

Configuring a highly available WebSphere Process Server environment

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What this exercise is about

In this exercise you will gain experience configuring a complex WebSphere Process Server clustered topology.

Using the *by-function* deployment pattern presented in the lectures, you will define and configure four separate application server clusters, install and configure the Common Event Infrastructure and Business Process Choreographer components along with their respective Service Integration Buses and Messages Engines.

Lab requirements

- WebSphere Process Server V6.0.2 binaries installed on two systems
- DB2[®] UDB 8.2 installed at least on one system

What you should be able to do

At the end of this lab you should be able to:

- Configure a highly available WebSphere Process Server Environment using the by-function deployment pattern.
- Create and configure active/standby Message Engine clusters
- Create and configure Service Component Architecture Service Integration Buses using the Business Integration Configuration Wizard.
- Install and configure the Common Event Infrastructure components manually to meet customized requirements, separating the Message Engine components from the application components.
- Install and configure the Business Process Choreographer components manually to meet customized requirements, separating the application components from the Message Engine components and from the infrastructural components.

Introduction

The following picture shows the logical view of the configuration using the by-function deployment pattern.

AdminCluster: will contain the Common Event Infrastructure (CEI) Server and Common Event Infrastructure MDB applications. It will also contain the Business Rules Manager application. This cluster will not contain any Message Engines

AdminMECluster: will contain the Message Engines needed by the **AdminCluster**. It will not contain any applications.

The AdminCluster and the AdminMECluster together provide the infrastructural functionality for the entire system.

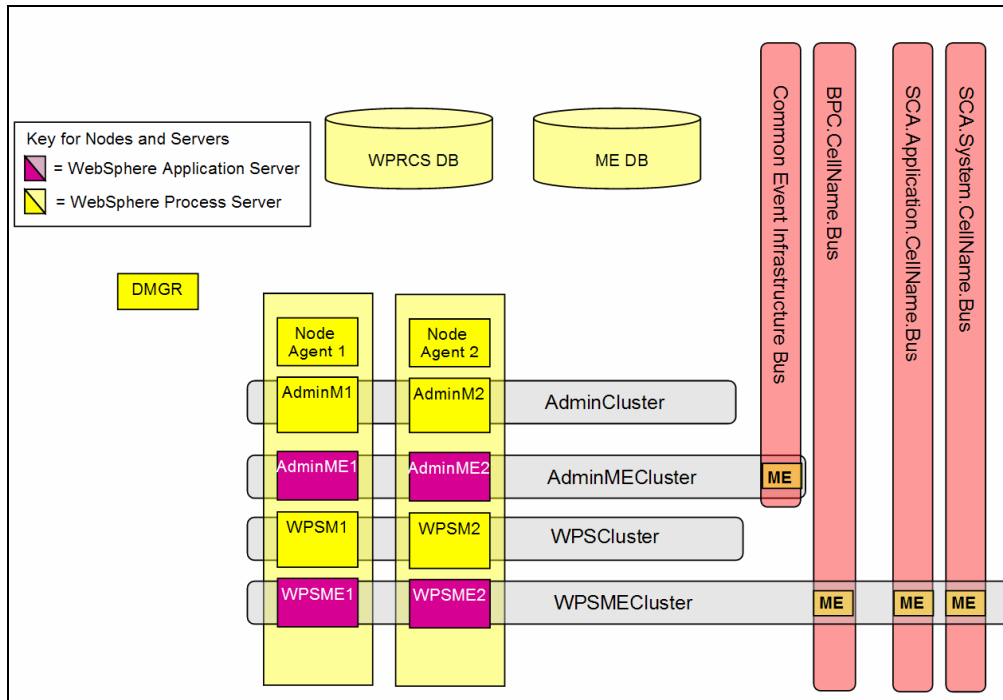
WPSCluster: will contain the Business Process Choreographer (BPC) and Human Task Manager (HTM) containers and will host the business process applications that utilizes these features. It will not contain any Message Engines

WPSMECluster: will contain the Message Engines needed for the **WPSCluster**. It will not contain any applications.

With this deployment pattern the WPSclusters are the clusters that host the WebSphere Process Server applications, that is to say, business processes. For simplicity, only one 'application' cluster with its associated Message Engine cluster will be used at this time. In a real production deployment there can and will most likely be multiple 'application' clusters, with a single 'administrative' cluster to contain and manage the infrastructural components of the WebSphere Process Server Cell.

By separating the Message Engines into a separate cluster, apart from the applications, a *highly available messaging server* dedicated to a specific set of collaborating applications is created. Recall from the

lecture, with the active/standby HA Policy, that there will only be one active Message Engine per cluster running in a server cluster member determined by the WebSphere High Availability and Workload Managers.



Exercise Instructions

Some instructions in this lab may be Windows[®] operating-system specific. If you plan on running the lab on an operating-system other than Windows, you will need to run the appropriate commands, and use appropriate files (.sh vs. .bat) for your operating system. The directory locations are specified in the lab instructions using symbolic references, as follows:

Reference Variable	Windows Location
<WPS_HOME>	C:\WPS
<PROFILE_HOME>	C:\WPS\pf
<LAB_FILES>	C:\Labfiles601\
<TEMP>	C:\temp

Windows users' note: When directory locations are passed as parameters to a Java[™] program such as EJBDeploy or wsadmin, it is necessary to replace the backslashes with forward slashes to follow the Java convention. For example, C:\LabFiles60\ would be replaced by C:/LabFiles60/

Part 1: Creating the required databases

DB2 Databases:

WPRCSDB: A general database for WebSphere Process Server. You will want to have created this database before you create the Deployment Manager profile. When you create the Deployment Manager profile, you will want to point it to this database.

For this lab, you are going to create all the databases and tables on the same machine where you plan to create a deployment manager profile

NOTE: You are also going to put all of your other tables into this database, instead of creating unique ones (that is, you will put the EVENT and BPEDB information in the WPRCS database instead of creating a number of separate databases) It is not a requirement that you put all the Business Process Choreographer and Common Event Infrastructure (CEI) tables in this database, you can put them in their separate databases if necessary.

____ 1. Creating WPRCS database

In your database provider (for example, DB2), create a database named WPRCSDB.

Open a DB2 Command window and use the following command

db2Start (the database manager may already be started)

db2 create database WPRCSDB

BPEDB: This database is used to hold necessary tables for the Business Process Choreographer.

But in this lab, you are not going to create a new BPEDB database to hold the tables. You are going to use the WPRCS database to hold the tables. The scripts for generating the tables are available under **<WPS_HOME>\dbscripts\ProcessChoreographer\DB2** folder

____ 2. Create the BPEL database tables. Remember that for this lab, you are using the WPRCSDB to hold the tables necessary for BPEL and CEI

Browse to **<WPS_HOME>\dbscripts\ProcessChoreographer\DB2** in windows explorer.

Create a backup copy of **createDatabase.ddl** and name it **createDatabase.org.ddl**

Edit the **createDatabase.ddl** file so that the Create Database statement is commented out. Make changes to connect to the existing WPRCSDB as a valid DB2 user. An example is shown below.

```
-- create the database
-- CREATE DATABASE BPEDB USING CODESET UTF-8 TERRITORY en-us;
-- connect to the created database:
-- Use CONNECT TO BPEDB USER xxx when another user should become owner of the schema
CONNECT TO WPRCSDB USER db2admin;
```

Execute the modified **createDatabase.ddl** file to create tables

Use the command

db2 -tf
<WPS_HOME>\dbscripts\ProcessChoreographer\DB2\createDatabase.ddl

You would be prompted for the password for the DB2 user that you specified in the createDatabaseDB2.ddl file. Provide a valid password

- ___ 3. In your database provider (that is, DB2), create a database named MEDB. The tables for your Messaging Engine's data stores will be automatically created later by the WebSphere Process Server runtime.

MEDB: Database is utilized by the Data store for the Messaging Engines

Open a DB2 Command window and use the following command

db2 create database MEDB

EsbLogMedDB: The "EsbLogMedDB" contains the MSGLOG table, which is required by the Logger Mediation Primitive.

In a stand-alone server environment, this database and datasource are automatically configured for you. In a Network Deployment environment, you will have to manually configure this database and datasource. In this lab, you are not going to create a new database to hold the tables. You are going to use the WPRCS database to hold the tables under a different schema. The scripts for generating the tables are available under **<WPS_HOME>\util\EsbLoggerMediation\yourdatabase** folder

- ___ 4. Create a copy of the Table.ddl file in **<WPS_HOME>\util\EsbLoggerMediation\DB2UDB_V82\Table.ddl** and save as orgTable.ddl
- ___ 5. Open command prompt window, type **db2cmd** and press enter. This should open a new command window.
- ___ 6. In DB2cmd window cd to **<WPS_HOME>\util\EsbLoggerMediation\DB2UDB_V82**
- ___ 7. Type the command **db2 -tf Table.ddl** and press enter.
- ___ 8. You would be prompted for the password for the DB2 user, enter the password.

WebSphere Process Server will also need a database and tables for the **Common Event Infrastructure (CEI)**. However, the scripts to create these are not available until you have created a profile. Delay the creation of this database to the section after creating the profiles.

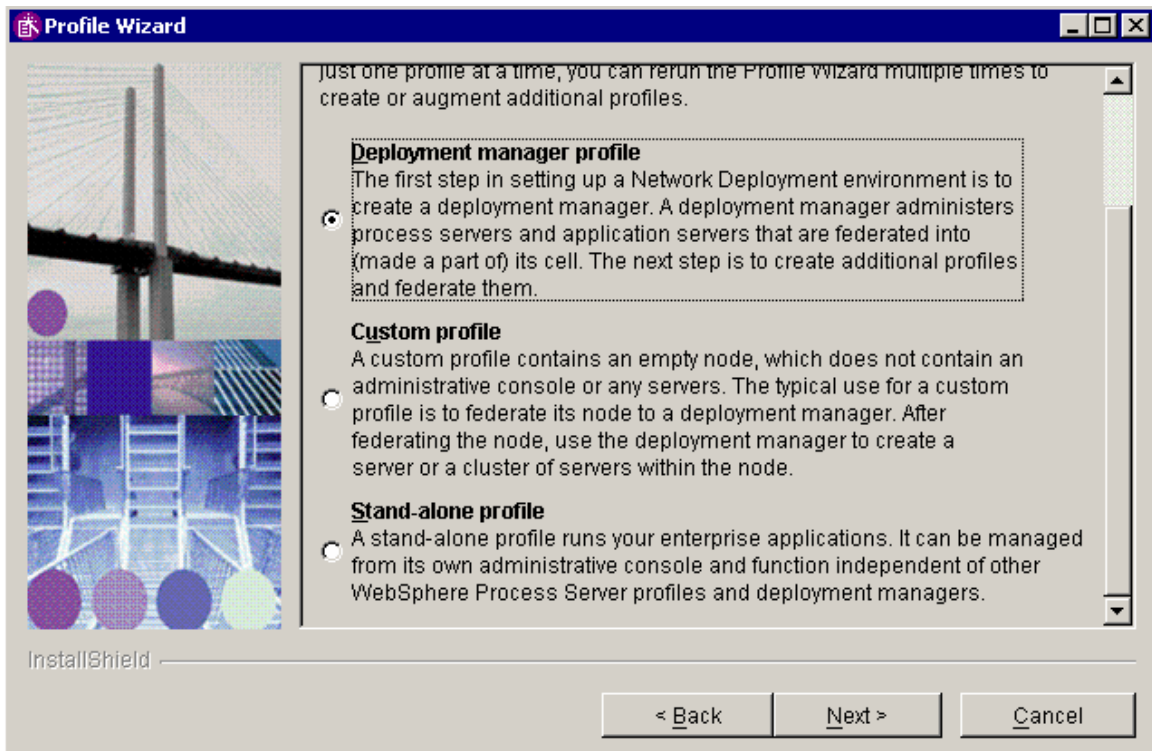
Part 2: Creating the deployment manager profile

The first profile you should be creating is the WPS Deployment Manager profile. **The lab scenario uses two machines. One is considered as a local machine and the other as remote machine. The machine on which you create the deployment manager profile is referred to as local machine throughout the instructions in this lab.**

