/BPM/logs/config/BPMConfig_20160802-140251.log.
The 'BPMConfig.sh -export -profile PServerDmgr -de PServer_DE -outputDir /opt/labfiles/scripts/updated/' command completed successfully.
localuser@bpminstance:/opt/IBM/BPM/bin$
```

- \_\_\_ e. Go to the /opt/labfiles/scripts/updated directory.

- \_\_\_ f. List the directory contents to see the files that are created during the export operation.  
Enter the following command:

```
ls
```

```
localuser@bpmhost: /opt/labfiles/scripts/updated
localuser@bpmhost:/opt/IBM/BPM/bin$ cd /opt/labfiles/scripts/updated
localuser@bpmhost:/opt/labfiles/scripts/updated$ ls
Application-config-bpc.xml ProcessServer_100SourceCustomMerged.xml
fileRegistry.xml PServer_DE.properties
ltpa.jceks resources-bpc.xml
PDW_100SourceCustomMerged.xml
localuser@bpmhost:/opt/labfiles/scripts/updated$
```

You can see that a number of files are created. The new properties file is named PServer\_DE.properties.

### **Part 3: Verifying messaging engine failover**

- \_\_\_ 1. Verify the status of the messaging engines by using the JVM logs.
- \_\_\_ a. Open File Browser and change to the /opt/IBM/BPM/profiles/PServerNode01/logs/MEClusterMember1 directory.
  - \_\_\_ b. Open the SystemOut.log file. Look for the messages about the messaging engine. You can find messages that are related to the messaging engine by searching for the word "MECluster.000." You see the following message in the JVM log for MEClusterMember1. Typically, this message is at the end of the log file:

Messaging engine MECluster.000-BPM.PServer\_DE.Bus is in state Started.



#### **Note**

You see messages in the log that indicate that the messaging engines went from the joined state to the starting state to the started state, which is the normal behavior. The last status messages in the log file indicate that the engines are in the started state.

- 
- \_\_\_ c. Close the SystemOut.log file, but leave File Browser open.
  - \_\_\_ d. Repeat the previous steps to explore the SystemOut.log file for MEClusterMember2. In File Browser, change to the /opt/IBM/BPM/profiles/PServerNode02/logs/MEClusterMember2 directory.
  - \_\_\_ e. Open the SystemOut.log file. Look for the messages about the messaging engine. You see the following message in the JVM log for MEClusterMember1. Typically, this message is at the end of the log file:

Messaging engine MECluster.000-BPM.PServer\_DE.Bus is in state Joined.

- \_\_\_ f. Close the SystemOut.log file, but leave File Browser open.



## Information

By default, when you start the messaging cluster, the first server that is started activates the messaging engine for the bus you configured. In this example, MEClusterMember1 is started first and activates the messaging engine. There is no problem if your runtime is different and MEClusterMember2 is running the active messaging. This runtime means that MEClusterMember2 started first and activated the messaging engine. Verify that the messaging engine on MEClusterMember1 is in a joined state.

- \_\_\_ 2. Verify messaging engine failover. To verify, you must stop the server that activated the messaging engine.
  - \_\_\_ a. Maximize the administrative console.
  - \_\_\_ b. Click **Servers > Server Types > WebSphere application servers**.
  - \_\_\_ c. Select the **MEClusterMember1** check box and click **Stop**.



## Hint

If MEClusterMember2 started the messaging engine in your runtime, stop MEClusterMember2.

- \_\_\_ d. Click **OK** to stop the server.
  - \_\_\_ e. Click **OK**.
  - \_\_\_ f. Click **Service integration > Buses > BPM.PServer\_DE.Bus > Messaging engines**. Verify that the messaging engine is started.
  - \_\_\_ g. Minimize the administrative console.
  - \_\_\_ h. In the File Browser, open the `SystemOut.log` file for MEClusterMember2. Look for the messages about the messaging engine. Typically, this message is at the end of the log file:  
  
Messaging engine MECluster.000-BPM.PServer\_DE.Bus is in state Started.
  - \_\_\_ i. Verify that the messaging engine is started. Failover for the messaging engine is working properly.
- \_\_\_ 3. Stop the MECluster.
    - \_\_\_ a. Maximize the administrative console.
    - \_\_\_ b. Click **Servers > Clusters > WebSphere application server clusters**.
    - \_\_\_ c. Select the **MECluster** check box and click **Stop**.

## 11.2. Creating messaging engine policies (optional)

By default, when you start the messaging cluster, the first server that is started activates the messaging engine for the bus you configured. To override this behavior, you must create a messaging engine policy and configure the preferred servers list to reflect which cluster member can run the messaging engine. In production, you might want to create policies to ensure that the most robust computer available is always the preferred messaging server. This configuration also allows you to use different servers to run the required messaging engines.

In this part of the exercise, you configure policies for the BPM.PServer\_DE.Bus messaging engine.

### **Part 1: Creating the policy**

In this part of the exercise, a policy is created for the BPM.PServer\_DE.Bus where the servers are MEClusterMember1 and MEClusterMember2. You create a policy to set MEClusterMember2 as the preferred server.

- \_\_ 1. Create a messaging engine policy for the BPM.PServer\_DE.Bus.
  - \_\_ a. Click **Servers > Core Groups > Core group settings**.



- \_\_ b. Click **DefaultCoreGroup**.

Select	Name	Description	Connected core groups
You can administer the following resources:			
	<a href="#">DefaultCoreGroup</a>	Default Core Group. The default core group cannot be deleted.	
Total 1			

- \_\_ c. In the Additional Properties section, click **Policies**.

The screenshot shows the 'Core Groups' properties dialog for the 'DefaultCoreGroup'. The 'Runtime' tab is selected. The 'General Properties' section contains fields for 'Name' (set to 'DefaultCoreGroup') and 'Description' (set to 'Default Core Group. The default core group cannot be deleted.'). The 'Additional Properties' section lists several options: 'Core group servers', 'Discovery and failure detection', 'Policies' (which is highlighted with a red box), 'Preferred coordinator servers', and 'Custom properties'. The 'Policies' option is the target for step c.

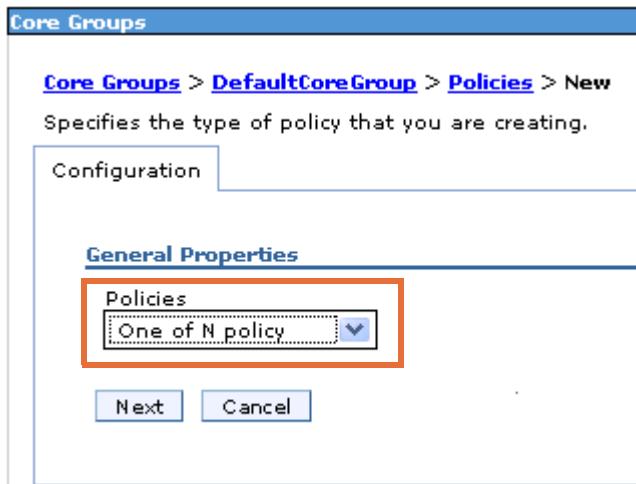
- \_\_ d. Click **New**.

The screenshot shows the 'Policies' page for the 'DefaultCoreGroup'. The title is 'Core Groups > DefaultCoreGroup > Policies'. A message says: 'Use this page to view and manage the policies associated with a core group. Coordinators use these policies to determine on which servers the core group members are activated or deactivated.' Below this is a 'Preferences' section with a 'New' button highlighted with a red box. The main area shows a table of policies:

Select	Name	Description	Policy type	Match criteria
<input type="checkbox"/>	<a href="#">Clustered TM Policy</a>	TM One-Of-N Policy	One of N policy	type=WAS_TRANSACTIONS
<input type="checkbox"/>	<a href="#">Default SIBus Policy</a>	SIBus One-Of-N Policy	One of N policy	type=WSAF_SIB
<input type="checkbox"/>	<a href="#">Default Sip Quorum Policy</a>	SIP All-active-policy with quorum disabled by default	All active policy	type=SIP_QUORUM

Total 3

- \_\_\_ e. In the General Properties section, from the **Policies** field, select **One of N policy**.



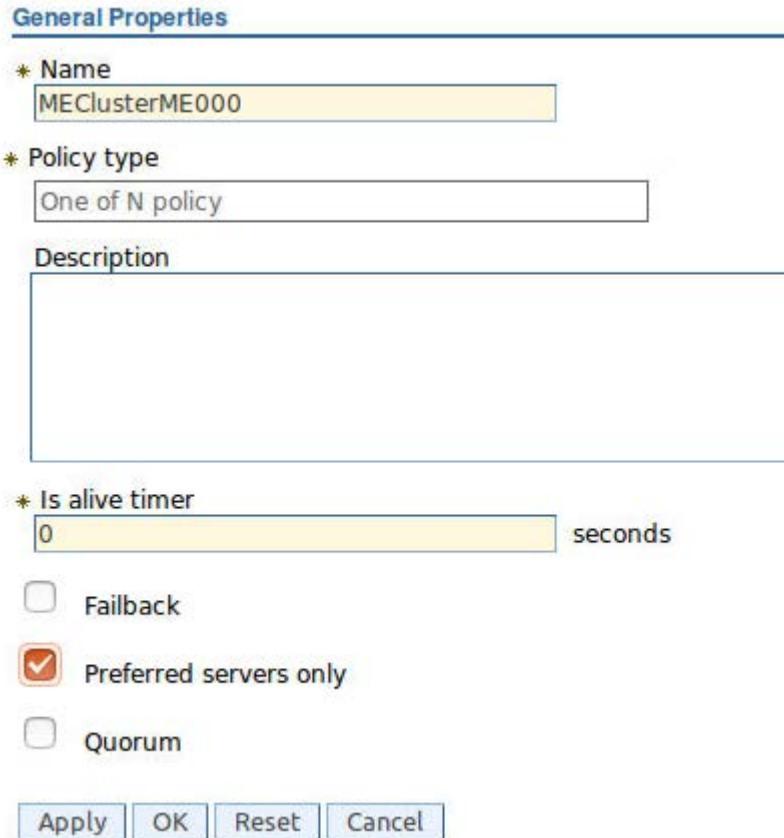
- \_\_\_ f. Click **Next**.

- \_\_\_ g. In the General Properties section, make the following entries:

- For **Name**, enter: MEClusterME000 (zero zero zero)
- **Policy type** is automatically set to **One of N policy**
- Leave the **Is alive timer** set to 0

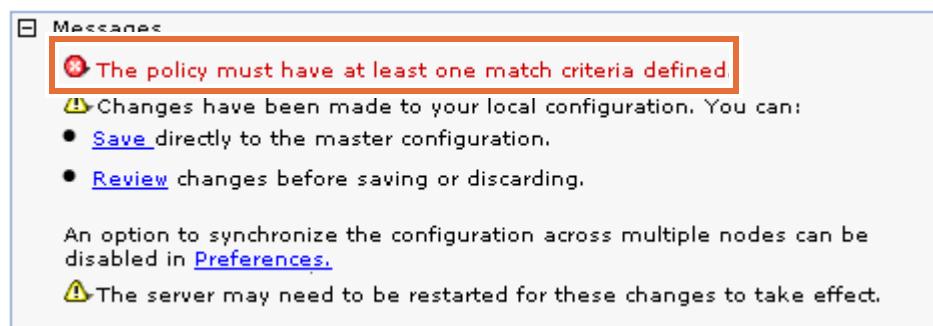
This field specifies the time interval, in seconds, at which the high availability manager checks the health of all of the active high availability group members that are running this application server process. If 0 (zero) is specified, the default value of 120 seconds is used.

- Select the **Preferred servers only** check box. (By selecting the **Preferred servers only** check box, the messaging engine is incapable of running on a server that is not in the preferred servers list.)



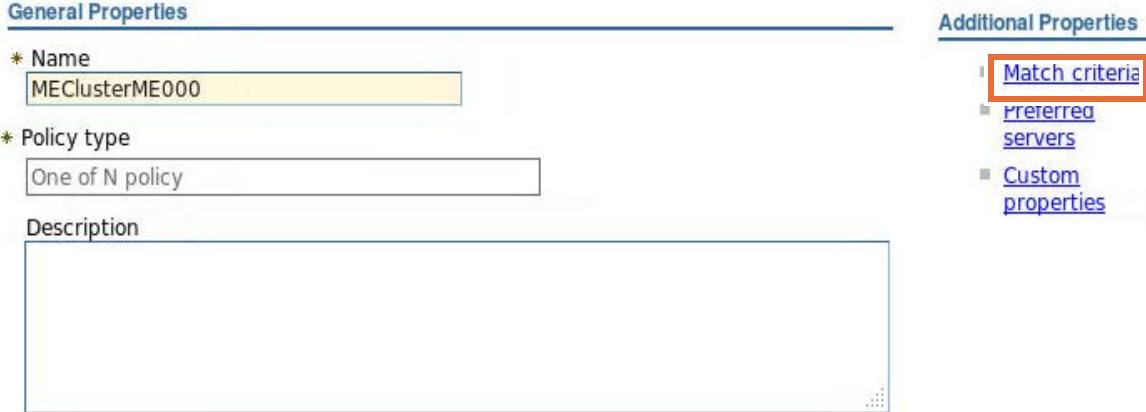
\_\_ h. Click **OK**. You can see the following message at the top of the window:

The policy must have at least one match criteria defined.

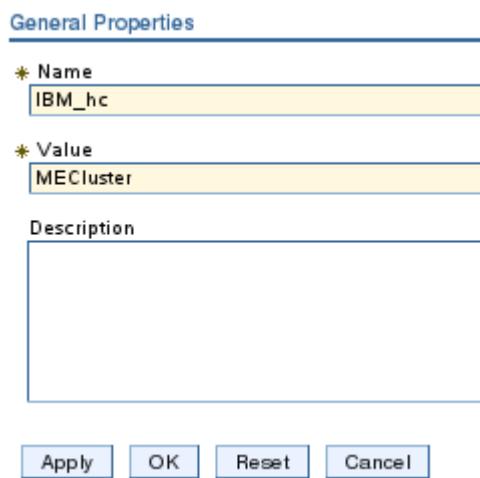


- \_\_ i. Save the changes. Click **OK**.
- \_\_ 2. Create the match criteria.
- \_\_ a. On the Policies pane, click **MEClusterME000**.

- \_\_\_ b. In the Additional Properties section, click **Match Criteria**.



- \_\_\_ c. Click **New**.  
 \_\_\_ d. In the General Properties section, enter the following information:  
   - **Name:** IBM\_hc (all messaging engines in a particular cluster)  
   - **Value:** MECluster



- \_\_\_ e. Click **OK**.  
 \_\_\_ f. When you are returned to the Match criteria pane, click **New**.

\_\_ g. In the General Properties section, enter the following information:

- **Name:** WSAF\_SIB\_BUS (a particular bus)
