

# WebLogic Multitenancy Workshop

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## **INTRODUCTION:**

Multitenancy in WebLogic Server provides a sharable infrastructure for use by client organizations (tenants). By allowing one domain to support multiple tenants, WLS MT improves density and achieves a more efficient use of resources while eliminating the trade-offs that are traditionally made in a shared environment: Isolation issues. Multitenancy essentially creates the tension between isolation and sharing. Isolation separates both the administration and runtime of different tenants from each other, where resource sharing among tenants improves efficiency and reduces operation costs.

## **Domain Partition:**

WebLogic Server MT provides resource isolation with in domain partitions, an administrative and runtime slice of a WebLogic domain that is dedicated to running application instances and related resources for a tenant. Domain Partition achieve greater density by allowing application instances and related resources to share the domain, WebLogic Server itself, the Java virtual machine, and the operating system while isolating tenant specific application data, configuration, and runtime traffic. Each domain partition has its own runtime copy of the application and resources.

## **Resource Groups:**

WLS MT introduces resource groups, simply as a convenient way to group together Java EE applications and the resources they use into a distinct administrative unit within the domain. The resources and applications are “fully qualified” in that administrator provides all information needed to start or connect to those resources, including credentials for connecting to data source and targeting information for Java EE application. A resource group will either contain these deployable resources directly or refer to a resource group templates which contain the resources. Resource group can be defined at the domain level, or be specific to domain partition.

All the resources in or referenced by a resource group are targeted together (to the same target). Resource group can be started and stopped.

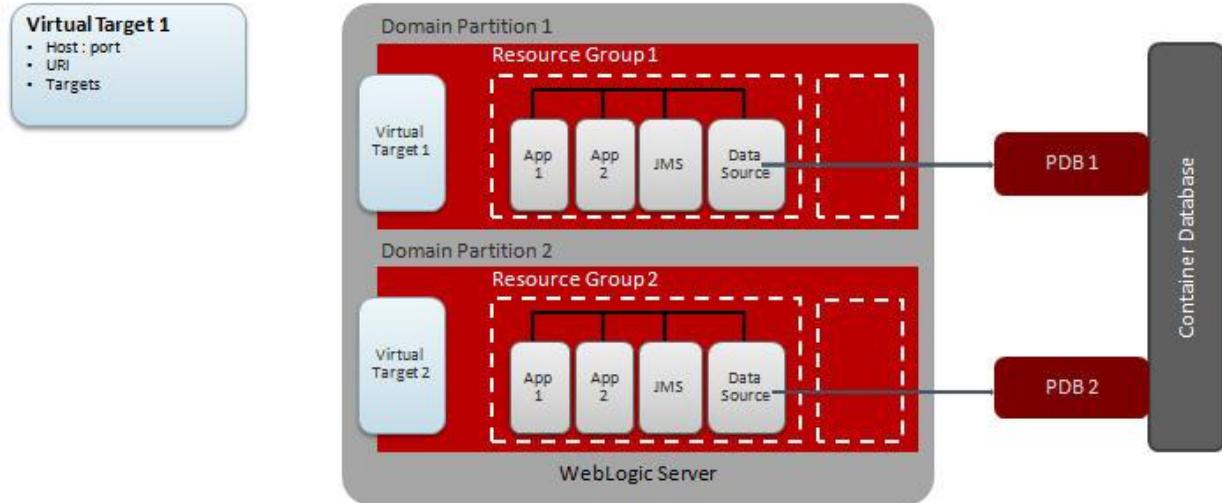
## **Virtual Target:**

Encapsulate where a partition or resource group runs and how to route traffic to them, including addresses, protocol settings, and targeting, Request routing is determined by the host name and optional URI.

May Include:-

- Host name and port
- Optional URI
- Network Access Point or Channel
- Protocol specific configuration
  - T3, IIOP
  - Web Server
- Target Clusters and managed servers

In Multitenant environment, We create Virtual Target first, In previous versions of WebLogic Server, We Targeted our application, system resources (JDBC or JMS Resources) to Clusters, Managed Servers part of Cluster or stand alone managed server. But here we target our resources to Virtual Target. After creation of Virtual Target, we create a domain partition, while creating domain partition we can create resource group. A domain partition can have multiple resource groups. Then we target domain partition to the Virtual Target. Below diagram gives you the picture how they work together.



As in the Above Diagram, We created Virtual target 1, Virtual Target 2 which are Targeted to WebLogic Server. Then we created Two Domain partitions, Domain partition 1 has Resource Group 1 and Domain Partition 2 has Resource Group 2.

To know more about the Multitenancy, you can follow the link [here](#).

We have total 6 Labs; the brief information about each lab is given below.

Lab 1 consist Non MT configuration, in this Lab we create basic configuration required for each lab. First we create **base\_domain** using the **Restricted-JRF** template. This is the domain we are using in each lab. Using the Fusion Middleware Control Console, we will create machine and one dynamic cluster of initial size of two managed server inside it.

Lab 2 consist creation of MT configuration, in which we creates virtual target, domain partition and resource group. We show you can easily deploy one application twice in a domain in different domain partition. In this case both applications will be connected to different database. Good thing is that you don't need to modify the application deploying to different domain partition because we have JNDI isolation. We also use day trader application which is build by IBM, we made few changes in the application to run the application in Non MT environment, and we took the same application to deploy in MT environment (inside domain partition). So you don't need any specific application development to deploy the application in Multitenant environment.

Lab3 shows how you can have two or more security realms active inside a domain. Traditionally in WebLogic server, we have more than one Security realm but only one is active for the domain. Here, we have multiple domain partition, so you can have separate security realm for each domain partition. In Lab 2 we deploy Medrec application in domain partition dp1 and dp2. As while creating domain partition dp2 we do not choose any security realm so it uses the default security realm. In Lab 3 we create a new security realm and assign it to domain partition dp1. So both domain partitions will have different set of authorized user.

Lab 4 shows how you can easily move domain partition from one environment to another environment. Generally we work in simple development environment, like no restricted JRF, no cluster. But we need to test our application in testing environment, run in production environment. In Lab 4 we create a dev\_domain using a by default templates and it consist only admin server. We do the required configuration for Medrec Application in dev\_domain, once we have Medrec application is deployed in domain partition Medrec-Dev in dev\_domain, we export the domain and import it in base\_domain.

Lab 5 shows how you can configure the resource configuration manager. As the domain partition is targeted to the Virtual target which is targeted to a cluster. So multiple domain partition may be using the same cluster, in that scenario to avoid one partition to use the resources excessively, we set the limit using resource configuration management, we specify the limit for notify, slow and shutdown action. As the resource uses reaches that limit, particular action happens.

Lab 6 shows how you can integrate OTD as a front end in domain partition. It shows the steps how to integrate OTD while creating the domain partition. This Lab also shows you the Resource group migration from one cluster to other cluster. As OTD is front ending your domain partition, so without any interruption you can access the application using the same URL.

You create three domains as part of this workshop. There role are as given:

**base\_domain:** We create this domain as part of Lab 1. This is the main domain which we are using in each lab. We create machine, dynamic cluster and domain partitions.

**dev\_domain:** We create this domain as part of Lab 4. This domain uses default template and contain Admin Server only. This domain represent domain which we generally uses for development purposes. We create a domain partition Medrec-Dev inside it, which we later export and import it to base\_domain.

**otd\_domain:** We create this domain as part of Lab 6. This domain consist Admin Server, and Load Balance instance.

How to Use Individual Labs:

Lab 1 and Lab 2 are compulsory.

Lab 3: You need to run Lab 1 and Lab2 before executing Lab 3.

Lab 4: You need to run Lab 1 and Lab 2 before executing Lab 4.

Lab 5: You need to run Lab 1 and Lab 2 compulsory for it. And if you do not execute Lab 4 before running Lab 5, then instead of modifying the changes to Medrec-Dev domain, you need to modify the domain partition dp1.

Lab 6: You need to run Lab 1 before executing the Lab 6.

## Virtual Box Environment

### The Hands on Lab Environment

#### Operating System Details

Operating System	Oracle Linux 6.4 x86_64
Hostname	localhost, wins-vbox
Root User	root/oracle
Oracle User	oracle/welcome1

Note: For this hand on lab you should only need to use **oracle** user account.

#### Installation Directories

JDK 1.8.0_60	/usr/java/jdk1.8.0_60/
WebLogic Server 12.2.1	/u01/wins/wls1221/
Oracle Traffic Director 12.2.1	/u01/wins/wls1221/
Oracle Database 12c	/u01/app/oracle/product/12.1.0/dbhome_1/

#### Workshop Content:

Labs Directory	/u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/
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## LAB 1: DOMAIN CREATION AND NON-MT CONFIG

### Overview

In this lab, we are going to perform the below operations.

- We create a WebLogic domain, in that domain we create machine, dynamic cluster.

### Start the database

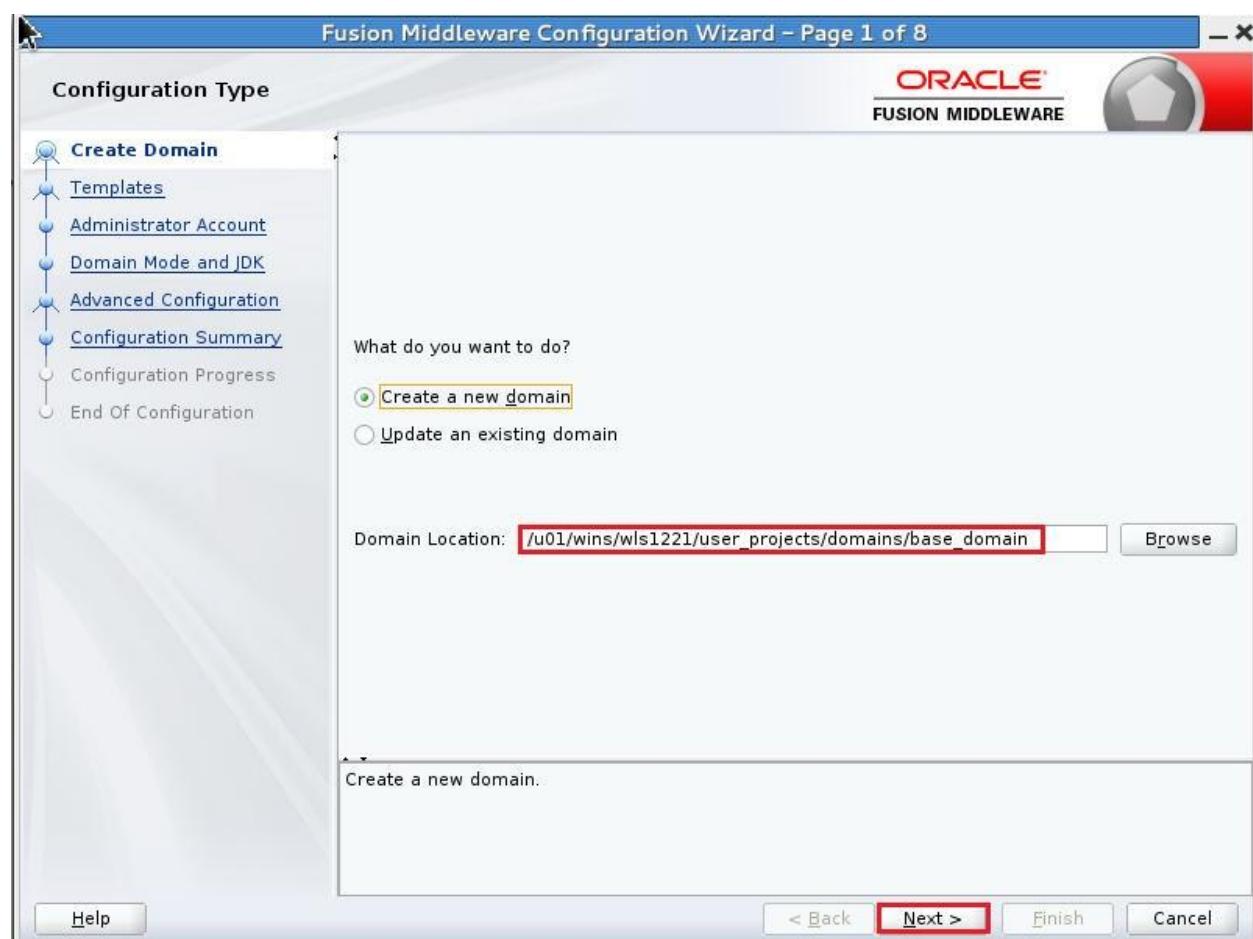
We have two Pluggable database **pdborcl** and **pdb2**; we are going to start both the database.

- a. In Desktop, Double Click on Icon “**Start Database**”.

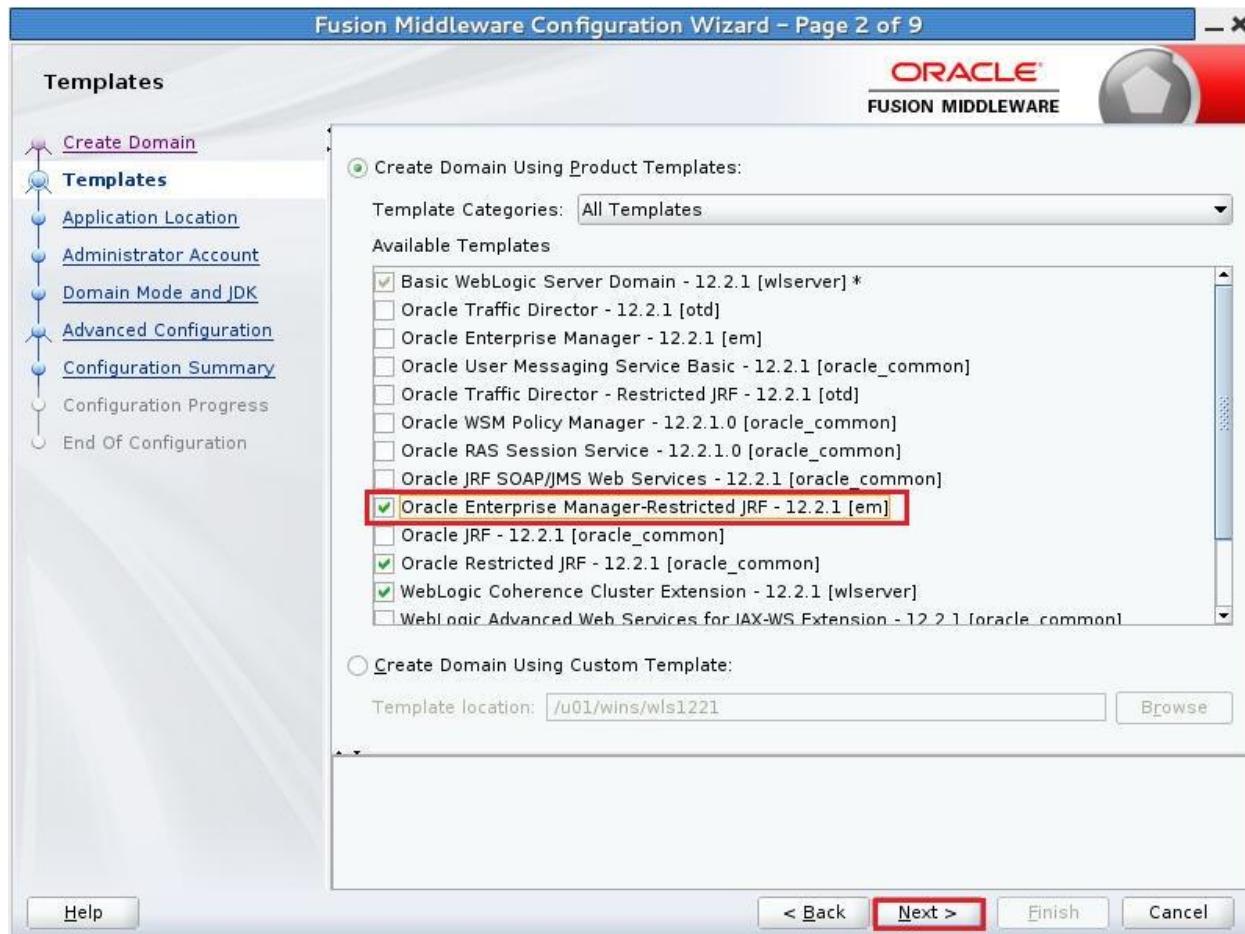
Note: Wait until the Window disappears.

### Create WebLogic Restricted JRF Domain

- a. Open a new terminal.
- b. cd /u01/wins/wls1221/oracle\_common/common/bin/
- c. ./config.sh
- d. Select “**Create a new domain**” and Enter  
“/u01/wins/wls1221/user\_projects/domains/base\_domain” as Domain Location then click on **Next**.



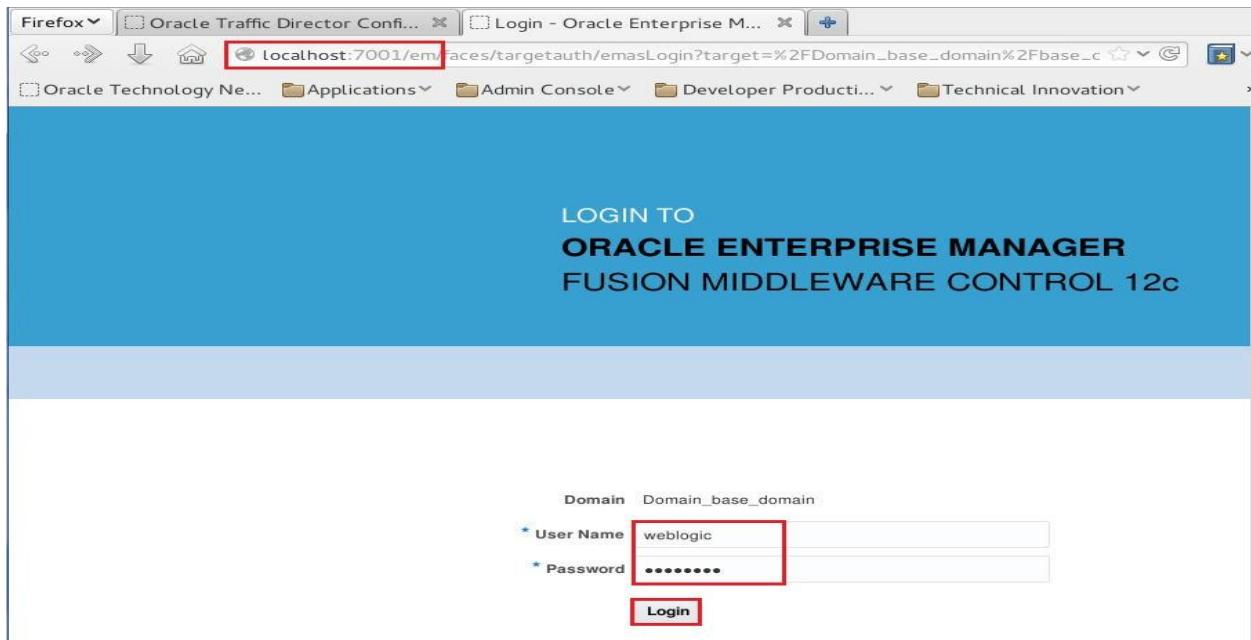
- e. Select “**Oracle Enterprise Manager –Restricted JRF-12.2.1 [em]**” as it also select the remaining required check boxes then click on **Next**.



- f. Leave Default on **Application Location** then click on **Next**.  
g. Enter **weblogic/welcome1** as Name/Password then click on **Next**.  
h. Leave Default on **Domain Mode and JDK Screen** then click on **Next**.  
i. Leave Default on **Advanced Configuration** then click on **Next**.  
j. Click on **Create**.  
k. Click on **Next** then click on **Finish**.

## Configuration of WebLogic base\_domain

- a. cd /u01/wins/wls1221/user\_projects/domains/base\_domain/bin/
- b. ./startNodeManager.sh
- c. In tab, Click on **Terminal -> Set Title**. Enter **base\_nm** as Title then click on OK.
- d. Open a new tab.
- e. cd /u01/wins/wls1221/user\_projects/domains/base\_domain/bin/
- f. ./startWebLogic.sh
- g. In tab, Click on **Terminal -> Set Title**. Enter **base\_admin** as Title then click on OK.
- h. Go back to Firefox and type the Fusion Middleware Control URL <http://localhost:7001/em>
- i. Enter **weblogic/welcome1** as **username/password** then click on **Login**.



- j. Create a Machine.
  - i. Click on **WebLogic Domain-> Environment -> Machine**.
  - ii. Click on **Create**.
  - iii. Enter “**machine**” as Name, Select “**Unix**” as Machine OS, then click on **Next**.
  - iv. Leave Defaults on Node Manager Properties then click on **Create**.
  - v. Click on the Machine name **machine**.
  - vi. Click on **Monitoring** tab and verify the status as **Reachable**.

k. Create a Dynamic Cluster

- Click on **WebLogic Domain -> Environment -> Clusters.**

The screenshot shows the Oracle Enterprise Manager interface. The left sidebar has three main categories: Server, Cluster, and Deployment. Under the Cluster category, the 'Environment' link is highlighted with a red box. The main content area shows a 'Domain Server' configuration with fields: Name (AdminServer), Host (localhost), and Port (7001). A dropdown menu is open under 'Clusters' with 'Clusters' highlighted by a red box. To the right is a table titled 'Clusters' with columns: Cluster, Machine, and State. One row is visible with the state 'Running'. At the bottom right of the table area, it says 'Servers 1 of 1'.

- Click on **Create -> Dynamic Cluster.**

The screenshot shows the 'Clusters' creation page. The top bar includes 'View', 'Create' (with 'Dynamic Cluster' highlighted by a red box), 'Delete', 'Control', and 'Scale Up/Down'. The main table has columns: Name, Cluster, Cluster Type, Servers, Cluster Messaging Mode, Default Load Algorithm, Replication Type, Multicast Address, and Multicast Port. A sub-table under 'Cluster' shows 'Dynamic Cluster'. Below the table, it says 'No clusters found'.

- Enter **app-cluster** as Name then click on **Next.**

- Leave Default on **Dynamic Server Properties** page and click on **Next.**

- v. Select “Use a single machine for all dynamic servers” and choose the **machine**, then click on **Next**.

**Create a Dynamic Cluster: Machine Bindings**

Use this page to associate dynamic servers with machines.

How do you want to distribute dynamic servers across machines?

Use any machine configured in this domain  
 Use a single machine for all dynamic servers  
Selected Machine: machine

Use a subset of machines in this domain

Machine Name Match Expression

- vi. Leave Default on Listen Port Bindings, and then click on **Next**.  
vii. Review the Configuration and click on **Create**.

- I. Start Managed Servers.  
i. Click on **WebLogic Domain -> Control ->Clusters**.

**base\_domain**

**WebLogic Domain**

- Control
- Servers
- Clusters
- Deployments
- JDBC Data Sources
- Messaging
- Cross Component Wiring
- Web Services
- Other Services
- Administration
- Refresh WebLogic Domain
- Security

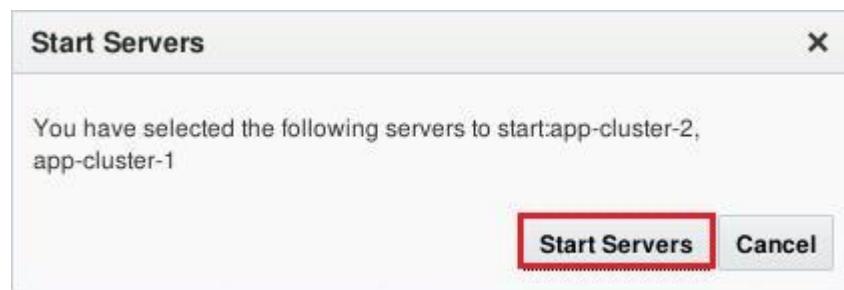
Clusters

Admin Server Port	Username	OTD Domain
8001	weblogic	otd_domain

- ii. Check the box near to **app-cluster** to make it highlighted and then Click on **Control -> Start -> Start Servers**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The title bar reads "ORACLE Enterprise Manager Fusion Middleware Control 12c". The top navigation bar includes "WebLogic Domain" and "weblogic", along with various icons and a timestamp "Nov 5, 2015 2:26:48 AM PST". The main content area is titled "Clusters (Control)". A pie chart indicates "Down (1)" status. Below it is a table with columns: Name, Cluster Type, Servers, Cluster Messaging Mode, Default Load Algorithm, and Replication Type. One row is selected, showing "app-cluster" in the Name column, "Dynamic" in Cluster Type, "2" in Servers, "Unicast" in Cluster Messaging Mode, "Round Robin" in Default Load Algorithm, and "(None)" in Replication Type. A context menu is open over the "app-cluster" row, with the "Start" option highlighted by a red box. Other options in the menu include Resume, Suspend, Shutdown, and Restart SSL.

