

A photograph of a young man with short brown hair, wearing a light blue denim shirt over a white t-shirt, sitting at a desk and looking down at a silver tablet computer he is holding in his hands. He is wearing khaki pants. In the background, there's a white wall and a white shelf with various items on it. The overall lighting is bright and even.

ORACLE OPEN WORLD

Modern Business in the Cloud

HOL10439 High Density Deployments in Oracle WebLogic Server 12c Release 2 with Domain Partition

WebLogic Server Product Management Team

ORACLE

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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

Note: This Hands-on Lab uses pre-release version of WebLogic Server 12.2.1, so few screen shot may differ when you use GA version of WebLogic Server 12.2.1.

LAB 1: MULTITENANCY CONFIGURATION

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 1.7.0_40	/u01/java/jdk1.8.0_60/
WebLogic Server 12.2.1	/u01/wins/wls1221/
Oracle Database 12c	/u01/app/oracle/product/12.1.0/dbhome_1/

WebLogic Server

In this hands-on lab two WebLogic Server Domains are used.

The base_domain is created with RESTRICTED-JRF template and it contains a dynamic cluster with two managed servers. The dev_domain is created with by-default template and it contains only Admin Server.

base_domain Details

ORACLE_HOME	/u01/wins/wls1221
Domain Directory	/u01/wins/wls1221/user_projects/domains/base_domain
Domain Name	base_domain
Admin Console URL	http://localhost:7001/console
Fusion Middleware Control URL	http://localhost:7001/em
Admin Server Host	localhost
Admin Server Port	7001
Admin Server User	weblogic
Admin Server Password	welcome1

dev_domain Details

ORACLE_HOME	/u01/wins/wls1221
Domain Directory	/u01/wins/wls1221/user_projects/domains/dev_domain
Domain Name	dev_domain
Admin Console URL	http://localhost:9001/console
Admin Server Host	localhost
Admin Server Port	9001
Admin Server User	weblogic
Admin Server Password	welcome1

Workshop Content:

Labs Directory	/u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/
----------------	---

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.

Start the database

We have created three pluggable databases. Go to Desktop, Click on **Start Database** to start the databases. Wait until the window closes.

We already created domain for you, which contains the **cluster of size 2**. Here you are just going to start the **Admin Server** and **two managed server**.

Starting the Domain

We are going to start the node manager of base_domain. This shell scripts starts the Node Manager.

- i. Open a new terminal.
- ii. cd /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab1/
- iii. ./start-nm.sh

```
[oracle@localhost Lab1]$ ./start-nm.sh
[oracle@localhost Lab1]$ Initializing WebLogic Scripting Tool (WLST) ...
[oracle@localhost Lab1]$
```

Initializng WebLogic Scripting Tool (WLST) ...

Welcome to WebLogic Server Administration Scripting Shell

Type help() for help on available commands

```
Launching NodeManager ...
Running startNodeManager.sh from the directory /u01/wls/wls1221/user_projects/domains/base_domain
./bin
NMProcess: NODEMGR_HOME is already set to /u01/wls/wls1221/user_projects/domains/base_domain/node
manager
```

Note: Go to next step after 5 seconds so that node manager starts properly.

We are going to start Admin Server first; once Admin Server started we start the cluster.

iv. ./start-domain.sh

```
[oracle@localhost Lab1]$ ./start-domain.sh
Initializing WebLogic Scripting Tool (WLST) ...
Welcome to WebLogic Server Administration Scripting Shell
Type help() for help on available commands

Connecting to Node Manager ...
<Sep 17, 2015 10:08:57 AM PDT> <Info> <Security> <BEA-090905> <Disabling the CryptoJ JCE Provider self-integrity check for better startup performance. To enable this check, specify -Dweblogic.security.allowCryptoJDefaultJCEVerification=true.>
<Sep 17, 2015 10:08:57 AM PDT> <Info> <Security> <BEA-090906> <Changing the default Random Number Generator in RSA CryptoJ from ECDRBG128 to HMACDRBG. To disable this change, specify -Dweblogic.security.allowCryptoJDefaultPRNG=true.>
<Sep 17, 2015 10:08:57 AM PDT> <Info> <Security> <BEA-090909> <Using the configured custom SSL HostnameVerifier implementation: weblogic.security.utils.SSLWLSHostnameVerifier$NullHostnameVerifier.>
Successfully Connected to Node Manager.
Starting server AdminServer ...
Successfully started server AdminServer ...
Connecting to t3://localhost:7001 with userid weblogic ...
Successfully connected to Admin Server "AdminServer" that belongs to domain "base_domain".

Warning: An insecure protocol was used to connect to the server.
To ensure on-the-wire security, the SSL port or Admin port should be used instead.

Starting the following servers in Cluster, app-cluster : app-cluster-1,app-cluster-2
.....
.....
All servers in the cluster app-cluster are started successfully.
Disconnected from weblogic server: AdminServer

Exiting WebLogic Scripting Tool.
```

Note: This step may take 4-5 minute as it starts the Admin Server first, then both the managed server.

Below table contains the information about domain partition, on which Virtual Target it is Targeted, Which Resource Group it contains, What Application we are going to deploy in this domain partition, which database the JDBC Datasources uses in this domain partition.

Virtual Target	Partition Name	Resource Group	Application Deployed	Pluggable Database
VT-Medrec-1	dp1	app1RG	Medrec	pdborcl
VT-Medrec-2	dp2	app2RG	Medrec	pdb2
VT-daytrader	dp3	app3RG	Day Trader	pdb3

Note: In creation of Virtual target, we will use partition name as URL Prefix, so that you can differentiate from which domain partition/database you are accessing the application.

Configuration of Medrec Application in Domain Partition dp1

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

- i. Go to **Firefox** and type the URL <http://localhost:7001/em>
- ii. Enter **weblogic/welcome1** as **username/password**, do not check the box for **Use Partition** then click on **Login**.

Domain Domain_base_domain

* User Name weblogic

* Password

Use Partition

Login

- iii. In Enterprise Manager, Click on **WebLogic Domain** Menu then Select **Environment -> Virtual Targets**.

iv. Click on **Create**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The top navigation bar includes 'WebLogic Domain' and 'weblogic'. The main area is titled 'Virtual Targets' under 'base_domain'. A toolbar at the top has a 'Create' button highlighted with a red box. Below it is a table with columns: Name, Host Names, Uri Prefix, Target, Explicit Port, Port Offset, Partition Channel, and Used By. A message 'No Virtual Targets found' is displayed.

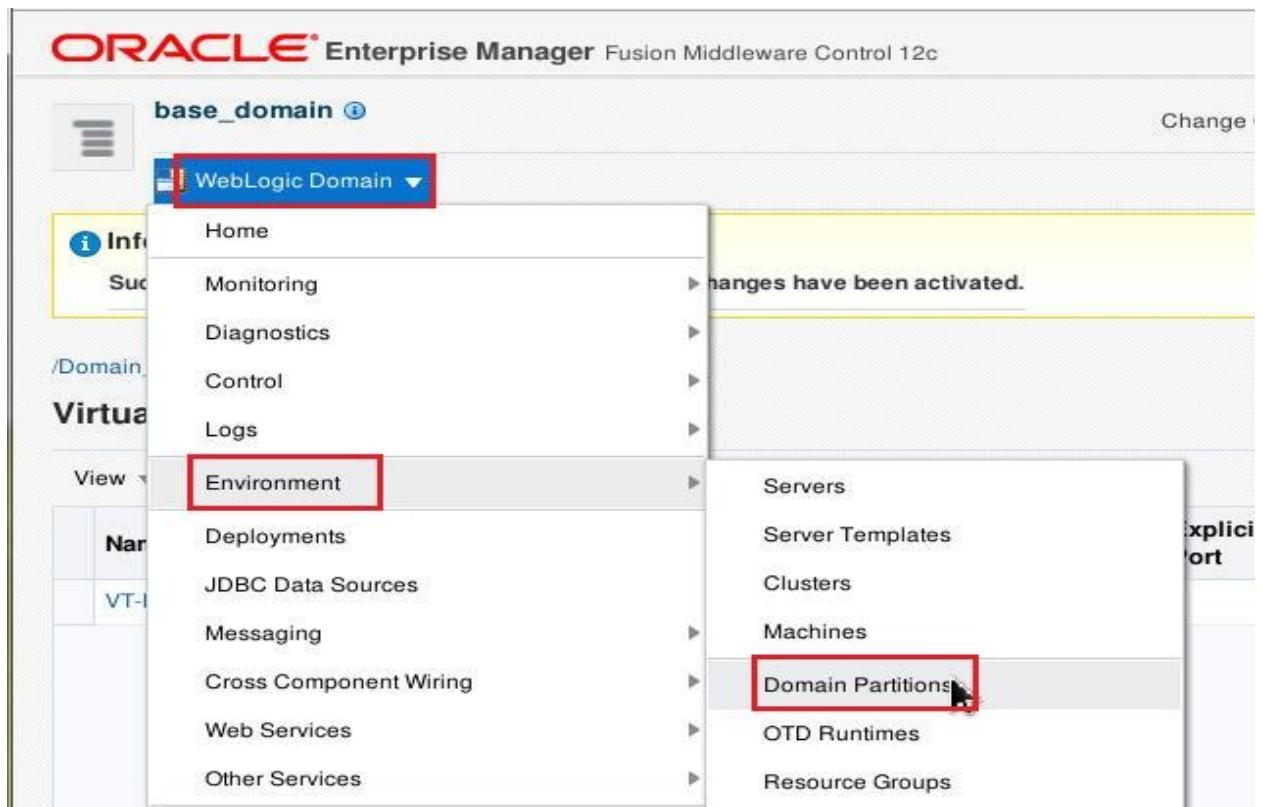
v. Enter **VT-Medrec-1** as Name and **/dp1** as Uri Prefix then click on **Next**.