- **Value:** BPM.PServer\_DE.Bus

**General Properties**

* Name	WSAF_SIB_BUS
* Value	BPM.PServer_DE.Bus
Description	

**Apply** **OK** **Reset** **Cancel**

\_\_ h. Click **OK**.

\_\_ i. When you are returned to the Match criteria pane, click **New**.

\_\_ j. In the General Properties section, enter the following information:

- **Name:** WSAF\_SIB\_MESSAGING\_ENGINE (a particular messaging engine)
- **Value:** MECluster.000-BPM.PServer\_DE.Bus

**General Properties**

* Name	WSAF_SIB_MESSAGING_ENGINE
* Value	MECluster.000-BPM.PServer_DE.Bus
Description	

**Apply** **OK** **Reset** **Cancel**

\_\_ k. Click **OK**.

\_\_ l. When you are returned to the Match criteria pane, click **New**.

\_\_ m. In the General Properties section, enter the following information:

- **Name:** type (any messaging engine)
- **Value:** WSAF\_SIB

General Properties

\* Name  
type

\* Value  
WSAF\_SIB

Description

Apply OK Reset Cancel

- \_\_\_ n. Click **OK**. Because this policy now has a match weight factor of 4, it overrides the default SIBus policy with its match weight factor of 1.
- \_\_\_ o. Save the changes and click **OK** when synchronization is complete.
- \_\_\_ 3. Set the preferred servers.
  - \_\_\_ a. Click the **MEClusterME000** link in the breadcrumb trail at the top of the core groups pane.

**Core Groups > DefaultCoreGroup > Policies : MEClusterME000 · Match criteria**

Use this page to define the match criteria for the policy. Match criteria consist of name-value pairs of data, in which the name is a property key and the value is a string value.

+ Preferences

New... Delete			
Select	Name ▾	Value ▾	Description ▾
You can administer the following resources:			
<input type="checkbox"/>	<a href="#">IBM_hc</a>	MECluster	
<input type="checkbox"/>	<a href="#">WSAF_SIB_BUS</a>	BPM.PServer_DE.Bus	
<input type="checkbox"/>	<a href="#">WSAF_SIB_MESSAGING_ENGINE</a>	MECluster.000-BPMPServer_DE.Bus	
<input type="checkbox"/>	<a href="#">type</a>	WSAF_SIB	
Total 4			

- \_\_ b. In the Additional Properties section, click **Preferred servers**.

General Properties		Additional Properties
* Name	MEClusterME000	<a href="#">Match criteria</a>
* Policy type	One of N policy	<a href="#">Preferred servers</a>
Description		<a href="#">Custom properties</a>

- \_\_ c. In the Core group servers section, select **PServerNode01/MEClusterMember1** and click **Add**.

The server PServerNode01/MEClusterMember1 is added to the Preferred servers section. Because it is the first server in the list, this server runs the messaging engine for the PServer\_DE.Bus.

- \_\_ d. In the Core group servers section, select **PServerNode02/MEClusterMember2** and click **Add>>**.

**Preferred servers**

[Move up ^](#)   [Move down v](#)

PServerNode01/MEClusterMember1

PServerNode02./MEClusterMember2

Verify that both servers are added to the Preferred servers section. You can also add multiple servers at the same time by using the Ctrl key.



### Note

The policy type that is configured is One of N with preferred servers, and the **Preferred servers only** setting is configured. The setting defines the behavior for the messaging engine so it runs only on servers in the list of preferred servers. The engine runs on the first server in the preferred servers list by default. It can fail over to the next server in the preferred list that is available at the time of failover. If no preferred servers are available, it cannot fail over to any other servers in the cluster. The messaging engine cannot run on a server that is not in the preferred servers list when **Preferred servers only** setting is configured.

The earlier a server is in the preferred servers list, the stronger the preference is for that server.

- \_\_\_ e. Move up MEClusterMember2 in the list so it is the first preferred server. Select **PServerNode02/MEClusterMember2** and click **Move up**. The server is now first, which indicates that you prefer to run the messaging engine on MEClusterMember2.



- \_\_\_ f. Click **OK**.
- \_\_\_ g. Save the changes to the master configuration.
- \_\_\_ h. Click **OK**. You are returned to the Policies pane and you can see MEClusterME000, which is the new policy.

<input type="button" value="New..."/> <input type="button" value="Delete"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
Select	Name	Description	Policy type	Match criteria
You can administer the following resources:				
<input type="checkbox"/>	<a href="#">Clustered TM Policy</a>	TM One-Of-N Policy	One of N policy	type=WAS_TRANSACTIONS
<input type="checkbox"/>	<a href="#">Default SIBus Policy</a>	SIBus One-Of-N Policy	One of N policy	type=WSAF_SIB
<input type="checkbox"/>	<a href="#">Default Sip Quorum Policy</a>	SIP All-active-policy with quorum disabled by default	All active policy	type=SIP_QUORUM
<input type="checkbox"/>	<a href="#">MEClusterME000</a>		One of N policy	IBM_hc=MECluster, WSAF_SIB_BUS=BPM.PServer_DE.Bus, WSAF_SIB_MESSAGING_ENGINE=MECluster.000 BPMPServer_DE.Bus, type=WSAF_SIB
Total 4				

## Part 2: Verifying the cluster configuration

Now that you completed the configuration of your messaging cluster, you can verify that the cluster members start without error and that the messaging policy is working correctly. According to the policies you created in the previous part, the BPM.PServer\_DE.Bus messaging engine on server PServerNode01/MEClusterMember1 should be in the joined state. The BPM.PServer\_DE.Bus messaging engine on server PServerNode02/MEClusterMember2 should be in the started state.

- \_\_\_ 1. Delete the `SystemOut.log` files for the MECluster cluster members.
  - \_\_\_ a. In File Browser, change to the `/opt/IBM/BPM/profiles/PServerNode01/logs/MEClusterMember1` directory.
  - \_\_\_ b. Delete the `SystemOut.log` file. Deleting the log file is not necessary. However, for the exercises, you delete the log file to start a new, smaller log file that contains fewer items to search.
  - \_\_\_ c. Change to the `/opt/IBM/BPM/profiles/PServerNode02/logs/MEClusterMember2` directory and delete the `SystemOut.log` file.
- \_\_\_ 2. Verify that the cluster members start without error.
  - \_\_\_ a. In the administrative console, click **Servers > Server Types > Clusters > WebSphere application server clusters**.
  - \_\_\_ b. Select the **MECluster** check box and click **Start**.

Wait a moment for the cluster to start before proceeding. When the cluster is started, the console refreshes, and the status changes from a dotted green arrow (partial start) to a solid green arrow (started). To manually refresh the console, click the **Refresh** icon.



### Hint

If you are still running the tail command for the logs, you can observe the output in the terminal window.

- 
- \_\_\_ c. Click **MECluster > Messaging engines**. Verify that the messaging engine has a state of started.
- 



### Hint

If a messaging engine is not started, verify the entries for the match criteria for the policy that is applied to the messaging engine.

- 
- \_\_\_ 3. Verify the status of the messaging engines by using the JVM logs.
    - \_\_\_ a. Open File Browser and change to the `/opt/IBM/BPM/profiles/PServerNode01/logs/MEClusterMember1` directory.
    - \_\_\_ b. Open the `SystemOut.log` file. According to your policies, the messaging engine is not started on this server. It is in a joined state.

You can find messages that are related to the messaging engine by searching for the word “MECluster.000.” You see the following message in the JVM log for MEClusterMember1. Typically, this message is at the end of the log file:

Messaging engine MECluster.000-BPM.PServer\_DE.Bus is in state Joined.

- \_\_\_ c. Close the SystemOut.log file but leave File Browser open.
- \_\_\_ d. Repeat the previous steps to explore the SystemOut.log file for MEClusterMember2. In File Browser, change to the /opt/IBM/BPM/profiles/PServerNode02/logs/MEClusterMember2 directory.

Open the SystemOut.log file. According to your policies, the messaging engine is in the Started state. You see the following message in the JVM log for MEClusterMember1. Typically, this message is at the end of the log file:

Messaging engine MECluster.000-BPM.PServer\_DE.Bus is in state Started.

- \_\_\_ e. Close the SystemOut.log file, but leave File Browser open.



### Note

If you see that MEClusterMember1 is in the state of “started” and not “joined,” stop the MECluster cluster and repeat the steps again. Delete the SystemOut.log file for each cluster member, and stop and start the cluster. You see messages in the log that indicate that the messaging engines went from state of “started” to the state of “stopping” to state of “joined.” The process takes a few minutes and a few tries to complete.

- 
- \_\_\_ f. Close the File Browser.
  - \_\_\_ g. Exit any terminal windows that are open.

### Part 3: Verifying the formation of the high availability groups

- 1. Verify the high availability groups.
  - a. In the navigation pane of the administrative console, click **Servers > Core Groups > Core group settings**.