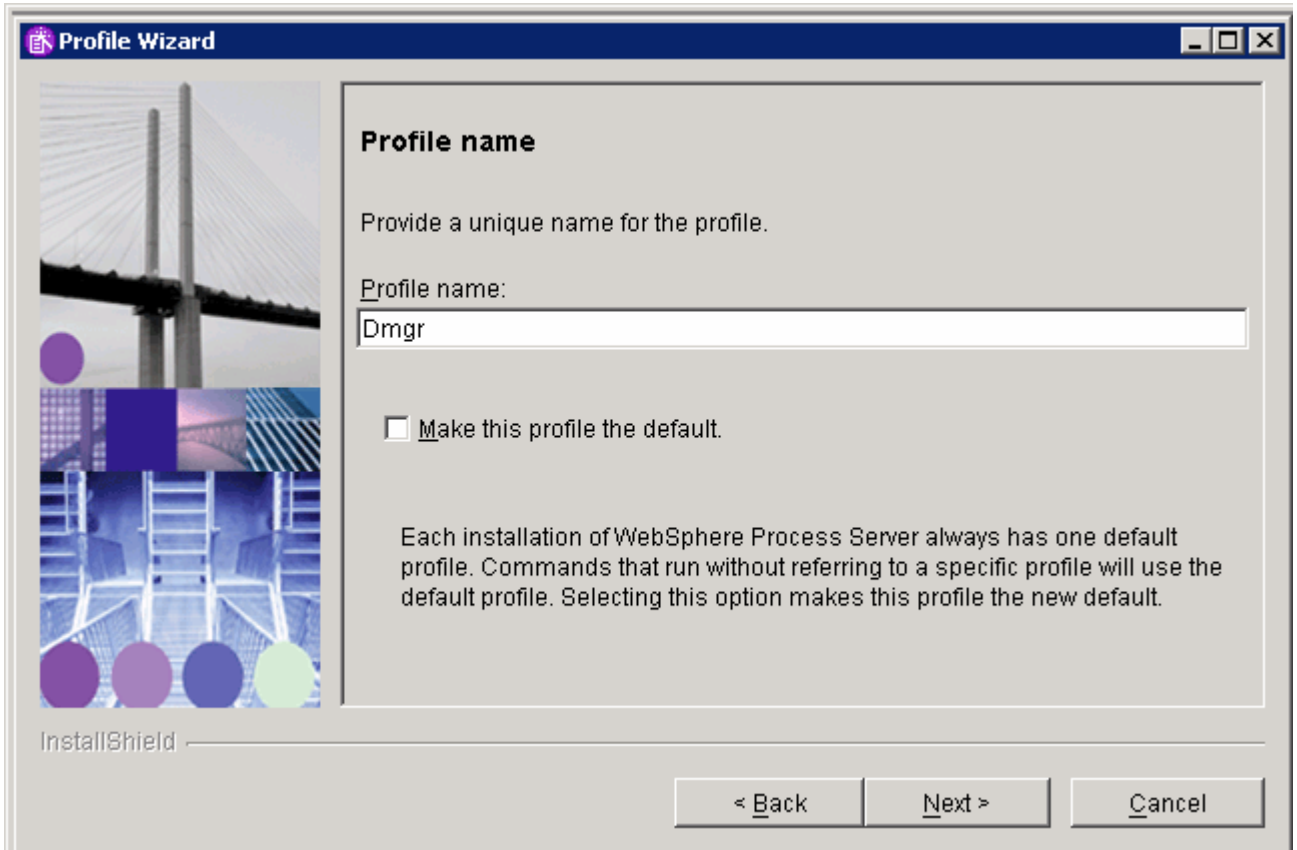
Note: You are going to create the deployment manager profile on the same machine where you created databases (in part1).

Note: The links from the Windows start menu can also be used for launching the Profile Creation Wizard, the Administration Console and for starting and stopping the nodes. Make sure that you use the menu selections for the Process Server 6.0.2; for example, the one that uses the files in the ProfileCreator_wbi folder.

- ___ 1. Launch the profile creation wizard from the directory <WPS_HOME>\bin\ProfileCreator_wbi. Make sure that you select this directory, and not the **ProfileCreator** directory, or you'll be creating the wrong Deployment Manager. You want to create a WebSphere Process Server deployment manager profile, not a WebSphere Application Server deployment manager profile.
 - ___ a. Double-click on the **pcatWindows.exe**.
- ___ 2. Click **Next** in the Profile Wizard Welcome screen.
- ___ 3. Select **Deployment manager profile** in the profile type selection.
 - ___ a. Click Next

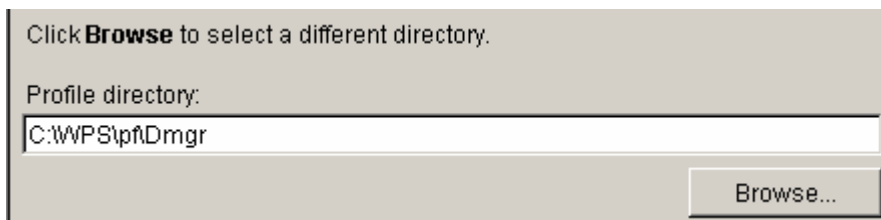


- ___ 4. Name your profile (for example, Dmgr) and click **Next**.



- ___ 5. Select the profile directory .Choose the shortest path possible to avoid the windows 259 character problem later.

Example: C:\WPS\pf\dmgr



- ___ a. Click **Next**.

- ___ 6. **Specify the hostname including the domain extension. Since you are using two machines for the lab scenario, both may not be in the same domain. Also provide node, and cell name keeping them as short as you can.**

Example: Node name: **dNode**

Host name: **wpseduhost.austin.ibm.com**

Cell name: **dCell**

- ___ a. Click **Next**.

Node, host, and cell names

Specify a node name, a host name, and a cell name for this profile. Refer to the installation and migration information for detailed field descriptions and migration considerations.

Node name:
dNode

Host name:
wpseduhost.austin.ibm.com

Cell name:
dCell

- ___ 7. In the next port value assignment screen, note down the **SOAP Connector port** you would need it for federating the custom nodes that you are going to create in the next section.

- ___ a. Click **Next**.

- ___ 8. In the Windows service definition screen:

- ___ a. Uncheck the **Run the WebSphere Process Server process as a Windows service** option.
- ___ b. Select the radio button next to **Log on as local system account**.

Windows service definition

Choose whether to use a Windows service to run the WebSphere Process Server. Windows Services can start and stop the WebSphere Process Server, and configure startup and recovery actions.

Run the WebSphere Process Server process as a Windows service

Log on as a local system account

Log on as a specified user account

- ___ c. Click **Next**.

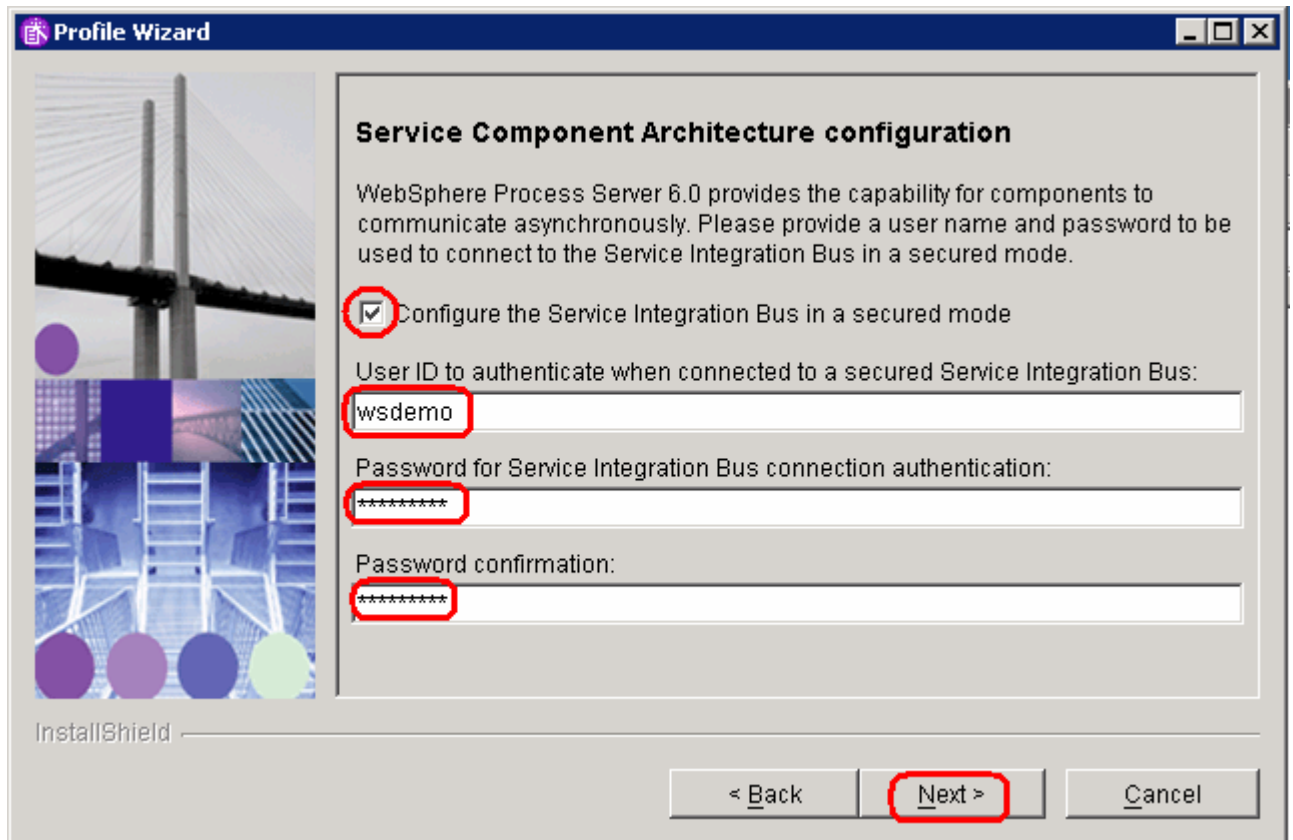
- ___ 9. The subsequent step is **important**. Select the check box next to **Configure the service Integration Bus in a secured mode**.

- ___ a. You will be asked for the user and password that the SCA infrastructure is going to use to connect to the system and application Service Integration Buses.
- ___ b. Provide a valid system user id and password that exists on your system.

Example: username: **wsdemo**

password: *********

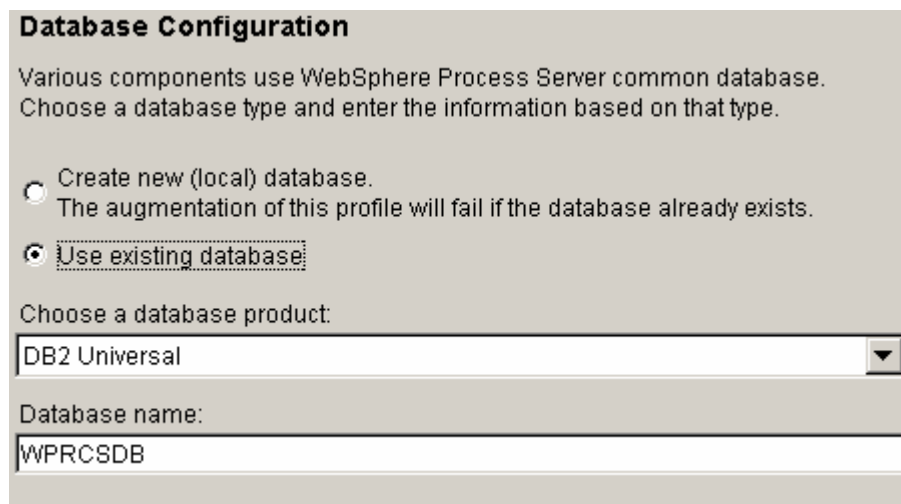
__ c. Click **Next**.



___ 10. For the Database Configuration, you are asked whether you want to create a new database, or use an existing database. You already created a database **WPRCSDB**.

__ a. Select **Use an existing database**.

__ b. Choose **DB2 Universal** for the database product and **WPRCSDB** for the database name.



__ c. Click **Next**.

- ___ 11. In the **Additional Database Configuration Information** screen,
 - ___ a. Enter the DB2 username, password (example: username: db2admin).
 - ___ b. Specify JDBC driver path required for accessing the DB2 database.
 - ___ c. Enter hostname (use fully qualified name including domain) and port.

Additional Database Configuration Information

Due to the database product that you selected, additional information is required.

User ID to authenticate with the database:
db2admin

Password (the password for database authentication):

Password confirmation:

Location (directory) of JDBC driver classpath files:
C:\wps601\universalDriver_wbi\lib

Browse...

Database server host name (for example, IP address):
table218.rchland.ibm.com

Server port:
50000

< Back Next > Cancel

- ___ d. Click **Next**.
- ___ 12. Review the summary and Click **Next**.

Note: Be patient. This might take some time.

- ___ 13. When the profile creation is complete, you would be given an option to launch First Steps window.
 - ___ a. Click **Finish** to launch First Steps.
 - ___ b. Click on **Start the deployment manager** link and wait for the server to start.
 - ___ c. Click on the **Administrative Console** link and wait for the Administrative Console to open.
 - ___ d. Click **Exit** on First Steps window.

- ____ 14. Verify that the J2C Authentication Aliases are in place. These are used in data sources and connection factories.

Navigate to **Security → Global security**.

Under Authentication, expand **JAAS Configuration** and select **J2C Authentication data**.