Name	Cluster Type	Servers	Cluster Messaging Mode	Default Load Algorithm	Replication Type
app-cluster	Dynamic	2	Unicast	Round Robin	(None)



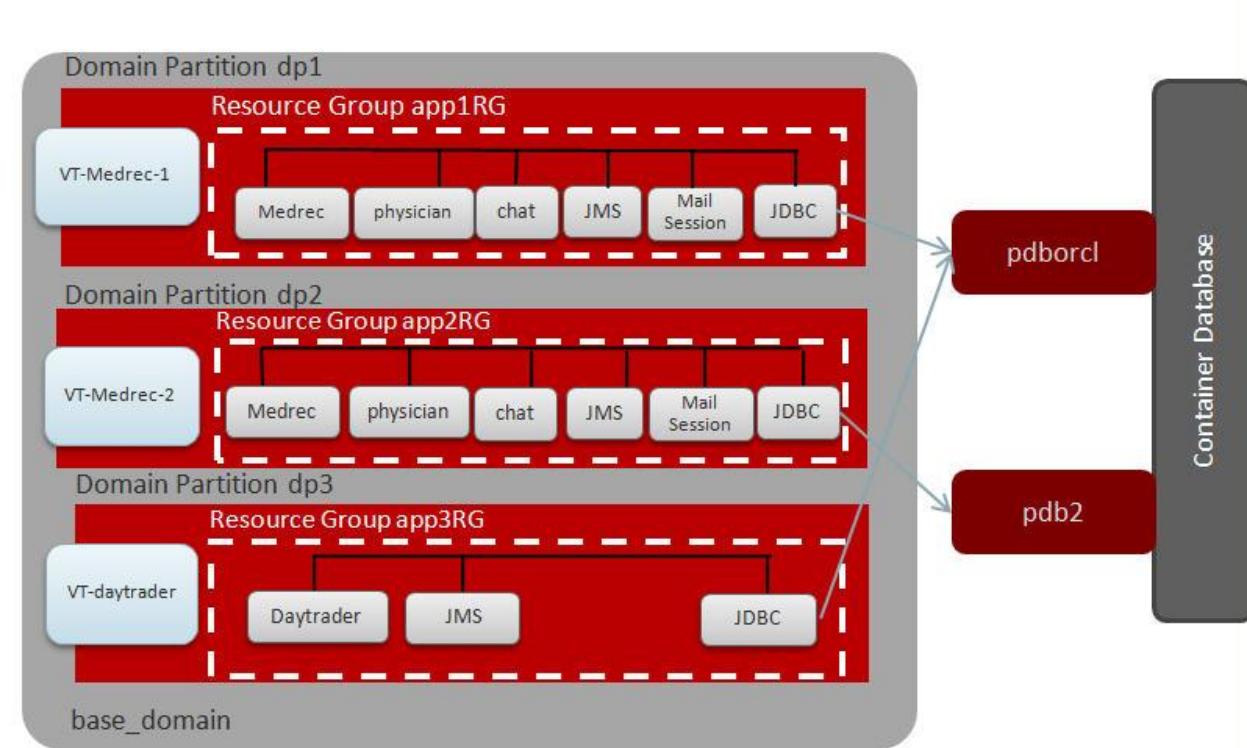
## LAB 2: MULTITENANCY CONFIGURATION

### Overview:

In this lab, we are going to learn the following:

- Configuration of Virtual Target, Domain Partition and Resource Group
- Run multiple instances of Medrec application in different domain partition without modifying the application. We try to show **JNDI Isolation** for that we are using the same Medrec applications and same JNDI name for the Datasources, connection factory and Distributed queue in both the domain partition.
- Run Day trader application which is build by WebSphere to WebLogic 12.2.1.
- You don't need to modify your application to run in Multitenant environment. So no special application development needed.

The final deployment architecture will look like the below where we will create three domain partitions . Deploy Medrec application in domain partition dp1 and dp2. And Day Trader application on domain partition dp3.



## Configuration of Medrec Application in Domain Partition 1

In the next step we are creating the below configuration for Medrec application in domain partition dp1.

Virtual Target: VT-Medrec-1

Domain Partition: dp1

Resource Group app1RG

app1RG:

Datasource:

Name: MedRecGlobalDataSourceXA

JNDI Name: jdbc/MedRecGlobalDataSourceXA

Mail Session:

Name: MedRecMailSession

JNDI Name: mail/MedRecMailSession

Persistence Store: MedRec-fs

JMS Server: MedRecJMSServer

JMS Module: MedRecModule

MedRecModule:

Subdeployment: MedRecJMS

Connection Factory:

Name: MedRecConnectionFactory

JNDI Name: com.oracle.medrec.jms.connectionFactory

Distributed Queue:

Name: PatientNotificationQueue

JNDI Name: com.oracle.medrec.jms.PatientNotificationQueue

Applications: medrec.ear

physician.ear

chat.war

- a. Open a new tab.
- b. cd /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2/
- c. **./Medrec1DB.sh** (It creates the required database user and populate sample data into database)
- d. Close the tab.
- e. In Enterprise Manager, Click on **WebLogic Domain > Environment -> Virtual Targets**.

The screenshot shows the Oracle Enterprise Manager interface. The left sidebar has a tree view with 'Cluster' selected. The main menu under 'WebLogic Domain' has 'Environment' highlighted with a red box. Under 'Environment', 'Virtual Targets' is also highlighted with a red box. A tooltip above the 'Virtual Targets' link says 'the selected Server(s):app-cluster-2, app-cluster-1'. On the right, there's a table for 'Virtual Targets' with columns: Cluster Messaging Mode, Default Load Algorithm, and Replication Type. One row is shown with values: Unicast, Round Robin, and (None). Below the table, it says 'Clusters 1 of 1'.

- f. Click on **Create**.
- g. Enter **VT-Medrec-1** as Name and **/dp1** as Uri Prefix and Add **localhost** as Hosts then click on **Next**.

The screenshot shows the 'Create Virtual Target: General' dialog in Oracle Enterprise Manager. It's Step 1 of 2. The 'Name' field contains 'VT-Medrec-1' and the 'Uri Prefix' field contains '/dp1'. Under 'Hosts', there's a table with a single entry 'localhost'. At the bottom, there are 'Back', 'Step 1 of 2', 'Next' (highlighted with a red box), and 'Cancel' buttons.

h. Select Cluster **app-cluster** as Target then click on **Create**.

The screenshot shows the Oracle Enterprise Manager interface for creating a virtual target. The top navigation bar says "ORACLE Enterprise Manager Fusion Middleware Control 12c". Below it, a breadcrumb path shows "base\_domain". A tabs section has "General" and "Targets" tabs, with "Targets" being the active one. The main content area is titled "Create Virtual Target: Targets". It contains a sub-header "Choose a server or cluster to be associated with this virtual target." and a dropdown menu where "Cluster" is selected from a list that includes "app-cluster". There are also "Server" and "Server" options. At the bottom right of the content area are buttons for "Back", "Step 2 of 2", "Next", "Create" (which is highlighted with a red border), and "Cancel".

i. Click on **WebLogic Domain -> Environment -> Domain Partitions**.

The screenshot shows the Oracle Enterprise Manager navigation tree. The root node is "base\_domain". Under "Virtual Targets", there is a "WebLogic Domain" node, which is expanded to show "Home", "Monitoring", "Diagnostics", "Control", "Logs", "Environment", "Deployments", "JDBC Data Sources", "Messaging", "Cross Component Wiring", "Web Services", "Other Services", "Administration", "Refresh WebLogic Domain", and "Security". The "Environment" node is highlighted with a red box. Under "Domain Partitions", there is a table with columns "Used By", "Servers", "Server Templates", "Clusters", "Machines", and "Domain Partitions". The "Domain Partitions" row is highlighted with a red box. The table shows one entry: "logs/virtualTarget..". At the bottom of the table, it says "Virtual Targets 1 of 1". The top right corner of the screen shows the date and time: "Nov 5, 2015 2:34:08 AM PST".

- j. Click on “**Enable Lifecycle Manager**”.
- k. Go back to base\_admin terminal, press CTRL+C, to stop the admin server.
- l. ./startWebLogic.sh
- m. Go back to Firefox, and type the Fusion Middleware Control Console URL <http://localhost:7001/em>.
- n. Enter **weblogic/welcome1** as **User Name/Password** then Click on **Login**.
- o. Click on **WebLogic Domain -> Environment -> Domain Partition**.
- p. Click on **Create**.
- q. Enter **dp1** as Name then click on Next.

**ORACLE® Enterprise Manager** Fusion Middleware Control 12c

base\_domain [i](#)

General Available Targets Resource Group Summary

**Create Domain Partition: General**

Back Step 1 of 4 **Next** Cancel

Use this page to specify general attributes for this domain partition.

* Name	dp1
Security Realm	None
Primary Identity Domain	

**Load Balancer Configuration**

If you wish to use a load balancer to front-end this domain partition, choose an Oracle Traffic Director runtime from the list of registered runtimes shown below. If you wish to register a new OTD runtime, please use the Environment->OTD Runtimes menu item on the WebLogic Domain menu.

Use OTD for load balancing	<input type="checkbox"/>
OTD Runtime	None

- r. Check the left box near **VT-Medrec-1** and also check the box for **Set as Default** then click on **Next**.

**ORACLE® Enterprise Manager** Fusion Middleware Control 12c

base\_domain [i](#)

General Available Targets Resource Group Summary

**Create Domain Partition: Available Targets**

Back Step 2 of 4 **Next** Cancel

Select the virtual targets that will be available for this domain partition to use. Note that virtual targets can only be used by one partition; so, only available virtual targets are listed below.

Select	Virtual Target	Set as Default
<input checked="" type="checkbox"/>	VT-Medrec-1	<input checked="" type="checkbox"/>

- s. Enter **app1RG** as Resource Group name and **None** as Resource Group Template, Move the **VT-Medrec-1** virtual target to **Selected targets** then click on **Next**.

**Create Domain Partition: Resource Group**

A resource group needs to be created within a partition before you can deploy applications or resources. The resource group can optionally extend a resource group template specified at the domain level.

\* Resource Group Name **app1RG**

Resource Group Template **None**

Targets for the Resource Group Select a target for the resource group from the list of available targets. If the partition has a default target specified, the resource group will implicitly inherit that target.

Available Targets	Selected Targets
VT-Medrec-1	VT-Medrec-1

- t. Verify the configuration and click on **Create**.  
u. Check the box near **dp1** and click on **Control -> Start**. Once you notice the message “**Partition state after the operation is RUNNING**” then Click on Close.

**Domain Partitions**

Domain partitions are the building blocks of WebLogic server multi-tenancy (MT). Multi-tenancy permits multiple client organizations to share a domain, improving efficiency and reducing operation costs. Before creating a domain partition, you must first create one or more virtual targets. Look at the Getting Started topics for more information.

► Getting Started with Multi-Tenancy

Hide Pie Chart

Name	Status	OTD Partition	Realm	Default Targets	Available Targets
dp1	Down	OTD Partition	Realm	Default Targets	Available Targets

Control ▾ Start

Domain Partitions 1 of 1



v. Click on the Domain Partition **dp1**.

Name	Status	State	OTD Partition	Realm	Default Targets	Available Targets
dp1		Running			VT-Medrec-1	VT-Medrec-1

w. Click on **Domain Partition -> Administration -> Resource Group**.

The screenshot shows the Oracle Enterprise Manager interface for Fusion Middleware Control 12c. The top navigation bar includes "WebLogic Domain" and "weblogic". The main content area is for the domain partition "dp1". On the left, there is a navigation tree with sections like Monitoring, Diagnostics, Control, Logs, Deployments, JDBC Data Sources, Messaging, Coherence Caches, Web Services, Other Services, Administration, Security, System MBean Browser, and Target Sitemap. The "Administration" section is highlighted with a red box. Under "Administration", the "Resource Groups" option is also highlighted with a red box. The right side of the screen displays monitoring metrics for "General" and "JDBC and JTA Usage", and a "Resource Usage" section.

- x. Click on Resource Group **app1RG**.
- y. Creation of Datasource.
  - i. Select the **Services** tab.
  - ii. Choose JDBC tab, click on **Create > Generic Data Source**.

The screenshot shows the Oracle Enterprise Manager interface for a WebLogic Domain named 'weblogic'. The top navigation bar includes 'WebLogic Domain' and 'weblogic'. Below the navigation is a toolbar with 'Domain Partition' (dp1), 'Start Up', 'Shut Down', 'Auto Refresh' (Off), and a date/time stamp 'Nov 5, 2015 2:44:29 AM PST'. The main content area is titled 'Resource Group : app1RG'. The 'Services' tab is selected, indicated by a red box. Under the 'JDBC' tab, a red box highlights the 'Create' button. A dropdown menu is open, showing options: 'Generic Data Source' (highlighted with a red box), 'GridLink Data Source', 'JNDI Name', 'Type', and 'Targets'. A message at the top states: 'This page lists the JDBC system data sources that have been created in this resource group. You can create or delete the system data sources from this page.' At the bottom left, it says 'Columns Hidden 4'. At the bottom right, it shows 'JDBC Data Sources 0 of 0'.

- iii. Enter **MedRecGlobalDataSourceXA** as Data Source Name and **jdbc/MedRecGlobalDataSourceXA** as JNDI Name, and then click on Select.

The screenshot shows the 'Create a JDBC Data Source: Data Source Properties' step of a wizard. The top navigation bar shows the progress: 'Data Source Properties' (highlighted with a blue circle), 'Connection Properties', 'Transaction Properties', 'Select Targets', and 'Review'. The sub-titles for the steps are: 'Create a JDBC Data Source: Data Source Properties', 'Step 1 of 5', 'Next', and 'Cancel'. The main content area has a heading 'Create a JDBC Data Source: Data Source Properties'. It includes fields for 'Data Source Name' (MedRecGlobalDataSourceXA), 'Scope' (Resource group "app1RG" in domain partition "dp1"), 'Type' (Generic), 'Database Type' (Oracle), 'Driver Class Name' (oracle.jdbc.OracleDriver), 'JNDI Name' (jdbc/MedRecGlobalDataSourceXA), and a 'Select...' button next to the Driver Class Name field. A note at the top states: 'Applications get a database connection from a data source by looking up the data source on the Java Naming and Directory Interface (JNDI) tree and then requesting a connection. The data source provides the connection to the application from its pool of database connections. Use this page to define the general configuration options for this JDBC data source.'

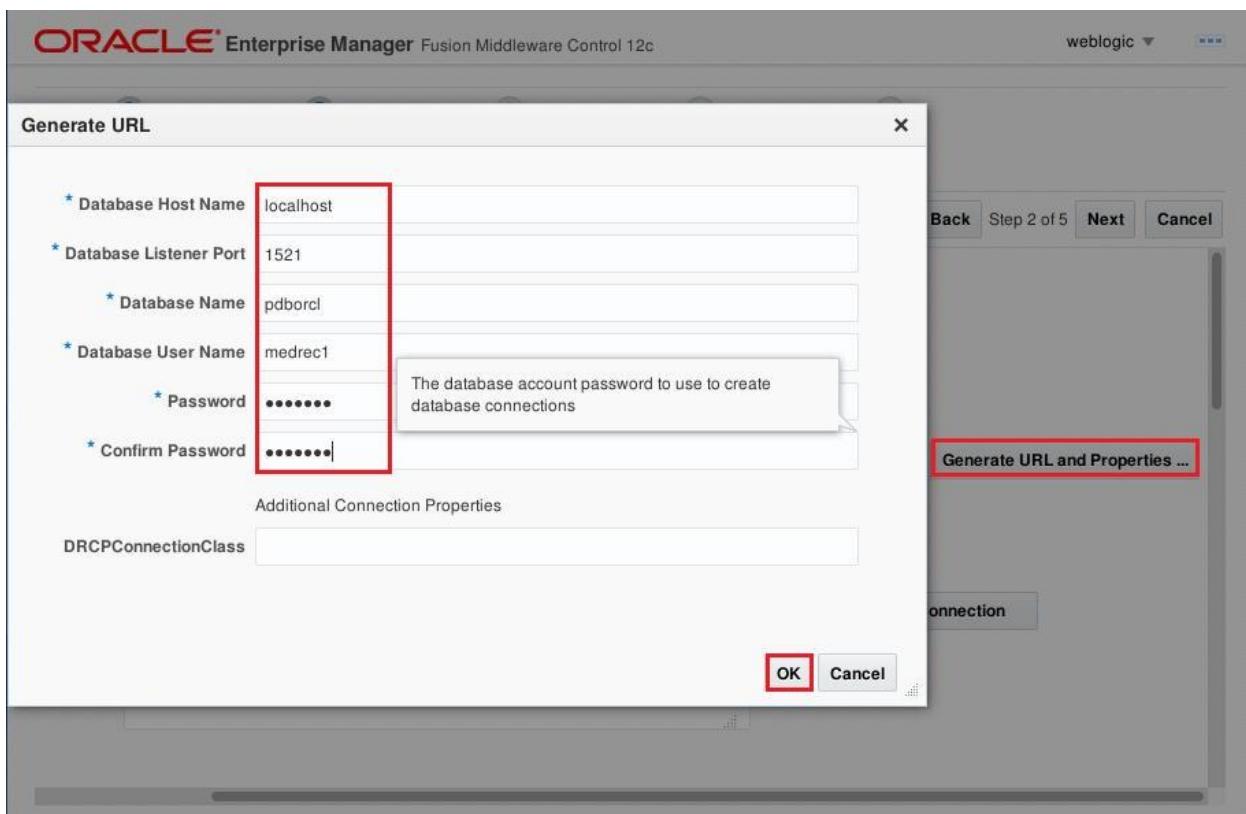
- iv. Select **Oracle** as Database Type and “**Oracle’s Driver (Thin XA) for service connections; Versions: Any**” as JDBC Driver then click on OK.



- v. Click on **Next**.  
vi. Click on **Generate URL and Properties** and Enter the following:

Host Name:	localhost
Listen Port:	1521
Database Name:	pdborcl
User Name:	medrec1
Password:	medrec1
Confirm Password	medrec1

Click OK.



vii. Click on **Test Database Connection** to verify the connection. Click **Next**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. A modal dialog titled "Confirmation" is displayed, stating "Connection test succeeded." with an "OK" button. The main page is titled "Create a JDBC Data Source: Connection" and contains "Database Connection Information". The "Driver Class" is set to "oracle.jdbc.xa.client.OracleXADataSource". The "Database URL" is "jdbc:oracle:thin:@//localhost:1521/pdborcl". The "Password" and "Confirm Password" fields both contain "\*\*\*\*\*". The "SQL ISVALID" field shows "Test Database Connection" (which is also highlighted with a red box). Below the form, there is a "Properties" section and a URL "localhost:7001/em/faces/as-emas\_createDS\_taskflow/as/jdbc/createDSStep2#".

viii. Leave Default on **Transaction Options** and click on **Next**.

ix. Verify the configuration and click on **Create**.

z. Adding User to Default Realm.

i. Click on **Weblogic Domain -> Security -> Users and Groups**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. On the left, under "base\_domain", there is a "Confirmation" message: "JDBC Data Source 'MedRecGlobalDataSourceXA' has been created successfully. All changes have been saved." The main panel shows the "Resource Group : app1RG" with the "Services" tab selected. Under the "JDBC" tab, a table lists a single entry: "Name" MedRecGlobalDataSourceXA and "JNDI Name" jdbc/MedRecGlobalDataSourceXA. The "Security Realms", "Users and Groups", and "Keystore" buttons are highlighted with red boxes. On the right, the navigation bar shows "WebLogic Domain" and "weblogic". A sidebar menu includes "Home", "Monitoring", "Diagnostics", "Control", "Logs", "Environment", "Deployments", "JDBC Data Sources", "Messaging", "Cross Component Wiring", "Web Services", "Other Services", "Administration", "Refresh WebLogic Domain", "Security" (which is highlighted with a red box), "System MBean Browser", and "WebLogic Server Administration Console".

- ii. In **Users** tab, click on **Create**.

**Users and Groups**

This page displays information about the users and groups that have been configured in the selected security realm in this WebLogic Server domain.

Select a Realm: myrealm

Default Realm for This WebLogic Domain: true

**Users** Groups

**Create** Delete Detach

Name	Description	Provider
LCMUser	This is the default service account ...	DefaultAuthenticator
OracleSystemUser	Oracle application software syste...	DefaultAuthenticator
weblogic	This user is the default administrator.	DefaultAuthenticator

Columns Hidden 1

Users 3 of 3

- iii. Enter the following then click on **Create**.

Name:	administrator
Description:	Medrec Admin
Provider:	Default Authenticator
Password:	administrator123
Confirm Password:	administrator123

aa. Configuring Mail Session.

- Click on **Weblogic Domain ->Environment ->Domain Partition**.
- Click on Domain Partition **dp1**.
- Click on **Domain Partition -> Other Services -> Mail Sessions**.

**ORACLE® Enterprise Manager** Fusion Middleware Control 12c

WebLogic Domain: weblogic

dp1

Domain Partition Start Up Shut Down

Nov 5, 2015 7:09:41 AM PST

**Monit** General JDBC and JTA Usage

- Monitoring
- Diagnostics
- Control
- Logs

State: Running

Default Targets: VT-Medrec-1

Available Targets: VT-Medrec-1

**Resou** Work Manager Resource Usage

- Deployments
- JDBC Data Sources
- Messaging
- Coherence Caches
- Web Services
- Other Services
- Administration
- Security
- System MBean Browser
- Target Sitemap

Requests (per minute): 6.41

Pending Requests: 0

Persistent Stores CPU Usage (%): Unavailable

Mail Sessions Open Files: Unavailable

Foreign JNDI Providers

Current Messages: 0

iv. Click on **Create**.

v. Enter the following and click on **Next**.

Name: MedRecMailSession  
Scope: Leave as default  
JNDI Name: mail/MedRecMailSession

The screenshot shows the 'Create a Mail Session: General Configuration' page. The 'Name' field contains 'MedRecMailSession'. The 'Scope' dropdown shows 'Domain Partition Resource Group' with 'app1RG in partition dp1' selected. The 'JNDI Name' field contains 'mail/MedRecMailSession'. The 'Next' button is highlighted with a red box.

vi. Click on **Create**.

bb. Configuring JMS Server.

i. Click on **Domain Partition** -> **Messaging** -> **JMS Servers**.

The screenshot shows the 'Domain Partition' section of the Oracle Enterprise Manager. The 'Messaging' option under 'Domain Partition' is selected and highlighted with a red box. A tooltip message 'as been created successfully. All changes have been activated.' is displayed above the 'JMS Servers' link. The 'JMS Servers' link is also highlighted with a red box.

- ii. Click on **Create**. Enter **MedRecJMSServer** as Name then click on **Create a Store** -> **File Store**.

JMS servers act as management containers for the queues and topics in JMS modules that are targeted to them. A JMS server's primary responsibility for its destinations is to maintain information on what persistent store is used for any persistent messages that arrive on the destinations, and to maintain the states of durable subscribers created on the destinations.

Use this page to define the general configuration parameters for this JMS server.

\* Name

Scope Domain Partition Resource Group

Persistent Store

- iii. Enter **MedRec-fs** as Name then click on **Next**. Click on **Create**.  
 iv. In **JMS Server: General Setting**, Select the newly created file store as persistent store then click on **Next**.

**Information**  
Persistent store "MedRec-fs" has been created successfully. All changes have been activated.

JMS servers act as management containers for the queues and topics in JMS modules that are targeted to them. A JMS server's primary responsibility for its destinations is to maintain information on what persistent store is used for any persistent messages that arrive on the destinations, and to maintain the states of durable subscribers created on the destinations.

Use this page to define the general configuration parameters for this JMS server.

\* Name

Scope Domain Partition Resource Group

Persistent Store

- v. Click on **Create**.
- cc. Configure JMS Module.
- Click on **Domain Partition -> Messaging -> JMS Resources and Modules**.

The screenshot shows the Oracle Enterprise Manager interface for a WebLogic Domain named 'weblogic'. The left sidebar shows a tree structure with 'dp1' selected. Under 'dp1', the 'Domain Partition' dropdown is open, and 'Messaging' is highlighted with a red box. The main content area displays a success message: 'JMS module has been created successfully. All changes have been activated.' Below this, there's a table titled 'JMS Resources and Modules' with one row: 'app1RG'. At the bottom right of the table, it says 'JMS Servers 1 of 1'. The top navigation bar includes 'Start Up' and 'Shut Down' buttons.

- Under the **JMS Modules** tab, click on **Create**.

The screenshot shows the same Oracle Enterprise Manager interface for domain partition 'dp1'. The 'JMS Modules' tab is now selected. A red box highlights the 'Create' button in the top navigation bar. The main content area displays a message: 'To configure and manage JMS modules, use the [WebLogic Server Administration Console](#)'. Below this, there's a table with columns: Name, Resource Group, Queues, Topics, Connection Factories, Distributed Queues, Distributed Topics, Foreign Servers, Quotas, and Hand. The table is currently empty. At the bottom, it says 'The table is empty'. The top navigation bar includes 'Start Up' and 'Shut Down' buttons.

- iii. Enter **MedRecModule** as Name then click on **Next**. Click on **Create**.
- iv. Under **JMS Modules** tab, click on **MedRecModule**.

**JMS Resources and Modules**

To configure and manage JMS modules, use the [WebLogic Server Administration Console](#).

Name	Resource Group	Queues	Topics	Connection Factories	Distributed Queues	Distributed Topics	Foreign Servers	Quotas	Handle
MedRecModule	app1RG	0	0	0	0	0	0	0	

- v. Under **Subdeployment** tab, click on **Create**.

