



A Step-By-Step Guide to Configuring HCL Portal v9.0 Cluster

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This guide describes a comprehensive procedure for installing, configuring, and building an HCL Portal v9.0 cluster using:

- Red Hat Enterprise Linux 7.4
- IBM WebSphere Application Server (WAS) 9.0.0.2 – 64 bit
- DB2 11.1 – Database Server
- IBM Directory Server 6.4 – LDAP Server
- IBM HTTP Server 9.0.0.7 – Web Server

NOTE: IBM and HCL have completed announced a definitive agreement under which HCL has acquired the IBM Digital Experience solutions, including WebSphere Portal and Web Content Manager.

IBM and HCL completed this transaction on July 1, 2019. HCL has renamed the products to "HCL Portal", "HCL Web Content Manager", and additional HCL Digital Experience offerings, but in this guide, you may still see references for its former name "WebSphere Portal" as related to install and configuration interfaces and processes.

For more information on HCL Digital Experience solutions, you may visit the HCL Software Digital Experience pages:

<https://www.hcltechsw.com/wps/portal/products/dx/features>

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Introduction

Higher Versions of HCL Portal and WebSphere Application Server

This guide is specifically written for 64-bit HCL Portal v9.0 cumulative fix 13 and WebSphere Application Server v9.0.0.2. However, the same steps may be executed on newer versions HCL Portal 9.0 cumulative fixes and newer WebSphere Application Server 9.0.x fixpacks.

Windows/Unix Differences

This guide was written using Linux as the base operating system, however the steps/concepts listed in this guide are independent of operating system.

The only significant difference is that for Windows, you must use the batch file commands instead of the UNIX shell commands listed in this guide. For example:

UNIX: `./startServer.sh WebSphere_Portal`

Windows: `startServer.bat WebSphere_Portal`

or

UNIX: `./ConfigEngine.sh cluster-node-config-cluster-setup`

Windows: `ConfigEngine.bat cluster-node-config-cluster-setup`

Migration Considerations

This guide is targeted towards new installations of HCL Portal 9.0. Many of the steps in this guide are not required if you are migrating from a previous version of HCL Portal. An Appendix is provided an outline of migration considerations. If you are migrating from a previous version of HCL Portal this guide strongly recommends contacting IBM Support to discuss migration options prior to executing the steps in this guide.

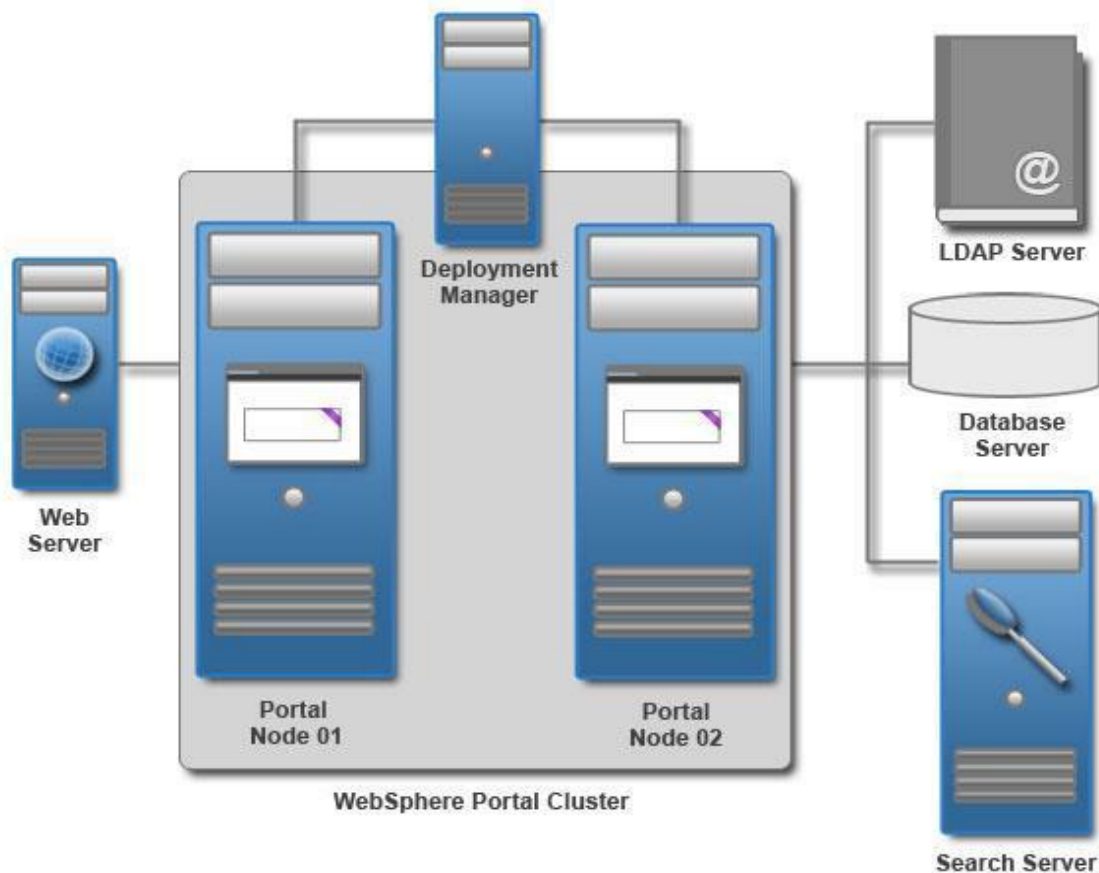
Cluster Concepts

Server – A Java Virtual Machine (JVM) that manages user applications (such as HCL Portal and Web Content Management).

Node – A logical grouping of one or more application servers. A node does not necessarily mean a single physical server.

Cell – A logical grouping of one more nodes.

Cluster – A logical grouping of one or more servers across one or more nodes. The servers are managed together and participate in workload management. Servers in a cluster share resources, such as applications. Multiple clusters can exist in a single cell, but a single cluster cannot exist across multiple cells.



A HCL Portal cluster with two horizontal nodes, each with two cluster members.

NOTE: There is a Remote Search Server in this illustration. This is a separate WebSphere Application server from the Portal Server.

Using this Guide

While there are numerous different ways to build a HCL Portal cluster, this guide describes the method widely considered the easiest: building a cluster with horizontal nodes and a remote Deployment Manager.

This can be achieved by following the steps in these chapters:

1. Installing HCL Portal v9.0 on the Primary Node
2. Configuring the Primary Node for a Remote Database
3. Installing and Configuring the Deployment Manager
4. Federating and Clustering the Primary Node
5. Configure the Portal Cluster for Federated LDAP Security
6. Installing HCL Portal on an Additional Horizontal Node
7. Federating and Clustering an Additional Horizontal Node
8. Configuring the Cluster with an External Web Server

Appendices are provided to guide you through additional concepts not covered in the main portion of the guide. The appendices contain tasks, features, and configuration options the authors of this guide have found useful for many Portal administrators but not required in all environments. The main portion of this guide is recommended for all Portal environments.

Before You Begin

This guide does **NOT** cover the following:

- Installing DB2
- Creating multiple clusters in a single cell
- Advanced Security configuration
- Installing and Configuring IBM Directory Server

For more information on these and other topics, visit the HCL Portal v8.5 and v9.0 Product Documentation:

https://help.hcltechsw.com/digital-experience/8.5/welcome/wp_welcome.html

https://help.hcltechsw.com/digital-experience/9.0/welcome/wp9_welcome.html

To perform the tasks described in this document, you need basic HCL Portal and WebSphere Application Server knowledge and administration skills. Some steps might require the assistance of another system administrator, such as the database administrator or LDAP administrator.

Hostnames Used in This Guide

To avoid confusion, each instance of the hostnames has been replaced with a sample value that corresponds to the server it belongs to so it is easier to understand to which server the guide is referring.

Sample Values:

Primary Portal Node - myprimaryportal.hcl.com
Secondary Portal Node – mysecondaryportal.hcl.com
Deployment Manager – mydmgr.hcl.com
Database Server – mydbserver.hcl.com
LDAP Server – myldapservice.hcl.com
IBM HTTP Server – mywebserver.hcl.com

The following references to HCL Portal and WebSphere Application Server file paths will be used throughout the guide:

AppServerRoot - The root path of the AppServer directory, for example:

/opt/IBM/WebSphere/AppServer

PortalServer root - The root path of the PortalServer directory, for example:

/opt/IBM/WebSphere/PortalServer

wp_profile - The root path of the wp_profile directory, for example:

/opt/IBM/WebSphere/wp_profile

dmgr_profile - The root path of the dmgr profile directory, for example:

/opt/IBM/WebSphere/AppServer/profiles/dmgr01

httpRoot – The root path of the IBM HTTP Server, for example:

/opt/IBM/HTTPServer

pluginRoot - The root path of the WebSphere Plugin directory, for example:

/opt/IBM/WebSphere/Plugins

The following references to relevant usernames and passwords will be used throughout the guide:

PortalAdminID - The HCL Portal administrator user ID, set during Portal installation.

PortalAdminPswd - The HCL Portal administrator password, set during Portal installation.

ConfigWizardID – The Configuration Wizard administrator ID, set during Portal installation.

ConfigWizardPswd – The Configuration Wizard administrator password, set during Portal installation.

dmgrAdminID – The Deployment Manager administrator ID, set by Portal scripting

dmgrAdminPswd – The Deployment Manager administrator password, set by Portal scripting

WASAdminInLDAP – The WAS administrator ID stored in the LDAP. This is set during the configuration of the Portal Cluster for federated LDAP security.

WASPswdInLDAP – The WAS administrator password stored in the LDAP. This is set during the configuration of the Portal Cluster for federated LDAP security.

NOTE: If you plan to configure an LDAP to your cluster, ensure the user names you choose for the *PortalAdminId* and *dmgrAdminID* values do NOT match any names in the LDAP.

Configuration Wizard Server Information

server1 – This is the name of the Configuration Wizard server. It should not be federated or added to the cluster. If the Configuration Wizard is stopped (after initial Portal installation), it can be restarted by navigating to:

AppServerRoot/profiles/cw_profile/bin

and running:

./startServer.sh server1

Getting the software

HCL Portal has five different offerings. Server, Enable, Extend, WCM, and WCM SE. You will need to download one of these from HCL License & Delivery Portal. You can find the link of all Portal 9.0 Offerings here, under “Your Downloads >> Collaboration”:

<https://hclsoftware.flexnetoperations.com/flexnet/operationsportal/startPage.dooration&orgId=HCL>

In this guide, we will be installing the Enable offering or “HCL Portal Enable V9.0 Multiplatform”. The 4 required components are:

CNH1VML.zip	HCL Portal Enable Setup V9.0 Multiplatform Multilingual Part 1
CNH1WML.zip	HCL Portal Enable Setup V9.0 Multiplatform Multilingual Part 2
CNH1XML.zip	HCL Portal Enable Setup V9.0 Multiplatform Multilingual Part 3
CNH1YML.zip	HCL Portal Enable Setup V9.0 Multiplatform Multilingual Part 4

Once you have the parts downloaded. Create a parent folder and unzip all .zip files provided with your Portal media into this folder.

Once all 4 parts are extracted, you should have a folder called SETUP under your parent folder. Navigating into the SETUP folder, there is a Product folder that holds the files and repositories for WAS 9.0.0.2, JDK 8.0.3, Portal 8.5.0.0, CF13 for Portal 8.5, Portal 9.0 and ifix PI59896.

The result will have the following directory structure:

```
<common_dir>/ SETUP/IFPI59896/  
<common_dir>/ SETUP/JDK803/  
<common_dir>/ SETUP/WASND90/  
<common_dir>/ SETUP/WP85_Enable/  
<common_dir>/ SETUP/WP85_Server/  
<common_dir>/ SETUP/WP90_Enable/  
<common_dir>/ SETUP/WP90_Portal/  
<common_dir>/ SETUP/WP8500CF13_Server/
```


Chapter 1 – Installing HCL Portal v9.0 on the Primary Node

Chapter Overview

This chapter will demonstrate how to install HCL Portal 9.0 on the primary node. In this guide, the installation was completed with a graphical user interface (GUI) using the root user with installation images on a local hard drive.

This chapter contains multiple sections each performing a specific action within the IBM Installation Manager (IIM) tool. Ensure you complete each section as outlined before proceeding to the section.

Section 1 – Installing IBM Installation Manager

Section 2 – Installing HCL Portal 8.5

Section 3 – Upgrading HCL Portal 8.5 to Cumulative Fix (CF) 13

Section 4 – Upgrading HCL Portal 8.5 CF13 to HCL Portal 9.0 CF13

Before installing HCL Portal, ensure you review the planning documentation:

https://help.hcltechsw.com/digital-experience/9.0/plan/plan_installation.html

Section 1 - Installing IBM Installation Manager

The IBM Installation Manager (IIM) is a tool that you can use to install and maintain your IBM software packages. Wizards guide you through the steps that you must take to install, modify, update, roll back, or uninstall your IBM / HCL products.

1. Open a terminal window and run: ping

```
myprimaryportal.hcl.com
```

where *myprimaryportal.hcl.com* is your fully qualified hostname.

2. In the same terminal window,

```
run: ping localhost
```

to verify that the localhost settings are properly configured on your server.

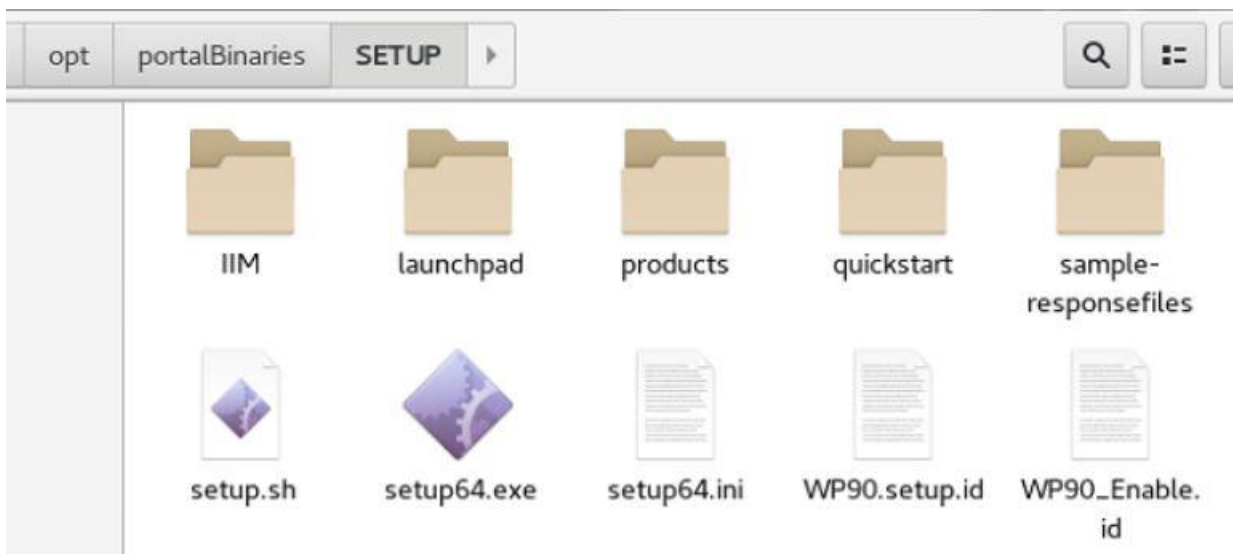
3. **Linux/UNIX environments only:** Ensure ulimit is set to 10240 or higher by running:

```
ulimit -n 10240
```

in the command line.

4. Unzip all .zip files provided with your Portal media into a single folder. This folder will be referred to as the *installationMediaRoot* folder.

For this guide the following directory is used for the *installationMediaRoot* folder:
/opt/portalBinaries/SETUP/products



5. From the HCL Portal v9.0 SETUP directory, navigate to:

SETUP/IIM/*yourEnvironment*

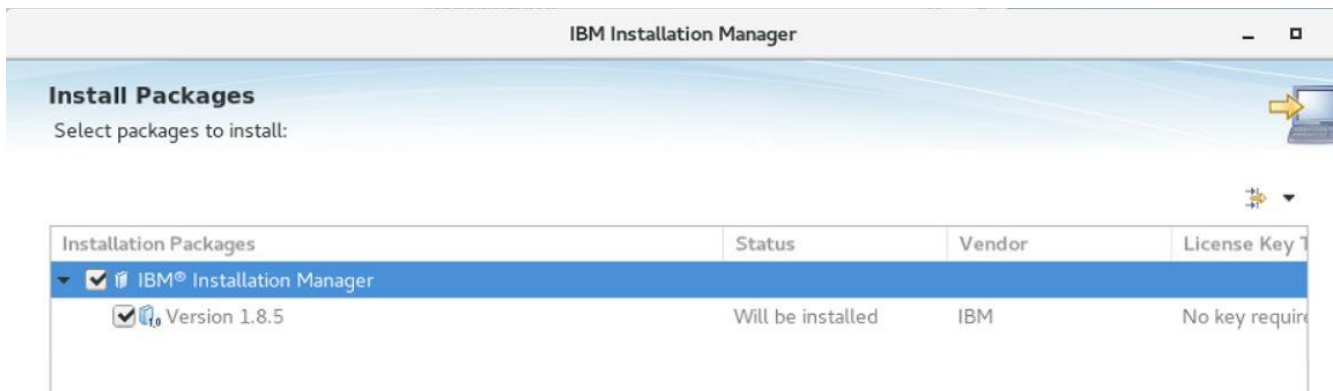
and run

`./install`

where *yourEnvironment* is the folder that best describes the operating system of the environment in which you are installing HCL Portal. For this guide the following is used:

`installationMediaRoot/SETUP/IIM/linux_x86_64`

The following window will appear:



6. Click **Next**.

7. Accept the license agreement and click **Next**.

The IPLA will automatically apply if Licensee elects to retain the Program after the Evaluation (or obtain additional copies of the Program for use after the Evaluation) by entering into a procurement agreement (e.g., the IBM International Passport Advantage or the IBM Passport Advantage Express agreements).

- ☒ I accept the terms in the license agreement
- ☐ I do not accept the terms in the license agreement



< Back

Next >

Install

8. Choose a directory in which to install IIM. This guide uses:

`/opt/IBM/InstallationManager/eclipse`

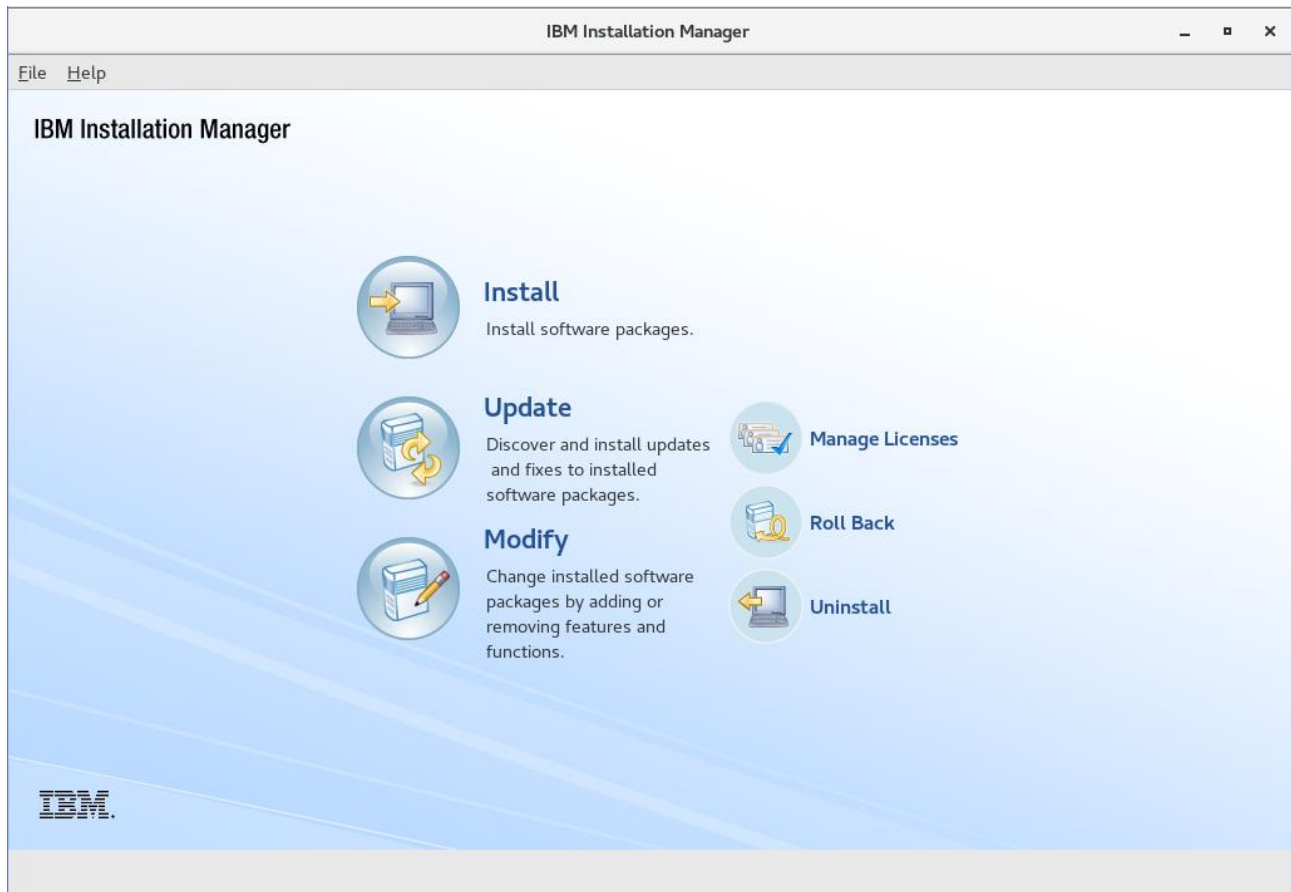
for Windows this guide recommends:

`c:\IBM\InstallationManager\eclipse`

NOTE: In Windows environments, the default location will be C:\Program Files\IBM\InstallationManager. Spaces in the file path can cause problems later in the installation/configuration of HCL Portal. This guide recommends creating a folder named “IBM” at C:\IBM or a similar location into which IIM and HCL Portal can be installed.

9. Click **Next**.
10. On the Summary screen, click **Install** to begin the installation.
11. When the installation is complete, click **Restart Installation Manager**.

12. The following screen will appear:



At the end of this section, you have successfully installed IBM Installation Manager 1.8.5.

Section 2 - Installing HCL Portal 8.5

This section will cover the installation of HCL Portal 8.5. HCL Portal 8.5 must be installed and thereafter upgraded to Portal 9.0. It is not possible to install Portal 9.0 directly.

1. In IIM, click **File > Preferences > Repositories**
2. Click **Add Repository**, navigate to

installationMediaRoot/WP85_Enable/repository.config

and click **OK**.

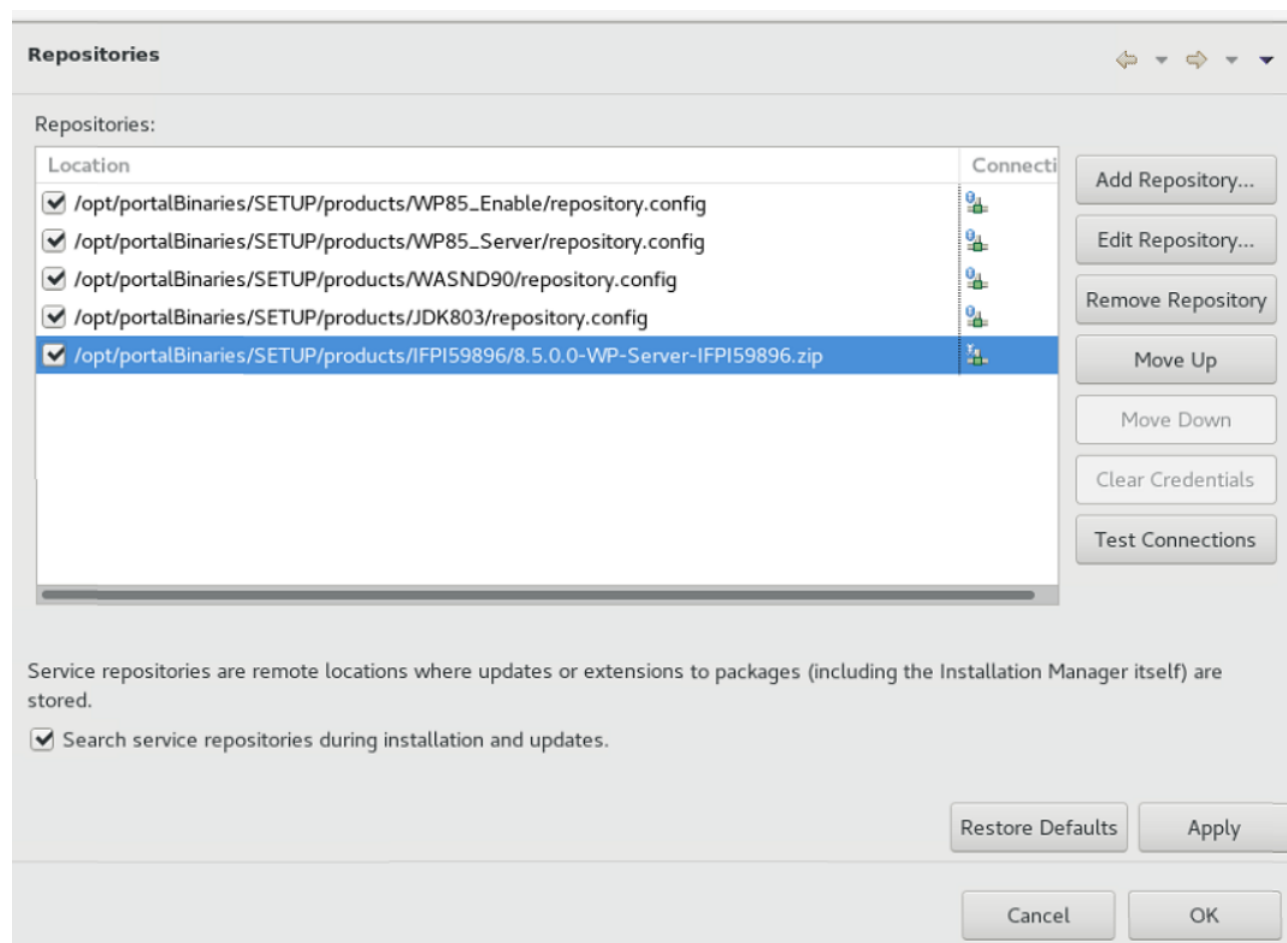
3. Repeat step 2 for the following repositories:

installationMediaRoot/WP85_Server/repository.config

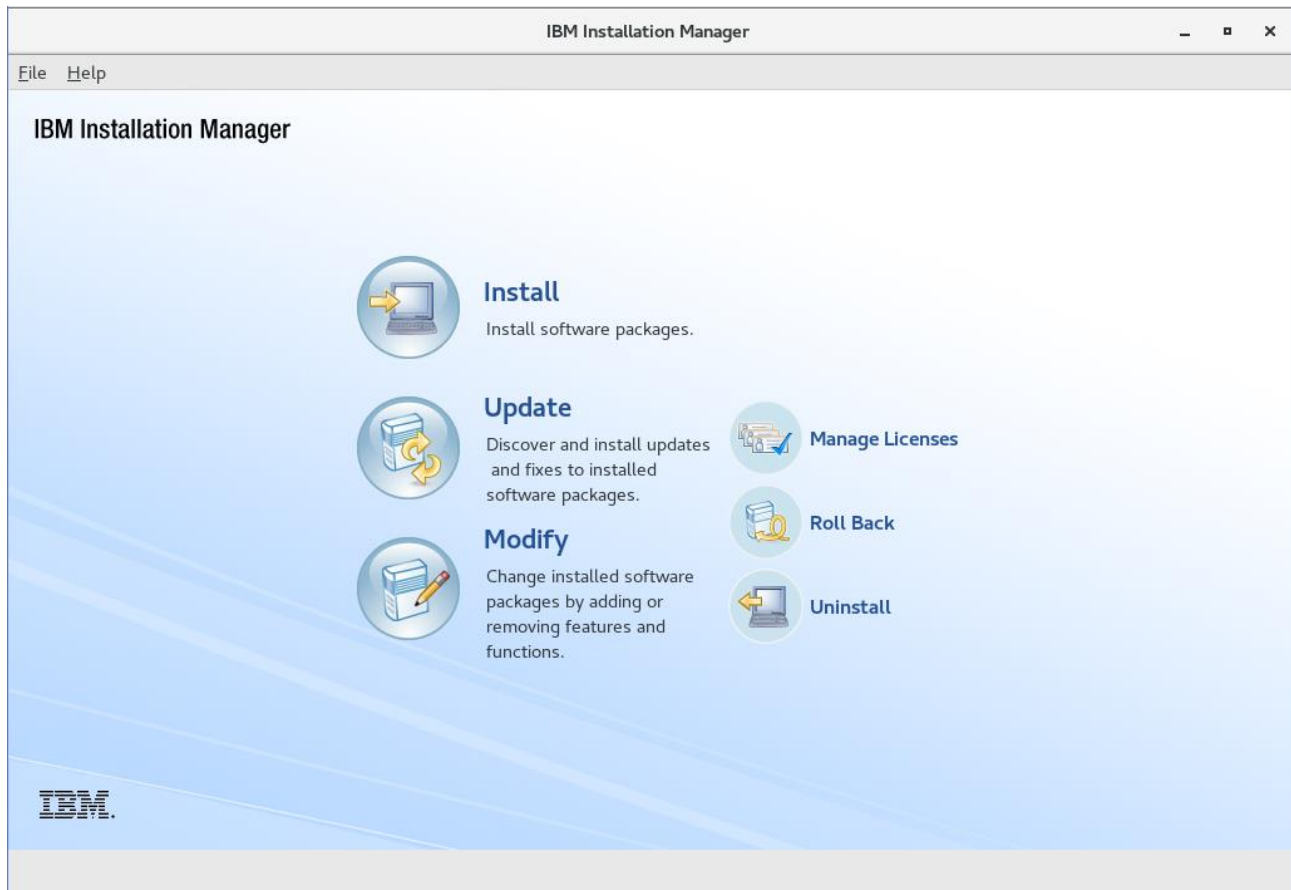
installationMediaRoot/WASND90/repository.config

installationMediaRoot/JDK803/repository.config

installationMediaRoot/IFPI59896/8.5.0.0-WP-Server-PI59896.zip



4. Ensure that all the repositories you just added are selected (i.e. there is a check mark in the box next to them) and click **Apply** then **OK**.
5. Back on the IIM Home Screen, click **Install**.



6. Check the boxes to install IBM WebSphere Application Server Network Deployment, IBM WebSphere Portal Server, and IBM WebSphere Portal Enable (or the offering you are installing, e.g. Extend, Express, etc.). IBM SDK, Java Technology Edition, Version 8 package should not be selected as it will be automatically installed with the IBM WebSphere Application Server Network Deployment package.

Install Packages

Select packages to install:

4 packages are selected.

Installation Packages	Status	Vendor
☒ IBM WebSphere Application Server Network Deployment ☒ Version 9.0.0.2	Will be installed	IBM
☒ IBM SDK, Java Technology Edition, Version 8 ☒ Version 8.0.3.20	Will be installed	IBM
☒ IBM WebSphere Portal Server ☒ Version 8.5.0.0	Will be installed	IBM
☐ IBM SDK, Java Technology Edition, Version 8 ☐ Version 8.5.0.0		
☒ IBM WebSphere Portal Enable ☐ Version 8.5.0.0	Will be installed	IBM

☐ Show all versions
 Check for Other V

Details

IBM WebSphere Portal Enable 8.5.0.0

IBM® WebSphere® Portal Enable helps increase efficiency and accuracy of website deployments. It places content cre
 content experts to create, maintain, and deliver online content while IT retains control. IBM WebSphere Portal Enable c
 information to the right audience It includes rich text editing tools, web content templates, and personalization services
 These websites can deliver highly targeted and dynamic content to customers, business partners, and employees in m

?

< Back
Next >

7. Click **Next**.

8. **Select** the iFix IFPI59896 and click **Next**

Install Packages
Select the fixes to install.

Fixes	Recommended	Vendor
▼ ☒ IBM WebSphere Portal Server 8.5.0.0		IBM
☒ 8.5.0.0-WP-Server-IFPI59896 8.5.0.20161201_1732		

Details
8.5.0.0-WP-Server-IFPI59896 8.5.0.20161201_1732
PI59896: Allows installation of Portal Server v8.5 on WebSphere Application Server v9 with JDK v8 [More info...](#)

- Repository: /opt/portalBinaries/SETUP/products/IFPI59896/8.5.0.0-WP-Server-IFPI59896.zip

9. **Accept** license agreement and click **Next**

Install Packages

Read the following license agreements carefully.

Install

Licenses

Location

Features

Summary

▼ IBM WebSphere Application Server Network Deployment

Software License Agreement

▼ IBM WebSphere Portal Enable

IBM WebSphere Portal Enable

▼ IBM WebSphere Portal Server

IBM WebSphere Portal Server

International Program License Agreement

Part 1 - General Terms

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< Back

Next >

10. Select a location for the IIM Shared Resources Directory. This guide uses:
/opt/IBM/WebSphere/IMShared

for Windows this guide recommends:
c:\IBM\WebSphere\IMShared

Install Packages

Select a location for the shared resources directory.

Install

Licenses

Location

Features

Summary

When you install packages, files are stored in two locations:

- 1) The shared resources directory - resources that can be shared by multiple packages.
- 2) The installation directory - any resources that are unique to the package that you are installing.



Important: You can only select the shared resources directory the first time you install a package with the IBM best results select the drive with the most available space because it must have adequate space for the share packages.

Shared Resources Directory: /opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

?

< Back

Next >

Click **Next**.

11. Click **IBM WebSphere Application Server** to set the WAS installation location. This guide uses:

`/opt/IBM/WebSphere/AppServer`

for Windows this guide recommends:

`C:\IBM\WebSphere\AppServer`

The screenshot shows the 'Install Packages' window for IBM WebSphere Application Server V9.0. The 'Location' tab is selected, showing a list of package groups and their installation directories. The 'IBM WebSphere Application Server V9.0' group is selected, with its installation directory set to '/opt/IBM/WebSphere/AppServer'. Below the list, the 'Package Group Name' is 'IBM WebSphere Application Server V9.0', the 'Installation Directory' is '/opt/IBM/WebSphere/AppServer', and the 'Architecture Selection' is '64-bit'. The 'Details' section shows the 'Shared Resources Directory' as '/opt/IBM/WebSphere/IMShared'. The 'Disk Space Information' table shows the volume '/' has 150.93 GB available space. At the bottom, there are buttons for '< Back', 'Next >', and 'Install'.

Package Group Name	Installation Directory	Architecture
IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer	64-bit
IBM WebSphere Application Server Network Deploym		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		
IBM WebSphere Portal Server V8.5	/opt/IBM/WebSphere/PortalServer	64-bit
IBM WebSphere Portal Server 8.5.0.0		

Package Group Name: IBM WebSphere Application Server V9.0

Installation Directory: /opt/IBM/WebSphere/AppServer

Architecture Selection: ☐ 32-bit ☒ 64-bit

Details

Shared Resources Directory: /opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

< Back Next > Install

Click **Next**.

12. Click **IBM WebSphere Portal Server V8.5** to set the Portal Server installation directory:

`/opt/IBM/WebSphere/PortalServer`

for Windows this guide recommends:

`C:\IBM\WebSphere\PortalServer`

The screenshot shows the 'Install Packages' window with the 'Location' tab selected. The window title is 'Install Packages'. Below the title bar, there is a progress bar with tabs: 'Install', 'Licenses', 'Location' (selected), 'Features', and 'Summary'. The main area displays a list of package groups. The 'IBM WebSphere Portal Server V8.5' group is selected and highlighted in blue. Below the list, the 'Package Group Name' is 'IBM WebSphere Portal Server V8.5', the 'Installation Directory' is '/opt/IBM/WebSphere/PortalServer', and the 'Architecture Selection' is '64-bit' (selected). At the bottom, there is a 'Details' section showing 'Shared Resources Directory: /opt/IBM/WebSphere/IMShared' and a 'Disk Space Information' table.

Package Group Name	Installation Directory	Archit
▼ IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer	64-bit
IBM WebSphere Application Server Network Deploym		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		
▼ IBM WebSphere Portal Server V8.5	/opt/IBM/WebSphere/PortalServer	64-bit
IBM WebSphere Portal Server 8.5.0.0		

Package Group Name: IBM WebSphere Portal Server V8.5

Installation Directory:

Architecture Selection: ☐ 32-bit ☒ 64-bit

Details

Shared Resources Directory: /opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

< Back Next > Install

Click **Next**.

13. Select any additional language translations your environment requires. Only English was selected for this guide. Click **Next**.

Install Packages
Select the translations to install.

Install Licenses Location **Features** Summary

Select the translations for the packages that will be installed to package group IBM WebSphere Portal Server V8.5, IBM WebSphere Application Server V9.0.

Translations Supported by All Packages

☒ English

Translations Supported by Only Some Packages

☐ Brazilian Portuguese	☐ Czech	☐ French	☐ German	☐ Hungarian
☐ Italian	☐ Japanese	☐ Korean	☐ Polish	☐ Romanian
☐ Russian	☐ Simplified Chinese	☐ Spanish	☐ Traditional Chinese	

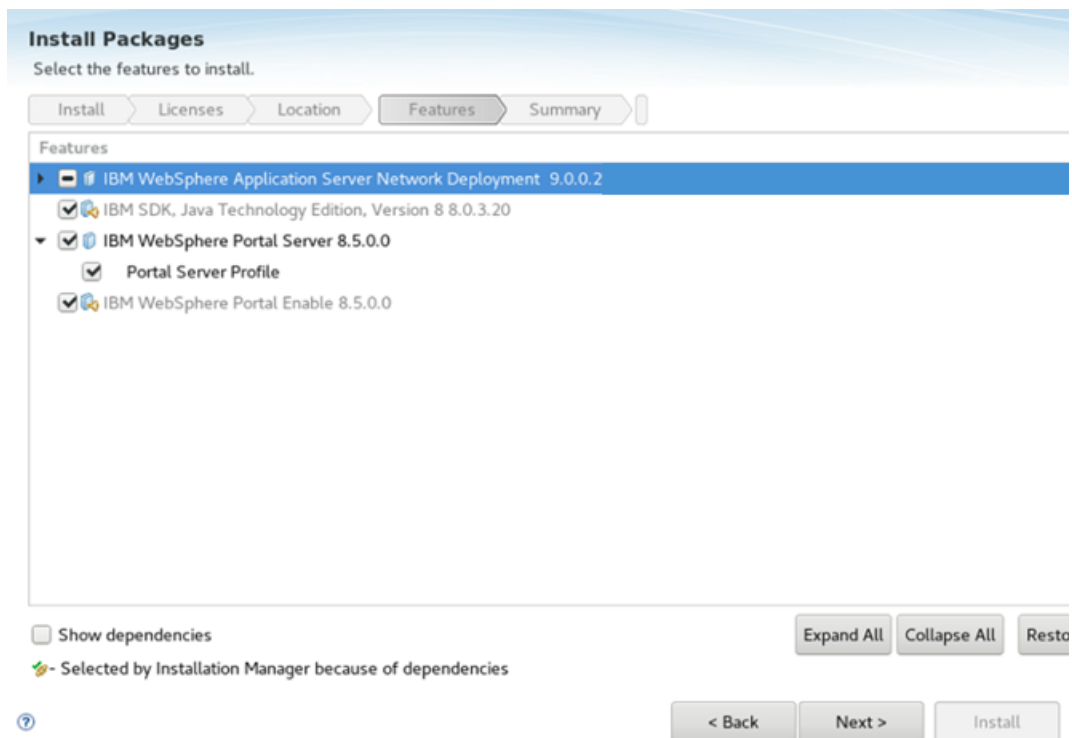
Select All Clear

? < Back Next > Install Can

14. View the features to install for both WebSphere Application Server and HCL Portal. For this guide, the defaults were used.

NOTE: Do not de-select any WebSphere Application Server features.

NOTE: Ensure you install a Portal Server Profile (selected by default).



Click **Next**.

15. Set the Configuration Wizard (Config Wizard) username and password. You can set these to any values you want to use for the Config Wizard credentials. “ConfigWizardID” is used for this guide.

IBM Installation Manager

Install Packages
Click Next to continue.

Install | Licenses | Location | **Features** | Summary

▼ IBM WebSphere Portal Server 8.5.0.0

- Enter the Administrator
- Enter the Administrator

Configuration for IBM WebSphere Portal Server 8.5.0.0
Enter the Administrator user ID and password for the Configuration Wizard.

Configuration Wizard Credentials
This ID is used only to log in to the Configuration Wizard and can be different from the Portal administrative ID.

Administrator user ID
ConfigWizardID

Administrator user password

Confirm administrator user password

? < Back Next > Install Cancel

Click **Next**.

16. Select Standard configuration mode. Set the hostname to match the fully qualified hostname of your system. Set the node and cell names.

Note: If you have an existing Deployment Manager, choose a node name and cell name different from the Deployment Manager node name and cell name.

The screenshot shows the 'IBM Installation Manager' window with the 'Install Packages' section active. The 'Features' tab is selected, displaying the 'Configuration for IBM WebSphere Portal Server 8.5.0.0'. The configuration mode is set to 'Standard'. The 'Standard details' section includes fields for 'Host name' (myprimaryportal.hcl.com), 'Node name' (Node01), and 'Cell name' (Cell01). Below these are fields for 'Admin Credentials for Portal Server', specifically 'Administrator user ID' and 'Administrator user password'. The 'Next >' button is highlighted, indicating the next step in the installation process.

17. Scroll down and set the Administrator user ID and password.

NOTE: These credentials will be stored in an internal repository and must be unique from any existing user names in your LDAP. Otherwise, LDAP configuration in Chapter6 will fail.

IBM Installation Manager

Install Packages
Click Next to continue.

Install | Licenses | Location | **Features** | Summary

▼ IBM WebSphere Portal Se

Enter the Administrator

Enter the Administrator

Configuration for IBM WebSphere Portal Server 8.5.0.0
Enter the Administrator user ID and password for the Portal Server.

Node01

Cell name
Cell01

Admin Credentials for Portal Server
Administrator user ID
PortalAdminID

Administrator user password

Confirm administrator user password

? < Back Next > Install Cancel

Click **Next**.