You should have two authentication aliases:

SCA_Auth_Alias (to be used when connecting to the Message Engines)

WPSDBAlias (for the WPS database)

Part 3: Creating the custom node profiles

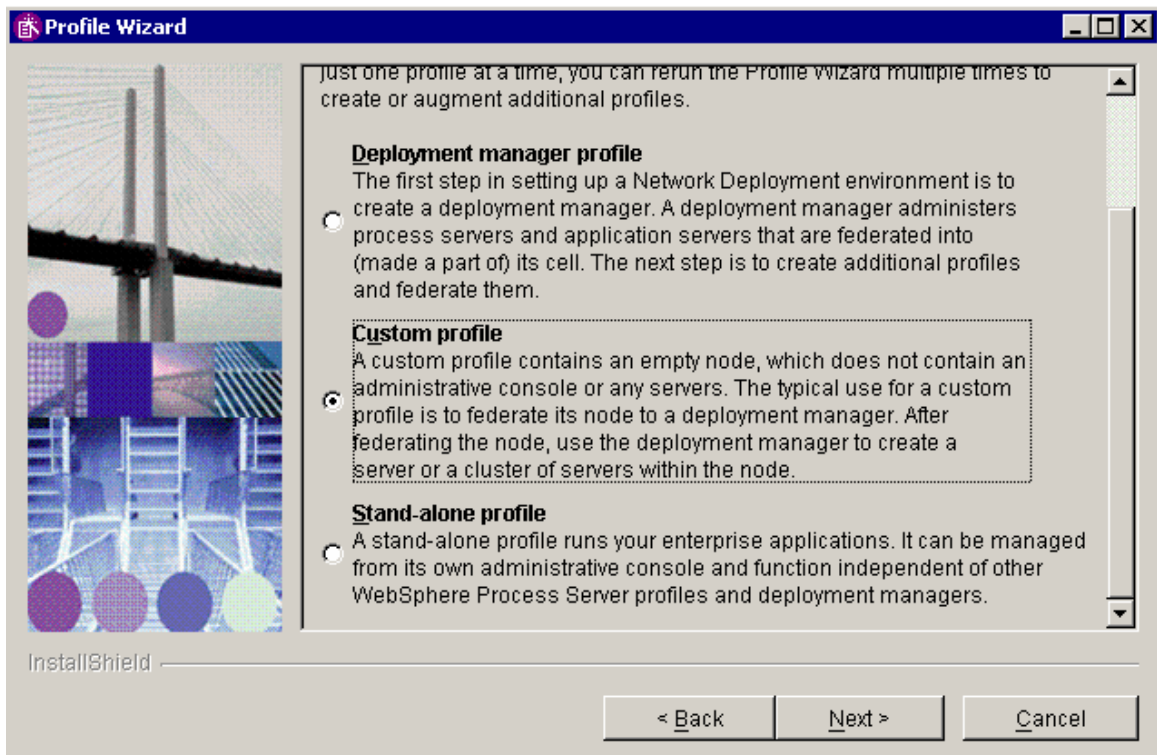
You have a deployment manager profile. You can now create the custom profiles to federate with the deployment manager. You will create one custom node on the same machine where you created the deployment manager. The other custom node is created on the remote machine.

1. Run the WPS profile creation wizard.

On the same machine where deployment manager profile is created, launch the profile creation wizard from the directory `<WPS_HOME>\bin\ProfileCreator_wbi`.

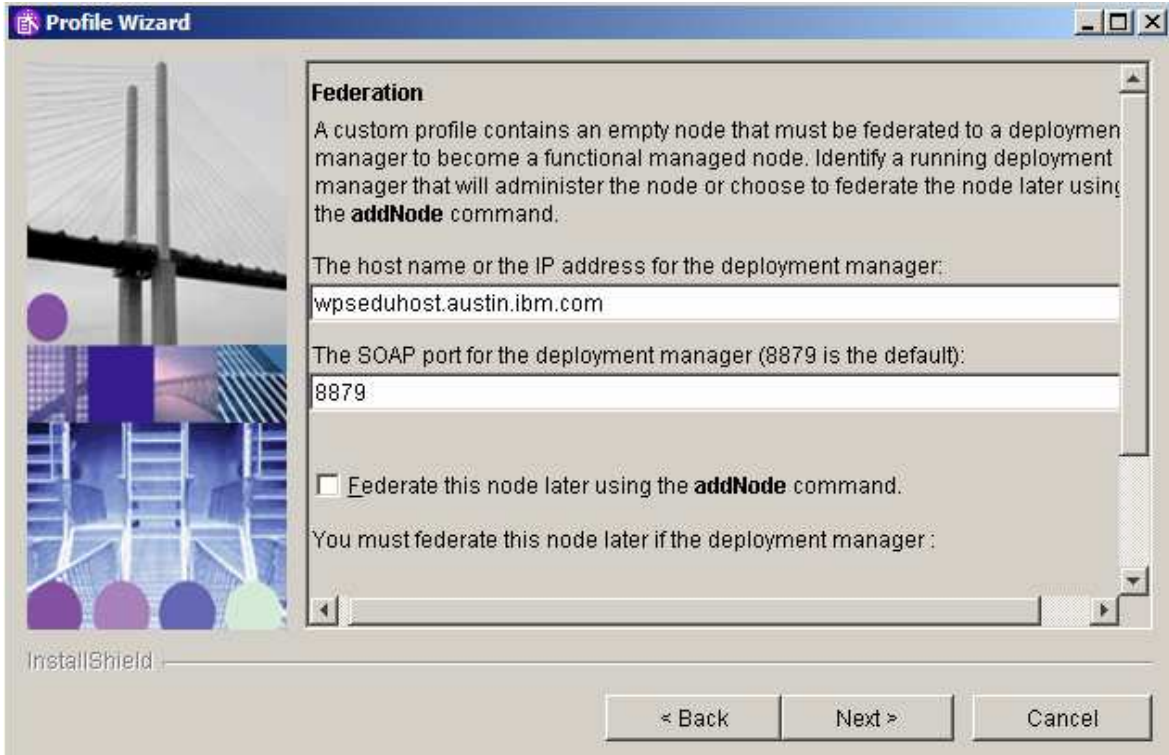
In the Welcome screen click **Next**.

Select **Custom Profile**.



Click **Next**.

In the next screen, specify the deployment manager SOAP port and the hostname (**fully qualified with domain included**) where the deployment manager is created.



Click **Next**.

Provide a name to this profile. Remember to keep it short so as to not run into the windows 259 character limit problem. Select the check box next to **“Make this profile the default”**

Example: CustomN1

Click **Next**.

Choose a directory for profile installation.

Example: C:\WPS\pf\CustomN1.

Note: To keep the path shorter, C:\WPS\pf\CustomN1 is used instead of the normal C:\WPS\profiles\CustomN1 path.

Click **Next**.

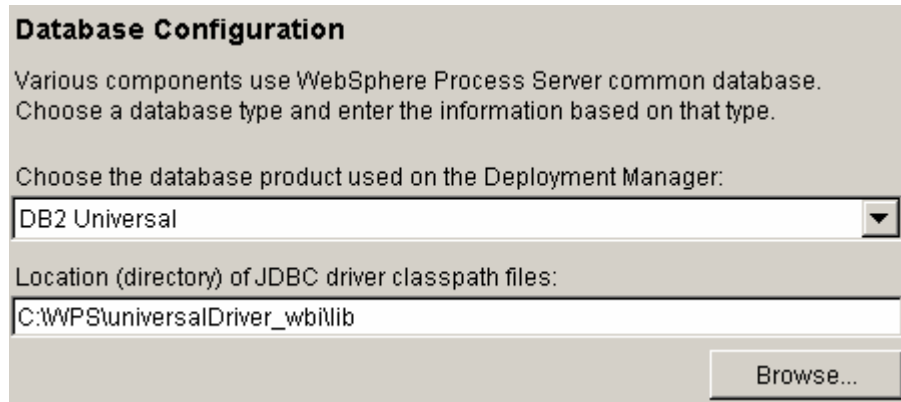
Provide the Node name and Host name.

Example: cNode1 for Node name and fully qualified host name.

Click **Next**.

On “Port Value Assignment” screen accept the defaults and click **Next**.

For the database configuration, select the database type and driver location. For DB2, the driver is shipped with the product and no changes are normally needed.



Click **Next**.

Review the summary and click **Next**.

Note: Be patient. This might take some time.

Deselect the check box to launch first steps and click **Finish**.

Click **Finish** to exit the wizard without further actions.

- ____ 2. You now need to create the second custom profile on the remote machine. Run the WebSphere Process Server profile creation wizard on the remote machine.

Note: You need to change to the second machine (remote) now.

Launch the profile creation wizard from the directory <WPS_HOME>\bin\ProfileCreator_wbi.

On the Welcome screen, click **Next**.

Select Custom Profile and click **Next**.

In the next screen, specify

The deployment manager SOAP port,

The hostname (fully qualified including domain name) where the deployment manager is created,

Click **Next**.

Provide a name to this profile. Remember to keep it short so as to not run into the windows 259 character limit problem.

Example: CustomN2

Click **Next**.

Choose a directory for profile installation.

Example: C:\WPS\pf\CustomN2.

Note: To keep the path shorter, C:\WPS\pf\CustomN2 is used instead of the normal C:\WPS\profiles\CustomN2 path

Click **Next**.

Provide the nodename and hostname. The hostname is the name of the machine where you are creating this profile. Remember to provide the fully qualified hostname including the domain.

Example: cNode2 for nodename

Click **Next**.

On “Port Value Assignment” screen,

Accept the defaults.

Click **Next**.

Click **Next**.

Select the database type and driver location. For DB2, the driver is shipped with the product and no changes are normally needed.

Review the summary and complete the creation of the profile.

Exit the wizard without further actions.

Part 4: Configure data source and WebSphere variables

Configure the datasource for EsbLogMedDB: You have created the tables for the **EsbLogMedDB** database under an **ESBLOG** schema in the **WPRCSDB** instead of creating a new database. Now you will configure a datasource that is at a cell scope to access the tables.

Note: You can use any of the two machines. But, you have to specify correct host name and port number of the Deployment manager.

- ____ 1. Open a browser and enter <http://<hostname>:<port>/admin> where hostname is the name of the machine where deployment manager is created. Port is the **WC_adminhost** port of deployment manager

example: <http://localhost:9062/admin>

- ____ 2. Log into the Administrative Console using any userid

- ____ 3. Create a JDBC Provider

Navigate to, **Resources → JDBC Providers**

Select **cell scope**

Click **New**.

Select **DB2, DB2 Universal JDBC Driver Provider**, and **XA Data source** for steps 1 to 3. Click **Next**.

Provider name: **DB2 Universal JDBC Driver Provider (XA) for Message Logger**

Click **OK** and save and synchronize the changes

- ____ 4. Create a datasource

Navigate to, **Resources → JDBC Providers**

Select **cell scope**

Click on **DB2 Universal JDBC Driver Provider (XA) for Message Logger**

Click **Data sources** under Additional properties.

Click **New**.

Provide the following values.

Name = **ESB Logger Mediation Data Source**

JNDI Name = **jdbc/mediation/messageLog**

Note: the JNDI name of the datasource is currently hard-coded. You **MUST** use **jdbc/mediation/messageLog**

Component-managed authorization alias = **WPSDBAlias**

Database name = **WPRCSDB**

Driver type = **4**

Server name = Provide fully qualified hostname of the machine with DB2 installed.

(This should be the same machine where the WPRCSDB was created.)
Port number = < your db2's port number >

* Scope
cells:dCell

* Name
ESB Logger Mediation Data Source

JNDI name
jdbc/mediation/messageLog

Use this Data Source in container managed persistence (CMP)

Description
DB2 Universal Driver Datasource

Category

Data store helper class name

Select a data store helper class

Data store helper classes provided by WebSphere Application Server

- DB2 Universal data store helper
(com.ibm.websphere.rsadapter.DB2UniversalDataStoreHelper)
- DB2 for iSeries data store helper
(com.ibm.websphere.rsadapter.DB2AS400DataStoreHelper)
- Cloudscape Network Server data store helper
(com.ibm.websphere.rsadapter.CloudscapeNetworkServerDataStoreHelper)

Specify a user-defined data store helper

Enter a package-qualified data store helper class name

Component-managed authentication alias

Component-managed authentication alias

Authentication alias for XA recovery

Use component-managed authentication alias
 Specify:

Container-managed authentication

Container-managed authentication alias (deprecated in V6.0, use resource reference authentication settings instead)

Mapping-configuration alias (deprecated in V6.0, use resource reference authentication settings instead)

DB2 Universal data source properties

* Database name

* Driver type

Server name

Port number

Click **OK** and synchronize changes with the nodes.

You would need to define “**DB2UNIVERSAL_JDBC_DRIVER_PATH** and **UNIVERSAL_JDBC_DRIVER_PATH**” WebSphere variables at cell scope.

This is one of those steps that are likely to be missed. One would expect the WebSphere environment variables to be in place. They are there, but not at the cell scope, which is where they’re need for this configuration.

In the Administration Console navigate to **Environment → WebSphere Variables**.

Select **cell scope**.

Click **New**.

Enter name as

Variable Name: **DB2UNIVERSAL_JDBC_DRIVER_PATH**
 Value: **<WPS_HOME>\universalDriver_wbi\lib**

Note: remember to replace the <WPS_HOME> variable with the actual value where WPS is installed.

Click **OK**.

In the Administration Console navigate to **Environment → WebSphere Variables**.

Select **cell scope**

Click **New**.

Enter name as

Variable Name: **UNIVERSAL_JDBC_DRIVER_PATH**
Value: **<WPS_HOME>\universalDriver\lib**

Note: remember to replace the <WPS_HOME> variable with the actual value where WPS is installed.

Click **OK**.

Save and synchronize changes.

Part 5: Identifying the necessary clusters

Up to this point this exercise has been focused on creating the Deployment Manger Cell and the custom profiles used to define the Nodes within the cell.

The focus will now shift to defining the 4 server clusters.

AdminCluster: will contain the Common Event Infrastructure (CEI) Server and Common Event Infrastructure MDB applications. It will also contain the Business Rules Manager application. This cluster will not contain any Message Engines

AdminMECluster: will contain the Message Engines needed by the **AdminCluster**. It will not contain any applications.

The AdminCluster and the AdminMECluster together provide the infrastructural functionality for the entire system.

WPSCluster: will contain the Business Process Choreographer (BPC) and Human Task Manager (HTM) containers and will host the business process applications that utilizes these features. It will not contain any Message Engines

WPSMECluster: will contain the Message Engines needed for **WPSCluster**. It will not contain any applications.

Part 6: Creating and configuring the AdminMECluster

___ 1. Create the **AdminMECluster** with one cluster member

In the Administration Console navigate to, **Servers → Clusters**.