The screenshot shows the 'Create Virtual Target: General' step. It has tabs for 'General' and 'Targets', with 'General' selected. The form fields include: 'Name' (VT-Medrec-1), 'Uri Prefix' (/dp1), 'Partition Channel' (empty), and 'Port' (radio buttons for 'Explicit' and 'Offset', with 'Explicit' selected). The 'Next' button is highlighted with a red box.

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

The screenshot shows the 'Create Virtual Target: Targets' step. It has tabs for 'General' and 'Targets', with 'Targets' selected. The form field 'Choose a server or cluster to be associated with this virtual target' has 'Cluster' selected and 'app-cluster' entered in the dropdown. The 'Create' button is highlighted with a red box.

vii. Click on **WebLogic Domain** Menu then Select **Environment -> Domain Partitions.**



viii. Click on **Create**.

ix. Enter **dp1** as Name and leave others as default then click on **Next**.

A screenshot of the 'Create Domain Partition: General' configuration page. At the top, there are tabs for 'General', 'Available Targets', 'Resource Group', and 'Summary'. The 'General' tab is selected. The main area is titled 'Create Domain Partition: General' and contains a sub-section 'Load Balancer Configuration'. It includes fields for 'Name' (dp1), 'Security Realm' (None), 'Primary Identity Domain' (empty), and 'OTD Runtime' (None). There is also a checkbox 'Use OTD for Load Balancing' which is unchecked. At the bottom right, there are buttons for 'Back', 'Step 1 of 4', 'Next' (highlighted with a red box), and 'Cancel'.

- x. Check the **left box** near **VT-Medrec-1** and also check the box for **Set as Default** 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-Medrec-1	<input checked="" type="checkbox"/>

Back Step 2 of 4 **Next** **Cancel**

- xi. Enter **app1RG** as Resource Group name and **None** as Resource Group Template, Move the **VT-Medrec-1** virtual target From **Available Targets** 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.

Targets for the Resource Group	Available Targets	Selected Targets
	VT-Medrec-1	

Back Step 3 of 4 **Next** **Cancel**

- xii. Verify the configuration and click on **Create**.
- xiii. We see that domain partition dp1 has been created. Now we are going to start the domain partition dp1.
- xiv. Check the box near **dp1** to make it highlighted and click on **Control -> Start**. Wait until you see the message "**Partition state after the operation is RUNNING**". Click on Close. Press refresh icon to get correct status.

Name	Status	OTD Partition	Realm	Default Targets	Available Targets	Resource Groups
dp1	Down			VT-Medrec-1	VT-Medrec-1	

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

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

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

The screenshot shows the Oracle Enterprise Manager interface for a WebLogic Domain. The top navigation bar includes 'WebLogic Domain' and 'weblogic'. The left sidebar has sections for 'Info', 'Monitoring', 'Diagnostics', 'Control', 'Logs', 'Deployments', 'JDBC Data Sources', 'Messaging', 'Coherence Caches', 'Web Services', 'Other Services', 'Administration', and 'System MBean Browser'. The 'Administration' section is highlighted with a red box. A sub-menu for 'Resource Groups' is open, also highlighted with a red box. The main content area displays 'JDBC and JTA Usage' and 'Resource Usage' metrics.

xvii. Click on Resource Group **app1RG**. In previous version of WebLogic, we target our resources to Cluster, Managed Server in a Cluster, Stand alone managed server. But here resources will be part of Resource Group which is targeted to Virtual Target.

xviii. Creation of Datasource.

a. Select the **Services** tab.

b. Choose JDBC tab, click on **Create -> Generic Data Source**.

The screenshot shows the 'Resource Group : app1RG' page in Oracle Enterprise Manager. The 'Services' tab is selected. The 'JDBC' tab is highlighted with a red box. The 'Create' button is also highlighted with a red box. The page lists system data sources and provides options to create, delete, or detach them.

- c. Enter **MedRecGlobalDataSourceXA** as Data Source Name and **jdbc/MedRecGlobalDataSourceXA** as JNDI Name, and then click on **Select** next to Driver Class Name field.
- d. Select **Oracle** as Database Type and “**Oracle’s Driver (Thin XA) for Service connections; Versions: Any**” as JDBC Driver then click on OK. Click on **Next**.

Create a JDBC Data Source: Data Source Properties

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.

* Data Source Name: MedRecGlobalDataSourceXA

Scope: Resource group "app1RG" in domain partition "dp1"

Type: Generic

Database Type: Oracle

* Driver Class Name: oracle.jdbc.xa.client.OracleXADatasource **Select...**

JNDI Name: jdbc/MedRecGlobalDataSourceXA

- e. Click on **Generate URL and Properties** and Enter the following:

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

Click OK.

Generate URL

* Database Host Name: localhost

Database Listener Port: 1521

* Database Name: pdborcl

* Database User Name: medrec1

* Password: *****

* Confirm Password: *****

Additional Connection Properties
DRCPConnectionClass: [empty]

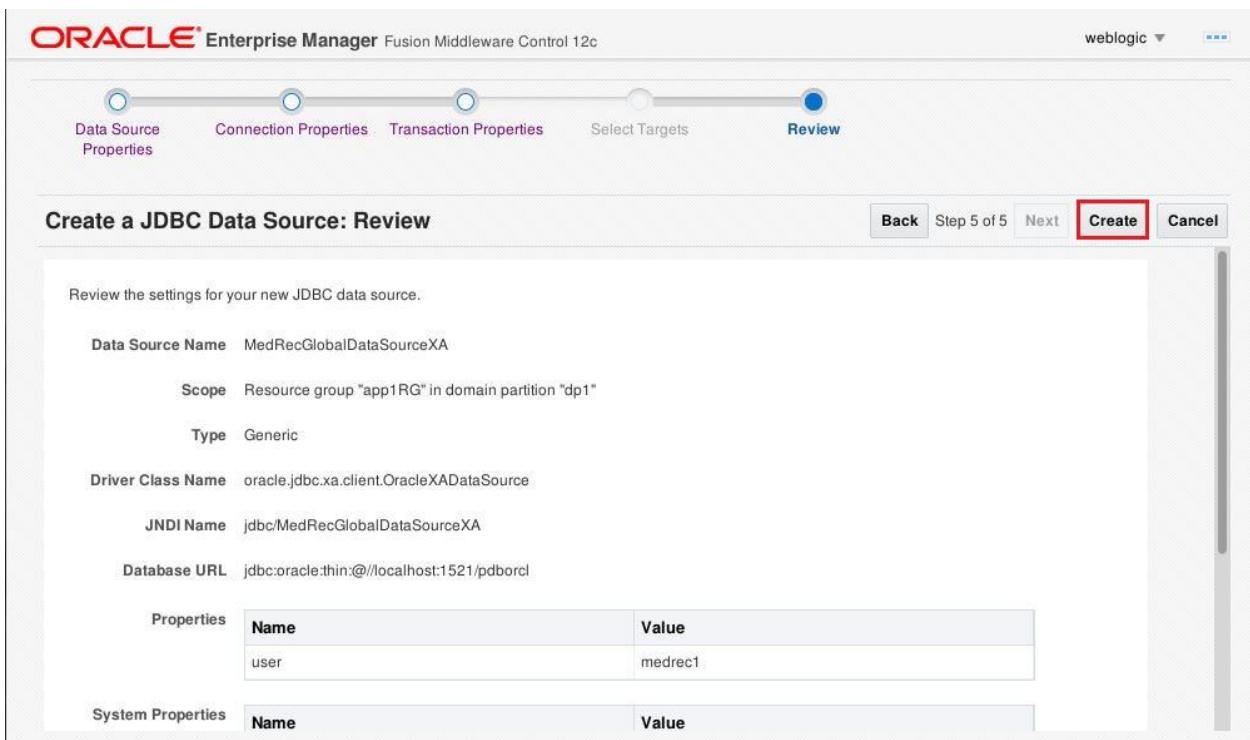
Test Database Connection

OK Cancel

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



- g. Leave Default on **Transaction Options** and click on **Next**.
h. Verify the configuration and click on **Create**.



xix. We are adding a user to default security realm, so that he can access the medrec application as an administrator.

a. Click on **WebLogic Domain -> Security -> Users and Groups**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The top navigation bar shows 'WebLogic Domain' and 'weblogic'. The left sidebar has links for Home, Monitoring, Diagnostics, Control, Logs, Environment, Deployments, JDBC Data Sources, Messaging, Cross Component Wiring, Web Services, Other Services, Administration, Refresh WebLogic Domain, Routing Topology, Security (highlighted with a red box), System MBean Browser, and WebLogic Server Administration Console. The main content area shows a confirmation message: 'JDBC Data Source "MedRecGlobalDataSourceXA" has been created successfully. All changes have been saved.' Below this, it says '/Domain_base_domain/base_domain/dp1 > Resource Groups > Resource Group : app1RG'. The 'Resource Group : app1RG' section has tabs for General, Deployments, Services (selected), Targets, Monitoring, Control, and Notes. Under Services, there are sub-tabs for JDBC (selected), Messaging, Mail, Persistent Stores, Foreign JNDI Providers, and Diagnostics. A table lists JDBC system data sources. The table has columns: Name and JNDI Name. One row shows 'MedRecGlobalDataSourceXA' and 'jdbc/MedRecGlobalDataSourceXA'. Below the table are buttons for View, Create, Create Like, Delete, and Detach. A context menu is open over the table, with 'Security Realms' expanded. The 'Users and Groups' option is highlighted with a red box. Other options in the menu include 'Keystore'.