18. Review your installation selections and click **Install**.

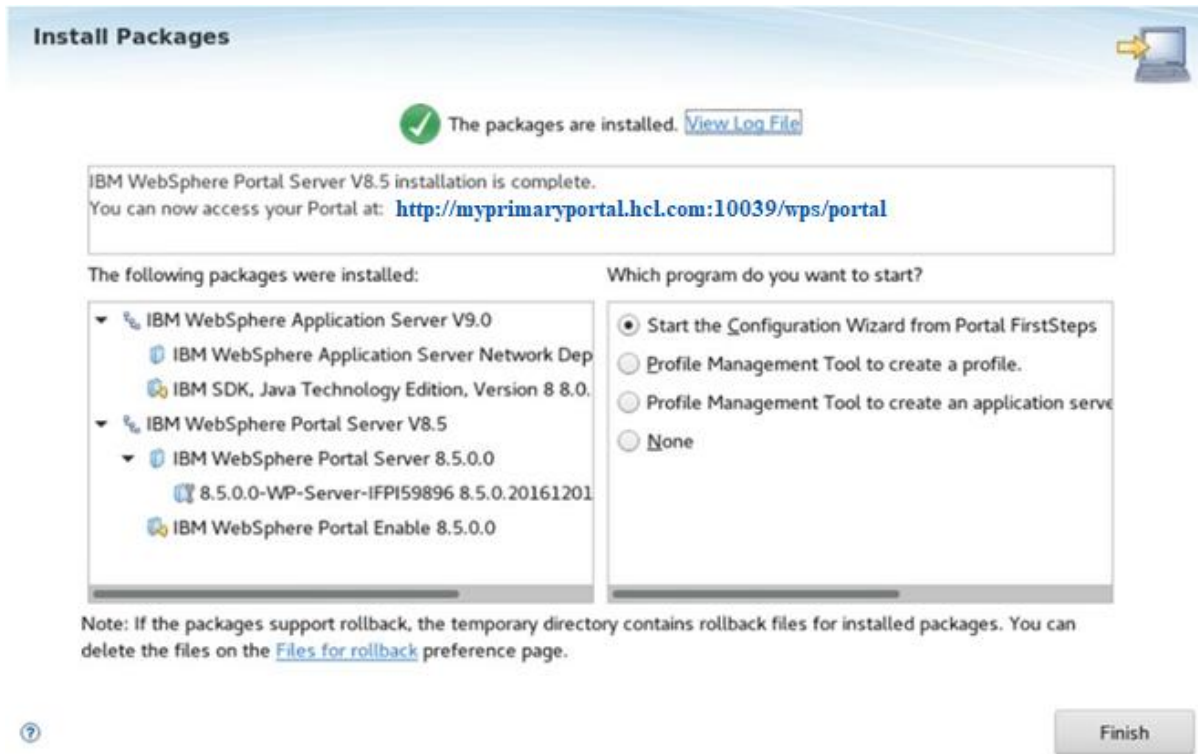
NOTE: The installation will take 30-60 minutes; don't be concerned if the Installation Manager seems to be stuck on one task for several minutes.

The screenshot shows the 'Install Packages' summary screen in the IBM WebSphere Application Server V9.0 installation wizard. The 'Summary' tab is selected in the top navigation bar. Below the navigation bar, the 'Target Location' is set to '/opt/IBM/WebSphere/IMShared'. The 'Packages' section lists the following components and their installation directories:

Packages	Installation Directory
IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer
IBM WebSphere Application Server Network Deployment	
EJBDeploy tool for pre-EJB 3.0 modules	
Stand-alone thin clients, resource adapters and e	
IBM SDK, Java Technology Edition, Version 8 8.0.3.2	

Below the packages list, the 'Environment' is set to 'English'. The 'Disk Space Information' section shows the total download size as 2.69 GB and the total installation size as 7.30 GB. At the bottom, there is a 'Repository Information' section and navigation buttons: '< Back', 'Next >', and 'Install'.

19. When the installation is finished, select the **None** option for “Which program do you want to start?” and click **Finish**.



20. Verify that you can access your Portal in an internet browser by navigating to:
<http://myprimaryportal.hcl.com:10039/wps/portal>

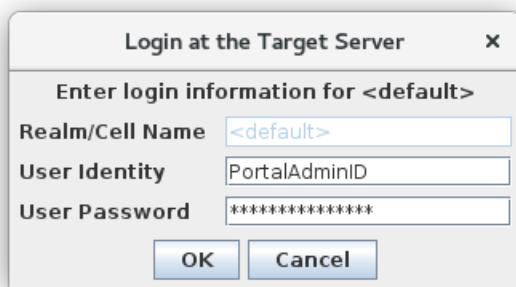
At the end of this section, you have successfully installed HCL Portal v8.5 with WebSphere Application Server v9.0.0.2

Section 3 – Upgrading HCL Portal 8.5 to Cumulative Fix (CF) 13

HCL Portal 8.5 now needs to be upgraded to Cumulative Fix 13 to support the installation of HCL Portal 9.0. You will need to stop the Portal Server and Configuration Wizard to proceed with the upgrade.

1. Open a terminal window and navigate to *wp_profile/bin*
2. Execute the following command:
`./stopServer.sh WebSphere_Portal -user PortalAdminID -password PortalAdminPswd`
3. You will be prompted for a userID and password. Enter your *PortalAdminID* for the userID and *PortalAdminPswd* for the password.

```
[root@ /]# cd /opt/IBM/WebSphere/wp_profile/bin/
[root@ bin]# ./stopServer.sh WebSphere_Portal
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/wp_profile/logs/WebSphere_Portal/stopServer.log
ADMU0128I: Starting tool with the wp_profile profile
ADMU3100I: Reading configuration for server: WebSphere_Portal
□
```



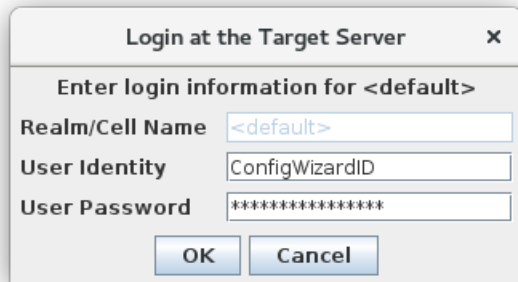
4. Navigate to the *AppServerRoot* folder. Continue in the directory structure to the */profiles/cw_profile/bin* subdirectory. This guide uses the following directory for the full path:

`/opt/IBM/WebSphere/AppServer/cw_profile/bin`

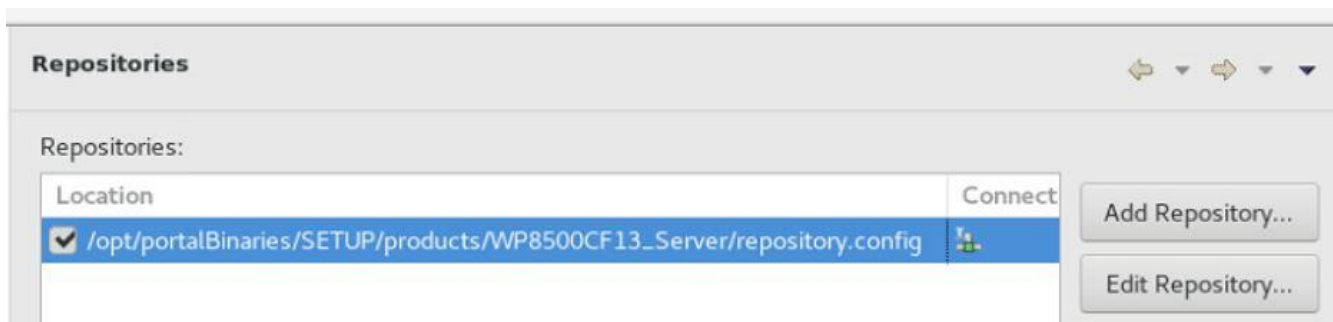
5. Execute the following command:
`./stopServer.sh server1 -user ConfigWizardID -password ConfigWizardPswd`

6. You will be prompted for a userID and password. Enter your *ConfigWizardID* for the userID and *ConfigWizardPswd* for the password.

```
[root@ /]# cd /opt/IBM/WebSphere/AppServer/profiles/cw_profile/bin/
[root@ bin]# ./stopServer.sh server1
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/AppServer/profiles/cw_profile/logs/server1/stopSer
ver.log
ADMU0128I: Starting tool with the cw_profile profile
ADMU3100I: Reading configuration for server: server1
]
```

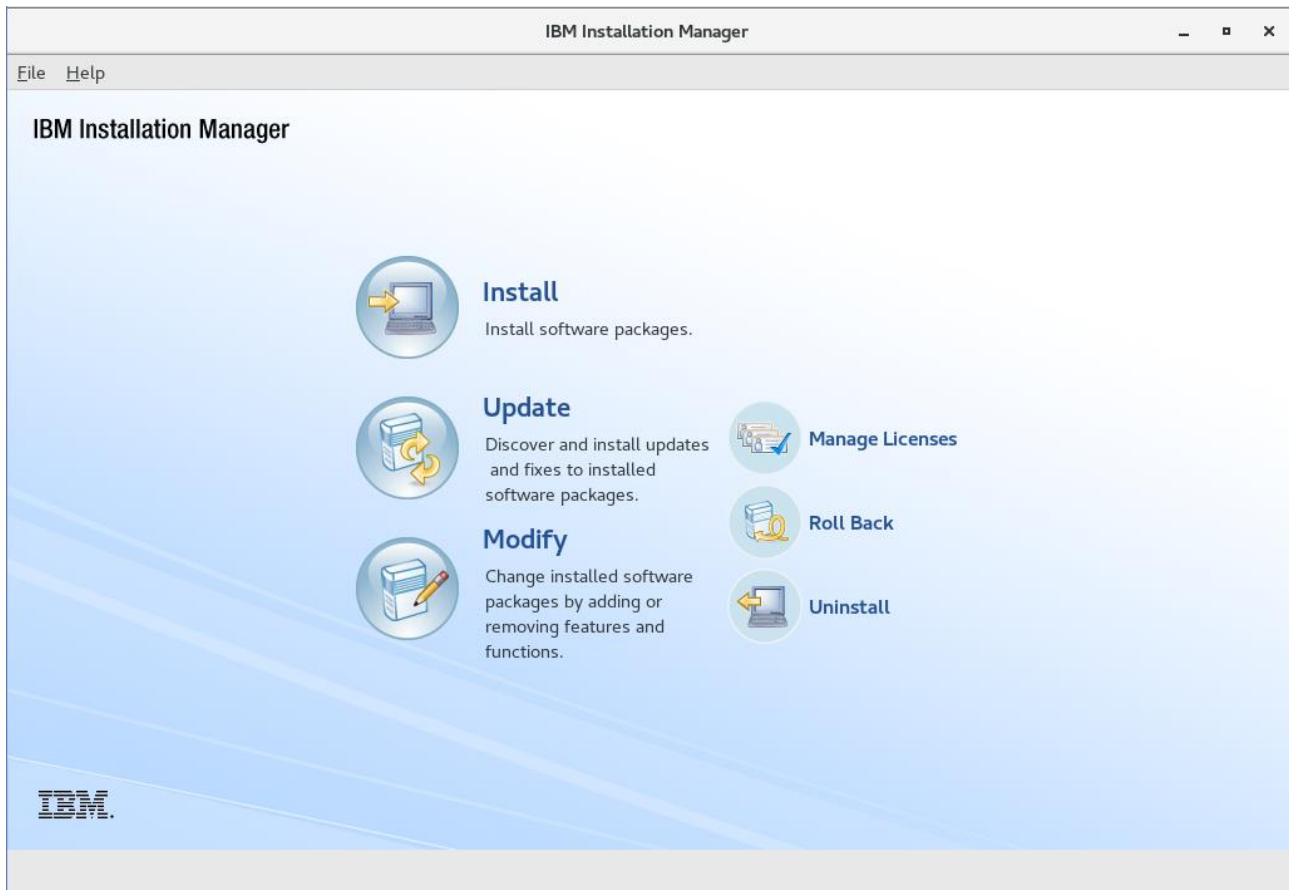


7. Return to IBM Installation Manager. Click **File > Preferences > Repositories**.
8. Select each of the existing Repositories and Click **Remove Repository**.
9. Click **Add Repository**, navigate to:
installationMediaRoot/SETUP/products/WP8500CF13_Server/repository.config

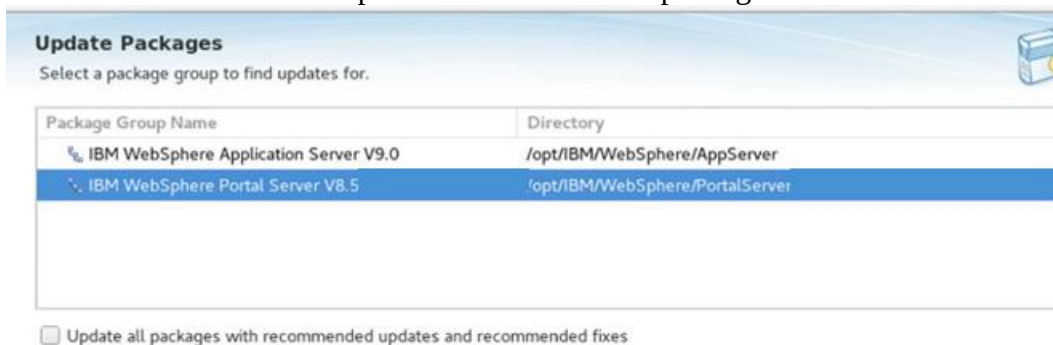


Click **OK** twice.

10. In IBM Installation Manager, click the Update icon:



11. Select the IBM WebSphere Portal Server 8.5 package.



12. Click **Next** to proceed with the Version 8.5.0.0 CF13 package.

13. Click **Next** to proceed beyond the Validation Results.

NOTE: IBM highly recommends that you backup of your entire Portal architecture when installing a cumulative fix on an established Portal system. As the system in this guide represents a brand new system, a backup is not required at this time.

14. Click the radio icon for “I accept the terms in the license agreement”. Click **Next**.
15. Click **Next** to Accept the terms of the licensing agreement.
16. Click **Next** to Install the IBM WebSphere Portal CF13 feature.
17. Click **Update**. This step will take approximately 20-30 minutes to execute.

 The packages are updated. [View Log File](#)

IBM WebSphere Portal Server V8.5 files have been upgraded.
To complete the process, you must now update all existing Portal profiles.
See the fix instructions for details:

The following update was installed:

Update	Installation Directory
- IBM WebSphere Portal Server V8.5 - IBM WebSphere Portal Server 8.5.0.0 CF13	/opt/IBM/WebSphere/PortalSe

Note: If the packages support rollback, the temporary directory contains rollback files for installed packages. You can delete the files on the [Files for rollback](#) preference page.

Finish

18. Click **Finish**.
19. Open a terminal window and navigate to `wp_profile/PortalServer/bin`
Execute the following command:
`./applyCF.sh -DWasPassword= PortalAdminPswd -DPortalAdminPwd=PortalAdminPswd`

```
[root@      bin]# pwd
/opt/IBM/WebSphere/wp_profile/PortalServer/bin
[root@      bin]# ./applyCF.sh -DWasPassword=PortalAdminPswd -DPortalAdminPwd=Po
rtalAdminPswd
```

20. Verify that you can access your Portal in an internet browser by navigating to:
<http://myprimaryportal.hcl.com:10039/wps/portal>

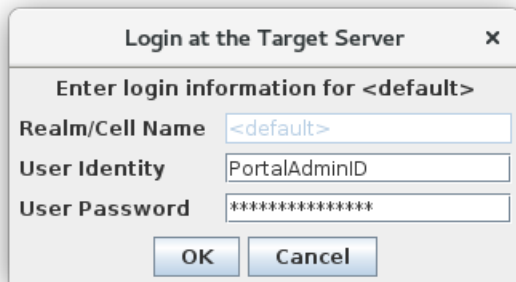
At the end of this section, you have successfully installed Cumulative Fix 13 for HCL Portal 8.5 on WebSphere Application Server 9.0.0.2.

Section 4 – Upgrading HCL Portal 8.5 CF13 to HCL Portal 9.0 CF13

In this final section HCL Portal 8.5 CF13 will be upgraded to HCL Portal Cumulative Fix 13. You will need to stop the Portal Server and Configuration Wizard to proceed with the upgrade.

1. Open a terminal window and navigate to `wp_profile/bin`
2. Execute the following command:
`./stopServer.sh WebSphere_Portal`
3. You will be prompted for a userID and password. Enter your *PortalAdminID* for the userID and *PortalAdminPswd* for the password.

```
[root@ /]# cd /opt/IBM/WebSphere/wp_profile/bin/
[root@ bin]# ./stopServer.sh WebSphere_Portal
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/wp_profile/logs/WebSphere_Portal/stopServer.log
ADMU0128I: Starting tool with the wp_profile profile
ADMU3100I: Reading configuration for server: WebSphere_Portal
□
```



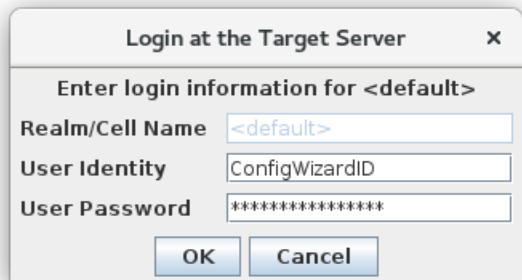
4. Navigate to the location you installed WebSphere Application Server. Continue in the directory structure to the `/profiles/cw_profile/bin` subdirectory. This guide uses the following directory for the full path:

`/opt/IBM/WebSphere/AppServer/cw_profile/bin`

5. Execute the following command:
`./stopServer.sh server1`

- You will be prompted for a userID and password. Enter your *ConfigWizardID* for the userID and *ConfigWizardPswd* for the password.

```
[root@ /]# cd /opt/IBM/WebSphere/AppServer/profiles/cw_profile/bin/
[root@ bin]# ./stopServer.sh server1
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/AppServer/profiles/cw_profile/logs/server1/stopSer
ver.log
ADMU0128I: Starting tool with the cw_profile profile
ADMU3100I: Reading configuration for server: server1
]
```

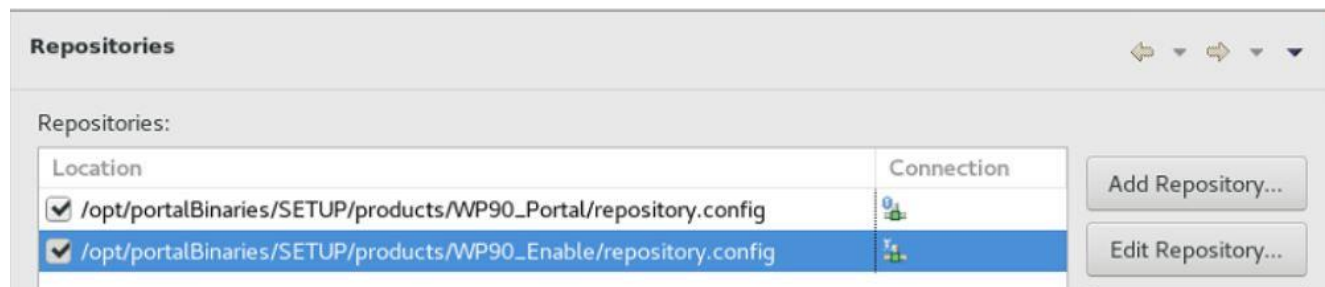


A dialog box titled "Login at the Target Server" with a close button (X). It prompts the user to "Enter login information for <default>". The fields are: "Realm/Cell Name" with a dropdown showing "<default>", "User Identity" with the text "ConfigWizardID", and "User Password" with masked characters "*****". There are "OK" and "Cancel" buttons at the bottom.

- Return to IBM Installation Manager. Click **File > Preferences > Repositories**.
- Select each of the existing Repositories and Click **Remove Repository**.
- Click **Add Repository**, navigate to:
installationMediaRoot/SETUP/products/WP90_Portal/repository.config

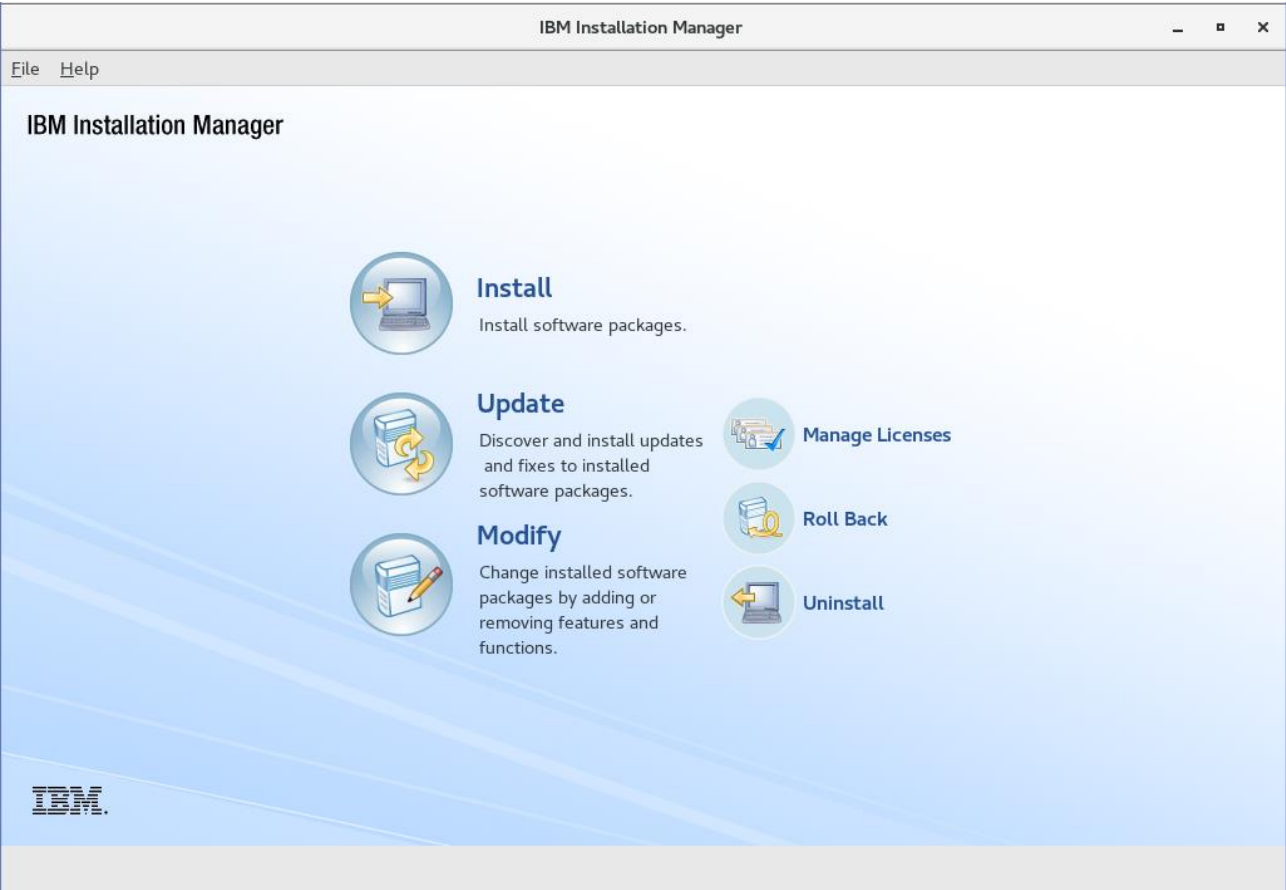
Click **OK**.

- Click **Add Repository**, navigate to:
installationMediaRoot/SETUP/products/WP90_Enable/repository.config

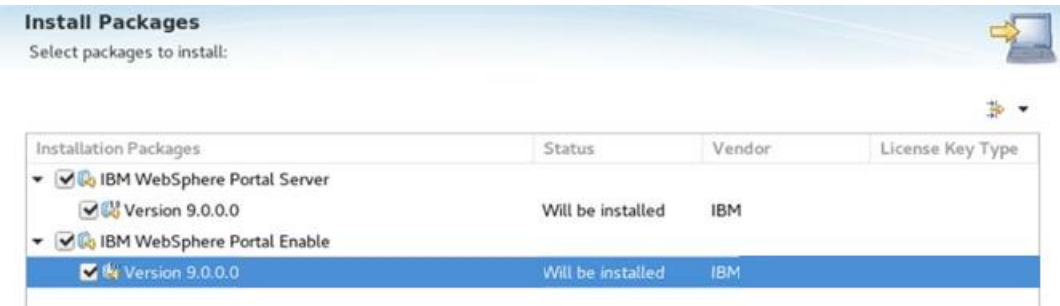


Click **OK** twice.

11. In IBM Installation Manager, click the Install icon:



12. Check the boxes to install the IBM WebSphere Portal Server and IBM WebSphere Portal Enable (or the offering you are installing, e.g. Extend, Express, etc.) packages.



Click **Next**

13. Accept terms of licensing agreement. Click **Next**.

14. Select the option **Use the existing package group** and click on **IBM WebSphere Portal v8.5**.

Install Packages

A package group is a location that contains one or more packages. Extensions can be installed into a common package group only and will share a common user interface. Select an existing package group for the extensions.

Install

Licenses

Location

Features

Summary

☒ Use the existing package group

☐ Create a new package group

Package Group Name	Installation Directory	Architecture
IBM WebSphere Portal Server V8.5	/opt/IBM/WebSphere/PortalServer	64-bit
IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer	64-bit

Package Group Name: IBM WebSphere Portal Server V8.5

Click **Next**

15. Enter your *PortalAdminID* and *PortalAdminPswd* for the Websphere Application Server credentials. Scroll down. Enter your *PortalAdminID* and *PortalAdminPswd* for the Portal Server credentials.

IBM WebSphere Portal Server 9.0.0.0

Application Server and Portal Server Credentials

Enter the administrator user ID and password for the WebSphere Application Server and the WebSphere Portal : The IBM Installation Manager uses these values to update the profile.

WebSphere Application Server

Administrator ID:

PortalAdminID

Password:

Confirm Password:

WebSphere Portal Server

Administrator ID:

36

16. Click **Validate Credentials**

▼ IBM WebSphere Portal Se

Application Server and

Configuration for IBM WebSphere Portal Server 9.0.0.0

Application Server and Portal Server Credentials

WebSphere Portal Server
Administrator ID:
PortalAdminID
Password:

Confirm Password:

Validate Credentials

☐ Check here to continue without validating credentials (not recommended).

Wait a few minutes for validation to complete. Click **Next**.

17. Review Summary. Select **Install**.

Install Packages

Review the summary information.

Install Licenses Location Features Summary

Target Location
Package Group Name: IBM WebSphere Portal Server V8.5
Installation Directory: /opt/IBM/WebSphere/PortalServer
Shared Resources Directory: /opt/IBM/IMShared

Packages
Packages
IBM WebSphere Portal Server 9.0.0.0
IBM WebSphere Portal Enable 9.0.0.0

Environment	Disk Space Information
English	Total Av
	/
	Total Download Size: 860.6 KB
	Total Installation Size: 3.87 MB

► Repository Information

?

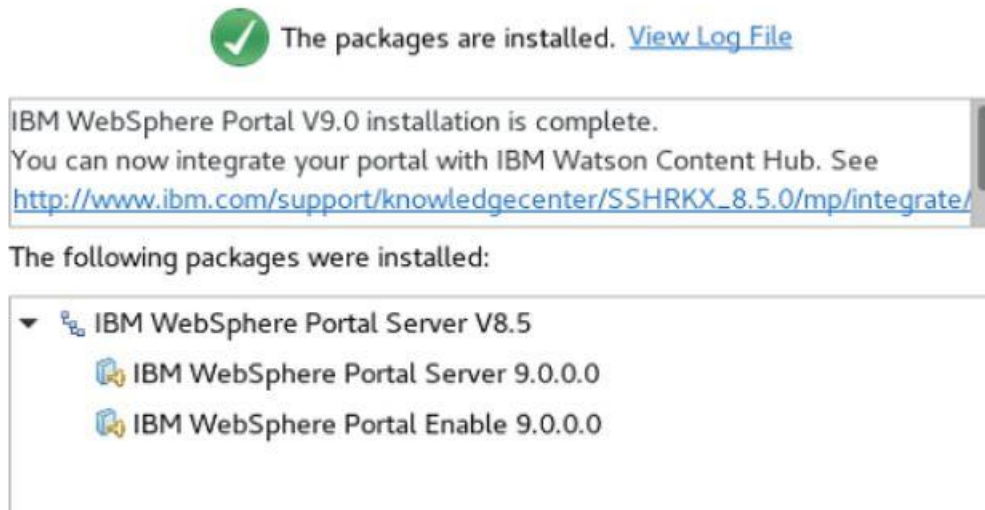
< Back

Next >

Install

37

18. When the installation is finished, you should see:



NOTE: On a successful upgrade, you will be presented with a link to fully integrate Portal 9.0 with Watson Content Hub. Watson Content Hub integration is not required to build a HCL Portal 9.0 cluster

19. Verify that you can access your Portal in an internet browser by navigating to:
[http://myprimaryportal.hcl.com:10039/wps/portal](\"http://myprimaryportal.hcl.com:10039/wps/portal\")

Chapter 2 – Configuring the Primary Node for a Remote Database

In this section, you will configure Portal to use an external database. For this guide, DB2 is used as the external database with Type 4 drivers installed and run on a different host than HCL Portal. More information about other databases that can be used with HCL Portal is available by referencing the HCL Portal v9.0 Product Documentation at this following link:

https://help.hcltechsw.com/digital-experience/9.0/config/prereq_db_software.html

To complete the task of configuring the Primary node for a remote database, execute the following steps:

1. On the Portal Server, create a directory called “dbdrivers” at the following location:

`wp_profile/PortalServer/dbdrivers`

for this guide:

`/opt/IBM/WebSphere/wp_profile/PortalServer/dbdrivers`

2. On the DB2 environment, navigate to *DB2InstallationRoot/YourDB2Version/java*, for example:

`opt /ibm/db2/V11.1/java`

and locate these two files:

`db2jcc4.jar`

`db2jcc_license_cu.jar`

```
[root@ java]# pwd
/opt/ibm/db2/V11.1/java
[root@ java]# ls -la | grep -i 'db2jcc4.jar\|db2jcc_license_cu.jar'
-r--r--r-- 1 bin bin 3894263 Jun 9 2016 db2jcc4.jar
-r--r--r-- 1 bin bin 1534 Jun 9 2016 db2jcc_license_cu.jar
[root@ java]#
```

3. Copy the two files from the DB2 server to the Primary Portal server and save them in the newly created `/opt/IBM/WebSphere/wp_profile/PortalServer/dbdrivers` folder.

NOTE : The next several steps will use a web-based tool called the Configuration Wizard. The Config Wizard helps you create custom scripts with instructions called workflows. Workflows are used to configure different aspects of HCL Portal. For more information see the following page in the HCL Portal Product Documentation:

https://help.hcltechsw.com/digital-experience/9.0/config/cw_overview.html

4. On the Portal Server, navigate to the *AppServerRoot*/profiles/cw_profile/bin directory. Execute the following command to start the Configuration Wizard:

```
./startServer.sh server1
```

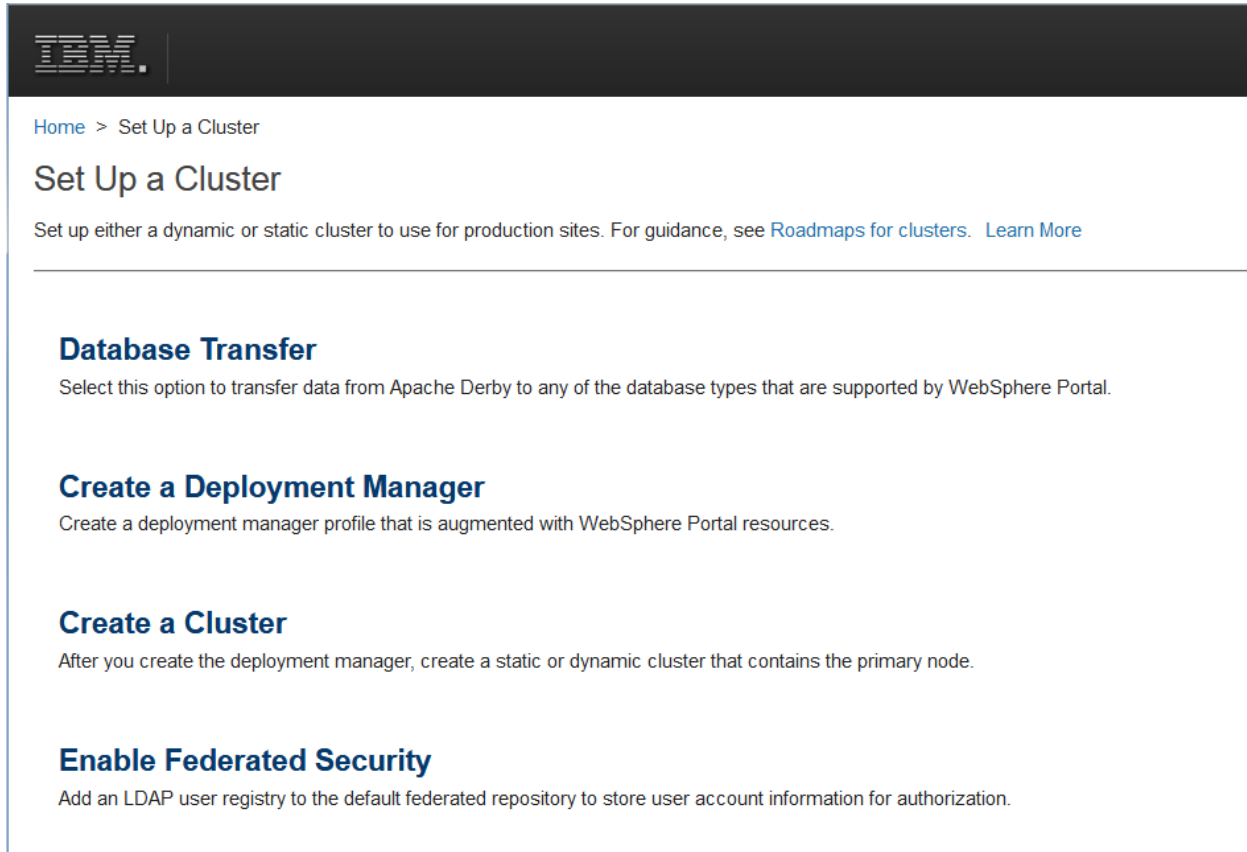
5. Open a web browser and navigate to the Configuration Wizard:

<http://myprimaryportal.hcl.com:10200/ibm/wizard>

and log in with the *ConfigWizardID* and *ConfigWizardPswd* user credentials you created during Portal installation.

CONFIG WIZARD CUMULATIVE FIX NOTE: The following screenshots are taken from a Portal system with cumulative fix 13 installed from Chapter 1 of this guide. If your installation has a different cumulative fix level, your Config Wizard options and screens could differ slightly from those shown in this guide.

6. From the Configuration Wizard home screen, select **Set Up a Cluster>Database Transfer**.



7. Choose your target operating system, name of your Portal profile, and Portal profile's location

Note: The profile name and profile location fields are pre-populated with the defaults.



wpsadmin | [Log Out](#)

[Home](#) > [Set Up a Cluster](#) > Database Transfer

Database Transfer

1 Answer Questions
In progress

2 Customize Values

3 Configure

Answer questions about your environment so that the wizard can determine which fields you must complete. Then, you can run the configuration, save your settings, or download the instruction and script files to run later. If you saved your settings from a previous session, you can upload the settings now. [Learn More](#)

[Upload Saved Selections](#)

System Information

Database Setup

Database Users



Target operating system:

Linux ▼

Target portal profile name:

wp_profile
Example: wp_profile

Target portal profile home directory:

/opt/IBM/WebSphere/wp_profile



Click the right arrow.

8. Provide answers for the following database setup items (examples shown; you can customize these values according to your environment or preferences):

Database management software: **DB2**

Do you want to transfer one database or multiple databases: **Multiple Databases**

Is the database hosted on the same server as the portal: **No**

Do you want the wizard to create users and assign them permission: **No, generate scripts**

Do you need advanced database collation support: **Yes**

Do you want to enable workload balancing for DB2 pureScale: **No**

Connect to database server to validate settings: **Yes**

System Information	Database Setup	Database Users
	Database management software:	DB2 ?
	Do you want to transfer to one database or multiple databases or schemas:	☐ One database ☒ Multiple databases or schemas ?
	Is the database hosted on the same server as the portal:	☐ Yes ☒ No ?
	Do you want the wizard to create schemas and assign permissions to users:	☐ Yes, create schemas and assign appropriate permissions ☒ No, generate scripts that I can use to create schemas and assign permissions ?
	Do you need advanced database collation support:	☒ Yes, provide manual collation instructions ☐ No, advanced collation support is not needed ?
	(For DB2 PureScale only): Do you want to enable workload balancing for DB2 pureScale:	☐ Yes ☒ No ?
	Connect to database server to validate settings	☒ Yes ☐ No ?

Click the right arrow.

9. HCL Portal leverages two different database users - a configuration user and a runtime user. The configuration user is used during a limited number of database operations and requires additional privileges on the database server. The runtime user is used to connect the Portal to the database during normal, day-to-day operations and requires fewer privileges.

Review the following link for more details on the required permissions for the configuration and runtime user for each of the Portal databases:

https://help.hcltechsw.com/digital-experience/9.0/plan/dbusers_common.html

This guide will use **db2inst1** for both the configuration user and runtime user for all databases in subsequent steps. For this step you must manually setup database configuration users and database runtime users on the database server to meet your company's enterprise database requirements. Record the IDs and passwords for each of the database users you created as they will be needed in subsequent steps.

10. Answer the database users questions (examples provided):

Do portal database domains use the same user ID and passwords: Yes

Do you need runtime database user ID for day-to-day operations: Yes

System Information	Database Setup	Database Users
Do portal database domains use the same user ID and passwords: ☒ Yes ☐ No		
Do you need runtime database user ID for day-to-day operations: ☒ Yes ☐ No		

Click the right arrow.

11. Fill in the name for each Portal Domain as well as the Database server hostname and port

Database Transfer

1 Answer Questions
Complete

2 Customize Values
In progress

3 Configure

Database Connection

System Information

Database Information

*Release database name:	WPREL	?
	Example: WPREL	
*Community database name:	WPCOMM	?
	Example: WPCOMM	
*Customization database name:	WPCUST	?
	Example: WPCUST	
*JCR database name:	WPJCR	?
	Example: WPJCR	
*Feedback database name:	WPFDBK	?
	Example: WPFDBK	
*Likeminds database name:	WPLM	?
	Example: WPLM	
*Host name:	mydbserver.hcl.com	?
	Example: yourhost.yourco.com	
*Port number:	50000	?
	Example: 50000	

Click the right arrow.

12. Fill in the values for your *PortalAdminID* and *PortalAdminPswd* specified during installation in Chapter 1.

1 Answer Questions
✔ Complete

2 Customize Values
In progress

3 Configure

Database Connection

System Information

Database Information

*WebSphere Application Server
administrator ID:

PortalAdminID



*WebSphere Application Server
administrator password:

.....

*Re-enter the password

.....

*WebSphere Portal installation
directory:

/opt/IBM/WebSphere/PortalServer

Example: /opt/IBM/WebSphere/PortalServer



13. Fill in your Configuration, Database administrator, and Runtime user ID's and corresponding passwords. All are **db2inst1** for this guide.

Database Connection	System Information	Database Information	
			Advanced
	*Configuration user ID:	db2inst1	?
	*Configuration password:		?
	*Re-enter the password		
	*Database administrator ID:	db2inst1	?
	*Database administrator password:		?
	*Re-enter the password		
	*Runtime user:	db2inst1	?
	*Runtime password:		?
	*Re-enter the password		

Step 13 is continued on the next page.

Scroll down and fill in the following values for each database:

- Database Name: this guide uses the pre-populated defaults
- Data Source: this guide uses the pre-populated defaults
- Database URL: use the example provided below the text box and add your database server hostname in place of mydbserver.hcl.com

NOTE: DO NOT put “@” symbols around the database urls. Be sure to end each URL with a semicolon. Example:

jdbc:db2://mydbserver.hcl.com:50000/<databaseName>:returnAlias=0;

*Release database name:	WPREL Example: WPREL	?
*Release data source:	wpreldbDS	?
*Release database URL:	jdbc:db2://mydbserver.hcl.com:50000/WPREL:returnAlias=0; Example: jdbc:db2://Your_Database_Server:50000/WPREL:returnAlias=0;	?
*Community database name:	WPCOMM Example: WPCOMM	?
*Community data source:	wpcommdbDS	?
*Community database URL:	jdbc:db2://mydbserver.hcl.com:50000/WPCOMM:returnAlias=0; Example: jdbc:db2://Your_Database_Server:50000 /WPCOMM:returnAlias=0;	?
*Customization database name:	WPCUST Example: WPCUST	?
*Customization data source:	wpcustdbDS	?
*Customization database URL:	jdbc:db2://mydbserver.hcl.com:50000/WPCUST:returnAlias=0; Example: jdbc:db2://Your_Database_Server:50000 /WPCUST:returnAlias=0;	?
*JCR database name:	WPJCR Example: WPJCR	?
*JCR data source:	wpjcrdbDS	?
*JCR database URL:	jdbc:db2://mydbserver.hcl.com:50000/WPJCR:returnAlias=0; Example: jdbc:db2://Your_Database_Server:50000/WPJCR:returnAlias=0;	?

14. Scroll down and fill in the last two values:

- IBM DB2 Library: the full paths to both type 4 DB2 drivers that you copied onto the primary Portal server, separated by a colon. This guide used:

/opt/IBM/WebSphere/wp_profile/PortalServer/dbdrivers/db2jcc4.jar:

/opt/IBM/WebSphere/wp_profile/PortalServer/dbdrivers/db2jcc_license_cu.jar

NOTE: For Windows environments, use a semi-colon between the two paths rather than a colon, which is used for Linux environments.

- Temporary directory to be used for collation: choose a name and location for your temporary directory. This guide uses:

/tmp/tmpdb

*IBM DB2 library:	/opt/IBM/WebSphere/wp_profile/PortalServer/dbdrivers/db2jcc4.jar:/opt/IBM/WebSphere/wp_profile/PortalServer/dbdrivers/db2jcc_license_cu.jar	?
Example: /opt/ibm/db2/V10.5/java/db2jcc4.jar:/opt/ibm/db2/V10.5/java/db2jcc_license_cu.jar		
*Temporary directory to be used for collation:	/tmp/tmpdb	?

Click the right arrow.

15. On the next screen, click **Download Configuration Scripts** and save the downloaded file.

1 Answer Questions
Complete

2 Customize Values
Complete

3 Configure
In progress

Optional

Download Wizard Selections

Download your selections in case you need to run the configuration again. You can also use your selections as a starting point to set up another server. [Learn More](#)

Download Configuration Scripts

If you plan to run scripts to set up the configuration instead of running the steps from the wizard, then download an archive of the scripts. The archive is named WorkflowInstanceScriptsAll.zip. [Learn More](#)

Do not close this window. Minimize it during the next step as you will need it again.

NOTE: Many of the following steps will be specific to DB2; see the instructions from the Config Wizard for steps specific to your database.

16. Move the downloaded .zip file to a convenient location on your database server as the database instance user. This guide uses /home/user/Desktop/CWScripts and db2inst1. Unzip the file by changing directories to the location of the scripts and running:

```
unzip WorkflowInstanceScriptsAll.zip
```

The CWScripts directory now contains the scripts you will run to create and setup your databases.