Click **New**

___ a. Provide Cluster name = **AdminMECluster**.

The screenshot shows a dialog box titled "Create a new cluster" with a progress indicator on the left. The current step is "Step 1: Enter basic cluster information." The main area contains the following fields and options:

- Cluster name:** AdminMECluster
- Prefer local
- Create a replication domain for this cluster

Buttons for "Next" and "Cancel" are visible at the bottom.

___ b. Click **Next**.

___ c. Provide

Member name = **AdminME1**,

Node = **cNode1**,

default application server template = **default**. (the default is a WebSphere Application Server)

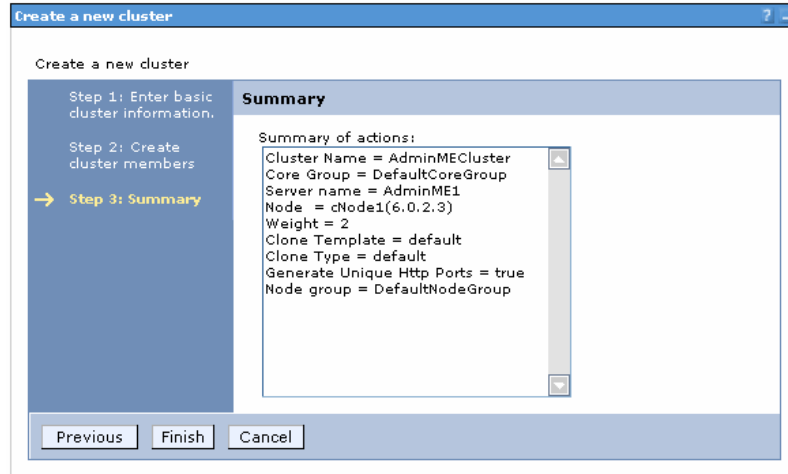
The screenshot shows the "Create a new cluster" dialog box at "Step 2: Create cluster members." The main area contains the following fields and options:

- Member name:** AdminME1
- Select node:** cNode1(6.0.2.3)
- Weight:** 2
- Generate Unique Http Ports
- Select template:** Default application server template. Choose a server template from this list: default

Buttons for "Apply", "Edit", and "Delete" are visible. At the bottom, there are "Previous", "Next", and "Cancel" buttons.

Select	Application servers	Nodes	Version	Weight
<input type="checkbox"/>				

___ d. Click **Apply** and then click **Next**.



___ e. Click **Finish**.

___ f. Save and synchronize the changes.

___ 2. In the Administrative Console, navigate to **Servers → Application Servers**.

___ a. Select the check box next to **AdminME1** and click the **Start** button.

___ b. Wait for the cluster to start before you continue.

___ 3. Create and configure resources for the Messaging Engine:

Create a cluster scoped JDBC provider and datasource that will be used by the datastore for the Message Engines in the **CommonEventInfrastructure_Bus**

Create a new JDBC Provider at the cluster scope

In the Administration Console navigate to, **Resources → JDBC Providers**.

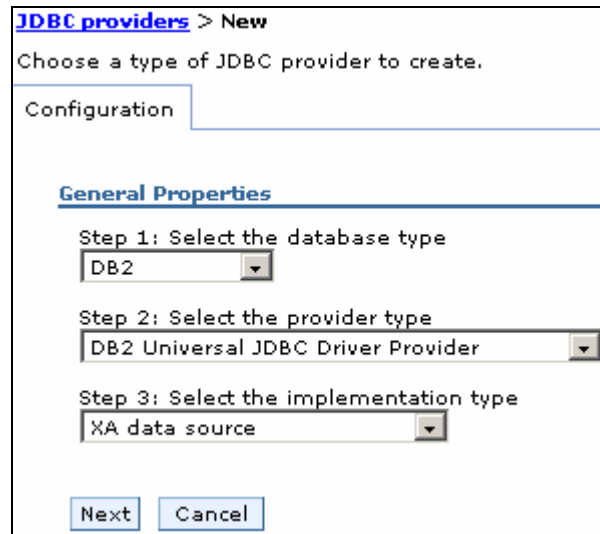
Click on **Browse Clusters** button,

Select the **AdminMECluster**

Click **OK**

Click **New** on the **JDBC Providers** wizard.

1) Select **DB2, DB2 Universal JDBC Driver Provider** and **XA data source** for Steps 1 to 3.



a) Click **Next**.

Provide Name = **DB2 Universal (XA) for CEI ME**

Click **OK**.

Save the configuration.

Create a new Data Source in the **DB2 Universal (XA) for CEI ME** JDBC Provider.

Click on the JDBC provider **DB2 Universal (XA) for CEI ME**

Click on **Data Sources** under the Additional Properties

Click **New**

Provide the following values:

Name = **Datasource for CEI ME**

JNDI = **jdbc/cei_bus/medb/AdminMECluster**

Category = **UDDI**

Component managed authentication alias = **WPSDBAlias**

Mapping configuration alias = **DefaultPrincipalMapping**

Database name = **MEDB**

Driver type = **4**

Server name = Provide fully qualified hostname of the machine with DB2 installed.
This should be the same machine where the MEDB was created

Port Number = Your_db2_port_number (the default is 50000)

Click **OK** and save configuration.

___ 4. Create a Service Integration Bus named **CommonEventInfrastructure_Bus**

___ a. In the Administration Console navigate to, **Service Integration → Buses**

Click **New**

Provide name as **CommonEventInfrastructure_Bus**

Select **Secure** option in Security panel

Select **SCA_Auth_Alias** as **Inter-engine authentication alias**

Click **OK**

Save and synchronize the changes.

___ 5. Add the **AdminMECluster** as a member of the **CommonEventInfrastructure_Bus**

In Administration Console navigate to, **Service Integration → Buses**

Click on the **CommonEventInfrastructure_Bus**

Click on **Bus Members** link under **Topology**

Click **Add** button which should open a wizard

Select the Radio button next to **Cluster** and select **AdminMECluster** from the drop down menu.

Enter **jdbc/cei_bus/medb/AdminMECluster** for Data Source JNDI name.

Select server or cluster

Choose the server or cluster to add to the bus

Server

Server
cNode1:AdminME1

Data store

Default

Data source JNDI name

Cluster

Cluster
AdminMECluster

Data store

* Data source JNDI name
jdbc/cei_bus/medb/AdminME

Click **Next**

Click **Finish** and save the changes

____ 6. Edit the datastore attributes of the Message Engine for the Service Integration Bus member

In the Administration Console navigate to
Service Integration → Buses → CommonEventInfrastructure_Bus

Click on **Bus members** link under **Topology**

Click on the entry **Cluster=AdminMECluster**

Click on **AdminMECluster.000-CommonEventInfrastructure_Bus**

Click on **Data Store** link under Additional Properties

There will be a unique schema in the MEDB for each messaging engine.
Change the default name of the SCHEMA to **AdminMECEIBus**

Select **WPSDBAlias** from the drop down menu for **Authentication alias**

Notice the “create tables” is checked. This will cause the tables, qualified with the schema name, to be created in the MEDB database when the AdminMECluster members are started.

Click **OK** and save changes

This completes the creation and configuration of AdminMECluster. You will need to add more cluster members which is covered in later sections.

Part 7: Creating and configuring the AdminCluster

- ___ 1. Create the **AdminCluster** with one cluster member.
- ___ a. In the Administration Console navigate to, **Servers → Clusters**.
 - ___ b. Click **New**
 - 1) Provide Cluster name = **AdminCluster**.
 - a) Click **Next**.
 - 2) Provide:
 - Member name = **AdminM1**,
 - Node = **cNode1**,
 - default application server template = **defaultProcessServer**.
 - 3) Click **Apply** and then Click **Next**.
 - 4) In the next screen, click **Finish**.
 - 5) Save and synchronize the changes.

- ___ 2. In the Administrative Console, navigate to **Servers → Clusters**
- ___ a. Select the check box next to **AdminCluster** and click the Start button.
 - ___ b. Wait for the cluster to start before you continue.
 - ___ c. Make sure that the cluster member AdminM1 is also started.

In the Administrative Console, navigate to **Servers → Application Servers**

- 1) Select the check box next to **AdminM1** and click the Start button.
- 2) Wait for the cluster to start before you continue.

The AdminCluster will be hosting the Common Event Infrastructure (CEI) application components. To install and configure the Common Event Infrastructure entails the creation of database tables, the installation of the CEI server applications and the CEI Message Driven Bean (MDB) application.

These tasks are not specific to the WebSphere Process Server but because of the custom topology involved, the separation of the application components from the Message Engine components, there are deviations from the default installation instructions, which is why it's covered in detail here.

The remainder of this section will be dealing with the configuration of the Common Event Infrastructure components.

- ___ 3. Create the database tables required for the Common Event Infrastructure.
-

In a test or production environment, a separate database, the EVENTDB, would be created. For this exercise the tables will be created in the global **WPRCSDB** database which already exists.

- ___ a. Generate the scripts using utilities provided by the WebSphere Process Server installation.
 - 1) Navigate to, **<PROFILE_HOME>\ProfileName\event\dbconfig**

Example: C:\WPS\pf\CustomN1\event\dbconfig

2) Edit the database response file (that is, DB2ResponseFile.txt)

Note: Make a backup copy of DB2ResponseFile.txt before editing it.

a) **CLUSTER_NAME=AdminCluster**

b) **SCOPE=cluster**

DB_NAME=WPRCSDB

JDBC_CLASSPATH=<WPS_HOME>\universalDriver_wbiVib

UNIVERSAL_JDBC_CLASSPATH= <WPS_HOME>\universalDriverVib

JDBC_DRIVER_TYPE=4

DB_HOST_NAME=<Provide fully qualified hostname of the machine with DB2 installed. This should be the same machine where the WPRCS was created>

DB_INSTANCE_PORT=<your db2 port value> (default is 50000)

EXECUTE_SCRIPTS=NO

3) Open a DB2cmd window and browse to the **<PROFILE_HOME>\CustomN1\event\dbconfig** directory and run the script using the response file as input:

config_event_database.bat DB2ResponseFile.txt

a) This will cause some scripts to be generated in the following directories:

<PROFILE_HOME>\CustomN1\event\dbscripts

and

<PROFILE_HOME>\CustomN1\event\dsscripts

___ b. Edit the file named "dbConfigureCr.bat" under the **<PROFILE_HOME>\CustomN1\event\dbscripts\db2** directory

1) Find the section of the script that occurs when you run the script on the DB machine. It starts with " :**SERVER_DB**"

2) Edit the file so that the 'create database' parts are commented out:

:SERVER_DB

REM Check for existing database by doing a database test connection

REM echo "Checking for existing database %DB_NAME%"

REM db2 -z "%CURRENT_DIR%\connect.log" "connect to %DB_NAME%"

REM Get return code from db2 command

REM set RC=%ERRORLEVEL%

REM event database does not exist, check SQLSTATE

REM if %RC%==4 goto CHECK_CONN_LOG

```
REM event database exist because successful connection, check SQLSTATE
REM if %RC%==0 goto CHECK_CONN_LOG
REM all other return codes are error
REM goto ERROR

:CHECK_CONN_LOG
REM FINDSTR /I /L "SQLSTATE=42705" "%CURRENT_DIR%\connect.log" > nul
REM set RC=%ERRORLEVEL%
REM DEL /F "%CURRENT_DIR%\connect.log"
REM if not %RC%==0 goto DB_EXIST

REM Create the database
REM echo db2 create database %DB_NAME% using codeset UTF-8 territory US
REM db2 create database %DB_NAME% using codeset UTF-8 territory US
REM set RC=%ERRORLEVEL%
REM if %RC%==0 set DB_CREATED=1
REM if not %RC%==0 goto ERROR
```

___ c. Run the database script

- 1) Open a DB2cmd window and change one of the following directories, depending on the location of the database installation.

<PROFILE_HOME>\CustomN1\event\dbscripts\db2 or **<TEMP>\WPSDB2Scripts**

- 2) Run the script that will create the event tables based on the information in the *dbConfigure.bat* file that was customized in the previous step. This script will call *dbConfigure.bat*.

cr_event_db2.bat *server username*

Example: cr_event_db2.bat *server wsdemo*

___ d. Run datasource script

- 1) Open a command prompt and change the directory to **<PROFILE_HOME>\CustomN1\events\dsscripts\db2** directory and run the script that will create the data source, using the name of the target cluster as a parameter.

cr_db2_jdbc_provider.bat *cluster AdminCluster*

- a) Provide the DB2 user id and password when prompted.

- 2) Next, update the datasource properties to use the **WPSDBAlias**.

- a) In the Administration Console navigate to, **Resources → JDBC Providers**
- b) Select AdminCluster Scope and click on “**Event_DB2_JDBC_Provider**”
- c) Click on **Data Sources**
- d) You should see the following two data sources

Select	Name	JNDI name	Description	Category
<input type="checkbox"/>	event	jdbc/cei	Event server data source	
<input type="checkbox"/>	event_catalog	jdbc/eventcatalog	Event catalog data source	
Total 2				

- e) Click on **event** and change **Component-managed authentication alias** to **WPSDBAlias**.
 - (1) Click **OK**
- f) Click on **event catalog** and change **Container-managed authentication alias** to **WPSDBAlias**.

Make sure that you changed “**Container**-managed authentication alias” and not “**Component**-managed authentication alias”

(1) Click **OK**

- g) Save and synchronize the changes.