- b. In **Users** tab, click on **Create**.
- c. Enter the following then click on **Create**.

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

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. On the left, there's a navigation tree with 'base_domain' selected. Under 'base_domain', 'WebLogic Domain' is expanded, showing 'myrealm'. The main panel displays 'Users and Groups' with a table of existing users: LCMUser, OracleSystemUser, and weblogic. A 'Create' button in the table header is highlighted with a red box. A modal window titled 'Create a User' is open over the table, specifically the 'User Properties' section. This section contains fields for Name (administrator), Description (Medrec Admin), Provider (DefaultAuthenticator), Password, and Confirm Password, all of which are highlighted with a red box. At the bottom right of the modal are 'Create' and 'Cancel' buttons, with 'Create' also highlighted with a red box.

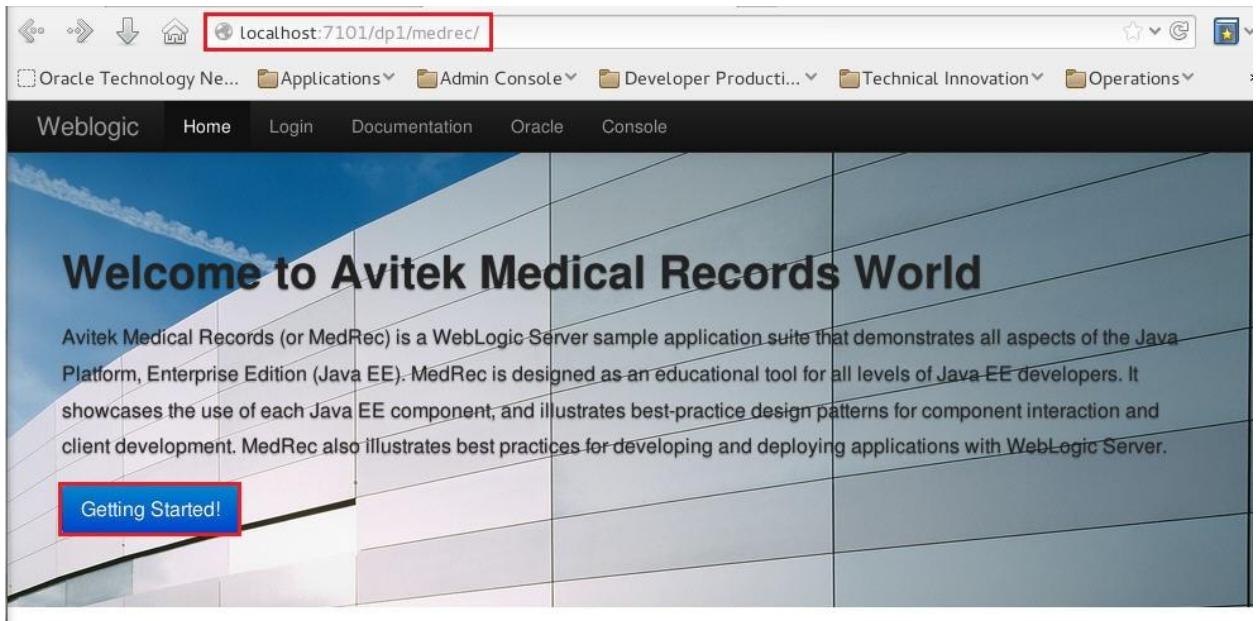
- xx. For configuring other resources we are using scripts to save our time. This MedrecInDP1.sh creates the JMS Server, JMS Module, Distributed Queue and Connection Factory then deploys the medrec.ear, physician.ear and chat.war.
- a. Go back to the terminal window
- b. ./MedrecInDP1.sh

```
[oracle@localhost Lab1]$ ./MedrecInDP1.sh
```

Accessing Medrec Application in Domain Partition dp1

While accessing the application we need to use the Virtual Target URI. As our domain partition is targeted to Virtual Target VT-Medrec-1, which has /dp1 as URI, we need to add it in URL for the accessing the application.

- 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**

A screenshot of a WebLogic browser window showing the 'Administrator' view and manage users page. The top navigation bar includes links for Home, Login, Documentation, Oracle, and Console. The main content area features a heading 'Administrator view and manage users.' Below this is a section with a woman's profile picture and two buttons: 'Login' and 'View Existing Users'. Further down, there is another section with a woman's profile picture and a heading 'Patient'. The word 'Patient' is highlighted with a red rectangular box. Below this heading is text describing the Patient application and two buttons: 'Login' and 'I'm New Here'. The 'I'm New Here' button is also highlighted with a red rectangular box.

iv. Enter the following or any other data then click on Submit.

Email:	weblogic@oracle.com
Password:	welcome1
Confirm Password:	welcome1
First Name:	Ankit
Last Name:	Pandey
Gender:	Male
DOB:	Jun 23, 1988
SSN:	123456788

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Account

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.

*Email	<input type="text" value="weblogic@oracle.com"/>
*Password	<input type="password" value="*****"/>
*Confirm Password	<input type="password" value="*****"/>

Name

*First Name	Middle Name	*Last Name
<input type="text" value="Ankit"/>		<input type="text" value="Pandey"/>

Personal Info

*Gender	<input type="text" value="Male"/>
*DOB	<input type="text" value="Sep 1, 2015"/>
*SSN	<input type="text" value="325436547"/>

Phone

Weblogic Home Login Documentation Oracle Console

Thank you for registering with us! Your registration will be processed by MedRec Administration.
Once approved, you will receive an email with instructions on how to log into MedRec to view your medical record.

v. Click on **Home**, then Click on **Getting Started!**.

vi. Under Administrator, click on **Login**.

localhost:7101/dp1/medrec/index.xhtml

Oracle Technology Ne... Applications Admin Console Developer Producti... Technical Innovation Operations

Weblogic Home Login Documentation Oracle Console



Administrator view and manage users.

The Administrator application allows an administrator to approve or deny new patient profile requests. The Administrator can reset passwords and create physicians.

[Login](#) [View Existing Users](#)

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

The screenshot shows a login form titled "Administrator". It has fields for "Username" containing "administrator" and "Password" containing a series of dots. A red box highlights the "Sign In" button at the bottom right.

- viii. Under **Pending Requests**, click on Go.

The screenshot shows the administrator dashboard. At the top, there's a navigation bar with "administrator", "Administrator Home", and "Logout". Below it, a green success message says "Successful Login.". There are two main sections: "Pending requests." (with a red box around the "Go" button) and "Statistics" (with a "Go" button). Both sections have descriptive text below them.

- ix. Click on the Email Id, and then click on Approve.
x. Click on **Logout**. Click on **Logout Again**.

The screenshot shows the administrator dashboard again. The "Logout" button in the top navigation bar is highlighted with a red box. Below it, a green success message says "Successfully approved or denied the registration request."

- xi. You can login as weblogic@oracle.com/welcome1 as username/password as Patient.
- xii. You can view your record summary, and you can also have interaction with physician.
- xiii. Click on Logout. Click on **Logout** Again.

The screenshot shows a web-based medical application interface. At the top, there is a navigation bar with a dark background. On the left, the user's name "Ankit Pandey" is displayed. To the right of the name are three menu items: "Patient Home", "Profile", and "Chat Room". The "Logout" button is located at the far right of the bar, highlighted with a red box. Below the navigation bar, a green success message box displays the text "Successful Login." with a close button "X" on the right. The main content area is divided into two sections. The left section is titled "View Record Summary" and contains the sub-instruction "Look up your medical records, and view your visit and prescription history." followed by a blue "Go" button. The right section is titled "Interaction with Physicians" and contains the sub-instruction "Click 'Join' to connect to the chat server. You can then select a physician to chat with from the list of online physicians. Choose one to join his or her chat room. If there are no physicians in the list except Eliza, then no physicians are currently online so that no chat room is available. Eliza is a special robot physician. You could chat one-to-one with her directly or you can use the 'Physician App' to have a real physician open the chat room." followed by a blue "Go" button.