17. Go up one directory:

```
cd ..
```

and run the following from /home/user/Desktop, or your equivalent location, to change the permissions on the scripts.:

```
chmod -R 777 CWScripts
```

The resulting permissions in the Scripts/ folder should look similar to this:

```
[db2inst1@ CWScripts]$ ls -la
total 376
drwxrwxrwx 4 db2inst1 db2adm  4096 Jun 18 09:33 .
drwxr-xr-x 3 db2inst1 db2adm  4096 Jun 18 09:20 ..
drwxrwxrwx 2 db2inst1 db2adm  4096 Jun 18 09:32 properties
drwxrwxrwx 2 db2inst1 db2adm  4096 Jun 18 09:32 scripts
-rwxrwxrwx 1 db2inst1 db2adm 22355 Jun 18 09:32 TransferDatabase.html
-rwxrwxrwx 1 db2inst1 db2adm 287827 Jun 18 09:32 TransferDatabase.wfi
-rwxrwxrwx 1 db2inst1 db2adm 11540 Jun 18 09:32 wfi-instance.xsl
-rwxrwxrwx 1 db2inst1 db2adm 40578 Jun 18 09:32 WorkflowInstanceScriptsAll.zip
```

18. Navigate to the scripts subdirectory. Change the name of “CreateDB2Database” to “CreateDB2Database.sh”.
19. As the db2inst1 user execute the CreateDB2Database.sh script (ensure that DB2 is started before running this script):

```
su db2inst1
```

```
./CreateDB2Database.sh
```

20. After that command completes successfully, execute the following command:

```
db2 -tvf SetupDB2Database.sql
```

21. Go back to the Config Wizard window. You should see a screen similar to the following:

Start Configuration Reset Steps		
Step	Task	Status
1	Manual Step: Create the database users and groups. Instructions for Step 1 Mark Step Complete	Not Started
2	Back up the properties files that the wizard uses during the configuration. View Step Command Run Step Skip Step	Not Started
3	Manual Step: Download the script and run it on the database server to create your database. Download Script Instructions for Step 3 Mark Step Complete	Not Started
4	Manual Step: Download the script and run it on the database server to set up your database. Download Script Instructions for Step 4 Mark Step Complete	Not Started
5	Manual Step: Set up JCR collation for correct language locale order. Instructions for Step 5 Mark Step Complete	Not Started
6	Stop the portal server. View Step Command Run Step Skip Step	Not Started
7	Manual Step: Restart the DB2 server. Instructions for Step 7 Mark Step Complete	Not Started
8	Validate the database connection and environment. View Step Command Run Step Skip Step	Not Started
9	Transfer the database. View Step Command Run Step Skip Step	Not Started
10	Manual Step: Download the script and run it on the database server to grant privileges to the runtime user. Download Script Instructions for Step 10 Mark Step Complete	Not Started
11	Configure the JCR domain to support large files. View Step Command Run Step Skip Step	Not Started
12	Start the portal server. View Step Command Run Step Skip Step	Not Started

22. Click **Mark Step Complete** for Step 1
23. Click **Run Step** for Step 2,
24. Click **Mark Step Complete** for Step 3 and Step 4.

3	Manual Step: Download the script and run it on the database server to create your database. Download Script Instructions for Step 3 Mark Step Complete	 Complete
4	Manual Step: Download the script and run it on the database server to set up your database. Download Script Instructions for Step 4 Mark Step Complete	 Complete

25. Click **Instructions for Step 5** and review the details provided.

5	Manual Step: Set up JCR collation for correct language locale order. Instructions for Step 5 Mark Step Complete
---	---

26. Copy the following files from the HCL Portal server to /tmp/tmpdb directory (the temporary folder you specified on the previous Config Wizard page) on the DB2 server:

/opt/IBM/WebSphere/PortalServer/jcr/wp.content.repository.install/lib/wp.content.repository.install.jar
/opt/IBM/WebSphere/wp_profile/PortalServer/jcr/config/registerCollationUDFTemplate.sql

27. Set up collation on the database where the JCR domain is located. Change to this directory:

```
db2_instance_owner_home/sqllib/function
```

28. Execute the following command:

```
db2home/sqllib/java/jdk/bin/jar -xvf /tmp/tmpdb/  
wp.content.repository.install.jar icm/CollationUDF.class
```

```
[db2inst1@    function]$ pwd  
/home/db2inst1/sqllib/function  
[db2inst1@    function]$ ../java/jdk64/bin/jar -xvf /tmp/tmpdb/wp.content.reposi  
tory.install.jar icm/CollationUDF.class  
inflated: icm/CollationUDF.class
```

29. Change to the temporary directory where you copied the files in a previous step. For example, you can use this temporary directory on the DB2 server:

```
/tmp/tmpdb
```

30. Open the file “registerCollationUDFTemplate.sql” and change all SCHEMA references to the JCR schema; for example, JCR. For this guide, the default schema name, JCR, was used and the final result looked like the following:

```
[db2inst1@    tmpdb]$ pwd  
/tmp/tmpdb  
[db2inst1@    tmpdb]$ more registerCollationUDFTemplate.sql  
CREATE FUNCTION JCR.SORTKEYJ  
(  
    VALUE          VARCHAR(32672),  
    LOCALEID       VARCHAR(50)  
)  
RETURNS VARCHAR(5000) FOR BIT DATA  
FENCED THREADSAFE  
DETERMINISTIC  
NO SQL  
NO EXTERNAL ACTION  
LANGUAGE JAVA  
PARAMETER STYLE JAVA  
EXTERNAL NAME 'icm.CollationUDF!generateKey'  
ALLOW PARALLEL  
RETURNS NULL ON NULL INPUT;  
  
GRANT EXECUTE ON FUNCTION JCR.SORTKEYJ TO PUBLIC;  
  
UPDATE DBM CFG USING JAVA HEAP SZ 4096;
```

31. Connect to the JCR database:

```
db2 connect to WPJCR user DBUser using DBPassword
```

32. Enter this command to run the script:

```
db2 -tvf /tmp/tmpdb/registerCollationUDFTemplate.sql
```

```
[db2inst1@ tmpdb]$ db2 connect to wpjcr user db2inst1 using db2password
```

Database Connection Information

```
Database server      = DB2/LINUX8664 11.1.0  
SQL authorization ID = DB2INST1  
Local database alias = WPJCR
```

```
[db2inst1@ tmpdb]$ db2 -tvf /tmp/tmpdb/registerCollationUDFTemplate.sql
```

33. Disconnect from the JCR database:

```
db2 disconnect all
```

34. Restart the DB2 instance.

```
db2stop
```

```
db2start
```

35. Connect to the JCR database. Validate the UDF template was registered

```
db2
```

```
connect to WPJCR user DBUser using DBPassword
```

```
values jcr.sortkey('abc','en')
```

This guide observed the following message after running the final command:

```
1 record(s) selected.
```

```
db2 => █
```

36. Disconnect from the DB2 terminal window

```
quit
```

```
db2 disconnect all
```

```
db2 terminate
```

37. Switch back to the Portal server. Open a terminal window and navigate to <wp_profile>/bin.

38. Execute the following command:

```
./startServer WebSphere_Portal
```

39. Open a web browser and navigate to the following URL:
<https://myprimarportal.hcl.com:10041/ibm/console>

Login with your *PortalAdminID* and *PortalAdminPswd* specified during installation.

40. Navigate to to **Resources > Resource Environment > Resource Environment Providers > JCR ConfigService PortalContent > Custom properties.**
41. Click **New**. Create a new property for each of the following. Click **OK** after specifying each property and **Save** to save the Changes.

Name: jcr.query.collation.db2.enabled
Value: true
Type: java.lang.String

Name: jcr.query.collation.en
Value: en
Type: java.lang.String

Name: jcr.query.collation.sv
Value: sv
Type: java.lang.String

Name: jcr.query.collation.zh
Value: zh
Type: java.lang.String

Name: jcr.query.collation.de
Value: de
Type: java.lang.String

Name: jcr.query.collation.da
Value: da
Type: java.lang.String

Name: jcr.query.collation.hu
Value: hu
Type: java.lang.String

Name: jcr.query.collation.jp
Value: jp
Type: java.lang.String

Filter		Search terms:
Name	▼	*jcr.query*
Go		

You can administer the following resources:

☐	jcr.query.collation.en	en
☐	jcr.query.collation.da	da
☐	jcr.query.collation.db2.enabled	true
☐	jcr.query.collation.zh	zh
☐	jcr.query.collation.de	de
☐	jcr.query.collation.jp	jp
☐	jcr.query.collation.sv	sv
☐	jcr.query.collation.hu	hu

42. Click **Mark Step Complete** for Step.5

43. Click **Run Step** for Step 6.

44. Restart the DB2 server. Run the following commands on the DB2 server:

db2stop

db2start

45. In the Config Wizard, click **Mark Step Complete** for Step 7.

46. In the Config Wizard, click, **Run Step** for Step 8 - Validate the database connection and environment..

NOTE: If this step fails, click “View Result” and look for the first ERROR message in the log. Issues with this step are often caused by small typing mistakes in the DB URL and DB2 Library (driver paths) fields. You can click the left arrow to return to the page where those values are defined and ensure that all information and formatting is correct, then click right again, mark steps 1-6 as Complete or Skip Step, then run the validation again.

47. In the Config Wizard, click, **Run Step** for Step 9 - Transfer the database.

48. For Step 10 – switch back to your DB2 server as the db2inst1 user and open a terminal window.
Navigate to /home/db2inst1/Desktop/CWScripts/scripts directory
49. Execute the following command:
db2 -tvf GrantDB2RuntimeUserPrivileges.sql
50. On the Config Wizard, click **Mark Step Complete** for Step 10.
51. Click **Run Step** for Step 11 – Configure the JCR domain to support large files.
52. Click **Run Step** for Step 12 – Start the portal server.
53. Click **Finished**.
54. Verify that you can access your Portal on the web after the database transfer by navigating to:

<http://myprimaryportal.hcl.com:10039/wps/portal>

in a browser.

At this point, you have successfully installed HCL Portal and configured it to use an external database.

Chapter 3 – Installing and Configuring the Deployment Manager

In this section, you will install the Deployment Manager (dmgr) on a separate server. The installation of the dmgr will leverage the IBM Installation Manager (IIM) tool - similar to the installation of the HCL Portal server on the primary node in Chapter 1. In this guide, the installation was completed with a graphical user interface (GUI) using the root user with installation images on a local hard drive.

Installing IBM Installation Manager

The IBM Installation Manager, (IIM) is a tool that you can use to install and maintain your IBM software packages. Wizards guide you through the steps that you must take to install, modify, update, roll back, or uninstall your IBM products.

1. Open a terminal window and run:

```
ping mydmgr.hcl.com
```

where *mydmgr.hcl.com* is your fully qualified hostname.

2. In the same terminal window,

```
run: ping localhost
```

to verify that the localhost settings are properly configured on your server.

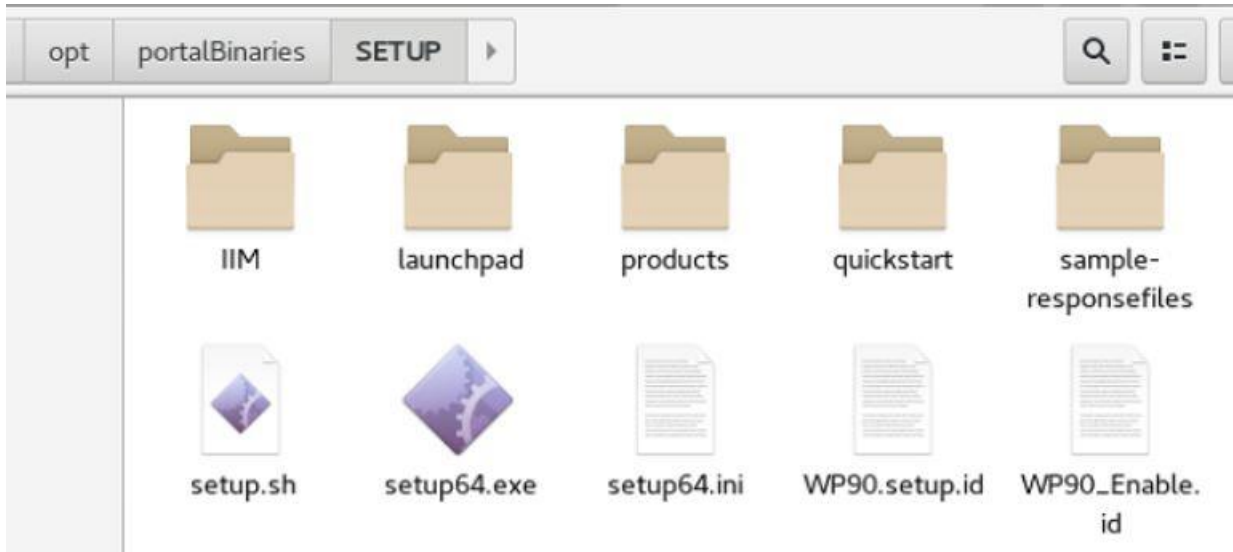
3. **Linux/UNIX environments only:** Ensure ulimit is set to 10240 or higher by running:

```
ulimit -n 10240
```

in the command line.

4. The installation media for the Deployment Manager is the same as the installation media for the Portal server. Unzip all .zip files provided with your Portal media into a single folder. This folder will be referred to as the `installationMediaRoot` folder.

For this guide the following directory is used for the `installationMediaRoot` folder:
`/opt/portalBinaries/SETUP/products`



5. From the HCL Portal v9.0 SETUP directory, navigate to:

`SETUP/IIM/yourEnvironment`

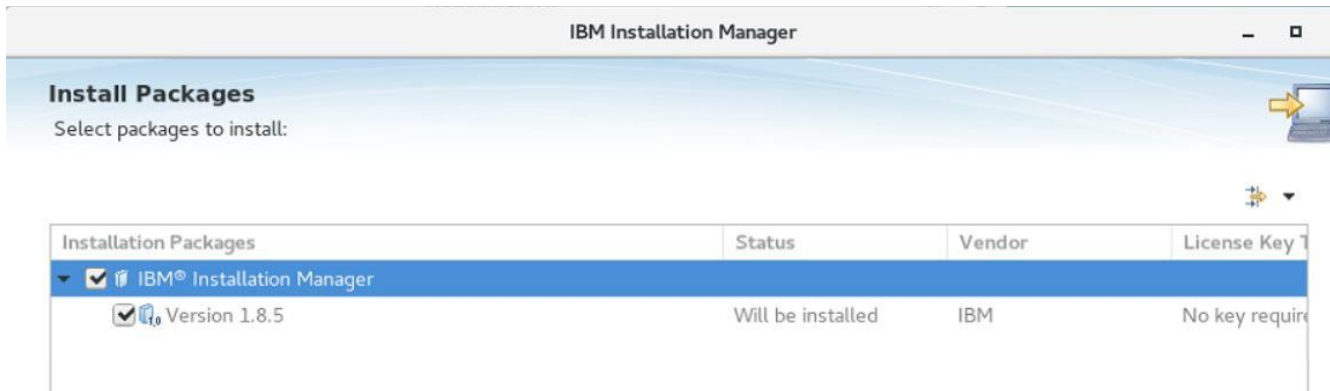
and run

`./install`

where *yourEnvironment* is the folder that best describes the operating system of the environment in which you are installing HCL Portal. For this guide the following is used:

`installationMediaRoot/SETUP/IIM/linux_x86_64`

The following window will appear:



6. Click **Next**.
7. Accept the license agreement and click **Next**.
8. Choose a directory in which to install IIM. This guide uses:

`/opt/IBM/InstallationManager/eclipse`

for Windows this guide recommends:

`c:\IBM\InstallationManager\eclipse`

NOTE: In Windows environments, the default location will likely be C:\Program Files\IBM\InstallationManager. Spaces in the file path can cause problems later in the installation/configuration of Portal. It is good practice to create a folder called “IBM” at C:\IBM or a similar location into which IIM and HCL Portal can be installed.

9. Click **Next**.
10. On the Summary screen, click **Install** to begin the installation.
11. When the installation is complete, click **Restart Installation Manager**.
12. In IIM, click **File > Preferences > Repositories**. Click **Add Repository** and add the following repositories:

`installationMediaRoot/WASND90/repository.config`
`installationMediaRoot/JDK803/repository.config`

where *installationMediaRoot* is set to `/opt/portalv9Binaries/SETUP/products` in this guide

13. Click **Apply**>**OK**. Then, back on the home screen click **Install**.

14. Select the check box for **IBM WebSphere Application Server Network Deployment** and click **Next**.



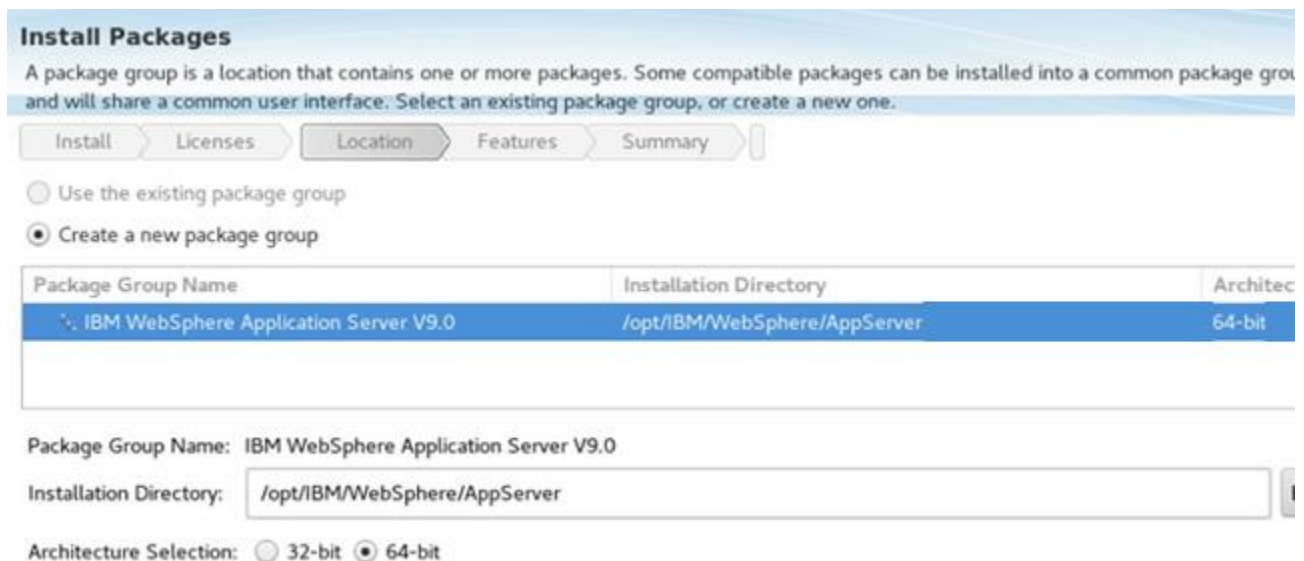
15. Accept the license agreement and click **Next**.

16. Select the location of the Shared Resources directory and click **Next**.

This guide uses: /opt/IBM/IMShared

17. Select the Installation Location for your Deployment Manager and click **Next**.

This guide uses: /opt/IBM/WebSphere/AppServer



18. Select any additional languages you want to install and click **Next**. For this guide, no additional languages were selected.

19. Select any additional features you want to install and click **Next**.

This guide uses the defaults with SDK v8 selected



20. On the summary screen, click **Install**.

21. When the installation completes, select the radio button **None** for **Which program do you want to start?** and click **Finish**.

22. In this next sequence of steps, you will use the Configuration Wizard to create and configure a profile for the Deployment Manager. Open the Configuration Wizard (Config Wizard) in a web browser by navigating to:

<http://myprimaryportal.hcl.com:10200/ibm/wizard>

Log in with your *ConfigWizardID* and *ConfigWizardPswdConfig* credentials.

23. On the Config Wizard Home Screen, click **Set Up a Cluster>Create a Deployment Manager**.

[Home](#) > [Set Up a Cluster](#)

Set Up a Cluster

Set up either a dynamic or static cluster to use for production sites. For guidance, see [Roadmaps for clusters](#). [Learn More](#)

Database Transfer

Select this option to transfer data from Apache Derby to any of the database types that are supported by WebSphere Portal.

Create a Deployment Manager

Create a deployment manager profile that is augmented with WebSphere Portal resources.

24. Choose your target operating system, name of your Portal profile, and the Portal profile location. The profile name and profile location pre-populated values are the defaults.

NOTE: wp_profile is the correct value for the **Target portal profile name** field.

The screenshot shows the 'Deployment Manager Information' tab. It contains three fields: 'Target operating system' with a dropdown menu set to 'Linux', 'Target portal profile name' with a text box containing 'wp_profile', and 'Target portal profile home directory' with a text box containing '/opt/IBM/WebSphere/wp_profile'. Navigation arrows are visible on the left and right sides.

Click the right arrow.

25. Select **On a remote server** for the deployment manager location.

The screenshot shows the 'Deployment Manager Information' tab. It contains a question 'Where is the deployment manager:' followed by two radio button options: 'On the same server as portal' and 'On a remote server'. The 'On a remote server' option is selected. Navigation arrows are visible on the left and right sides.

Click the right arrow.

26. Fill in the hostname of your primary Portal server.

The screenshot shows the 'Portal Information' tab. It contains a field 'WebSphere Application Server host name:' with a text box containing 'myprimaryportal.hcl.com'. Below the text box is an example: 'Example: my_host_name.mydomain.com'. A help icon (?) is visible to the right of the text box. Navigation arrows are visible on the left and right sides.

27. Fill in the following values (examples given):

Deployment manager host name: **mydmgr.hcl.com**

New deployment manager profile name: **dmgr01**

Deployment manager profile path:
/opt/IBM/WebSphere/AppServer/profiles/dmgr01

Deployment manager cell name: this guide uses the default, **dmgrCell01**, but you can change it to anything EXCEPT the name of the previously created Portal cell.

Deployment manager node name: this guide uses the default, **dmgrNode01**, but you can change it to anything EXCEPT the name of the previously created Portal node.

WebSphere Application Server installation directory:
/opt/IBM/WebSphere/AppServer

WebSphere Application Server administrator ID: **dmgrAdminID**

WebSphere Application Server administrator password: **dmgrAdminPswd**

Re-enter the password: your **dmgrAdminPswd** again

Portal Information	Deployment Manager Information
	*Deployment manager host name: mydmgr.hcl.com ? *New deployment manager profile name: dmgr01 ? *Deployment manager profile path: /opt/IBM/WebSphere/AppServer/profiles/dmgr01 Example: /opt/IBM/WebSphere/AppServer/profiles/dmgr01 ? *Deployment manager cell name: dmgrCell01 Example: dmgrCell01 ? *Deployment manager node name: dmgrNode01 Example: dmgrNode01 ? *WebSphere Application Server installation directory: /opt/IBM/WebSphere/AppServer Example: /opt/IBM/WebSphere/AppServer ? *WebSphere Application Server administrator ID: dmgrAdminID ? *WebSphere Application Server administrator password: *Re-enter the password:

Click the right arrow.

28. The following screen will appear:

Optional

Download Wizard Selections

Download your selections in case you need to run the configuration again. You can also use your selections as a starting point to set up another server. [Learn More](#)

Download Configuration Scripts

If you plan to run scripts to set up the configuration instead of running the steps from the wizard, then download an archive of the scripts. The archive is named WorkflowInstanceScriptsAll.zip. [Learn More](#)

Click **Start Configuration** to begin. When the wizard reaches a manual step, it pauses the process until you can complete the manual step. You cannot cancel a running configuration. If you leave the page or lose your connection, the configuration continues to run. Log back in to return to a configuration that is in progress. [Learn More](#)

Start Configuration

Reset Steps

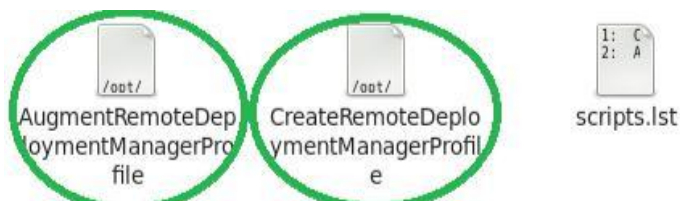
Step	Task	Status
1	Manual Step: Download the script and view instructions to create the deployment manager. Download Script Instructions for Step 1 Mark Step Complete	Not Started
2	Manual Step: Add the required WebSphere Portal files to the remote deployment manager. Instructions for Step 2 Mark Step Complete	Not Started
3	Manual Step: Download the script and view instructions to augment the deployment manager with WebSphere Portal files. Download Script Instructions for Step 3 Mark Step Complete	Not Started

29. Click **Download Configuration Scripts**, save WorkflowInstanceScriptsAll.zip in an easily accessible location, then unzip it.

30. Copy the following files and save them in a temporary location on the

dmgr server: AugmentRemoteDeploymentManagerProfile

CreateRemoteDeploymentManagerProfile



For this guide, they were placed in the following location:

/tmp/Scripts

31. Change the permissions on this folder as follows:

```
chmod -R 777 /tmp/Scripts
```

32. Change the name of “CreateRemoteDeploymentManagerProfile” to “CreateRemoteDeploymentManagerProfile.sh”

33. Run CreateRemoteDeploymentManagerProfile.sh:

```
./CreateRemoteDeploymentManagerProfile.sh
```

34. Click **Mark Step Complete** for Step 1 – Download the script and view instructions to create the Deployment Manager.

1 Manual Step: Download the script and view instructions to create the deployment manager. ✔ Complete

[Download Script](#) [Instructions for Step 1](#)

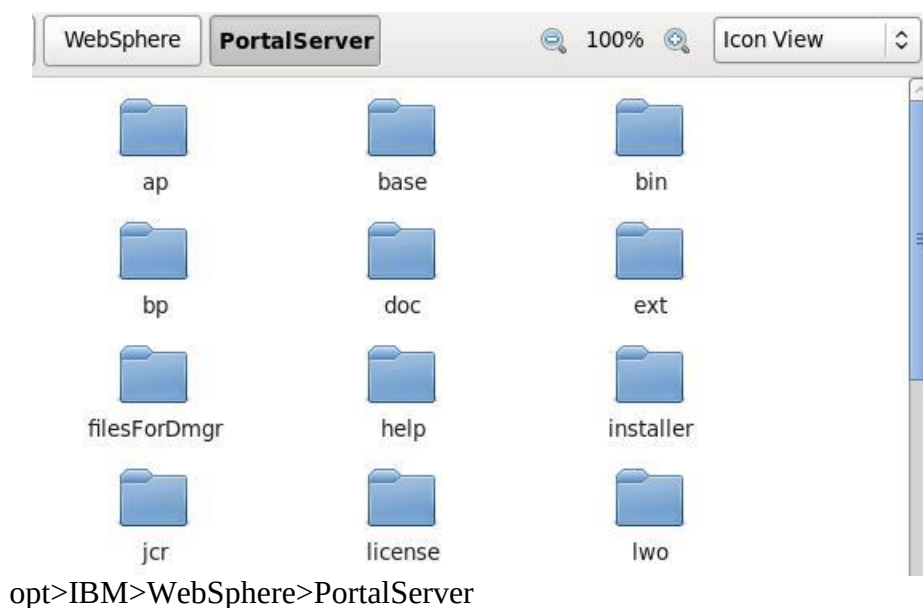
Mark Step Complete

35. Ensure that the newly created dmgr is stopped:

```
cd /opt/IBM/WebSphere/AppServer/profiles/dmgr01/bin
```

```
./stopManager.sh -user dmgrAdminID -password dmgrAdminPswd
```

36. Back on the Primary Portal Server, navigate to *WebSphereInstallationRoot/PortalServer*:



37. Copy the folder named “filesforDmgr” and save it in the /tmp directory on the Deployment Manager Server.
38. Open the filesforDmgr folder on the dmgr Server. Move the filesforDmgr.zip file in this directory to the AppServer directory and unzip it there. Example:

```
mv /tmp/filesForDmgr/filesForDmgr.zip /opt/IBM/WebSphere/AppServer
cd /opt/IBM/WebSphere/AppServer
unzip filesforDmgr.zip
```

39. If the deployment manager profile was not created in the default \${WasHome}/profiles/Dmgr01 directory, then the metadata_wkplc.xml file, which is in the \${WasHome}/profiles/Dmgr01/config/.repository directory in the compressed file, must be copied into the config/.repository subdirectory under the deployment manager profile directory.

This guide used a non-default name of dmgr01 and thus ran the following command:
cp /opt/IBM/WebSphere/AppServer/profiles/Dmgr01/config/.repository/metadata_wkplc.xml
/opt/IBM/WebSphere/AppServer/profiles/dmgr01/config/.repository/

40. Back on the Config Wizard, click **Mark Step Complete** for Step 2 – Add the required HCL Portal files to the remote deployment manager.

2

Manual Step: Add the required WebSphere Portal files to the remote deployment manager.
[Instructions for Step 2](#)
[Mark Step Complete](#)

 **Complete**

41. On the dmgr Server, change the name of the file

AugmentRemoteDeploymentManagerProfile
to
AugmentRemoteDeploymentManagerProfile.sh

42. Run the AugmentRemoteDeploymentManagerProfile.sh script

```
cd /tmp
./AugmentRemoteDeploymentManagerProfile.sh
```

When this is complete you should see the line “Profile augmentation succeeded” about one third of the way down in the command line output.

```
[root@ ...] ./AugmentRemoteDeploymentManagerProfile.sh
ADMU0116I: Tool information is being logged in file
/opt/ibm/WebSphere/AppServer/profiles/dmgr01/logs/dmgr/startServer.log
ADMU0128I: Starting tool with the dmgr01 profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
INSTCONFSUCCESS: Profile augmentation succeeded.
```



43. Click **Mark Step Complete** for Step 3 – Download the script and view instructions to augment the deployment manager with HCL Portal files

3 44. Click **Finished**.

Step	Task	Status
1	Manual Step: Download the script and view instructions to create the deployment manager. Download Script Instructions for Step 1 Mark Step Complete	✓ Complete
2	Manual Step: Add the required WebSphere Portal files to the remote deployment manager. Instructions for Step 2 Mark Step Complete	✓ Complete
3	Manual Step: Download the script and view instructions to augment the deployment manager with WebSphere Portal files. Download Script Instructions for Step 3 Mark Step Complete	✓ Complete

Finished

45. Verify that you can access your newly created Deployment Manager's console by opening a web browser and navigating to:

<https://mydmgr.hcl.com:9043/ibm/console>

WebSphere. software Welcome wpsadmin Help | Logout

View: All tasks

- Welcome
- Guided Activities
- Servers
- Applications
- Jobs
- Services
- Resources
- Runtime Operations
- Security
- Operational policies
- Environment
- System administration
- Users and Groups
- Monitoring and Tuning
- Troubleshooting
- Service integration
- UDDI

Welcome

Integrated Solutions Console provides a common administrative console for multiple products. The table lists the product suites that can be administered through this installation. Select a product suite to view more information.

Suite Name	Version
WebSphere Application Server	9.0.0.2

About this Integrated Solutions Console

Integrated Solutions Console, 9.0.0.2
Build Number: cf021645.01
Build Date: 11/8/16
--
LICENSED MATERIALS PROPERTY OF IBM

At this point, you have installed the Deployment Manager and created a dmgr profile.

Chapter 4 – Federating and Clustering the Primary Node

In this section you will create a cluster using the Configuration Wizard, add the Primary Portal Node to this cluster, and federate the Primary Node.

1. Open the Configuration Wizard in a web browser:

<http://myprimaryportal.hcl.com:10200/ibm/wizard>

and sign in with your *ConfigWizardID* and *ConfigWizardPswd*.

2. On the Config Wizard Home screen, Click **Set Up a Cluster>Create a Cluster**.

3. Select your target operating system, Portal profile name, and Portal profile home directory.

Answer questions about your environment so that the wizard can determine which fields you must complete. Then, you can run the configuration, save your settings, or download the instruction and script files to run later. If you saved your settings from a previous session, you can upload the settings now. [Learn More](#)

Upload Saved Selections

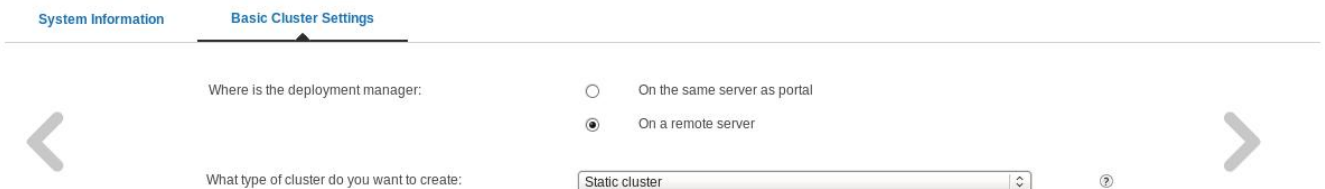


Click the right arrow.

4. Select the deployment manager's location and the type of cluster you are creating. This guide uses a static cluster with a remote Deployment Manager For more information on static and dynamic clustering, see the following documentation:

https://help.hcltechsw.com/digital-experience/9.0/plan/plan_clus_ovr.html

https://help.hcltechsw.com/digital-experience/9.0/plan/plan_xdclus.html



Click the right arrow.

5. Fill in your Portal Administrator ID, Portal Administrator password, release database configuration userID and release configuration user database password.

*WebSphere Portal administrator ID:	PortalAdminId	?
*WebSphere Portal administrator password:		?
*Re-enter the password		
*Release configuration user:	db2inst1	?
*Release configuration password:		?
*Re-enter the password		

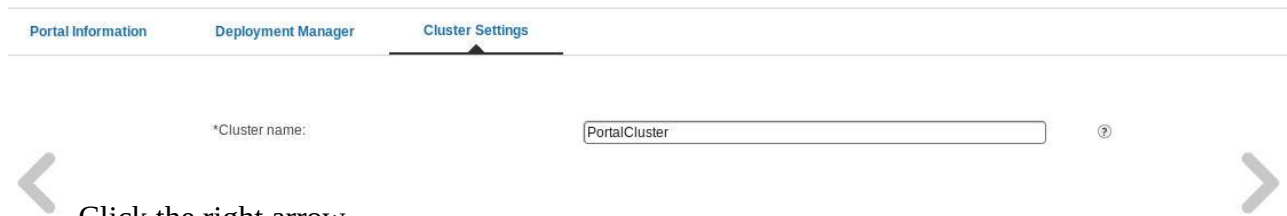
Click the right arrow.

6. Fill in your *dmgrAdminID*, *dmgrAdminPswd*, *dmgrAdminPswd* again, dmgr Cell name, dmgr Node name, dmgr profile path dmgr host name, and dmgr soap port. All values were specified previously during dmgr installation. The SOAP port default is 8879, which this guide uses.

Portal Information	Deployment Manager	Cluster Settings
*WebSphere Application Server administrator ID:	dmgrAdminID	?
*WebSphere Application Server administrator password:		
*Re-enter the password		
*Deployment manager cell name:	dmgrCell01 Example: dmgrCell01	?
*Deployment manager node name:	dmgrNode01 Example: dmgrNode01	?
*Deployment manager profile path:	/opt/IBM/WebSphere/AppServer/profiles/dmgr01 Example: /opt/IBM/WebSphere/AppServer/profiles/dmgr01	?
*Deployment manager host name:	mydmgr.hcl.com	?
*SOAP port:	8879	?

Click the right arrow.

7. Choose a cluster name. For this guide, the default, **PortalCluster**, is used.



Portal Information Deployment Manager **Cluster Settings**

*Cluster name: ?

Click the right arrow.

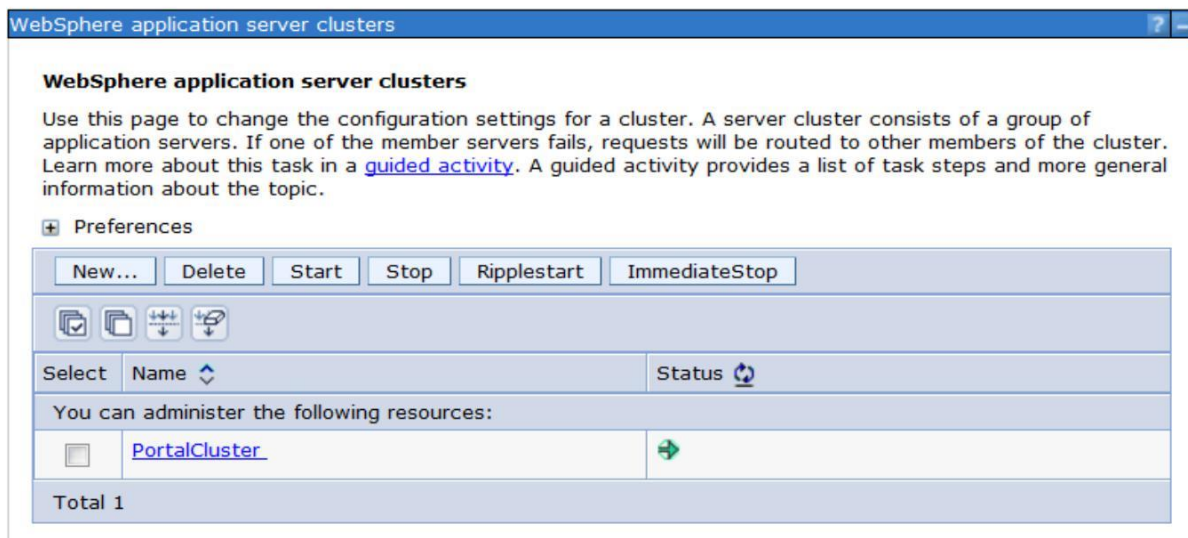
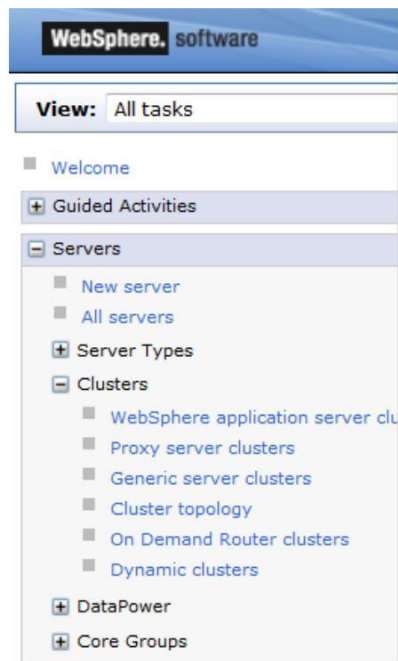
8. Check the system clocks on the Primary Portal Server and the Deployment Manager Server and ensure that their times are within five minutes of each other. Mark Step 1 on the Config Wizard **Create a Cluster** page complete.
9. For Step 2 – Federate the node, click **Run Step**.
10. For Step 3 – Prepare the node for clustering, click **Run Step**. This will run the post-federation configuration engine task.
11. For Step 4 – Complete the cluster setup, click **Run Step**. This will run the cluster-setup configuration engine task.
12. After all four steps have been successfully completed, click **Finish**.

Step	Task	Status
1	Manual Step: Verify that the portal node and deployment manager system clocks are within 5 minutes of each other. Instructions for Step 1	✔ Complete
2	Federate the node. This node then becomes a managed node in the deployment manager cell. View Step Command Run Step Skip Step	✔ Complete View Result
3	Prepare the node for clustering. View Step Command Run Step Skip Step	✔ Complete View Result
4	Complete the cluster setup. View Step Command Run Step Skip Step	✔ Complete View Result

Finished

13. Verify that you can access your Portal in a web browser:
<http://myprimaryportal.hcl.com:10039/wps/portal>
14. Open the dmgr console in a web browser:
<https://mydmgr.hcl.com:9043/ibm/console>

15. Login to the dmgr using your *dmgrAdminID* and *dmgrAdminPswd*.
16. On the left side, click **Servers>Clusters>WebSphere application server clusters** and ensure that your newly created cluster **PortalCluster** is present



In the following steps, you will enable Memory-to-Memory replication for the primary cluster member.

Special note on Memory-to-Memory (M2M) replication: M2M replication takes session data from one Portal sever and copies it to another Portal server. This is useful in situations where one Portal server catastrophically fails. Failover to an additional Portal server in the cluster can occur with no disruption for the end user. The user's session data will be retained. M2M's disadvantage is the additional overhead needed to store and replicate the session data across all cluster members. Suppose you have a two server cluster without M2M enabled. Each server utilizes 1GB of memory to store session data. With M2M enabled, each server would now consume 2GB of session data. In a ten server cluster, assuming similar scaling, it would be 10GB of session data. Similar scaling with CPU would be needed to ensure replication of data could occur, which is necessary for successful failover.

IBM has generally found that most Portal environments can safely enable M2M replication. For larger scale Portal deployments M2M does not scale and alternatives are recommended. Replication domains, session databases and WebSphere Extreme Scale caching are three examples of many alternatives that may perform better for scaling purposes. Open a case with IBM WebSphere Application Server L2 support to discuss details of options available if you have a larger-scale Portal environment.

17. While logged in to the dmgr, navigate to **Servers → Server Types → WebSphere application servers → WebSphere_Portal → Session Management → Distributed Environment Settings**.

[Application servers](#) > [WebSphere_Portal](#)

Use this page to configure an application server. An application server is a server that provides services required to run enterprise applications.

[Runtime](#) [Configuration](#) [Reports](#) [Operations](#)

General Properties

Name

WebSphere_Portal

Node name

Node01

☐ Run in development mode

☒ Parallel start

☐ Start components as needed

Access to internal server classes

Allow

Container Settings

☒ [Session management](#)

☐ SIP Container Settings

☐ Web Container Settings

☐ Portlet Container Settings

☐ EJB Container Settings

☐ Container Services

☐ Business Process Services

Applications

☐ [Installed applications](#)

Use this page to configure session manager properties to control the behavior of Hypertext Transfer Protocol (HTTP) session support. These settings apply to both the SIP container and the web container.

Configuration

General Properties

Session tracking mechanism:

- ☐ Enable SSL ID tracking
- ☒ [Enable cookies](#)
- ☐ Enable URL rewriting
- ☐ Enable protocol switch rewriting

Additional Properties

- ☐ [Custom properties](#)
- ☐ [Distributed environment settings](#)

18. Click the blue link for **Memory-to-memory replication**.

19. In the Replication Domain drop-down menu, select your cluster (e.g. PortalCluster).

20. In the Replication Mode drop-down menu, select **Both client and server**.

Use this page to configure memory-to-memory replication for failure recovery.

Configuration

General Properties

Replication domain

PortalCluster ▼

Replication mode

Both client and server ▼

Apply

OK

Reset

Cancel

21. Click **OK** and Save all changes.

22. Back on the **Session management** page (which you should see after saving the changes), click **Custom Properties**.

Configuration

General Properties

Session tracking mechanism:

- ☐ Enable SSL ID tracking
- ☒ [Enable cookies](#)
- ☐ Enable URL rewriting
- ☐ Enable protocol switch rewriting

Additional Properties

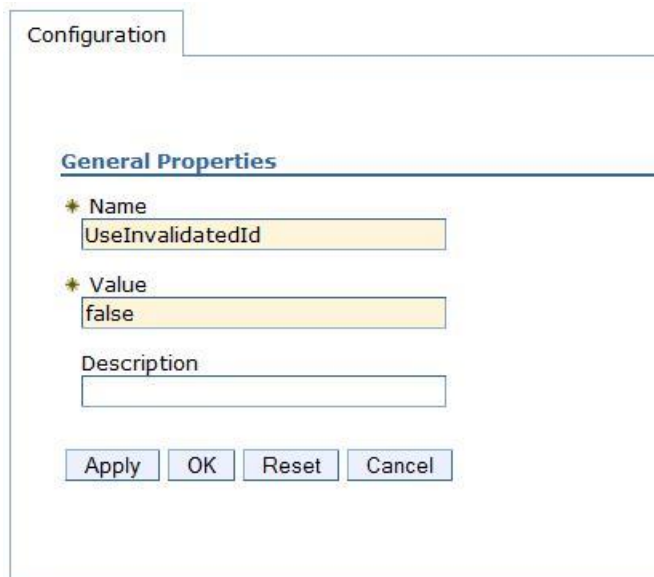
- ☒ [Custom properties](#)
- ☐ [Distributed environment settings](#)

23. Create a new custom property by clicking **New**.



The screenshot shows a table with a header row containing 'Select', 'Name', 'Value', and 'Description'. Below the header, the first row is empty, and the second row contains 'None'. A 'Total 0' row is at the bottom. A 'New...' button is highlighted in the top left corner of the table area.

24. For the **Name**, type in “UseInvalidatedId” and for the **Value**, type in “false”



The screenshot shows a 'Configuration' dialog box with a 'General Properties' section. The 'Name' field is set to 'UseInvalidatedId' and the 'Value' field is set to 'false'. The 'Description' field is empty. At the bottom, there are 'Apply', 'OK', 'Reset', and 'Cancel' buttons.

25. Click **OK** and save the changes.

26. Restart the DMGR, NodeAgent, and WebSphere_Portal server.

27. Verify Portal is functional by accessing it in your web browser:

<http://myprimaryportal.hcl.com:10039/wps/portal>

At this point you have successfully completed building a one-node cluster using the out of the box security configuration. In the remaining sections, you will configure the Portal cluster with a federated LDAP and add an additional horizontal node to the cluster.