4. Next, install the Common Event Infrastructure server application. The following steps will create the resources for the Common Event Infrastructure and deploy the Common Event Infrastructure Server application.

NOTE: You want to create the CEI Resources at the ‘AdminCluster’ scope.

Open a command prompt to the **<PROFILE_HOME>\ProfileName\event\application** directory

Example:

Change directory to **C:\WPS\pf\CustomN1\event\application>** and use the following command

```
..\.bin\wsadmin -f event-application.jacl -profile event-profile.jacl -action install -earfile event-application.ear -backendid DB2UDBNT_V8_1 -cluster AdminCluster
```

After the CEI Server application has been installed, go into the application and make note of the JNDI name of the **EventAccessEJB**. This information will be needed later when using the “CommonBaseEventBrowser” application to browse for events.

Navigate to, Applications → Enterprise Applications → EventServer

- 1) Under **Additional Properties**
 - a) click on **Provide JNDI Names for Beans**

EventAccessEjb should have a value like **ejb/com/ibm/events/access/EventAccess**

Go to the CEI Resources and locate the JNDI name for the EmitterFactoryProfile which points to this CEI configuration.

Navigate to, **Resources → Common Event Infrastructure Provider**

Select **Cell scope**

Under Additional Properties,

click on Emitter Factory Profile

JNDI name should be like:

com/ibm/events/configuration/emitter/AdminCluster

___ 5. Next, install the CEI MDB application. The following steps will describe how to deploy the Common Event Infrastructure MDB application.

___ a. Open a command prompt to the **<PROFILE_HOME>\ProfileName\event\application** directory

Example:

change directories to **C:\WPS\pf\CustomN1\event\application>** and use the following command

..\bin\wsadmin -f default-event-message.jacl -profile event-profile.jacl -earfile event-message.ear -action install -cluster AdminCluster

___ b. You will be prompted for userid and password for embedded messaging authentication. Enter a valid system user id and password

Note: Be patient. This might take some time.

Example: Username: **wsdemo**

Password: *********

___ 6. Re-configure the **CommonEventInfrastructure_Bus** for the active/standby configuration where the Message Engine is in separate (remote) cluster.

By default the Common Event Infrastructure scripts configure the Message Engine to be local to the server or server cluster hosting the Common Event Infrastructure applications. In the *by-function* deployment pattern, the configuration of the Message Engine is in the AdminMECluster, which is remote from the AdminCluster. The next several steps involve reconfiguring the resources for the remote configuration.

Remove **cluster=AdminCluster** from the **CommonEventInfrastructure_Bus**

In the Administration Console navigate to, **Service Integration → Buses** and click on **CommonEventInfrastructure_Bus**.

Click on **Bus Members** under Topology

Check box for **Cluster=AdminCluster** and click **Remove**.

Save the configuration

Create the destinations to use the remote Message Engine.

In the Administration Console navigate to, **Service Integration → Buses** and click on **CommonEventInfrastructure_Bus**

Click on **Destinations** under **Destination resources**

Click **New**

Select Destination type as **Queue** and click **Next**

Type in the Identifier as **CommonEventInfrastructureQueueDestination** and click **Next**

Select **AdminMECluster** as bus member. Click **Next**

Click **Finish**.

Save the configuration.

The JMS resources need to point to the new 'correct' destinations.

Go to **Resources → JMS Providers → Default Messaging**

Select **Cell Scope**

Click on **JMS Queue Connection Factory**

Click on **CommonEventInfrastructure_QueueCF**

Delete the text in the Provider endpoints text area. (defect 318807)

Change the **Component-managed authentication alias** to **SCA_Auth_Alias**

Click **OK** and save

- ___ 7. Re-configure the CEI EmitterFactoryProfile to emit Asynchronous Events
- ___ a. Navigate to **Resources → Common Event Infrastructure Provider**
 - ___ b. Select **Cell Scope**
 - ___ c. Select **Additional Properties → Emitter Factory Profile**
 - ___ d. Go to the **EmitterFactoryProfile** that was created for this CEI Server.
 - ___ e. Click on entry with JNDI name **com/ibm/events/configuration/emitter/AdminCluster**
 - ___ f. De-select **Preferred Synchronization Mode**
 - ___ g. Click **OK** and then Save

This will cause event that are emitted from this EmitterFactoryProfile to be asynchronous

- ___ 8. Install the Business Rules Manager
- ___ a. Navigate to **Servers → Clusters → AdminCluster**
 - ___ b. Under **Additional Properties**, click on **Business Integration Configuration**

Runtime | **Configuration** | Local Topology

General Properties

* Cluster name
AdminCluster

Bounding node group name
DefaultNodeGroup

Prefer local

Enable high availability for persistent services

Apply OK Reset Cancel

Additional Properties

- Cluster members
- Backup cluster
- Common Event Infrastructure Destination
- Business Rules Manager Configuration
- Business Integration Configuration**
- Service Component Architecture
- Business process container
- Human task container
- Endpoint Listeners

- ___ c. Ensure that the radio button under **Select a cluster to configure** is selected and Select **AdminCluster** from the drop down menu
- ___ d. Check the box under **Business Rules Manager**

Select a cluster to configure

AdminCluster

Select a server to configure

[]

Add

Remove

Select	Server/Cluster Name	Node	Setup SCA Destination		Business Rule Manager	Business Processes	Human Tasks
			Local	Remote			
<input type="checkbox"/>	AdminCluster		<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total 1

Next Cancel

- ___ e. Click **Next**
- ___ f. Enter the following in the screen that follows:
 - 1) JDBC Provider: **DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Provider (XA) type 4)**

2) User Name: **wsbeta**

3) User Password: *********

__ g. Click **Next**

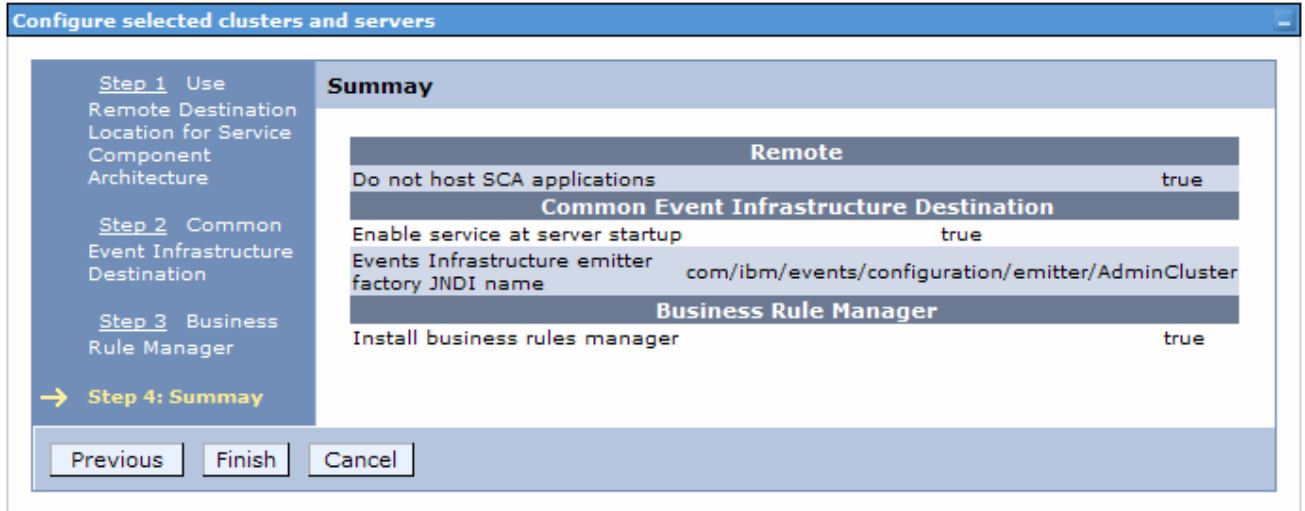
__ h. For the **Step 1: Use Remote Destination Location for Service Component Architecture**, select the radio button next to **Do not host SCA applications** and click **Next**

__ i. For **Step 2: Common Event Infrastructure Destination**, select **com/ibm/events/configuration/emitter/AdminCluster** from the drop down menu

1) Click **Next**

__ j. For **Step 3: Business Rules Manager**, ensure that the box next to **Install business rules manager** is checked and click **Next**

__ k. For **Step 4**, Review the summary and click **Finish**



__ l. After the network deployment configuration is completed, click on **Save to Master Configuration**

The network deployment configuration finished!

To make the network deployment configuration take effect, first save changes to master configuration.

[Save to Master Configuration](#)

__ m. **Save** and synchronize the changes

MANUAL WORKAROUND FOR DEFECT 317434

Make sure you have a 'valid' Emitter Factory Profile:

- ___ 1. In the Administration Console navigate to, **Resources → Common Event Infrastructure Provider**
- ___ 2. Under **Additional Properties** go to **Emitter Factory Profile**
- ___ 3. Find the resource with the default JNDI name = **com/ibm/events/configuration/emitter/Default**
- ___ 4. There is a text box for you to enter a Synchronous Transmission Profile. By default, the value is **com/ibm/events/configuration/bus-transmission/Default**.

Change the JNDI name of this Synchronous Transmission Profile so that it references your 'valid' Synchronous Transmission Profile.

Change the value to **com/ibm/events/configuration/bus-transmission/AdminCluster**

- ___ 5. Click **OK**.
- ___ 6. Save and synchronize
- ___ 7. Restart the Deployment Manager

Open a command prompt and change directory to

<PROFILE_HOME>\deployment manager profile name\bin. Example: C:\WPS\pf\Dmgr\bin

Use the command **stopmanager.bat** to stop the deployment manager

Wait for the server to stop.

To start the deployment manager, use the command **startmanager.bat**.

Wait for the server to start.

This completes the configuration of AdminCluster.

Part 8: Creating and configuring the WPSMECluster

- ___ 1. Create the WPSMECluster with one cluster member
 - ___ a. In the Administration Console navigate to, **Servers → Clusters**.
 - ___ b. Click **New**.
 - 1) Provide
Cluster name = **WPSMECluster**
 - a) Click Next
 - 2) Provide Member name = **WPSME1**,
Node = **cNode1**,
default application server template = **default**. (this will be a WebSphere Application Server)
 - 3) Click **Apply** and then click **Next**.
 - 4) Click **Finish**.
 - ___ c. Save and synchronize the changes
- ___ 2. In the Administrative Console, navigate to **Servers → Clusters**
 - ___ a. Select the check box next to **WPSMECluster** and click the Start button.
 - ___ b. Wait for the cluster to start before you continue.
 - ___ c. Make sure that the member WPSME1 is also started:

In the Administrative Console, navigate to **Servers → Application Servers**
 - 1) Select the check box next to **WPSME1** and click the Start button.
 - 2) Wait for the cluster to start before you continue.
- ___ 3. Configure the **WPSMECluster** to host SCA Applications
 - ___ a. In the Administration Console navigate to, **Servers → Clusters → WPSMECluster**
 - ___ b. Under **Additional Properties**, click on **Business Integration Configuration**
 - ___ c. Ensure that the radio button under **Select a cluster to configure** is selected and select **WPSMECluster** from the drop down menu
 - ___ d. Do **not** check the box under Business Rules Manager
 - ___ e. For the SCA Destination option, select local.

Select a cluster to configure

WPSMECluster

Select a server to configure

[Empty Dropdown]

Add

Remove

Select	Server/Cluster Name	Node	Setup SCA Destination		Business Rule Manager	Business Processes	Human Tasks
			Local	Remote			
<input type="checkbox"/>	WPSMECluster		<input checked="" type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total 1

Next Cancel

__ f. Click **Next**

__ g. Enter the following in the screen that follows:

- 1) JDBC Provider: **DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Provider (XA) type 4)**
- 2) User Name: **wsbeta**
- 3) User Password: *********

JDBC Provider: DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Driver Provider (XA) type 4)

User Name: wsbeta

User Password: *****

Previous Next Cancel

__ h. Click **Next**

__ i. For the **Step 1: Use Remote Destination Location for Service Component Architecture**, select the radio button next to **Configure a destination location**

- 1) For Database setup, ensure that you have the following:
 - a) **DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Driver Provider (XA) type 4)** for **JDBC Provider**
 - b) For the **User name** and **Password** fields, enter your database user id and password
- 2) Under **System Bus**, enter the following:
 - a) Schema name: **SCASysBus**

b) For Database properties, make the following changes:

DatabaseName = **MEDB**

DriverType = **4**

ServerName = <Provide fully qualified hostname of the machine with DB2 installed. This should be the same machine where the MEDB was created> (**example: wpseduhost.austin.ibm.com**)

PortNumber = Enter your DB2 port number (default value is **50000**)

3) Under **Application Bus**, enter the following:

a) Schema name: **SCAAppBus**

b) For Database properties, make the following changes:

DatabaseName = **MEDB**

DriverType = **4**

ServerName = <Provide fully qualified hostname of the machine with DB2 installed. This should be the same machine where the MEDB was created> (**example: wpseduhost.austin.ibm.com**)

PortNumber = Enter your DB2 port number (default value is **50000**)

Step 1: Use Remote Destination Location for Service Component Architecture

WPSMECluster

Step 2 Summary

Use Remote Destination Location for Service Component Architecture

Do not host SCA applications

Use a remote destination location

Configure a destination location

Database Setup

* JDBC provider: DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Driver Provider (XA) type 4)

* Implementation class name: com.ibm.db2.jcc.DB2XADataSource

* User name: wsbeta

* Password:

System Bus

Use existing data source

WPSDB

* Schema name: SCASysBus

Database properties:

```

databaseName=MEDB
driverType=4
serverName=rdyavana.austin.ibm.com
portNumber=50000
description=SIB DataSource for SCA
traceLevel=
traceFile=
fullyMaterializeLobData=true
resultSetHoldability=2
currentPackageSet=
    
```

Application Bus

Use existing data source

WPSDB

* Schema name: SCAAppBus

Database properties:

```

databaseName=MEDB
driverType=4
serverName=|rdyavana.austin.ibm.com|
portNumber=50000
description=SIB DataSource for SCA
traceLevel=
traceFile=
fullyMaterializeLobData=true
resultSetHoldability=2
currentPackageSet=
    
```

Create tables

___ j. For **Step 2**, review the summary and click **Finish**

___ k. After the network deployment configuration is completed, click on **Save to Master Configuration**

___ l. **Save** and synchronize the changes

___ 4. Create the **WBI.FailedEvent.WPSCluster** queue destination for the cluster that will be used to deploy the applications so that it can channel the failed event messages to the Common Event Infrastructure.