Configuration of Medrec Application in Domain Partition dp2

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

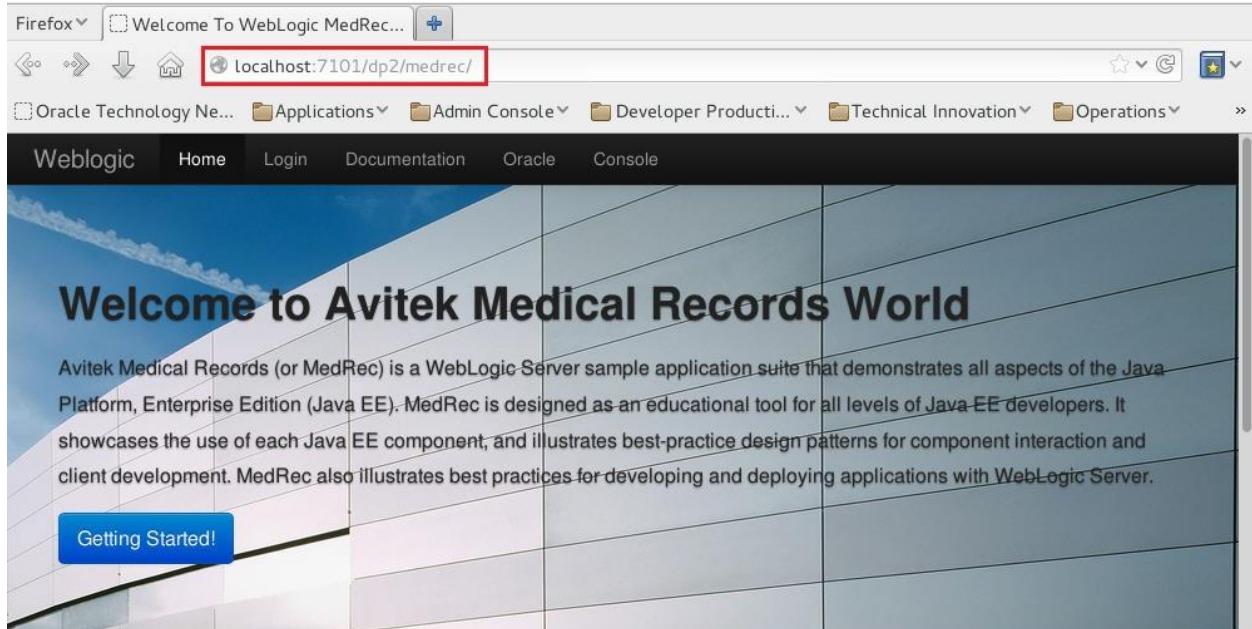
The Scripts MedrecInDP2.sh creates the Virtual Target, Domain Partition, Resource Group, JDBC Datasource, JMS Server, JMS Module, Distributed Queue and Connection Factory then deploys the medrec.ear, physician.ear and chat.war.

- Go Back to terminal window
- cd /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab1/
- ./MedrecInDP2.sh
- Go back to Fusion Middleware Control <http://localhost:7001/em>
- (Optionally) Verify the creation of following the following resources.
 - Click on **WebLogic Domain ->Environment ->Virtual Target**. Here we have **dp2** as **URI Prefix** for the Virtual Target **VT-Medrec-2**.
 - Click on **WebLogic Domain ->Environment ->Domain Partition**.
 - Click on Domain Partition **dp2** then Select **Domain Partition -> Administration -> Resource Groups**.
 - Click on Resource group **app2RG**.
 - 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.

- i. Go to Firefox and type the URL: <http://localhost:7101/dp2/medrec/>



The MedRec User Type

To begin using MedRec, click the **Start Using MedRec** button below.
From there, you can begin by registering as a new patient or you can

Documentation

Avitek Medical Records (or MedRec) is a comprehensive sample application that demonstrates how to use Oracle WebLogic Server and

- ii. Click on Getting Started!
- iii. Under **Patient**, Click on Login, Try to login with 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 dp3

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:	jdbc/datasources/TradeDataSource
Name:	jdbc/datasources/NoTxTradeDataSource
JNDI Name:	jdbc/datasources/NoTxTradeDataSource

Persistence Store: MyFileStore

JMS Server: MyJMSServer

JMS Module: MyJMSModule

MyJMSModule:

Subdeployment: MySubdeployment

Connection Factory:

Name:	jms/myQueueConnectionFactory,
JNDI Name:	jms/myQueueConnectionFactory
Name:	jms/myTopicConnectionFactory
JNDI Name:	jms/myTopicConnectionFactory

Distributed Queue:

Name:	jms/TradeBrokerQueue
JNDI Name:	jms/TradeBrokerQueue

Distributed Topic:

Name:	jms/TradeStreamerTopic
JNDI Name:	jms/TradeStreamerTopic

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.

- i. Go back to terminal
- ii. cd /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab1/
- iii. ./DayTraderInDP3.sh
- iv. Go back to Fusion Middleware Control <http://localhost:7001/em>
- v. **(Optionally)** Verify the creation of following the following resources.
 - a. Click on **WebLogic Domain ->Environment ->Virtual Target**. Here we have **dp3** as **URI Prefix** for the Virtual Target **VT-daytrader**.
 - b. Click on **WebLogic Domain ->Environment ->Domain Partition**.
 - c. Click on Domain Partition to **dp3** then Select **Domain Partition -> Administration -> Resource Groups**.
 - d. Click on Resource group **app3RG**.
 - e. In **Services and Deployments** tab, you can verify the creation of above System Resources here.

Access Day Trader Application in Domain Partition dp3

- i. Go to Firefox and type the URL: <http://localhost:7101/dp3/daytrader/>
- ii. You see the Home Page of application, it proves that application deployed successfully.

The screenshot shows a Firefox browser window with the title bar "Firefox" and tabs "Welcome To WebLogic Med..." and "DayTrader". The address bar shows "localhost:7101/dp3/daytrader/". Below the browser is the DayTrader application interface. The header features the "DAYTRADER PERFORMANCE BENCHMARKING" logo. A navigation menu at the top includes "Home", "Trading & Portfolios", "Configuration" (which is highlighted in red), "Primitives", and "FAQ". The main content area has a table titled "Benchmark Configuration Tools" with four rows:

Benchmark Configuration Tools	Description
Reset DayTrader (to be done before each run)	Reset the DayTrader runtime to a clean starting point by logging off all users, removing new registrations and other general cleanup. For consistent results this URL should be run before each Trade run.
Configure DayTrader run-time parameters	This link provides an interface to set configuration parameters that control DayTrader run-time characteristics such as using EJBs or JDBC. This link also provides utilities such as setting the UID and Password for a remote or protected database when using JDBC.
(Re)-create DayTrader Database Tables and Indexes	This link is used to (a) initially create or (b) drop and re-create the DayTrader tables. A DayTrader database should exist before doing this action. The existing DayTrader tables, if any, are dropped, then new tables and indexes are created. Please stop and re-start the Daytrader application (or your application server) after this action and then use the "Repopulate DayTrader Database" link below to repopulate the new database tables.
(Re)-populate DayTrader Database	This link is used to initially populate or re-populate the DayTrader database with fictitious users (uid:0, uid:1, ...) and stocks (s:0, s:1, ...). First all existing users and stocks are deleted (if any). The database is then populated with a new set of DayTrader users and stocks. This option does not drop and recreate the Daytrader db tables.

At the bottom of the page, there is a copyright notice "Copyright 2006, Apache Software Foundation. All Rights Reserved" and a "POWERED BY APACHE Geronimo" logo.

LAB 2: EXPORT /IMPORT DOMAIN PARTITION

Overview

In this Lab, We already created a Non-JRF domain dev_domain and configured 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.

Stop and remove the domain partition dp1 from base_domain

- i. In Fusion Middleware Control <http://localhost:7001/em> , Click on **WebLogic Domain -> Environment -> Domain Partition**.
- ii. Check the **box** near **dp1** then click on **Control -> Stop**. On the Confirmation Screen Click on **OK**. Click on **Close**. Click on **Refresh** icon to verify the **Shutdown** State of domain partition. If you see the “**Shutting Down**” state, again click on **Control->Stop** and in the end verify the “**Shutdown**” state. This issue is fixed in the final release.
- iii. Check the box near **dp1** and make it highlighted then click on **Delete**. In Delete Domain Partition Screen, click on **OK**.
- iv. Go to Firefox and type the URL: <http://localhost:7101/dp1/medrec/>
- v. Confirm that page return “**Error 404—Not Found**”.

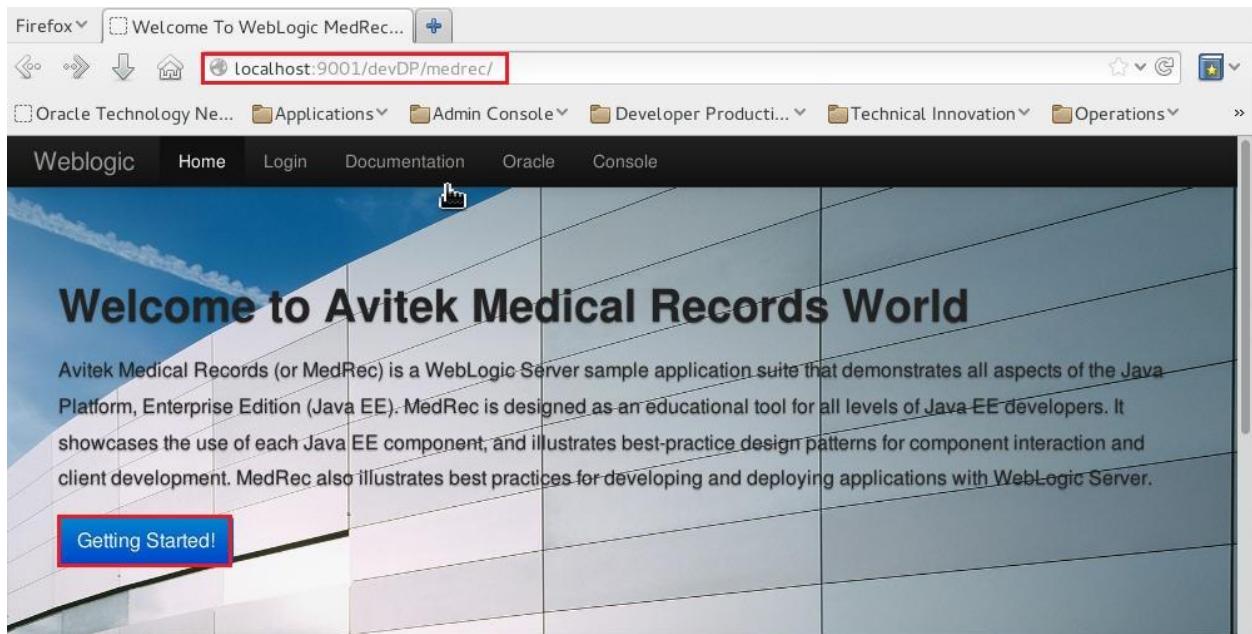


This shows that Domain Partition associated with Virtual Target exposed by URI: /dp1 has been stopped and all applications deployed there are unavailable.