**JMS Module: MedRecModule**

To configure and manage this JMS module, use the [WebLogic Server Administration Console](#).

Name	Resources	Targets
The table is empty		

- vi. Enter **MedRecJMS** as Name and Select the box near **MedRecJMSServer** then click on **Create**.

**Create a Subdeployment**

Subdeployment Name **MedRecJMS**

Select targets for this subdeployment.

**JMS Servers**

Select Name  
MedRecJMSServer

**SAF Agents**

Select Name  
No data to display

**Create** **Cancel**

- vii. Under **General** tab, click on **Create**.

**JMS Module: MedRecModule**

To configure and manage this JMS module, use the [WebLogic Server Administration Console](#).

**General** Subdeployments Notes

This page displays general information about a JMS system module and its resources. It also allows you to configure new resources and access existing resources.

Name: MedRecModule  
Scope: Resource group "app1RG" in domain partition "dp1"  
Descriptor File Name: partitions/dp1/jms/medrecmodule-jms.xml

This page summarizes the JMS resources that have been created for this JMS system module, including queue and topic destinations, connection factories, JMS templates, destination sort keys, destination quota, distributed destinations, foreign servers, and store-and-forward parameters.

**Create** **Delete** **Detach**

- viii. Select box near **Connection Factory** then click on **Next**.

**Create a JMS System Module Resource: Resource Type**

Choose the type of JMS resource that you would like to create.

- ▲ Connection Factory
  - Connection Factory
- ▲ Destination
  - Destination Key
  - Quota

**Connection Factory**

A connection factory defines configuration parameters that are used to create connections for WebLogic JMS clients. A client's connection factory must be hosted on the same server or cluster as the client's destinations.

Back Step 1 of 5 **Next** Cancel

- ix. Leave Default in **JMS System Module** Page then click on **Next**.  
 x. Enter **MedRecConnectionFactory** as Name and  
**com.oracle.medrec.jms.connectionFactory** as JNDI Name then click on **Next**. Click on **Create**.

**Create a Connection Factory: Properties**

Specify the properties that you would like to identify your new JMS resource.

Resource Type	Connection Factory
* Name	<input type="text" value="MedRecConnectionFactory"/>
JNDI Name	<input type="text" value="com.oracle.medrec.jms.connectionFactory"/>
Notes	

<p>The global JNDI name used to look up a connection factory within a clustered JNDI namespace.</p>

Back Step 3 of 5 **Next** Cancel

- xi. Under General tab, Click on **Create**.
- xii. Select **Uniform Distributed Queue** then click on **Next**.

**Create a JMS System Module Resource: Resource Type**

Choose the type of JMS resource that you would like to create.

**Resource Type**

- Connection Factory
  - Connection Factory
- Destination
  - Destination Key
  - Quota
  - JMS Template
- Queue
  - JMS Queue
  - Uniform Distributed Queue
- Topic
  - JMS Topic
  - Uniform Distributed Topic

**Uniform Distributed Queue**

A uniform distributed topic is a logical topic that references a set of automatically generated JMS topic instances, each hosted on a different JMS server.

Note: depending on the type of resource selected, you will be prompted to enter basic information for the new JMS resource to be created in next step. For targetable resources, like stand-alone queues and topics, connection factories, distributed queues and topics, foreign servers, and SAF import destinations, you can also proceed to "Targets" step for selecting the appropriate targeting policy. For untargetable resources, like destination keys, quotas, templates, SAF error handling, and remote SAF context, the "Targets" step will be skipped.

xiii. Click on **Next**.

xiv. Enter the following and click on **Next**.

Name: PatientNotificationQueue

JNDI Name: com.oracle.medrec.jms.PatientNotificationQueue

**Create a Uniform Distributed Queue: Properties**

Specify the properties that you would like to identify your new JMS resource.

**Properties**

Resource Type	Uniform Distributed Queue
* Name	PatientNotificationQueue
Notes	<p>The name used to bind a virtual destination to the JNDI tree. Applications can use the JNDI name to look up the virtual destination.</p>
JNDI Name	com.oracle.medrec.jms.PatientNotificationQueue
Template	(None)

- xv. Click on **Create**. Click on **PatientNotificationQueue**, Under **Targeting**, Select **Subdeployment targeting as Targeting Policy** and **MedRecJMS** as **Subdeployment** then click on **Apply**.

The screenshot shows the Oracle Enterprise Manager interface for configuring a JMS resource. The top navigation bar includes Configuration, Monitoring, Notes, General, Advanced Configuration, Delivery Failure, Delivery Overrides, Logging, and Thresholds and Quotas. The General tab is selected. In the main content area, there is a 'Reset Delivery Count On Forward' checkbox. Below it, the 'Targeting' section is expanded, showing two radio buttons: 'Subdeployment targeting' (selected) and 'Default to the parent module's target'. Under 'Subdeployment', a dropdown menu is open, with 'MedRecJMS' selected.

Note: You must restart domain partition before going to deploy Medrec Application.

- Click on Change Center -> View Restart Checklist.

The screenshot shows the Oracle Enterprise Manager interface with a context menu open over a domain partition named 'dp1'. The menu items include Edit Sessions, Lock & Edit, View Change List, View & Resolve Conflicts, Release Configuration, Activate Changes, Undo All Changes, and a redboxed 'View Restart Checklist'. Other menu items like Console and Help are also visible. The main pane shows a confirmation message: 'Settings updated successfully. All changes have been activated. There are 1 or more item(s) that must be effect. Use the "View Restart Checklist" menu in Change Center to view the details.' Below this, the 'Uniform Distributed Queue: PatientNotificationQueue' configuration page is shown, with the General tab selected. The configuration details include Name: PatientNotificationQueue and Scope: Resource group "app1RG" in domain partition "dp1".

b. Select the box near to dp1 then click on Restart.

Restart Checklist			
This page lists servers, domain partitions, system components, and other resources that must be restarted for configuration changes to take effect. To restart, select the resource you would like to restart and click <b>Restart</b> button.			
Name	Resource Type	Targets	Status of Last Action
dp1	Domain Partition		START (TASK COMPLETED)

c. On Confirmation Screen, Click on Restart.

dd. Deployment of Medrec Application.

i. Click on **WebLogic Domain -> Environment -> Resource Groups**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The top navigation bar includes 'WebLogic Domain' (set to 'weblogic'), 'Logs' (highlighted with a red box), 'Monitoring', 'Diagnostics', 'Control', 'Environment' (highlighted with a red box), 'Deployments', 'JDBC Data Sources', 'Messaging', 'Cross Component Wiring', 'Web Services', 'Other Services', 'Administration', 'Refresh WebLogic Domain', 'Security', 'System MBean Browser', and 'WebLogic Server Administration Console'. The main content area displays the configuration for a 'Uniform Distributed Queue: PatientNotificationQueue'. The 'General' tab is selected. The configuration details include:

- Name:** PatientNotificationQueue
- Scope:** Resource group
- JNDI Name:** com.oracle.
- Template:** None

The left sidebar shows the navigation path: /Domain\_base\_domain/base\_domain/dp1 > JMS Resources and Modules > Settings for Uniform Distributed Queue. The right sidebar shows various management options: Servers, Server Templates, Clusters, Machines, Domain Partitions, OTD Runtimes, Resource Groups (highlighted with a red box), Resource Group Templates, Partition Work Managers, Resource Consumption Managers, Virtual Hosts, Virtual Targets, and Migratable Targets.

- ii. Click on Resource Group **app1RG**, click on **Deployments** tab.
- iii. Click on **Deployment -> Deploy**.

The screenshot shows the Oracle Enterprise Manager interface for a WebLogic Domain. The top navigation bar includes 'WebLogic Domain' and 'weblogic'. The main title is 'Resource Group : app1RG'. Below it, there are tabs: General, **Deployments** (which is selected), Services, Targets, Monitoring, Control, and Notes. A message box states 'This page displays a list of Java EE applications and standalone application modules that have been deployed to this resource group.' Below this, there are filter options: View, Show All, Deployment (with 'Deploy' highlighted), Override, and Control. A table header shows columns: Name, Status, State, Health, and Type. A note below the table says 'No deployments found. Select a deployment target to view existing applications, resource adapters, and libraries.' At the bottom right of the table area, it says 'Deployments 0 of 0'. A context menu is open over the 'Deployment' dropdown, with 'Deploy' highlighted.

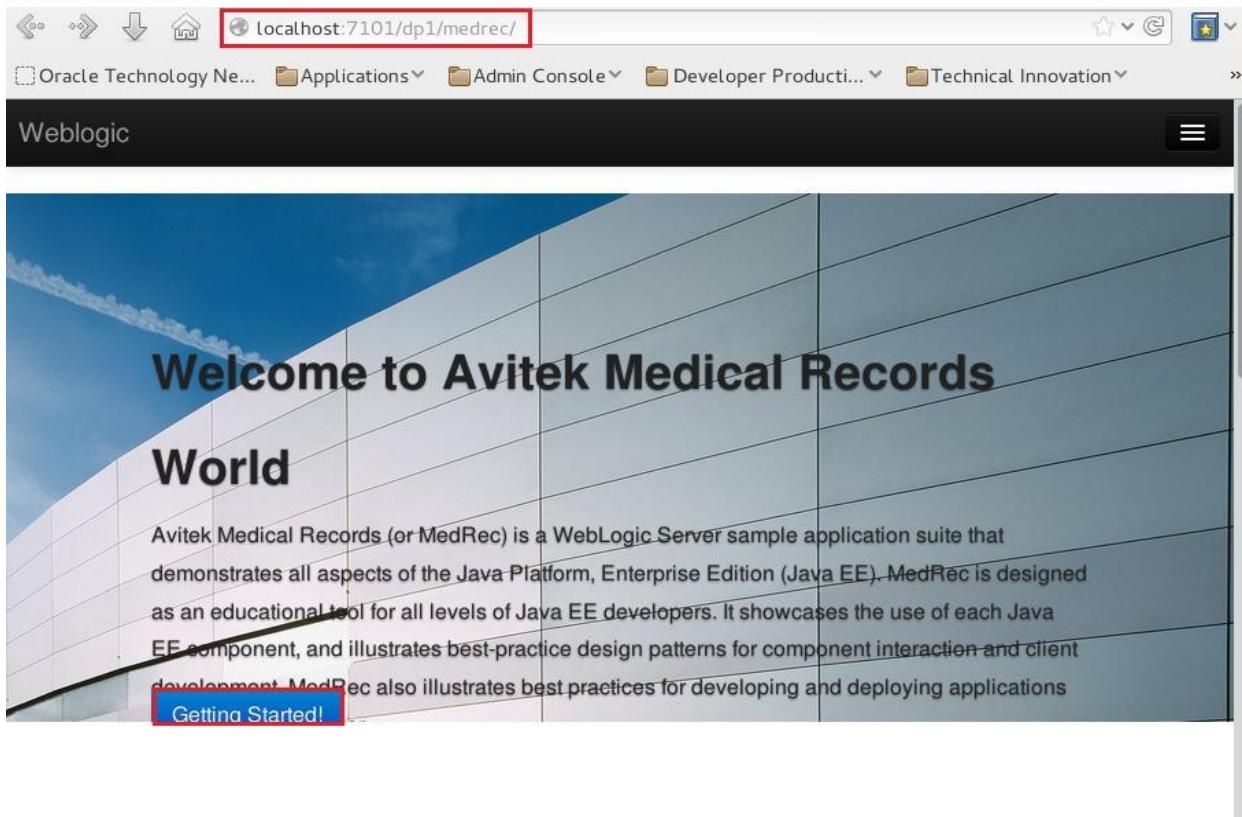
- iv. Select “Archive or exploded directory is on the server where Enterprise Manager is running” then click on **Browse**. Specify the location of **medrec.ear** from **/u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2** then click on **OK**.

The screenshot shows the 'Deploy Java EE Application: Select Archive' wizard, Step 1 of 4. It has four tabs: Select Archive (selected), Select Target, Application Attributes, and Deployment Settings. The 'Scope' section indicates the scope is 'Resource group "app1RG" in domain partition "dp1"'. The 'Archive or Exploded Directory' section contains a note about deploying Java EE archives, Web Modules (WAR files), EJB Modules (EJB JAR files), Resource Adapter Modules (RAR files), Coherence Archives (GAR files), JDBC Modules, JMS Modules, and library files (Jar files). It also notes that an exploded archive can be deployed if present on the server. There are two radio button options: 'Archive is on the machine where this Web browser is running.' (unchecked) and 'Archive or exploded directory is on the server where Enterprise Manager is running.' (checked). The path '/u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2/medrec.ear' is entered in the input field next to the 'Browse...' button, which is highlighted with a red box.

- v. Click on **Next** then click on **Deploy**. Click on Close.
- vi. Deploy **physician.ear** file similarly from the **/u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2** location.
- vii. Deploy **chat.war** file similarly from the **/u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2** location.

## Accessing Medrec Application in Domain Partition dp1

- i. Go to Firefox and type the URL: <http://localhost:7101/dp1/medrec/>
- ii. Click on Getting Started.



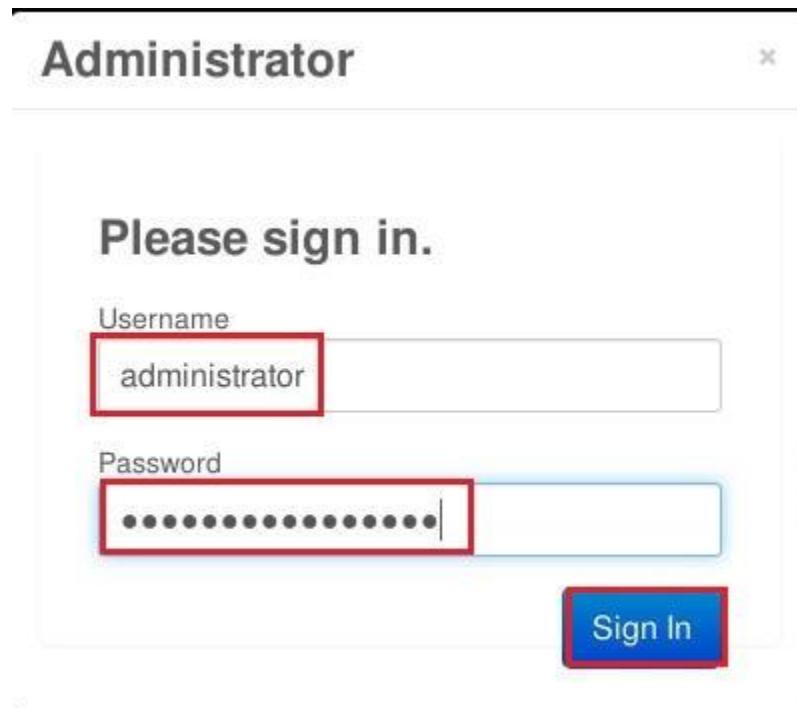
- iii. Under Patient, Click on **I'm New Here**
- iv. Enter the following or any other data then click on Submit.

Email:	<a href="mailto:weblogic@oracle.com">weblogic@oracle.com</a>
Password:	welcome1
Confirm Password:	welcome1
First Name:	Ankit
Last Name:	Pandey
Gender:	Male
DOB:	Jun 23, 1988
SSN:	123456788

Note: Make sure you not use 123456789 as SSN Number.

- v. Click on **Getting Started** again on Medrec Home Page.
- vi. Under Administrator, Click on **Login**.

- vii. Enter **administrator/administrator123** as username and password then click on **Sign In**.



The screenshot shows a login interface titled "Administrator". The main message is "Please sign in." There are two input fields: "Username" containing "administrator" and "Password" containing a series of dots. A blue "Sign In" button is at the bottom right.

- viii. Under **Pending Requests**, click on **Go**.  
ix. Click on the Email Id, and then click on **Approve**.  
x. Click on Logout. Click on Logout again.  
xi. You can login as [weblogic@oracle.com/welcome1](mailto:weblogic@oracle.com/welcome1) as username/password as Patient.  
xii. You can view your record summary, and you can also have interaction with physician.



**Patient** look up and view your visit and prescription history and edit your profile information.

The Patient application allows patients to log in, edit their profile information, or request that their profile be added to the system. Patients can also view prior medical records of visits with their physician.

**Login**

**I'm New Here**

## Configuration of Medrec Application in Domain Partition 2

In the next step we are creating the below configuration for Medrec application in domain partition dp2. We are using the same Medrec applications and same JNDI name for the Datasources, connection factory and Distributed queue but we will connect to different database. So there are two benefits of Multitenancy.

- In a domain, you can deploy the same application in two different domain partitions and there will be no JNDI conflict. You do not have to make any changes in application.
- In single domain, you can have same application deployed in two different domain partitions and connected to two databases. So both the application will have different Set of Users in our case or different set of Application Specific Data.

Virtual Target: VT-Medrec-2

Domain Partition: dp2

Resource Group app2RG

app1RG:

Datasource:	MedRec2GlobalDataSourceXA, jdbc/MedRecGlobalDataSourceXA
Mail Session:	MedRecMailSession, mail/MedRecMailSession
Persistence Store:	MedRec2-fs
JMS Server:	MedRec2JMSServer
JMS Module:	MedRec2Module
MedRecModule:	
Subdeployment:	MedRec2JMS
Connection Factory:	MedRec2ConnectionFactory, com.oracle.medrec.jms.connectionFactory
Distributed Queue:	PatientNotificationQueue com.oracle.medrec.jms.PatientNotificationQueue
Applications:	medrec.ear physician.ear chat.war

The Scripts MedrecInDP2.sh creates the Virtual Target, Domain Partition, Resource Group, JDBC Datasource, JMS Server, JMS Module, Distributed Queue and Connection Factory then deploys the medrec.ear, physician.ear and chat.war.

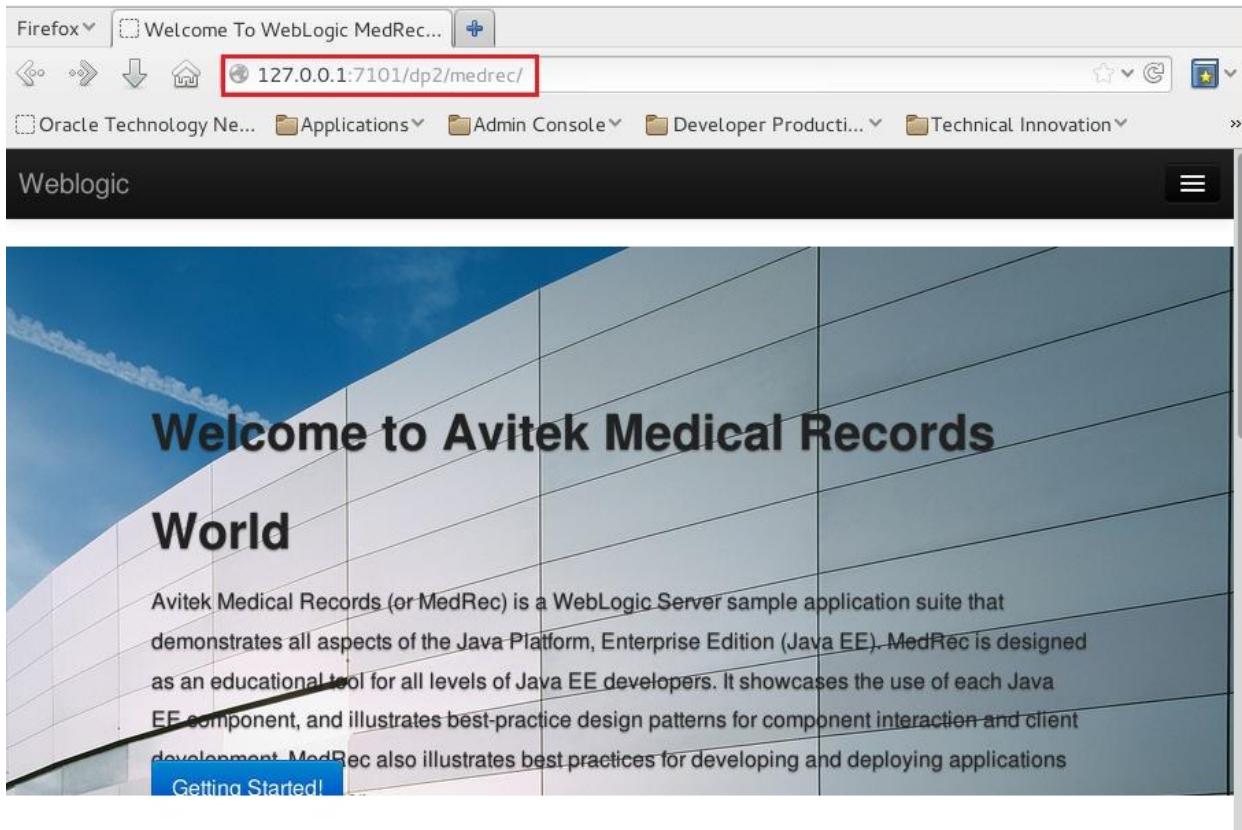
- a. Open a new tab.
- b. cd /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2
- c. ./Medrec2DB.sh (It creates the required user medrec2 in pdb2 and populates the sample data.)
- d. ./MedrecInDP2.sh
- e. Go back to Fusion Middleware Control <http://localhost:7001/em>.
- f. Verify the creation of the following resources.
  - i. Click on **WebLogic Domain ->Environment ->Virtual Target**. Here we have **dp2** as **URI Prefix** for the Virtual Target **VT-Medrec-2**.
  - ii. Click on **WebLogic Domain ->Environment ->Domain Partition**.
  - iii. Click on Domain Partition **dp2** then Select **Domain Partition -> Administration -> Resource Groups**.
  - iv. Click on Resource group **app2RG**.

- v. In the “Services” and “Deployments” tab, you can verify the creation of above System Resources here.

## Accessing Medrec Application in Domain Partition dp2

While accessing the application we need to use the Virtual Target URI. As domain partition dp2 is targeted to Virtual Target VT-Medrec-2, which has /dp2 as URI, we need to add it in URL for the accessing the application.

- a. In Firefox, type the URL: <http://localhost:7101/dp2/medrec/>



- b. As both this application has exactly same JNDI name used within application, JNDI name of Datasource, JMS connection factory, mail sessions, Distributed Queue.
- c. Click on Getting Started!
- d. Under **Patient**, Click on Login, Try to login with [weblogic@oracle.com/welcome1](mailto:weblogic@oracle.com/welcome1). You will not be able to login. As both Medrec application is connected to different database. So in Multitenant WebLogic Server, you can deploy exactly same application with same configuration but with different database and there will be no JNDI conflict in domain.

## Configuration of Day Trader application in domain partition 3

Here we will create the below configuration through WLST to Run Day Trader Application on Domain Partition dp3.

Virtual Target: VT-daytrader

Domain Partition: dp3

Resource Group app3RG

app1RG:

Datasource:

Name:	jdbc/datasources/TradeDataSource,
JNDI Name:	<b>jdbc/datasources/TradeDataSource</b>
Name:	jdbc/datasources/NoTxTradeDataSource
JNDI Name:	<b>jdbc/datasources/NoTxTradeDataSource</b>

Persistence Store: MyFileStore

JMS Server: MyJMServer

JMS Module: MyJMSModule

MyJMSModule:

Subdeployment: MySubdeployment

Connection Factory:

Name:	jms/myQueueConnectionFactory,
JNDI Name:	<b>jms/myQueueConnectionFactory</b>
Name:	jms/myTopicConnectionFactory
JNDI Name:	<b>jms/myTopicConnectionFactory</b>

Distributed Queue:

Name:	jms/TradeBrokerQueue
JNDI Name:	<b>jms/TradeBrokerQueue</b>

Distributed Topic:

Name:	jms/TradeStreamerTopic
JNDI Name:	<b>jms/TradeStreamerTopic</b>

Applications: web-3.0.0.war

This DayTraderInDP3.sh creates the Virtual Target, Domain Partition, Resource Group, JDBC Datasource, JMS Server, JMS Module, Distributed Queue and Connection Factory then deploys the web-3.0.0.war.

- a. cd / u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab2
- b. ./DayTrader3DB.sh (It creates the required user for pdborcl database.)
- c. ./DayTraderInDP3.sh
- d. Go back to Fusion Middleware Control <http://localhost:7001/em>
- e. Verify the creation of the following resources.
  - i. Click on **WebLogic Domain ->Environment ->Virtual Target**. Here we have **dp3** as **URI Prefix** for the Virtual Target **VT-daytrader**.
  - ii. Click on **WebLogic Domain ->Environment ->Domain Partition**.
  - iii. Click on Domain Partition to **dp3** then Select **Domain Partition -> Administration -> Resource Groups**.
  - iv. Click on Resource group **app3RG**.
  - v. In **Services** and **Deployments** tab, you can verify the creation of above System Resources here.

## **Access Day Trader Application in Domain Partition dp3**

- a. Go to Firefox and type the URL: <http://localhost:7101/dp3/daytrader/>
- b. We will not test here the application behavior. The application is loaded and is running inside partition.

You can create many domain partitions in WebLogic 12.2.1. Your application does not require any specific application development. Your application which is working in previous version of WebLogic 12c, you can deploy them in multitenant environment without modifying the application. Daytrader application is developed by IBM which we deployed in domain partition dp3. So you can also easily deployed application build on different platform to WebLogic Server.