Chapter 5 – Configuring the Portal Cluster for Federated LDAP Security

This section covers adding a federated LDAP Server to the cluster's security configuration. For more details about LDAP/Security configuration, refer to the product documentation:

https://help.hcltechsw.com/digital-experience/9.0/config/cw_ldap.html

NOTE: The screenshots in this chapter are taken from a Portal system with cumulative fix 13 installed. If your installation has a different cumulative fix level, your Config Wizard options and screens could differ slightly from those shown in this guide.

NOTE: If you have user ID's stored in your LDAP that are the same as your Portal or WAS administrator ID's, or if you have a preexisting LDAP group named wpsadmins, either of these conditions will cause a failure while executing the steps in this chapter. See Appendix D2 if this condition applies to you and before executing the steps in this chapter.

NOTE: This guide uses an IBM Directory Server LDAP server to configure security in the cluster. Your LDAP server may be different. Review the following Portal and LDAP Integration guide, especially if this is your first time configuring Portal with an LDAP server.

https://support.hcltech.com/csm?id=kb_article&sysparm_article=KB0076380

The guide is applicable to both HCL Portal 8.5 and HCL Portal 9.0. The guide will help you identify the configuration values needed for this section.

1. Open the Configuration Wizard (Config Wizard) in a web browser
<http://myprimaryportal.hcl.com:10200/ibm/wizard>
2. Click **Set Up a Cluster**>**Enable Federated Security**.

[Home](#) > [Set Up a Cluster](#)

Set Up a Cluster

Set up either a dynamic or static cluster to use for production sites. For guidance, see [Roadmaps for installation and deployment](#) and select the roadmap that best matches your needs. [Learn More](#)

Database Transfer

Select this option to transfer data from Apache Derby to any of the database types that are supported by WebSphere Portal.

Create a Deployment Manager

Create a deployment manager profile that is augmented with WebSphere Portal resources.

Create a Cluster

After you create the deployment manager, create a static or dynamic cluster that contains the primary node.

Enable Federated Security

Add an LDAP user registry to the default federated repository to store user account information for authorization.

Create an Additional Cluster Node

After you create a static or dynamic cluster, create an additional cluster node to handle failover requests.

3. Specify your target operating system, primary Portal profile name, and path to the primary Portal profile.

System Information

Security Settings

<

Target operating system:

Linux

Target portal profile name:

wp_profile

Target portal profile home directory:

/opt/IBM/WebSphere/wp_profile

>

Click the right arrow.

4. Specify the following values:

- User registry software: Your LDAP software type; **IBM Directory Server** for this guide.
- Do you need SSL between the portal server and the user registry: **No** for this guide.
- Can portal update entries in your LDAP registry: **Yes** if Portal is used for user registration or similar information creation/updates. No if Portal will use your LDAP data as read only. Yes for this guide.
- Use Administrator ID's stored in your LDAP user registry: **Yes** if you want your Portal administrator credentials to be stored in your LDAP system. If this is a production system, you **MUST** select Yes. No if you want to continue to use the Portal administrator credentials stored in the Portal file system AND this is a non-production system. Yes for this guide.
- Validate LDAP user registry entries: Choosing **Yes** and the configuration wizard will do real-time value checks against the ldap server.

System Information Security Settings

User registry software: IBM Directory Server ⓘ

Do you need SSL between the portal server and the user registry: ☐ Yes, enable SSL ⓘ
☒ No, do not enable SSL

Can portal update entries in your LDAP registry: ☒ Yes, portal can create, update, and delete entries ⓘ
☐ No, portal cannot modify entries

Use Administrator IDs stored in your LDAP user registry: ☒ Yes, use the IDs from the LDAP user registry ⓘ
☐ No, use the IDs in the file-based system repository

Validate LDAP user registry entries: ☒ Yes ⓘ
☐ No

Click the right arrow.

- Specify your *PortalAdminID*, *PortalAdminPswd* and *PortalAdminPswd* again. These values will match those that were specified during the Portal installation. Do not input values for userIDs or passwords in LDAP - those will be entered in a later step.

Existing Administrator Information User Registry Information User Registry Credentials Detailed User Registry Information

*WebSphere Application Server administrator ID: ⓘ

*WebSphere Application Server administrator password:

*Re-enter the password:

*WebSphere Portal administrator ID: ⓘ

*WebSphere Portal administrator password: ⓘ

*Re-enter the password:

Click the right arrow.

- Enter a repository ID value. This is a descriptive label used to identify this LDAP in your Portal configuration. Also specify your LDAP host name and LDAP port number. The default LDAP port for most LDAP servers is port 389.

*LDAP Repository ID: ⓘ
Example: myldapid

*LDAP host name: ⓘ
Example: yourhost.yourco.com

*LDAP port: ⓘ

Click the right arrow

- Enter the Bind DN and Bind password.

Existing Administrator Information User Registry Information User Registry Credentials Detailed User Registry Information

*Bind DN: ⓘ
Example: uid=wpsadmin,cn=users,dc=yourco,dc=com

*Bind password: ⓘ

Click the right arrow

8. Enter the Base DN, Administrator group/user DN, LDAP Administrator password, default parent for new groups created by Portal, and the default parent for entry type PersonAccount.

This guide followed the LDAP Integration Guide link at the beginning of this chapter to determine appropriate values to enter. Consult with your LDAP administrator if you are uncertain which values to use for your LDAP:

Base DN:	dc=hcl,dc=com	?
	Example: dc=yourco,dc=com	
*Administrator group DN from LDAP:	cn=portaladmins,cn=groups,dc=hcl,dc=com	?
	Example: cn=myNewAdminGroup,cn=groups,dc=yourco,dc=com	
*Administrator DN from LDAP:	uid=portaladmin,cn=users,dc=hcl,dc=com	?
	Example: uid=myNewAdmin,cn=users,dc=yourco,dc=com	
*Administrator password from LDAP:	*****	?
*Re-enter the password	*****	
Default parent for group:	cn=groups,dc=hcl,dc=com	?
	Example: cn=groups,dc=yourco,dc=com	
Default parent for PersonAccount:	cn=users,dc=hcl,dc=com	?
	Example: cn=users,dc=yourco,dc=com	

Click the right arrow.

9. You will see the following screen

1	Create a backup of the WebSphere Portal profile before modifying the cell security. View Step Command Run Step Skip Step	Not Started
2	Validate your LDAP server settings. View Step Command Run Step Skip Step	Not Started
3	Add an LDAP user registry to the existing federated repository. View Step Command Run Step Skip Step	Not Started
4	Register the WebSphere Application Server scheduler tasks. View Step Command Run Step Skip Step	Not Started
5	Replace the existing WebSphere Portal and WebSphere Application Server users and groups with new users and groups from your LDAP server. View Step Command Run Step Skip Step	Not Started
6	Update the user registry where new users and groups are stored. View Step Command Run Step Skip Step	Not Started
7	Recycle the servers after a security change. View Step Command Run Step Skip Step	Not Started
8	Update the search administration user. View Step Command Run Step Skip Step	Not Started
9	After you change the security model, the servers need to be restarted. Restart the portal server. View Step Command Run Step Skip Step	Not Started
10	Verify that all defined attributes are available in the configured LDAP user registry. View Step Command Run Step Skip Step	Not Started
11	Manual Step: Update the MemberFixerModule.properties file with the values for your LDAP users. Instructions for Step 11 Mark Step Complete	Not Started
12	Run the member fixer tool. View Step Command Run Step Skip Step	Not Started
13	Restart the WebSphere Portal server. View Step Command Run Step Skip Step	Not Started
14	Manual Step: Map attributes to ensure proper communication between WebSphere Portal and the LDAP server. Instructions for Step 14 Mark Step Complete	Not Started

Click **Run Step** for Steps 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10

10. On the Primary portal server, locate the file named “MemberFixerModule.properties” in following directory:
/opt/IBM/WebSphere/wp_profile/PortalServer/wcm/shared/app/config/wcmservices

Open the MemberFixerModule.properties file with a text editor. Add the following line, using the full Distinguished Name for the *WASAdminInLDAP* user ID. This guide added the following line:

```
uid=wpsadmin,o=defaultWIMFileBasedRealm -> uid=portaladmin,cn=users,dc=hcl,dc=com
```

and save the changes to the file. For more information on this step, click **Instructions for Step 10** in the Config Wizard.

```
# Configure full replacement of one distinguished name with another
#
# Example: To replace any instance of cn=group1,dc=lotus,o=ibm with cn=group2,dc=rational,o=ibm, use:
# cn=group1,dc=lotus,o=ibm -> cn=group2,dc=rational,o=ibm
#
# uid=user1,ou=websphere,c=au,o=ibm -> uid=user2,ou=tivoli,c=au,o=ibm
# cn=group1,dc=lotus,o=ibm -> cn=group2,dc=rational,o=ibm
#
# Configure part replacement of a distinguished names. This will
# change all of the distinguished name except the ID
#
# Example: To replace all DNs like cn=[ID],dc=websphere,o=ibm with cn=[ID],dc=tivoli,o=ibm, use:
# cn=[ID],dc=websphere,o=ibm -> cn=[ID],dc=tivoli,o=ibm
#
# uid=[ID],ou=websphere,c=au,o=ibm -> uid=user2,ou=tivoli,c=au,o=ibm
# cn=[ID],dc=websphere,o=ibm -> cn=[ID],dc=tivoli,o=ibm
uid=wpsadmin,o=defaultWIMFileBasedRealm -> uid=portaladmin,cn=users,dc=hcl,dc=com
```

Click **Mark Step Complete** for step 11 in the Config Wizard.

11	Manual Step: Update the MemberFixerModule.properties file with the values for your LDAP users. Instructions for Step 11 Mark Step Complete
----	--

11. Click **Run Step** for Step 12. Click **Run Step** for Step 13.

12	Run the member fixer tool. View Step Command Run Step Skip Step
13	Restart the WebSphere Portal server. View Step Command Run Step Skip Step

12. **NOTE:** The final step ,Step 14, was skipped for this guide as no additional attribute mapping was required. If you need to complete this step, Click “**Instructions for Step 14**” and follow the provided steps. Otherwise Click **Mark Step Complete**.

Instructions for Step 14

1. Use a text editor to open the `wkplc.properties` file.
2. Enter a value for the following set of parameters in the `wkplc.properties` file to correct any issues that are found in the configuration trace file:

The following parameters are found in the LDAP attribute configuration validation heading:
 - `federated.ldap.attributes.nonSupported`
 - `federated.ldap.attributes.nonSupported.delete`
 - `federated.ldap.attributes.mapping.ldapName`
 - `federated.ldap.attributes.mapping.portalName`
 - `federated.ldap.attributes.mapping.entityTypes`
The following values flag `certificate` and `members` as unsupported attributes and maps `ibm-primaryEmail` to `mail` and `ibm-jobTitle` to `title` for the `PersonAccount` entityTypes:


```
federated.ldap.attributes.nonSupported=certificate, members
federated.ldap.attributes.nonSupported.delete=
federated.ldap.attributes.mapping.ldapName=mail, title
federated.ldap.attributes.mapping.portalName=ibm-primaryEmail, ibm-jobTitle
federated.ldap.attributes.mapping.entityTypes=PersonAccount
```


If you want to map attributes for your groups instead of users, set the `entityTypes` to `Group`.


```
federated.ldap.attributes.mapping.entityTypes=Group
```
3. Save your changes to the `wkplc.properties` file.
4. Run the following task to update the LDAP user registry configuration with the following items:
 - A list of unsupported attributes
 - The correct mapping between WebSphere Portal and the LDAP user registry

```
ConfigEngine.sh wp-update-federated-ldap-attribute-config -DwasPassword=password
```
5. Stop and restart the appropriate servers to propagate the changes. For specific instructions, go to [Starting and stopping servers, deployment managers, and node agents](#).
6. Complete the following steps to flag an attribute as either unsupported or required for the entire WebSphere Portal environment instead of just for the specified LDAP:
 1. Enter a value for the following required parameters in the `wkplc.properties` file:
 - `user.attributes.required`
 - `user.attributes.nonSupported`
Go to the properties file for specific information about the parameters.
 2. Save your changes to the `wkplc.properties` file.
 3. Run the following task:


```
ConfigEngine.sh wp-update-attribute-config -DwasPassword=password
```
 4. Stop and restart all necessary servers to propagate your changes.

13. On the Config Wizard, click **Finish**.

14. Verify that you can login to your dmgr with the `WASAdminInLDAP` and `WASPwdInLDAP`
<https://mydmgr.hcl.com:9043/ibm/console>

15. Verify that you can log into the primary the `WASAdminInLDAP` and `WASPwdInLDAP`
<http://myprimaryportal.hcl.com:10039/wps/portal>

At this point, you have successfully built a single node cluster using a remote database and a federated LDAP server.

Chapter 6 – Installing HCL Portal on an Additional Horizontal Node

Chapter Overview

This chapter will demonstrate how to install HCL Portal 9.0 on an additional horizontal node. In this guide, the installation was completed with a graphical user interface (GUI) using the root user with installation images on a local hard drive.

This chapter contains multiple sections each performing a specific action within the IBM Installation Manager (IIM) tool. Ensure you complete each section as outlined before proceeding to the section.

Section 1 – Installing IBM Installation Manager

Section 2 – Installing HCL Portal 8.5 Binaries Only

Section 3 – Upgrading HCL Portal 8.5 to Cumulative Fix (CF) 13

Section 4 – Upgrading HCL Portal 8.5 CF13 to HCL Portal 9.0 CF13

Before installing HCL Portal, ensure you review the planning documentation:

https://help.hcltechsw.com/digital-experience/9.0/plan/plan_installation.html

NOTE: Many of the steps in this chapter will repeat steps executed in Chapter 1 - Installing HCL Portal v9.0 on the Primary Node. There are critical steps which are applicable only to the additional horizontal node. Hence a separate chapter was created for this guide.

Section 1 - Installing IBM Installation Manager

1. Open a terminal window on your additional horizontal Portal node and run:

```
ping mysecondaryportal.hcl.com
```

where *mysecondaryportal.hcl.com* is your fully qualified hostname.

2. In the same terminal window,

```
run: ping localhost
```

to verify that the localhost settings are properly configured on your server.

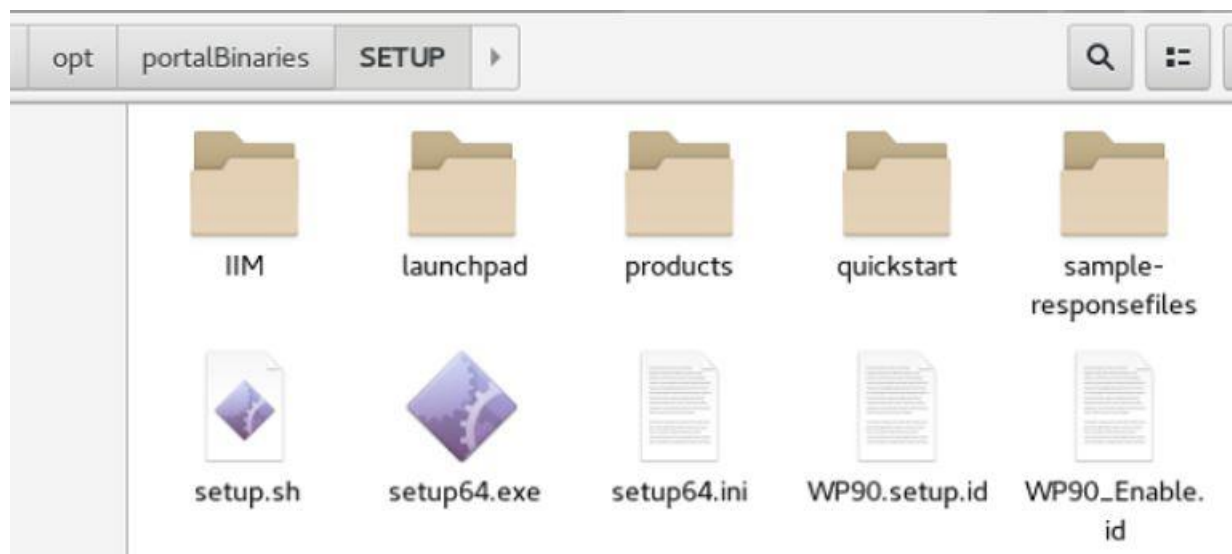
3. **Linux/UNIX environments only:** Ensure ulimit is set to 10240 or higher by

```
running: ulimit -n 10240
```

in the command line.

4. Unzip all .zip files provided with your Portal media into a single folder. This folder will be referred to as the *installationMediaRoot* folder.

For this guide the following directory is used for the *installationMediaRoot* folder:
/opt/portalBinaries/SETUP/products



5. From the HCL Portal v9.0 SETUP directory, navigate to:

SETUP/IIM/*yourEnvironment*

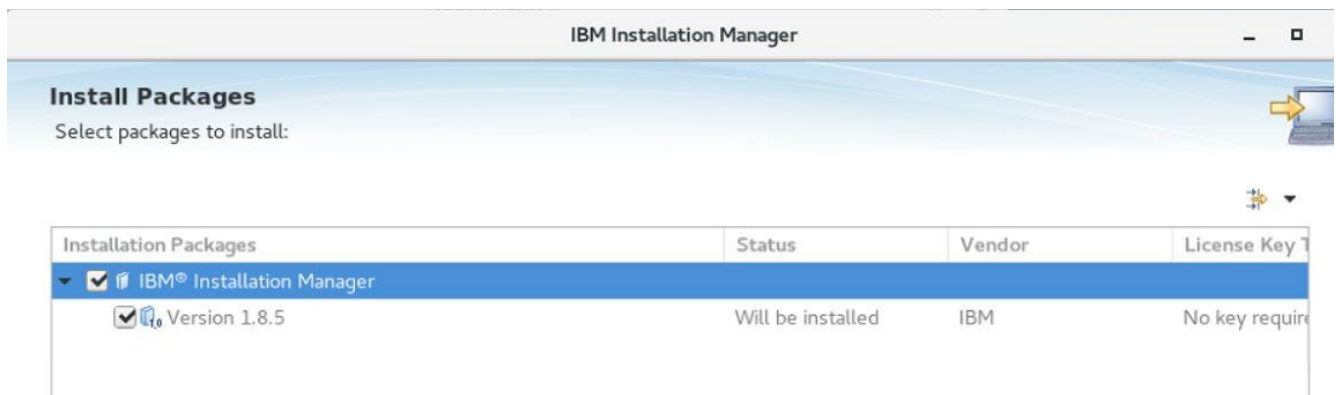
and run

`./install`

where *yourEnvironment* is the folder that best describes the operating system of the environment in which you are installing HCL Portal. For this guide the following is used:

installationMediaRoot/SETUP/IIM/linux_x86_64

The following window will appear:



6. Click **Next**.

7. Accept the license agreement and click **Next**.

The IPLA will automatically apply if Licensee elects to retain the Program after the Evaluation (or obtain additional copies of the Program for use after the Evaluation) by entering into a procurement agreement (e.g., the IBM International Passport Advantage or the IBM Passport Advantage Express agreements).

- ☒ I accept the terms in the license agreement
- ☐ I do not accept the terms in the license agreement



< Back

Next >

Install

8. Choose a directory in which to install IIM. This guide uses:

`/opt/IBM/InstallationManager/eclipse`

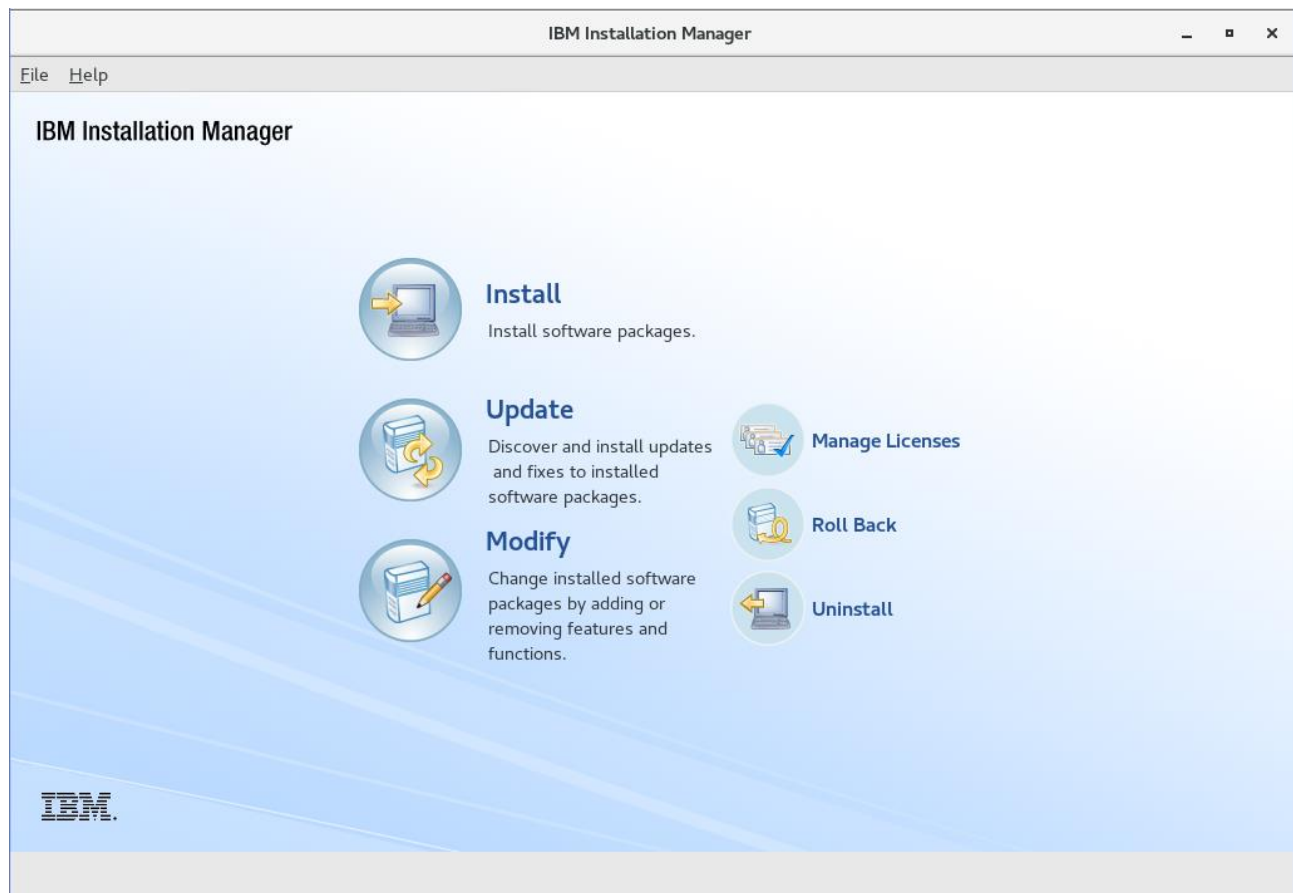
for Windows this guide recommends:

`c:\IBM\InstallationManager\eclipse`

NOTE: In Windows environments, the default location will likely be C:\Program Files\IBM\InstallationManager. Spaces in the file path can cause problems later in the installation/configuration of Portal. It is good practice to create a folder called “IBM” at C:\IBM or a similar location into which IIM and HCL Portal can be installed.

9. Click **Next**.
10. On the Summary screen, click **Install** to begin the installation.
11. When the installation is complete, click **Restart Installation Manager**.

12. The following screen will appear:



At the end of this section, you have successfully installed IBM Installation Manager 1.8.5.

Section 2 - Installing HCL Portal 8.5 Binaries Only

This section will cover the installation of HCL Portal 8.5. HCL Portal 8.5 must be installed and thereafter upgraded to Portal 9.0. It is not possible to install Portal 9.0 directly.

1. In IIM, click **File > Preferences > Repositories**
2. Click **Add Repository**, navigate to

installationMediaRoot/WP85_Enable/repository.config

and click **OK**.

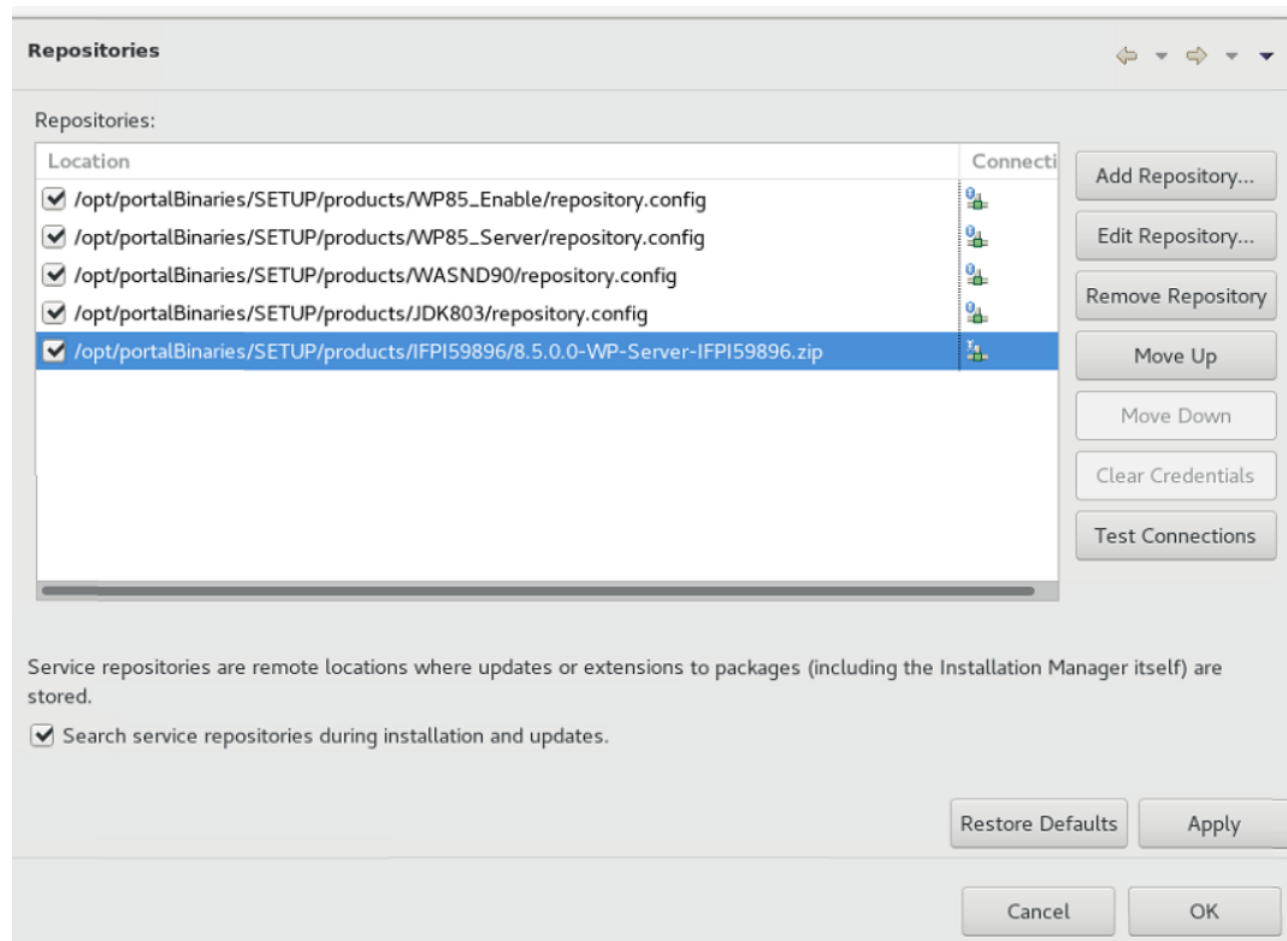
3. Repeat step 2 for the following repositories:

installationMediaRoot/WP85_Server/repository.config

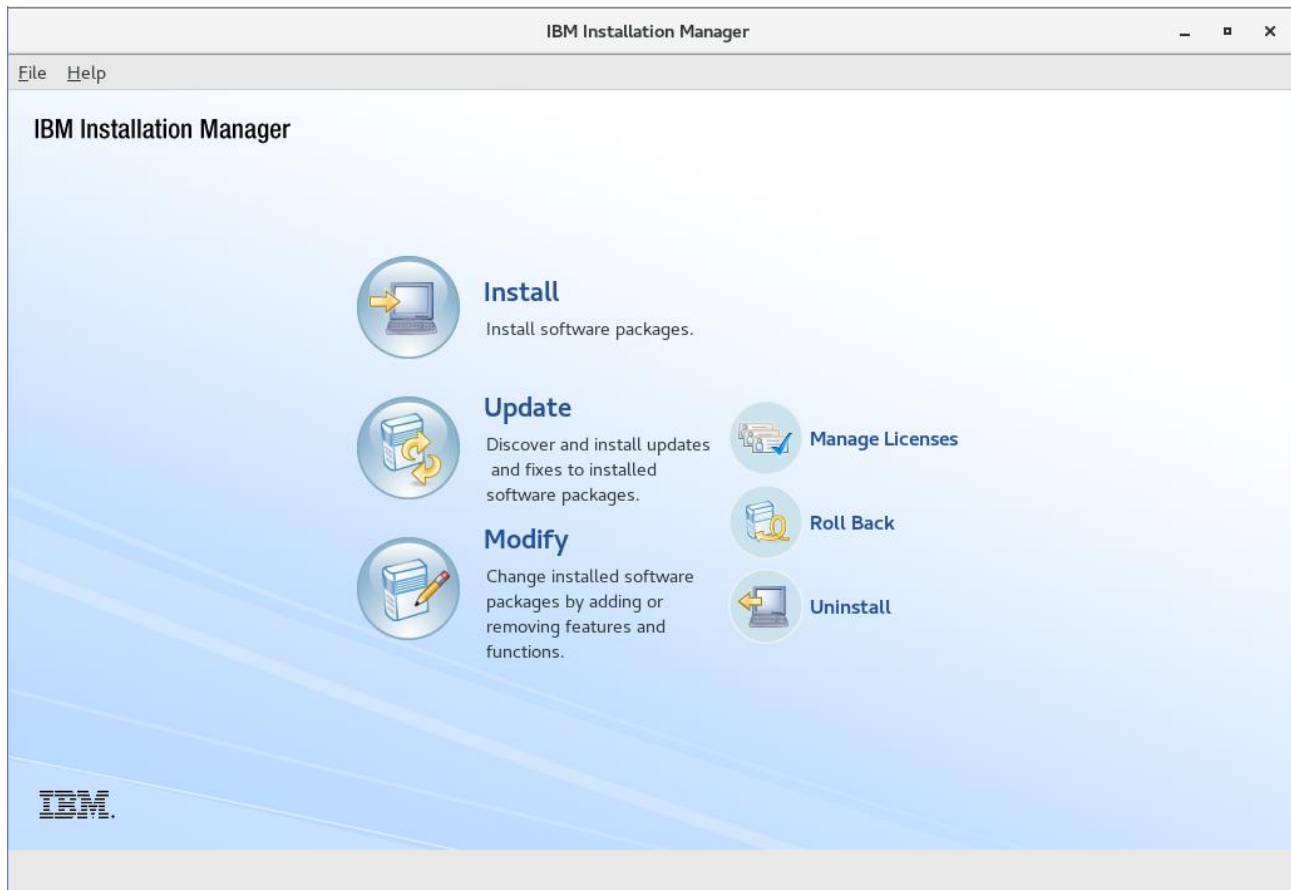
installationMediaRoot/WASND90/repository.config

installationMediaRoot/JDK803/repository.config

installationMediaRoot/IFPI59896/8.5.0.0-WP-Server-PI59896.zip



4. Ensure that all the repositories you just added are selected (i.e. there is a check mark in the box next to them) and click **Apply** then **OK**.
5. Back on the IIM Home Screen, click **Install**.



6. Check the boxes to install IBM WebSphere Application Server Network Deployment, IBM WebSphere Portal Server, and IBM WebSphere Portal Enable (or the offering you are installing, e.g. Extend, Express, etc.). IBM SDK, Java Technology Edition, Version 8 package should not be elected as it will be automatically installed with the IBM WebSphere Application Server Network Deployment package.

Install Packages

Select packages to install:

4 packages are selected.

Installation Packages	Status	Vendor
☒ IBM WebSphere Application Server Network Deployment ☒ Version 9.0.0.2	Will be installed	IBM
☒ IBM SDK, Java Technology Edition, Version 8 ☒ Version 8.0.3.20	Will be installed	IBM
☒ IBM WebSphere Portal Server ☒ Version 8.5.0.0	Will be installed	IBM
☐ IBM SDK, Java Technology Edition, Version 8 ☒ IBM WebSphere Portal Enable	Will be installed	IBM

☐ Show all versions
 Check for Other V

Details

IBM WebSphere Portal Enable 8.5.0.0

IBM® WebSphere® Portal Enable helps increase efficiency and accuracy of website deployments. It places content cre
 content experts to create, maintain, and deliver online content while IT retains control. IBM WebSphere Portal Enable c
 information to the right audience It includes rich text editing tools, web content templates, and personalization services
 These websites can deliver highly targeted and dynamic content to customers, business partners, and employees in m

?

< Back
Next >

7. Click **Next**.

8. **Select** the iFix IFPI59896 and click **Next**

Install Packages
Select the fixes to install.

Fixes	Recommended	Vendor
▼ ☒ IBM WebSphere Portal Server 8.5.0.0		IBM
☒ 8.5.0.0-WP-Server-IFPI59896 8.5.0.20161201_1732		

Details
8.5.0.0-WP-Server-IFPI59896 8.5.0.20161201_1732
PI59896: Allows installation of Portal Server v8.5 on WebSphere Application Server v9 with JDK v8 [More info...](#)

- Repository: /opt/portalBinaries/SETUP/products/IFPI59896/8.5.0.0-WP-Server-IFPI59896.zip

9. **Accept** license agreement and click **Next**

Install Packages
Read the following license agreements carefully.

Install Licenses Location Features Summary

- ▼ IBM WebSphere Application Server Network Deployment
 - Software License Agreement
- ▼ IBM WebSphere Portal Enable
 - IBM WebSphere Portal Enable
- ▼ IBM WebSphere Portal Server
 - IBM WebSphere Portal Server

International Program License Agreement

Part 1 - General Terms

BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR OTHERWISE USING THE PROGRAM, YOU AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THESE TERMS ON BEHALF OF LICENSEE, YOU WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND THE LICENSEE TO THESE TERMS. IF YOU DO NOT AGREE TO THESE TERMS, YOU MAY:

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- * PROMPTLY RETURN THE UNUSED MEDIA, DOCUMENTATION, AND OTHER MATERIALS TO THE PARTY FROM WHOM YOU OBTAINED THE PROGRAM FOR A REFUND OF THE AMOUNT PAID FOR THE PROGRAM, AND DESTROY ALL COPIES OF THE PROGRAM.

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☐ I do not accept the terms in the license agreements

? < Back Next >

10. Select a location for the IIM Shared Resources Directory. This guide uses:
/opt/IBM/WebSphere/IMShared

for Windows this guide recommends:
c:\IBM\WebSphere\IMShared

The screenshot shows the 'Install Packages' wizard with the 'Location' step selected. The wizard has a progress bar at the top with steps: Install, Licenses, Location (selected), Features, and Summary. Below the progress bar, there is a section titled 'When you install packages, files are stored in two locations:' followed by two numbered points: 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. To the left of this text is a yellow warning icon with an exclamation mark. Below the warning icon, there is an important note: 'Important: You can only select the shared resources directory the first time you install a package with the IBM best results select the drive with the most available space because it must have adequate space for the share packages.' Below this note, there is a text box labeled 'Shared Resources Directory:' containing the path '/opt/IBM/WebSphere/IMShared'. Below the text box, there is a section titled 'Disk Space Information' with a table showing the available space on the root drive. At the bottom left, there is a help icon (a question mark in a circle). At the bottom right, there are two buttons: '< Back' and '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 with the IBM best results select the drive with the most available space because it must have adequate space for the share packages.

Shared Resources Directory: /opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

 < Back Next >

Click **Next**.

11. Click **IBM WebSphere Application Server** to set the WAS installation location. This guide uses:

`/opt/IBM/WebSphere/AppServer`

for Windows this guide recommends:

`C:\IBM\WebSphere\AppServer`

The screenshot shows the 'Install Packages' window for IBM WebSphere Application Server V9.0. The 'Location' tab is selected, showing a list of package groups and their installation directories. The 'IBM WebSphere Application Server V9.0' group is selected, with its installation directory set to '/opt/IBM/WebSphere/AppServer'. Below the list, the 'Package Group Name' is 'IBM WebSphere Application Server V9.0', the 'Installation Directory' is '/opt/IBM/WebSphere/AppServer', and the 'Architecture Selection' is '64-bit'. The 'Details' section shows the 'Shared Resources Directory' as '/opt/IBM/WebSphere/IMShared'. The 'Disk Space Information' table shows the volume '/' has 150.93 GB available space. At the bottom, there are buttons for '< Back', 'Next >', and 'Install'.

Package Group Name	Installation Directory	Architecture
IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer	64-bit
IBM WebSphere Application Server Network Deploym		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		
IBM WebSphere Portal Server V8.5	/opt/IBM/WebSphere/PortalServer	64-bit
IBM WebSphere Portal Server 8.5.0.0		

Package Group Name: IBM WebSphere Application Server V9.0

Installation Directory: /opt/IBM/WebSphere/AppServer

Architecture Selection: ☐ 32-bit ☒ 64-bit

Details

Shared Resources Directory: /opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

< Back Next > Install

Click **Next**.

12. Click **IBM WebSphere Portal Server V8.5** to set the Portal Server installation directory:

`/opt/IBM/WebSphere/PortalServer`

for Windows this guide recommends:

`C:\IBM\WebSphere\PortalServer`

The screenshot shows the 'Install Packages' window with the 'Location' tab selected. The window title is 'Install Packages' and the subtitle is 'The packages will be installed into the indicated package groups. Select the package group to change the installation directory.' The window has a tabbed interface with 'Install', 'Licenses', 'Location', 'Features', and 'Summary'. The 'Location' tab is active, showing a list of package groups. The 'IBM WebSphere Portal Server V8.5' package group is selected, and its installation directory is set to '/opt/IBM/WebSphere/PortalServer'. Below the list, the 'Package Group Name' is 'IBM WebSphere Portal Server V8.5', the 'Installation Directory' is '/opt/IBM/WebSphere/PortalServer', and the 'Architecture Selection' is '64-bit'. The 'Details' section shows the 'Shared Resources Directory' as '/opt/IBM/WebSphere/IMShared'. The 'Disk Space Information' section shows the volume '/' with 150.93 GB available space. At the bottom, there are buttons for '< Back', 'Next >', and 'Install'.

Package Group Name	Installation Directory	Archit
IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer	64-bit
IBM WebSphere Application Server Network Deploym		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		
IBM WebSphere Portal Server V8.5	/opt/IBM/WebSphere/PortalServer	64-bit
IBM WebSphere Portal Server 8.5.0.0		

Package Group Name: IBM WebSphere Portal Server V8.5

Installation Directory: /opt/IBM/WebSphere/PortalServer

Architecture Selection: ☐ 32-bit ☒ 64-bit

Details

Shared Resources Directory: /opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

< Back Next > Install

Click **Next**.

13. Select any additional language translations your environment requires. Only English was selected for this guide. Click **Next**.

Install Packages

Select the translations to install.

Install

Licenses

Location

Features

Summary

Select the translations for the packages that will be installed to package group IBM WebSphere Portal Server V8.5, IBM WebSphere Application Server V9.0.

Translations Supported by All Packages

☒ English

Translations Supported by Only Some Packages

☐ Brazilian Portuguese☐ Czech☐ French☐ German☐ Hungarian☐ Italian☐ Japanese☐ Korean☐ Polish☐ Romanian☐ Russian☐ Simplified Chinese☐ Spanish☐ Traditional Chinese

Select All

Clear

?

< Back

Next >

Install

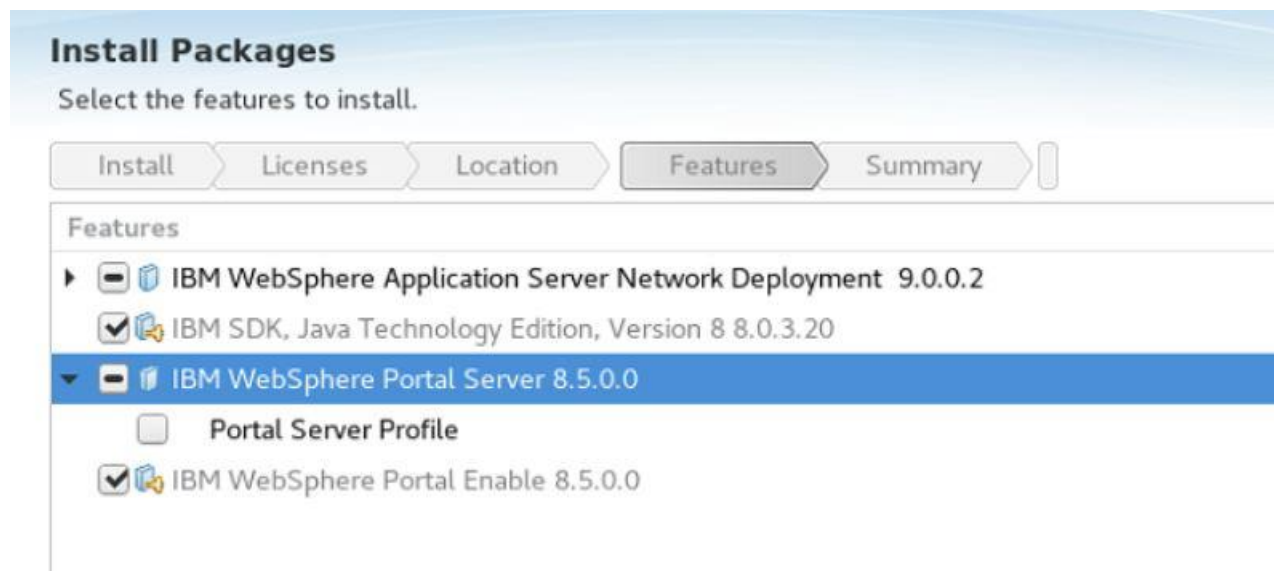
Cancel

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14. Review the features to install for both WebSphere Application Server and HCL Portal.
UNCHECK the box for Portal Server Profile.

NOTE: Do not de-select any WebSphere Application Server features.

NOTE: Ensure you do not install a HCL Portal profile. You will copy over profile information from the primary Portal server and create a profile for this server in a later step.



Click **Next**

15. Set the Configuration Wizard (Config Wizard) username and password. You can set these to any values you want to use for the Config Wizard credentials. “ConfigWizardID” is used for this guide.

IBM Installation Manager

Install Packages
Click Next to continue.

Install Licenses Location **Features** Summary

IBM WebSphere Portal Server 8.5.0.0

Enter the Administrator

Enter the Administrator

Configuration for IBM WebSphere Portal Server 8.5.0.0
Enter the Administrator user ID and password for the Configuration Wizard.

Configuration Wizard Credentials
This ID is used only to log in to the Configuration Wizard and can be different from the Portal administrative ID.

Administrator user ID
ConfigWizardID

Administrator user password

Confirm administrator user password

? < Back Next > Install Cancel

Click **Next**.

16. Review your installation selections and click **Install**.

NOTE: The installation will take 30-60 minutes; don't be concerned if the Installation Manager seems to be stuck on one task for several minutes

Install Packages

Review the summary information.