In the **SCA.SYSTEM.<CellName>.Bus**, create a queue destination for the **WPSMECluster**

Navigate to **Service Integration → Buses**

Click on **SCA.SYSTEM.dCell.Bus**

dCell is the cell name of the Deployment Manager used in this exercise.

Click on **Destinations** under **Destination resources**

Click **New**

Select the radio button next to **Queue**

Specify the identifier as **WBI.FailedEvent.WPSCluster**

Click **Next**

Select Bus member as **WPSMECluster**. Click **Next**

Click **Finish** and save and synchronize the configuration changes

___ 5. Create the **WBI.FailedEvent.AdminCluster** queue destination

___ a. In the **SCA.SYSTEM.<CellName>.Bus**, create a queue destination for the **WPSMECluster**

Navigate to, **Service Integration → Buses**

Click on **SCA.SYSTEM.dCell.Bus**

dCell is the cell name of the Deployment Manager used in this exercise.

Click on **Destinations** under **Destination resources**

Click on **New**

Select the radio button next to **Queue**

Specify the identifier as **WBI.FailedEvent.AdminCluster**

Click **Next**

Select Bus member as **WPSMECluster**. Click **Next**

Click **Finish** and save and synchronize the configuration changes

___ 6. The next step in the configuration involves creating the SCA and JMS resources for the *Business Process Choreographer* and *Human Task Manager*.

___ 7. Create the Service Integration Bus named **BPC.<CellName>.Bus** (if it does not already exist)

Navigate to, **Service Integration → Buses**

Click on **New**

Enter name as **BPC.dCell.Bus**

Select **Secure** check box

Select the authorization alias for **Inter-engine authentication alias** as **SCA_Auth_Alias**.

Click **OK**

Save and synchronize the changes

Note: if you select a name other than **BPC.yourcellname.Bus** you will run into issues. The Business Process Choreographer and Human Task Manager Installation wizards will create a new bus and new resources if they don't find a bus by that name. There is a defect opened on this.

- ___ a. Create a new JDBC Provider for the **WPSMECluster** for use with the Message Engine. The scope of the JDBC Provider and datasource will be the cluster.

Navigate to, **Resources → JDBC Providers**

Click on **Browse Clusters** button,

Select the **WPSMECluster**

Click **OK**

Click **New** on the JDBC Providers wizard.

Select **DB2**, **DB2 Universal JDBC Driver Provider**, and **XA data source** for Steps 1 to 3

JDBC providers > New
Choose a type of JDBC provider to create.
Configuration

General Properties

Step 1: Select the database type
DB2

Step 2: Select the provider type
DB2 Universal JDBC Driver Provider

Step 3: Select the implementation type
XA data source

Next Cancel

Click **Next**

Provide Name = **DB2 Universal (XA) for BPC MEs** and click **OK**.

Save the configuration.

- ___ b. Create a new data source in **DB2 Universal (XA) for BPC MEs** JDBC Provider to be use with the Message Engines in this cluster.

Click on the JDBC provider **DB2 Universal (XA) for BPC MEs**

Click on **Data Sources** under the Additional properties

Click **New**

Provide the following values

Name = **Datasource for BPC MEs**

JNDI = **jdbc/bpc_bus/medb/WPSMECluster**

category = **UDDI**

Component managed authentication alias = **WPSDBAlias**

Mapping configuration alias = **DefaultPrincipalMapping**

Database name = **MEDB**

Driver type = **4**

Server name = <Provide fully qualified hostname of the machine with DB2 installed. This should be the same machine where the MEDB was created. example: wpseduhost.austin.ibm.com >

Port Number = Your_db2_port_number (50000)

Click **OK** and save configuration.

Add the 'WPSMECluster' server cluster as the member of the BPC bus

Got to **Service Integration → Buses** and click on the **BPC.dCell.Bus**,

Click on **Bus Members** link under **Topology**

Click **Add**

Select the radio button next to **cluster**

Select the **WPSMECluster** from the drop down menu

Specify the datasource JNDI = **jdbc/bpc_bus/medb/WPSMECluster**

Save the changes

- ___ c. Edit the schema name and the authentication alias for the datastore used by the Message Engine for the BPC bus member.

Each Message Engine has a unique set of tables which are uniquely qualified in the database by the schema name. The Message Engine associates a server or server cluster with a specific Service Integration Bus. In order to easily verify that the tables for a given Message Engine have been created, it's helpful to create a schema name that encodes the relationship between the server or server cluster and the Service Integration Bus.

In the Administration Console navigate to,
Service Integration → Buses → BPC.dCell.Bus

Click on **Bus members** link under **Topology**

Click on the entry **Cluster=WPSMECluster**

Click on **WPSMECluster.000-BPC.dCell.Bus**

Click on **Data Store** link under **Additional Properties**

There will be a unique schema in the MEDB for each messaging engine.
Change the default name of the SCHEMA to **WPSMEBPCBus**

Select **WPSDBAlias** from the drop down menu for **Authentication alias**

Click **OK** and save changes

- ___ d. Create Queue Destinations on your **BPC.YourCellName.Bus** (Queue Destinations)

1) BPEApiQueue_WPSCluster

- a) Navigate to, **Service Integration → Buses** and click on **BPC.dCell.Bus**.
- b) Click on **Destinations** link under **Destination Resources**.
- c) Click on **New**.

- d) Select radio button next to **Queue**. Click **Next**
 - e) Enter the Identifier as **BPEApiQueue_WPSCluster**. Click **Next**.
 - f) Select **WPSMECluster** as bus member. Click **Next**
 - g) Click **Finish** and save changes.
- 2) BPEHIdQueue_WPSCluster
- a) Navigate to, **Service Integration → Buses** and click on **BPC.dCell.Bus**.
 - b) Click on **Destinations** link under **Destination Resources**.
 - c) Click on **New**.
 - d) Select radio button next to **Queue**. Click **Next**.
 - e) Enter the Identifier as **BPEHIdQueue_WPSCluster**. Click **Next**.
 - f) Select **WPSMECluster** as bus member. Click **Next**.
 - g) Click **Finish** and save changes.
- 3) BPEIntQueue_WPSCluster
- a) Navigate to, **Service Integration → Buses** and click on **BPC.dCell.Bus**.
 - b) Click on **Destinations** link under **Destination Resources**.
 - c) Click on **New**.
 - d) Select radio button next to **Queue**. Click **Next**.
 - e) Enter the Identifier as **BPEIntQueue_WPSCluster**. Click **Next**.
 - f) Select **WPSMECluster** as bus member. Click **Next**.
 - g) Click **Finish** and save changes.
- 4) BPERetQueue_WPSCluster
- a) Navigate to, **Service Integration → Buses** and click on **BPC.dCell.Bus**
 - b) Click on **Destinations** link under **Destination Resources**
 - c) Click on **New**.
 - d) Select radio button next to **Queue**. Click **Next**.
 - e) Enter the Identifier as **BPERetQueue_WPSCluster**. Click **Next**.
 - f) Select **WPSMECluster** as bus member. Click **Next**.
 - g) Click **Finish** and save changes.
- 5) HTMHIdQueue_WPSCluster
- a) Navigate to, **Service Integration → Buses** and click on **BPC.dCell.Bus**

- b) Click on **Destinations** link under **Destination Resources**.
- c) Click on **New**.
- d) Select radio button next to Queue. Click **Next**.
- e) Enter the Identifier as **HTMHldQueue_WPSCluster**. Click **Next**.
- f) Select **WPSMECluster** as bus member. Click **Next**.
- g) Click **Finish** and save changes.

6) HTMIIntQueue_WPSCluster

- a) Navigate to, **Service Integration → Buses** and click on **BPC.dCell.Bus**.
- b) Click on **Destinations** link under **Destination Resources**.
- c) Click on **New**.
- d) Select radio button next to Queue. Click **Next**.
- e) Enter the Identifier as **HTMIIntQueue_WPSCluster**. Click **Next**.
- f) Select **WPSMECluster** as bus member. Click **Next**.
- g) Click **Finish** and save changes.

<input type="checkbox"/>	BPEApiQueue_WPSCluster	Queue
<input type="checkbox"/>	BPEHldQueue_WPSCluster	Queue
<input type="checkbox"/>	BPEIntQueue_WPSCluster	Queue
<input type="checkbox"/>	BPERetQueue_WPSCluster	Queue
<input type="checkbox"/>	Default.Topic.Space	Topic space
<input type="checkbox"/>	HTMHldQueue_WPSCluster	Queue
<input type="checkbox"/>	HTMIIntQueue_WPSCluster	Queue
<input type="checkbox"/>	_SYSTEM.Exception.Destination.WPSMECluster.000-BPC.dCell,Bus	Queue

Part 9: Creating and configuring the WPSCluster

- ___ 1. Create the **WPSCluster** with one cluster member.
 - ___ a. In the Administrative Console go to **Servers → Clusters**. Click **New**.
 - 1) Provide Cluster name = **WPSCluster**.
 - a) Click **Next**.
 - 2) Provide Member name = **WPSM1**,
Node = **cNode1**,
default application server template = **defaultProcessServer**.
 - 3) Click **Apply** and then click **Next**.
 - 4) Click **Finish**.
 - ___ b. Save and synchronize the changes
- ___ 2. In the Administrative Console, navigate to **Servers → Clusters**
 - ___ a. Select the check box next to **WPSCluster** and click the Start button.
 - ___ b. Wait for the cluster to start before you continue.
 - ___ c. Make sure that the member **WPSM1** is also started.
- ___ 3. Configure the WPSCluster for Service Component Architecture using the **Business Integration Configuration Wizard**.
 - ___ a. Navigate to, **Servers → Clusters → WPSCluster**.
 - ___ b. Under **Additional Properties**, click on **Business Integration Configuration**
 - ___ c. Ensure that the radio button under **Select a cluster to configure** is selected and Select **WPSCluster** from the drop down menu
 - ___ d. Do **not** check the box under **Business Rules Manager**
 - ___ e. Check the boxes under Business Processes and Human Tasks

Select a cluster to configure

WPSCluster

Select a server to configure

[]

Add

Remove

Select	Server/Cluster Name	Node	Setup SCA Destination		Business Rule Manager	Business Processes	Human Tasks
			Local	Remote			
<input type="checkbox"/>	WPSCluster		<input type="radio"/>	<input checked="" type="radio"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Total 1

Next Cancel

__ f. Click **Next**

__ g. Enter the following in the screen that follows:

- 1) JDBC Provider: **DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Provider (XA) type 4)**
- 2) User Name: **wsbeta**
- 3) User Password: *********

JDBC Provider: DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Driver Provider (XA) type 4)

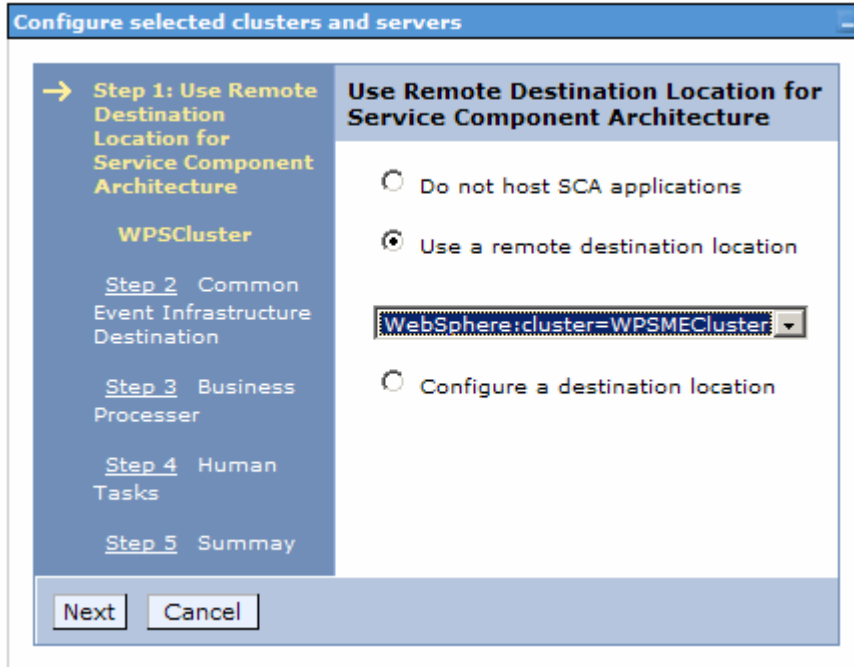
User Name: wsbeta

User Password: *****

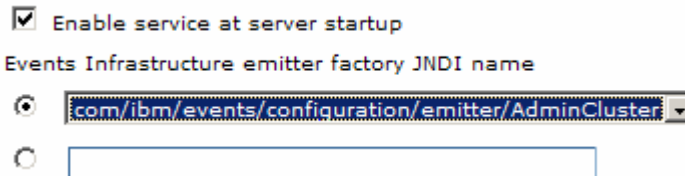
Previous Next Cancel

4) Click **Next**

__ h. For the **Step 1: Use Remote Destination Location for Service Component Architecture**, select the radio button next to **Use a remote destination location**