Accessing Medrec Application on Single Server (Admin Server) domain

This domain doesn't have deployed Fusion Middleware Control, so all administrative operations we will perform through classical WebLogic Admin Console.

- i. Go back to terminal window
- ii. cd /u01/wls/wls1221/user_projects/domains/dev_domain/
- iii. ./startWebLogic.sh
- iv. Verify the creation of following the following resources.
 - a. Go to Firefox and type the URL of WebLogic Admin Console:
<http://localhost:9001/console>.
 - b. Enter **weblogic/welcome1** as Username/Password then click on Login.
 - c. In left side menu click on **Environment ->Virtual Target**. Here we have **devDP** as **URI Prefix** for the Virtual Target **VT-Medrec-1**.
 - d. In left side under Domain Structure click on **Domain Partitions**.
 - e. Click on Domain Partition **Medrec-Dev** then click on **Resource Groups** tab. Click on **app1RG**.
 - f. In **Deployments and Services** tab, you can verify the creation of **System Resources** in Resource group.
- v. Go to Firefox and access the application on
<http://localhost:9001/devDP/medrec>
- vi. Click on **Getting Started!**.



- vii. Under Patient, Click on Login.
- viii. Enter fred@golf.com/weblogic as username/password then click on Sign In.
- ix. Verify the proper behavior of Application then click on Logout. Click on Logout again.

The screenshot shows a web browser window with the URL `localhost:9001/devDP/medrec/patient/patientHome.xhtml`. The top navigation bar includes links for Oracle Technology Network, Applications, Admin Console, Developer Productivity, Technical Innovation, and Operations. The user is logged in as "Fred I Winner". A red box highlights the "Logout" link. Below the navigation, a green success message box displays "Successful Login." A red box highlights the "Logout" link again. The main content area has two sections: "View Record Summary" and "Interaction with Physicians". The "View Record Summary" section contains a brief description and a "Go" button. The "Interaction with Physicians" section contains descriptive text and a "Go" button. At the bottom, there is a footer with links to Oracle Home, Products and Services, Industries, Support, Store, Partners, Communities, and About, along with copyright information.

Exporting the Domain Partition

- i. Go to Firefox and type the URL of WebLogic Admin Console:
<http://localhost:9001/console>
- ii. Enter `weblogic/welcome1` as Username/Password then click on Login.

The screenshot shows a Firefox browser window with the URL `localhost:9001/console/Login/LoginForm.jsp`. The top navigation bar is identical to the previous screenshot. The main content area features a large "12c" watermark on the left. On the right, there is a "Welcome" message and a login form. The login form fields for "Username" (containing "weblogic") and "Password" (containing masked text) are highlighted with a red box. A red box also highlights the "Login" button. The overall theme is blue and white, consistent with Oracle's branding.

- iii. On left Side, Click on **Domain Partitions**, and then check the box near to "Medrec-Dev" then click on **Export**.

Name	Resource Groups	Default Target(s)	State
Medrec-Dev	app1RG	VT-Medrec-1	RUNNING

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

- v. Go to Desktop and verify the creation of **Medrec-Dev.zip** and **Medrec-Dev-attribute.json**.

Importing the Domain Partition

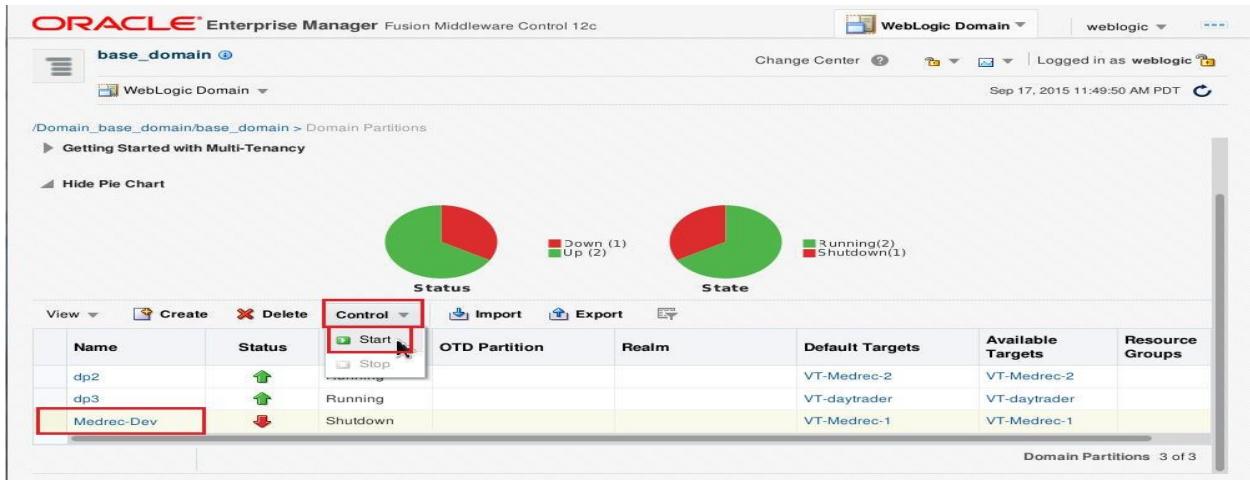
- i. Go back to Fusion Middleware Control of base_domain. Go to Firefox and type the URL: <http://localhost:7001/em>.
- ii. Enter **weblogic/welcome1** as Username/Password and click on **Login**.
- iii. Click on **WebLogic Domain-> Environment ->Domain Partition**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The left sidebar shows navigation categories: Server, Cluster, Deployment, and Administration. Under 'base_domain', the 'WebLogic Domain' section is selected. A red box highlights the 'Environment' link under 'WebLogic Domain'. The main content area shows the 'Admin Server' configuration with 'Name: AdminServer' and 'Host: localhost'. Below this, the 'Domain Partitions' link is highlighted with a red box. On the right, a table lists domain partitions:

Partition	Machine	State
cluster	machine	Running
cluster	machine	Running

Servers 3 of 3

- iv. Click on **Import**. Click on **Browse** button. Search for previously created files in the process of exporting domain. Select the file **Medrec-Dev.zip** from **/home/oracle/Desktop** directory then click on **OK**.
- v. Click on **OK** then click on Refresh icon.
- vi. Initially it will have State “**Unknown**”. Wait for 1 or 2 minute, click on Refresh icon to get the current state.
- vii. Once the status for Medrec-Dev domain partition is **Shutdown**, check the box, near **Medrec-Dev** then click on **Control -> Start**. Once Domain Partition started successfully, Click on Close. Click on the Refresh icon to get the current state.



- viii. Go Firefox and type the URL: <http://localhost:7101/dp1/medrec/> (before importing we got 404 page on that URL)
- ix. Click on “Getting Started!” Under Administrator, click on Login.
- x. Enter **administrator/administrator123** as Username/Password then click on Sign in.
- xi. Click on Logout. Click again on Logout.

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.

- xii. Come back to terminal
- xiii. Stop the WebLogic Server running in dev_domain, by pressing Ctrl +C in terminal in which Admin Server is running.

LAB 3: 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.

In this lab we are going to learn the following:

- 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

Resource Consumption Management is integrated with JRR 8u40+ and it uses some Oracle JVM Features. First we will stop the cluster and Add parameter to JAVA_OPTIONS, then we will start the cluster again.