Install Licenses Location Features Summary

Target Location
Shared Resources Directory: /opt/IBM/IMShared

Packages

Packages	Installation Directory
IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/AppServer
IBM WebSphere Application Server Network Deployment 9.0.0.2	
EJBDeploy tool for pre-EJB 3.0 modules	
Stand-alone thin clients, resource adapters and embeddable containers	
IBM SDK, Java Technology Edition, Version 8 8.0.3.20	

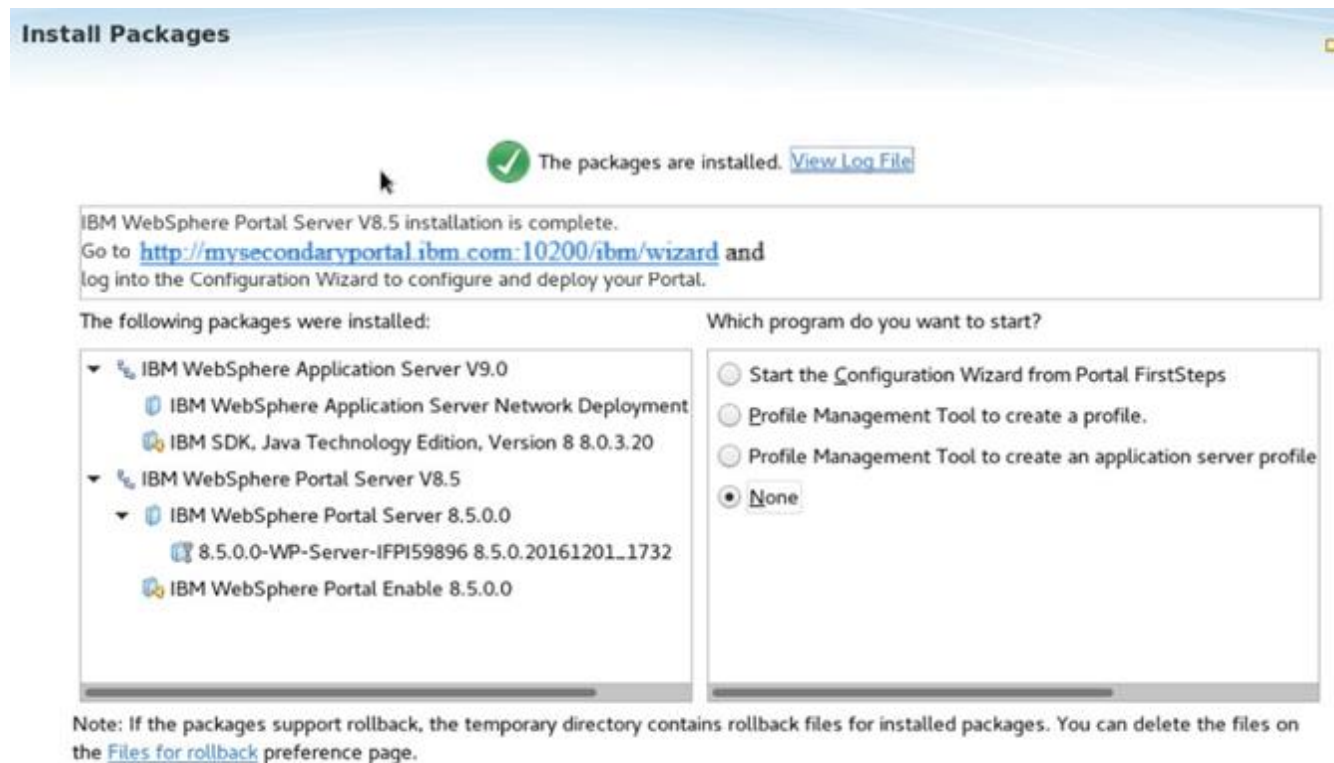
Environment
English

Disk Space Information

/

Total Download Size: 2.69 GB
Total Installation Size: 6.59 GB

17. When the installation is finished, select **None** for **Which program do you want to start?** and click **Finish**.



NOTE: There is not yet a profile on this system. Therefore, you cannot access this Portal in a web browser at this time. You can access the Config Wizard on the additional horizontal node. You will use the Config Wizard in the next chapter to create a profile on the additional horizontal node. Complete all sections of this chapter first before proceeding to the next chapter.

At this point, you have successfully installed HCL Portal v8.5 with WebSphere Application Server 9.0.0.2 binaries on an additional horizontal node.

Section 3 – Upgrading HCL Portal 8.5 to Cumulative Fix (CF) 13

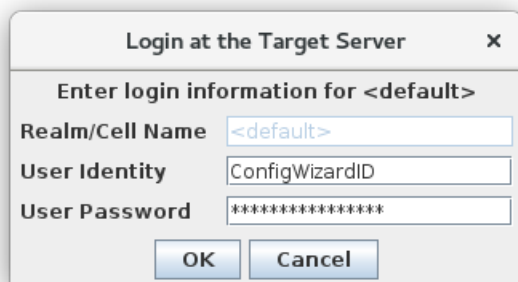
HCL Portal 8.5 now needs to be upgraded to Cumulative Fix 13 to support the installation of HCL Portal 9.0. You will need to stop the Configuration Wizard to proceed with the upgrade.

1. Navigate to the location you installed WebSphere Application Server. Continue in the directory structure to the /profiles/cw_profile/bin subdirectory. This guide uses the following directory for the full path:

`/opt/IBM/WebSphere/AppServer/cw_profile/bin`

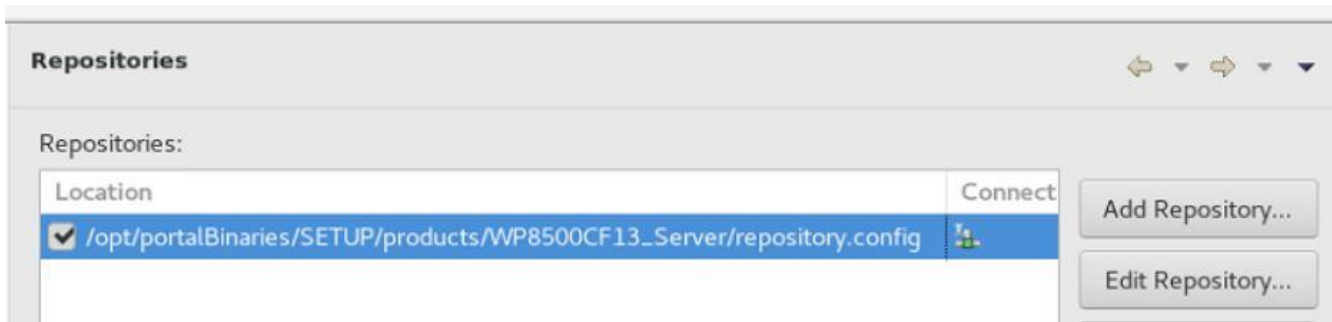
2. Execute the following command:
`./stopServer.sh server1 -user ConfigWizardID -password ConfigWizardPswd`
3. You will be prompted for a userID and password. Enter your *ConfigWizardID* for the userID and *ConfigWizardPswd* for the password.

```
[root@ /]# cd /opt/IBM/WebSphere/AppServer/profiles/cw_profile/bin/
[root@ bin]# ./stopServer.sh server1
ADMU0116I: Tool information is being logged in file
/opt/IBM/WebSphere/AppServer/profiles/cw_profile/logs/server1/stopServer.log
ADMU0128I: Starting tool with the cw_profile profile
ADMU3100I: Reading configuration for server: server1
```



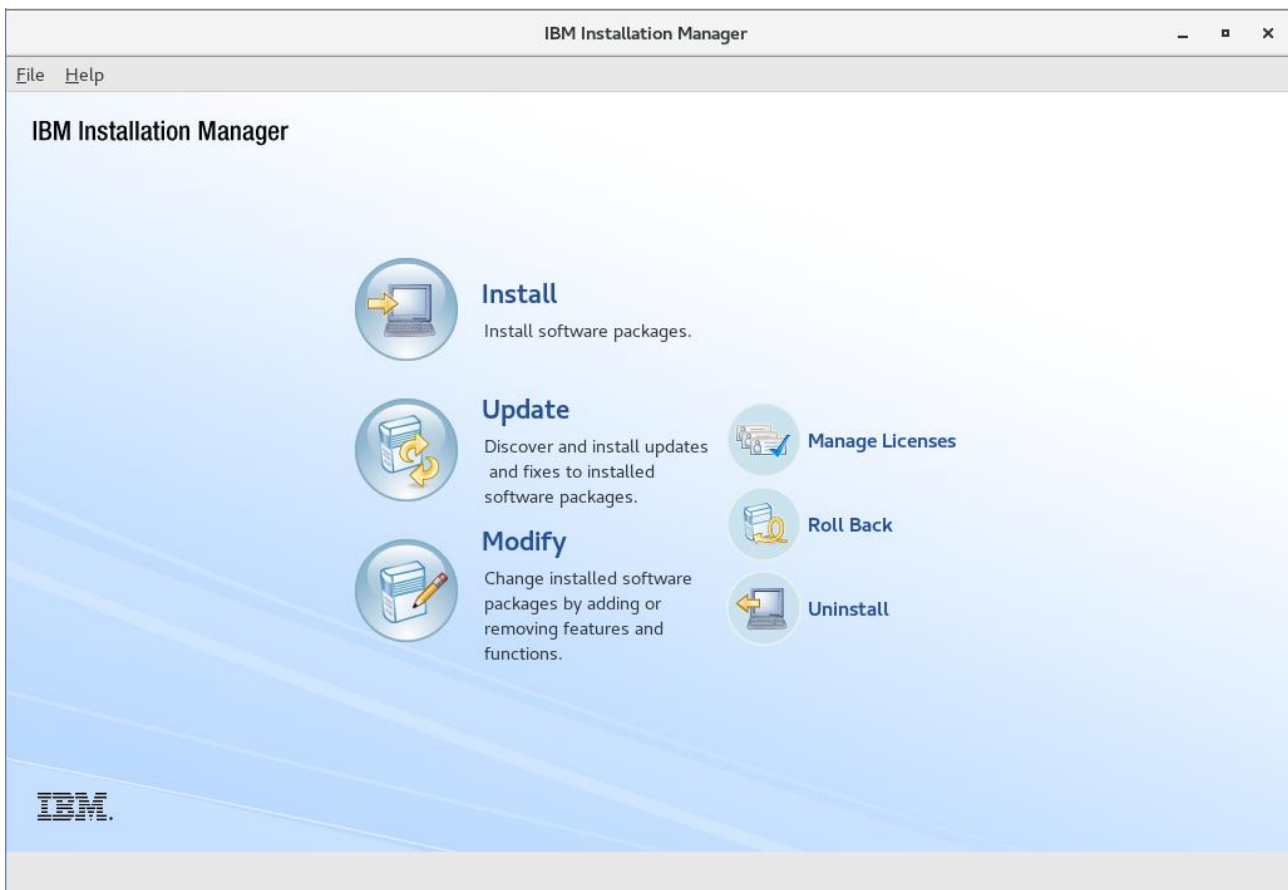
4. Return to IBM Installation Manager. Click **File > Preferences > Repositories**.
5. Select each of the existing Repositories and Click **Remove Repository**.

6. Click **Add Repository**, navigate to:
installationMediaRoot/SETUP/products/WP8500CF13_Server/repository.config

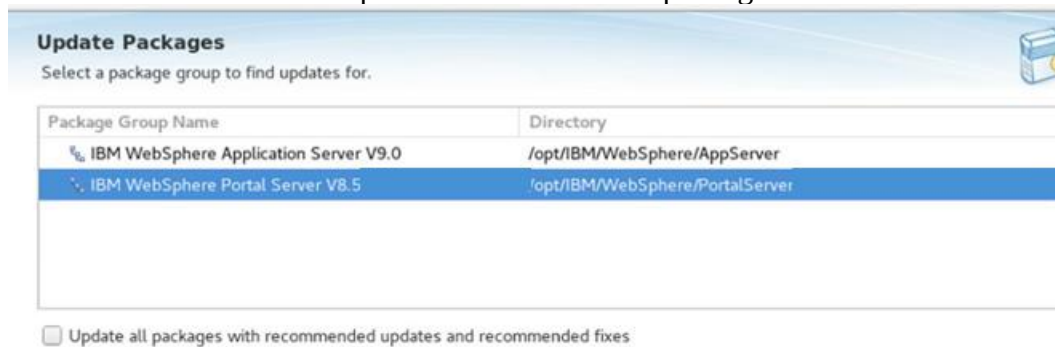


Click **OK** twice.

7. In IBM Installation Manager, click the Update icon:



8. Select the IBM WebSphere Portal Server 8.5 package.



9. Click **Next** to proceed with the Version 8.5.0.0 CF13 package.
10. Click **Next** to proceed beyond the Validation Results.

NOTE: IBM highly recommends that you backup of your entire Portal architecture when installing a cumulative fix on an established Portal system. Backups will be covered in more detail in Appendix As the system in this guide represents a brand new system, a backup is not required at this time.

11. Click the radio icon for “I accept the terms in the license agreement”. Click **Next**.
12. Click **Next** to Accept the terms of the licensing agreement.
13. Click **Next** to Install the IBM WebSphere Portal CF13 feature.
14. Click **Update**. This step will take approximately 20-30 minutes to execute.
15. Click **Finish**.

NOTE: The applyCF.sh command to update the <wp_profile> cannot be run at this time as a profile does not exist on the additional horizontal node at this time. The next chapter will guide you through creating a profile on the additional horizontal node.

At the end of this section, you have successfully installed Cumulative Fix 13 for HCL Portal 8.5 on WebSphere Application Server 9.0.0.2.

Section 4 – Upgrading HCL Portal 8.5 CF13 to HCL Portal 9.0 CF13

In this final section HCL Portal 8.5 CF13 will be upgraded to HCL Portal Cumulative Fix 13. You will need to stop the Configuration Wizard to proceed with the upgrade.

1. Navigate to the location you installed WebSphere Application Server. Continue in the directory structure to the /profiles/cw_profile/bin subdirectory. This guide uses the following directory for the full path:

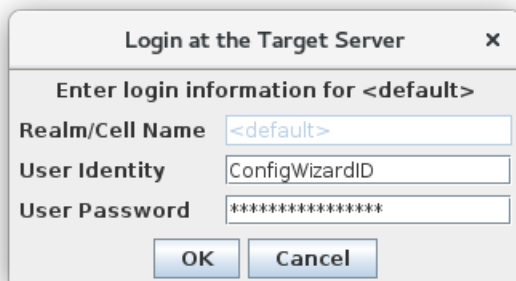
/opt/IBM/WebSphere/AppServer/cw_profile/bin

2. Execute the following command:

```
./stopServer.sh server1
```

3. You will be prompted for a userID and password. Enter your *ConfigWizardID* for the userID and *ConfigWizardPswd* for the password.

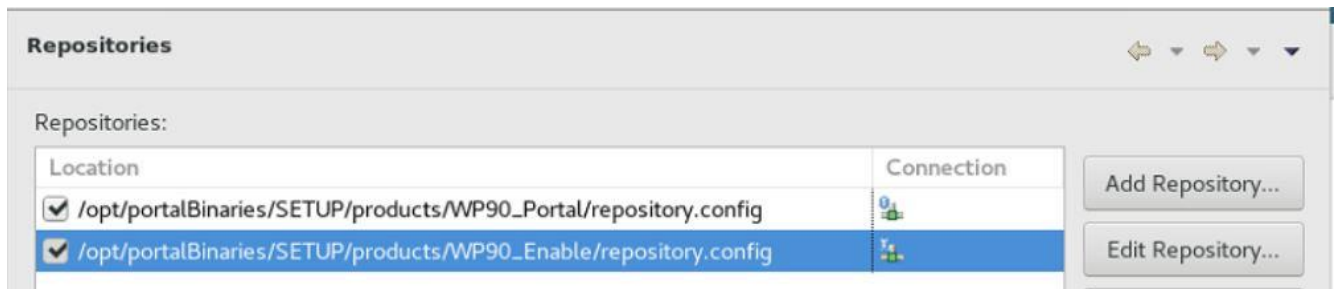
```
[root@ /]# cd /opt/IBM/WebSphere/AppServer/profiles/cw_profile/bin/
[root@ bin]# ./stopServer.sh server1
ADMU0116I: Tool information is being logged in file
          /opt/IBM/WebSphere/AppServer/profiles/cw_profile/logs/server1/stopSer
ver.log
ADMU0128I: Starting tool with the cw_profile profile
ADMU3100I: Reading configuration for server: server1
]
```



4. Return to IBM Installation Manager. Click **File > Preferences > Repositories**.
5. Select each of the existing Repositories and Click **Remove Repository**.
6. Click **Add Repository**, navigate to:
installationMediaRoot/SETUP/products/WP90_Portal/repository.config

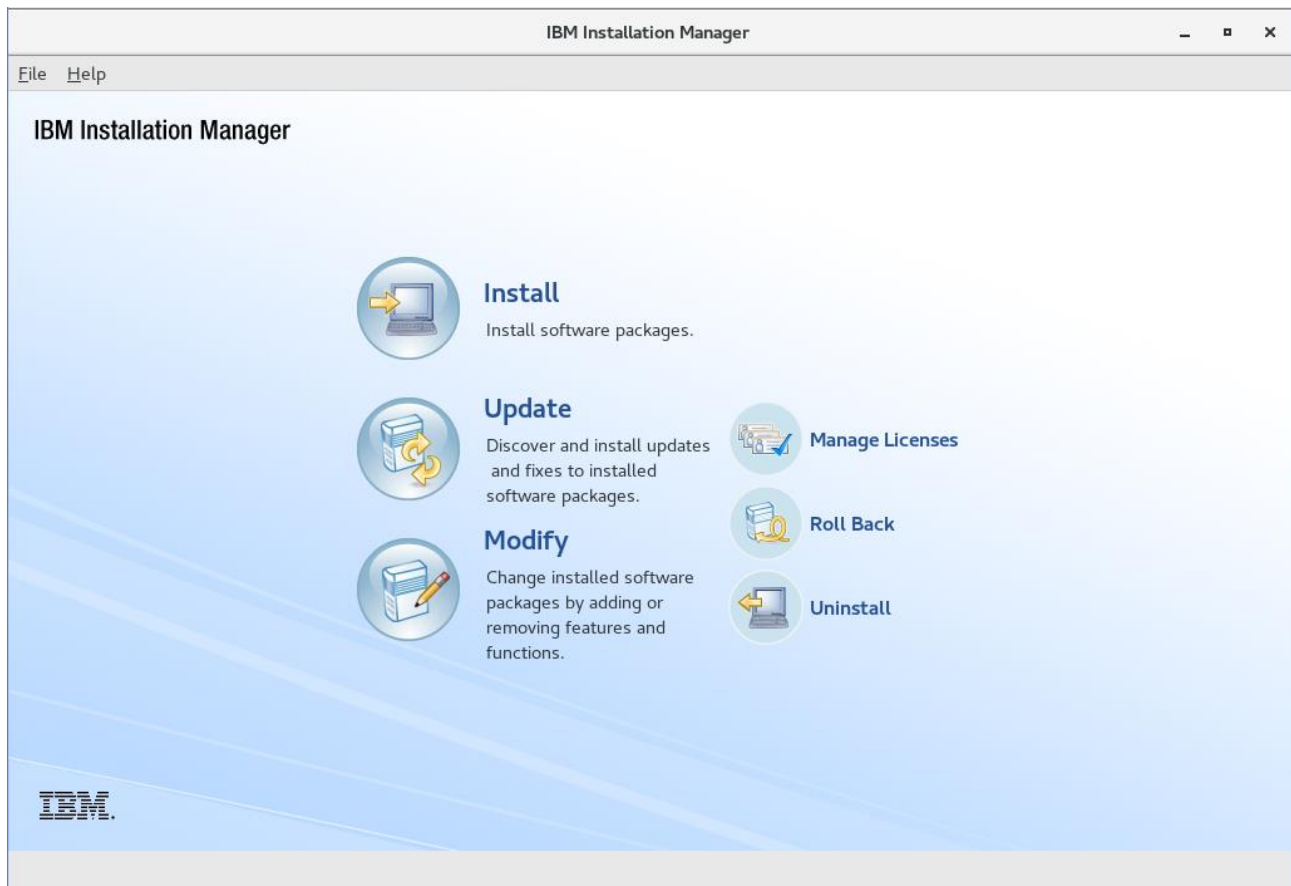
Click **OK**.

7. Click **Add Repository**, navigate to:
installationMediaRoot/SETUP/products/WP90_Enable/repository.config

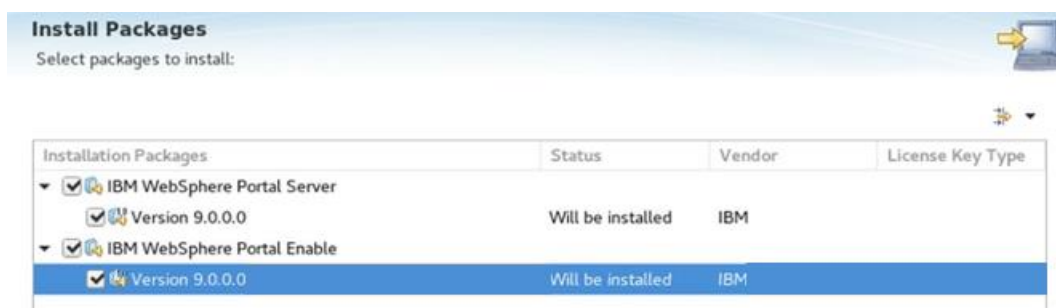


Click **OK** twice.

8. In IBM Installation Manager, click the Install icon:

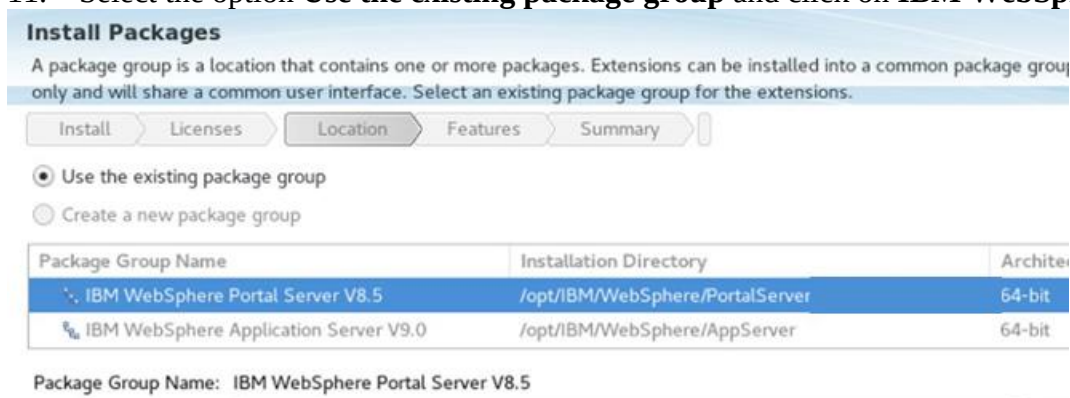


9. Check the boxes to install the IBM WebSphere Portal Server and IBM WebSphere Portal Enable (or the offering you are installing, e.g. Extend, Express, etc.) packages.



Click **Next**

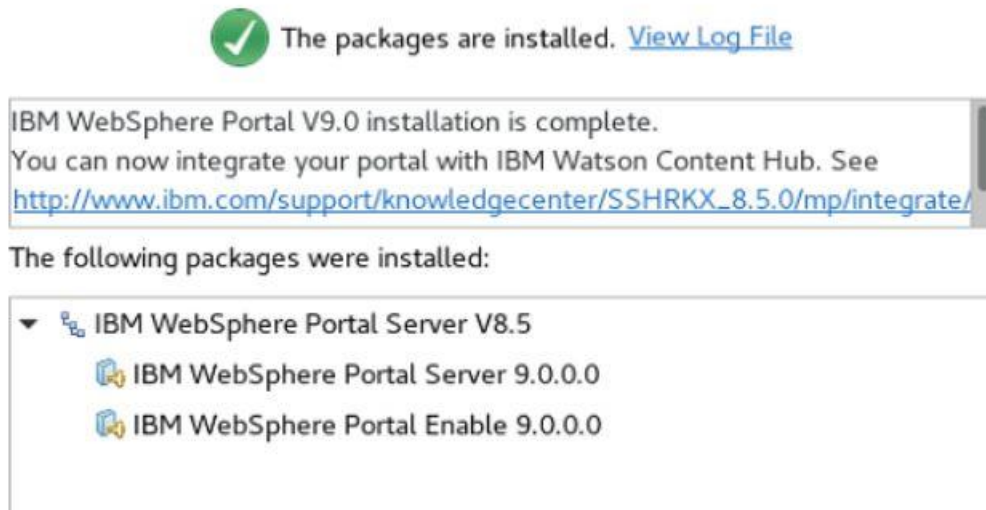
10. Accept terms of licensing agreement. Click **Next**.
11. Select the option **Use the existing package group** and click on **IBM WebSphere Portal v8.5**.



Click **Next**

12. Review Summary. Select **Install**.

13. When the installation is finished, you should see:



NOTE: On a successful upgrade, you will be presented with a link to fully integrate Portal 9.0 with Watson Content Hub. Watson Content Hub integration is not required to build a HCL Portal 9.0 cluster.

NOTE: Your additional horizontal node does not have a <wp_profile> and therefore cannot be accessed in a web browser. Proceed to the next chapter to create a <wp_profile> for your additional horizontal node so it is accessible in a web browser.

Chapter 7 – Federating and Clustering an Additional Horizontal Node

This section covers adding the additional node to the Deployment Manager cell and adding a new HCL Portal server as a horizontal cluster member to the previously created cluster. Once this section is completed, you will have a functional two-node horizontal cluster using federated LDAP security.

IMPORTANT: If you have applied a Cumulative Fix (CF) to the primary Portal node, you need to apply the same CF to the additional horizontal Portal node before adding it to the cluster. All Portal binaries and profiles must be on the same CF level before being added to a cluster. This guide installed Cumulative Fix 13 to the primary node in Chapter 1, and, Cumulative Fix 13 to the additional horizontal node in Chapter 6. Thus, the additional horizontal node may be safely added to the existing Portal cluster.

1. Open the Config Wizard for the additional horizontal node in a web browser:

<http://mysecondaryportal.hcl.com:10200/ibm/wizard>

Sign in with your *ConfigWizardID* and *ConfigWizardPswd* Config Wizard credentials.

2. On the Config Wizard home screen, click **Set Up a Cluster>Create an Additional Cluster Node**.

Create an Additional Cluster Node

After you create a static or dynamic cluster, create an additional horizontal cluster node to handle failover requests. When you create an additional horizontal cluster node on a different server, run the wizard from that server. For guidance on using the wizard for this configuration option, or detailed instructions on manually creating an additional vertical cluster node, see [Roadmap: Production and delivery environment](#).

3. Select your target operating system, Portal profile name, and Portal profile home directory.
NOTE: A Portal profile does not exist yet on the additional horizontal node. Fill in the values that would correspond to the profile if it did exist.



System Information Basic Cluster Settings

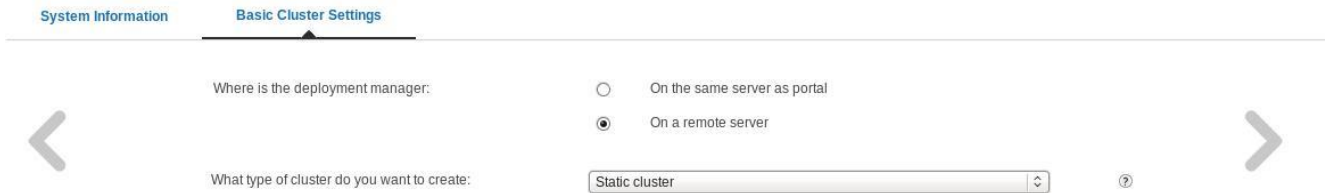
Target operating system: Linux

Target portal profile name: wp_profile

Target portal profile home directory: /opt/IBM/WebSphere/wp_profile

Click the right arrow.

4. Select the location of the Deployment Manager for your environment and the type of cluster you created.



System Information Basic Cluster Settings

Where is the deployment manager:

☐ On the same server as portal

☒ On a remote server

What type of cluster do you want to create: Static cluster ?

Click the right arrow.

5. Specify the following:

- Cell name: a new cell name for the new profile. **Cell02** for this guide.
- Node name: a new node name for the new profile. **Node02** for this guide.

Note: Choose a node name and cell name different from the Deployment Manager node name and cell name.

- WAS installation directory: **/opt/IBM/WebSphere/AppServer**, set to default
- Portal host name: **mysecondaryportal.hcl.com**
- Portal installation directory: **/opt/IBM/WebSphere/PortalServer**, set to default
- First port number: This value will be pre-populated to **10012** but can be set to any available port number. If set to the default you will access your additional horizontal portal server in a web browser via port 10039 at the end of this chapter.

The screenshot shows the 'New Profile Information' tab in the IBM WebSphere Administration Console. The tab is active, and the following fields are visible:

- *Cell name: Cell02
- *Node name: Node02
- *WebSphere Application Server installation directory: /opt/IBM/WebSphere/AppServer (Example: /opt/IBM/WebSphere/AppServer)
- WebSphere Portal host name: mysecondaryportal.hcl.com
- *WebSphere Portal installation directory: /opt/IBM/WebSphere/PortalServer (Example: /opt/IBM/WebSphere/PortalServer)
- First port number: 10012

Navigation arrows (left and right) are visible on the left and right sides of the form.

Click the right arrow.

- Specify your WAS administrator ID from your LDAP, WAS administrator password from your LDAP, dmgr cell name, dmgr node name, dmgr profile path, dmgr host name, and Portal installation directory.

New Profile Information	Deployment Manager	Cluster Settings
		
*WebSphere Application Server administrator ID: WASAdminInLDAP 		
*WebSphere Application Server administrator password: 		
*Re-enter the password: 		
*Deployment manager cell name: dmgrCell01  Example: dmgrCell01		
*Deployment manager node name: dmgrNode01  Example: dmgrNode01		
*Deployment manager profile path: /opt/IBM/WebSphere/AppServer/profiles/dmgr01  Example: /opt/IBM/WebSphere/AppServer/profiles/dmgr01		
*Deployment manager host name: mydmgr.hcl.com 		
*SOAP port: 8879 		
WebSphere Portal installation directory: /opt/IBM/WebSphere/PortalServer  Example: /opt/IBM/WebSphere/PortalServer		



Click the right arrow.

- Specify your cluster name.

New Profile Information	Deployment Manager	Cluster Settings
		
*Cluster name: PortalCluster 		



Click the right arrow.

8. You will see the following screen:

Start Configuration		Reset Steps
Step	Task	Status
1	Manual Step: Install portal binary files on the server where you plan to add a node to your cluster. Instructions for Step 1 Mark Step Complete	Not Started
2	Manual Step: Install profile templates. Instructions for Step 2 Mark Step Complete	Not Started
3	Manual Step: Copy the database drivers from the primary node to the additional node. Instructions for Step 3 Mark Step Complete	Not Started
4	Manual Step: Verify that the portal node and deployment manager system clocks are within 5 minutes of each other. Instructions for Step 4 Mark Step Complete	Not Started
5	Create the profile for the secondary portal node. View Step Command Run Step Skip Step	Not Started
6	Federate the node. This node then becomes a managed node in the deployment manager cell. View Step Command Run Step Skip Step	Not Started
7	Add a secondary node to the cluster. View Step Command Run Step Skip Step	Not Started
8	Start the portal server. View Step Command Run Step Skip Step	Not Started

9. Click **Mark Step Complete** for Step 1, since you have already installed the Portal binaries on this server.

Step	Task	Status
1	Manual Step: Install portal binary files on the server where you plan to add a node to your cluster. Instructions for Step 1 Mark Step Complete	 Complete

10. On the primary Portal server, copy the following file to the additional horizontal node.

```
/opt/IBM/WebSphere/PortalServer/profileTemplates/profileTemplates.zip
```

Save the .zip file in the /opt/IBM/WebSphere/PortalServer/profileTemplates folder on the additional horizontal Portal node. If the profileTemplates folder does not exist on the additional horizontal Portal node, create it.

11. Run the following to unzip the file:

```
cd /opt/IBM/WebSphere/PortalServer/profileTemplates
```

```
unzip profileTemplates.zip
```

12. Run the following to install the profile templates copied from the primary server:

```
./installPortalTemplates.sh /opt/IBM/WebSphere/AppServer
```

Note: If your Portal environment is on Windows, the command syntax should be:

```
./installPortalTemplates.bat C:\IBM\WebSphere\AppServer  
C:\IBM\WebSphere\PortalServer\profileTemplates
```

Adjust the path to match your environment if necessary.

13. Click **Mark Step Complete** for Step 2.

2

Manual Step: Install profile templates.
[Instructions for Step 2](#)
Mark Step Complete

 Complete

14. Click **Mark Step Complete** for Step 3.

3

Manual Step: Copy the database drivers from the primary node to the additional node.
[Instructions for Step 3](#)
Mark Step Complete

 Complete

NOTE: This guide specified in Chapter 2 to place the database drivers in the <wp_profile>/PortalServer/dbdrivers directory. They will be automatically copied over as a part of the profileTemplates.zip file. Therefore, this guide required no additional actions to complete this step. If the database drivers are outside of the wp_profile directory in your environment, then they will not get packaged up in the profileTemplates.zip file. You will need to do the manual copy the drivers to the additional horizontal node in the same directory location as primary node.

15. Ensure that the system clocks on the Primary Portal server, additional horizontal Portal node Portal, and the dmgr server are all within five minutes of one another.

16. Click **Mark Step Complete** for Step 4

4	Manual Step: Verify that the portal node and deployment manager system clocks are within 5 minutes of each other. Instructions for Step 4 Mark Step Complete	 Complete
---	--	---

17. Click **Run Step** for Step 5 – Create the profile for the second portal node.

5	Create the profile for the secondary portal node. View Step Command Run Step Skip Step	 Complete View Result
---	--	--

18. Click **Run Step** for Step 6 – Federate the node.

6	Federate the node. This node then becomes a managed node in the deployment manager cell. View Step Command Run Step Skip Step	 Complete View Result
---	---	--

19. Click **Run Step** for Step 7 – Add a secondary node to the cluster.

7	Add a secondary node to the cluster. View Step Command Run Step Skip Step	 Complete View Result
---	---	---

20. Click **Run Step** for Step 8 – Start the portal server.

8	Start the portal server. View Step Command Run Step Skip Step	 Complete View Result
---	---	--

21. After each step is successfully completed, the Config Wizard page will match the following:

Step	Task	Status
1	Manual Step: Install portal binary files on the server where you plan to add a node to your cluster. Instructions for Step 1 Mark Step Complete	✔ Complete
2	Manual Step: Install profile templates. Instructions for Step 2 Mark Step Complete	✔ Complete
3	Manual Step: Copy the database drivers from the primary node to the additional node. Instructions for Step 3 Mark Step Complete	✔ Complete
4	Manual Step: Verify that the portal node and deployment manager system clocks are within 5 minutes of each other. Instructions for Step 4 Mark Step Complete	✔ Complete
5	Create the profile for the secondary portal node. View Step Command Run Step Skip Step	✔ Complete View Result
6	Federate the node. This node then becomes a managed node in the deployment manager cell. View Step Command Run Step Skip Step	✔ Complete View Result
7	Add a secondary node to the cluster. View Step Command Run Step Skip Step	✔ Complete View Result
8	Start the portal server. View Step Command Run Step Skip Step	✔ Complete View Result

Finished

Click **Finished**.

22. Verify that you can access both your Primary Portal:

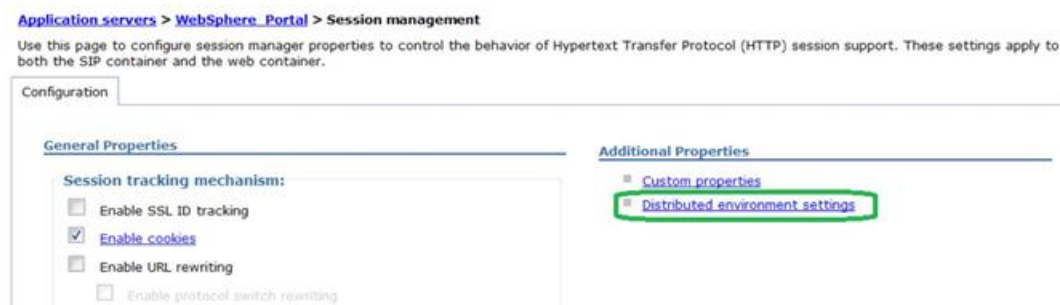
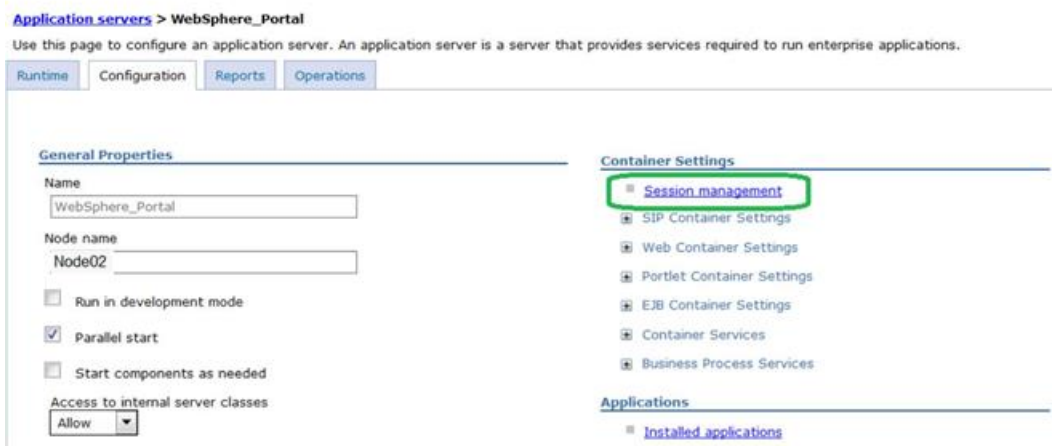
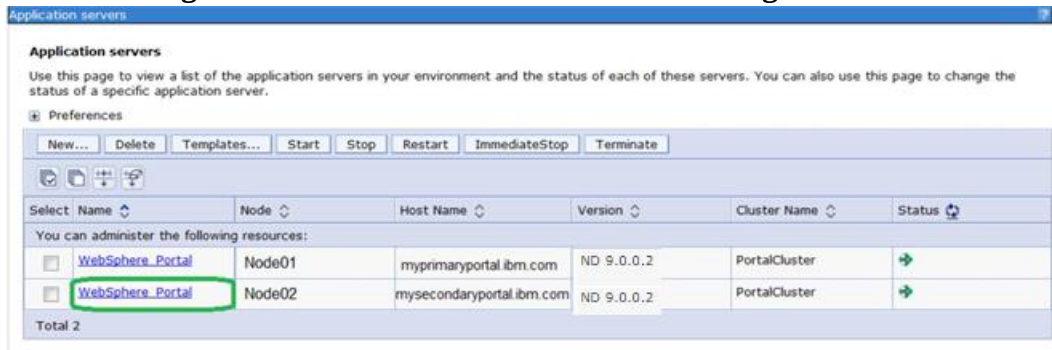
<http://myprimaryportal.hcl.com:10039/wps/portal>

and your additional horizontal Portal node:

<http://mysecondaryportal.hcl.com:10039/wps/portal>

In the following steps, you will enable memory to memory replication for the additional horizontal node you created.

24. While logged in to the dmgr, navigate to **Servers** → **Server Types** → **WebSphere application servers** → **WebSphere_Portal** (additional horizontal Node02) → **Session Management** → **Distributed Environment Settings**.



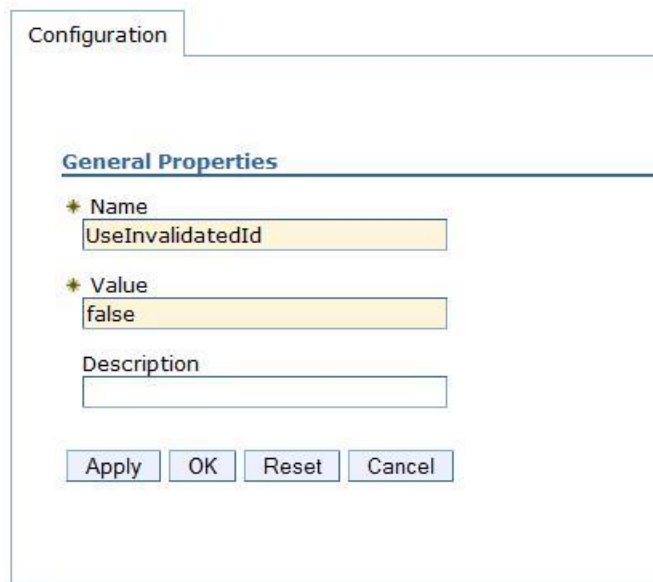
- Use this page to configure memory-to-memory replication for failure recovery.
- Configuration

28. Click **OK** and Save all changes.
29. Back on the **Session management** page (which you should see after saving the changes), click **Custom Properties**.

30. Create a new custom property by clicking **New**.

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31. For the **Name**, type in “UseInvalidatedId” and for the **Value**, type in “false”



The image shows a configuration dialog box with a tab labeled "Configuration". Inside the dialog, there is a section titled "General Properties". Under this section, there are three fields: "Name" with the value "UseInvalidatedId", "Value" with the value "false", and "Description" which is empty. At the bottom of the dialog, there are four buttons: "Apply", "OK", "Reset", and "Cancel".

32. Click **OK** and save the changes.

33. Restart the DMGR, NodeAgent, and WebSphere_Portal server on the additional horizontal node.

34. Verify Portal is functional by accessing it in your web browser:

<http://mysecondaryportal.hcl.com:10039/wps/portal>

At this point, you have successfully built a two-node HCL Portal cluster using a remote database and federated LDAP security.

Chapter 8 – Configuring the Cluster with an External Web Server

This chapter describes how to configure the Portal cluster with an external web server. In this guide, you will configure the Portal cluster with IBM HTTP Server (IHS) v9.0.0.7. In previous chapters, the WebSphere Application Server and HCL Portal code levels were required to be those shipped with the Portal installation media. In this chapter, no such requirement exists and you will install IBM HTTP Server with the latest code levels available.

Note: Appendix B describes how to enable SSL on your web server after completing the steps in this chapter. The authors of this guide strongly recommend SSL be enabled on your Portal cluster. However, SSL is not required for a HCL Portal cluster to function correctly.

1. You will find the installation packages for IBM HTTP Server 9.0 in HCL License & Delivery Portal, under “Your Downloads >> Collaboration” >> HCL Portal Enable V9.0 Multiplatform:

https://hclsoftware.flexnetoperations.com/flexnet/operationsportal/entitledDownloadFile.action?downloadPkgId=HCL_Portal_Enable_9.0&orgId=HCL

2. This guide uses the following part numbers:

was.repo.9000.ihs.zip	IBM WebSphere Application Server V9.0 Supplements - IBM HTTP Server
was.repo.9000.plugins.zip	IBM WebSphere Application Server V9.0 Supplements - Web Server Plugins
was.repo.9000.wct.zip	IBM WebSphere Application Server V9.0 Supplements - WebSphere Customization Toolkit

3. Download the latest fixpack of IBM HTTP Server v9 and WebServer Plugin v9 from IBM Fix Central. Both items are available in a single download.