## LAB 3: SECURITY ISOLATION

### Overview

A security realm comprises mechanism for protecting WebLogic resources. Each security realm consists of a set of configured security providers, users, groups, security roles, and security policies. You use realms to configure authentication, authorization, role mapping, credential mapping, auditing and other services.

WebLogic Server traditionally supports multiple realms in a domain configuration, but only one realm—typically referred to as the “default realm” or “admin realm”—can be active at any given time.

In contrast, WebLogic Server MT supports multiple active realms and allows each partition to execute against a different realm.

This means that a partition can have unique security providers, users, groups, security roles and security policies. Resources and applications in the domain partition are available to only to users within the domain partition’s security realm. Other tenants cannot see or access the resources or applications.

Note: Partition can share a security realm, with consequent loss of independence isolation. In particular if you do not specify a realm when you create a partition, the default realm is shared with the partition and there is no security isolation between the partition and the domain.

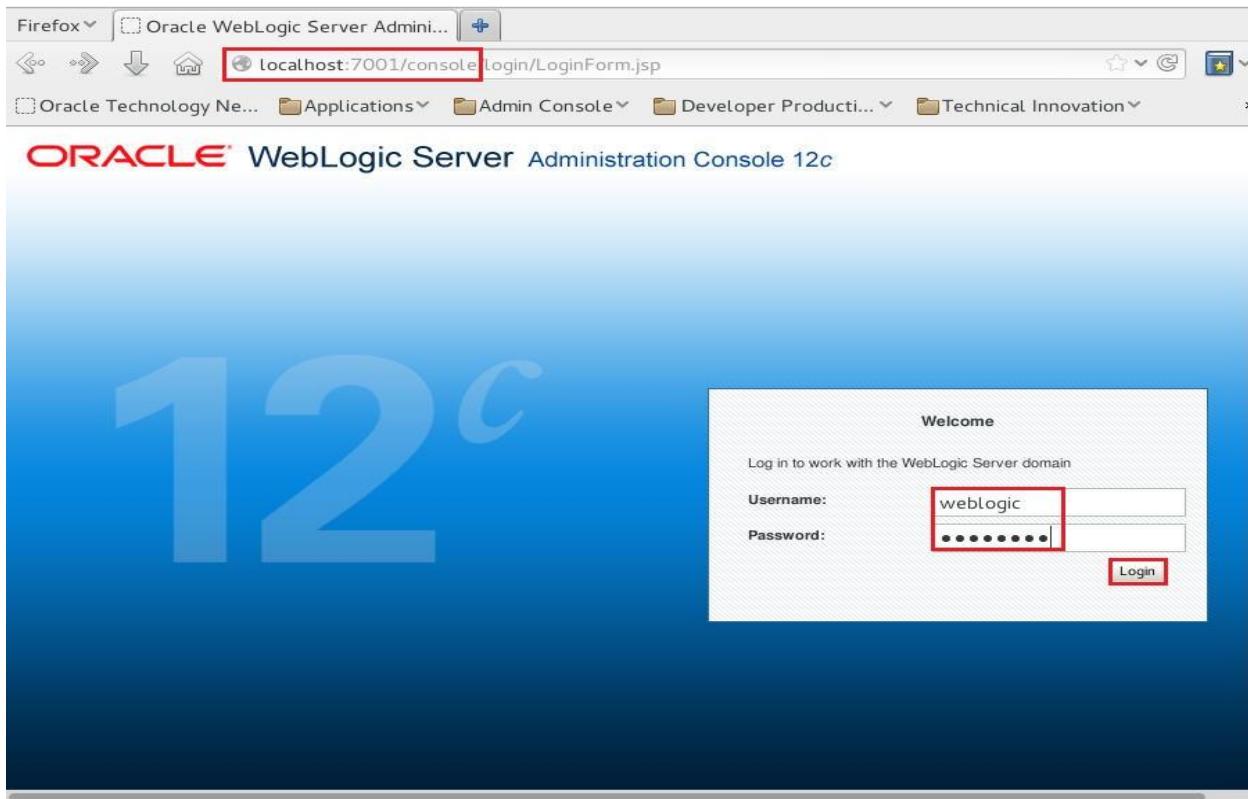
In this Lab, first we will create a new security realm then we will assign the security realms to a partition dp1. So we will have two security realms in our domain one which we created and one is default security realm. Domain partition dp1 will have new security realm and other domain partitions will have default security realm. Default security realm has a user administrator with password administrator123. And new security realm will have user administrator with password welcome1. So Medrec application deployed in dp1 can be used by users of new security realm. You will not be able to login as an Admin in Medrec Application with default security realm user (administrator/administrator123).

In this lab we are going to perform the following operations:

- Creation of New Security Realm.
- Assigning a new Security realm to Domain Partition.
- Medrec application deployed in two different domain partitions which are using two different security realms in single domain.

## Creating a New Security Realm

- i. The creation of Security Realm is more automated still inside WebLogic Console versus Fusion Middleware Control. This is why we will use WebLogic Console for that action. Go to Firefox and type the WebLogic Admin Console URL: <http://localhost:7001/console>.
- ii. Enter **weblogic/welcome1** as username/password then click on Login.



- iii. Under Domain Structure, click on **Security Realms**.

A screenshot of the Oracle WebLogic Server Administration Console 12c home page. The left sidebar shows a 'Domain Structure' tree with nodes like 'base\_domain', 'Environment', 'Deployments', 'Services', and 'Security Realms' (which is highlighted with a red box). The main content area has sections for 'Home Page', 'Information and Resources', 'Helpful Tools' (with links to 'Configure applications', 'Configure GridLink for RAC Data Source', etc.), and 'General Information' (with links to 'Common Administration Task Descriptions', 'Read the documentation', etc.). A red box highlights the 'Security Realms' link in the domain structure tree.

- iv. Click on **New**.
- v. Enter **mynewrealm** as Name; check the box for “**Create default providers within new realm**” and “**Ignore Deploy Credential Mapping**” then click on **OK**.

**Create a New Realm**

**Realm Properties**

The following properties will be used to identify your new realm.

\* Indicates required fields

What would you like to name your new realm?

\* Name:

Valid security realms must include a number of providers, each of which is responsible for some aspect of the overall security framework. You can use either the WebLogic Server supplied providers or your own custom providers.

**Create default providers within this new realm**

To avoid overwriting new credential mapping information with old information in a weblogic-ra.xml deployment descriptor file, check the Ignore Deploy Credential Mapping setting below.

**Ignore Deploy Credential Mapping**

- vi. Click on **mynewrealm**.
- vii. Click on **Users and Groups -> Users** tab.

**Settings for mynewrealm**

Configuration **Users and Groups** Credential Mappings Providers Migration

**Users** Groups

This page displays information about each user that has been configured in this security realm.

Customize this table

Users (Filtered - More Columns Exist)

	Name	Description	Provider
There are no items to display			

New Delete Showing 0 to 0 of 0 Previous | Next

- viii. Click on New.
- ix. Enter the following then click on OK.

Name: administrator  
 Description: Domain Partition 2 users  
 Provider: Default Authenticator  
 Password: welcome1  
 Confirm Password: welcome1

Create a New User

OK Cancel

**User Properties**

The following properties will be used to identify your new User.

\* Indicates required fields

What would you like to name your new User?

\* Name: **administrator**

How would you like to describe the new User?

Description: **Domain Partition 2 users**

Please choose a provider for the user.

Provider: **DefaultAuthenticator**

The password is associated with the login name for the new User.

\* Password: **\*\*\*\*\***

\* Confirm Password: **\*\*\*\*\***

OK Cancel

## Assign the mynewrealm security realm to domain partition dp1.

- i. Click on **Domain Partitions**, then on **Control** tab.
- ii. Check the box near dp1 and click on **Shutdown ->Force Shutdown Now**.

The screenshot shows the Oracle WebLogic Server Administration Console interface. On the left, there's a sidebar with 'Domain Structure' showing 'base\_domain' with 'Domain Partitions' selected. The main area is titled 'Summary of Domain Partitions' with tabs for 'Configuration' and 'Control'. The 'Control' tab is active. It displays a table of domain partitions (dp1, dp2, dp3) with columns for Name, Default Target, Status, and Status of Last Action. A dropdown menu under the 'Shutdown' column for dp1 is open, with 'Force Shutdown Now' highlighted. The status for dp1 is shown as 'RUNNING' with 'TASK COMPLETED' last action.

- iii. Once domain partition shutdown, click on dp1.
- iv. In Configuration-> General tab, Under Use Realm, select **mynewrealm** then click on **Save**.

The screenshot shows the 'Settings for dp1' configuration page. At the top, there are two tabs: 'Configuration' (highlighted with a red box) and 'Resource Groups', followed by other tabs like Deployments, Services, etc. Below that, there are sub-tabs: Work Manager, Concurrent Templates, Monitoring, Notes, General (highlighted with a red box), Available Targets, File Systems, JTA, Concurrency, and Partition Work Manager. There's also a 'Resource Management' link. A 'Save' button is at the bottom left. The main content area is titled 'Select Default Targets:' and shows two panes: 'Available' (empty) and 'Chosen' (containing 'VT-Medrec-1'). Below this, there's a 'Use Realm:' dropdown set to 'mynewrealm' (highlighted with a red box). At the bottom, there's a 'Primary Identity Domain:' field containing 'idd\_dp1'.

- v. Click on **Domain Partitions**, then on **Control** tab.
- vi. Select the box near dp1 and click on **Start**.

The screenshot shows the Oracle WebLogic Server Administration Console interface. On the left, there's a navigation tree under 'Domain Structure' for 'base\_domain' with 'Domain Partitions' selected. A red box highlights this selection. On the right, the 'Control' tab of the 'Summary of Domain Partitions' page is active. It displays a table of domain partitions:

Name	Default Target(s)	State	Status of Last Action
<input checked="" type="checkbox"/> dp1	VT-Medrec-1	SHUTDOWN	TASK COMPLETED
<input type="checkbox"/> dp2	VT-Medrec-2	RUNNING	TASK COMPLETED
<input type="checkbox"/> dp3	VT-daytrader	RUNNING	TASK COMPLETED

## Verified that we have two security realms in different domain partition in single domain

- i. Go to Firefox and type the URL: <http://localhost:7101/dp1/medrec/index.xhtml>
- ii. Under Administrator, click on Login.
- iii. Login with old security realm credential that is administrator/administrator123.
- iv. You must get “Incorrect username or password!”
- v. Login with new security realm credential that is administrator/welcome1.
- vi. Click on Logout. Click on Logout again.
- vii. Go to Firefox and type the URL: <http://localhost:7101/dp2/medrec/index.xhtml>
- viii. Under Administrator, click on Login.
- ix. Login with new security realm credential that is administrator/welcome1.
- x. You must get “Incorrect username or password!”
- xi. Login with old security realm credential that is administrator/administrato123.
- xii. Click on Logout. Click on Logout again.

Here we learned how you can have two security realms in a domain. So one of your domain partitions can use default security realm and other can use custom security realm created by you in same domain.

## LAB 4: EXPORT/IMPORT DOMAIN PARTITION

### Overview

Exporting and importing partitions let WLS system administrators easily move partitions from one domain to another, including the applications that are deployed to the partition. This feature is useful for replicating partitions across the domains and for moving domains from a development to a testing then production environment.

Exporting a domain partition creates a partition backup and stores it in an archived format. You can export a domain partition from source domain with its entire configuration and data. With few configuration changes, you can then import the partition archive into another instance of multi-tenant WLS (the target domain). You might need to update any domain dependencies, such as targets and security realms, and optionally update other attributes in the partition configuration to make it valid.

When a partition is exported from the source domain it is packaged in a partition archive. Included in the partition archive is:

- The partition configuration.
- Any resource group contained in the partitions.
- Any resource group templates referred to by those resource groups.
- The contents of the file system, <partition-file-system>/config directory.
- Optionally, application binaries and configuration for applications deployed to the partition.

No application runtime state or application-specific runtime configuration is included in the partition archive. Examples of what would not be exported are JMS messages in queues, users in an embedded LDAP realm.

In this Lab, We will create a Non-JRF domain dev\_domain and configure it with all required resources for Medrec application. You will remove domain partition dp1 from base\_domain. As this domain partition is targeted to Virtual Target VT-Medrec-1 and we are going to import a new domain partition on this Virtual target. So we need to remove this domain partition dp1 for this Lab2.

We are going to learn the following:

- Exporting a domain partition from a Non-JRF domain dev\_domain and importing it to a Restricted JRF domain base\_domain.

**Note:** To simplify import/export both domains contain Virtual Target with the same name. In our case, base\_domain and dev\_domain has VT-Medrec-1 as Virtual Target. It is possible to make import/export without that restriction. To import partition and bind it to virtual target of different name, you should modify settings inside associated “\*-attributes.JSON” file

Please remember that Virtual Target may be assigned to the one and only one domain partition. This is why before importing please ensure that original domain partition “dp1” was completely removed from domain configuration (don’t miss step c on page 47!)

## Stop and remove domain partition dp1 from base\_domain.

- In Fusion Middleware Control <http://localhost:7001/em>, Click on **WebLogic Domain -> Environment -> Domain Partition**.
- Check the **box** near **dp1** then click on **Control -> Stop->Force Stop Now**. On the Confirmation Screen Click on **OK**. Once you see the message "**Partition state after the operation is SHUTDOWN**" then click on **Close**.

Name	Status	OTD Partition	Realm	Default Targets	Available Targets
dp1	Up (3)	dp1	When work completes	VT-Medrec-1	VT-Medrec-1
dp2	Running	dp2	Force stop now	VT-Medrec-2	VT-Medrec-2
dp3	Running	dp3		VT-daytrader	VT-daytrader

- c. Check the box near **dp1** and make it highlighted then click on **Delete**. In Delete Domain Partition Screen, click on OK.

The screenshot shows the Oracle Enterprise Manager interface for a WebLogic Domain named 'base\_domain'. The 'Domain Partitions' section is displayed. Two pie charts are shown: 'Status' (Up 2, Down 1) and 'State' (Running 2, Shutdown 1). Below the charts is a table of domain partitions. The row for 'dp1' is selected and highlighted with a red box. The 'Delete' button in the toolbar above the table is also highlighted with a red box. The table columns include Name, Status, State, OTD Partition, Realm, Default Targets, and Available Targets. The data in the table is:

Name	Status	State	OTD Partition	Realm	Default Targets	Available Targets
dp1		Shutdown		mynewrealm	VT-Medrec-1	VT-Medrec-1
dp2		Running			VT-Medrec-2	VT-Medrec-2

- d. Go to Firefox and type the URL: <http://localhost:7101/dp1/medrec/>  
e. Confirm that page return “Error 404—Not Found”.

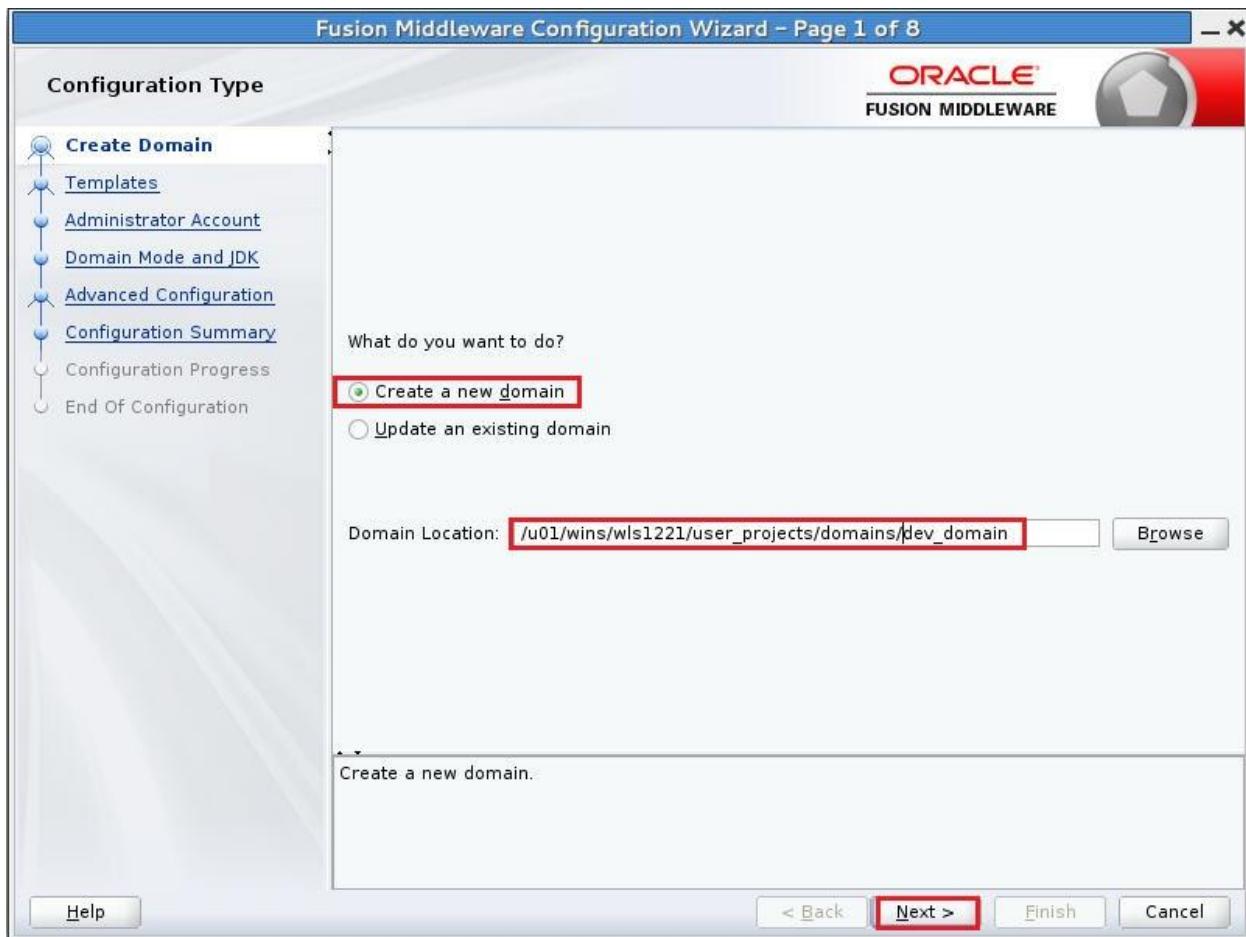
The screenshot shows a Firefox browser window with the following details:

- Address bar: [localhost:7101/dp1/medrec/](http://localhost:7101/dp1/medrec/) (highlighted with a red box)
- Page title: Error 404--Not Found
- Content area: A box labeled "Error 404--Not Found" is highlighted with a red box.
- Page footer: From RFC 2068 Hypertext Transfer Protocol -- HTTP/1.1:  
**10.4.5 404 Not Found**  
The server has not found anything matching the Request-URI. No indication is given of whether the condition is temporary or permanent.  
If the server does not wish to make this information available to the client, the status code 403 (Forbidden) can be used instead. The 410 (Gone) status code SHOULD be used if the server knows, through some internally configurable mechanism, that an old resource is permanently unavailable and has no forwarding address.

## Create a new dev single server (Admin Server) domain

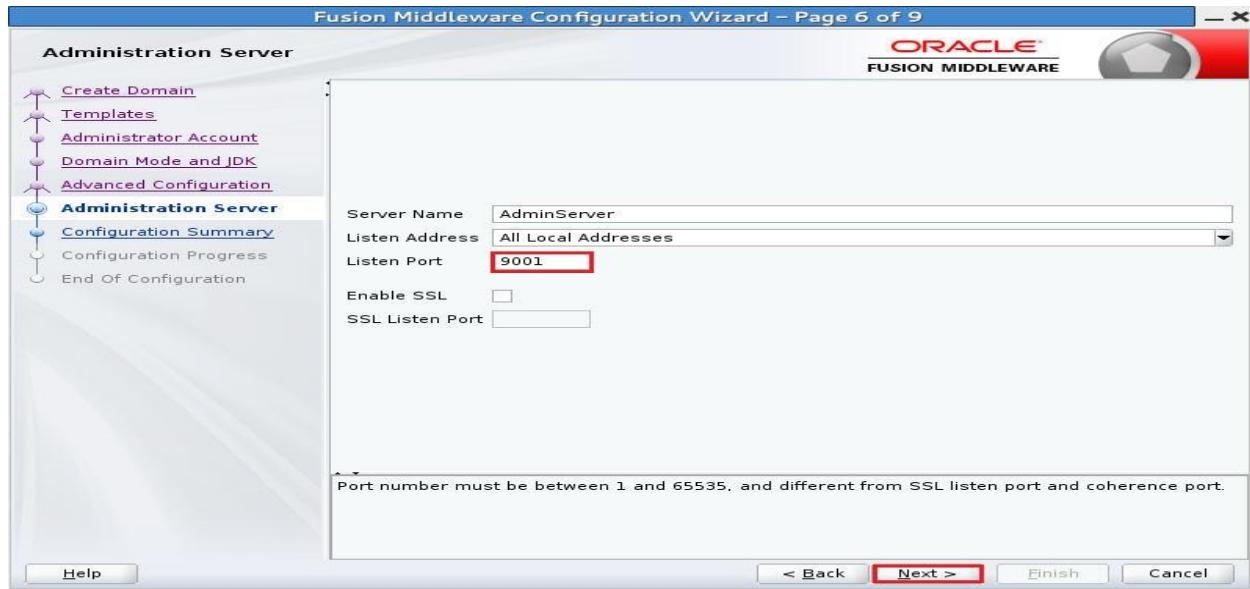
We are going to create a domain which contains only Admin Server, as the previous domain base\_domain is created with RESTRICTED-JRF template. But this domain will be created by default template that is with basic template.

- a. Open a new tab.
- b. cd /u01/wins/wls1221/oracle\_common/common/bin/
- c. ./config.sh
- d. Select “Create a new domain” and Enter “/u01/wins/wls1221/user\_projects/domains/dev\_domain” as Domain Location then click on **Next**.



- e. Leave Default on Templates then click on **Next**.
- f. Enter **weblogic/welcome1** as Name/Password in Administrator Account then click on **Next**.
- g. Leave default on Domain Mode and JDK then click on **Next**.
- h. Check the box near to Administration Server then click on **Next**.

- i. In Administration Server, Enter 9001 as Listen Port then click on **Next**.



- j. Click on **Create** then click on **Next**. Click on **Finish**.

### Configure domain for Medrec Application.

In Lab 2, you configure the domain using Fusion Middleware console, but here we are going to configure domain using Weblogic Admin Console. The operation related to Multitenancy, we can also perform using WebLogic Admin Console.

- cd /u01/wls/wls1221/user\_projects/domains/dev\_domain/
- ./startWebLogic.sh
- In Tab, Click on Terminal -> Set Title, Enter **dev\_admin** as Title then Click on OK.
- Go to Firefox and type the WebLogic Admin Console URL:  
<http://localhost:9001/console>.
- Enter **weblogic/welcome1** as **Username/Password** then click on Login.
- Creation of Virtual Target.
  - Click on **Environment -> Virtual Targets**.



- ii. Click on New.
- iii. Enter the following then click on **OK**.
 

Name:	VT-Medrec-1 (Both Virtual Target Name will be same)
Target:	Admin Server
URI Prefix:	/devDP

Home >Summary of Virtual Targets

Create a New Virtual Target

**OK** | **Cancel**

**Virtual Target Properties**

The following properties will be used to identify your new virtual target.

What would you like to name your new virtual target?

**Name:** **VT-Medrec-1**

Select one managed server or cluster on which you would like to deploy this virtual target

**Target:** **AdminServer**

Enter one or more hostnames, each on separate lines within the text box.

**Host Names:**

Enter an URI prefix starting with a / (forward slash).

**URI Prefix:** **/devDP**

- g. Creation of Domain Partition.
- i. Click on **Domain Partition -> New**.

ORACLE WebLogic Server Administration Console 12c

Change Center

View changes and restarts

Configuration editing is enabled. Future changes will automatically be activated as you modify, add or delete items in this domain.

Domain Structure

- dev\_domain
  - + **Domain Partitions**
  - Environment
  - Servers
  - Clusters
  - Coherence Clusters
  - Resource Groups
  - Resource Group Templates
  - Machines
  - Virtual Hosts
  - Virtual Targets
  - Work Managers
  - Concurrent Templates
  - Resource Management

How do I...

- Create Domain Partitions
- Configure Domain Partition General Settings
- Export partitions
- Import partitions

System Status

Health of Running Servers

Home >Summary of Virtual Targets >Summary of Domain Partitions

Welcome, weblogic | Connected to: dev\_domain

**Summary of Domain Partitions**

**Configuration** | **Control**

Domain partitions are an administrative and runtime slice of a WebLogic domain that is dedicated to running application instances and related resources for a tenant.

This page summarizes the domain partitions that have been configured in the current WebLogic Server domain.

**Customize this table**

**Domain Partitions (Filtered - More Columns Exist)**

<b>New</b>	<b>Delete</b>	<b>Import</b>	<b>Export</b>	Showing 0 to 0 of 0 Previous   Next
<b>Name</b>	<b>Resource Groups</b>	<b>Default Target(s)</b>	<b>State</b>	
There are no items to display				

**New** | **Delete** | **Import** | **Export** | Showing 0 to 0 of 0 Previous | Next

- ii. Enter **Medrec-Dev** as Name and **unchecked** the box for **Default Resource Group**. Click on **Next**.
- iii. Check the box for **VT-Medrec-1** then click on **Next**.
- iv. In Default Targets, Move **VT-Medrec-1** to Chosen. Click on **Finish**.