- ___ i. For **Step 2: Common Event Infrastructure Destination**, select **com/ibm/events/configuration/emitter/AdminCluster** from the drop down menu

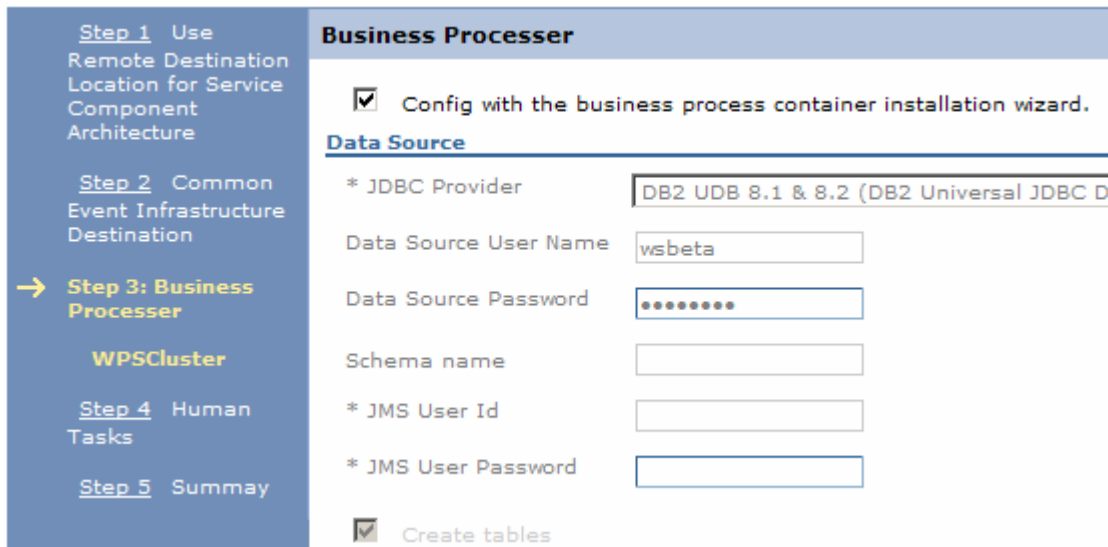


1) Click **Next**

Note: In the following steps, you will defer the Business Process and Human task configuration so that you can use the Business Process Container Installation Wizard and Human Task Container Installation Wizard in the later stages of this lab.

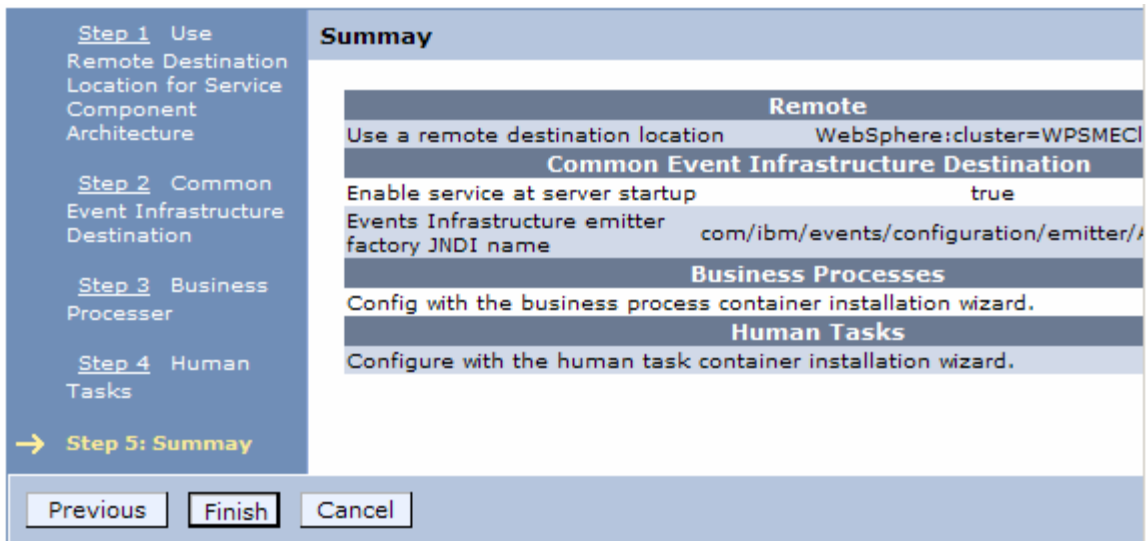
The Business Process Container Installation and Human Task Container Installation wizards provide access to configuration properties that are not available from the Business Integration Configuration wizard.

- ___ j. For **Step 3: Business Processes**, check the box next to “Config with the business process container installation wizard.” and click **Next**



___ k. For **Step 4**: Human Tasks, check the box next to Configure with the business process container installation wizard and click **Next**

___ l. For **Step 5**, review the summary and click **Finish**



___ m. After the network deployment configuration is completed, click on **Save to Master Configuration**

___ n. **Save** and synchronize the changes

___ 4. Next, create the resources used by the Business Process Choreographer and Human Task Manager.

___ a. Create the JMS Resources for Business Process Choreographer and Human Task Manager.

The connection factories, the JMS queues, and the activation specifications must be created and configured to use the destinations configured on the BPC Bus.

1) Navigate to, **Resources → JMS Providers → Default messaging**

- a) Set the scope to the **WPSCluster** level.
- 2) Create the connection factories first.
 - a) Click **JMS Queue Connection Factory**.
 - b) Click **New**.
 - c) Set the name to **BPECF** and the JNDI name to **jms/BPECF**.
 - d) Set the bus name to **BPC.dCell.Bus**
 - e) Set the **Component-managed Auth Alias** to **SCA_Auth_Alias**.
 - f) Click **OK**.
- 3) Repeat the steps for **BPECFC** (jndi: jms/BPECFC) and **HTMCF** (jndi: jms/HTMCF)
- 4) You should now have three Queue Connection Factories:

Select	Name	JNDI name
<input type="checkbox"/>	BPECF	jms/BPECF
<input type="checkbox"/>	BPECFC	jms/BPECFC
<input type="checkbox"/>	HTMCF	jms/HTMCF
Total 3		

- 5) Save the changes.
- ___ b. Now create the JMS queues.
 - 1) Navigate to, **Resources → JMS Providers → Default Messaging (WPSCluster scope)**
 - 2) Click **JMS queue** under Destinations.
 - 3) Click **New**.
 - a) Name: **BPEApiQueue_WPSCluster**
 - b) JNDI Name: **jms/BPEApiQueue**
 - 4) Select the bus **BPC.dCell.Bus** from the pull down list, and then select the corresponding Queue **BPEApiQueue_WPSCluster** from the drop down for Queue name

The screenshot shows a configuration window with two main sections: Administration and Connection. The Administration section includes fields for Scope (cells:dCell:clusters:WPSCluster), Name (BPEApiQueue_WPSCluster), and JNDI name (jms/BPEApiQueue), along with a Description text area. The Connection section includes dropdown menus for Queue name (BPEApiQueue_WPSCluster), Bus name (BPC.dCell.Bus), and Delivery mode (Application).

- 5) Click **OK**.
- 6) Click **JMS queue** under Destinations.
- 7) Click **New**.
 - a) Name: **BPEHIdQueue_WPSCluster**
 - b) JNDI Name: **jms/BPEHIdQueue**
- 8) Select the bus **BPC.dCell.Bus** from the pull down list, and then select the corresponding Queue **BPEHIdQueue_WPSCluster** from the drop down for Queue name
- 9) Click **OK**.
- 10) Click **JMS queue** under Destinations.
- 11) Click **New**.
 - a) Name: **BPEIntQueue_WPSCluster**
 - b) JNDI Name: **jms/BPEIntQueue**
- 12) Select the bus **BPC.dCell.Bus** from the pull down list, and then select the corresponding Queue **BPEIntQueue_WPSCluster** from the drop down for Queue name
- 13) Click **OK**.
- 14) Click **JMS queue** under Destinations.
- 15) Click **New**.





- a) Name: **BPERetQueue_WPSCluster**
- b) JNDI Name: **jms/BPERetQueue**
- 16) Select the bus **BPC.dCell.Bus** from the pull down list, and then select the corresponding Queue **BPERetQueue_WPSCluster** from the drop down for Queue name
- 17) Click **OK**.
- 18) Click **JMS queue** under Destinations.
- 19) Click **New**.
 - a) Name: **HTMHidQueue_WPSCluster**
 - b) JNDI Name: **jms/HTMHidQueue**
- 20) Select the bus **BPC.dCell.Bus** from the pull down list, and then select the corresponding Queue **HTMHidQueue_WPSCluster** from the drop down for Queue name
- 21) Click **OK**.
- 22) Click **JMS queue** under Destinations.
- 23) Click **New**.
 - a) Name: **HTMIntQueue_WPSCluster**
 - b) JNDI Name: **jms/HTMIntQueue**
- 24) Select the bus **BPC.dCell.Bus** from the pull down list, and then select the corresponding Queue **HTMIntQueue_WPSCluster** from the drop down for Queue name
- 25) Click **OK**.
- 26) Save and synchronize the changes
- 27) At the end you should have the following queues configured

Default messaging provider > JMS queue

A JMS queue is used as a destination for point-to-point messaging. Use JMS queue destination administrative objects to manage JMS queues for the default messaging provider.

⊕ Preferences

New Delete

Select	Name	JNDI name	Description
<input type="checkbox"/>	BPEApiQueue WPSCluster	jms/BPEApiQueue	
<input type="checkbox"/>	BPEHIdQueue WPSCluster	jms/BPEHIdQueue	
<input type="checkbox"/>	BPEIntQueue WPSCluster	jms/BPEIntQueue	
<input type="checkbox"/>	BPERetQueue WPSCluster	jms/BPERetQueue	
<input type="checkbox"/>	HTMHIdQueue WPSCluster	jms/HTMHIdQueue	
<input type="checkbox"/>	HTMIntQueue WPSCluster	jms/HTMIntQueue	

Total 6

___ c. Now create the **Activation Specs** that are needed. There are two Activation Specs needed for the flow manager and one for the Human Tasks.

- 1) Navigate again to, **Resources → JMS Providers → Default Messaging** and make sure that the scope is set to the **WPSCluster** level.
- 2) Click **JMS Activation Specification** under Activation Specifications.
- 3) Click **New**
 - a) Name: **BPEApiActivationSpec**
 - b) JNDI Name: **eis/BPEApiActivationSpec**
- 4) Set the Destination Type to Queue and the Destination JNDI Name to **jms/BPEApiQueue**.
Select the bus where you want the Activation Spec created
(it has to be the **BPC.dCell.Bus**)
- 5) Set the Authentication Alias for the Message Engine to **SCA_Auth_Alias**.

___ d. Click **OK**.

___ e. Repeat the steps to create two more activation specs with following values

Name: **BPEInternalActivationSpec**

JNDI Name: **eis/BPEInternalActivationSpec**

Destination Type: **Queue**

Destination JNDI Name: **jms/BPEIntQueue**

Bus Name: **BPC.dCell.Bus**

Authentication alias: **SCA_Auth_Alias**

Name: **HTMInternalActivationSpec**

JNDI Name: **eis/HTMInternalActivationSpec**

Destination Type: **Queue**

Destination JNDI Name: **jms/HTMIntQueue**

Bus Name: **BPC.dCell.Bus**

Authentication alias: **SCA_Auth_Alias**

___ f. Save your configuration.

Select	Name	JNDI name
<input type="checkbox"/>	BPEApiActivationSpec	eis/BPEApiActivationSpec
<input type="checkbox"/>	BPEInternalActivationSpec	eis/BPEInternalActivationSpec
<input type="checkbox"/>	HTMInternalActivationSpec	eis/HTMInternalActivationSpec
Total 3		

___ 5. Install the Business Process Container to the WPSCluster

___ a. Navigate to, **Servers → Clusters → WPSCluster**

___ b. Under Additional Properties, click on **Business Process Container**

___ c. Click on **Business process container installation wizard**

___ d. For **Step 1**, enter the following:

- 1) For JDBC Providers, select **DB2 UDB 8.1 & 8.2 (DB2 Universal JDBC Driver Provider (XA) type 4)**
- 2) Enter the Data Source user name and password.
- 3) Under Custom properties, enter the following:
 - a) change database name from BPEDB to **WPRCSDB**
 - b) Ensure that the driver type is **4**

- c) Specify your fully qualified hostname including domain of machine that has the DB2 database server where the WPRCSDB is created .Also provide the port for DB2 server

→ **Step 1 : Select the database configuration that this business process container will use**

Select the desired JDBC provider. A new XA datasource will be created for this provider. ?

* JDBC providers

Implementation class name ? The Java class name of the JDBC driver implementation.

Classpath ? A list of paths or JAR file names which together form the location for the resource provider classes. Class path entries are separated by using the ENTER key and must not contain path separator characters (such as ';' or ':'). Class paths may contain variable (symbolic) names that can be substituted using a variable map. Check your driver installation notes for specific JAR file names that are required.