This guide uses version 9.0.0.7, available at the following link:

<http://www.ibm.com/support/docview.wss?uid=swg24044620#Supple>

4. Copy the downloaded files to your IHS server environment. Extract each of the downloads. This guide the following directory structure:

- /opt/ihsBinaries/IHS
- /opt/ihsBinaries/Plugin
- /opt/ihsBinaries/WCT
- /opt/ihsBinaries/FP7

5. Copy the following two directories from your primary Portal server to your IHS server:
 - /opt/portalsv9binaries/SETUP/IIM
 - /opt/portalsv9binaries/SETUP/products/JDK803

6. You will see the following directory structure

```
[root@      ihsBinaries]# pwd
/opt/ihsBinaries
[root@      ihsBinaries]# ls -la
total 0
drwxr-xr-x  8 root root 72 Jun 19 08:29 .
drwxr-xr-x  5 root root 49 Jun 19 08:19 ..
drwxr-xr-x  3 root root 51 Jun 19 08:22 FP7
drwxr-xr-x  3 root root 44 Jun 19 08:22 IHS
drwxr-xr-x  3 root root 82 Jun 19 08:23 IIM
drwxr-xr-x  3 root root 60 Jun 19 08:25 JDK803
drwxr-xr-x  3 root root 51 Jun 19 08:25 Plugin
drwxr-xr-x  3 root root 44 Jun 19 08:26 WCT
```

7. Navigate to:

SETUP/IIM/*yourEnvironment*

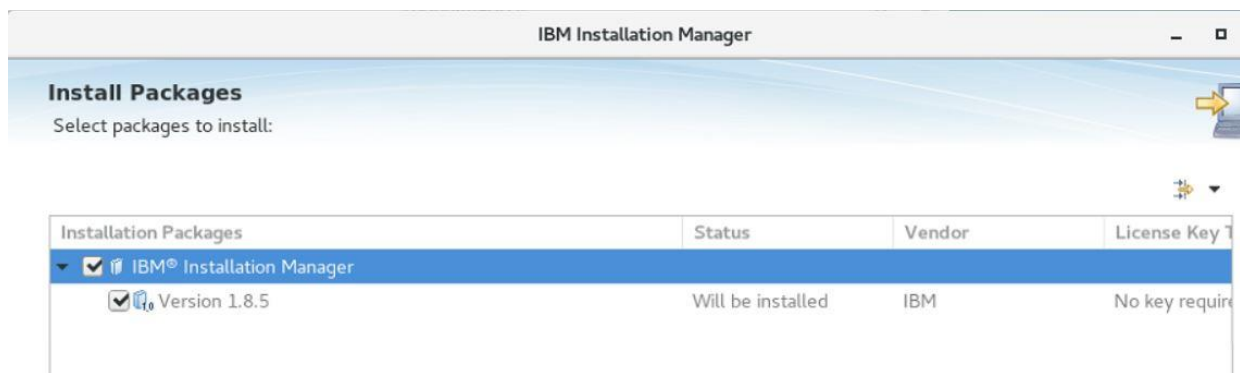
and run

`./install`

where *yourEnvironment* is the folder that best describes the operating system of the environment in which you are installing HCL Portal. For this guide the following is used:

`installationMediaRoot/SETUP/IIM/linux_x86_64`

The following window will appear:



8. Click **Next**.

9. Accept the license agreement and click **Next**.

10. Choose a directory in which to install IIM. This guide uses:

`/opt/IBM/InstallationManager/eclipse`

which is the default location for Linux.

NOTE: In Windows environments, the default location will be C:\Program Files\IBM\InstallationManager. Spaces in the file path can cause problems later in the installation/configuration of HCL Portal. This guide recommends creating a folder named “IBM” at C:\IBM or a similar location into which IIM and HCL Portal can be installed.

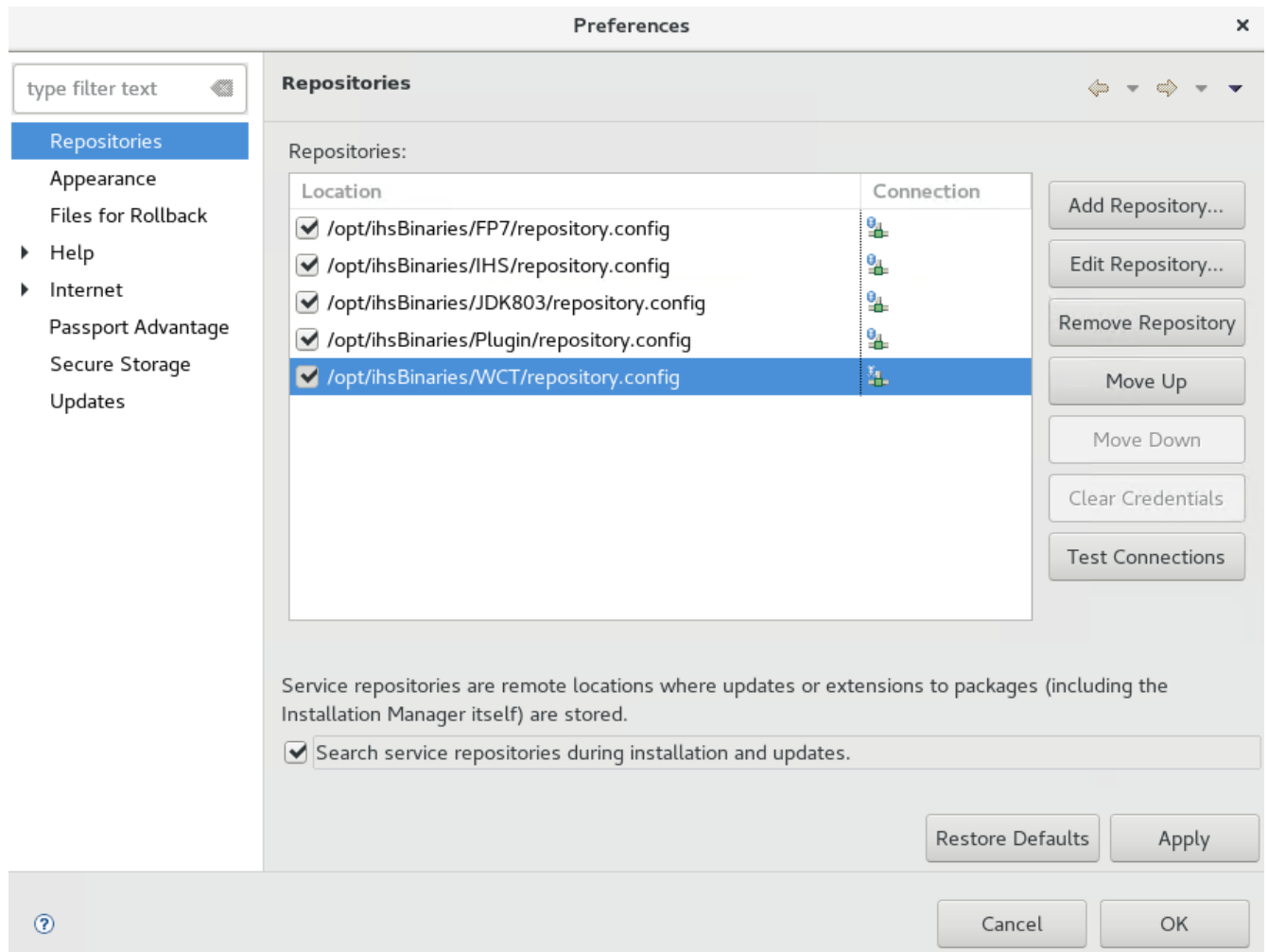
11. Click **Next**.

12. On the Summary screen, click **Install** to begin the installation.

13. When the installation is complete, click **Restart Installation Manager**.

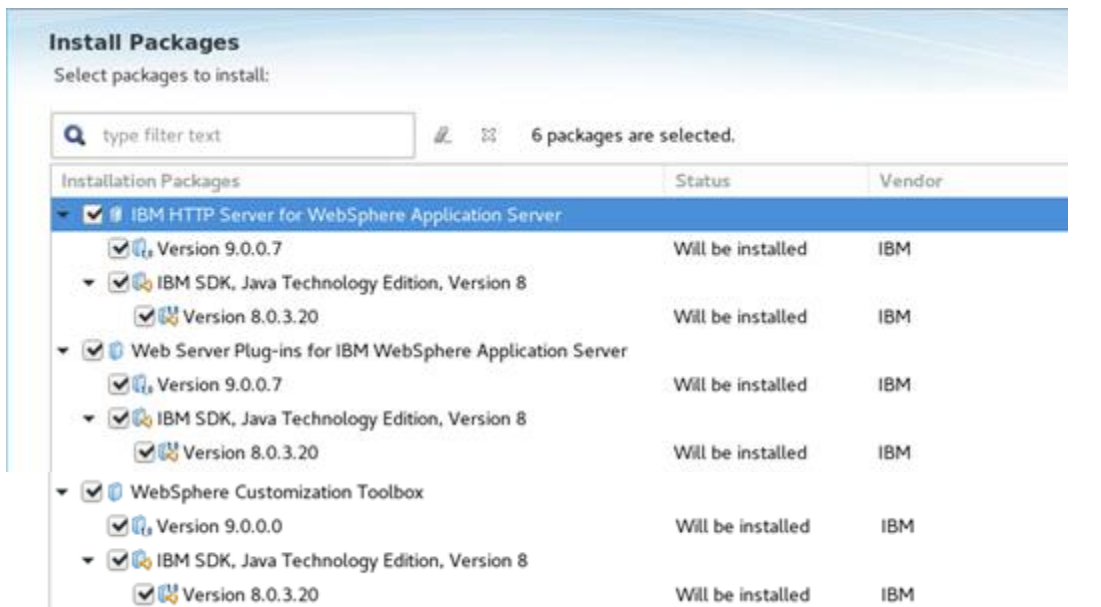
14. Go to File → Preferences → Repositories

15. Add the repositories for the IBM HTTP Server, WebSphere WebServer Plugin and WebSphere Customization Toolbox, IHS FP7, and Java8. Your end result should look like:

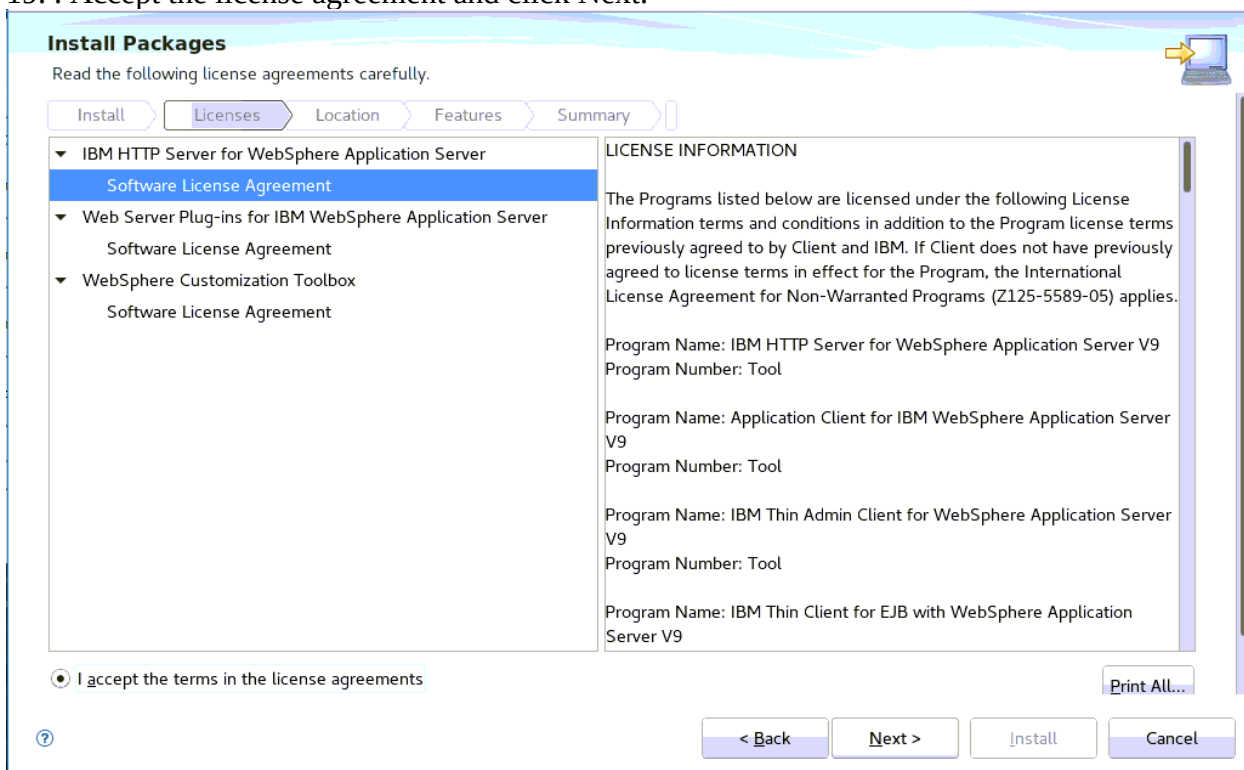


16. Click OK to save the changes.
17. On the Installation Manager screen, click Install.

18. Check the box for IBM HTTP Server for WebSphere Application Server, Web Server Plug-ins, and WebSphere Customization Toolbox. Click Next:



19. . Accept the license agreement and click Next.



20. You will see a screen to select the Installation directory for shared objects used by IIM. Choose a directory and 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 with the IBM best results select the drive with the most available space because it must have adequate space for the share packages.

Shared Resources Directory:

/opt/IBM/WebSphere/IMShared

Disk Space Information

Volume	Available Space
/	150.93 GB

?

< Back

Next >

21. Click the Package Group Name for each component and select an Installation Directory. This guide uses the prepopulated defaults. Click **Next**.

The screenshot shows the 'Install Packages' window with the 'Location' tab selected. The window title is 'Install Packages'. Below the title bar, there is a message: 'The packages will be installed into the indicated package groups. Select the package group to change the installation directory.' Below this message is a navigation bar with tabs: 'Install', 'Licenses', 'Location' (selected), 'Features', and 'Summary'. The main area contains a table with three columns: 'Package Group Name', 'Installation Directory', and 'Architecture'. The table lists several package groups, including 'IBM HTTP Server V9.0', 'Web Server Plug-ins for IBM WebSphere Application Server V9.0', and 'WebSphere Customization Toolbox V9.0'. Below the table, there is a section for 'Package Group Name: IBM HTTP Server V9.0' with an 'Installation Directory' field set to '/opt/IBM/HTTPServer' and a 'Browse...' button. Below this is an 'Architecture Selection' section with radio buttons for '32-bit' and '64-bit' (selected). At the bottom, there is a 'Details' section with 'Shared Resources Directory: /opt/IBM/IMShared' and a 'Disk Space Information' table showing 'Volume /' and 'Available Space 143.05 GB'. At the bottom right, there are four buttons: '< Back', 'Next >', 'Install', and 'Cancel'.

Package Group Name	Installation Directory	Architecture
IBM HTTP Server V9.0	/opt/IBM/HTTPServer	64-bit
IBM HTTP Server for WebSphere Application Server 9.0.0.7		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		
Web Server Plug-ins for IBM WebSphere Application Server V9.0	/opt/IBM/WebSphere/Plugins	64-bit
Web Server Plug-ins for IBM WebSphere Application Server 9.0.0.7		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		
WebSphere Customization Toolbox V9.0	/opt/IBM/WebSphere/Toolbox	64-bit
WebSphere Customization Toolbox 9.0.0.0		
IBM SDK, Java Technology Edition, Version 8 8.0.3.20		

Package Group Name: IBM HTTP Server V9.0

Installation Directory: /opt/IBM/HTTPServer Browse...

Architecture Selection: ☐ 32-bit ☒ 64-bit

Details

Shared Resources Directory: /opt/IBM/IMShared

Disk Space Information

Volume	Available Space
/	143.05 GB

< Back Next > Install Cancel

22. Select additional translations to install. This guide chose no additional translations. Click **Next**:

The screenshot shows the 'Install Packages' window with the 'Features' tab selected. The window title is 'Install Packages'. Below the title bar, there is a message: 'Select the translations to install.' Below this message is a navigation bar with tabs: 'Install', 'Licenses', 'Location', 'Features' (selected), and 'Summary'. The main area contains a section for 'Translations Supported by All Packages' with a list box containing 'English'. Below this is a section for 'Translations Supported by Only Some Packages' with 'Select All' and 'Clear All' buttons. At the bottom right, there are four buttons: '< Back', 'Next >', 'Install', and 'Cancel'.

Select the translations to install.

Translations Supported by All Packages

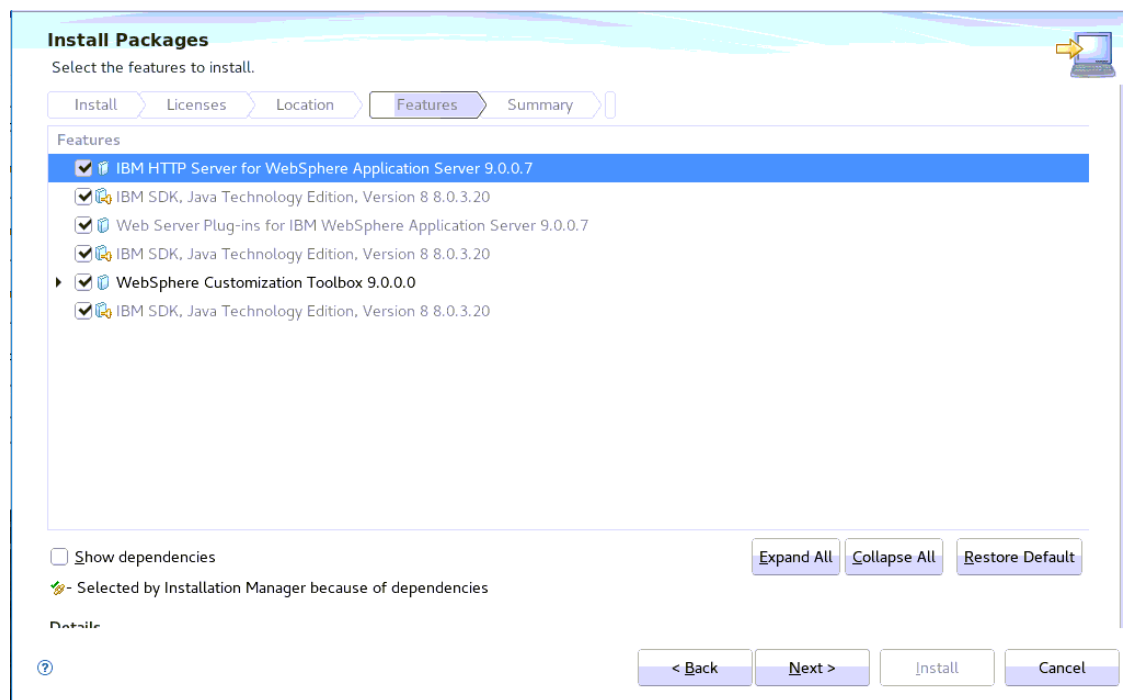
☒ English

Translations Supported by Only Some Packages

Select All Clear All

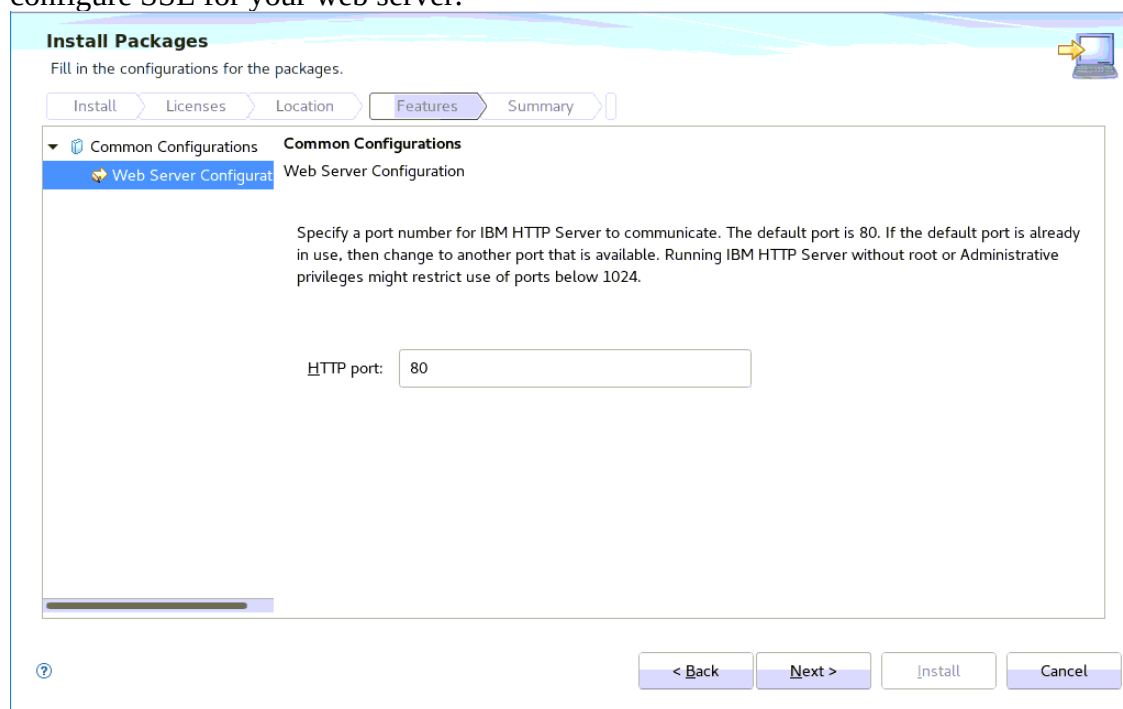
< Back Next > Install Cancel

23. Select any additional features you'd like for the WebSphere Customization Toolbox. For this guide, the defaults were used. Click **Next**:

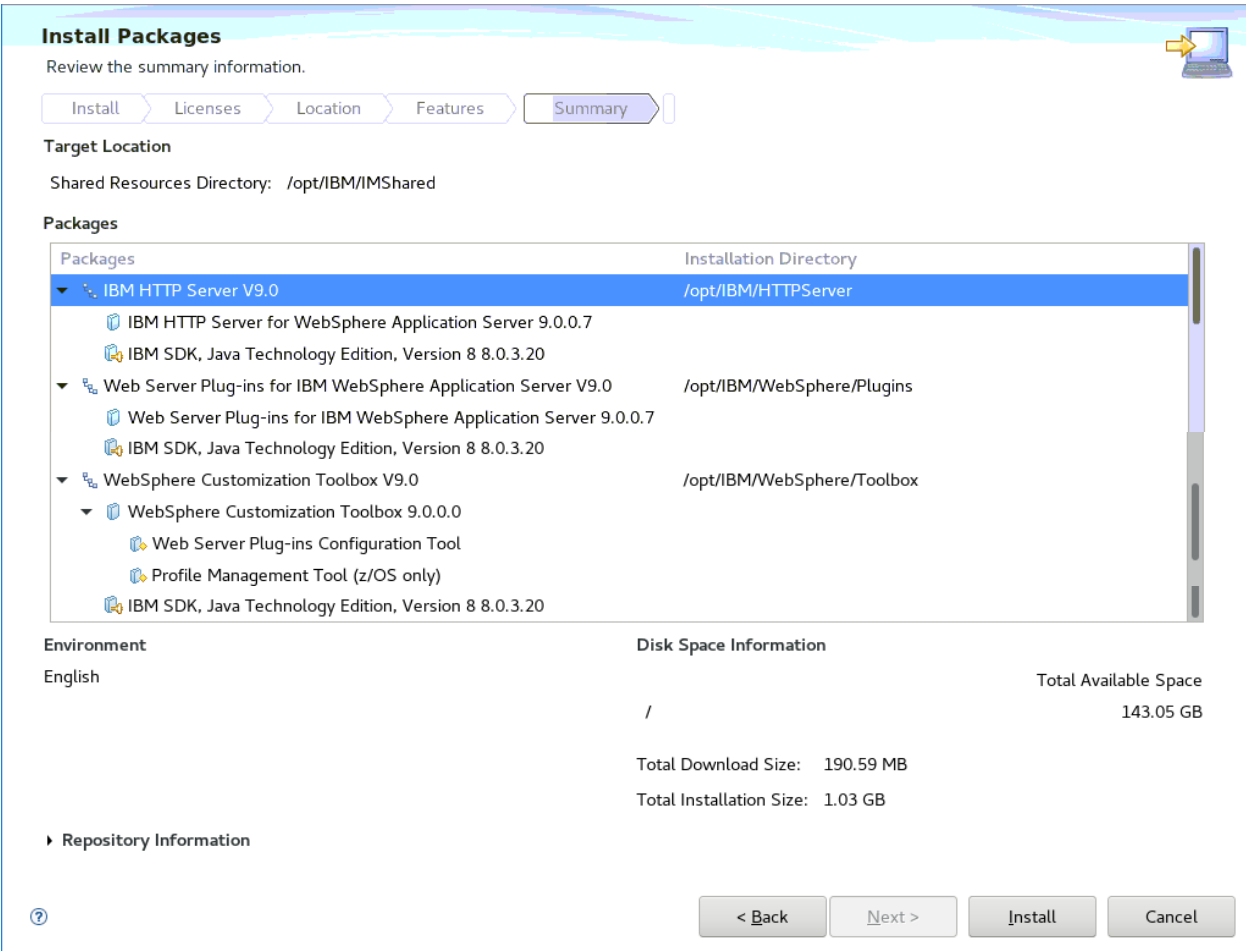


24. Select the non-SSL HTTP Port for the web server. This guide recommends the prepopulated default port 80. Click **Next**:

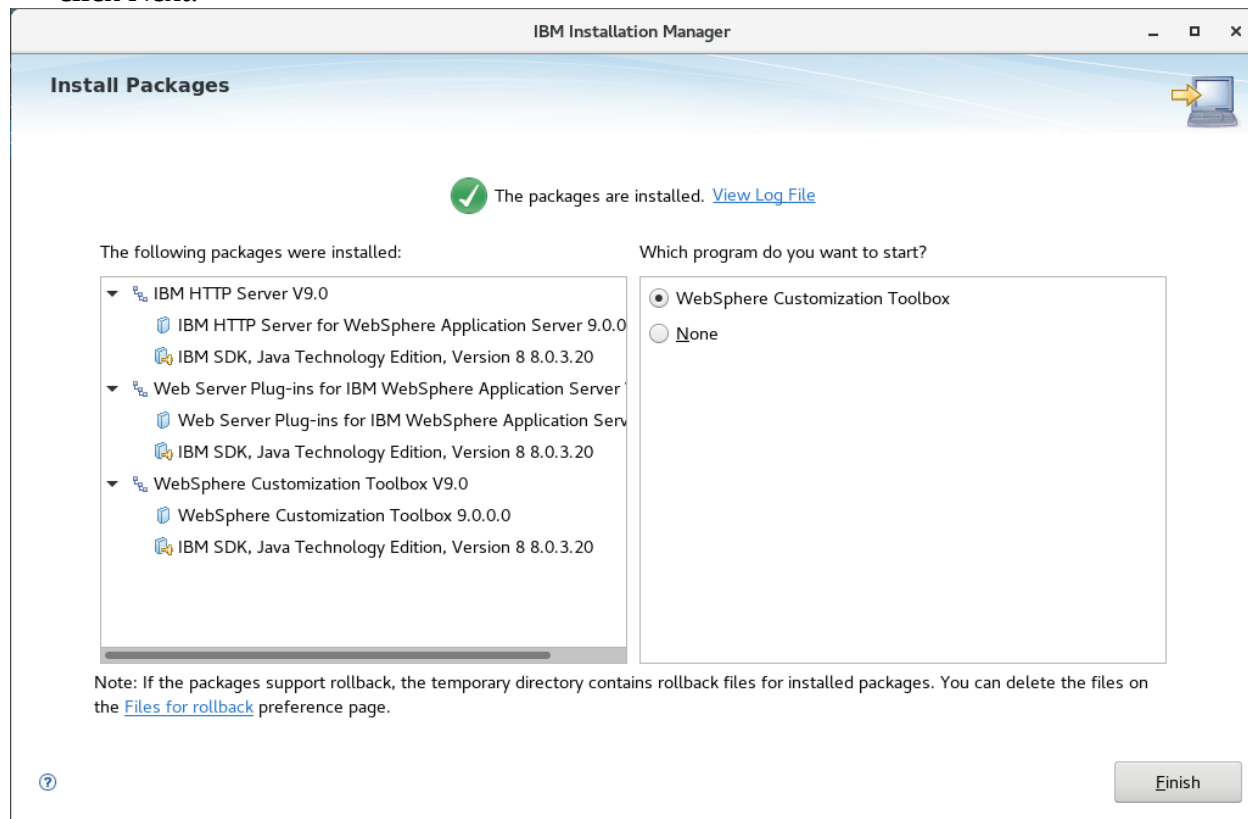
NOTE: You can modify your IHS configuration post-installation to remove the HTTP port and configure SSL for your web server.



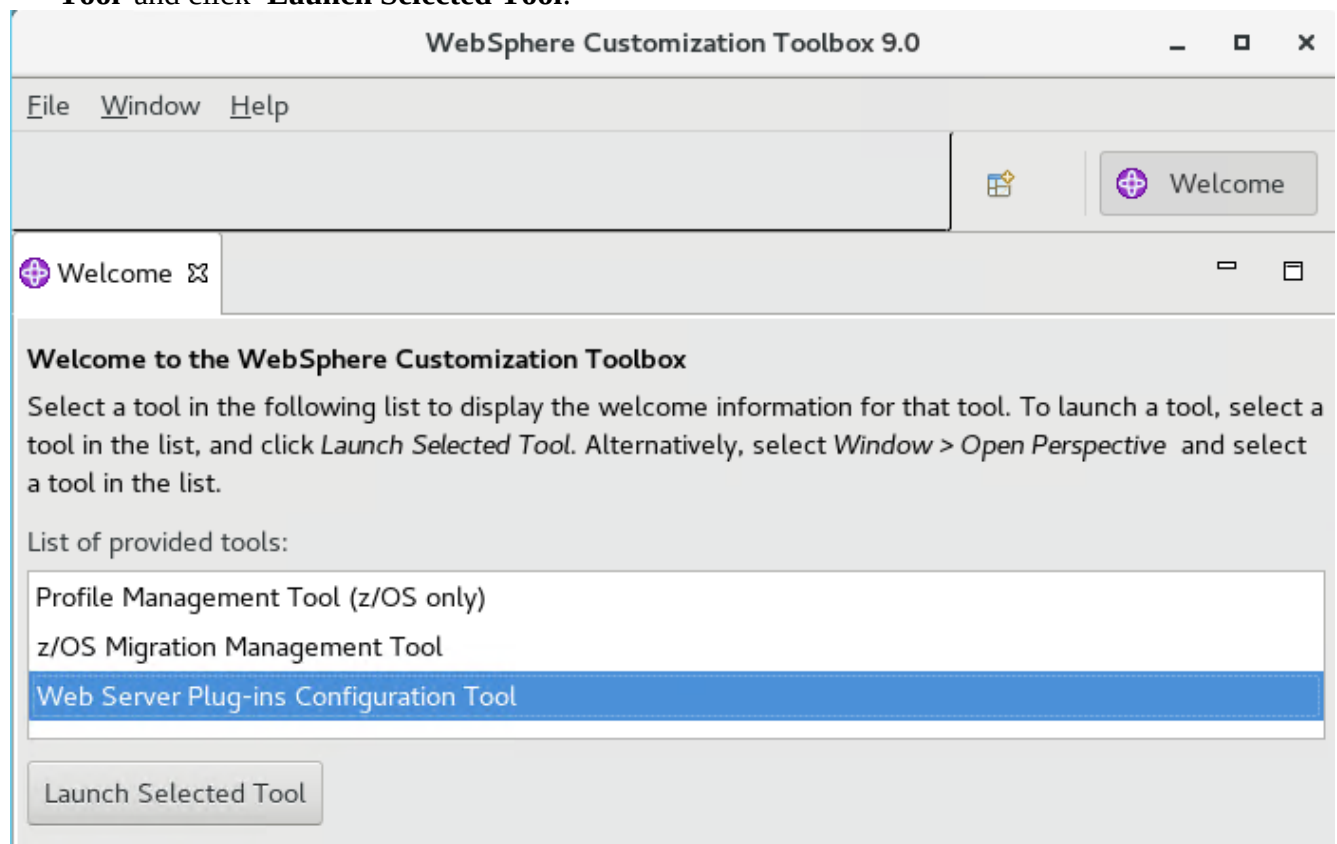
25. On the summary screen, ensure everything is correct and click Install to begin the installation.



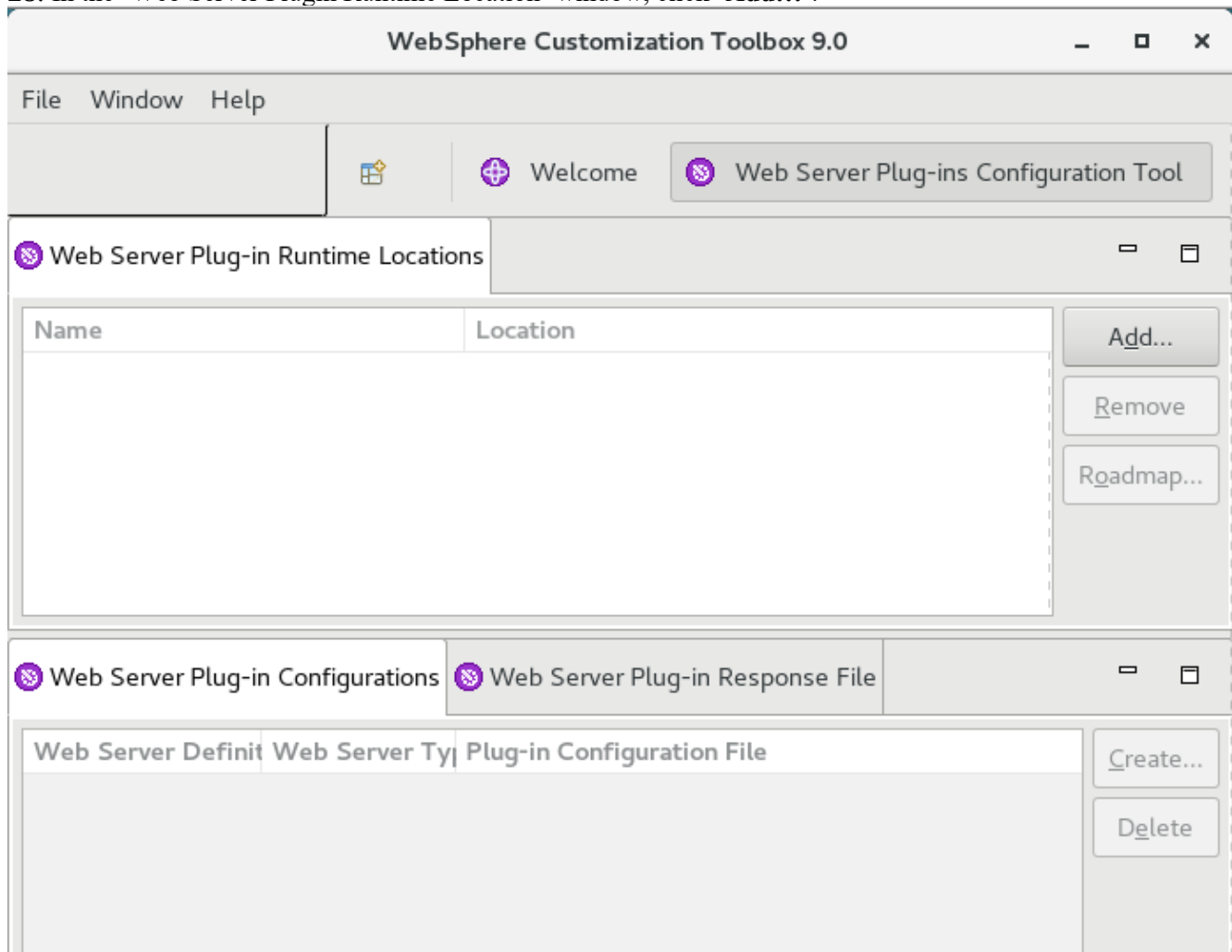
26. Once the installation finishes, select the radio button for WebSphere Customization Toolbox and click Next:



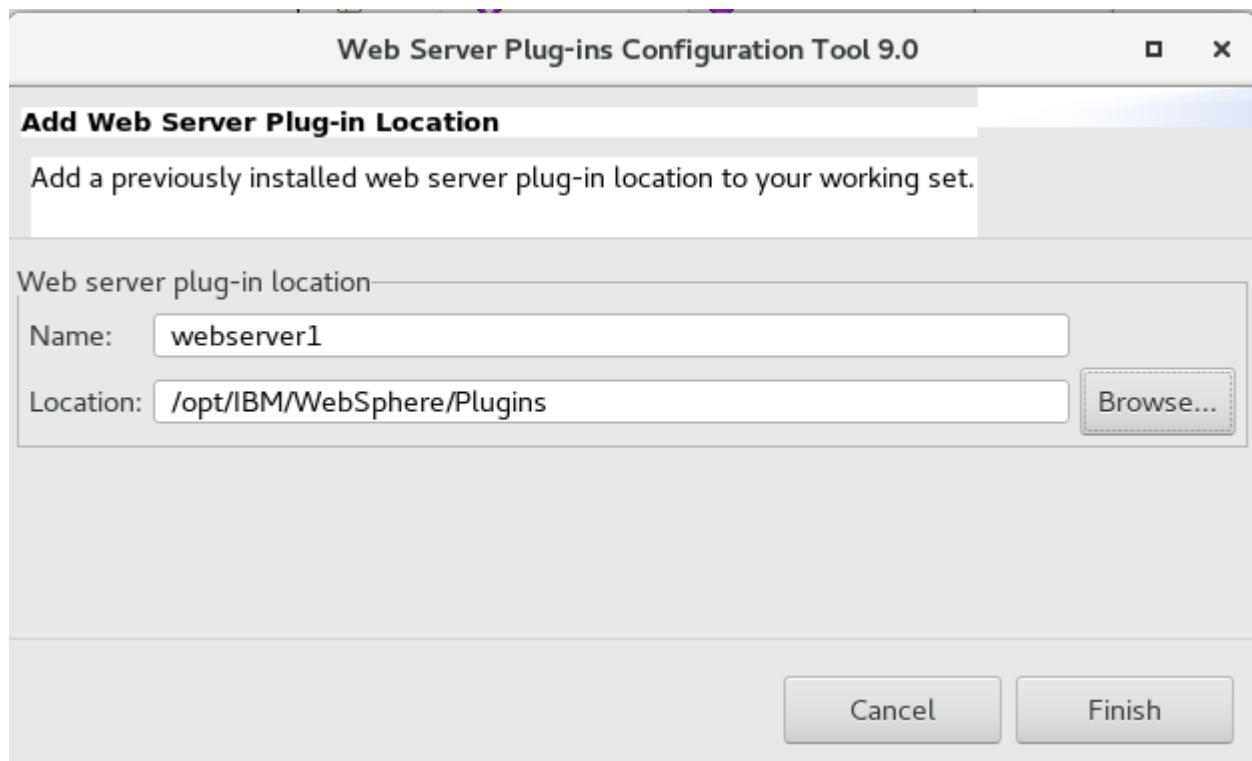
27. When WebSphere Customization Toolbox loads, select '**Web Server Plug-ins Configuration Tool**' and click '**Launch Selected Tool**':



28. In the 'Web Server Plugin Runtime Location' window, click '**Add...**'.



29. Provide a Web Server name and the location of the WebSphere Plug-ins directory. This guide recommends **webserver1** for the name and uses the default directory location specified during installation **/opt/IBM/WebSphere/Plugins**



The image shows a screenshot of the 'Web Server Plug-ins Configuration Tool 9.0' dialog box. The title bar at the top reads 'Web Server Plug-ins Configuration Tool 9.0' with standard window control buttons. The main content area has a section titled 'Add Web Server Plug-in Location' with a subtitle 'Add a previously installed web server plug-in location to your working set.' Below this, there is a label 'Web server plug-in location' followed by two input fields. The 'Name' field contains the text 'webserver1'. The 'Location' field contains the text '/opt/IBM/WebSphere/Plugins'. To the right of the 'Location' field is a 'Browse...' button. At the bottom right of the dialog are two buttons: 'Cancel' and 'Finish'.

Web Server Plug-ins Configuration Tool 9.0

Add Web Server Plug-in Location

Add a previously installed web server plug-in location to your working set.