**Create a New Domain Partition**

**Back** **Next** **Finish** **Cancel**

**Domain Partition Configuration**

The following properties will be used to configure your new domain partition.

**Default Targets:**

**Available:** [Empty list]

**Chosen:**  VT-Medrec-1

Navigation icons: >>> <<< ▲ ▼

**Security**: Not assigned

**Realm:** Not assigned

Partition File System

- v. In **Domain Partition -> Control tab**, check the box near Medrec-Dev and click on Start.

**Summary of Domain Partitions**

**Configuration** **Control**

This page lists the state of the domain partitions in this WebLogic Server domain.

Domain Partitions				
Start	Resume	Suspend	Shutdown	Showing 1 to 1 of 1 Previous   Next
<input checked="" type="checkbox"/> Medrec-Dev	VT-Medrec-1	SHUTDOWN	None	<a href="#">Start</a> <a href="#">Resume</a> <a href="#">Suspend</a> <a href="#">Shutdown</a>

h. Creation of Resource Group

- i. Click on domain partition **Medrec-Dev**.
- ii. Click on **Resource Groups -> Configuration tab** then click on New.

This page summarizes the resource groups of a domain partition that have been configured in the current WebLogic Server domain.

Name	Resource Group Template	Effective Targets	State	Notes
There are no items to display				

- iii. Enter **appRG** as Name, Leave others as default then click on **OK**.

Note: We have created script through which you can create the remaining resources, you need to run the file **MedrecInMedrec-Dev.sh** inside **/u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab4**, and then you can directly go to **Exporting the domain partition** section.

i. Creation of Data Source.

- i. Click on **dev\_domain -> Services -> Data Sources** then click on **New-> Generic Data Sources**.

A JDBC data source is an object bound to the JNDI tree that provides database connectivity through a pool of JDBC connections. Applications can look up a data source on the JNDI tree and then borrow a database connection from a data source.

Type	JNDI Name	Targets	Scope	Domain Partitions
There are no items to display				

ii. Enter the following and click on **Next**.

Name: MedRecGlobalDataSourceXA  
JNDI Name: jdbc/MedRecGlobalDataSourceXA  
Scope: appRG in Medrec-Dev  
Database Type: Oracle

Create a New JDBC Data Source

Back | **Next** | Finish | Cancel

**JDBC Data Source Properties**

The following properties will be used to identify your new JDBC data source.

\* Indicates required fields

What would you like to name your new JDBC data source?

\* Name: **MedRecGlobalDataSourceXA**

What scope do you want to create your data source in ?

Scope: **appRG in Medrec-Dev**

What JNDI name would you like to assign to your new JDBC Data Source?

JNDI Name: **jdbc/MedRecGlobalDataSourceXA**

What database type would you like to select?

Database Type: **Oracle**

iii. Select “**Oracle’s Driver (Thin XA) for Service connections; Version: Any**” then click on **Next**.

iv. In Transaction Options, click on **Next**.

v. Enter the following and click on **Next**.

Database Name:	pdborcl
Host Name:	localhost
Port:	1521
Database User Name:	medrec1
Password:	medrec1

**Create a New JDBC Data Source**

Back | **Next** | Finish | Cancel

**Connection Properties**

Define Connection Properties..

What is the name of the database you would like to connect to?

**Database Name:**

What is the name or IP address of the database server?

**Host Name:**

What is the port on the database server used to connect to the database?

**Port:**

What database account user name do you want to use to create database connections?

**Database User Name:**

What is the database account password to use to create database connections?

**Password:**

**Confirm Password:**

- vi. Click on **Test Configuration** and verify the connectivity.  
 vii. Click on **Next** then Click on **Finish**.

j. Creation of JMS Server.

- i. Click on **Services -> Messaging -> JMS Servers**.
- ii. Click on **New**.

**ORACLE WebLogic Server Administration Console 12c**

Change Center

**View changes and restarts**

Configuration editing is enabled. Future changes will automatically be activated as you modify, add or delete items in this domain.

Domain Structure

- dev\_domain
  - + Domain Partitions
  - + Environment
  - Deployments
  - Services**
    - ↳ **Messaging**
      - JMS Servers**
      - Store-and-Forward Agents
      - JMS Modules
      - Path Services
      - + Bridges
      - Data Sources
      - Persistent Stores
      - Foreign JNDI Providers

How do I...
 
  - Configure JMS servers
  - Configure JMS system modules

Home Log Out Preferences Record Help

Welcome, weblogic | Connected to: dev\_domain

Home >Summary of Virtual Targets >Summary of Domain Partitions >Medrec-Dev >Summary of JDBC Data Sources >Summary of JMS Servers

**Summary of JMS Servers**

JMS servers act as management containers for the queues and topics in JMS modules that are targeted to them. This page summarizes the JMS servers that have been created in the current WebLogic Server domain.

Customize this table

**JMS Servers (Filtered - More Columns Exist)**

<input type="checkbox"/>	Name	Persistent Store	Target	Current Target	Health	Scope	Domain Partitions
There are no items to display							

iii. Enter the following and click on **Next**.

Name: DevJMServer  
Scope: appRG in Medrec-Dev

Create a New JMS Server

Back Next Finish Cancel

**JMS Server Properties**

The following properties will be used to identify your new JMS Server.  
\* Indicates required fields

What would you like to name your new JMS Server?

\* Name: **DevJMServer**

Would you like this new JMS Bridge Destination to be restricted to a specific resource group template or resource group ?

Scope: **appRG in Medrec-Dev**

Back **Next** Finish Cancel

iv. Click on **Create a New Store**.

v. Select “File Store” as Type then click on **Next**.

vi. Enter “MedrecDev-fs” as Name and “appRG in Medrec-Dev” as Scope then click on **Next**. Click on **Finish**.

Create a New JMS Server

Back Next Finish Cancel

**File Store Properties**

The following properties will be used to identify your new file store.  
\* Indicates required fields

What would you like to name your new file store?

\* Name: **MedrecDev-fs**

What scope do you want to create your jms file store in ?

Scope: **appRG in Medrec-Dev**

The pathname to the directory on the file system where the file store is kept. This directory must exist on your system, so be sure to create it before completing this tab.

Directory:

Back **Next** Finish Cancel

vii. Select “**MedrecDev-fs**” as Persistent Store then click on **Next**.



viii. Click on **Finish**.

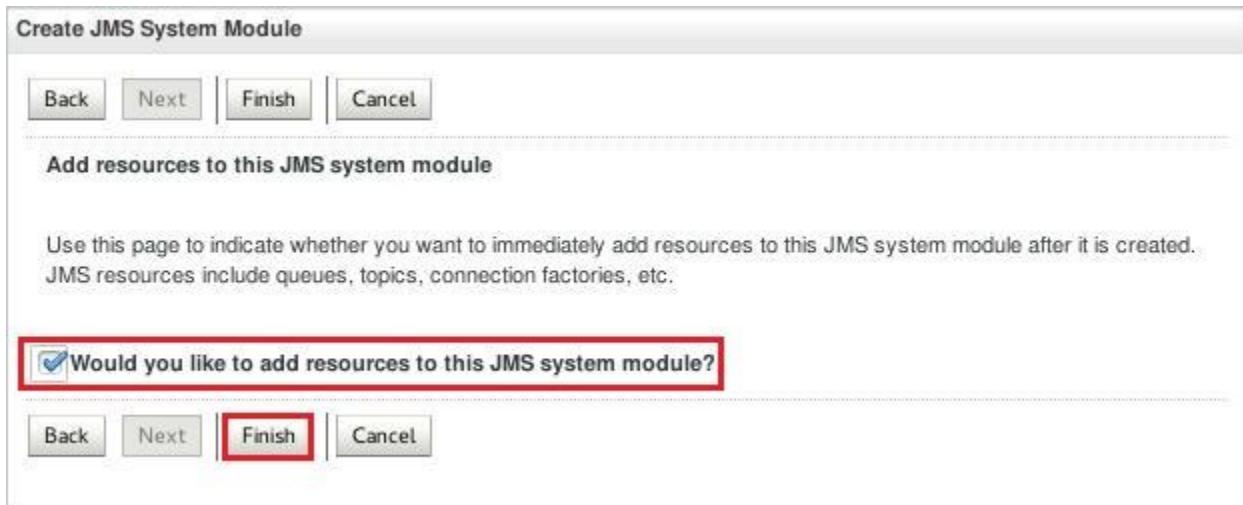
k. Creation of JMS Module.

i. Click on **Services -> Messaging -> JMS Modules** then click on **New**.

The screenshot shows the Oracle WebLogic Server Administration Console. The title bar says 'ORACLE WebLogic Server Administration Console 12c'. The left sidebar has a 'Change Center' section with 'View changes and restarts' and a 'Domain Structure' section showing 'dev\_domain' with its sub-components like 'Domain Partitions', 'Environment', 'Deployments', 'Services' (which is expanded to show 'Messaging', 'JMS Servers', 'Store-and-Forward Agents', and 'JMS Modules'), 'Path Services', 'Bridges', 'Data Sources', 'Persistent Stores', and 'Foreign JNDI Providers'. Below this is a 'How do I...' section with links to 'Configure JMS system modules' and 'Configure resources for JMS system modules'. The main content area is titled 'Summary of JMS Modules'. It contains a summary text about JMS system resources and a table titled 'JMS Modules' with columns 'Name', 'Type', 'Scope', and 'Domain Partitions'. The table is currently empty, showing the message 'There are no items to display'. There are 'New' and 'Delete' buttons at the top of the table.

ii. Enter **DevJMSModule** as Name and “**appRG in Medrec-Dev**” then click on **Next**.

- iii. Check the box for “Would you like to add resources to this JMS system module” then click on **Finish**.



- I. Creation of Subdeployment.  
i. Select **Subdeployments** tab then click on New.

The screenshot shows a page titled "Settings for DevJMSModule". At the top, there are four tabs: "Configuration", "Subdeployments" (which is highlighted with a red border), "Security", and "Notes". Below the tabs, a note states: "This page displays subdeployments created for a JMS system module. A subdeployment is a mechanism by which JMS module resources (such as queues, topics, and connection factories) are grouped and targeted to a server resource (such as JMS servers, server instances, or cluster)". Below the note, there is a link "Customize this table". Under the heading "Subdeployments", there is a table with columns: "Name" (with a sort arrow), "Resources", and "Targets". The table is empty, showing the message "There are no items to display". There are "New" and "Delete" buttons above the table, and "Showing 0 to 0 of 0 Previous | Next" links below it.

- ii. Enter **DevMedrecJMS** as Name then click on **Next**.  
iii. Select **DevJMSServer** as Target then click on **Finish**.

- m. Creation of Connection Factory.
- Click on Configuration tab then click on New.

**Settings for DevJMSModule**

Configuration	Subdeployments	Security	Notes																								
This page displays general information about a JMS system module and its resources. It also allows you to configure new resources and access existing resources.																											
Name:	DevJMSModule																										
			The name of this JMS system module. <a href="#">More Info...</a>																								
Scope:	appRG in Medrec-Dev																										
			Specifies if the JMS system module is accessible within the domain, a partition, or a resource group template. <a href="#">More Info...</a>																								
Descriptor File Name:	partitions/Medrec-Dev/jms/devjmsmodule-jms.xml																										
The name of the JMS module descriptor file. <a href="#">More Info...</a>																											
This page summarizes the JMS resources that have been created for this JMS system module, including queue and topic destinations, connection factories, JMS templates, destination sort keys, destination quota, distributed destinations, foreign servers, and store-and-forward parameters.																											
<p>Customize this table</p> <p><b>Summary of Resources</b></p> <table border="1"> <thead> <tr> <th>New</th> <th>Delete</th> <th colspan="4">Showing 0 to 0 of 0 Previous   Next</th> </tr> <tr> <th><input type="checkbox"/></th> <th>Name </th> <th>Type</th> <th>JNDI Name</th> <th>Subdeployment</th> <th>Targets</th> </tr> </thead> <tbody> <tr> <td colspan="6">There are no items to display</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>New</th> <th>Delete</th> <th colspan="4">Showing 0 to 0 of 0 Previous   Next</th> </tr> </thead> </table>				New	Delete	Showing 0 to 0 of 0 Previous   Next				<input type="checkbox"/>	Name	Type	JNDI Name	Subdeployment	Targets	There are no items to display						New	Delete	Showing 0 to 0 of 0 Previous   Next			
New	Delete	Showing 0 to 0 of 0 Previous   Next																									
<input type="checkbox"/>	Name	Type	JNDI Name	Subdeployment	Targets																						
There are no items to display																											
New	Delete	Showing 0 to 0 of 0 Previous   Next																									

- Select the box for Connection Factory then click on **Next**.
  - Enter **DevMedRecConnectionFactory** as Name and **com.oracle.medrec.jms.connectionFactory** and leave other default then click on **Next**.
  - Click on **Finish**.
- n. Creation of Distributed Queue.
- Click on New.
  - Select the box for Distributed Queue then click on **Next**.
  - Enter **PatientNotificationQueue** as Name and **com.oracle.medrec.jms.PatientNotificationQueue** as JNDI Name and leave other default then click on **Next**.

- iv. Click on **Advanced Targeting**, Select DevMedrecJMS as Subdeployments and DevJMSServer as Targets then click on **Finish**.

**Create a New JMS System Module Resource**

Back | Next | **Finish** | Cancel

The following properties will be used to target your new JMS system module resource

Use this page to select a subdeployment to assign this system module resource. A subdeployment is a mechanism by which JMS resources are grouped and targeted to a server instance, cluster, or SAF agent. If necessary, you can create a new subdeployment by clicking the **Create a New Subdeployment** button. You can also reconfigure subdeployment targets later by using the parent module's subdeployment management page.

Select the subdeployment you want to use. If you select (none), no targeting will occur.

**Subdeployments:** **DevMedrecJMS** ▾ Create a New Subdeployment

What targets do you want to assign to this subdeployment?

**Targets:** **DevJMSServer** ▾

Back | Next | **Finish** | Cancel

- o. Creation of Mail Session.  
i. Click on **Services -> Mail Sessions**.



- ii. Click on **New**.  
iii. Enter the following then click on **Next**.
- |            |                        |
|------------|------------------------|
| Name:      | MedRecMailSession      |
| JNDI Name: | mail/MedRecMailSession |
| Scope:     | appRG in Medrec-Dev    |

**Create a New Mail Session**

Back **Next** Finish Cancel

**Mail Session Properties**

The following property will be used to identify your new mail session.

\* Indicates required fields

What would you like to name your new mail session?

\* Name: **MedRecMailSession**

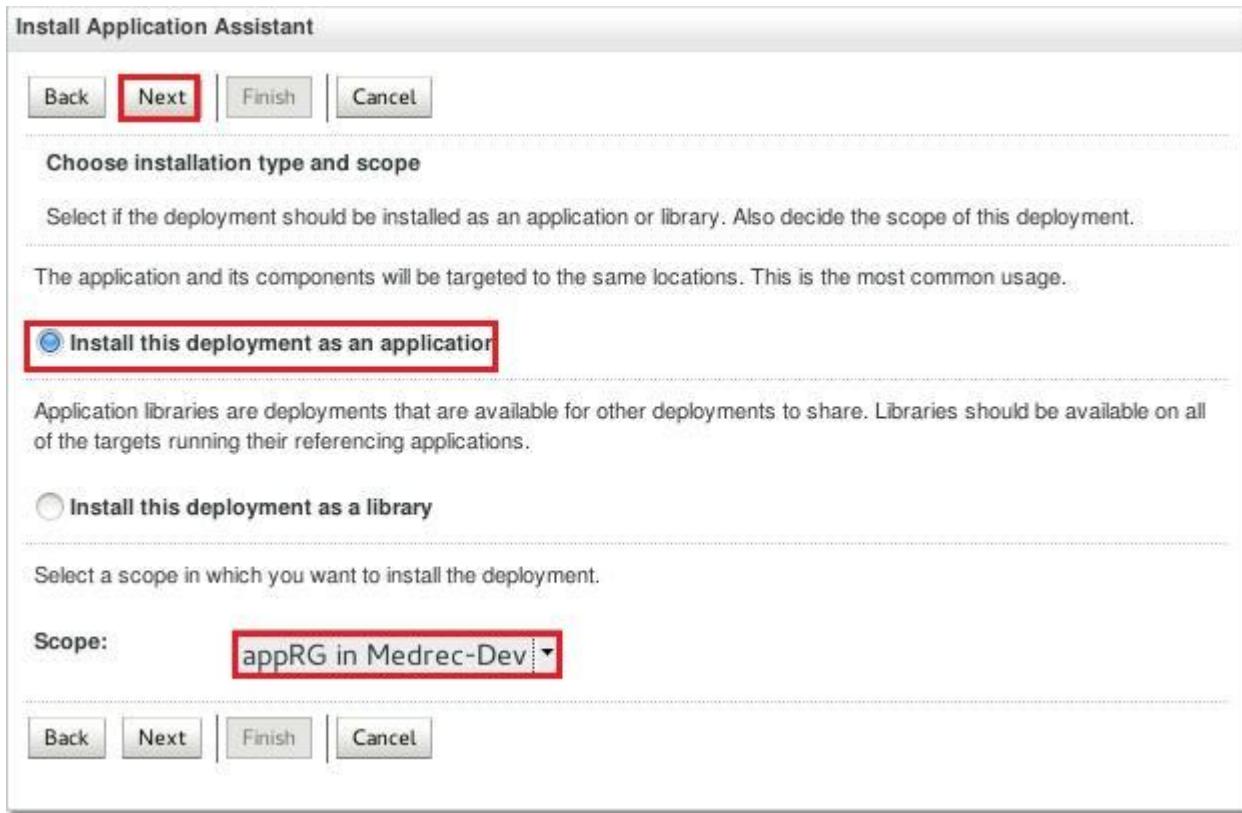
\* JNDI Name: **mail/MedRecMailSession**

What scope do you want to create your mail session in ?

Scope: **appRG in Medrec-Dev**

- iv. Click on **Finish**.
- p. Deployments of Application
- Click on **Deployments** then on **Install**.
  - Select the medrec.ear application from the Path /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab4/ then click on **Next**.

- iii. Select “**Install this deployment as an application**” and “**appRG in Medrec-Dev**” as Scope then click on **Next**. Click on **Finish**.



- iv. Click on **Install** then Select the physician.ear application from the Path /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab4/ then click on **Next**.
- v. Select “**Install this deployment as an application**” and “**appRG in Medrec-Dev**” as Scope then click on **Next**. Click on **Finish**.
- vi. Click on **Install** then Select the chat.war application from the Path /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab4/ then click on **Next**.
- vii. Select “**Install this deployment as an application**” and “**appRG in Medrec-Dev**” as Scope then click on **Next**. Click on **Finish**.
- viii. Go to Firefox and type the URL: <http://localhost:9001/devDP/medrec/> and confirm the execution of application.

## Exporting the domain partition

- Go back to admin console <http://localhost:9001/console/> of dev\_domain.
- Click on **Domain Partition**, and then check the box near to “**Medrec-Dev**” then click on Export.

Summary of Domain Partitions

Name	Resource Groups	Default Target(s)	State
Medrec-Dev	appRG	VT-Medrec-1	RUNNING

- Select the box for “**Include Application Bits**” and enter **/home/oracle/Desktop** as Path then click on **OK**.

Export a Domain Partition

OK Cancel

Export a Domain Partition

Select or enter the directory where the domain partition archive should be placed. Each domain partition should be located in its own directory. The domain partition archive will be overwritten if it already exists. Other files in the directory may be overwritten as well.

Domain: Medrec-Dev  
Partition Name:

Do you want to include the installed applications in the exported ZIP file?

Include Application Bits

What is the full path to the key file you want to use to encrypt attributes in the partition archive?

Full path to the Key File: [empty input field]

Where do you want the domain partition archive to be placed?

Path: /home/oracle/Desktop

- Go to Desktop and Verify the Creation of **Medrec-Dev-attributes.json** and **Medrec-Dev.zip** file.

## Importing the domain partition

- Go back to EM console of base\_domain. Go to Firefox and type the WebLogic Admin Console URL: <http://localhost:7001/em>.
- Enter **weblogic/welcome1** as Username/Password and click on Login.
- Click on **WebLogic Domain-> Environment ->Domain Partition**.
- Click on Import. Click on **Browse** button, Select the file **Medrec-Dev.zip** from **/home/oracle/Desktop** directory then click on **OK**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The top navigation bar includes 'WebLogic Domain' and 'weblogic'. The main content area is titled 'base\_domain'. Under 'Domain Partitions', there is a pie chart showing two green circles: one labeled 'Up (2)' and another labeled 'Running(2)'. Below the chart is a table with columns: Name, Status, State, OTD Partition, Realm, Default Targets, and Available Targets. Two rows are listed: dp2 (Status Up, State Running, Default Targets VT-Medrec-2, Available Targets VT-Medrec-2) and dp3 (Status Up, State Running, Default Targets VT-daytrader, Available Targets VT-daytrader). A red box highlights the 'Import' button in the toolbar above the table. The status bar at the bottom right shows 'Nov 5, 2015 9:32:21 PM PST'.

The screenshot shows the 'Import Domain Partition' dialog box. It contains instructions: 'Use this dialog to import a partition archive into the domain. The archive was previously generated by exporting a partition.' Below this is a text input field 'Import domain partition from zip file' containing the path '/home/oracle/Desktop/Medrec-Dev.zip', which is also highlighted with a red box. To the right of this input field is a 'Browse...' button. There are three checkboxes at the bottom: 'Overwrite existing resource group templates' (unchecked), 'Override domain partition name (optional)' (unchecked), and 'Full path to the key file used to decrypt attributes (optional)' (unchecked). At the bottom right are 'OK' and 'Cancel' buttons, with 'OK' also highlighted with a red box.

- e. Initially it will have State “**Unknown**”. Wait for 1 or 2 minute, click on Refresh icon to get the current state.
- f. Once the status for **Medrec-Dev** domain partition is **Shutdown**, check the box, near Medrec-Dev then click on **Control -> Start**. Click on **Close**. Click on the Refresh icon to get the current state.

**Domain Partitions**

Domain partitions are the building blocks of WebLogic server multi-tenancy (MT). Multi-tenancy permits multiple client organizations to share a domain, improving efficiency and reducing operation costs. Before creating a domain partition, you must first create one or more virtual targets. Look at the Getting Started topics for more information.

► Getting Started with Multi-Tenancy

Hide Pie Chart

Name	Status	State	OTD Partition	Realm	Default Targets	Available Targets
dp2	Up	Running			VT-Medrec-2	VT-Medrec-2
dp3	Up	Running			VT-daytrader	VT-daytrader
Medrec-Dev	Up	Running			VT-Medrec-1	VT-Medrec-1

- g. Go to Firefox and type the URL: <http://localhost:7101/dp1/medrec/>
- h. Click on “**Getting Started!**” Under Administrator, click on Login.
- i. Enter **administrator/administrator123** as Username/Password then click on Sign in.
- j. Click on Logout. Click on Logout again.

Note: As we have VT-Medrec-1 as Virtual target in both the domains `base_domain` and `dev_domain`. In `base_domain`, we have added administrator user to default security realm. So as this domain partition becomes part of this domain. It also uses the default security realm. Here you are accessing the application using `/dp1` in the URL because, we have Virtual target VT-Medrec-1 has `/dp1` as URI, So Virtual target definition do not change during import.

- k. Come back to tab **dev\_admin**.
- l. Stop the Weblogic Server running in `dev_domain`, by pressing **Ctrl +C** in tab in which Admin Server is running. Close the Tab.

## LAB 5: RESOURCE CONSUMPTION MANAGEMENT

### Overview

When applications that are deployed to multiple collocated Domain Partitions, access shared resources (low level resources such as CPU, network, storage) two key problems are likely to be faced:

- Contention and unfairness during allocation: Multiple request for a Shared resources results in contention and interference. Abnormal resource consumption requests may happen due to benign reasons (high traffic-genuine or DDoS), misbehaving, buggy applications or malicious code. These requests could overload the capacity of shared resources, thereby preventing another consumer's access to the resource.
- Variable performance leading to potential Service Level Agreement (SLA) violations: From a cloud operations perspective, performance for different collocated consumers.

It is therefore critical to manage and isolate access to shared resources in the WebLogic application Server by domain partition to ensure fairness in allocation, prevent contention/interferences of access to shared resources and to provide consistent performance for multiple co resident tenants. The Resource Consumption Management (RCM) feature in WebLogic 12.2.1 Multitenancy allows WebLogic System administrator to specify resource consumption management policies (allows the specification of constraints, recourse actions and notification) on shared resources such as CPU, Heap, File and Network. You can create resource manager based on the following parameter:

- Retained Heap
- CPU Time
- Open File Descriptor

You need to provide the value for below action, as it reaches to that value. It will trigger the following action:

- Notify:** Inform administrator that a threshold has been crossed.  
**Slow:** Reduce Partition ability to consume more resources.  
**Stop:** Initiate the shutdown sequence for the offending partition.