- i. Go to terminal window
- ii. cd /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab3/
- iii. ./stop-cluster.sh
- iv. We need to modify startup scripts of WebLogic Server to enable Resource Consumption Management capability of JVM. To do that you would need to add the below options **-XX:+UnlockCommercialFeatures -XX:+ResourceManagement -XX:+UseG1GC** in JAVA_OPTIONS in setDomainEnv.sh file. However for a need of that lab we simplified the process. We have prepared modified setDomainEnv.sh file as Lab3 assets. It is enough to copy that file into the startup directory of WebLogic Server

```
cp /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-  
Workshop/Lab3/setDomainEnv.sh  
/u01/wins/wls1221/user_projects/domains/base_domain/bin/
```

v. ./start-cluster.sh

```
[oracle@localhost Lab3]$ vi /u01/wins/wls1221/user_projects/domains/base_domain/bin/setDomainEnv.sh  
[oracle@localhost Lab3]$ ./start-cluster.sh  
Initializing WebLogic Scripting Tool (WLST) ...  
Welcome to WebLogic Server Administration Scripting Shell  
Type help() for help on available commands  
Connecting to t3://localhost:7001 with userid weblogic ...  
Successfully connected to Admin Server "AdminServer" that belongs to domain "base_domain".  
Warning: An insecure protocol was used to connect to the server.  
To ensure on-the-wire security, the SSL port or Admin port should be used instead.  
Location changed to edit tree.  
This is a writable tree with DomainMBean as the root.  
To make changes you will need to start an edit session via startEdit().  
For more help, use help('edit').  
Starting an edit session ...  
Started edit session, be sure to save and activate your changes once you are done.  
Starting the following servers in Cluster, app-cluster : app-cluster-1,app-cluster-2  
.....  
.....  
.....  
All servers in the cluster app-cluster are started successfully.  
Activating all your changes, this may take a while ...  
The edit lock associated with this edit session is released once the activation is completed.  
Activation completed  
Disconnected from weblogic server: AdminServer  
[oracle@localhost Lab3]$ █
```

vi. tail -f /u01/wins/wls1221/user_projects/domains/base_domain/servers/app-cluster-1/logs/app-cluster-1.log

vii. In this terminal, Click on **Terminal -> Set Title** and **app-cluster-1** then click on **OK**. We will use these logs to monitor resource consumption manager lab.

oracle@localhost:/u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab2

```

File Edit View Search Terminal Help
2a-172a0e8260f7-00000 Change Profile
ff-44c0de3e3286] [par Set Title...
337)--Thread(Thread[[ Set Character Encoding
Threads])--The primary
####<Sep 17, 2015 12: 1. 80x24
cuteThread: '13' for
2a-172a0e8260f7-00000 2. 80x43
ff-44c0de3e3286] [par 3. 132x24
337)--Thread(Thread[[ 4. 132x43
Threads])--The foreign
####<Sep 17, 2015 12: 1. 80x24
cuteThread: '13' for
2a-172a0e8260f7-00000 2. 80x43
ff-44c0de3e3286] [par 3. 132x24
337)--Thread(Thread[[ 4. 132x43
Threads])--The primary key column name for the mapping element [field patient] is being defaulted to: ID.>
####<Sep 17, 2015 12:01:16 PM PDT> <Info> <EclipseLink> <localhost.localdomain> <app-cluster-1> <[ACTIVE]> ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <WLS Kernel>> <> <2956eb57-fe2c-49af-bf 2a-172a0e8260f7-00000016> <1442516476939> <severity-value: 64> [rid: 0] [partition-id: dd365104-de23-411d-b7 ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-2005000> <2015-09-17 12:01:16.939-> <ServerSession(1450012 337)--Thread(Thread[[ACTIVE] ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)',5,Pooled Threads])--The foreign key column name for the mapping element [patient] is being defaulted to: PATIENT_ID.>
####<Sep 17, 2015 12:01:16 PM PDT> <Info> <EclipseLink> <localhost.localdomain> <app-cluster-1> <[ACTIVE]> ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <WLS Kernel>> <> <2956eb57-fe2c-49af-bf 2a-172a0e8260f7-00000016> <1442516476939> <severity-value: 64> [rid: 0] [partition-id: dd365104-de23-411d-b7 ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-2005000> <2015-09-17 12:01:16.939-> <ServerSession(1450012 337)--Thread(Thread[[ACTIVE] ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)',5,Pooled Threads])--The primary key column name for the mapping element [field physician] is being defaulted to: ID.>
####<Sep 17, 2015 12:01:16 PM PDT> <Info> <EclipseLink> <localhost.localdomain> <app-cluster-1> <[ACTIVE]> ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <WLS Kernel>> <> <2956eb57-fe2c-49af-bf 2a-172a0e8260f7-00000016> <1442516476940> <severity-value: 64> [rid: 0] [partition-id: dd365104-de23-411d-b7 ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-2005000> <2015-09-17 12:01:16.94-> <ServerSession(1450012 337)--Thread(Thread[[ACTIVE] ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)',5,Pooled T hreads])--The foreign key column name for the mapping element [physician] is being defaulted to: PHYSICIAN_ID
>

```

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

- i. Go to Fusion Middleware Control <http://localhost:7001/em>.
- ii. Enter **weblogic/welcome1** as **Username/Password** then click on **Login**.
- iii. Click on **WebLogic Domain->Environment -> Resource Consumption Managers**.

The screenshot shows the Oracle Enterprise Manager Fusion Middleware Control 12c interface. The left sidebar is titled 'Domain' and lists various options like Home, Monitoring, Diagnostics, Control, Logs, Environment (which is selected and highlighted with a red box), Deployments, JDBC Data Sources, Messaging, Cross Component Wiring, Web Services, Other Services, Administration, Refresh WebLogic Domain, and Routing Topology. The main content area has a title 'Resource Consumption Managers' with a red box around it. Below the title is a sub-menu with options: Servers, Server Templates, Clusters, Machines, Domain Partitions, OTD Runtimes, Resource Groups, Resource Group Templates, Partition Work Managers, and Resource Consumption Managers (which is also highlighted with a red box). To the right of the sub-menu is a table titled 'Resource Consumption Managers' with three columns: Default Targets, Available Targets, and Resource Groups. The table contains two rows: VT-Medrec-2 and VT-daytrader under both Default Targets and Available Targets, and no entries under Resource Groups. A status bar at the bottom indicates 'Running(2)' and 'Shutdown(1)'. The top right corner shows the user is logged in as 'weblogic'.

- iv. 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

Note: These numbers are so small for demo purposes only. In Production runtime we recommend it minimum 1 GB for shutdown action.

The screenshot shows the 'Add Resource Manager' dialog box. At the top, there is a 'Resource Manager' input field containing 'smallHeap' with a red box around it. Below it is a note: 'Define one policy now. Specify any additional policies after this Resource Manager is created.' Under 'Policy Type', a dropdown menu shows 'HeapRetained' with a red box around it. Under 'Fair Share', there is a 'Weight' input field with up and down arrows. At the bottom, there is a 'Triggers' section with a table:

	Shutdown	Slow	Notify
Shutdown	400		
Slow		250	
Notify			200

At the bottom right of the dialog box are 'OK' and 'Cancel' buttons, both with red boxes around them.

- v. Associate the Resource Manager with **Medrec-Dev** domain partition.
- Click on **WebLogic Domain -> Environment->Domain Partition** then click on **Medrec-Dev**.

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

- b. Click on **Domain Partition ->Administration -> Resource Sharing**.

Use this page to specify resource sharing policies for this partition. A Partition Work Manager manages the threads allocated to the partition, manages scheduling work instances to those threads. A Resource Consumption Manager allows you to partition access to shared JDK resources such as CPU, Heap, File and Network, monitor their access and enforce comprehensive policies on the consumption of these resources for this partition.

Partition Work Manager Configuration

Select a Partition Work Manager defined for this domain or specify the following attributes here to prioritize the thread usage of the WLS thread pool amongst partitions. This helps set the relative priority of the partitions.

No Partition Work Manager
 Use a Partition Work Manager configured for the domain.

Specify the Partition Work Manager settings for this domain partition.

Resource Manager Configuration

Select a resource manager defined for this domain or create a partition specific resource manager and policies. Note that the resource manager policies will only be

- c. 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 Oracle WebLogic Server Administration Console interface. In the top navigation bar, the domain is identified as "Medrec-Dev". Below the navigation, there are buttons for "Domain Partition", "Start Up", and "Shut Down...". The date and time are shown as "Sep 17, 2015 12:17:35 PM PDT". The main content area has a title "Partition Work Manager Configuration" with a sub-instruction about prioritizing thread usage. It contains three radio button options: "No Partition Work Manager" (selected), "Use a Partition Work Manager configured for the domain" (highlighted with a red box), and "Specify the Partition Work Manager settings for this domain partition". Below this is another section titled "Resource Manager Configuration" with a similar instruction. It also contains three radio button options: "No Resource Manager" (unchecked), "Use a Resource Manager configured for the domain" (selected and highlighted with a red box), and "Use a partition specific resource manager: (A new resource manager will be created.)" (unchecked).

- vi. We will deploy a sample application to demonstrate the functionality of Resource Isolation.