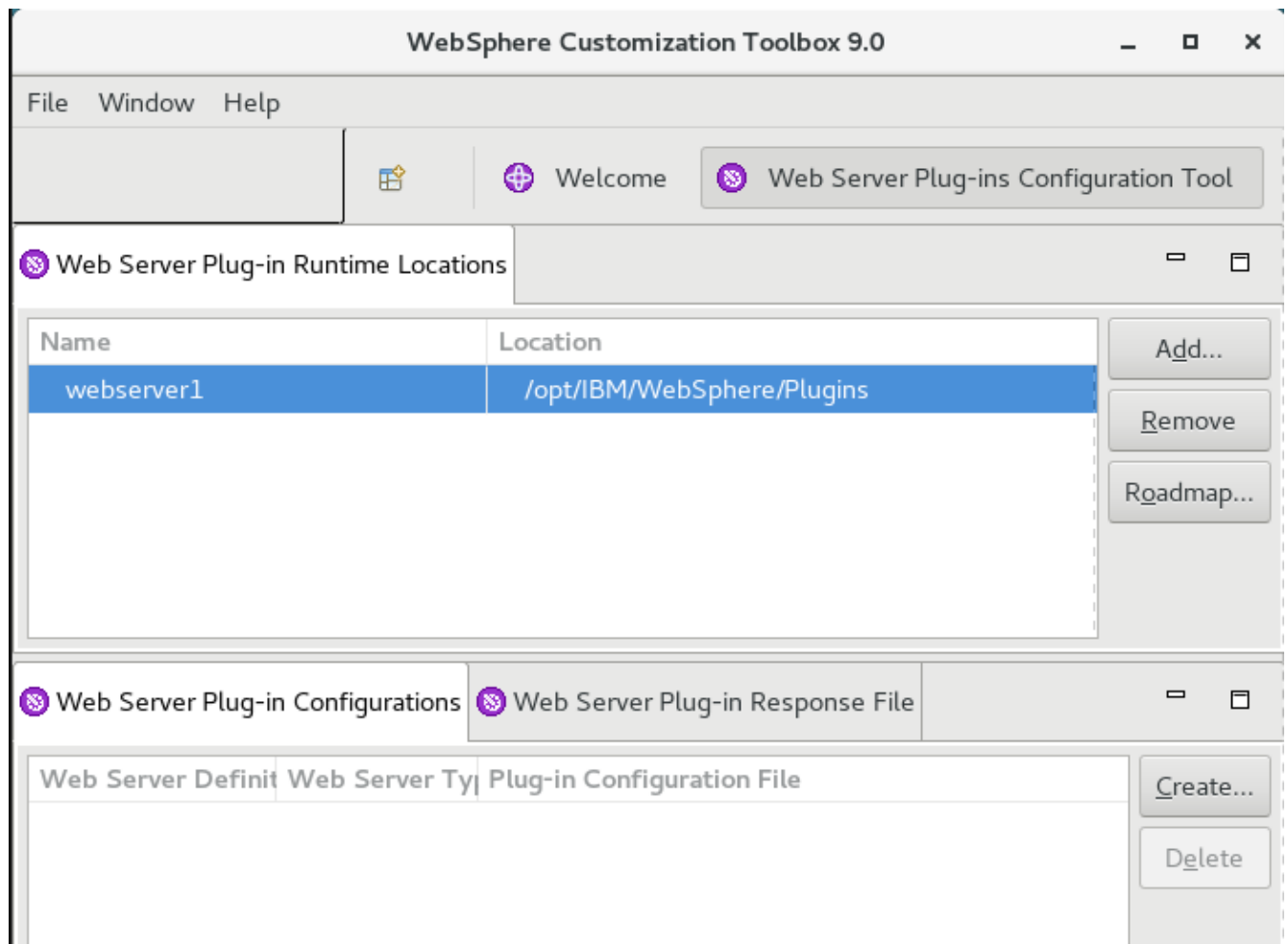
Web server plug-in location

Name:

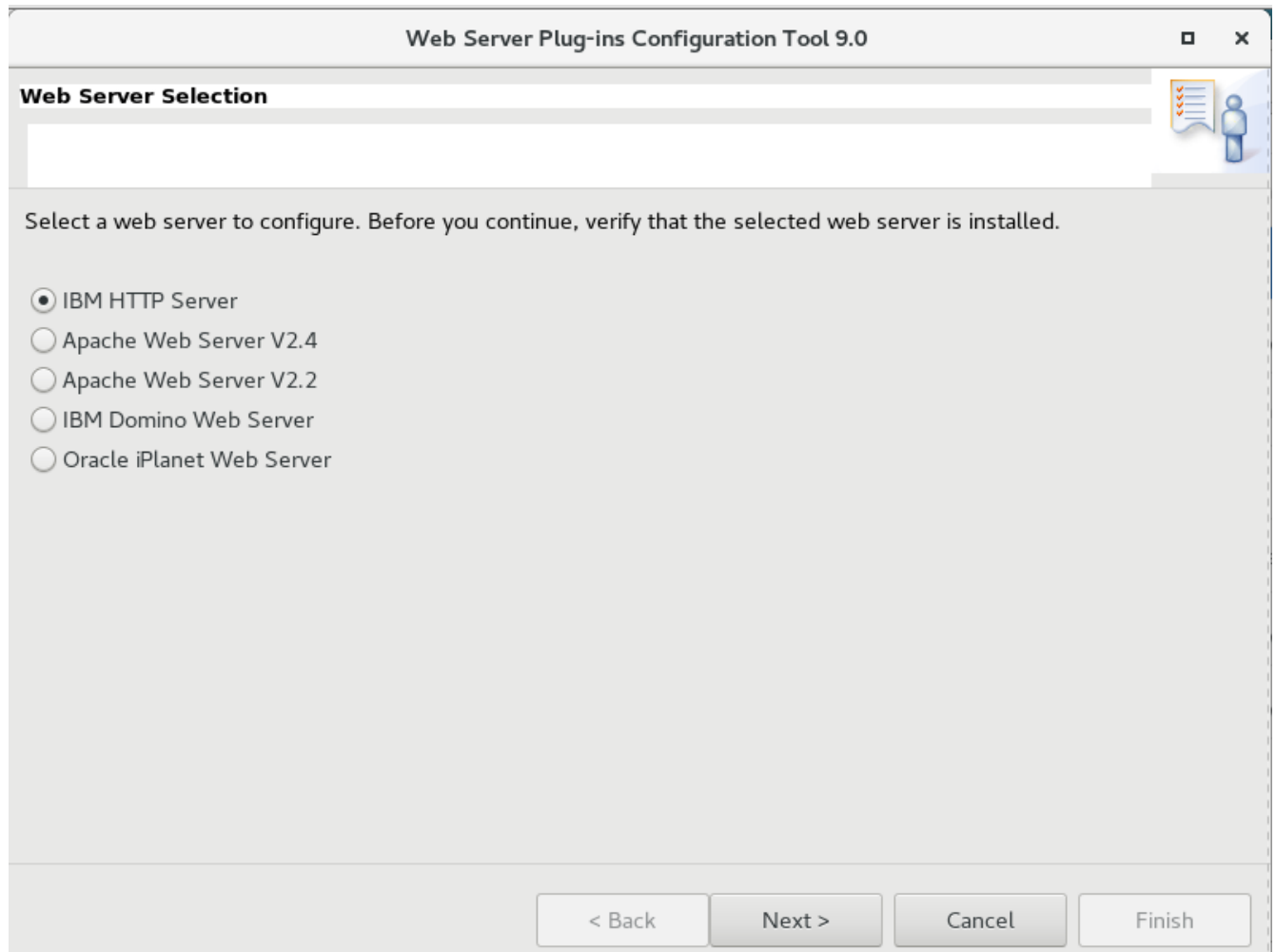
Location:

30. Click Finish.

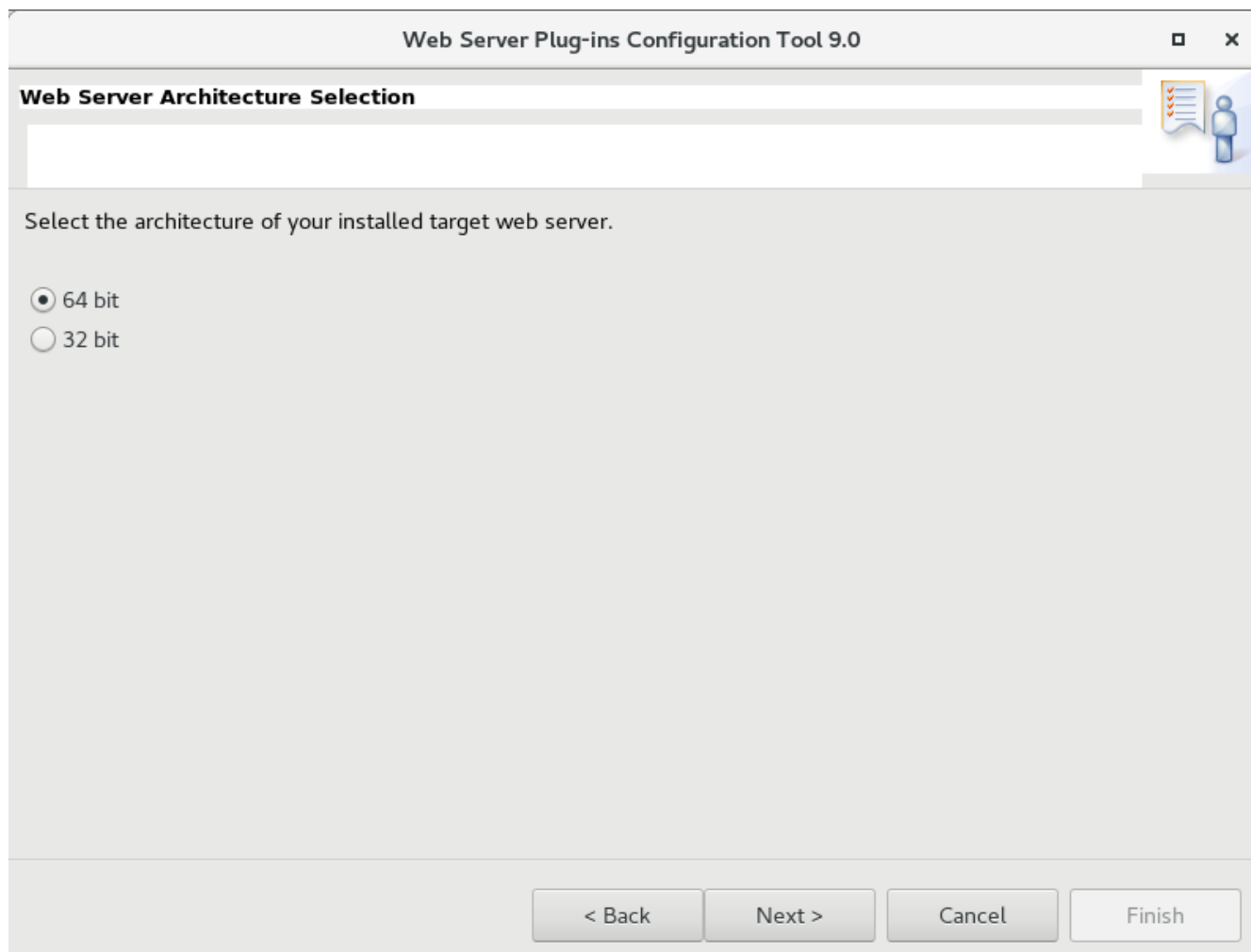
31. You will now see the **webserver1** name defined in the top window titled Web Server Plug-in Runtime Locations. In the bottom window titled Web Server Plugin Configurations click **Create**.



32. Select your Web Server type and click Next. This guide uses IBM HTTP Server.



33. Select the architecture of the installed target web server. This guide uses **64 bit**. Click **Next**.



The image shows a screenshot of the 'Web Server Plug-ins Configuration Tool 9.0' window. The title bar at the top reads 'Web Server Plug-ins Configuration Tool 9.0'. Below the title bar, the window has a header section titled 'Web Server Architecture Selection'. The main area of the window contains the instruction 'Select the architecture of your installed target web server.' followed by two radio button options: '64 bit' (which is selected) and '32 bit'. At the bottom of the window, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Finish'. The 'Next >' button is highlighted, indicating it is the recommended action.

Web Server Plug-ins Configuration Tool 9.0

Web Server Architecture Selection

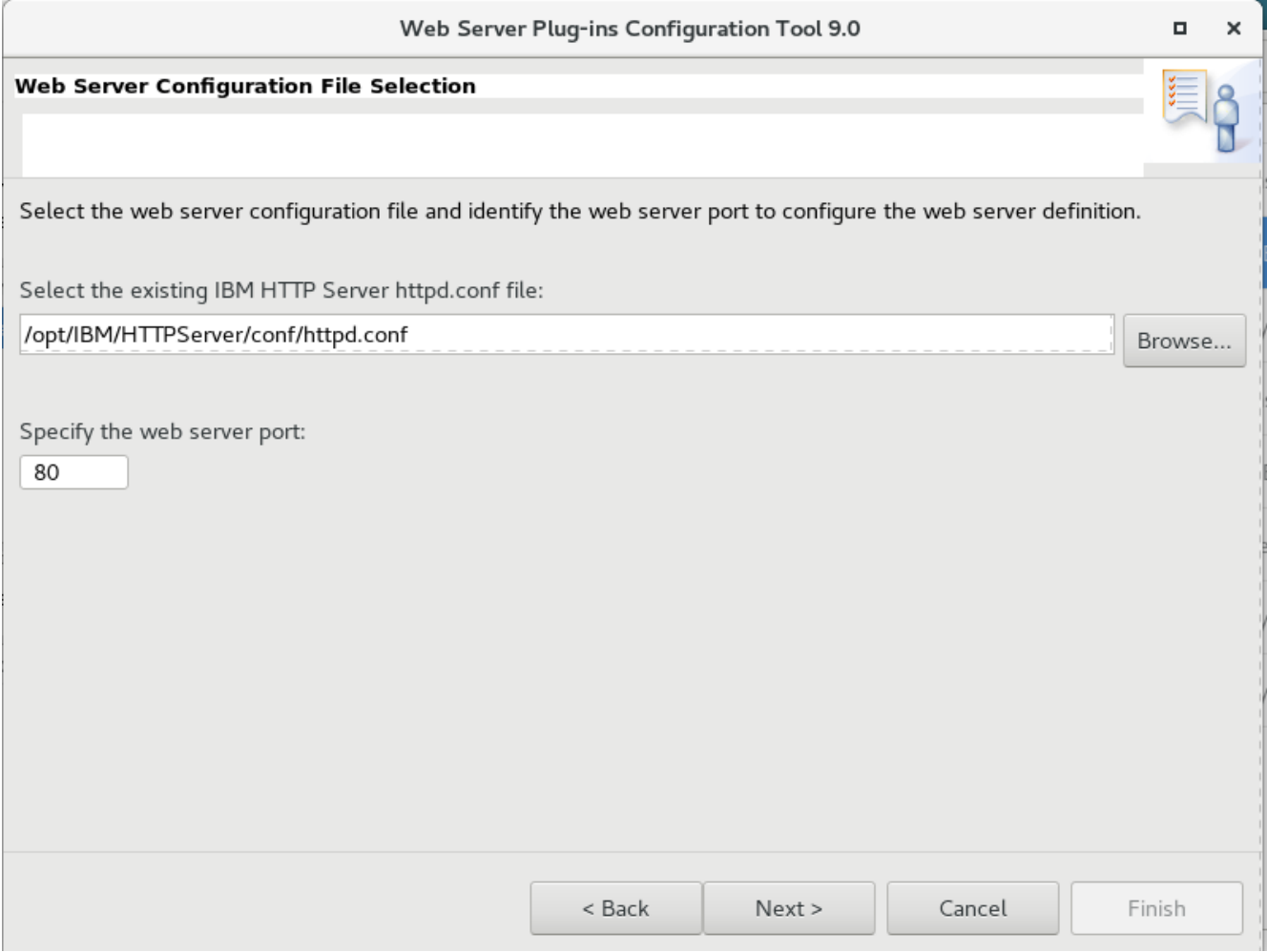
Select the architecture of your installed target web server.

☒ 64 bit

☐ 32 bit

< Back Next > Cancel Finish

34. Specify the location of the httpd.conf file and the port you chose during installation. This guide uses the prepopulated defaults of **/opt/IBM/HTTPServer/conf/httpd.conf** for the directory and **80** for the port. Click **Next**.



The image shows a window titled "Web Server Plug-ins Configuration Tool 9.0". The main heading is "Web Server Configuration File Selection". Below this, there is a text area with the instruction: "Select the web server configuration file and identify the web server port to configure the web server definition." Underneath, it says "Select the existing IBM HTTP Server httpd.conf file:". A text input field contains the path "/opt/IBM/HTTPServer/conf/httpd.conf", and a "Browse..." button is to its right. Below that, it says "Specify the web server port:" and a text input field contains the number "80". At the bottom of the window, there are four buttons: "< Back", "Next >", "Cancel", and "Finish".

Web Server Plug-ins Configuration Tool 9.0

Web Server Configuration File Selection

Select the web server configuration file and identify the web server port to configure the web server definition.

Select the existing IBM HTTP Server httpd.conf file:

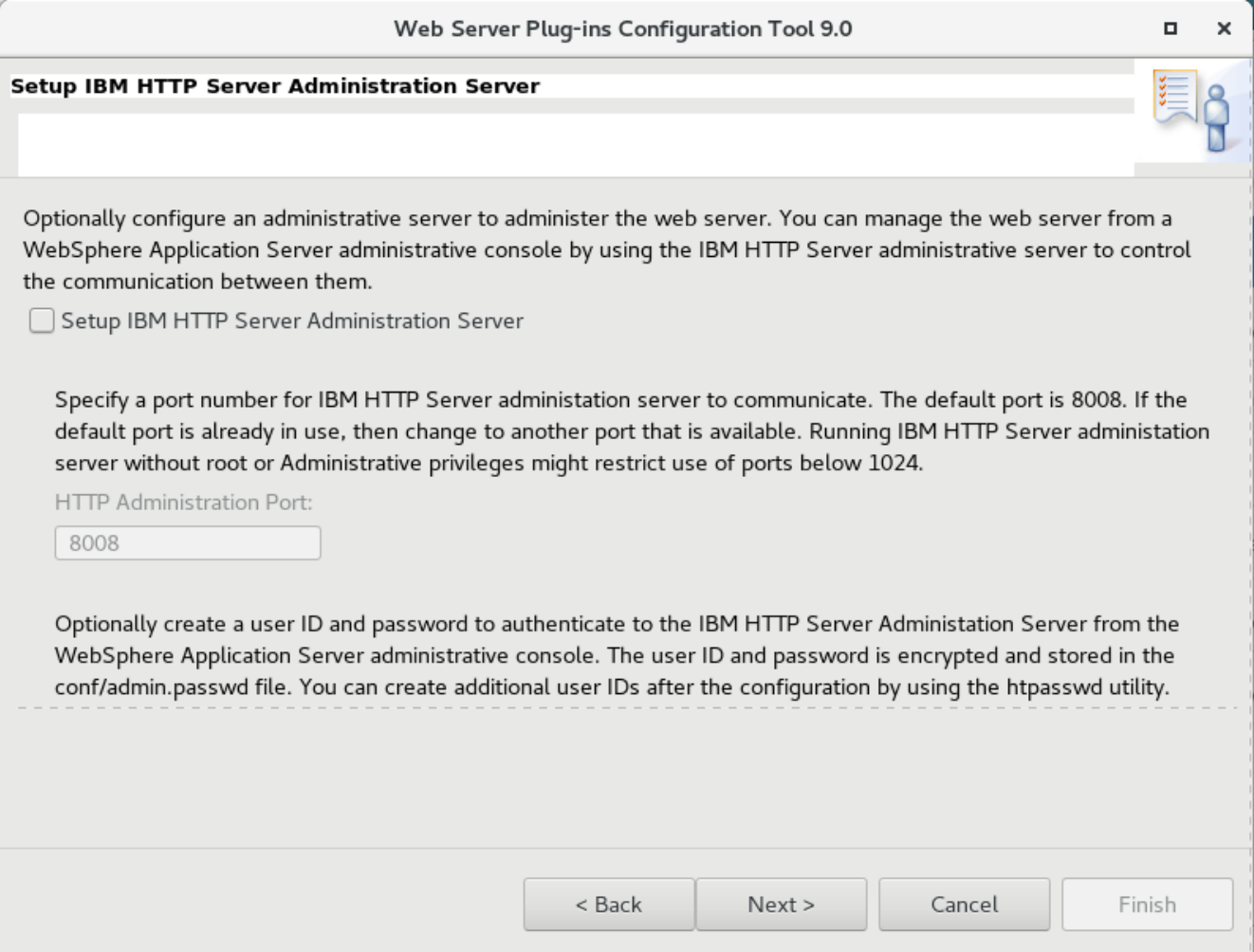
/opt/IBM/HTTPServer/conf/httpd.conf Browse...

Specify the web server port:

80

< Back Next > Cancel Finish

35. Select to Setup IBM HTTP Server Administration Server. By default the checkbox will be checked. This guide recommends deselecting the checkbox and not configuring the IBM HTTP Server Administration Server at this time. Click **Next**.



Web Server Plug-ins Configuration Tool 9.0

Setup IBM HTTP Server Administration Server

Optionally configure an administrative server to administer the web server. You can manage the web server from a WebSphere Application Server administrative console by using the IBM HTTP Server administrative server to control the communication between them.

☐ Setup IBM HTTP Server Administration Server

Specify a port number for IBM HTTP Server administration server to communicate. The default port is 8008. If the default port is already in use, then change to another port that is available. Running IBM HTTP Server administration server without root or Administrative privileges might restrict use of ports below 1024.

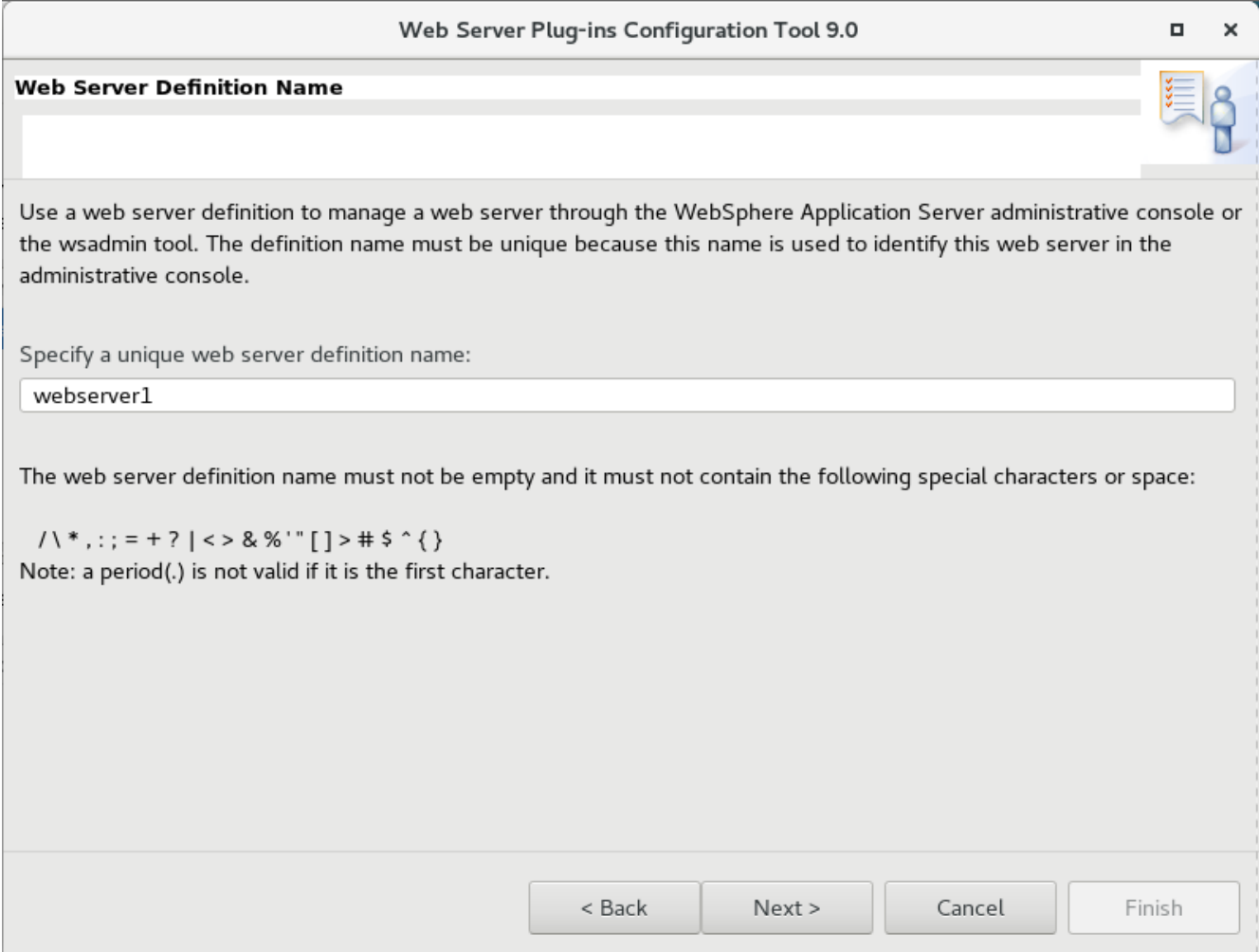
HTTP Administration Port:

8008

Optionally create a user ID and password to authenticate to the IBM HTTP Server Administration Server from the WebSphere Application Server administrative console. The user ID and password is encrypted and stored in the conf/admin.passwd file. You can create additional user IDs after the configuration by using the htpasswd utility.

< Back Next > Cancel Finish

36. Specify the name of your webserver you created previously. This guide uses **webserver1**. Click **Next**.



The image shows a Windows-style dialog box titled "Web Server Plug-ins Configuration Tool 9.0". It has a standard title bar with minimize, maximize, and close buttons. The main content area is divided into sections. The first section is titled "Web Server Definition Name" and contains a text input field. Below this, there is a paragraph of text explaining the purpose of the web server definition name. Then, there is a label "Specify a unique web server definition name:" followed by another text input field containing the text "webserver1". Below this, there is a paragraph of text stating that the name must not be empty and must not contain certain special characters or space, followed by a list of these characters. A note specifies that a period is not valid if it is the first character. At the bottom of the dialog, there are four buttons: "< Back", "Next >", "Cancel", and "Finish".

Web Server Plug-ins Configuration Tool 9.0

Web Server Definition Name

Use a web server definition to manage a web server through the WebSphere Application Server administrative console or the wsadmin tool. The definition name must be unique because this name is used to identify this web server in the administrative console.

Specify a unique web server definition name:

webserver1

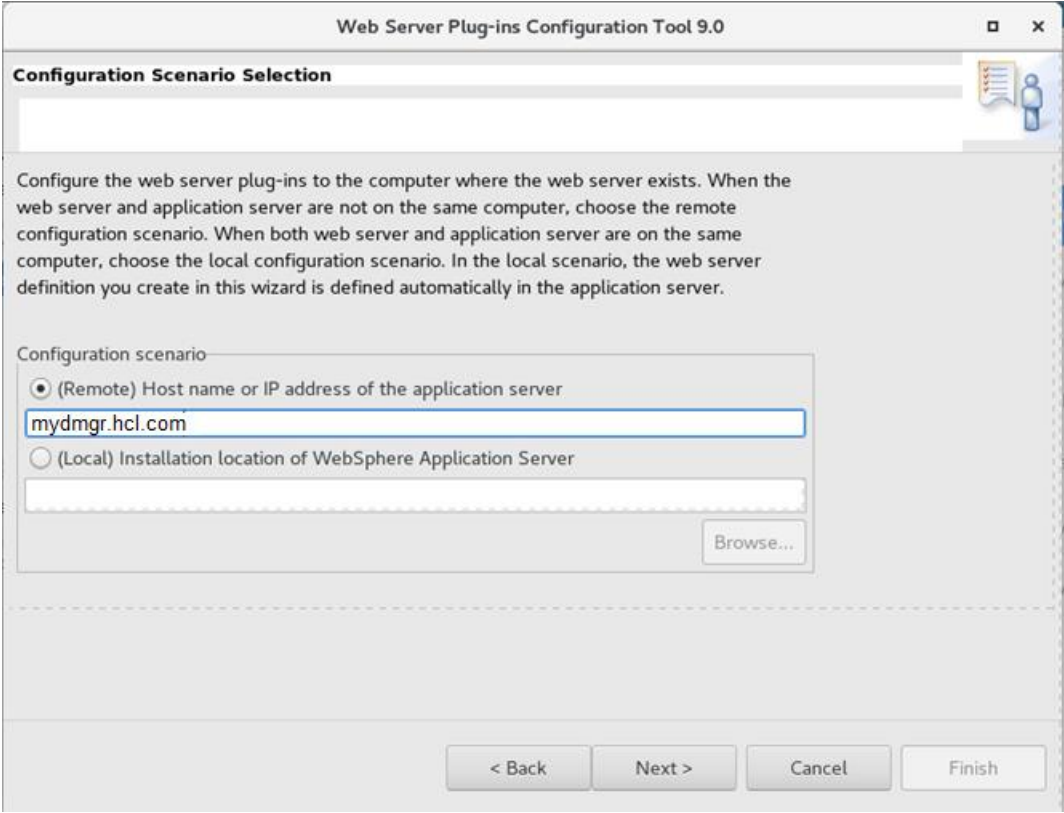
The web server definition name must not be empty and it must not contain the following special characters or space:

/ \ * , . ; = + ? | < > & % ' " [] > # \$ ^ { }

Note: a period(.) is not valid if it is the first character.

< Back Next > Cancel Finish

37. On this next screen enter the hostname of your Deployment Manager and click **Next**.



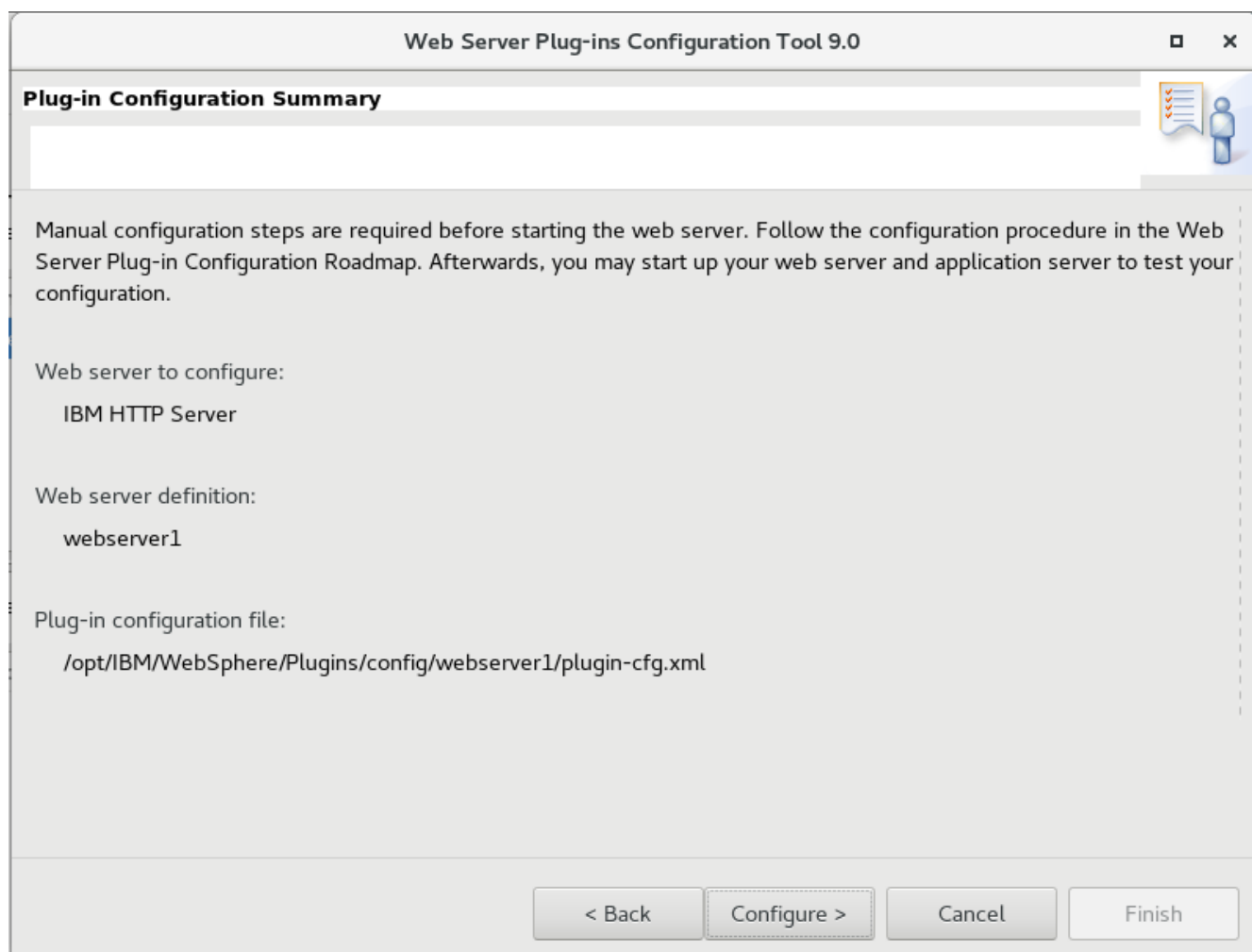
The image shows a screenshot of the 'Web Server Plug-ins Configuration Tool 9.0' window. The title bar at the top reads 'Web Server Plug-ins Configuration Tool 9.0'. Below the title bar, the window is titled 'Configuration Scenario Selection'. There is a small icon of a person with a speech bubble in the top right corner. The main text area contains the following instructions: 'Configure the web server plug-ins to the computer where the web server exists. When the web server and application server are not on the same computer, choose the remote configuration scenario. When both web server and application server are on the same computer, choose the local configuration scenario. In the local scenario, the web server definition you create in this wizard is defined automatically in the application server.'

Below the instructions, there is a section labeled 'Configuration scenario' with two radio button options:

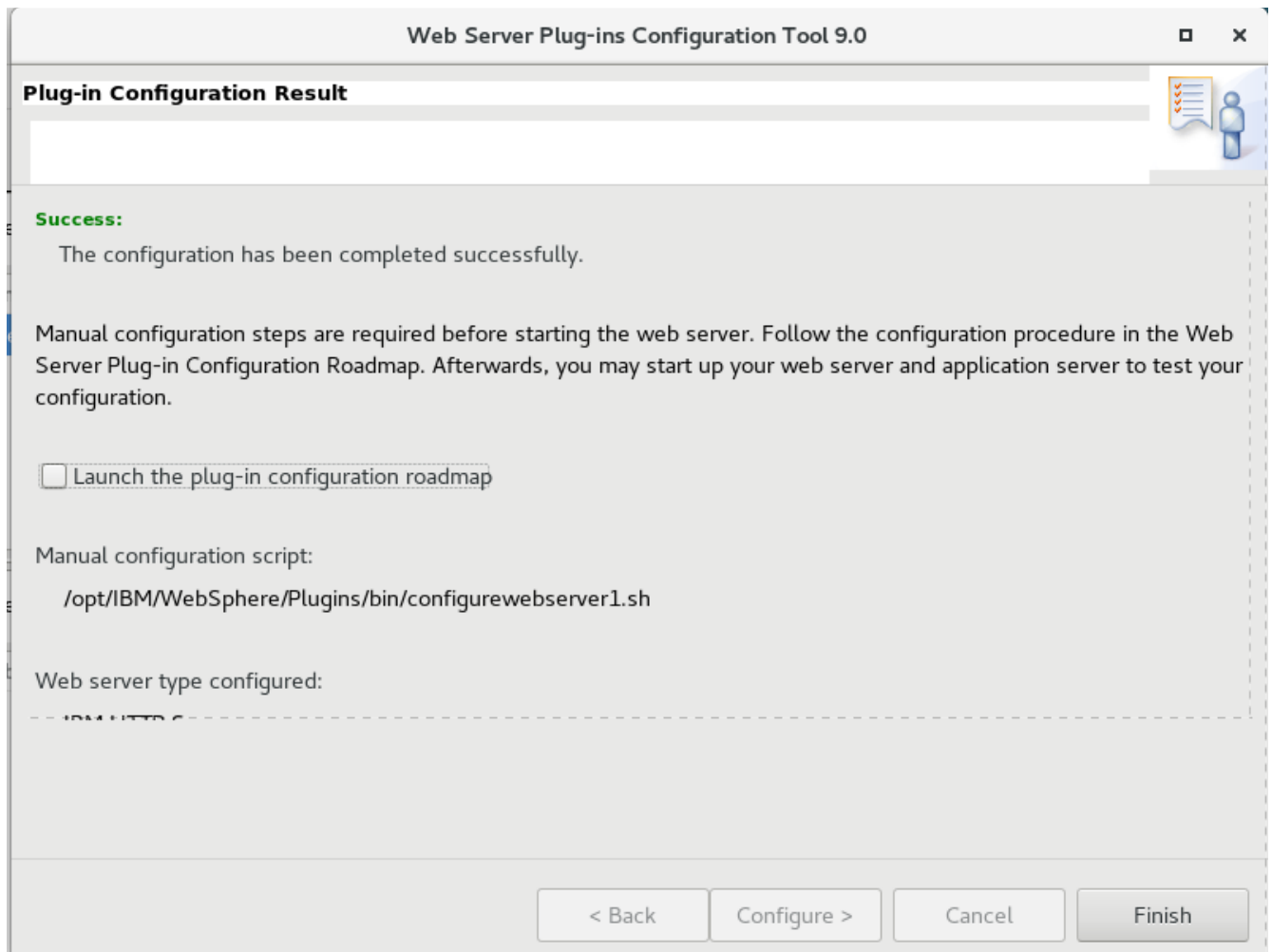
- ☒ (Remote) Host name or IP address of the application server
- ☐ (Local) Installation location of WebSphere Application Server

The text 'mydmgr.hcl.com' is entered into the text field associated with the 'Remote' option. Below the 'Local' option is an empty text field and a 'Browse...' button. At the bottom of the window, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Finish'.

38. Click **Configure** to configure the plug-in.



39. When the process completes, deselect **Launch the plug-in configuration roadmap**. Click **Finish**.



40. Copy the following file from your IHS web server:
`/opt/IBM/WebSphere/Plugins/bin/configurewebserver1.sh`

To your Deployment Manager server in the following location:
`/opt/IBM/WebSphere/AppServer/bin`

41. Switch to the Deployment Manager server. Run the following :
`chmod 777 /opt/IBM/WebSphere/AppServer/bin/configurewebserver1.sh`

42. Run the following from the `/opt/IBM/WebSphere/AppServer/profiles/dmgr01/bin` directory:
`./startManager.sh`

43. Run the following command from the `/opt/IBM/WebSphere/AppServer/bin` directory
`./configurewebserver1.sh -profileName dmgr01 -user WASAdminInLDAP
-password WASPswdInLDAP`

44. After the script completes, login into your Deployment Manager via a web browser and navigate to the Servers > Server Types > Web Servers

Click the box next to your web server name and click 'Generate Plug-in'

Generate Plug-in		Propagate Plug-in
		
Select	Name 	Web server Type 
You can administer the following resources		
☒	webserver1	IBM HTTP Server
Total 1		

45. You will see a message similar to the following:

 Messages
 PLGC0005I: Plug-in configuration file = /opt/IBM/WebSphere/AppServer/profiles/dmgr01/config/cells/dmgrCell01/nodes/mydmgr.ibm.com-node/servers/webserver1/plugin-cfg.xml
 PLGC0052I: Plug-in configuration file generation is complete for the Web server.

Copy the generated plugin-cfg.xml file from Deployment Manager server to the IHS server. This guide copied the plugin-cfg.xml from the location noted in the screenshot above to the following directory on the IHS server: **/opt/IBM/WebSphere/Plugins/config/webserver1**

46. Switch to your web server. Navigate to the `<httpRoot>/conf` directory. Open the `httpd.conf` file in a text editor
47. Locate the following line in the `httpd.conf` file.
`#LoadModule rewrite_module modules/mod_rewrite.so`
48. Uncomment the line by removing the pound symbol at the beginning of the line.
`LoadModule rewrite_module modules/mod_rewrite.so`
49. Locate the following line in the `httpd.conf` file.
`# Diagnostic log files, uncomment to enable.`
50. Insert the following two lines above this line.

```
RewriteEngine on  
RedirectMatch ^/$ /wps/portal/
```

Example end result:

```
RewriteEngine on  
RedirectMatch ^/$ /wps/portal/  
  
# Diagnostic log files, uncomment to enable.
```

Note: By default accessing your Portal site via <http://mywebserver.hcl.com/> will result in an IBM HTTP Server page being shown instead of your Portal site. This configuration change will ensure accessing <http://mywebserver.hcl.com/> will show your Portal site.

51. Save the `httpd.conf` file.
52. Restart the deployment manager, nodeagents, portal servers, and webserver.
53. Verify that you can access the Portal cluster from the web server address:

<http://mywebserver.hcl.com/>

Conclusion

In this guide, you built a two horizontal node HCL Portal v9.0 CF13 cluster using an external database and federated LDAP security.

At this point, this guide recommends you upgrade to the latest fixpack of Java, latest fixpack of WebSphere Application Server, and latest Cumulative Fix (CF) available for HCL Portal.

At this link you will find the latest Java and WebSphere Application Server fixpacks:

<http://www.ibm.com/support/docview.wss?uid=swg27004980>

At this link you will find the latest HCL Portal cumulative fix:

https://support.hcltech.com/csm?id=kb_article&sysparm_article=KB0013939

Recommended Additional Reading

This guide was intended as a starting point for HCL Portal administrators building their Portal environments. Additional resources are available to guide you through additional configuration and usage of your Portal environment. Links provided may note different versions of Portal, however, all links are applicable to Portal 9.0. This guide recommends the following for additional reading:

Building a Proof of Concept Website with Portal:

<http://www.redbooks.ibm.com/abstracts/sg248313.html?Open>

Portal Administration Guide:

<https://developer.ibm.com/digexp/wp-content/uploads/sites/27/2014/09/portal85adminworkshop.pdf>

Portal Performance Tuning Guide:

https://support.hcltechsw.com/csm?id=kb_article&sysparm_article=KB0074411

Portal Security Hardening Guide:

https://support.hcltechsw.com/csm?id=kb_article&sysparm_article=KB0074054

Developing Themes for HCL Portal:

<https://www-10.lotus.com/ldd/portalwiki.nsf/xpViewCategories.xsp?lookupName=Developing%20Themes%20for%20WebSphere%20Portal%208.5>

Creating Pages and Adding Content with Managed Pages:

https://www-10.lotus.com/ldd/portalwiki.nsf/dx/Managed_Pages

Integrating with Watson Content Hub:

https://help.hcltechsw.com/digital-experience/8.5/integrate/int_dch.html

Modern Scripting Development with Portal:

https://www.youtube.com/watch?v=7R8SGPdNC_g

Planning Deployments Across Multiple Portal Environments:

<https://www-01.ibm.com/support/docview.wss?uid=swg27048801>

HCL Portal v9 Knowledge Center:

https://help.hcltechsw.com/digital-experience/9.0/welcome/wp9_welcome.html

Appendix A - Silently Installation

Find the detailed instructions for installing Installation Manager 1.8.5 and HCL Portal 9.0 silently in the following guide:

“A Step-By-Step Guide to performing a silent installation of HCL Portal 9.0”

https://support.hcltechsw.com/csm?id=kb_article&sysparm_article=KB0074142

1. You can find the instructions to install the Installation Manager in silent mode on page 5;
2. For the silent installation of HCL Portal 9.0 on the Primary Node, follow the steps on pages 6-12;
3. For the silent installation of HCL Portal 9.0 on Additional Horizontal Nodes, follow the steps on pages 15-19

Appendix B - Enabling SSL on the Web Server

Introduction

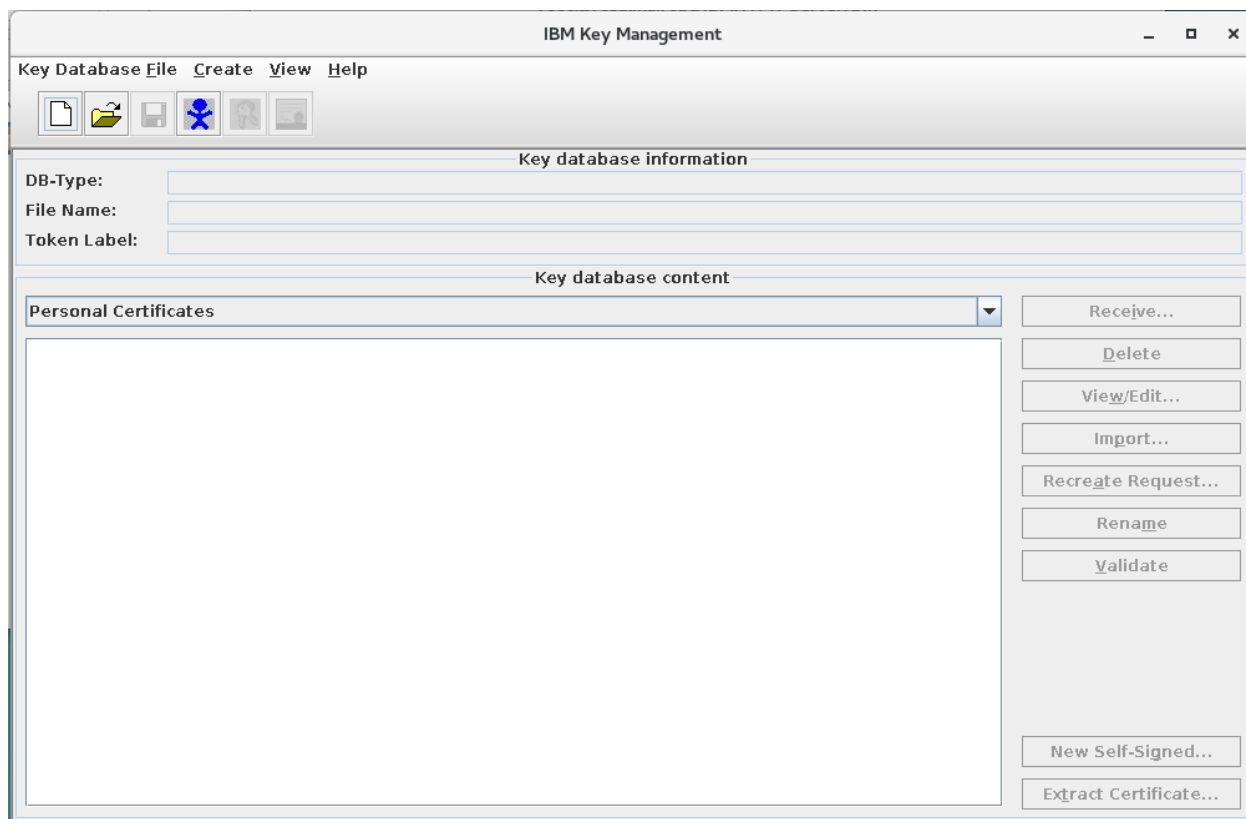
This appendix will guide you through enabling SSL on your IBM HTTP Server. This appendix also provides instructions for how to configure IBM HTTP Server with logic that will ensure any visitors to your Portal site will always browse over a secure https:// link and never over an unsecure http:// link. This appendix also provides details on how to enable SSL communications between your Portal servers and web server. Finally, this appendix will provide an example of how to allow visitors to your Portal site to automatically be redirected to the /wps/portal portion of your Portal server.