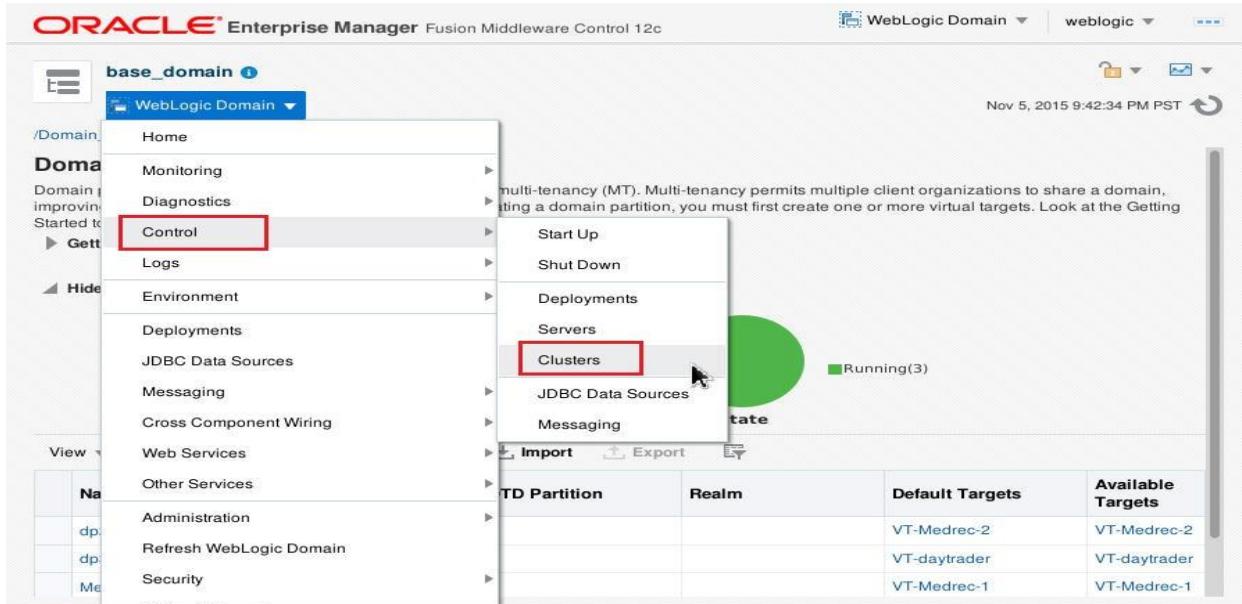
In this lab first we create a resource manager based on the Heap size then we specify the values with respective actions. So as following values reaches that action get triggered. We will use sample application through which we can modify the value of Heap size and we will see the action associated.

In this lab we are going to perform the following operations:

- Enabling RCM by adding extra arguments in Server Java Arguments.
- Creating Resource manager on the basis of Heap Size.
- Assign Resource manager to a Domain Partition.
- Running an example to understand the functioning of RCM.

## Enabling RCM by adding extra arguments in Server JAVA\_OPTION Arguments

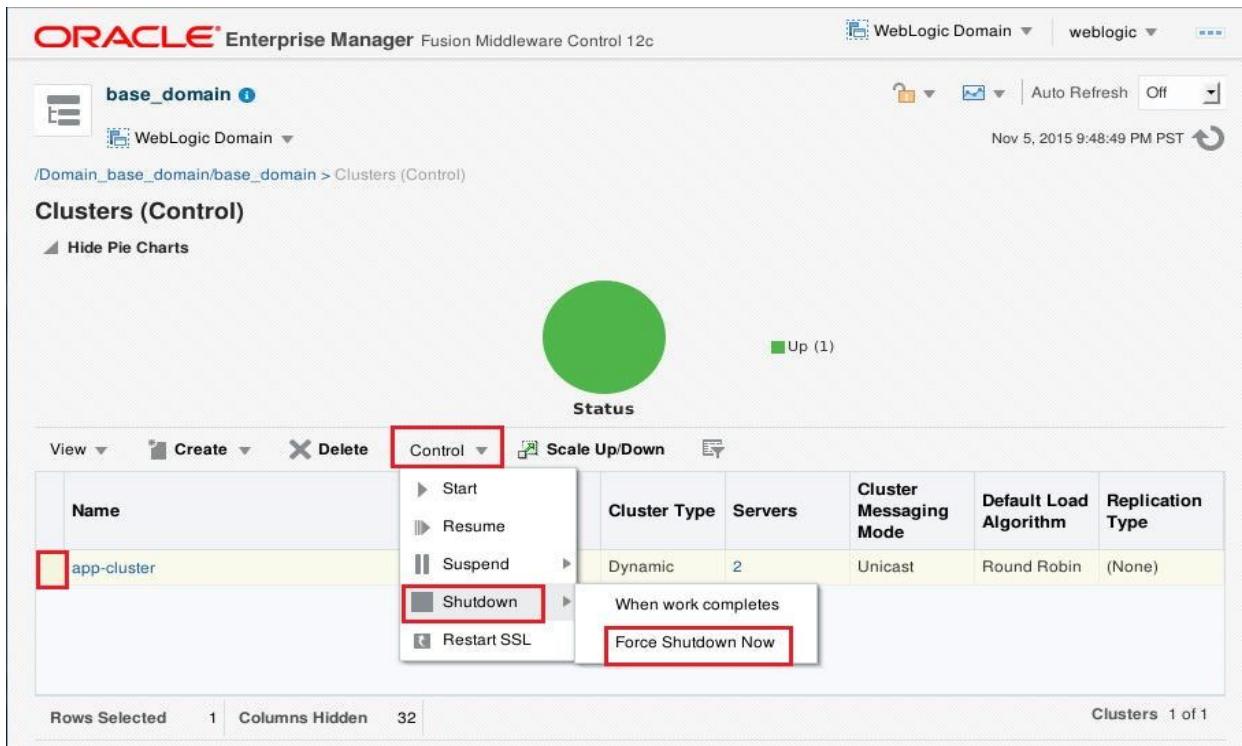
- Go to Firefox and type the Fusion Middleware Control Console URL:  
<http://localhost:7001/em>
- Click on **WebLogic Domain -> Control -> Clusters.**



The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The left sidebar has 'Domain' selected. Under 'Control', 'Clusters' is highlighted and selected. A tooltip explains multi-tenancy (MT) and virtual targets. The main panel shows a pie chart indicating 3 clusters are running. Below it is a table:

TD Partition	Realm	Default Targets	Available Targets
		VT-Medrec-2	VT-Medrec-2
		VT-daytrader	VT-daytrader
		VT-Medrec-1	VT-Medrec-1

- Check the boxes near app-cluster then click on **Control -> Shutdown ->Force Shutdown Now**. Click on **Forcibly Shutdown Servers**.



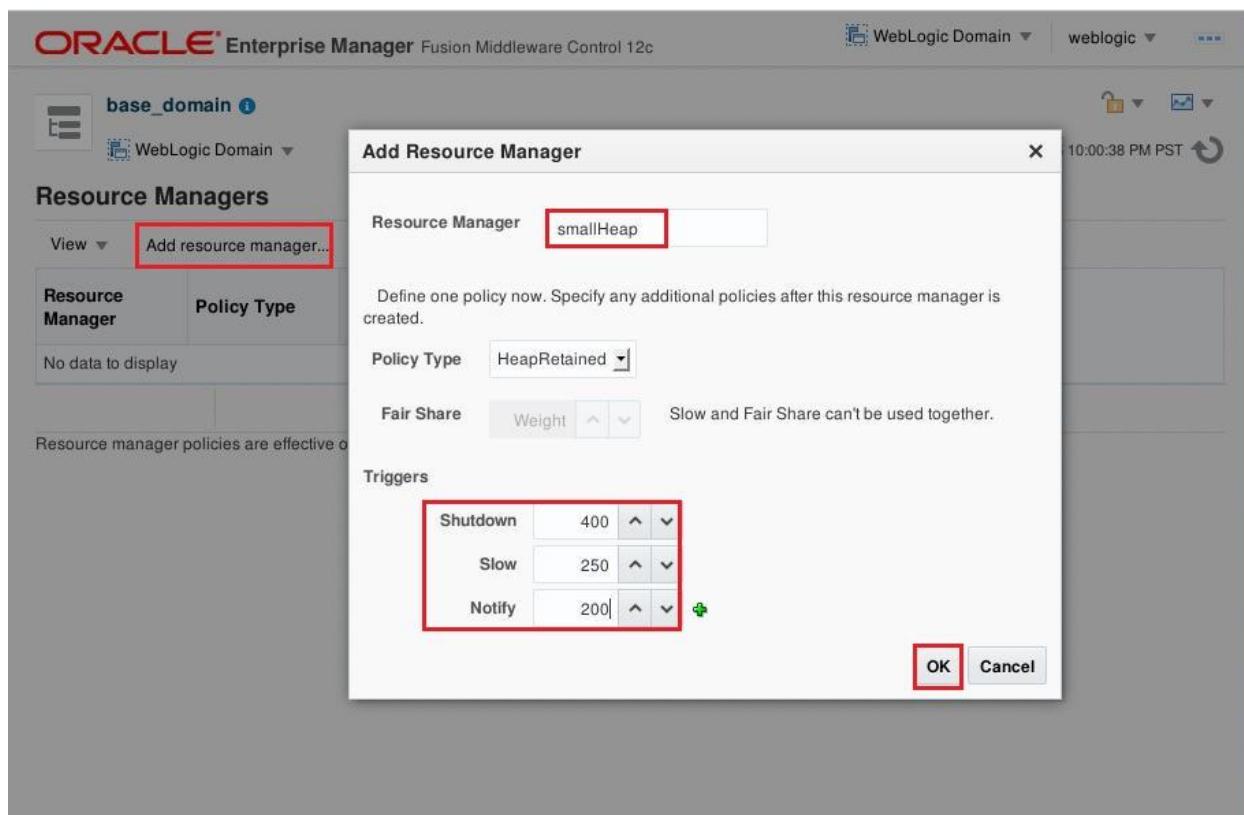
The screenshot shows the 'Clusters (Control)' page. The 'Control' dropdown is open, and 'Shutdown' is selected. A submenu shows 'When work completes' and 'Force Shutdown Now'. The table below lists the cluster details:

Name	Cluster Type	Servers	Cluster Messaging Mode	Default Load Algorithm	Replication Type
app-cluster	Dynamic	2	Unicast	Round Robin	(None)

- d. Open a new tab.
- e. cd /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab5
- f. cp setDomainEnv.sh /u01/wins/wls1221/user\_projects/domains/base\_domain/bin/
- g. In above command we have modified the JAVA\_OPTIONS as specified below.  
**JAVA\_OPTIONS="-XX:+UnlockCommercialFeatures -XX:+ResourceManagement -XX:+UseG1GC \${JAVA\_OPTIONS} \${JAVA\_PROPERTIES}"**
- h. cd /u01/wins/wls1221/user\_projects/domains/base\_domain/bin/
- i. ./setDomainEnv.sh
- j. Go back to Fusion middleware control then click on **WebLogic Domain -> Control -> Clusters**.
- k. Check the box near to app-cluster-1 to make it highlighted and then click on **Control -> Start -> Start Servers**.
- l. tail -f /u01/wins/wls1221/user\_projects/domains/base\_domain/servers/app-cluster-1/logs/app-cluster-1.log
- m. In this tab, Click on Enter Terminal -> Set Title and app-cluster-1 then click on **OK**.  
We will use these logs to monitor resource consumption manager lab.

## Creating a Resource Manager and Configuring Resource Manager for a domain partition

- a. Go to FMW control <http://localhost:7001/em>
  - b. Enter weblogic/welcome1 as Username/Password then click on Login.
  - c. Click on **WebLogic Domain->Environment -> Resource Consumption Managers**.
  - d. Click on **Add Resource Manager** and Enter the following value then click on **OK**
- |                   |              |
|-------------------|--------------|
| Resource Manager: | smallHeap    |
| Policy Type:      | HeapRetained |
| Shutdown:         | 400          |
| Slow:             | 250          |
| Notify:           | 200          |



## Associate the Resource Manager with Medrec-Dev domain partition.

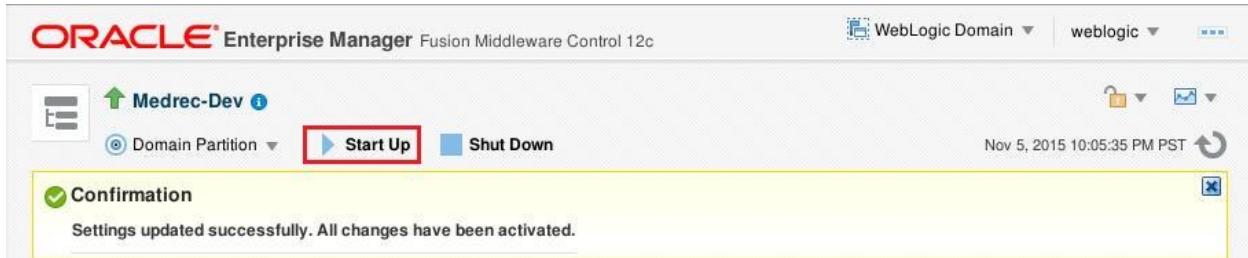
- Click on **WebLogic Domain -> Environment->Domain Partition** then click on **Medrec-Dev**.
- Click on **Domain Partition ->Administration -> Resource Sharing**.

The screenshot shows the Oracle Enterprise Manager interface for a 'Medrec-Dev' domain. The left sidebar has sections for Monitoring, Resource, Deployment, and Administration. Under 'Administration', the 'Resource Sharing' option is highlighted with a red box. The main panel displays 'JDBC and JTA Usage' and 'Resource Usage' metrics. The 'Resource Sharing' section is expanded, showing options like Available Targets, Resource Groups, Load Balancer Configuration, Resource Overrides, and Notes. The 'Pending Messages' and 'Current Messages' counts are both 0.

- Under **Resource Manager Configuration**, and Select “**Use a Resource Manager configured for the domain**” and choose “**smallHeap**” then click on **Save**.

The screenshot shows the 'Partition Work Manager Configuration' page for the 'Medrec-Dev' partition. It includes sections for 'Partition Work Manager Configuration' (with 'No Partition Work Manager' selected) and 'Resource Manager Configuration' (with 'Use a resource manager configured for the domain: smallHeap' selected). The 'Save' button is highlighted with a red box.

- d. Click on **Start Up** near Domain partition. Click on Close.



- e. Open a new tab.
- f. cd /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab5
- g. ./DeployHeap.sh
- h. Close the tab.
- i. Go back to Firefox and type the URL: <http://localhost:7101/dp1/heapApp/>
- j. Enter 160 in **Allocate Heap** then click on Submit then observe the logs of app-cluster-1 managed server. After that no Warning message should be observed in the log as we didn't cross the boundary of any RCM action.

- k. Enter 50 in **Allocate Heap** then click on Submit then observe the logs of app-cluster-1 managed server. We will cross the first ("Notify") boundary of RCM actions. So we should see associated log message.

```
####<Nov 5, 2015 10:12:23 PM PST> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-73> <weblogic> <> <f11a4b64-f694-4af6-8b28-7f32a9f96d47-0000003c> <1446790343249> <[Notifying Quota Reached For Partition: Medrec-Dev] [severity-value: 32] [rid: 0] [Previous Usage: 207153216] [partition-id: cd3147a2-5e49-4731-bad1-94689b69cd5b] [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttributes] [Current Usage: 215825984] [partition-name: Medrec-Dev]> <BEA-2165799> <Resource Consumption Management Notification Message: Given quota has been reached for the partition and a notify action has been executed.>
```

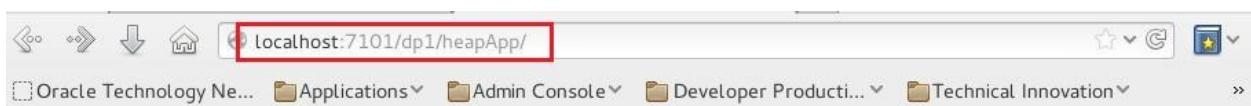
- l. Enter 50 in **Allocate Heap** then click on Submit then observe the logs of app-cluster-1 managed server. We crossed the second limit ("Slow") so the associated message should be seen in the log.

```
####<Nov 5, 2015 10:14:04 PM PST> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-72> <weblogic> <> <f11a4b64-f694-4af6-8b28-7f32a9f96d47-0000003d> <1446790444011> <[Slow Action Quota Reached For Partition: Medrec-Dev] [Current Usage: 299741448] [severity-value: 32] [Previous Usage : 298576032] [Was Required action to Slow the Partition is executed?: true] [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttributes] [partition-id: cd3147a2-5e49-4731-bad1-94689b69cd5b] [partition-name: Medrec-Dev] [rid: 0]> <BEA-2165800> <Resource Consumption Management Slow Message: Given quota has been reached for the partition and a slow action has been executed.>
```

- m. Enter 150 in **Allocate Heap** then click on Submit then observe the logs of app-cluster-1 managed server. This will exceed the limit of memory allowed to be used by that partition. So to prevent other partitions from suffering of lack of memory WebLogic will shutdown the partition.

```
####<Nov 5, 2015 10:15:15 PM PST> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-74> <weblogic> <> <f11a4b64-f694-4af6-8b28-7f32a9f96d47-0000003e> <1446790515227> <[severity-value: 32] [Proposed Usage: 459764600] [rid: 0] [partition-id: cd3147a2-5e49-4731-bad1-94689b69cd5b] [Shutdown Action Quota Reached For Partition: Medrec-Dev] [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttributes] [Current Usage: 442240104] [partition-name: Medrec-Dev]> <BEA-2165801> <Resource Consumption Management Shutdown Message: Given quota has been reached for the partition and a shutdown action has been executed.>
```

- n. Refresh the page, <http://localhost:7101/dp1/heapApp/> which return 404 and confirm shutdown of the domain partition Medrec-dev in managed server 1.



## Error 404--Not Found

**From RFC 2068 Hypertext Transfer Protocol -- HTTP/1.1:**

### 10.4.5 404 Not Found

The server has not found anything matching the Request-URI. No indication is given of whether the condition is temporary or permanent.

If the server does not wish to make this information available to the client, the status code 403 (Forbidden) can be used instead. The 410 (Gone) status code SHOULD be used if the server knows, through some internally configurable mechanism, that an old resource is permanently unavailable and has no forwarding address.

Note: As this domain partition is target to virtual target which is target at cluster which consists of two managed servers. So this domain partition stopped working on managed server 1, but if you access the application on managed server 2, you still will be able to access the application in this domain partition. If similar things happen in managed server 2 and domain partition shutdown on managed server 2 as well, then domain partition will be shutdown.

## LAB 6: OTD INTEGRATION AND RESOURCE MIGRATION

### Overview

This lab describes how Oracle Traffic Director can front end a WLS MT Deployment topology for a large enterprise, providing an integrated, end to end administration experience for the server life cycle, and partition management.

For this lab, we installed OTD in Collocated mode. We create one domain otd\_domain for OTD instance then we show how to register an OTD instance in WebLogic Domain base\_domain. Then we show how you can create partition front ended by OTD.

Oracle Traffic Director has an administration plug in which is responsible for handling life cycle events and automatically configuring Oracle Traffic Director with the corresponding configuration

When you create a WLS MT partition, a corresponding Oracle Traffic Director partition is created for you. The Oracle Traffic Director partition is simply a grouping with the same name as the partition and the resource group. The life cycle of an Oracle Traffic Director partition and its corresponding artifacts are linked to the life cycle of the partition.

The Oracle Traffic Director console provided a partition table with the list of Oracle Traffic Director Partitions to identify the Oracle Traffic director artifacts that are mapped to partitions and resource groups.

Oracle Traffic Director Artifacts map to WebLogic Server MT artifacts as follows:

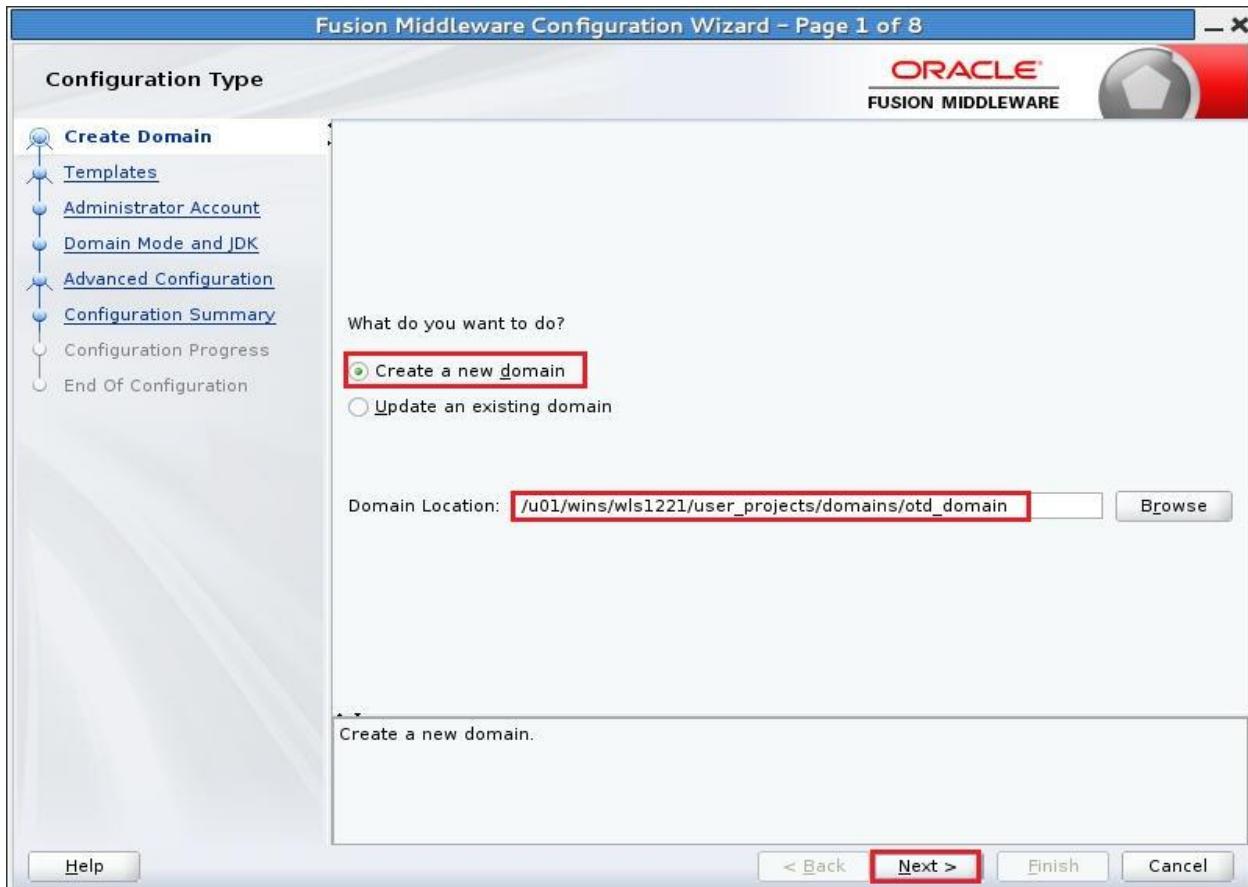
- Each cluster maps to an origin server pool.
- The hostnames of a virtual target that is associated with the partitions and/or resource groups maps to a virtual server.
- Each partition or resource group maps to a route within the virtual server corresponding to the hostname of the virtual target.

In this lab, we are going to perform the below operations.

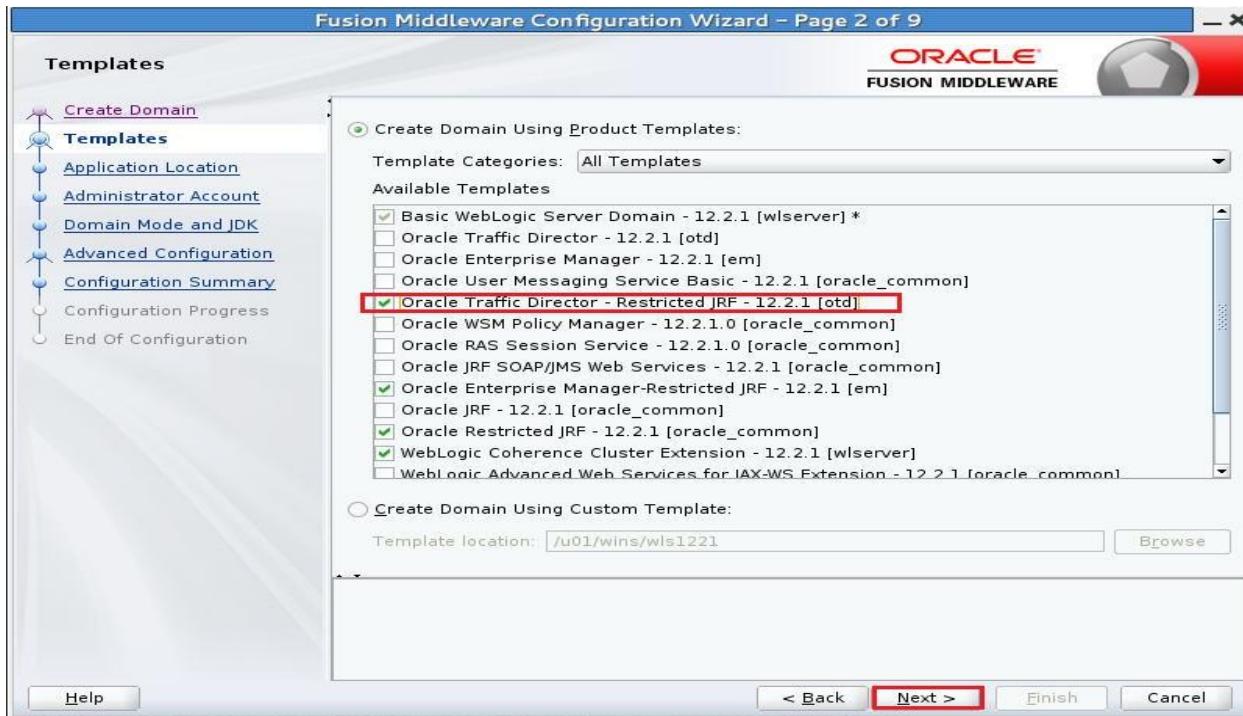
- We create an OTD domain; in that domain we create a machine and OTD configuration.
- We register that OTD Runtime instance inside the WebLogic domain.
- We create a domain partition front ended by OTD.
- We deploy a simple application to verify the OTD integration with domain partition.
- We migrate a resource group from one cluster to other cluster.