- Open a new terminal.
- `cd /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab3/`
- `./DeployHeap.sh`

```
[oracle@localhost Lab3]$ ./DeployHeap.sh
Initializing WebLogic Scripting Tool (WLST) ...

Welcome to WebLogic Server Administration Scripting Shell
Type help() for help on available commands

Connecting to t3://localhost:7001 with userid weblogic ...
Successfully connected to Admin Server "AdminServer" that belongs to domain "base_domain".

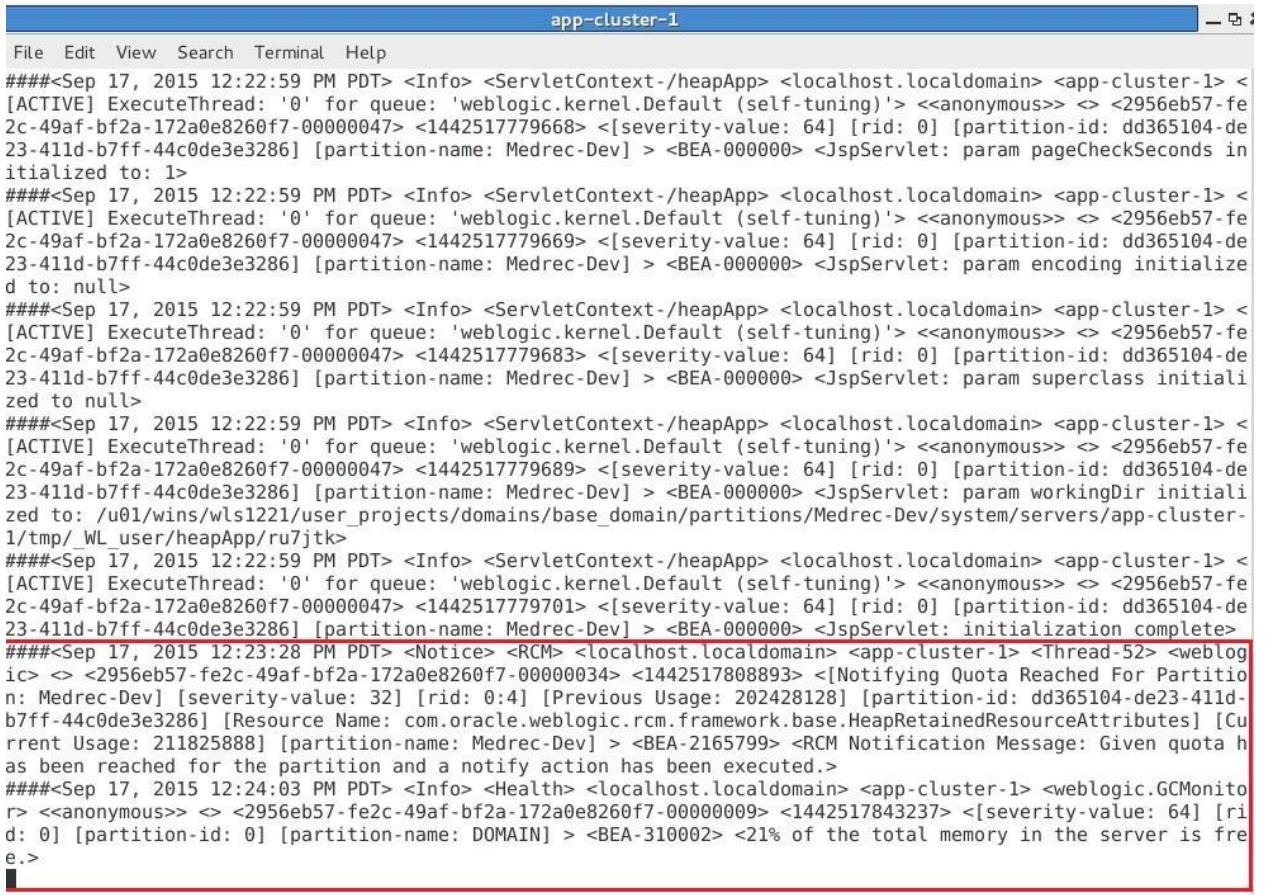
Warning: An insecure protocol was used to connect to the server.
To ensure on-the-wire security, the SSL port or Admin port should be used instead.

Location changed to edit tree.
This is a writable tree with DomainMBean as the root.
To make changes you will need to start an edit session via startEdit().
For more help, use help('edit').

Starting an edit session ...
Started edit session, be sure to save and activate your changes once you are done.
Deploying application from /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab3/heapApp.war
to targets (upload=false) ...
<Sep 17, 2015 12:21:45 PM PDT> <Info> <J2EE Deployment SPI> <BEA-260121> <Initiating deploy operation for application, heapApp [archive: /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/Lab3/heapApp.war ], to configured targets.>
You have an edit session in progress, hence WLST will not block for your deployment to complete.
Started the Deployment of Application. Please refer to the returned WLSTProgress object or variable LAST to track the status.
Activating all your changes, this may take a while ...
The edit lock associated with this edit session is released once the activation is completed.
Activation completed
Disconnected from weblogic server: AdminServer
<Sep 17, 2015 12:21:52 PM PDT> <Warning> <JNDI> <BEA-050001> <WLContext.close() was called in a different thread than the one in which it was created.>
[oracle@localhost Lab3]$
```

- vii. Go back to Firefox and type the URL: <http://localhost:7101/dp1/heapApp/>.
- viii. 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
- ix. 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

```
#####<Sep 17, 2015 12:23:28 PM PDT> <Notice> <RCM> <localhost.localdomain>
<app-cluster-1> <Thread-52> <weblogic> <> <2956eb57-fe2c-49af-bf2a-
172a0e8260f7-00000034> <1442517808893> <[Notifying Quota Reached For
Partition: Medrec-Dev] [severity-value: 32] [rid: 0:4] [Previous Usage: 202428128]
[partition-id: dd365104-de23-411d-b7ff-44c0de3e3286] [Resource Name:
com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttributes]
[Current Usage: 211825888] [partition-name: Medrec-Dev] > <BEA-2165799>
<RCM Notification Message: Given quota has been reached for the partition and a
notify action has been executed.>
```



```
File Edit View Search Terminal Help
#####<Sep 17, 2015 12:22:59 PM PDT> <Info> <ServletContext-/heapApp> <localhost.localdomain> <app-cluster-1> <[ACTIVE] ExecuteThread: '0' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <2956eb57-fe
2c-49af-bf2a-172a0e8260f7-00000047> <1442517779668> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de
23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-000000> <JspServlet: param pageCheckSeconds in
ialized to: 1>
#####<Sep 17, 2015 12:22:59 PM PDT> <Info> <ServletContext-/heapApp> <localhost.localdomain> <app-cluster-1> <[ACTIVE] ExecuteThread: '0' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <2956eb57-fe
2c-49af-bf2a-172a0e8260f7-00000047> <1442517779669> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de
23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-000000> <JspServlet: param encoding initialize
d to: null>
#####<Sep 17, 2015 12:22:59 PM PDT> <Info> <ServletContext-/heapApp> <localhost.localdomain> <app-cluster-1> <[ACTIVE] ExecuteThread: '0' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <2956eb57-fe
2c-49af-bf2a-172a0e8260f7-00000047> <1442517779683> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de
23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-000000> <JspServlet: param superclass initiali
zed to null>
#####<Sep 17, 2015 12:22:59 PM PDT> <Info> <ServletContext-/heapApp> <localhost.localdomain> <app-cluster-1> <[ACTIVE] ExecuteThread: '0' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <2956eb57-fe
2c-49af-bf2a-172a0e8260f7-00000047> <1442517779689> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de
23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-000000> <JspServlet: param workingDir initiali
zed to: /u01/wins/wls1221/user_projects/domains/base_domain/partitions/Medrec-Dev/system/servers/app-cluster-
1/tmp/_WL_user/heapApp/rU7jtk>
#####<Sep 17, 2015 12:22:59 PM PDT> <Info> <ServletContext-/heapApp> <localhost.localdomain> <app-cluster-1> <[ACTIVE] ExecuteThread: '0' for queue: 'weblogic.kernel.Default (self-tuning)'> <> <2956eb57-fe
2c-49af-bf2a-172a0e8260f7-00000047> <1442517779701> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de
23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] > <BEA-000000> <JspServlet: initialization complete>
#####<Sep 17, 2015 12:23:28 PM PDT> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-52> <weblog
ic> <> <2956eb57-fe2c-49af-bf2a-172a0e8260f7-00000034> <1442517808893> <[Notifying Quota Reached For Partition: Medrec-Dev] [severity-value: 32] [rid: 0:4] [Previous Usage: 202428128] [partition-id: dd365104-de23-411d-b7ff-44c0de3e3286] [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttributes] [Current Usage: 211825888] [partition-name: Medrec-Dev] > <BEA-2165799> <RCM Notification Message: Given quota has been reached for the partition and a notify action has been executed.>
#####<Sep 17, 2015 12:24:03 PM PDT> <Info> <Health> <localhost.localdomain> <app-cluster-1> <weblogic.GCMonitor> <> <2956eb57-fe2c-49af-bf2a-172a0e8260f7-00000009> <1442517843237> <[severity-value: 64] [rid: 0] [partition-id: 0] [partition-name: DOMAIN] > <BEA-310002> <21% of the total memory in the server is free.>
```

- x. 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.

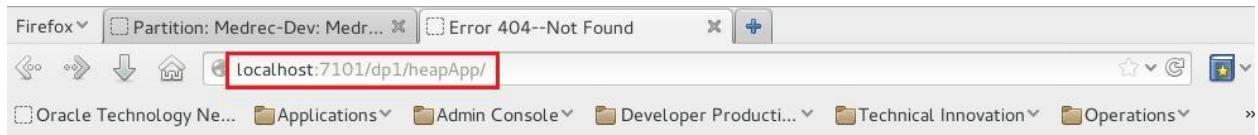
```
####<Sep 17, 2015 12:26:09 PM PDT> <Notice> <RCM>
<localhost.localdomain> <app-cluster-1> <Thread-51> <weblogic> <> <2956eb57-fe2c-
49af-bf2a-172a0e8260f7-00000034> <1442517969737> <[Slow Action Quota Reached
For Partition: Medrec-Dev] [Current Usage: 284744072] [severity-value: 32] [Previous
Usage: 272825472] [Was Required action to Slow the Partition is executed?: true]
[ResourceName:
com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttributes]
[partition-id: dd365104-de23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev]
[rid: 0:3] > <BEA-2165800> <RCM Slow Message: Given quota has been reached for the
partition and a slow action has been executed.>
```

```
####<Sep 17, 2015 12:26:09 PM PDT> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-51> <weblog
ic> <> <2956eb57-fe2c-49af-bf2a-172a0e8260f7-00000034> <1442517969737> <[Slow Action Quota Reached For Partit
ion: Medrec-Dev] [Current Usage: 284744072] [severity-value: 32] [Previous Usage: 272825472] [Was Required ac
tion to Slow the Partition is executed?: true] [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRet
ainedResourceAttributes] [partition-id: dd365104-de23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] [r
id: 0:3] > <BEA-2165800> <RCM Slow Message: Given quota has been reached for the partition and a slow action
has been executed.>
```