Note: The authors of this guide STRONGLY recommend SSL be enabled on your web server for all Portal sites. However, there are valid arguments to be made where SSL should not be enabled. Hence, the instructions for enabling SSL on the web server are located in an appendix of this guide rather than being contained within Chapter 8 of the guide.

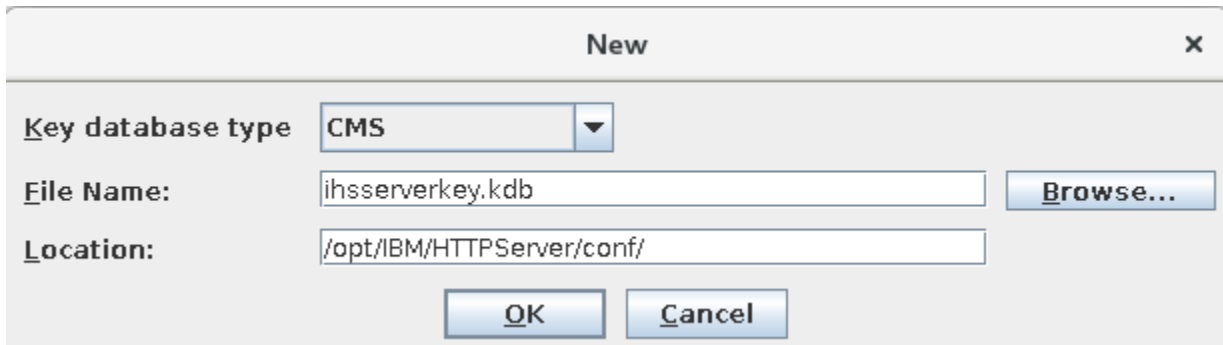
1. Navigate to the <HTTPServer>/bin/ikeyman directory of your web server.
2. Launch the IBM Key Management tool via executing the ikeyman command

```
[root@      bin]# cd /opt/IBM/HTTPServer/bin/  
[root@      bin]# ./ikeyman
```

3. You will see the following screen:

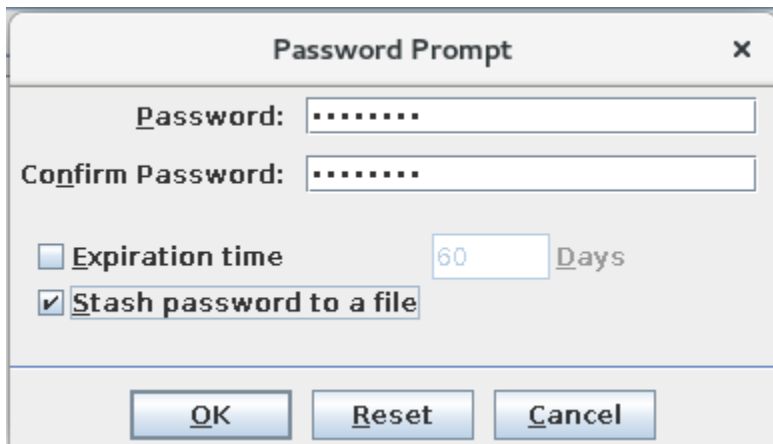


4. Click **Key Database File > New**
5. Select **CMS** for Key Database type. Provide a File Name and Location. Click **OK**.



The 'New' dialog box is used to create a new key database file. It features a title bar with the text 'New' and a close button (X). The main area contains three fields: 'Key database type' with a dropdown menu set to 'CMS', 'File Name:' with a text box containing 'ihsserverkey.kdb' and a 'Browse...' button, and 'Location:' with a text box containing '/opt/IBM/HTTPServer/conf/'. At the bottom are 'OK' and 'Cancel' buttons.

6. Provide a password for the key file. Retype the same password in the Confirm Password field. Click the checkbox to **Stash password to a file**. Click **OK**.



The 'Password Prompt' dialog box is used to set a password for the key file. It has a title bar with 'Password Prompt' and a close button (X). The main area contains two password fields labeled 'Password:' and 'Confirm Password:', both filled with dots. Below these is an 'Expiration time' section with a checkbox, a text box containing '60', and the word 'Days'. At the bottom is a checkbox labeled 'Stash password to a file' which is checked. At the very bottom are 'OK', 'Reset', and 'Cancel' buttons.

Note: This guide uses a self-signed SSL certificate for demonstration purposes. If you are installing a self-signed SSL certificate, proceed with executing steps #7 - #9 of this Appendix.

However, many Portal sites will use an SSL certificate issued by their company's Certificate Authority, or, an SSL certificate issued by a trusted third-party Certificate Authority such as Comodo, Symantec, GoDaddy, etc. If you require a certificate issued by your company or by a trusted third-party, see the following document:

<https://www.ibm.com/support/docview.wss?uid=swg21006430>

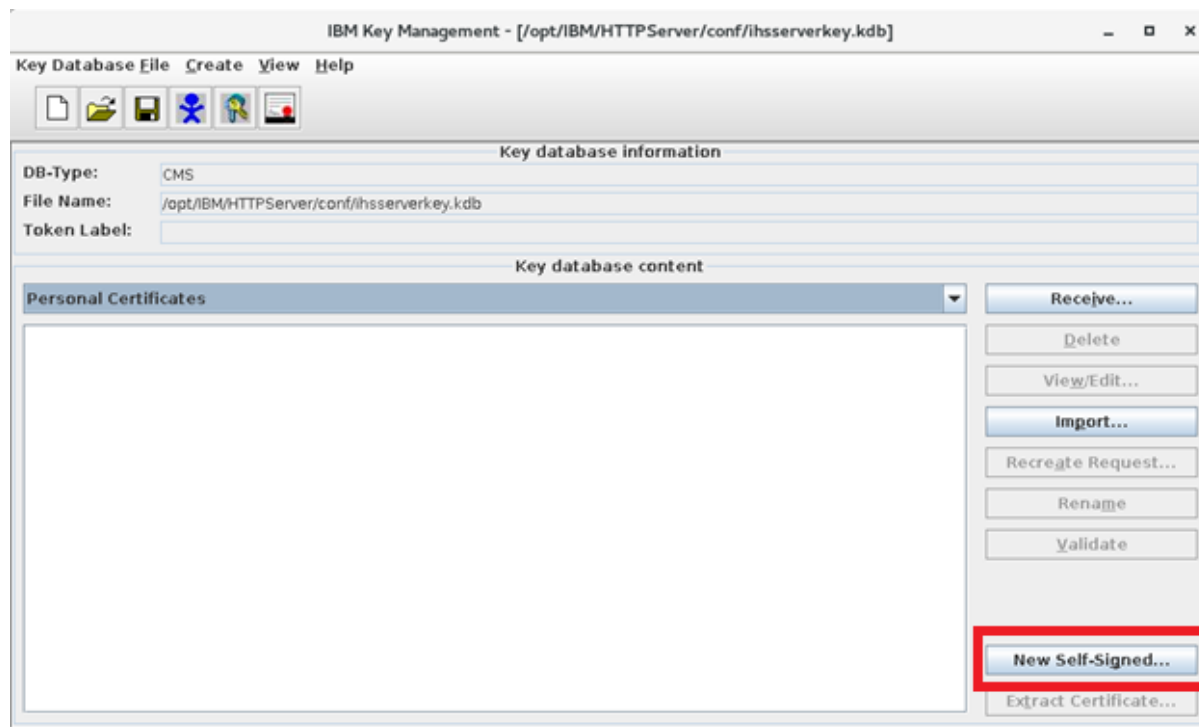
Execute the steps in the sections titled:

How do I create a new "Certificate Request" to send to a CA (for example, Verisign)?

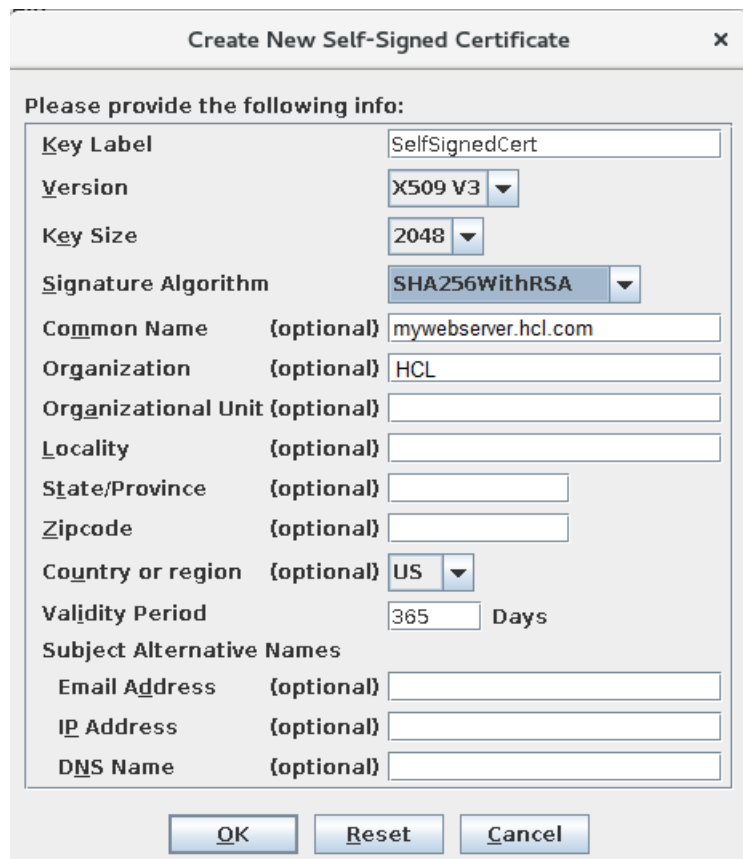
How do I receive the Certificate into the Key Database File (.kdb) file after getting it back from the CA?

And skip steps #7 - #9 of this Appendix. Resume on step #10.

7. Click on **New Self-Signed...** in the lower right of the window.



8. Fill in the **Key Label, Key Size, Signature Algorithm, Common Name, and Organization fields**. For the Common Name field, use the hostname of the IBM HTTP Server, mywebserver.hcl.com for this guide. Click **OK**.

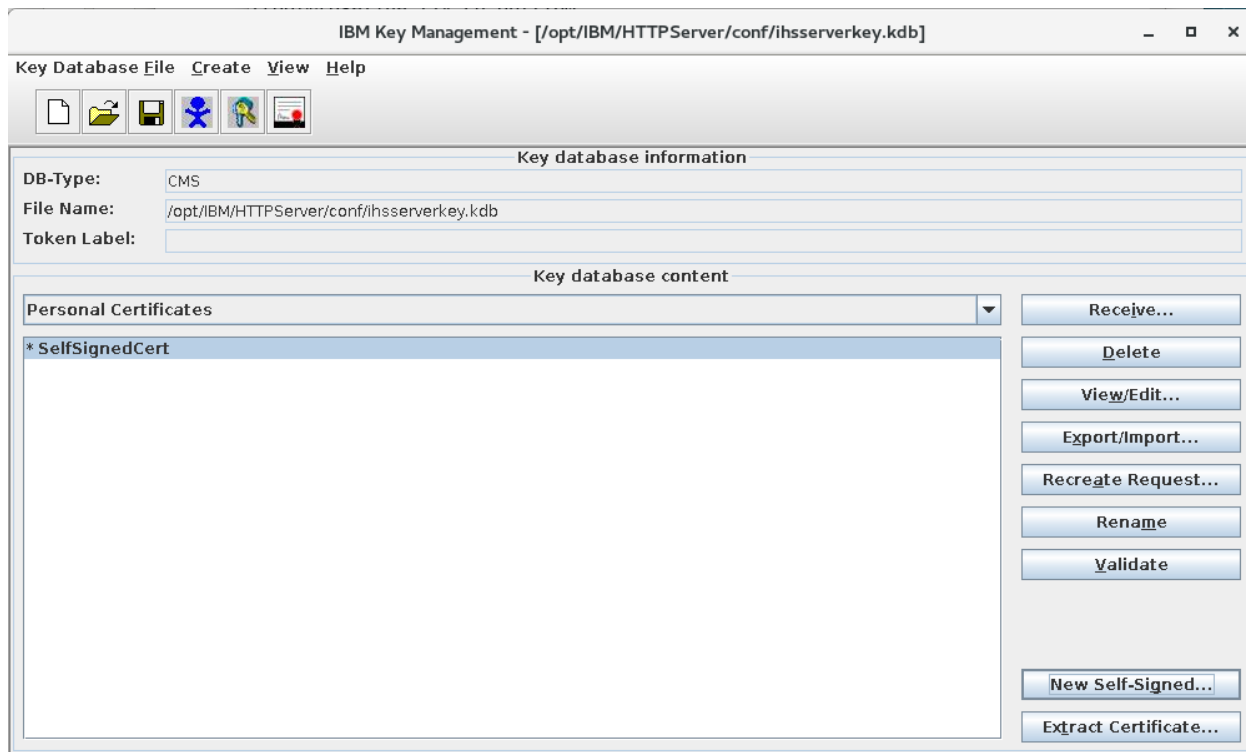


The image shows a 'Create New Self-Signed Certificate' dialog box. It contains several input fields and dropdown menus for configuring a self-signed certificate. The fields are: Key Label (text box with 'SelfSignedCert'), Version (dropdown with 'X509 V3'), Key Size (dropdown with '2048'), Signature Algorithm (dropdown with 'SHA256WithRSA'), Common Name (text box with 'mywebserver.hcl.com'), Organization (text box with 'HCL'), Organizational Unit (text box), Locality (text box), State/Province (text box), Zipcode (text box), Country or region (dropdown with 'US'), Validity Period (text box with '365' and 'Days'), Subject Alternative Names (a section with three optional text boxes: Email Address, IP Address, and DNS Name). At the bottom are three buttons: OK, Reset, and Cancel.

Please provide the following info:	
Key Label	SelfSignedCert
Version	X509 V3
Key Size	2048
Signature Algorithm	SHA256WithRSA
Common Name	{optional} mywebserver.hcl.com
Organization	{optional} HCL
Organizational Unit	{optional}
Locality	{optional}
State/Province	{optional}
Zipcode	{optional}
Country or region	{optional} US
Validity Period	365 Days
Subject Alternative Names	
Email Address	{optional}
IP Address	{optional}
DNS Name	{optional}

OK Reset Cancel

9. You will see the following screen.



10. Click **Key Database File > Exit** to close the IBM Key Management tool.

11. Navigate to the <HTTPServer_root>/conf directory. For this guide: /opt/IBM/HTTPServer/conf.
12. Open the httpd.conf file in a text editor.
13. Locate the line in the httpd.conf file which begins with **Example SSL section**

```
# Example SSL configuration
# To enable this support:
#   1) Create a key database with ikeyman or bin/gskcapicmd
#   2) Update the KeyFile directive below to point to that key database
#   3) Uncomment the directives up through the end of the example
#
#LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
#Listen 443
#SSLCheckCertificateExpiration 30
#<VirtualHost *:443>
#    #SSLEnable
#    #Header always set Strict-Transport-Security "max-age=31536000; includeSubDomains; preload"
#</VirtualHost>
#KeyFile /opt/IBM/HTTPServer/conf/ihserverkey.kdb
#SSLDisable
# End of example SSL configuration
```

14. Update this section with the following text

```
LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
Listen 443
SSLCheckCertificateExpiration 30
<VirtualHost *:443>
    SSLEnable
    SSLClientAuth None
    Header always set Strict-Transport-Security "max-age=31536000; includeSubDomains; preload"
</VirtualHost>
KeyFile /opt/IBM/HTTPServer/conf/ihserverkey.kdb
SSLDisable
```

Example end result for this guide:

```
# Example SSL configuration
# To enable this support:
#   1) Create a key database with ikeyman or bin/gskcapicmd
#   2) Update the KeyFile directive below to point to that key database
#   3) Uncomment the directives up through the end of the example
#
LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
Listen 443
SSLCheckCertificateExpiration 30
<VirtualHost *:443>
    SSLEnable
    SSLClientAuth None
    Header always set Strict-Transport-Security "max-age=31536000; includeSubDomains; preload"
</VirtualHost>
KeyFile /opt/IBM/HTTPServer/conf/ihserverkey.kdb
SSLDisable
# End of example SSL configuration
```

15. In the httpd.conf file - locate the following two lines rule you implemented in Chapter 8.

```
RewriteEngine on
RedirectMatch ^/$ /wps/portal/
```

16. Update the lines to match the following text:

```
RewriteEngine on
RewriteCond %{SERVER_PORT} =80
RewriteRule ^(.*) https://%{SERVER_NAME}%{REQUEST_URI} [R,L]
RedirectMatch ^/$ /wps/portal/
```

Note: For this guide, the end result of the changes in the httpd.conf file looking like the following.

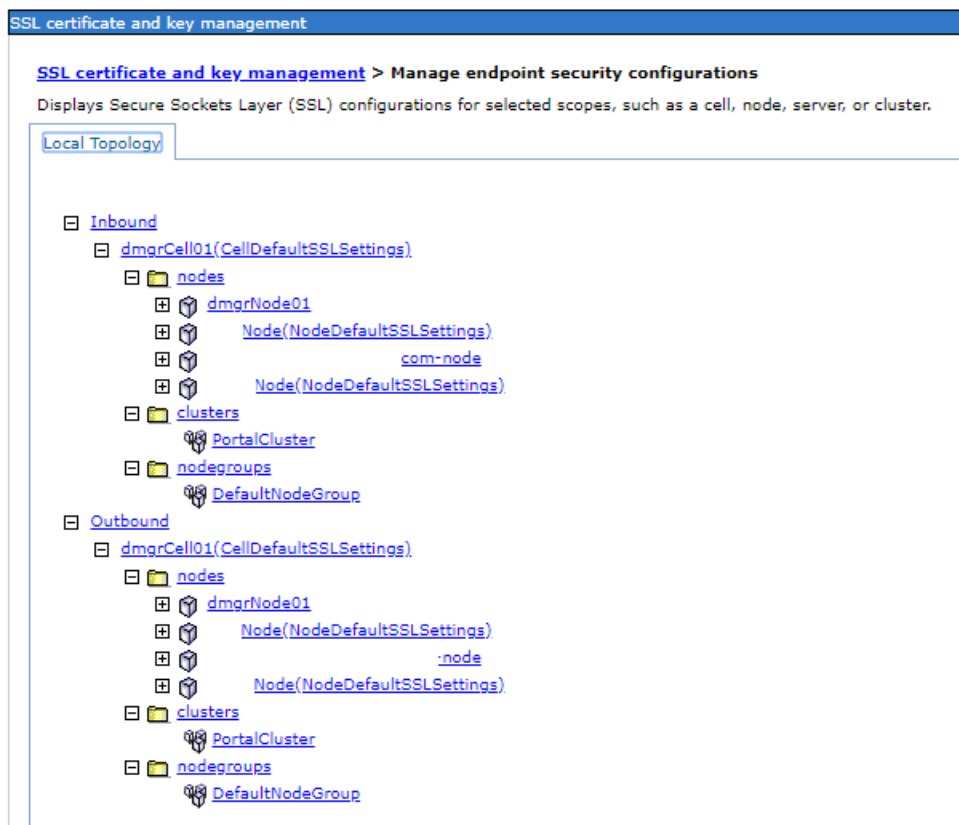
```
LoadModule ibm_ssl_module modules/mod_ibm_ssl.so
Listen 443
SSLCheckCertificateExpiration 30
<VirtualHost *:443>
    SSLEnable
    SSLClientAuth None
    Header always set Strict-Transport-Security "max-age=31536000; includeSubDomains; preload"
</VirtualHost>
KeyFile /opt/IBM/HTTPServer/conf/ihsserverkey.kdb
SSLDisable
# End of example SSL configuration

RewriteEngine on
RewriteCond %{SERVER_PORT} =80
RewriteRule ^(.*) https://%{SERVER_NAME}%{REQUEST_URI} [R,L]
RedirectMatch ^/$ /wps/portal/

# Diagnostic log files, uncomment to enable.
```

17. Save and close the httpd.conf file.

18. Login to the Deployment Manager via a web browser.
19. Navigate to **Security > SSL certificate and key management > Manage endpoint security configurations**. You will see a screen similar to the following:



20. Under the heading Inbound, you will have four total entries representing your Deployment Manager node, primary portal node, additional horizontal portal node, and web server node. Click on **NodeDefaultSSLSettings** for **your primary Portal node**.

21. You will see the following screen:

SSL certificate and key management

SSL certificate and key management > Manage endpoint security configurations > PortalNode

Displays Secure Sockets Layer (SSL) configurations for selected scopes, such as a cell, node, server, or cluster.

General Properties

Name
PortalNode

Direction
Inbound

Inherited SSL configuration

Inherited SSL configuration name
CellDefaultSSLSettings

Inherited certificate alias
null

Related Items

- SSL configurations
- Dynamic outbound endpoint SSL configurations
- Key stores and certificates
- Key sets
- Key set groups
- Key managers
- Trust managers
- Certificate Authority (CA) client configurations

Specific SSL configuration for this endpoint

☒ Override inherited values

SSL configuration
NodeDefaultSSLSettings Update certificate alias list Manage certificates

Certificate alias in key store
(none)

Apply OK Reset Cancel

22. Click on **Key stores and certificates** on the right side. You will see the following screen:

SSL certificate and key management

SSL certificate and key management > Manage endpoint security configurations > PortalNode > Key stores and certificates

Defines keystore types, including cryptography, RACF(R), CMS, Java(TM), and all truststore types.

Keystore usages
SSL keystores

Preferences

New... Delete Change password... Exchange signers...

☒ ☐ ☐ ☐

Select	Name	Description	Path
You can administer the following resources:			
☐	CellDefaultKeyStore	Default key store for dmgrCell01	\${CONFIG_ROOT}/cells/dmgrCell01/key.p12
☐	CellDefaultTrustStore	Default trust store for dmgrCell01	\${CONFIG_ROOT}/cells/dmgrCell01/trust.p12
☐	NodeDefaultKeyStore	Default key store for PortalNode	\${CONFIG_ROOT}/cells/dmgrCell01/nodes/PortalNode/key.p12
☐	NodeDefaultTrustStore	Default trust store for PortalNode	\${CONFIG_ROOT}/cells/dmgrCell01/nodes/PortalNode/trust.p12

Total 4

23. Click on **NodeDefaultKeyStore**. You will see the following screen.

SSL certificate and key management

SSL certificate and key management > Manage endpoint security configurations > Node > Key stores and certificates > NodeDefaultKeyStore

Defines keystore types, including cryptography: RACF(R), CMS, Java(TM), and all truststore types.

General Properties	Additional Properties
Name NodeDefaultKeyStore	• Signer certificates • Personal certificates • Personal certificate requests • Custom properties
Description Default key store for Node	
Management scope {cell}:dmgrCell01:(node) Node	
Path \${CONFIG_ROOT}/cells/dmgrCell01/nodes/Node/key.p12	
★ Password	
Type PKCS12	
☐ Remotely managed Host list	
☐ Read only	
☐ Initialize at startup	
☐ Enable cryptographic operations on hardware device	
Apply OK Reset Cancel	

24. Click on **Personal certificates** on the right-hand side. You will see the following screen.

SSL certificate and key management

SSL certificate and key management > Manage endpoint security configurations > Node > Key stores and certificates > NodeDefaultKeyStore > Personal certificates

Manages personal certificates.

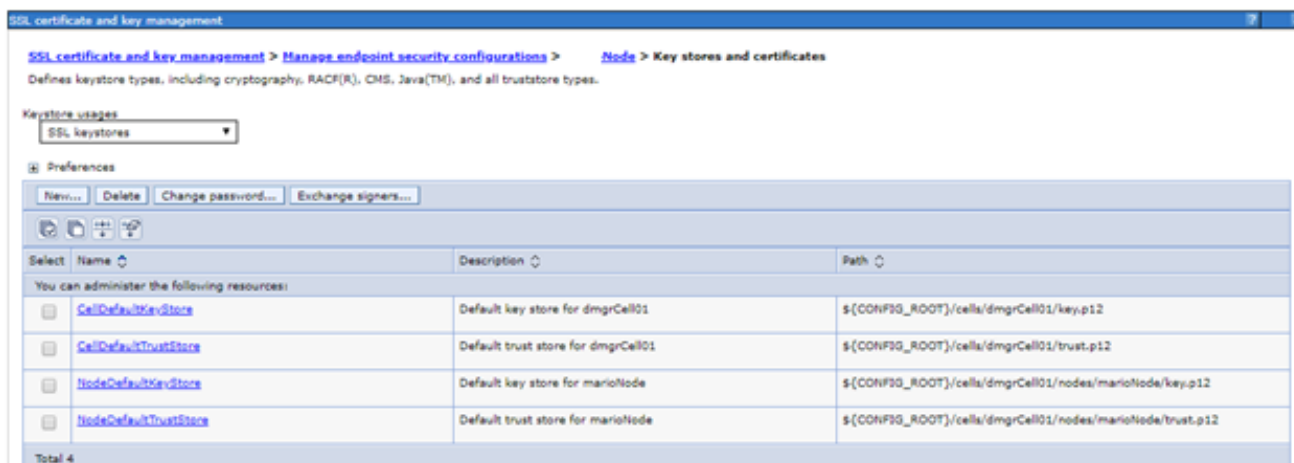
Preferences

Create ▾ Delete Receive from a certificate authority... Replace... Extract... Import... Export... Revoke... Renew

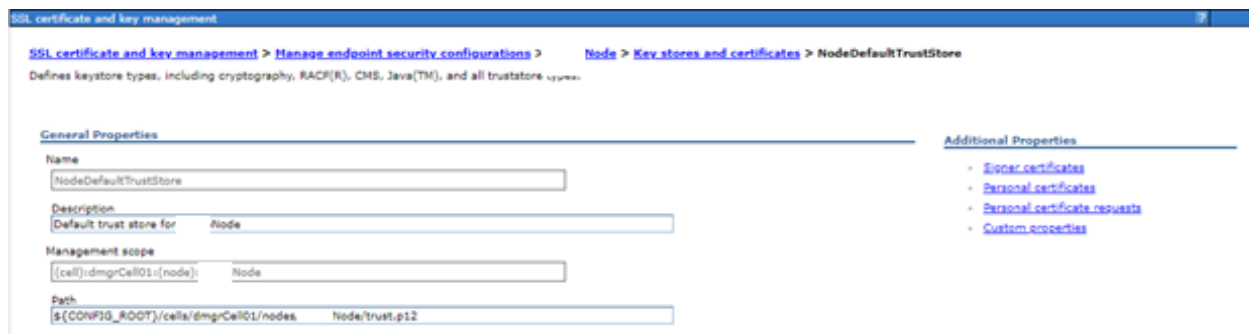
Select	Alias	Issued To	Issued By	Serial Number	Expiration
You can administer the following resources:					
☐	default	CN=Node, OU=Cell, O=IBM, C=US	CN=Certificate, OU=dmgrCell01, OU=dmgrNode01, O=IBM, C=US	1069463936447	Valid from May 31, 2018 to May 31, 2019.
☐		CN=Certificate, OU=dmgrCell01, OU=dmgrNode01, O=IBM, C=US	CN=Certificate, OU=dmgrCell01, OU=dmgrNode01, O=IBM, C=US	1189393461368024	Valid from May 31, 2018 to May 27, 2023.
Total 2					

25. The first entry on this screen is a personal certificate. The second entry on this screen is a signer certificate. Record the serial number of the signer certificate - **1189393461368024** for this guide.

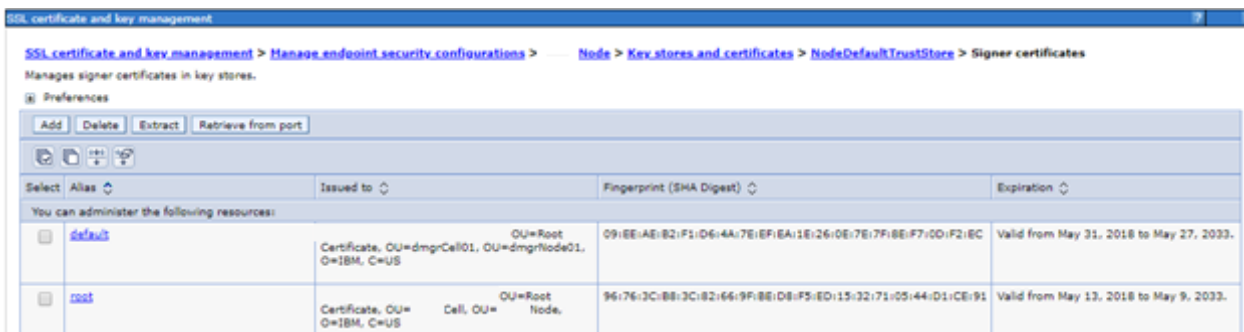
26. At the top of the page click on **Key stores and certificates**. You will screen the following screen.



27. Click on **NodeDefaultTrustStore**. You will see the following screen.



28. Click on **Signer certificates** on the right side. You will see the following screen.



29. Click on the alias named **default**. You will see the following screen.

SSL certificate and key management > Manage endpoint security configurations > Node > Key stores and certificates > NodeDefaultTrustStore > Signer certificates > default

Manages signer certificates in key stores.

General Properties

Alias: default

Version: 3

Key size: 2048

Serial number: 1189393461368024

Validity period: Valid from May 31, 2018 to May 27, 2033.

30. Validate the serial number that appears on this screen matches the serial number you previously recorded. If it does not, go back to the **NodeDefaultTrustStore** and choose a different certificate alias name. Inspect each certificate alias until you identify the correct one with the matching serial number. For this guide the alias **default** contained a matching serial number.

31. Click on the **NodeDefaultTrustStore** at the top of the page. Click the checkbox next to the alias you identified with the matching serial number. **default** alias for this guide. Click **Extract**.

SSL certificate and key management > Manage endpoint security configurations > Node > Key stores and certificates > NodeDefaultTrustStore > Signer certificates

Manages signer certificates in key stores.

Preferences

Add Delete Extract Retrieve from port

Select Alias Issued to Fingerprint (SHA Digest) Expiration

You can administer the following resources:

Select	Alias	Issued to	Fingerprint (SHA Digest)	Expiration
☒	default	ibm.com, OU=Root Certificate, OU=dmgrCell01, OU=dmgrNode01, O=IBM, C=US	09:EE:AE:B2:F1:D6:4A:7E:EF:EA:1E:26:0E:7E:7F:8E:F7:0D:F2:EC	Valid from May 31, 2018 to May 27, 2033.

32. Enter a temporary path and filename. Click OK. This will create a file on the Deployment Manager. Copy this file to a temporary location on your IHS server.

SSL certificate and key management > Manage endpoint security configurations > Node > Key stores and certificates > NodeDefaultTrustStore > Signer certificates > Extract signer certificate

Extracts a signer certificate from a personal certificate to a file.

General Properties

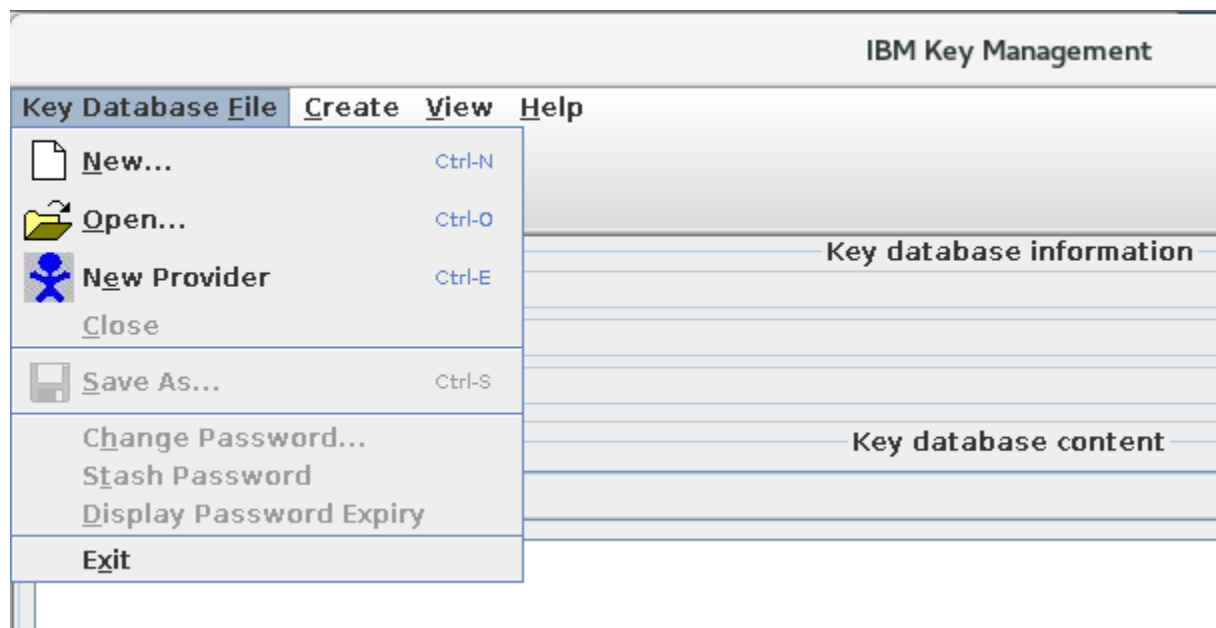
* File name: /tmp/nodeRootSigner.arm

Data type: Base64-encoded ASCII data

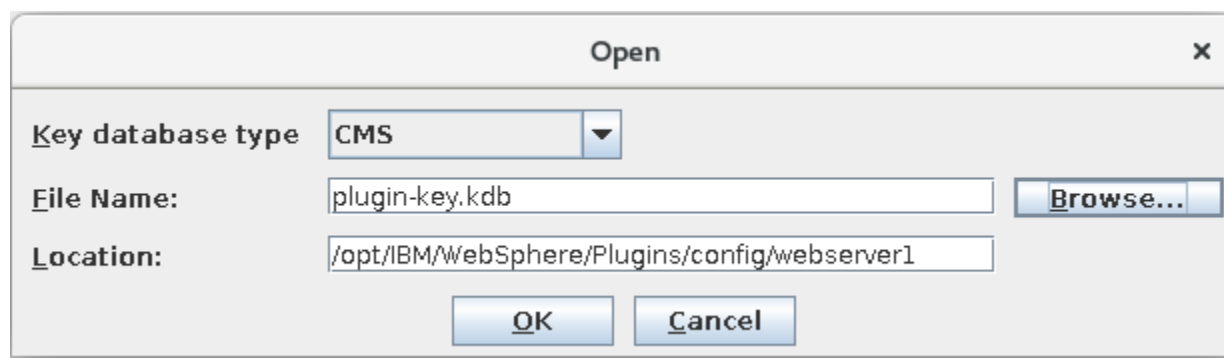
Apply OK Reset Cancel

33. Navigate to the `<httpRoot>/bin/` directory of your web server. Launch the IBM Key Management tool via executing the `ikeyman` command.

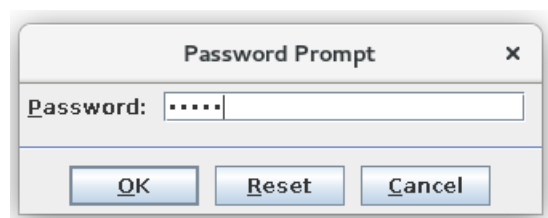
34. Click on **Key Database File > Open...**



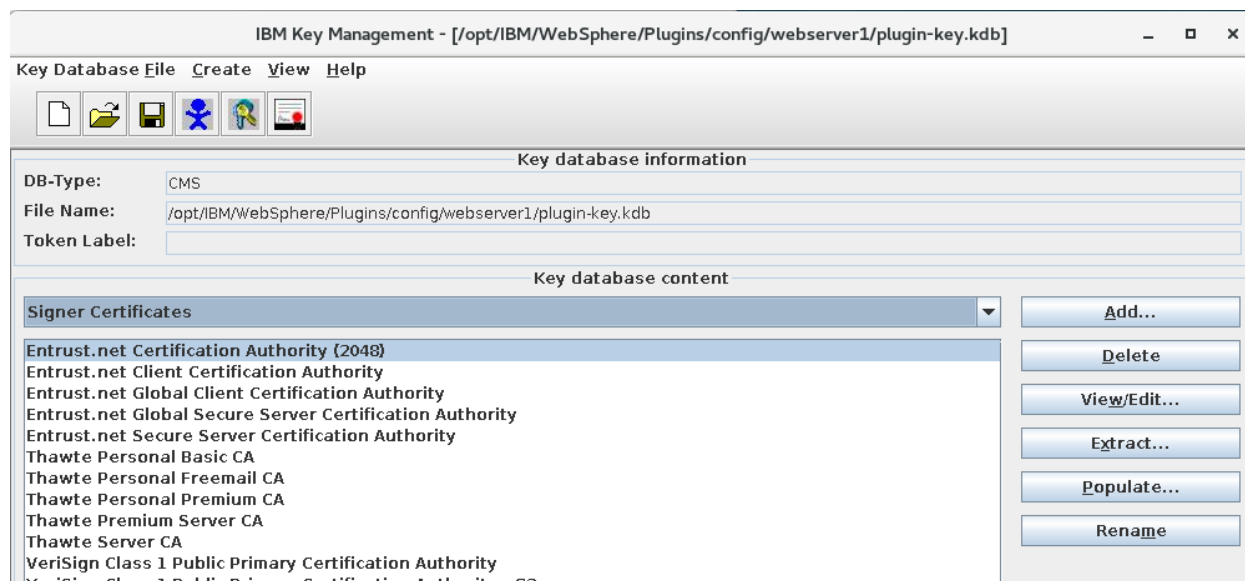
35. Click **Browse...** Navigate to the `<pluginRoot>/Plugins/config/webserver1` directory and select the `plugin-key.kdb` file.



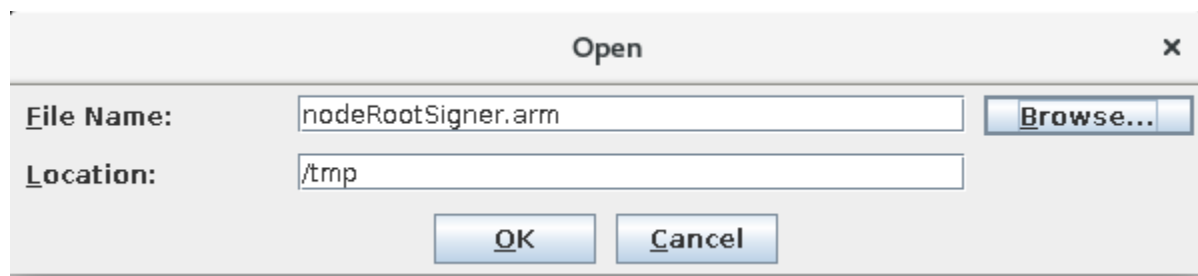
36. Click **OK**. You will be prompted for the password of the `plugin-key.kdb` file. The default password is **WebAS**. Enter the password and click **OK**.



37. Click the drop down box to change from Personal Certificates and select **Signer Certificates**.



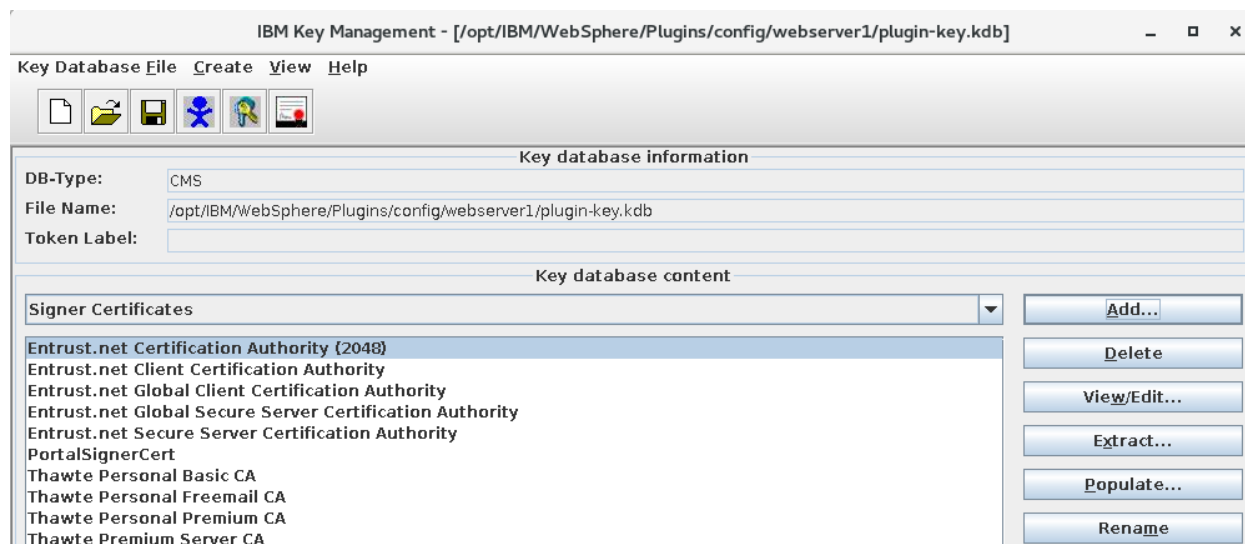
38. Click **Add...** Fill in the File Name and location where you copied the extracted certificate file nodeRootSigner.arm on the webserver. Click **OK**.



39. Enter a value to label the certificate. This guide recommends **PortalSignerCert**. Click **OK**.



40. You will now see your **PortalSignerCert** in the list of Signed Certificates.



41. Close the ikeyman tool. You will be in the `<httpRoot>/bin` directory.

42. Restart the web server by executing the following two commands:

```
./apachectl stop
```

```
./apachectl start
```

```
root@      :/opt/IBM/HTTPServer/bin
File Edit View Search Terminal Help
[root@      bin]# ./apachectl stop
[root@      bin]# ./apachectl start
```

43. Validate you are able to access your webserver over https in a web browser:

<https://mywebserver.hcl.com/>

44. Validate you are able to access your webserver over http in a web browser.

<http://mywebserver.hcl.com/>

Note: The end result in the web browser should be a secure https:// url.

SSL is now successfully enabled on your web server. Any visitors to your Portal site who attempt to access over http will automatically be redirected to a secure https:// link.

Encountering Issues and Receiving Help

If you encounter any failures following the steps in this guide, you may open a case with HCL Portal Support.

In order to best assist you with any issues you encounter, the HCL Portal Support engineer may request that you run the wpcollector tool.

wpcollector is a command line tool that automates the collection of portal logs and configuration files saving valuable time. Using automated log collection early in the case life cycle can greatly reduce the number of doc requests that are made by Support.

For more information on wpcollector and how to use it, see the following documentation:

https://support.hcltech.com/csm?id=kb_article&sysparm_article=KB0012545

For questions, error message explanations, and more, try searching or posting a question on HCL Community Forum. This is an HCL run forum to ask and answer technical questions:

https://hclpnpsupport.service-now.com/community?id=community_home

Questions About This Guide

If you have any questions **specifically regarding the contents of this guide**, the primary editor - Travis Cornwell - can be reached at:

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Acknowledgments

Celine Hall, Forms L2 Support Engineer, for technical content contributions and significant contributions to guide formatting.

Brett Gordon, , HCL Portal L2 Support Engineer, for significant technical review and feedback on initial release of this guide.

Version History

Date	Version	Notes
2018.06.29	1.0	Initial publication
*****	1.1	- Added Section “Getting the Software” - Added Appendixes for Silent Installation and SSL enablement on IBM HTTP Server - Version History Sections - Incorporated technical feedback in multiple chapters to avoid rare pitfalls - Replacing IBM WebSphere Portal to HCL Portal where possible - Replacing IBM links to new HCL links
2020.08.17	1.2	- Added syntax for Windows on step 12 on page 114