  - b. Click **DefaultCoreGroup**.
  - c. In the DefaultCoreGroup pane, click the **Runtime** tab.

#### [Core Groups > DefaultCoreGroup](#)

Use this page to specify the settings for a core group.

Operations    **Runtime**    Configuration

**General Properties**

\* Name  
DefaultCoreGroup

Description  
Default Core Group. The default core group cannot be deleted.

\* Number of coordinators  
1

- d. In the Group name properties section, click **Show groups**.

#### [Core Groups > DefaultCoreGroup](#)

Use this page to specify the settings for a core group.

Operations    Runtime    Configuration

**Group name properties**

\* Group name properties  
\*

Number of matches  
7    Calculate groups

**Show groups**    Show servers

The entry in the **Number of matches** field in your environment might not match the number in the screen capture (7). The difference does not indicate an issue with your environment.

- \_\_\_ e. In the High availability groups pane, you can see a number of high availability groups. The one entry corresponds to the policy you created. Select the high availability group name that represents the **MECluster000** policy.

High availability group ^
an administer the following resources:
<u>BPM_Repo=BPM_Repo,IBM_hc=MECluster,type=WSAF_SIB</u>
<u>ES_HA=ES_HA,IBM_hc=MECluster,type=WSAF_SIB</u>
<u>GN_PS=PROD-PServerCell\PServerNode01</u> <u>\MEClusterMember1,IBM_hc=MECluster,type=WAS_TRANSACTIONS</u>
<u>GN_PS=PROD-PServerCell\PServerNode02</u> <u>\MEClusterMember2,IBM_hc=MECluster,type=WAS_TRANSACTIONS</u>
<u>IBM_hc=MECluster,WSAF_SIB_BUS=BPM.PServer_DE.Bus,WSAF_SIB_MESSAGING_ENGINE=MECluster.000</u> <u>BPM.PServer_DE.Bus,type=WSAF_SIB</u>
<u>IBM_hc=MECluster,policy=AllActiveQuorumPolicy,type=SIP_QUORUM</u>
<u>RepDomainName=dummyRepDomain,WMContextRoot=SessionRemoteInvalidateAll,policy=DefaultNOOPPolicy</u>

- \_\_\_ f. The messaging engine is running on MECluster\_member2 as the status indicates that it is active.

[Core Groups](#) > [DefaultCoreGroup](#) > [High availability groups](#) > [High availability group](#)

Use this page to manage the state of members of a high availability group. The page lists the current members of the high availability group. Note: only high availability groups governed by a 'No operation' policy can have its members activated and deactivated.

[+ Preferences](#)

<a href="#">Enable</a> <a href="#">Disable</a> <a href="#">Activate</a> <a href="#">Deactivate</a>				
Select	Name	Node	Version	Status
You can administer the following resources:				
<input type="checkbox"/>	MEClusterMember1	PServerNode01	8.5.5.8	
<input type="checkbox"/>	MEClusterMember2	PServerNode02	8.5.5.8	
Total 2				

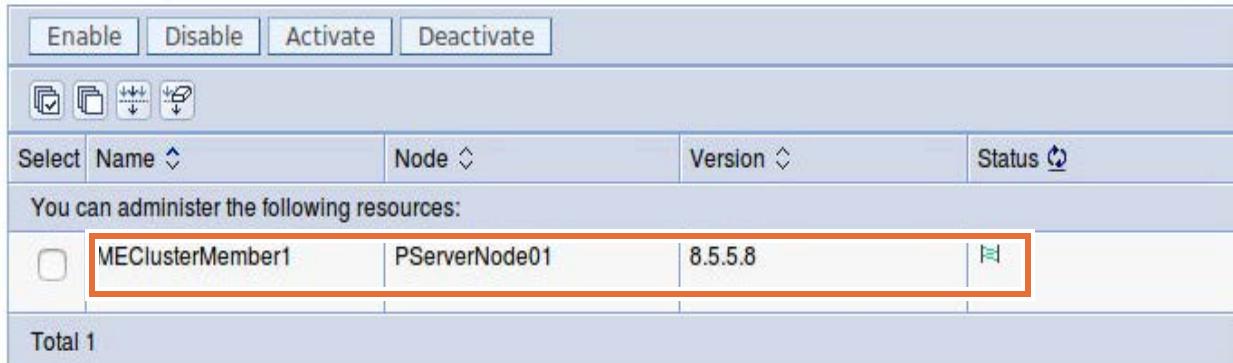
## Part 4: Verifying failover functions

- \_\_\_ 1. Verify failover of the messaging engines.
  - \_\_\_ a. In the administrative console, click **Servers > Server Types > WebSphere application servers**.
  - \_\_\_ b. Select the **MEClusterMember2** check box and click **Stop**.
  - \_\_\_ c. Click **OK**.
  - \_\_\_ d. Wait for the server to stop. Click **OK**.
  - \_\_\_ e. Click **Servers > Core Groups > Core group settings > DefaultCoreGroup**.
  - \_\_\_ f. In the DefaultCoreGroup pane, click the **Runtime** tab.
  - \_\_\_ g. Click **Show groups**.
  - \_\_\_ h. Select the high availability group name that represents the **MECluster000** policy. The messaging engine is running on MEClusterMember1 as the status indicates that it is active. Failover is successful.

### [Core Groups > DefaultCoreGroup > High availability groups > High availability group](#)

Use this page to manage the state of members of a high availability group. The page lists the current members of the high availability group. Note: only high availability groups governed by a 'No operation' policy can have its members activated and deactivated.

#### [+ Preferences](#)



Select	Name	Node	Version	Status
You can administer the following resources:				
<input type="checkbox"/>	MEClusterMember1	PServerNode01	8.5.5.8	
Total 1				

- \_\_\_ i. Click **Servers > Clusters > WebSphere application server clusters**.
- \_\_\_ j. Select the **MECluster** check box and click **Stop**. Wait for the server to stop.

## 11.3. Sharing transaction and recovery log files

A transaction log file (`translog`) stores critical transactional data that is written to a database. It is an internal file that WebSphere uses to manage in-flight transactions and attempts to recover them if the server locks up. How does this work? The transaction service logs information about active transactional work in the transaction recovery log. The transaction recovery log stores the information in a persistent form, which means that any transactional work in progress at the time of a server failure can be resolved when the server is restarted. This activity is known as transaction recovery processing. In addition to completing outstanding transactions, this processing also ensures that any locks that are held in the associated resource managers are released.

As an administrator, you must have a recovery process to recover from a failure in your environment. Two critical steps in a recovery process are to not have the transaction logs local on the cluster members and to not delete transaction logs. Transaction logs are placed on a shared drive. A shared drive is the only way to allow peer recovery, which helps minimize the downtime during recovery. Note, peer recovery processing takes place between members of the same server cluster. The high availability of the transaction service configures any server in a cluster to recover the transactional work for any other server in the same cluster.

To configure transaction-related aspects of servers for optimum availability, store the transaction log files on a fast disk in a highly available file system, such as a RAID device. Every global transaction must access the transaction log file and use it for transaction recovery after a crash. Therefore, the disk that the log files are being written to should be on a highly available file system, such as a RAID device.

The performance of the disk also directly affects the transaction performance. In general, a global transaction makes two disk writes, one after the prepare phase when the outcome of the transaction is known (this information is forced to disk) and a further disk write at transaction completion. Therefore, the transaction logs should be placed on the fastest disks available.

In order for automatic failover of transaction log recovery to work in a cluster topology, network-mounted devices must be used for storing the transaction logs. A fast, highly available file system, such as a RAID device, provides the best storage choice. Each cluster member must be able to access the system.



### Attention

Never delete the transaction logs from a production environment. Deleting the `translog` file removes information about in-flight transactions from the IBM Business Process Manager memory. Without the `translog` file, there is no ability to recover transactional information. In addition, long-running processes remain in an inconsistent state, and you cannot complete the process flow except by deleting running instances. Deleting running instances might cause you to lose operational or business-critical data, which makes the database inconsistent with the messaging destination.

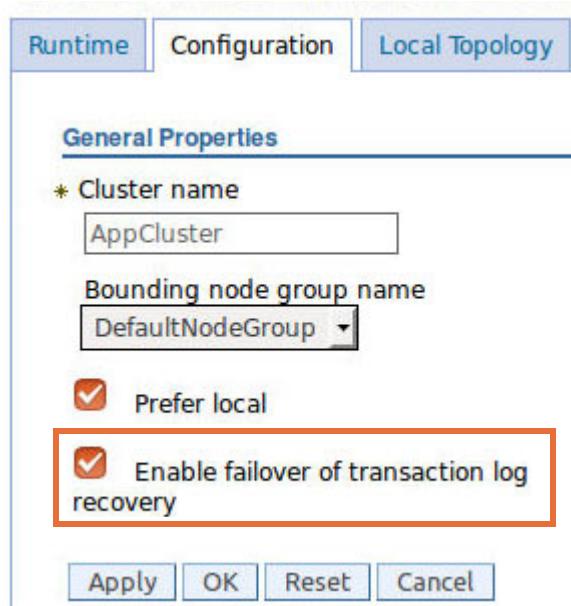
### **Part 1: Configuring failover**

By default, an application server places transaction log files in a subdirectory of the installed environment, where the subdirectory name is the same as the server name. You can define a specific location for the transaction log directory for an application server by setting the **Transaction Log Directory** property for the server.

To configure failover handling, the transaction and recovery log of each cluster member must be shared. Through sharing, each node or cluster member accesses common log files. From the multiple technologies available today to establish a shared file store among systems, choose whatever fits your needs best.

In this part of the exercise, transaction and recovery log sharing is configured, and the shared file store technique that is used for this example is Network File System (NFS).

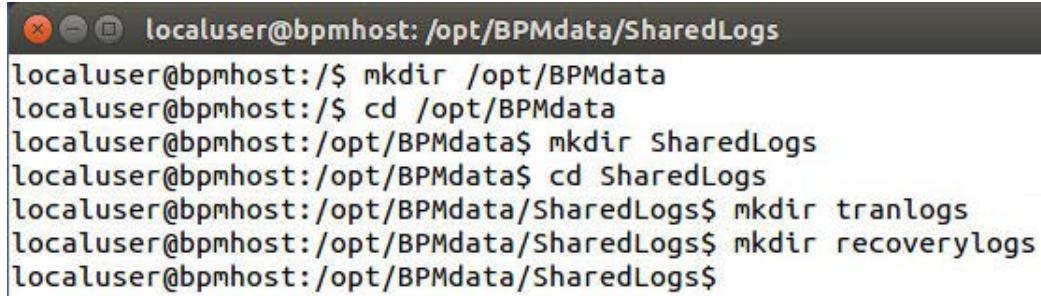
- \_\_\_ 1. Configure failover for each cluster.
  - \_\_\_ a. In the navigation pane of the administrative console, click **Servers > Clusters > WebSphere application server clusters**.
  - \_\_\_ b. Click **AppCluster**.
  - \_\_\_ c. In the General Properties section, select **Enable failover of transaction log recover**.



- \_\_\_ d. Click **OK**.
- \_\_\_ e. Repeat the previous steps for the **MECluster** and **SupCluster**.
- \_\_\_ f. Save the changes. Click **OK**.
- \_\_\_ g. Minimize the administrative console browser.
- \_\_\_ 2. Create the transaction and recovery log directories.
  - \_\_\_ a. Open a terminal window.

- \_\_\_ b. Enter the following commands to create the required directories:

```
mkdir /opt/BPMdata
cd /opt/BPMdata
mkdir SharedLogs
cd SharedLogs
mkdir tranlogs
mkdir recoverylogs
```



```
localuser@bpghost: /opt/BPMdata/SharedLogs
localuser@bpghost: $ mkdir /opt/BPMdata
localuser@bpghost: $ cd /opt/BPMdata
localuser@bpghost: /opt/BPMdata$ mkdir SharedLogs
localuser@bpghost: /opt/BPMdata$ cd SharedLogs
localuser@bpghost: /opt/BPMdata/SharedLogs$ mkdir tranlogs
localuser@bpghost: /opt/BPMdata/SharedLogs$ mkdir recoverylogs
localuser@bpghost: /opt/BPMdata/SharedLogs$
```

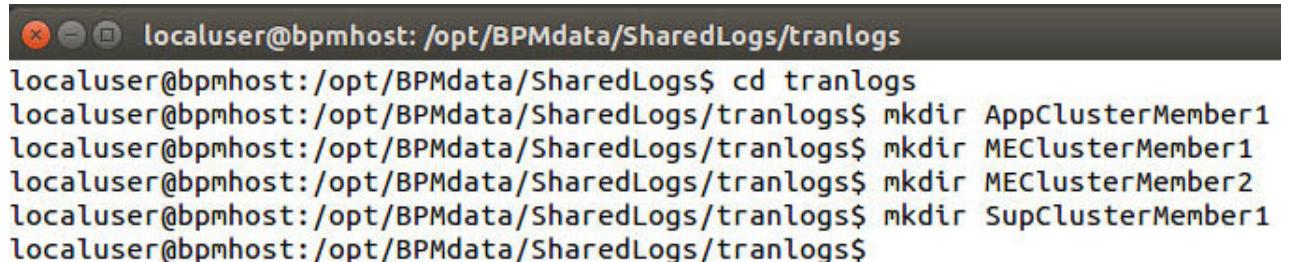


### Note

This scenario assumes that the defined mount point on the file system is `/BPMdata` and that this mount point is available to every node of the cell.

- \_\_\_ c. Create a directory for each server in the environment by using the following commands:

```
cd tranlogs
mkdir AppClusterMember1
mkdir MEClusterMember1
mkdir MEClusterMember2
mkdir SupClusterMember1
```



```
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs
localuser@bpghost: /opt/BPMdata/SharedLogs$ cd tranlogs
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs$ mkdir AppClusterMember1
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs$ mkdir MEClusterMember1
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs$ mkdir MEClusterMember2
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs$ mkdir SupClusterMember1
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs$
```

- \_\_\_ d. Create a directory for each server in the AppCluster cluster by using the following commands:

```
cd ../recoverylogs/
mkdir AppClusterMember1
```

```
localuser@bpghost: /opt/BPMdata/SharedLogs/recoverylogs
```

```
user@bpghost:/opt/BPMdata/SharedLogs/tranlogs$ cd .. /recoverylogs/
user@bpghost:/opt/BPMdata/SharedLogs/recoverylogs$ mkdir AppClusterMember1
user@bpghost:/opt/BPMdata/SharedLogs/recoverylogs$
```

- \_\_\_ 3. Configure each of the cluster members in the shared transaction log folder.
  - \_\_\_ a. Maximize the administrative console browser window.
  - \_\_\_ b. Click **Servers > Server Types > WebSphere application servers > AppClusterMember1**.
  - \_\_\_ c. In the Container Settings section, expand **Container Services** and click **Transaction Service**.
  - \_\_\_ d. In the General Properties section, make the following changes:
    - For **Transaction log directory**, enter:  
/opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1
    - Clear the **Enable file locking** check box.

**Transaction log directory**  
/BPMdata/SharedLogs/tranlogs/AppClus

\* Total transaction lifetime timeout  
120 seconds

\* Async response timeout  
30 seconds

\* Client inactivity timeout  
60 seconds

\* Maximum transaction timeout  
14400 seconds

Heuristic retry limit  
0 retries

Heuristic retry wait  
0 seconds

Enable logging for heuristic reporting

Heuristic completion direction  
ROLLBACK ▾

Accept heuristic hazard

Enable file locking



## Information

If you use Network File System (NFS) for storing transaction recovery logs, and you want to use automated peer recovery, you must first disable file locking. WebSphere obtains an exclusive lock on the physical recovery log files whenever it is instructed to undertake recovery processing, and releases this lock when it is instructed to pass ownership of the logs to another server. Access to a recovery log is available only when the exclusive lock is held.

NFSv3 supports exclusive file locks, but holds them on behalf of a failed host until that host can restart. In this context, the host is the physical computer that is running the application server that requests the lock. It is the restart of the host, not the application server, that eventually triggers the locks to release.

- e. Keep all remaining defaults. Scroll to the bottom and click **OK**.
  - f. Save the changes.
  - g. Click **OK**. You are placed on the Application servers pane. Repeat the previous steps for each of the remaining cluster members to configure their specific transaction logs.
4. Configure the members of the AppCluster cluster to the shared recovery folder.



## Note

In the course exercises, there is only one member of the AppCluster cluster. However, in production, to provide high availability, you would have multiple cluster members.

- a. On the Application servers pane, click **AppClusterMember1**.
- b. In the Container Settings section, expand **Container Services** and click **Compensation Service**.
- c. In the General Properties section, make the following changes:
  - Verify that the **Enable service at server startup** check box is selected
  - For **Recovery log directory**, enter:  
`/opt/BPMdata/SharedLogs/recoverylogs/AppClusterMember1`
- d. Keep all remaining defaults. Scroll to the bottom and click **OK**.
- e. Save the changes. Click **OK**.

## Part 2: Verifying failover

- 1. Start the clusters.
  - a. In the navigation pane of the administrative console, click **Servers > Clusters > WebSphere application server clusters**.
  - b. Select **MECluster** and click **Start**. Wait for the cluster to start.
  - c. Select **SupCluster** and click **Start**.

- d. Select **AppCluster** and click **Start**. Wait for the cluster to start.
  - e. Minimize the administrative console browser window.
2. Verify that the `translog` and `recoverylog` files exist.
- a. In a terminal window, change to the `/opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1` directory.
  - b. List the directory contents, and verify the `partnerlog` and `translog` directories. List the contents of each of these directories.