- xi. 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.

```
####<Sep 17, 2015 12:26:09 PM PDT> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-51> <weblog
ic> <> <2956eb57-fe2c-49af-bf2a-172a0e8260f7-00000034> <1442517969737> <[Slow Action Quota Reached For Partit
ion: Medrec-Dev] [Current Usage: 284744072] [severity-value: 32] [Previous Usage: 272825472] [Was Required ac
tion to Slow the Partition is executed?: true] [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRet
ainedResourceAttributes] [partition-id: dd365104-de23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev] [r
id: 0:3] > <BEA-2165800> <RCM Slow Message: Given quota has been reached for the partition and a slow action
has been executed.>
####<Sep 17, 2015 12:28:12 PM PDT> <Notice> <RCM> <localhost.localdomain> <app-cluster-1> <Thread-53> <weblog
ic> <> <2956eb57-fe2c-49af-bf2a-172a0e8260f7-00000034> <1442518092544> <[severity-value: 32] [Proposed Usage:
449121936] [rid: 0:5] [partition-id: dd365104-de23-411d-b7ff-44c0de3e3286] <Shutdown Action Quota Reached Fo
r Partition: Medrec-Dev> [Resource Name: com.oracle.weblogic.rcm.framework.base.HeapRetainedResourceAttribute
s] [Current Usage: 449476920] [partition-name: Medrec-Dev] > <BEA-2165801> <RCM Shutdown Message: Given quota
has been reached for the partition and a shutdown action has been executed.>
####<Sep 17, 2015 12:28:12 PM PDT> <Notice> <Partition Lifecycle> <localhost.localdomain> <app-cluster-1> <[A
CTIVE] ExecuteThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <<WLS Kernel>> <> <2956eb57-fe
2c-49af-bf2a-172a0e8260f7-00000048> <1442518092550> <[severity-value: 32] [rid: 0] [partition-id: dd365104-de
23-411d-b7ff-44c0de3e3286] [partition-name: Medrec-Dev]> <BEA-2192303> <The partition lifecycle operation "F
ORCE_SHUTDOWN" for partition "Medrec-Dev" is initiated.>
####<Sep 17, 2015 12:28:12 PM PDT> <Info> <Deployer> <localhost.localdomain> <app-cluster-1> <[ACTIVE] Execut
eThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <<WLS Kernel>> <> <2956eb57-fe2c-49af-bf2a-
172a0e8260f7-00000048> <1442518092570> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de23-411d-b7ff-
44c0de3e3286] [partition-name: Medrec-Dev]> <BEA-149059> <Module medrec/physician of application physician i
s transitioning from STATE_ACTIVE to STATE_ADMIN on server app-cluster-1.>
####<Sep 17, 2015 12:28:12 PM PDT> <Info> <Deployer> <localhost.localdomain> <app-cluster-1> <[ACTIVE] Execut
eThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <<WLS Kernel>> <> <2956eb57-fe2c-49af-bf2a-
172a0e8260f7-00000048> <1442518092575> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de23-411d-b7ff-
44c0de3e3286] [partition-name: Medrec-Dev]> <BEA-149060> <Module medrec/physician of application physician s
uccessfully transitioned from STATE_ACTIVE to STATE_ADMIN on server app-cluster-1.>
####<Sep 17, 2015 12:28:12 PM PDT> <Info> <Deployer> <localhost.localdomain> <app-cluster-1> <[ACTIVE] Execut
eThread: '13' for queue: 'weblogic.kernel.Default (self-tuning)'> <<WLS Kernel>> <> <2956eb57-fe2c-49af-bf2a-
172a0e8260f7-00000048> <1442518092575> <[severity-value: 64] [rid: 0] [partition-id: dd365104-de23-411d-b7ff-
44c0de3e3286] [partition-name: Medrec-Dev]> <BEA-149059> <Module common.jar of application physician is tran
sitioning from STATE_ACTIVE to STATE_ADMIN on server app-cluster-1.>
```

xii. Refresh the page, <http://localhost:7101/dp1/heapApp/> which return 404 and confirm shutdown of the domain partition **Medrec-dev** in **app-cluster-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.

LAB4: SECURITY ISOLATION (Optional)

Overview

When you create a domain, it already contains a default security realm. You can also create a custom security realm and use it in your domain as default security realm. In WebLogic 12.2.1 where we have MT, we can create many domain partitions. When we create the domain partition we also get the option to choose the security realm. If we do not choose it, by default our domain partition uses default security realms.

Here you can create your own Security realm and assign it to a domain partition. So In single domain, you will have two domain partitions which are using different security realms.

In this lab we are going to learn the following:

- 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. Go to Firefox and type the URL: <http://localhost:7001/console>.
- ii. Enter **weblogic/welcome1** as username/password then click on Login.
- iii. Under Domain Structure, click on **Security Realms**.
- iv. Click on **New**.

The screenshot shows the Oracle WebLogic Server Administration Console interface. The browser address bar shows the URL http://localhost:7001/console/console.portal?_nfpb=true&_pageLabel=SecurityRealmRealmTablePage. The main content area displays the "Summary of Security Realms" page. On the left, there is a "Domain Structure" tree view with "base_domain" expanded, showing "Domain Partitions", "Environment", "Deployments", "Services", and "Security Realms" (which is highlighted with a red box). A "Change Center" sidebar indicates pending changes. The "Summary of Security Realms" panel contains a table titled "Realms (Filtered - More Columns Exist)". The table has columns for "Name" and "Default Realm". It shows one row for "myrealm" with "true" in the "Default Realm" column. Buttons for "New" and "Delete" are visible at the top of the table. Navigation links at the bottom of the page include "Showing 1 to 1 of 1 Previous | Next".

- 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

OK | **Cancel**

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: **mynewrealm**

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

OK | **Cancel**

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

Settings for mynewrealm

Configuration | **Users and Groups** | Roles and Policies | 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)

New	Delete	Showing 0 to 0 of 0 Previous Next		
	Name	Description	Provider	
There are no items to display				

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

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:

How would you like to describe the new User?

Description:

Please choose a provider for the user.

Provider:

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

* Password:

* Confirm Password:

OK | Cancel

x. Click on Activate changes.

Assign the mynewrealm security realm to domain partition Medrec-Dev.

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

ORACLE WebLogic Server Administration Console 12c

Change Center

View changes and restarts

Pending changes exist. They must be activated to take effect. You may activate them now. Otherwise, they will be automatically activated when you next modify, add or delete items in this domain.

Activate Changes | Undo All Changes

Domain Structure

- base_domain
 - + Domain Partitions
 - + Environment
 - Deployments
 - Services
 - Security Realms
 - Interoperability
 - Diagnostics
 - Log Files
 - Diagnostic Modules
 - Built-in Diagnostic Modules
 - Diagnostic Images
 - Request Performance Archives

Summary of Domain Partitions

Configuration | **Control**

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

Customize this table

Domain Partitions

Name	Default	When work completes	State	Status of Last Action
dp2	VT-Medrec-2	Force Shutdown Now	RUNNING	TASK COMPLETED
dp3	VT-daytrader		RUNNING	TASK COMPLETED
Medrec-Dev	VT-Medrec-1		RUNNING	TASK COMPLETED

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

Settings for Medrec-Dev

Configuration Resource Groups Deployments Services Resource Overrides Coherence Caches Work Manager

Concurrent Templates Monitoring Notes

General Available Targets File Systems JTA Concurrency Partition Work Manager Resource Management

Save

Use this page to view or change the configuration of a domain partition. Only the targets that have been selected on the Targets page will be available and shown on this page.

Select Default Targets:

Available: [Empty list]

Chosen: VT-Medrec-1

Select default targets for this domain partition. These targets will be applied for any resource group that does not specify a target. [More Info...](#)

Use Realm: **mynewrealm**

Select a realm to use for this domain partition. [More Info...](#)

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

ORACLE WebLogic Server Administration Console 12c

Change Center

View changes and restarts

Pending changes exist. They must be activated to take effect. You may activate them now. Otherwise, they will be automatically activated when you next modify, add or delete items in this domain.

Activate Changes

Undo All Changes

Domain Structure

- base_domain
 - + Domain Partitions
 - + Environment
 - Deployments
 - + Services
 - + Security Realms
 - + Interoperability
 - Diagnostics
 - Log Files
 - Diagnostic Modules
 - Built-in Diagnostic Modules
 - Diagnostic Images
 - Request Performance
 - Archives

How do I... ▾

Summary of Domain Partitions

Configuration **Control**

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

Customize this table

Domain Partitions

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

Showing 1 to 3 of 3 Previous | Next

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.
- 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/administratior123**.
- xii. Click on Logout.

Clean UP

1. Cleaning Up Environment.
 - i. cd /u01/content/weblogic-innovation-seminars/WInS_Demos/MT-Workshop/CleanUp
 - ii. ./stopDP.sh
 - iii. ./stop-nm.sh
 - iv. Delete the domain directory for base_domain.
 - v. Unzip the domain directory for base_domain.