Data source user name ? The user name used to access the data source

Data source password ? The password used to access the data source

Custom Properties ? Consult the help documentation for more information about properties that might be required by the JDBC provider.

4) Click **Next**

___ e. On **Step 2** on the subsequent page,

- 1) Under JMS Configuration, specify a valid system user/password for JMS user ID and password. (example: wsbeta/wsbeta's password)
- 2) Under Business process container security configuration, specify a valid system user/password for JMS API User ID and password (example: wsbeta/wsbeta's password)

3) Specify a valid WebSphere group or user for the Administrator role and for the System Monitor role.

→ **Step 2 : Configure the JMS configuration, SCA Bindings and Security settings**

Select the JMS configuration. ?

JMS configuration

* JMS user ID ? The queue connection factory uses this user ID to establish a connection to the queue.

* JMS password ? The password for the user ID entered above

SCA Bindings configuration

* Webservice Endpoint ? Specifies the Webservice endpoint for the Webservice API entered previously.

Business process container security configuration

* JMS API User ID ? The user ID that the business process container uses when processing asynchronous API calls.

* JMS API password ? The password for the user ID entered above

* Administrator security role mapping ? The group from the domain's user registry that is associated with the business process administrator role.

* System monitor security role mapping ? The group from the domain's user registry that is associated with the business process system monitor role.

Previous **Next** Reset Cancel

4) Click **Next**

___ f. On **Step 3**, check the checkboxes that relate to installing the BPC web client and enabling the Common event Infrastructure logging

→ **Step 3 : Configure the Business Process Choreographer Explorer, Business Process Choreographer Observer**

Choose whether to install the Business Process Choreographer Explorer and the Business Process Choreographer Observer. In addition, enable state observer logging. ?

Business Process Choreographer Explorer.

Select this check box to install the Business Process Choreographer Explorer (Web client). ?

Context Root

State observer logging

Enable audit logging for all processes running in this container. ?

Enable Common Event Infrastructure logging for all processes running in this container. ?

Business Process Choreographer Observer.

Select this check box to install the Business Process Choreographer Observer and the Business Process Choreographer Explorer.

* JMS User ID ? The User ID used to connect to the CEI Bus.

* JMS password ? A valid password for the JMS User ID above.

___ g. Click **Next**.

___ h. On **Step 4**, review the choices and click **Finish**

- ___ i. After the application is successfully installed, save your configuration
- ___ 6. Install the Human Task Container to the cluster
 - ___ a. Navigate to, **Servers→ Clusters → WPSCluster**
 - ___ b. Under Additional Properties, click on **Human Task Container**
 - ___ c. Click on **Human Task container installation wizard**
 - 1) On **Step 1**, specify a valid system userid and password for JMS user ID and password, and the Escalation user ID and password. (example: wsbeta/wsbeta's password)
 - 2) Specify a valid WebSphere group or user for the Administrator role and for the System Monitor role

→ **Step 1 : Configure the JMS configuration, SCA Bindings and Security settings**

Select the JMS configuration. ?

JMS configuration

* JMS user ID ? The queue connection factory uses this user ID to establish a connection to the queue.

* JMS password ? The password for the user ID entered above

SCA Bindings configuration

* Webservice Endpoint ? Specifies the Webservice endpoint for the Webservice API entered previously.
/sca/com/ibm/task/api/sca/HTMWS

Human Task Manager security configuration

* Escalation user ID ? The user ID that the Human Task Manager will use when processing escalations.

* Escalation password ? The password for the user ID entered above

* Administrator security role mapping ? The group from the domain's user registry that is associated with the human task administrator role.

* System monitor security role mapping ? The group from the domain's user registry that is associated with the human task system monitor role.

a) Click **Next**.

3) On **Step 2**,

a) Select checkbox for **Enable Common Event Infrastructure logging**

→ **Step 2 : Select the Mail Session and Logging**

Select the mail session and state observer logging. ?

Mail session resource

Mail session for Human Task Manager ?

State observer logging

Enable Common Event Infrastructure logging ?

Enable audit logging for all human tasks ?

Previous Next Reset Cancel

b) Click **Next**

4) In **Step 3**, review the choices and click **Finish**.

5) Once the application is installed successfully, save and synchronize the configuration.

Part 10: Adding additional members to the AdminCluster and the AdminMECluster

Adding Members to AdminMECluster

- ___ 1. Create additional cluster members for the AdminMECluster
 - ___ a. Go to **Servers → Clusters → AdminMECluster**
 - ___ b. Click on **Cluster Members** under **Additional Properties**
 - ___ c. Click **New**
 - ___ d. Provide the following values
 - 1) Member Name = **AdminME2**
 - 2) Node = **cNode2**
 - 3) Click **Apply**
 - ___ e. Click **Next**
 - ___ f. Click **Finish**.
 - ___ g. Save and synchronize the changes
- ___ 2. Start the AdminME2 server
 - ___ a. In the Administrative Console, navigate to **Servers → Application Servers**
 - ___ b. Select check box next to **AdminME2**
 - ___ c. Click **Start**.
 - ___ d. Wait for the server to start

Adding Members to AdminCluster

- ___ 1. Create additional cluster members for the AdminCluster
 - ___ a. Go to **Servers → Clusters → AdminCluster**
 - ___ b. Click on **Cluster Members** under **Additional Properties**
 - ___ c. Click **New**
 - ___ d. Provide the following values
 - 1) Member Name = **AdminM2**
 - 2) Node = **cNode2**
 - 3) Click **Apply**
 - ___ e. Click **Next**
 - ___ f. Click **Finish**.

- ___ 2. Remember to add the **WC_defaulthost** port of each of the members of the AdminCluster to the list of host aliases on the virtual host for default_host
- ___ a. In Administration Console navigate to, **Environment → Virtual hosts**
 - ___ b. Click on **default_host**
 - ___ c. Under Additional Properties, click on **Host Aliases**
 - ___ d. Click **New**
 - ___ e. Provide a fully qualified hostname including domain on which the AdminM1 is created
 - ___ f. In the port text box, enter your **WC_defaulthost** port value for server **AdminM1**

Note: To get the **WC_defaulthost** port value, go to **Servers → Application Servers** and click on the server you want the port information. In the next screen, click on the **+** sign next to **Ports**. This will list all the ports used by the server. Note down the **WC_defaulthost** port from the screen. Remember that each server has different ports. So if you want to get port information for a different server, you would need to go to **Servers → Application Servers** and click on the server you want the port information. In the next screen, click on the **+** sign next to ports

Container Settings

- Web Container Settings
- EJB Container Settings
- Container Services
- Business Process Services

Server messaging

- Messaging engines
- Messaging engine inbound transports
- WebSphere MQ link inbound transports
- SIB service

Server Infrastructure

- Java and Process Management
- Administration

Communications

- Ports

Port Name	Port	details
BOOTSTRAP_ADDRESS	9811	
SOAP_CONNECTOR_ADDRESS	8881	
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	9404	
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	9405	
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	9406	
WC_adminhost	9061	
WC_defaulthost	9081	
DCS_UNICAST_ADDRESS	9354	
WC_adminhost_secure	9044	
WC_defaulthost_secure	9444	
SIB_ENDPOINT_ADDRESS	7276	
SIB_ENDPOINT_SECURE_ADDRESS	7286	
SIB_MQ_ENDPOINT_ADDRESS	5558	
SIB_MQ_ENDPOINT_SECURE_ADDRESS	5578	
ORB_LISTENER_ADDRESS	0	

- ___ g. Click **OK**. Save and synchronize the changes.
- ___ 3. You need to add the **WC_defaulthost** port of AdminM2 to the list of host aliases on the virtual host for default_host

- ___ a. In Administration Console navigate to, **Environment → Virtual hosts**
 - ___ b. Click on **default_host**
 - ___ c. Under Additional Properties, click on **Host Aliases**
 - ___ d. Click **New**
 - ___ e. Provide a fully qualified hostname including domain on which the AdminM2 is created
 - ___ f. In the port text box, enter your **WC_defaulthost** port value for server **AdminM2**
 - ___ g. Click **OK**. Save and synchronize the changes
- ___ 4. You need to restart the servers for the changes to take effect.
- ___ a. Log in to Administrative Console
 - ___ b. Navigate to **Servers → Application Servers**
 - ___ c. Select the check box next to **AdminM1**
 - ___ d. Click **Stop**. Wait for the server to stop
 - ___ e. After the AdminM1 is stopped, select the check boxes next to **AdminM1** and **AdminM2**
 - ___ f. Click **Start** button.
 - ___ g. Wait for the servers to start.

Part 11: Adding additional members to the WPSCluster and the WPSMECluster

Adding Members to WPSMECluster

- ___ 1. Create additional cluster members for the WPSMECluster
 - ___ a. Navigate to, **Servers → Clusters → WPSMECluster**
 - ___ b. Under Additional Properties, click on **Cluster Members**
 - ___ c. Click **New**
 - ___ d. Provide the following values
Member Name = **WPSME2**
Node = **cNode2**
 - ___ e. Click **Apply** and then **Next**
 - ___ f. Click **Finish**.
 - ___ g. Save and synchronize the configuration changes
- ___ 2. Start the WPSME2 server
 - ___ a. In the Administrative Console, navigate to **Servers → Application Servers**
 - ___ b. Select check box next to **WPSME2**
 - ___ c. Click **Start**.
 - ___ d. Wait for the server to start

Adding Members to WPSCluster

- ___ 1. Create additional cluster members for the WPSCluster
 - ___ a. Navigate to, **Servers → Clusters → WPSCluster**
 - ___ b. Under Additional Properties, click on **Cluster Members**
 - ___ c. Click **New**
 - ___ d. Provide the following values
Member Name = **WPSM2**
Node = **cNode2**
 - ___ e. Click **Apply** and then **Next**
 - ___ f. Click **Finish**.
- ___ 2. Add the **WC_defaulthost** port of each of the members of the WPSCluster to the list of host aliases on the virtual host for default_host
 - ___ a. In Administration Console navigate to, **Environment → Virtual hosts**

- ___ b. Click on **default_host**
 - ___ c. Under Additional Properties, click on **Host Aliases**
 - ___ d. Click **New**
 - ___ e. Provide a fully qualified host name of the machine including domain on which the **WPSM1** is created.
 - ___ f. In the port text box, enter your **WC_defaulthost** port value for server **WPSM1**
 - ___ g. Click **OK**. Save and synchronize the changes.
- ___ 3. Add the **WC_defaulthost** port of **WPSM2** the list of host aliases on the virtual host for default_host
- ___ a. In Administration Console navigate to, **Environment → Virtual hosts**
 - ___ b. Click on **default_host**
 - ___ c. Under Additional Properties, click on **Host Aliases**
 - ___ d. Click **New**
 - ___ e. Provide a fully qualified host name of the machine including domain on which the **WPSM2** is created.
 - ___ f. In the port text box, enter your **WC_defaulthost** port value for server **WPSM2**
 - ___ g. Click **OK**. Save and synchronize the changes
- ___ 4. You need to restart the servers for the changes to take effect.
- ___ a. Log in to Administrative Console
 - ___ b. Navigate to **Servers → Application Servers**
 - ___ c. Select the check box next to **WPSM1**
 - ___ d. Click Stop. Wait for the server to stop
 - ___ e. After the **WPSM1** is stopped, select the check boxes next to **WPSM1** and **WPSM2**
 - ___ f. Click **Start** button.
 - ___ g. Wait for the servers to start.
- ___ 5. Restart the Deployment Manager
- ___ a. From the command window go to **<PROFILE_HOME>\deploymentmanagerprofilename\bin**
Example: C:\WPS\pf\Dmgr\bin
 - ___ b. Use the command **stopmanager.bat** to stop the server. Wait for the stop to complete
 - ___ c. Use the command **startmanager.bat** to start the Deployment Manager

What you did in this exercise

In this exercise you created 4 application server clusters based on the *by-function* deployment pattern, which optimizes the Message Engine cluster for high availability using an active/standby (1 of N) HA Policy. This is the default policy when adding a server cluster as a member of a Service Integration Bus.

This entails:

1. Creating the Deployment Manager Cell with 2 Nodes one node on each machine, using the WBI Profile Creation Wizard.
2. Creating and configuring server clusters
 - a. Creating Service Integration Buses for the Business Process Choreographer and the Common Event Infrastructure
 - b. Using the Business Integration Configuration Wizard to configure the Service Component Architecture specific components
 - c. Configuring remote and local Message Engines
 - d. Installing and configuring application specific components for a non-default configuration.
 - i. Common Event Infrastructure
 - ii. Business Process Choreographer

When separating the application components from the Message Engine components there are additional tasks involved in setting up the JMS resources to utilize the remote Message Engine in the message engine server cluster. This becomes evident when manually configuring the Business Process Choreographer and Human Task Manager.

When separating the Common Event Infrastructure service into an administrative cluster there are additional tasks that must be done to configure the destinations for the Failed Event Manger which the applications, in the application clusters will need to use.

Setting up a clustered WebSphere Process Server environment differs from a regular WebSphere Application Server Network Deployment V6 environment in that WebSphere Process Server requires the use of the Business Process Choreographer and Human Task Manager, which in turn require messaging. It's also important to note that asynchronous Service Component Architecture invocations also require messaging.

For this reason it's imperative to have a thorough understanding of the ramifications of clustering the Message Engine, which essentially means keeping the Message Engine cluster separate from the application cluster.