## Create OTD Restricted JRF Domain

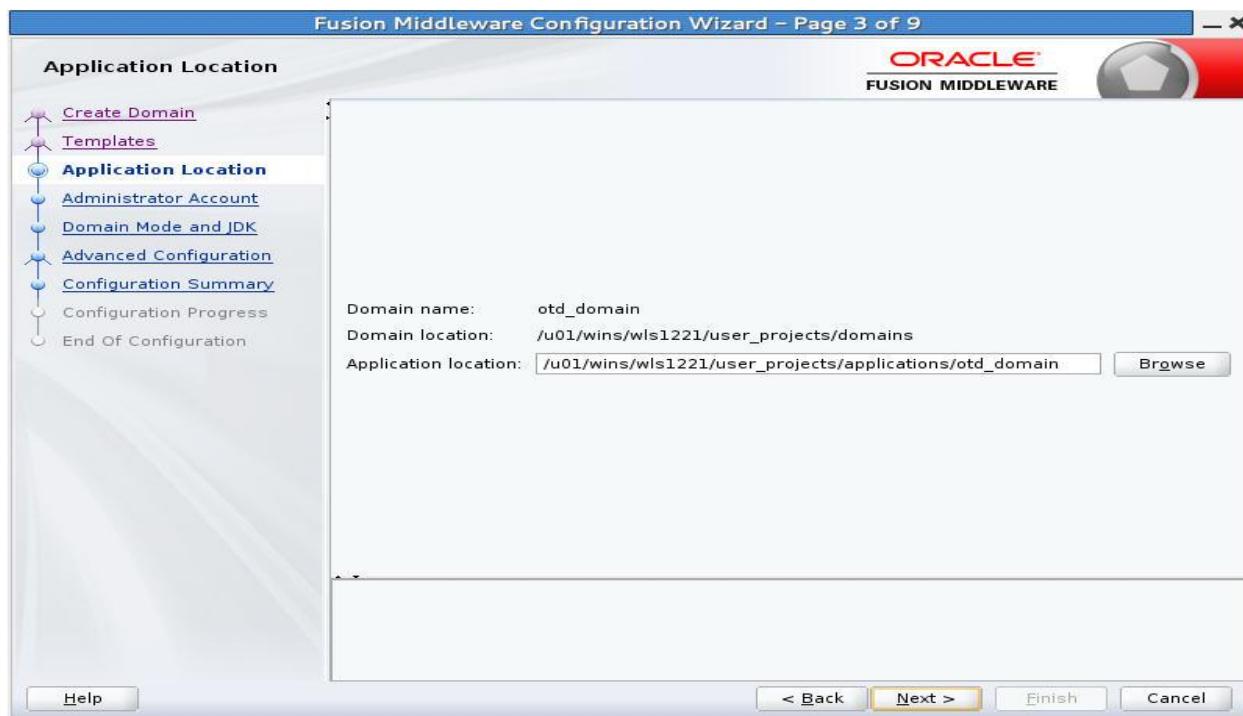
- a. Open a new tab.
- b. cd /u01/wins/wls1221/oracle\_common/common/bin/
- c. ./config.sh
- d. Select “Create a new domain” and enter “**/u01/wins/wls1221/user\_projects/domains/otd\_domain**” as Domain Location then Click on Next.



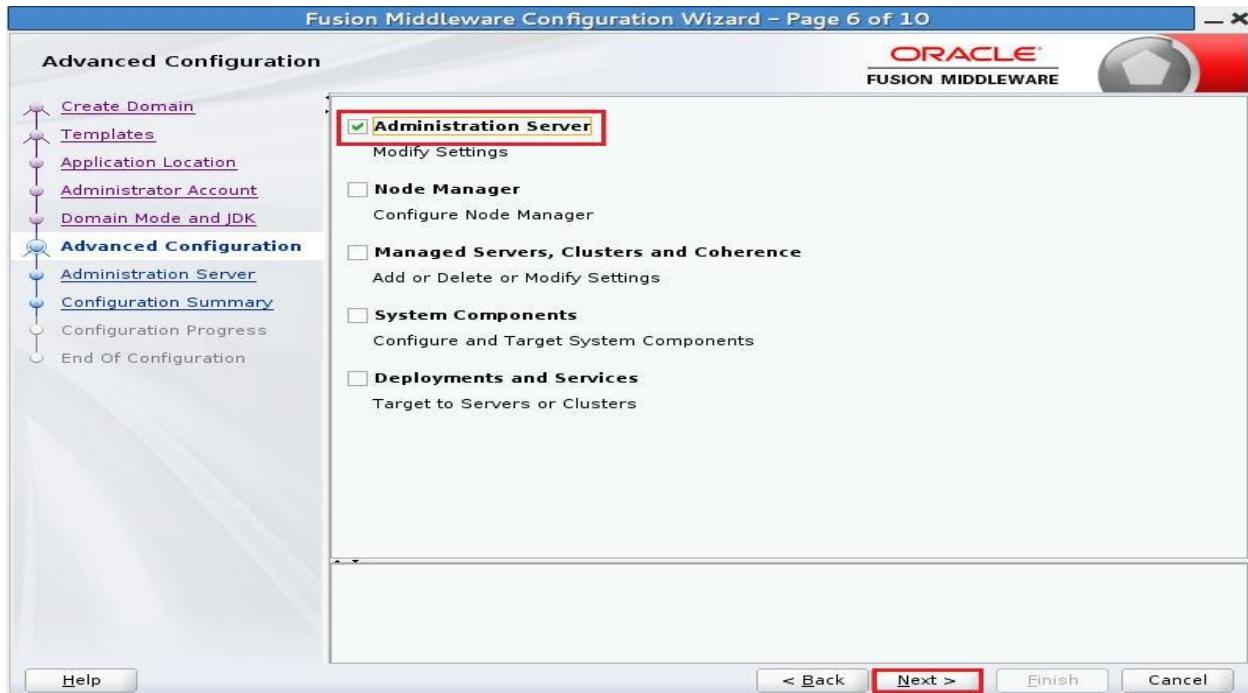
- e. Enter “**Oracle Traffic Director- Restricted JRF**” Template as it also selects other required template then Click on Next.



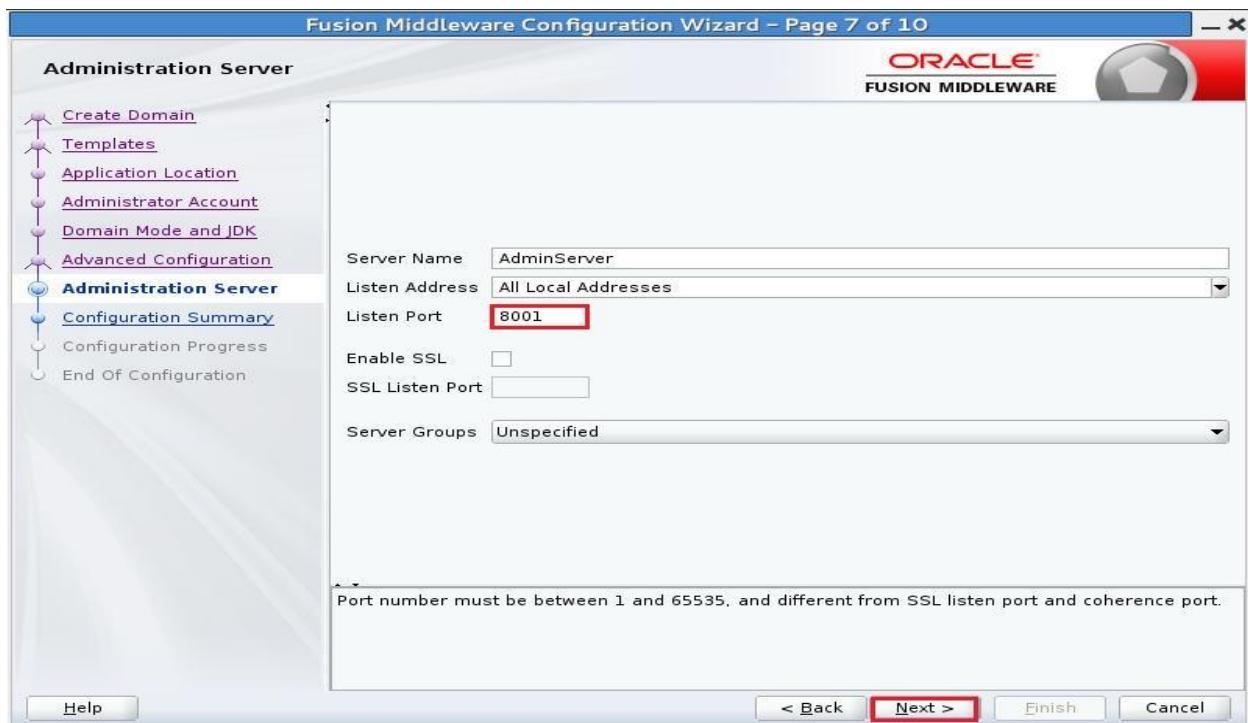
- f. Enter “/u01/wins/wls1221/user\_projects/applications/otd\_domain” as Application Location then Click on Next.



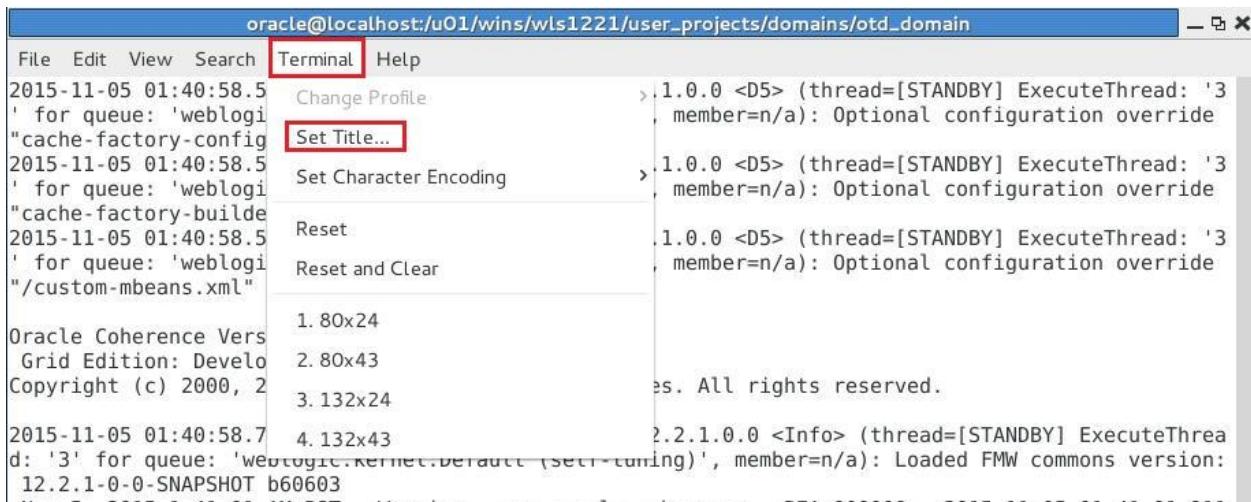
- g. Enter “**weblogic/welcome1**” as **Username/Password** then Click on Next.
- h. Leave Default in **Domain Mode and JDK** then Click on Next.
- i. In **Advanced Configuration**, Select the box near **Administration Server** then Click on Next.



- j. Change Listen port to **8001** then click on Next.



- k. Click on **Create**.
- l. Click on **Next** then Click on **Finish**.
- m. cd /u01/wins/wls1221/user\_projects/domains/otd\_domain/
- n. ./startWebLogic.sh
- o. In terminal, Click on **Terminal -> Set Title**. Enter **otd\_admin** as Title then click on OK.



```
oracle@localhost:/u01/wins/wls1221/user_projects/domains/otd_domain
File Edit View Search Terminal Help
2015-11-05 01:40:58.5
' for queue: 'weblogi
"cache-factory-config
2015-11-05 01:40:58.5
' for queue: 'weblogi
"cache-factory-build
2015-11-05 01:40:58.5
' for queue: 'weblogi
"/custom-mbeans.xml"
Oracle Coherence Vers
Grid Edition: Develo
Copyright (c) 2000, 2
2015-11-05 01:40:58.7
4. 132x43
d: '3' for queue: 'weblogic.kernel.default (seti-tuning)', member=n/a): Loaded FMW commons version:
12.2.1-0-0-SNAPSHOT b60603
1. 80x24
2. 80x43
3. 132x24
es. All rights reserved.

2.2.1.0.0 <Info> (thread=[STANDBY] ExecuteThrea

```

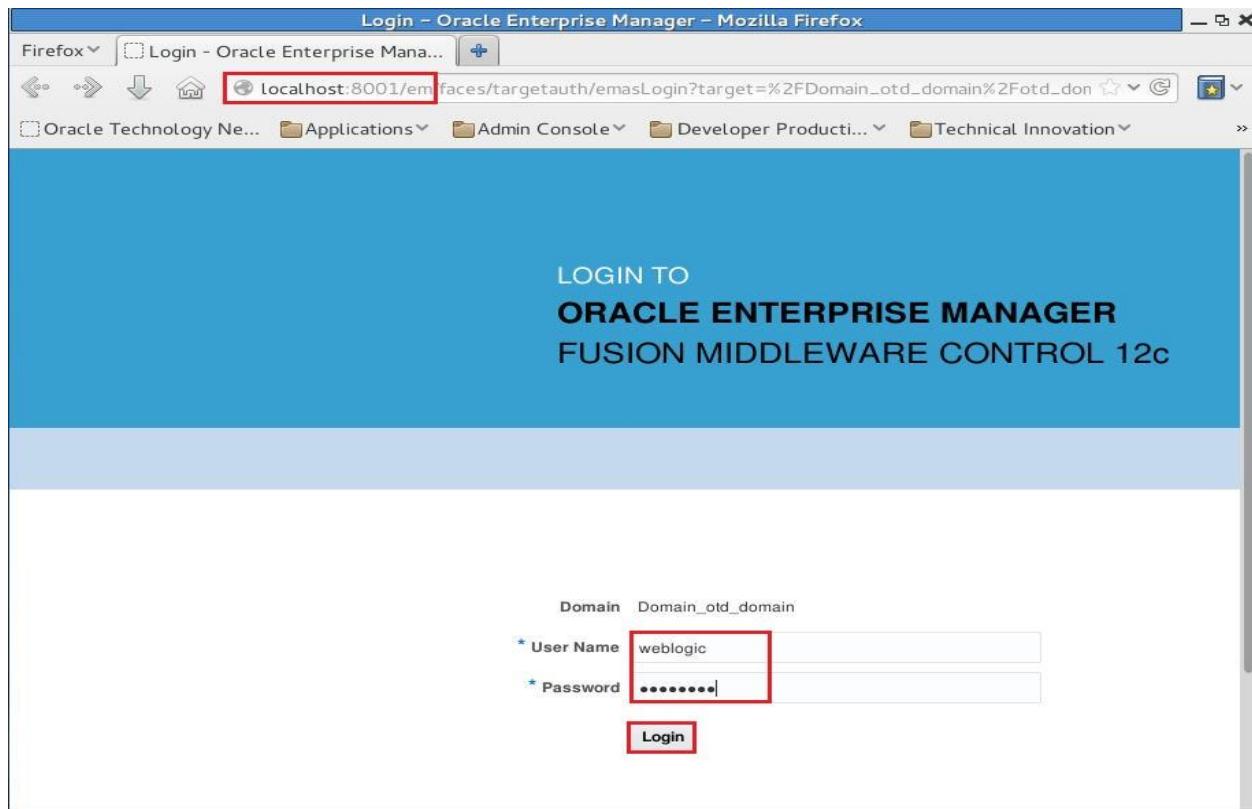
- p. Open a New tab.
- q. cd /u01/wins/wls1221/user\_projects/domains/otd\_domain/
- r. vi nodemanager/nodemanager.properties
- s. Change Listen Port to 5557 then save the file and close it.

---

```
#Node manager properties
#Thu Nov 05 01:39:36 PST 2015
DomainsFile=/u01/wins/wls1221/user_projects/domains/otd_domain/nodemanager/nodemanager.domains
LogLimit=0
PropertiesVersion=12.2.1
AuthenticationEnabled=true
NodeManagerHome=/u01/wins/wls1221/user_projects/domains/otd_domain/nodemanager
JavaHome=/u01/java/jdk1.8.0_60
LogLevel=INFO
DomainsFileEnabled=true
StartScriptName=startWebLogic.sh
ListenAddress=localhost
NativeVersionEnabled=true
ListenPort=5557
LogIostderr=true
SecureListener=true
LogCount=1
StopScriptEnabled=false
QuitEnabled=false
LogAppend=true
StateCheckInterval=500
CrashRecoveryEnabled=false
StartScriptEnabled=true
LogFile=/u01/wins/wls1221/user_projects/domains/otd_domain/nodemanager/nodemanager.log
LogFormatter=weblogic.nodemanager.server.LogFormatter
ListenBacklog=50
```

- t. bin/startNodeManager.sh
- u. In tab, Click on **Terminal -> Set Title**. Enter **otd\_nm** as Title then click on OK.

- v. Go to Firefox and type the Fusion Middleware Control URL <http://localhost:8001/em> .  
w. Enter “weblogic/welcome1” as Username/Password then click on Login.



- x. Create a Machine.  
i. Click on **WebLogic Domain ->Environment ->Machines**.

Server	Machine	State
		Running

- ii. Click on Create, Enter “**otd\_machine**” as Name and “**Unix**” as Machine OS then Click on Next.

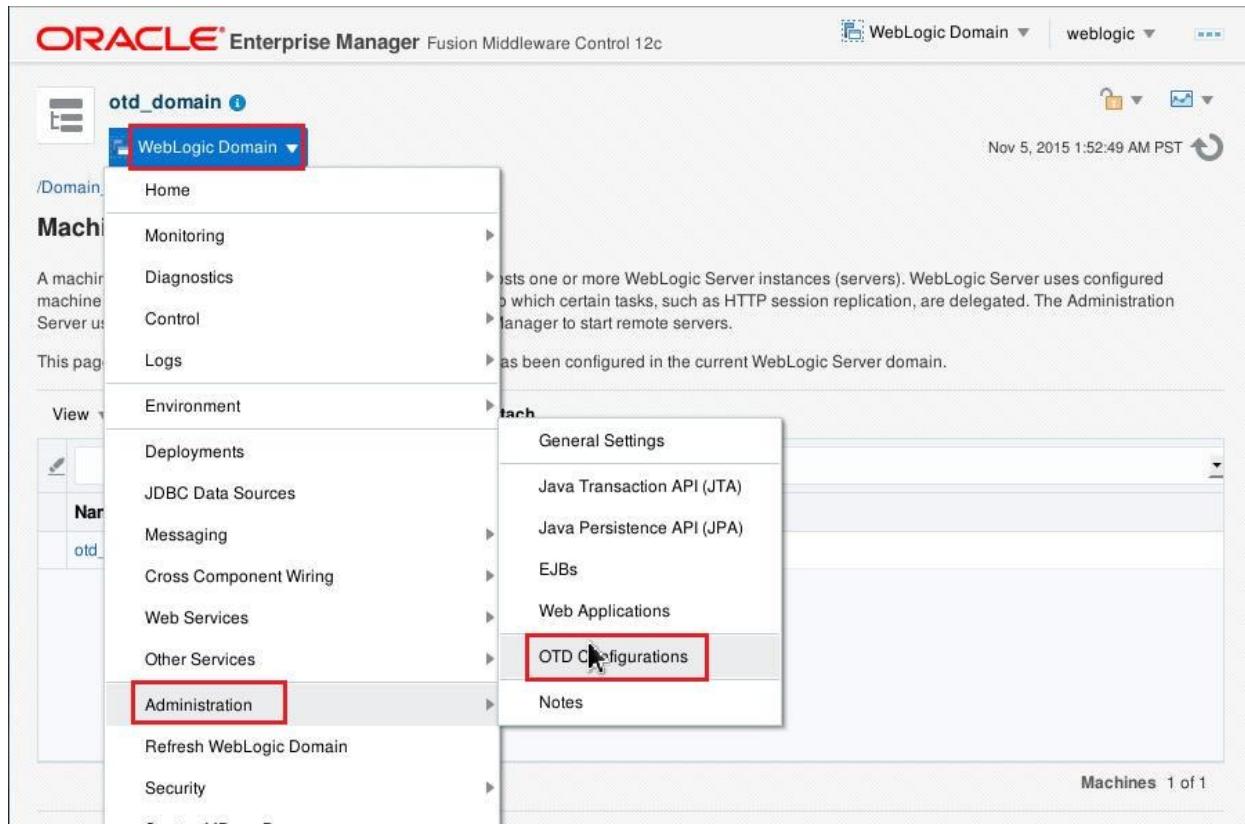
The screenshot shows the Oracle Enterprise Manager interface for creating a machine named 'otd\_domain'. The current step is 'Machine Identity'. The 'Name' field contains 'otd\_machine' and the 'Machine OS' dropdown is set to 'Unix'. The 'Next' button is highlighted with a red box.

- iii. Change Listen Port to **5557** then Click on Next.

The screenshot shows the Oracle Enterprise Manager interface for creating a machine named 'otd\_domain'. The current step is 'Node Manager Properties'. The 'Node Manager Type' is set to 'SSL'. Under 'Node Manager Properties', the 'Listen Address' is 'localhost' and the 'Listen Port' is '5557'. The 'Listen Port' field is highlighted with a red box.

- iv. Click on **Create**.

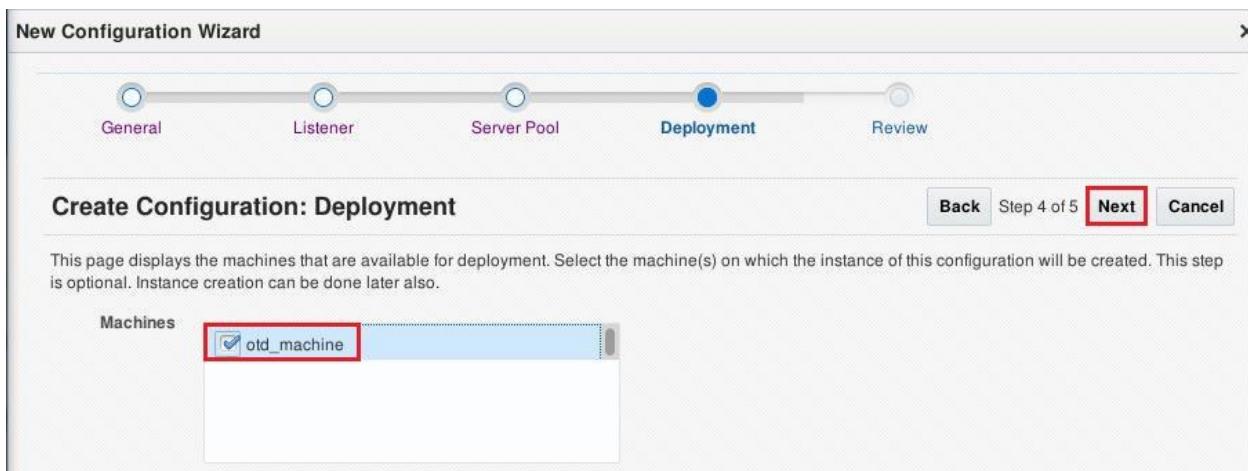
- y. Create an OTD Configuration.
- Click on **WebLogic Domain -> Administration -> OTD Configurations**.



- Click on Create.
- Enter "mt" as Name and "HTTP" as Origin Server Type then click on Next.

The screenshot shows the 'New Configuration Wizard' with the 'General' step selected. The 'Create Configuration: General' page displays a note about configuration elements and a warning about invalid names. The 'Name' field contains 'mt' and the 'Origin Server Type' is set to 'HTTP' (radio button selected). The 'Next' button is highlighted with a red box.