```
localuser@bpghost: /opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1
localuser@bpghost:/opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1$ ls
partnerlog tranlog
localuser@bpghost:/opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1$ ls -l
log
total 8
-rw-r--r-- 1 localuser localuser 0 Aug 3 15:46 DO NOT DELETE LOG FILE
-rw-r--r-- 1 localuser localuser 1048576 Aug 3 15:51 log1
-rw-r--r-- 1 localuser localuser 1048576 Aug 3 15:46 log2
localuser@bpghost:/opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1$ ls -l
nerlog/
total 40
-rw-r--r-- 1 localuser localuser 0 Aug 3 15:46 DO NOT DELETE LOG FILE
-rw-r--r-- 1 localuser localuser 1048576 Aug 3 15:46 log1
-rw-r--r-- 1 localuser localuser 1048576 Aug 3 15:49 log2
localuser@bpghost:/opt/BPMdata/SharedLogs/tranlogs/AppClusterMember1$
```

The files `log1` and `log2` exist in the `translog` directory. Note the `DO NOT DELETE LOG FILES` message as a reminder to never delete transaction log files. You can also see the `log1` and `log2` files in the `partnerlog` directory.

- c. Repeat the previous steps for the remaining cluster member directories.
- d. Repeat the previous steps to verify the `/opt/BPMdata/SharedLogs/recoverylogs/AppClusterMember1` directory.



### Information

To avoid confusion, it is also a good idea to delete the log files in the directory where they were previously stored.

- e. Exit the terminal window when completed.
  - f. Maximize the administrative console browser window.
3. Stop the clusters.
- a. In the navigation pane of the administrative console, click **Servers > Clusters > WebSphere application server clusters**.
  - b. Select each of the clusters and click **Stop**. Wait for the cluster to stop.

- c. Log out of the administrative console.
- d. Close the browser window.

## End of exercise

## Exercise review and wrap-up

This exercise covered the creation of a second node and second cluster member in the MECluster. Next, you create messaging engine policies to set a preferred server in the MECluster cluster. Finally, high availability of transaction and recovery log files was configured.

---

# Exercise A. Installing IBM Business Process Manager Advanced by using the GUI

## Overview

This exercise covers the installation of IBM Business Process Manager Advanced by using the GUI.

## Objectives

After completing this exercise, you should be able to:

- Install IBM Business Process Manager Advanced
- Confirm the installation

## Introduction

IBM Installation Manager is an installation management tool that installs and maintains Installation Manager-based software packages. You can use the Eclipse-based tool to install and modify packages, search for updates, uninstall, and rollback updates. Installation Manager makes it easier for you to download and install code for a number of IBM software packages.

IBM Installation Manager is used to install IBM Business Process Manager. IBM Business Process Manager is available in four configurations where each targets various enterprise needs. The following four configurations can be installed:

- Advanced
- Advanced: Process Server
- Standard
- Express

In this exercise, IBM Business Process Manager Advanced is installed.

## Requirements

To complete this exercise, you need the IBM Business Process Manager Advanced binary files for IBM Business Process Manager Advanced.

## Exercise instructions

### Part 1: *Installing IBM Business Process Manager Advanced*

Before you install IBM Installation Manager, you must make several decisions. First, you must decide in which mode to run Installation Manager. The mode determines which user or user group can complete the installation. The choices are administrator, non-administrator, or group. Second, you must decide where the product files and runtime data are going to be located.

In this part of the exercise, you install IBM Installation Manager as a non-root user. Then, using IBM Installation Manager, you install IBM Business Process Manager.



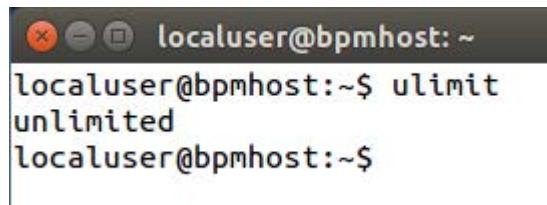
#### Information

You can find more details about the IBM Installation Manager in the IBM Knowledge Center at:

[http://www.ibm.com/support/knowledgecenter/SSDV2W\\_1.8.4/com.ibm.cic.agent.ui.doc/helpindex\\_imic.html](http://www.ibm.com/support/knowledgecenter/SSDV2W_1.8.4/com.ibm.cic.agent.ui.doc/helpindex_imic.html)

- 
- \_\_\_ 1. Install IBM Installation Manager.
    - \_\_\_ a. Open a terminal window.
    - \_\_\_ b. On Linux, you must set the level of ulimit open files for the installation. The ulimit open files values must be set to a minimum value of 65536. To verify the value, enter the following command:

`ulimit`

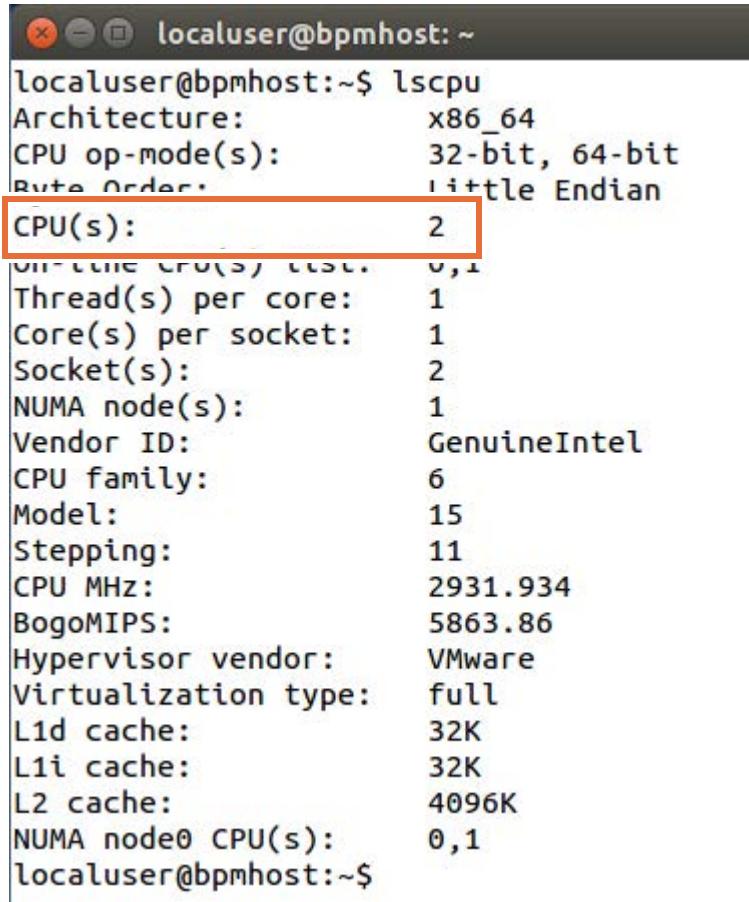


A screenshot of a terminal window titled "localuser@bpmhost: ~". The window contains the following text:  
localuser@bpmhost:~\$ ulimit  
unlimited  
localuser@bpmhost:~\$

You can see that open files is set to unlimited, which does not require a specific value.

- \_\_\_ c. Verify that the course image has two CPU cores. To see the number of CPU cores, enter the following command:

```
lscpu
```



```
localuser@bpghost: ~$ lscpu
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 2
Thread(s) per core: 1
Core(s) per socket: 1
Socket(s): 2
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 15
Stepping: 11
CPU MHz: 2931.934
BogoMIPS: 5863.86
Hypervisor vendor: VMware
Virtualization type: full
L1d cache: 32K
L1i cache: 32K
L2 cache: 4096K
NUMA node0 CPU(s): 0,1
localuser@bpghost: ~$
```

You can see the value for CPU(s) is 2. It is important that Business Process Manager servers are installed on a modern server system with multiple processor cores.

- \_\_\_ d. Go to the following directory:

```
/opt/software/BPM/IM64
```

- \_\_\_ e. To start the installation of IBM Installation Manager as a non-root user, enter the following command:

```
./userinst
```

**Note**

Terminology that the Installation Manager uses includes the following terms:

- A **repository** is where the installable packages are found. The repository includes metadata that describes the software version and how it is installed. It has a list of files that are organized in a tree structure. The repository can be on the local computer or on a remote server.
- A **package** is a software product that Installation Manager installs. It is a separately installable unit that can operate independently from other packages of that software.
- A **package group** represents a directory that contains resources that packages share with other packages in the same group. Some packages support installing to the same package group, and others must be installed to a new package group.

- \_\_\_ f. The installation GUI starts. Verify that the **IBM Installation Manager** check box is selected and click **Next**.

**Install Packages**

Select packages to install:

Installation Packages	Status	Vendor
▼ <input checked="" type="checkbox"/> IBM® Installation Manager		
<input checked="" type="checkbox"/> Version 1.8.4	Will be installed	IBM

- \_\_\_ g. Select **I accept the terms in the license agreement**. Click **Next**.

- \_\_\_ h. Modify the Installation Manager Directory to:

/opt/IBM/InstallationManager/eclipse

**Install Packages**

Select a location for Installation Manager.

Install

Licenses

Location

Summary



Once installed, IBM Installation Manager will be used to install, update, modify,

Installation Manager Directory: /opt/IBM/InstallationManager/eclipse

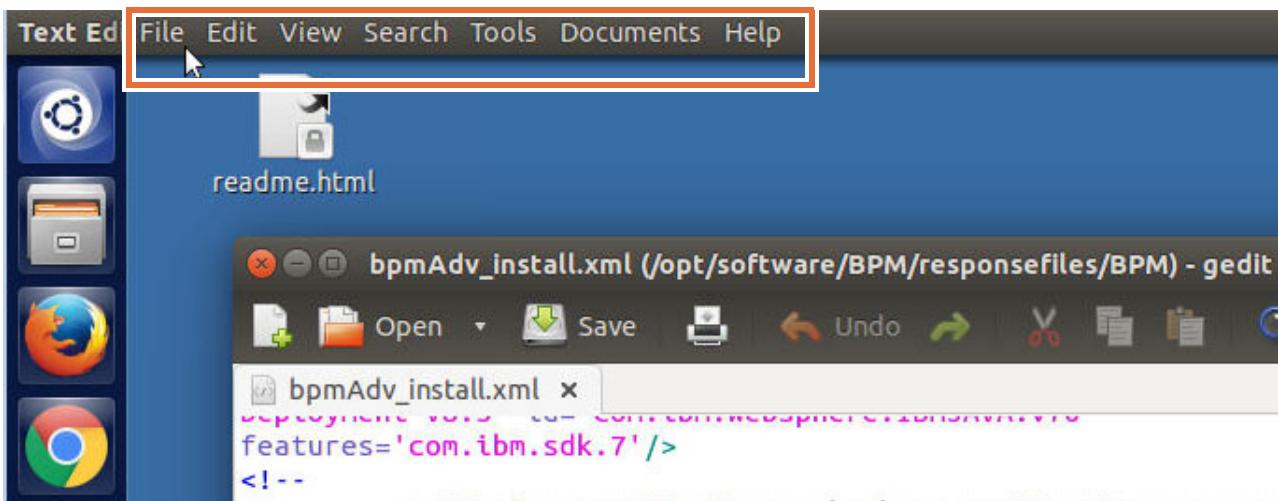
- \_\_\_ i. Click **Next**.

- \_\_\_ j. On the summary page, review the packages. Only one package is listed, IBM Installation Manager 1.8.4. Click **Install**.
  - \_\_\_ k. At the bottom of the pane, observe the progress of the installation. A message indicates that the packages are installed. When completed, click **Restart Installation Manager**.
- \_\_\_ 2. Modify the IBM Installation Manager preferences.



### Information

The desktop for Ubuntu is the Unity desktop. Unity uses a global menu. Which means application menus are not located in the window for the application. They are on the top pane. When a window is the active window, that window does not have any menu items, but the application type is displayed in the black bar that spans the top of the desktop. You cannot see the menu for the application until you hover your mouse over the top pane. When you hover your move over the black bar, the menu items for the active window are displayed.



- \_\_\_ a. Click **File > Preferences**.
- \_\_\_ b. Select **Repositories**.
- \_\_\_ c. Click **Add Repository**.
- \_\_\_ d. Browse to /opt/software/BPM/repository/repos\_64bit/ and select **repository.config**. Click **OK**.
- \_\_\_ e. Click **OK**.

- \_\_\_ f. The repository is added to the list of repositories. Clear the **Search service repositories during installation and updates** check box.

**Repositories:**

Location	Connection
/opt/software/BPM/repository/repos_64bit/repository	?

Add Repository...  
Edit Repository...  
Remove Repository  
Move Up  
Move Down  
Clear Credentials  
Test Connections

Service repositories are remote locations where updates or extensions to packages (including the Installation Manager itself) are stored

Search service repositories during installation and updates.

Restore Defaults    Apply  
Cancel    OK

\_\_\_ g. Click **Apply**.

\_\_\_ h. Click **OK**.



### Note

Installation Manager uses repositories to identify the packages or updates to install. A repository is a location that stores data for installing, modifying, rolling back, updating, or uninstalling packages. Each installed package has an embedded location for its default update repository. You can add, edit, or remove repositories for use by Installation Manager.

By default, Installation Manager is configured to use a service repository that is made up of repositories at ibm.com. In this case, internet access is required. If a computer does not have internet access, Installation Manager can be configured to look for a local repository. Updates can be downloaded and placed in a temporary directory on the computer. Installation Manager looks in this directory for installable updates. You must manually configure local repositories.

- \_\_\_ 3. Install IBM Business Process Manager.
  - \_\_\_ a. Click the **Install** icon.
  - \_\_\_ b. The following packages are available for installation:
    - IBM WebSphere Application Server Network Deployment
    - IBM WebSphere SDK Java Technology Edition (Optional)
    - IBM Business Process Manager Advanced
    - IBM DB2 Express 64 bit

Select the check box next to all of the packages except **IBM DB2 Express 64 bit**. DB2 is already installed on the course image and is used for the course exercises. Install all the remaining packages.

### Install Packages

Select packages to install:

Installation Packages	Status	Ver
▼ <input checked="" type="checkbox"/> IBM WebSphere Application Server Network Deployment <input checked="" type="checkbox"/> Version 8.5.5.8	Will be installed	IBN
▼ <input checked="" type="checkbox"/> IBM WebSphere SDK Java Technology Edition (Optional) <input checked="" type="checkbox"/> Version 7.0.9.10_0001	Will be installed	IBN
▼ <input checked="" type="checkbox"/> IBM® Business Process Manager Advanced <input checked="" type="checkbox"/> Version 8.5.7.0	Will be installed	IBN
▼ <input type="checkbox"/> IBM® DB2 Express 64 bit <input type="checkbox"/> Version 10.5.0.4		IBN

- \_\_\_ c. Click **Next**.
- \_\_\_ d. In the Install Packages pane, select the **IBM WebSphere Application Server Network Deployment 8.5.5.8** and **IBM WebSphere SDK Java Technology Edition (Optional)** check boxes. This action selects all of the fixes listed. Click **Next**.

### Install Packages

Select the fixes to install.

Fixes	Recommended
▼ <input checked="" type="checkbox"/> IBM WebSphere Application Server Network Deployment 8.5.5.8 <input checked="" type="checkbox"/> 8.5.0.0-WS-WASJavaSDK-LinuxX64-IFPI55778 8.5.0.20160126_0939	
▼ <input checked="" type="checkbox"/> IBM WebSphere SDK Java Technology Edition (Optional) 7.0.9.10_0001 <input checked="" type="checkbox"/> 7.0.1.0-WS-WASJavaSDK7-LinuxX64-IFPI55776 7.0.1000.20160126_1544	

- \_\_\_ e. The Licenses pane opens. You can read the license agreements for any of the packages to be installed. When completed, select **I accept the terms in the license agreement** and click **Next**.
- \_\_\_ f. In the Location pane, accept the default location `/opt/IBM/IMShared` for the Shared Resources Directory. Click **Next**.

## Install Packages

Select a location for the shared resources directory.

Install

Licenses

Location

Features

Summary

When you install packages, files are stored in two locations:

- 1) The shared resources directory - resources that can be shared by multiple packages.
- 2) The installation directory - any resources that are unique to the package that you are installing.



**Important:** You can only select the shared resources directory the first time you install a package. For best results select the drive with the most available space because it must have adequate space for all packages.

Shared Resources Directory: `/opt/IBM/IMShared`

### Disk Space Information

Volume	Available Space
<code>/opt</code>	96.69 GB

- \_\_\_ g. In the Location pane, the package for IBM WebSphere Application Server Network Deployment V8.5 is selected along with **Create a new package group**. Modify the Installation Directory to: `/opt/IBM/BPM`

The package group name is automatically modified to be unique. Click **Next**.

## Install Packages

A package group is a location that contains one or more packages. Some compatible packages can be grouped and will share a common user interface. Select an existing package group, or create a new one.

Install

Licenses

Location

Features

Summary

- Use the existing package group
- Create a new package group

Package Group Name	Installation Directory
IBM WebSphere Application Server V8.5	/opt/IBM/BPM

Package Group Name: IBM WebSphere Application Server V8.5

Installation Directory: /opt/IBM/BPM

- h. The Features pane indicates the individual language packs for the runtime environment and administrative console. Keep the default setting and click **Next**.
- i. The Features pane lists more features for installation. Verify that **IBM Business Process Manager Advanced Process Center License** is selected. You need to expand **IBM Business Process Manager Advanced** to see the options. Click **Next**.

## Install Packages

Select the features to install.

Install

Licenses

Location

Features

Summary

### Features

- ▶  IBM WebSphere Application Server Network Deployment 8.5.5.8
- ▶  IBM WebSphere SDK Java Technology Edition (Optional) 7.0.9.10\_0001
- ▼  IBM® Business Process Manager Advanced 8.5.7.0
  - ▼  IBM® Business Process Manager Advanced
    - Business Process Manager Advanced Process Center License
    - Business Process Manager Advanced Process Server Production License
    - Business Process Manager Advanced Process Server Non-production License

**Note**

The installation process installs IBM Process Center or IBM Process Server server components that are based on your selection.

- Process Center provides a repository for process assets, a runtime environment for testing and studying the performance of processes, and a console for administering access to assets and deploying processes to test, stage, or production environments.
- Process Server is a runtime environment for process applications and a data warehouse for collecting performance data from the applications. It includes administrative consoles for managing and maintaining the runtime environments and data warehouses.

In the features pane, the following features are selectable to install:

- *Business Process Manager Advanced Process Center License*
- *Business Process Manager Advanced Production License* to use the server in production
- *Business Process Manager Advanced Non-production License* to use the server only for test, staging, or development
- *Basic Case Management License* to install basic case management capabilities

Do not mix production and non-production servers in the same cell.

You can select the Basic Case Management License feature if you are licensed to install basic case management capabilities. With Basic Case Management, knowledge workers can drive business outcomes by using a combination of structured workflows, ad hoc tasks, and document processing. You must order a license for the Basic Case Management Feature to be entitled to use it.

In this lab, only the Business Process Manager Advanced Process Center License feature is selected to install. After installation, the Deployment Environment wizard is used to create a Process Center deployment environment. In later exercises, the BPMConfig command utility is used to create a Process Server production deployment environment.

- \_\_ j. In the Summary pane, confirm your previous choices. If necessary, you can click **Back** to modify any choices.

The screenshot shows the 'Install Packages' window with the 'Summary' tab selected. At the top, it says 'Review the summary information.' Below is a navigation bar with tabs: Install, Licenses, Location, Features, Summary (which is highlighted). The 'Target Location' section shows:

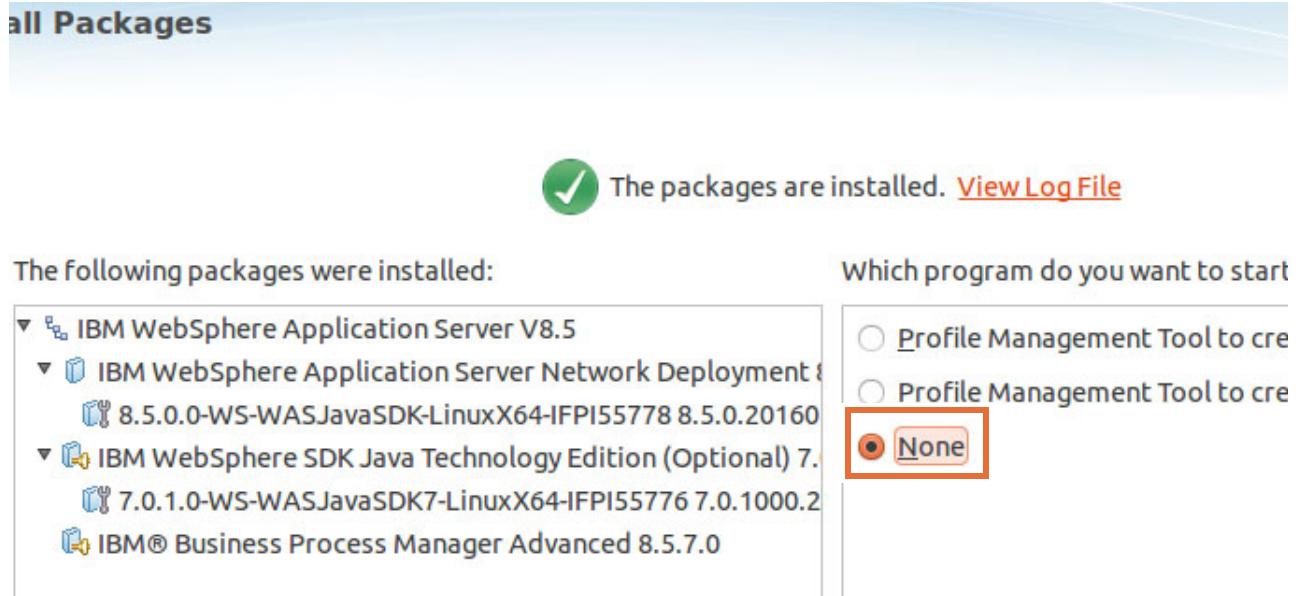
- Package Group Name: IBM WebSphere Application Server V8.5
- Installation Directory: /opt/IBM/BPM
- Shared Resources Directory: /opt/IBM/IMShared

The 'Packages' section lists installed components:

- IBM WebSphere Application Server Network Deployment 8.5.5.8
  - IBM WebSphere Application Server Network Deployment 8.5.5.8
  - 8.5.0.0-WS-WASJavaSDK-LinuxX64-IFPI55778 8.5.0.20160126\_0939
- IBM WebSphere SDK Java Technology Edition (Optional) 7.0.9.10\_0001
  - IBM WebSphere SDK Java Technology Edition (Optional) 7.0.9.10\_0001
  - 7.0.1.0-WS-WASJavaSDK7-LinuxX64-IFPI55776 7.0.1000.20160126\_1544
- IBM® Business Process Manager Advanced 8.5.7.0
  - IBM® Business Process Manager Advanced 8.5.7.0

- \_\_ k. Click **Install** to begin the installation. Depending on system resources, the installation takes several minutes. During the installation, verify the progress with the progress bar at the bottom of the window.

- \_\_\_ l. When the installation completes, the installation results are displayed at the top of the pane. You can view the log file now or later. Select **None** in the area that indicates the programs to start.



- \_\_\_ m. Click **Finish**.  
 \_\_\_ n. Click **File > Exit** to exit the Installation Manager.

## **Part 2: Confirming the installation**

- \_\_\_ 1. Verify the installed products and versions.  
 \_\_\_ a. In the terminal window, go to the `/opt/IBM/BPM/bin` directory.  
 \_\_\_ b. Enter the following command:

```
./versionInfo.sh
```

**Installed Product**

Name	IBM WebSphere Application Server Network Deployment
Version	8.5.5.8
ID	ND
Build Level	cf081545.03
Build Date	11/12/15
Package	com.ibm.websphere.ND.v85_8.5.5008.20151112_0939
Architecture	x86-64 (64 bit)
Installed Features	IBM 64-bit WebSphere SDK for Java WebSphere Application Server Full Profile EJBDeploy tool for pre-EJB 3.0 modules Embeddable EJB container Stand-alone thin clients and resource adapters

**Installed Product**

Name	IBM WebSphere SDK Java Technology Edition (Optional)
Version	7.0.9.10
ID	IBMJAVA7
Build Level	cf081545.02
Build Date	11/12/15
Package	com.ibm.websphere.IBMJAVA.v70_7.0.9010.20151112_0100
Architecture	x86-64 (64 bit)
Installed Features	IBM WebSphere SDK for Java Technology Edition 7

**Installed Product**

Name	IBM Business Process Manager Advanced
Version	8.5.7.0
ID	BPMPC
Build Level	20160301-140232
Build Date	3/1/16
Package	com.ibm.bpm.ADV.v85_8.5.7000.20160301_1551
Architecture	x86-64 (64 bit)
Installed Features	Business Process Manager Advanced Process Center Lice

**End Installation Status Report**

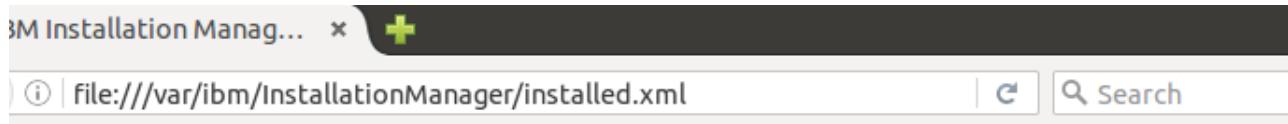
```
localuser@bpghost:/opt/IBM/BPM/bin$
```

The version information utility should return IBM Business Process Manager Advanced version 8.5.7.0 and IBM WebSphere Application Server Network Deployment version 8.5.5.8.

- \_\_\_ c. In the terminal window, go to the /var/ibm/InstallationManager directory.

- \_\_ d. Examine the `installed.xml` file to see the installed offerings. To open the file in a browser, enter the following command:

```
firefox installed.xml&
```



## IBM Installation Manager - Installed

### IBM® Installation Manager Version 1.8.4 (1.8.4000.1)

**Installation Directory:** /opt/IBM/InstallationManager/eclipse  
**Architecture:** 64-bit

**Shared Resource Directory:** /opt/IBM/IMShared

**Package Group Name:** IBM WebSphere Application Server  
**Package Group Installation Directory:** /opt/IBM/BPM  
**Package Group Translations:** en  
**Package Group Architecture:** 32-bit

- \_\_\_ e. In this file, you can see all the installed products. Scroll down to examine the IBM WebSphere Application Server V8.5 details.

<b>IBM WebSphere Application Server Network Deployment</b>	
<b>Packages</b>	
<b>IBM® Business Process Manager Advanced</b> <b>Version 8.5.7.0 (8.5.7000.20160301_1551)</b>	<ul style="list-style-type: none"> <li>o Business Proces</li> </ul>
<b>Repository</b> <b>/opt/software/BPM/repository/repos_64bit</b>	
<b>IBM WebSphere SDK Java Technology Edition (Optional)</b> <b>Version 7.0.9.10_0001 (7.0.9010.20151112_0100)</b>	
<b>Repository</b> <b>/opt/software/BPM/repository/repos_64bit</b>	
<b>Fixes</b>	
<ul style="list-style-type: none"> <li>o <b>7.0.1.0-WS-WASJavaSDK7-LinuxX64-IFPI55776</b> <b>Version 7.0.1000.20160126_1544</b> <b>(7.0.1000.20160126_1544)</b></li> </ul>	
<b>IBM WebSphere Application Server Network Deployment</b> <b>Version 8.5.5.8 (8.5.5008.20151112_0939)</b>	<ul style="list-style-type: none"> <li>o IBM 64-bit Web</li> <li>o EJBDeploy tool</li> <li>o Embeddable E</li> <li>o Stand-alone th</li> </ul>
<b>Repository</b> <b>/opt/software/BPM/repository/repos_64bit</b>	
<b>Fixes</b>	

You can see the details on the packages that are installed, including the version numbers. It also lists the feature that is installed for each package.

- \_\_\_ f. Close the browser when completed.  
\_\_\_ g. Exit the terminal window.

## End of exercise

## Exercise review and wrap-up

In this exercise, you installed IBM Installation Manager. Then, you used the IBM Installation Manager to install IBM Business Process Manager Advanced.

# Appendix B. List of Linux commands

<b>alias</b>	Create an alias for a command
<b>apropos</b>	Provide a list of man pages relevant to a particular subject
<b>cat</b>	Type file out  cat <file>
<b>cd</b>	Change directory to absolute or relative path  cd /home/waslocal  cd .. (Change directory up one level)
<b>chgrp</b>	Change file group ownership
<b>chmod</b>	Change access mode bits on files  chmod 744 <file> (Change mode for user=all, group=rw, and other=rw)  chmod g+rwx <file> (Change mode for group to have all permissions)  chmod a=x <file> (Change mode and give all execute permission)
<b>chown</b>	Change file owner
<b>clear</b>	Clear the screen
<b>cp</b>	Copy files
<b>date</b>	Display or set date
<b>df</b>	Show free disk space  df -k (Show the free space in kilobytes)  df -m (Show the free space in megabytes)
<b>diff</b>	Show differences between two files
<b>du</b>	Show disk usage
<b>echo</b>	Show output status text to the screen or a file  echo \$DISPLAY (Show the value for the DISPLAY variable)  echo \$PATH (Show the value for the PATH variable)
<b>emacs</b>	Start an emacs edit session
<b>env</b>	Display the list of current environment variables
<b>exit</b>	Exit a shell script
<b>export</b>	Set the value of one or more shell variables  export DISPLAY=:0.0
<b>find</b>	Find and locate files  find / -name <file>

<b>firefox</b>	Launch a Firefox browser window firefox -p <profile-name> -no-remote
<b>ftp</b>	File transfer protocol
<b>gedit</b>	Start a gedit editing session, text editor for the GNOME desktop gedit <file>
<b>gnome-terminal</b>	Launch a GNOME terminal window
<b>grep</b>	Search files for text patterns grep <string> <file> grep localhost /etc/hosts
<b>groups</b>	Show the groups that a user belongs to
<b>gzip</b>	Compress and decompress gzip <file>
<b>head</b>	Show the first few lines of a file
<b>help</b>	Access help for shell commands
<b>history</b>	Show the list of previous commands
<b>hostname</b>	Show the host name
<b>ifconfig</b>	View, enable, and disable a network interface, IP address, broadcast address, and subnet mask
<b>jobs</b>	List child processes of current process
<b>kill</b>	Terminate a running command or process kill <PID> kill 1423
<b>ln -s</b>	Create a symbolic link ln -s <file/directory> <link>
<b>ls</b>	List files or directories ls -l (Long format listing) ls -la (Long format list all files, including normally hidden files)
<b>man</b>	Get information about a command by using online reference manuals (man pages) man mkdir (Displays the man page for the mkdir command)
<b>mkdir</b>	Create a directory
<b>more</b>	Type out a file by one screen at a time more SystemOut.txt
<b>mount</b>	Instruct the operating system that a file system is ready to use, and associate it with a particular point in the file system hierarchy

<b>mv</b>	Move or rename files or directories  mv <from> <to>
<b>passwd</b>	Set password
<b>ps</b>	Show processes  ps -ef (Show all processes and do a full listing)  ps -ef   grep java (Search the list of all processes for the word java)
<b>pwd</b>	Print your present working directory
<b>reboot</b>	Reboot system
<b>rm</b>	Remove files  rm /tmp/myfile
<b>rmdir</b>	Remove directories
<b>sed</b>	Stream editor – edit one or more files without user interaction
<b>ssh</b>	Secure Shell, a network protocol that allows data to be exchanged by using a secure channel between two networked devices
<b>su</b>	Become a substitute user  su - db2inst1
<b>shutdown</b>	Allow a user to change system state, taking system down  shutdown -h (Halt after shutdown)  shutdown -P (Halt action is to turn off power)
<b>source</b>	Read and execute commands from a file in the current shell script
<b>tail</b>	Show the last few lines of a file  tail SystemOut.txt (Show the last 10 lines of the file)  tail -f SystemOut.txt (Show output as it is appended to the file)
<b>tar</b>	Create or expand archive files  tar cvf myfile.tar <directory> (Create tar file from directory)  tar xvf myfile.tar . (eXpand tar file here)
<b>telnet</b>	Connect to another system
<b>time</b>	Display and set time
<b>top</b>	Dynamically display process information
<b>touch</b>	For one or more files, update the access time and modification time to current date and time
<b>vi</b>	Visual text editor
<b>wc</b>	Print a character, word, and line count for files
<b>whereis</b>	Locate files

<b>which</b>	Is used to identify the location of executables within the path
<b>whoami</b>	Print the effective user name
<b>xterm</b>	Launch an xterm window
<b>~</b>	HOME directory of the current user cd ~/temp
<b> </b>	Pipe ps -ef   grep java (Pipes the ps command into the grep command)
<b>&lt;</b>	Redirect
<b>&gt;&gt;</b>	Append date >> /tmp/mylog
<b>!</b>	Recall !34 (Recall the 34th command from the history list) !ps (Recall the last command that begins with "ps")
<b>./</b>	Execute file in current working directory .startManager.sh

# Appendix C. List of abbreviations

<b>AIS</b>	Advanced Integration services
<b>AIX</b>	Advanced IBM UNIX
<b>AMI</b>	Application Messaging Interface
<b>APAR</b>	authorized program analysis report
<b>API</b>	application programming interface
<b>ARM</b>	Application Response Measurement
<b>ASCII</b>	American Standard Code for Information Interchange
<b>AST</b>	Application Server Toolkit
<b>B2B</b>	business-to-business
<b>BAL</b>	Business Action Language
<b>BFM</b>	Business Flow Manager
<b>BLA</b>	business-level application
<b>BO</b>	business object
<b>BPC</b>	Business Process Choreographer
<b>BPCIVT</b>	Business Process Choreographer Installation Verification Test
<b>BPD</b>	business process definition
<b>BPE</b>	business process engine
<b>BPEL</b>	Business Process Execution Language
<b>BPM</b>	business process management
<b>BPMN</b>	Business Process Model and Notation
<b>BRM</b>	Business Rules Manager
<b>BSM</b>	business state machine
<b>CA</b>	certificate authority
<b>CEI</b>	Common Event Infrastructure
<b>CGBI</b>	core group bridge interface
<b>CGBS</b>	core group bridge service
<b>CICS</b>	Customer Information Control System
<b>CIFS</b>	Common Internet File System
<b>COBOL</b>	Common Business Oriented Language
<b>COE</b>	Center of Excellence

<b>CORS</b>	cross-origin resource sharing
<b>CPU</b>	central processing unit
<b>CVS</b>	Concurrent Versions System
<b>DCS</b>	Distribution and Consistency Services
<b>DDL</b>	Data Definition Language
<b>DDT</b>	database design tool
<b>DMZ</b>	demilitarized zone
<b>DNS</b>	Domain Name System
<b>DRS</b>	data replication service
<b>EAI</b>	Enterprise Application Infrastructure
<b>EAR</b>	enterprise archive
<b>EE</b>	Enterprise Edition
<b>EIS</b>	Enterprise Information System
<b>EJB</b>	Enterprise JavaBeans
<b>EM</b>	Event Manager
<b>EPV</b>	exposed process value
<b>ESB</b>	enterprise service bus
<b>FFDC</b>	first-failure data capture
<b>FQDN</b>	fully qualified domain name
<b>FTP</b>	File Transfer Protocol
<b>GC</b>	garbage collector
<b>GUI</b>	graphical user interface
<b>HA</b>	high availability
<b>HACMP</b>	High-Availability Cluster Multi-Processing
<b>HAM</b>	high availability manager
<b>HPEL</b>	High Performance Extensible Logging
<b>HTM</b>	Human Task Manager
<b>HTTP</b>	Hypertext Transfer Protocol
<b>HTTPS</b>	Hypertext Transfer Protocol Secure
<b>IBM</b>	International Business Machines Corporation
<b>IIOP</b>	Internet Inter-ORB Protocol
<b>ILO</b>	instructor-led online
<b>ILT</b>	instructor-led training
<b>IMS</b>	Information Management System

<b>I/O</b>	input/output
<b>IP</b>	Internet Protocol
<b>ISC</b>	Integrated Solutions Console
<b>ISMP</b>	Install Shield MultiPlatform
<b>IT</b>	information technology
<b>IVT</b>	installation verification test
<b>J2C</b>	J2EE Connector architecture
<b>J2EE</b>	Java 2 Platform, Enterprise Edition
<b>JAAS</b>	Java Authentication and Authorization Service
<b>JAR</b>	Java archive
<b>Java EE</b>	Java Platform, Enterprise Edition
<b>JCA</b>	Java Connector Architecture
<b>JDBC</b>	Java Database Connectivity
<b>JDK</b>	Java Development Kit
<b>JEE</b>	Java Enterprise Edition
<b>JMS</b>	Java Messaging Service
<b>JMX</b>	Java Management Extensions
<b>JNDI</b>	Java Naming and Directory Interface
<b>JSF</b>	JavaServer Faces
<b>JSON</b>	JavaScript Object Notation
<b>JSP</b>	JavaServer Pages
<b>JSSE</b>	Java Secure Socket Extensions
<b>JVM</b>	Java virtual machine
<b>KPI</b>	key performance indicator
<b>LDAP</b>	Lightweight Directory Access Protocol
<b>LOB</b>	line of business
<b>LSD</b>	location service daemon
<b>LTPA</b>	Lightweight Third Party Authentication
<b>LTS</b>	long-term support
<b>MDB</b>	message-driven bean
<b>ME</b>	messaging engine
<b>MEDB</b>	messaging engine database
<b>MQ</b>	Message Queue
<b>MQI</b>	Message Queue Interface

<b>ND</b>	Network Deployment
<b>NFS</b>	Network File System
<b>OASIS</b>	Organization for the Advancement of Structured Information Standards
<b>ODM</b>	IBM Operational Decision Manager
<b>ODR</b>	on-demand router
<b>ORB</b>	Object Request Broker
<b>PaaS</b>	platform as a service
<b>PC</b>	Process Center
<b>PD</b>	problem determination
<b>PDW</b>	Process Data Warehouse
<b>PFS</b>	Process Federation Server
<b>PHD</b>	Portable Heap Dump
<b>PMI</b>	Performance Monitoring Infrastructure
<b>PMR</b>	problem management report
<b>PMT</b>	Profile Management Tool
<b>POC</b>	Proof-of-concept
<b>POJO</b>	plain old Java object
<b>QA</b>	quality assurance
<b>QCF</b>	queue connection factory
<b>QoS</b>	quality of service
<b>RA</b>	resource adapter
<b>RAID</b>	Redundant Array of Independent Disks
<b>RAM</b>	random access memory
<b>RAR</b>	resource adapter archive
<b>REST</b>	Representational State Transfer
<b>RMI</b>	Remote Method Invocation
<b>RMI/IOP</b>	Remote Method Invocation over Internet InterORB Protocol
<b>RMLT</b>	resource manager local transaction
<b>RMM</b>	Reliable Multicast Messaging
<b>SAM</b>	Security Access Manager
<b>SAN</b>	storage area network
<b>SAS</b>	Secure Association Service
<b>SCA</b>	Service Component Architecture
<b>SCDL</b>	Service Component Definition Language

<b>SDO</b>	Service Data Object
<b>SIBus</b>	Service integration bus
<b>SMO</b>	service message object
<b>SMTP</b>	Simple Mail Transfer Protocol
<b>SOA</b>	service-oriented architecture
<b>SOAP</b>	A lightweight, XML-based protocol for exchanging information in a decentralized, distributed environment. SOAP can be used to query and return information and invoke services across the Internet.
<b>SPI</b>	service provider interface
<b>SQL</b>	Structured Query Language
<b>SR</b>	service request
<b>SSL</b>	Secure Sockets Layer
<b>SWAM</b>	Simple WebSphere Authentication Mechanism
<b>TCP</b>	Transmission Control Protocol
<b>TCP/IP</b>	Transmission Control Protocol/Internet Protocol
<b>TM</b>	transaction manager
<b>UCA</b>	undercover agent
<b>UI</b>	user interface
<b>UML</b>	Unified Modeling Language
<b>UNIX</b>	Uniplexed Information and Computing System
<b>URI</b>	Uniform Resource Identifier
<b>URL</b>	Uniform Resource Locator
<b>UTE</b>	unit test environment
<b>UUID</b>	Universally Unique Identifier
<b>VMM</b>	virtual member manager
<b>WAR</b>	Web archive
<b>WLM</b>	workload management
<b>WS-BPEL</b>	Web Services Description Language
<b>WSDL</b>	Web Services Description Language
<b>XCT</b>	cross-component trace
<b>XML</b>	Extensible Markup Language
<b>XSL</b>	Extensible Stylesheet Language
<b>XSLT</b>	Extensible Stylesheet Language Transformation
<b>z/OS</b>	zSeries Operating System





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