- Leave Default in "Create Configuration: Listener" then click on Next.
- Leave Default in "Create Configuration: Server Pool" then click on Next.
- Select the "otd\_machine" then click on Next.



- vii. Click on “Create Configuration”.
- viii. Check the box near “mt” to make it highlighted and then click on **Start Instances**. Click on Close.

**ORACLE® Enterprise Manager** Fusion Middleware Control 12c

WebLogic Domain ▾ weblogic ▾ ...

Nov 5, 2015 2:00:12 AM PST

**otd\_domain** ⓘ

WebLogic Domain ▾

**i Information**

Successfully created configuration "mt".

Successfully created instance(s) of configuration "mt" on machine(s) "otd\_machine".  
All changes have been activated.

**Oracle Traffic Director Configurations**

This page displays all the Oracle Traffic Director configurations. A configuration is a collection of elements that determine the run-time behavior of an Oracle Traffic Director instance. Click on 'Delete' to delete the selected configuration.

Configuration Name	Target Full Name
mt	/Domain_otd_domain/otd_domain/mt

**Create... Duplicate Delete... Stop Instances Start Instances**



Note: Go to Firefox and type the URL <http://localhost:8080/> to verify that server is listening.

The screenshot shows a Firefox browser window with the address bar set to 'localhost:8080'. The main content area displays a red-bordered 'Service Unavailable' header followed by the message 'The server is too busy to respond to your request. Please try again later.'

## Registering an OTD Runtime Instance

- i. Go to base domain Fusion Middleware Control Console <http://localhost:7001/em>.
- ii. Enter weblogic/welcome1 as User Name/Password then click on Login.
- iii. Click on **Weblogic Domain -> Environment -> OTD Runtimes**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The left sidebar is expanded to show 'base\_domain'. Under 'WebLogic Domain', the 'Environment' link is highlighted with a red box. In the main content area, a message box says 'All changes have been activated.' Below it, the 'OTD Runtimes' link is also highlighted with a red box. A table on the right lists one entry:

ID	Replication Type	Multicast Address	Multicast Port
1	(None)	239.192.0.0	7001

At the bottom right of the table, it says 'Clusters 1 of 1'.

iv. Click on **Register Runtime**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The top navigation bar includes the Oracle logo, the title "Enterprise Manager Fusion Middleware Control 12c", and a "WebLogic Domain" dropdown set to "weblogic". Below the header, there's a sidebar with a "base\_domain" icon and a "WebLogic Domain" dropdown. The main content area is titled "OTD Runtimes". A sub-header below it states: "Oracle Traffic Director can be used to front-end domain partitions created in this WebLogic domain. Oracle Traffic Director can be installed within this same domain or in a separate domain. OTD runtimes need to be registered with this WebLogic domain before they can be used." A "View" dropdown and a "Register Runtime" button (which is highlighted with a red box) are visible above a table. The table has columns: Name, OTD Configuration Name, Admin Server Host, Admin Server Port, Username, and OTD Domain Name. A message at the bottom of the table says: "No Oracle Traffic Director runtimes have been registered in this WebLogic domain."

v. Enter the following and then click on OK.

Runtime Name:	otd_runtime
OTD Configuration Name:	mt
Admin Server Host:	localhost
Admin Server Port:	8001
Username:	weblogic
Password:	welcome1
OTD Domain Name:	otd_domain

The screenshot shows the "Register Runtime" dialog box. The title bar says "Register Runtime". The main text area says: "An OTD configuration will be used to front-end domain partitions. Provide the OTD configuration name and connection information (host, port and credentials) for the WebLogic Admin Server where this configuration is located." Below this, there are six input fields, each with an asterisk indicating it is required. The fields are: "Runtime Name" (value: otd\_runtime), "OTD Configuration Name" (value: mt), "Admin Server Host" (value: localhost), "Admin Server Port" (value: 8001), "Username" (value: weblogic), and "Password" (value: welcome1). At the bottom, there are "OK" and "Cancel" buttons, with "OK" being highlighted with a red box.

## Creating Domain Partition front ended by OTD

- a. Click on **WebLogic Domain -> Environment ->Virtual Targets**.
- b. Click on Create.
- c. Enter **VT-1** as Name and **/dp4** as Uri Prefix then click on Add to Enter **localhost** as Host Name then click on Next.

ORACLE® Enterprise Manager Fusion Middleware Control 12c

base\_domain

General Targets

Create Virtual Target: General

Name \* VT-1

Uri Prefix /dp4

Hosts

Specify the host name(s) that will be used for front-end access. If you are not using Oracle Traffic Director (OTD) to load balance connections for a domain partition, specify the actual host name(s) of the WebLogic server cluster or managed server. If you are using OTD to load balance connections for a domain partition, specify the host name(s) of the OTD administration server.

+ Add X Delete

Host Name

localhost

Advanced Options

Back Step 1 of 2 **Next** Cancel

- d. Select “app-cluster” as Cluster then click on **Create**.

ORACLE® Enterprise Manager Fusion Middleware Control 12c

base\_domain

General Targets

Create Virtual Target: Targets

Choose a server or cluster to be associated with this virtual target.

Cluster app-cluster

Server

Logging Configuration

Log File Name

Notes

Notes

Back Step 2 of 2 **Create** Cancel

- e. Click on **WebLogic Domain -> Environment -> Domain Partition**.
- f. Click on **Create**.

- g. Enter **dp4** as name and Check the box for “**Use OTD for load balancing**” and select “**otd\_runtime**” then click on Next.

**Create Domain Partition: General**

Use this page to specify general attributes for this domain partition.

\* Name: dp4

Security Realm: None

Primary Identity Domain:

**Load Balancer Configuration**

If you wish to use a load balancer to front-end this domain partition, choose an Oracle Traffic Director runtime from the list of registered runtimes shown below. If you wish to register a new OTD runtime, please use the Environment->OTD Runtimes menu item on the WebLogic Domain menu.

Use OTD for load balancing

OTD Runtime: otd\_runtime

- h. Check the box for “VT-1” as shown below then click on Next.

**Create Domain Partition: Available Targets**

Select the virtual targets that will be available for this domain partition to use. Note that virtual targets can only be used by one partition; so, only available virtual targets are listed below.

Select	Virtual Target	Set as Default
<input checked="" type="checkbox"/>	VT-1	<input checked="" type="checkbox"/>

- i. Enter **app4RG** as Resource Group Name and Move **VT-1** to **Selected Targets** then click on Next.

**Create Domain Partition: Resource Group**

A resource group needs to be created within a partition before you can deploy applications or resources. The resource group can optionally extend a resource group template specified at the domain level.

\* Resource Group Name: app4RG

Resource Group Template: None

Targets for the Resource Group: Select a target for the resource group from the list of available targets. If the partition has a default target specified, the resource group will implicitly inherit that target.

Available Targets	Selected Targets
	VT-1

- j. Review the Configuration then click on **Create**.  
k. Check box near to **dp4** and click on **Control -> Start**. Click on Close.

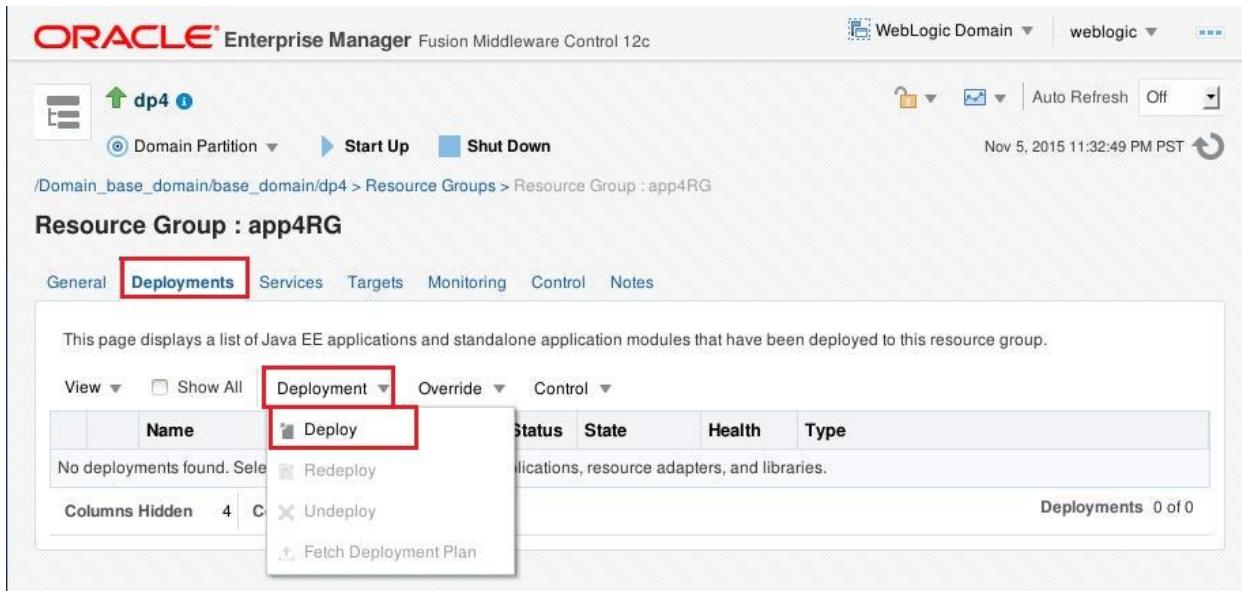
**Domain Partitions** 4 of 4

Name	Status	OTD Partition	Realm	Default Targets	Available Targets
dp2	Up			VT-Medrec-2	VT-Medrec-2
dp3	Up	Running		VT-daytrader	VT-daytrader
dp4	Shutdown	dp4		VT-1	VT-1
Medrec-Dev	Up	Running		VT-Medrec-1	VT-Medrec-1

## Deploying simple application to test OTD integration with weblogic

Here we are going to deploy heapApp.war which we used in Lab5. We will access that application through **load balancer** now.

- a. Click on dp4.
- b. Click on **Domain Partition -> Administration -> Resource Groups**.
- c. Click on Resource Group **app4RG**.
- d. Click on **Deployments** tab, and then click on **Deployment -> Deploy**.



The screenshot shows the Oracle Enterprise Manager interface for a WebLogic Domain named 'weblogic'. The navigation path is /Domain\_base\_domain/base\_domain/dp4 > Resource Groups > Resource Group : app4RG. The 'Deployments' tab is selected. A sub-menu is open over the 'Deployment' button, with the 'Deploy' option highlighted by a red box. Other options in the menu include 'Redeploy', 'Undeploy', and 'Fetch Deployment Plan'. The main table below shows deployment details with one row: 'No deployments found. Select a deployment plan to view its status.' The table has columns for Name, Status, State, Health, and Type.

- e. Select “Archive or exploded directory is on the server where Enterprise Manager is running” then click on **Browse**. Select the file **heapApp.war** from **/u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab6/** location then click on **OK**.

**ORACLE Enterprise Manager** Fusion Middleware Control 12c

weblogic ▾ ...  
dp4 i

**Select Archive** Select Target Application Attributes Deployment Settings

**Deploy Java EE Application: Select Archive**

**Scope**  
The scope that this application will be deployed to : Resource group "app4RG" in domain partition "dp4"

**Archive or Exploded Directory**  
Java EE archives, Web Modules (WAR files), EJB Modules (EJB JAR files), Resource Adapter Modules (RAR files), Coherence Archives (GAR files), JDBC Modules, JMS Modules, and library files (Jar files) can be deployed. You can also deploy an exploded archive that is present on the server where Enterprise Manager is running.

Archive is on the machine where this Web browser is running.  
 Archive or exploded directory is on the server where Enterprise Manager is running.

Browse... No file selected.  Archive or exploded directory is on the server where Enterprise Manager is running. /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/Lab6/heapApp.war

**Deployment Plan**  
The deployment plan is a file that contains the deployment settings for an application. You can use a previously saved deployment plan for this application. Later in the deployment process, you can optionally edit the deployment plan and save it for a future deployment of this application. If you

- f. Click on **Next** then click on **Deploy**. Click on **Close**.
- g. Go to Firefox and type the URL <http://localhost:8080/dp4/heapApp/>.

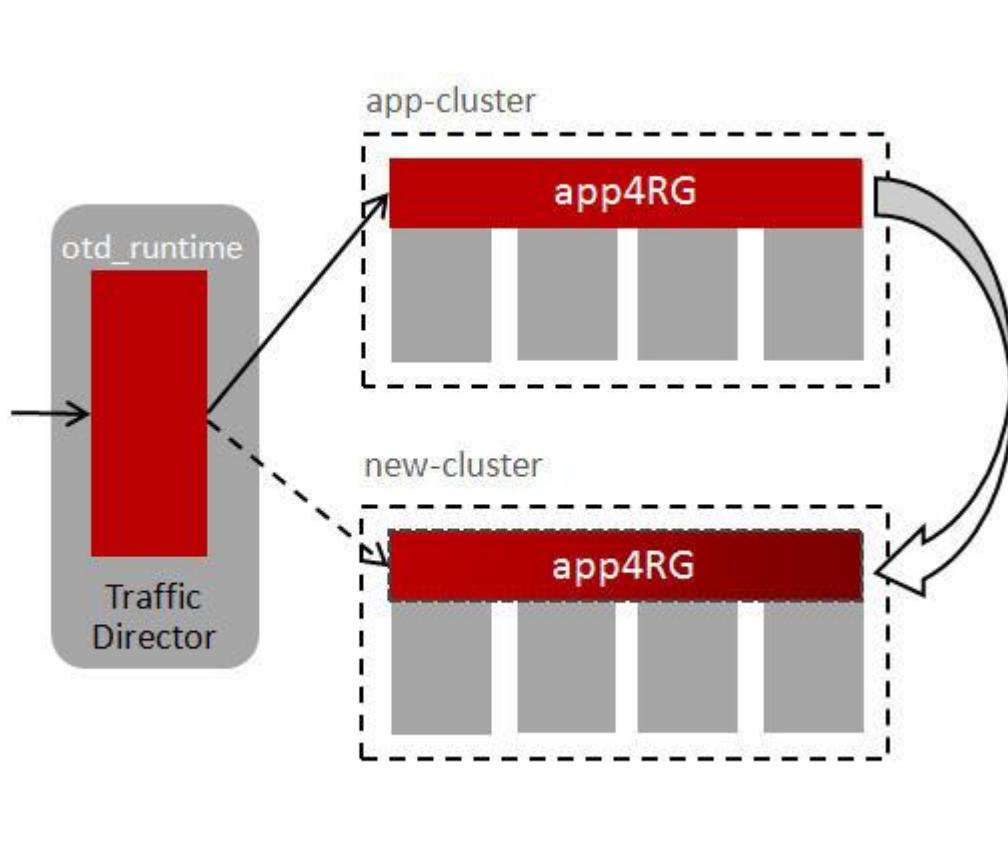


Total Heap in Use = 0 MB

Allocate Heap :  MB

## Migration Resource Group from one Cluster to other Cluster

Now we are going to migrate Resource Group app4RG from app-cluster to another cluster. As the application deployed in app4RG are front ended by OTD, when you migrate your resource group on other cluster. WebLogic automatically detect the server setting and you can access the application continuously without doing any manual configuration.



- When you click on **migrate** the following actions performs:
- Migrate API is called
- Resource Group starts on new hosts
- Sessions are replicated to new hosts.
- New origin server pool added to the OTD Configuration
  - Old pool used for sticky request to old pool only
  - New pool used for all new requests.
- Graceful shutdown called on resource group on original hosts.
- Virtual target configuration updated with new cluster only.

So using the same URL, you can access the application.

- a. Go back to Fusion middleware control console <http://localhost:7001/em>
- b. Create a new Cluster.
  - i. Click on **WebLogic Domain -> Environment -> Clusters**.
  - ii. Click on **Create -> Dynamic Cluster**.
  - iii. Enter **new-cluster** as Name then click on Next.
  - iv. Enter 1 as Dynamic Cluster Size then click on Next.
  - v. Select the box for "**Use a single machine for all dynamic servers**" and choose "**machine**" as Selected Machine then click on Next.
  - vi. Enter 9100 and 10101 as **Base Listen Port** and **SSL Base Listen Port** Respectively then click on Next.
  - vii. Review the Configuration then click on **Create**.
  - viii. Click on **WebLogic Domain -> Control -> Clusters**.
  - ix. Check the box near **new-cluster** to make it highlighted and then click on **Control -> Start -> Start Servers**.

Note: Before going to next step, wait till managed server in new-cluster get started, you can monitor the progress in base\_nm tab.

- c. Migration of Resource Group.
  - i. Click on **WebLogic Domain -> Environment -> Resource Groups..**
  - ii. Check the box near to app4RG to make it highlighted and then click on Migrate. Select **new-cluster** as New Target then click on Migrate. In Confirmation window, click on Migrate.
  - iii. Once you notice "**Migrating resource group "app4RG" – Completed successfully**" message then click on Close.

The screenshot shows the Oracle Enterprise Manager interface for Fusion Middleware Control 12c. The main window displays a 'Resource Group Migration' dialog. On the left, a sidebar lists resource groups: app2RG, app3RG, app4RG (highlighted with a red box), and appRG. The migration dialog shows the following details:

- Resource Group:** app4RG
- Virtual Target:** VT-1
- Current Target:** app-cluster (Cluster)
- New Target:** new-cluster (Dynamic cluster) (highlighted with a red box)

A confirmation dialog box is overlaid on the main window, stating:

**Confirmation**

**Migrating resource group "app4RG" - Completed Successfully**

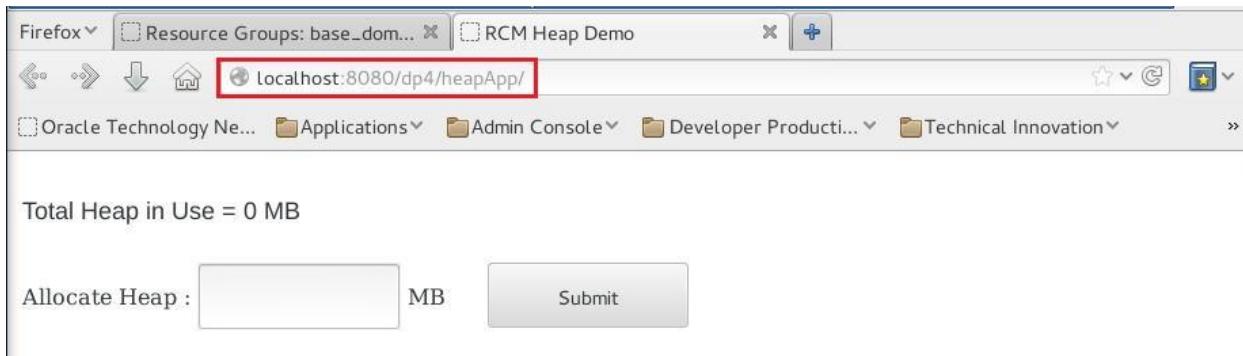
The virtual target "VT-1", to which this resource group is targeted to, has been migrated from "app-cluster (Cluster)" to "new-cluster (Dynamic cluster)"

Buttons in the confirmation dialog include **Migrate** (highlighted with a red box) and **Cancel**.

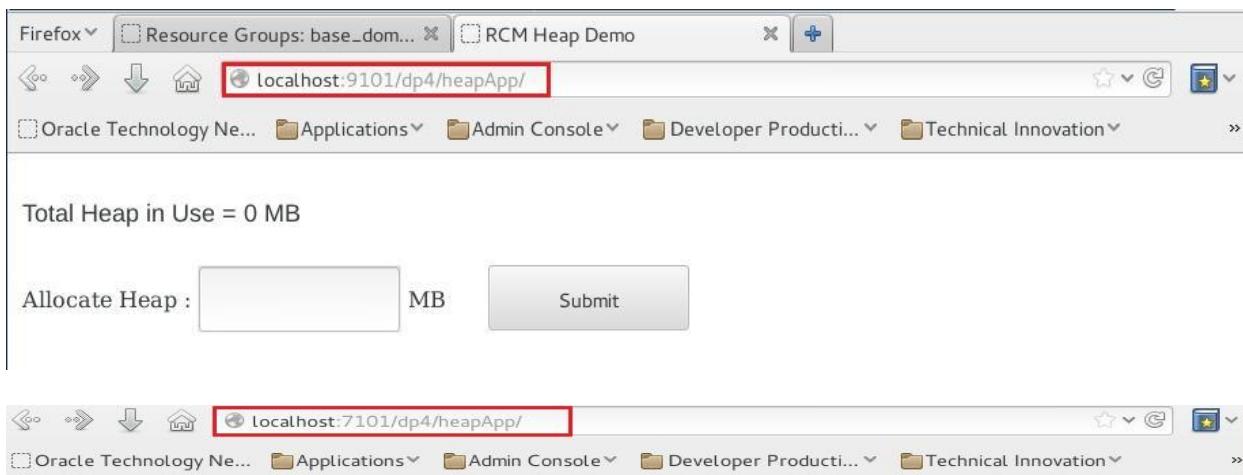
At the bottom of the main window, status bars show "Rows Selected 1" and "Resource Groups 4 of 4".

## Access Application through OTD

- Go to Firefox and type the URL <http://localhost:8080/dp4/heapApp>



- As the Resource group migrated from app-cluster to new-cluster. But still you are able to access the application through same URL. Load balancer is redirecting all requests to new cluster. new-cluster-1 is running on 9101 port and app-cluster-1 is running on 7101.



## Error 404--Not Found

From RFC 2068 *Hypertext Transfer Protocol -- HTTP/1.1*:

### 10.4.5 404 Not Found

The server has not found anything matching the Request-URI. No indication is given of whether the condition is temporary or permanent.

If the server does not wish to make this information available to the client, the status code 403 (Forbidden) can be used instead. The 410 (Gone) status code SHOULD be used if the server knows, through some internally configurable mechanism, that an old resource is permanently unavailable and has no forwarding address.

So you can successfully migrate the resource group from one cluster to another cluster without affecting the front end of your application.

## CLEANING AND RESETTING

### Cleaning up Environment

- a. Go back to Fusion Middleware Control <http://localhost:7001/em>
- b. Click on WebLogic Domain -> Control -> Cluster.
- c. Check the boxes near to both the cluster then click on Control -> Shutdown -> Force Shutdown now. Click on Forcibly Shutdown Servers.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The top navigation bar includes 'WebLogic Domain' and 'weblogic'. The main content area is titled 'Clusters (Control)' and shows a table of clusters. The table has columns: Name, Cluster Type, Servers, Cluster Messaging Mode, Default Load Algorithm, and Replication Type. Two clusters are listed: 'app-cluster' and 'new-cluster'. The 'app-cluster' row is selected, indicated by a yellow background. The 'Control' dropdown menu is open over the 'app-cluster' row, showing options like Start, Resume, Suspend, Shutdown, and Restart SSL. The 'Shutdown' option is highlighted with a red box. A sub-menu for 'Shutdown' appears, showing 'When work completes' and 'Force Shutdown Now', with 'Force Shutdown Now' also highlighted with a red box. A status pie chart at the top right indicates 'Up (2)'. The bottom of the screen shows 'Rows Selected: 2' and 'Clusters: 2 of 2'.

- d. Press CTRL + C on Tab title with otd\_admin, otd\_nm, base\_nm, base\_admin, dev\_admin, app-cluster-1.
- e. Open a new terminal.
- f. cd /u01/content/weblogic-innovation-seminars/WInS\_Demos/MT-Workshop/CleanUp/
- g. ./CleanEnvironment.sh

## **Appendix:**

This Section is to provide you help, if you already run this workshop once, and only interested to showcase any specific features or any specific lab. We created few scripts about which the description is given below.

**Lab1-2.sh:** It starts the DB, and create user and populates the DB for all domain partition we need. Then it create the base\_domain, in that domain we create the machine and dynamic cluster. After that we create three domain partition dp1, dp2 and dp3. Basically after execution of this script, you will be at the end of Lab 2.

**Lab3.sh:** This script stop the domain partition dp1 and create new security realm newrealm and assign this security realm to dp1, and start the domain partition dp1. It perform the same task what Lab 3 does.

**Lab4.sh:** This script creates dev\_domain, it configures the Medrec application in Medrec-Dev domain partition in dev\_domain, and then it removes the dp1 in base\_domain. So you can login to admin console of dev\_domain and export the partition and later import it in base\_domain through admin console.

**Lab5.sh:** It sets the configuration parameter for RCM in SetDomainEnv.sh script then it restart the cluster and also deploys heapApp.war in dp2 partition in base\_domain.

**Lab6.sh:** This script creates otd\_domain first, inside otd\_domain; it creates otd\_machine and OTD Configuration. Then it creates load balancer instance and start it. Then in base\_domain, it creates the Virtual target VT-1, and registers OTD Runtime, after that it creates domain partition dp4 with otd\_runtime and then deploy the heapApp.war in app4RG resource group inside dp4 partition. It also create new-cluster dynamic cluster, and start domain partition dp4 and server in new-cluster. After running this script, you can move to resource group app4RG in dp4 in FMW console, and migrate the resource group.

**CleanEnvironment.sh:** This script stops the servers and Node managers, remove the otd\_domain, base\_domain, dev\_domain. It also removes the user from pluggable database, and then it stops the DB.