Oracle WebLogic Server 11*g*:
Administration Essentials

Activity Guide

ORACLE

Authors

Shankar Raman, Steve Friedberg

Technical Contributors and Reviewers

Anand Rudrabatla, Angelika Krupp, Bala Kothandaraman, David Cabelus, Holger Dindler, Rasmussen, Matthew Slingsby, Mike Blevins, Mike Lehmann, Nagavalli Pataballa, Serge Moiseev, Shailesh Dwivedi, Steve Button, Takyiu Liu, TJ Palazzolo, Werner Bauer, William Albert, Will Hopkins

This book was published using: Oracle Tutor

Table of Contents

Table of Contents

i

Table of Contents

ii

Practices for Lesson 1

Chapter 1

Practices for Lesson 1

Practices for Lesson 1

There are no practices for Lesson 1.

Practices for Lesson 1

Practices for Lesson 2

Chapter 2

Practices for Lesson 2

Practices for Lesson 2

Practices Overview

Lab Familiarity

The lab uses a virtual machine grid to host your Linux environment. To use the lab environment, you use a client on the local PC to access the desktop on the remote PC. The instructor will give you the host names and IP addresses to be used by your team. The key tasks are:

- Logging on to the local PC
- Configuring the local client
- Starting the NoMachine client
- Logging on to the remote PC
- Arranging the remote desktop

Big Picture:
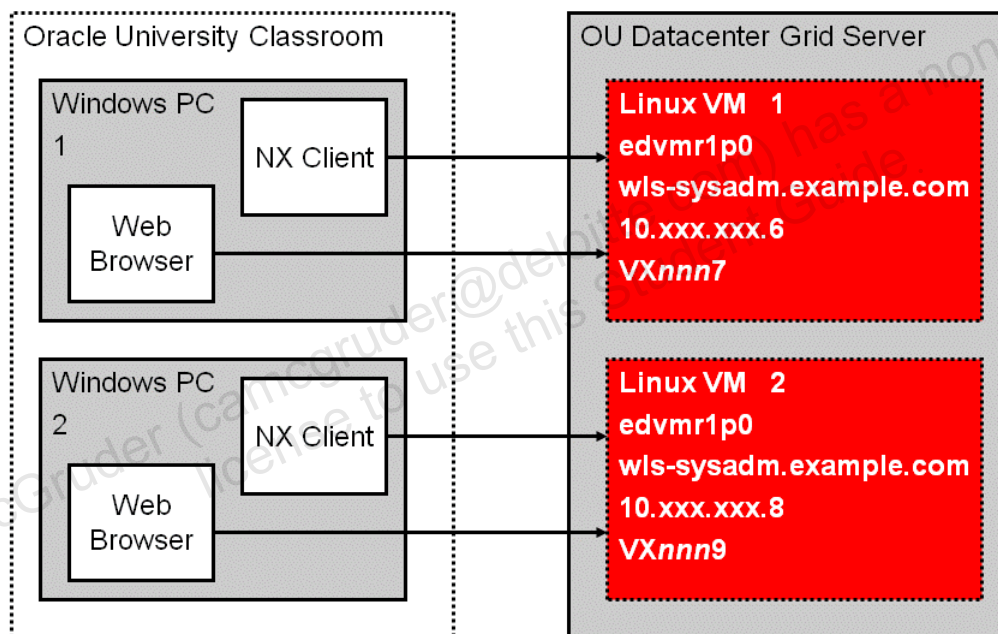
Although all the host names are identical, the numbered designators (including host aliases) are unique. There is no obvious correlation between the PC number and the VX number and the IP addresses.

Practice 2-1: Connecting to the Classroom Grid

In this practice, you configure the remote desktop client software so that you can access and operate the remote Linux desktop.

1. Make sure that the local Windows PC is powered on. It should automatically log you in.

2. Your instructor will assign virtual machines for each lab team. Write down the following information:

Field	Value
Host name	
Host IP address	
Username	
User password	

3. From your Windows Start menu, select Start > All Programs > NX Client for Windows > NX Connection Wizard. The Welcome page appears.

4. Click Next.

5. On the Session page, in the Session field, enter any name to identify this session—for example, **WLS-Labs** or your own name.

6. In the Host field, enter the host name given to you by the instructor. Leave all the other values and settings as the defaults. Click Next.

7. On the Desktop page, select GNOME in the second drop-down list. Change the size of the remote desktop to 1024x768. Click Next.
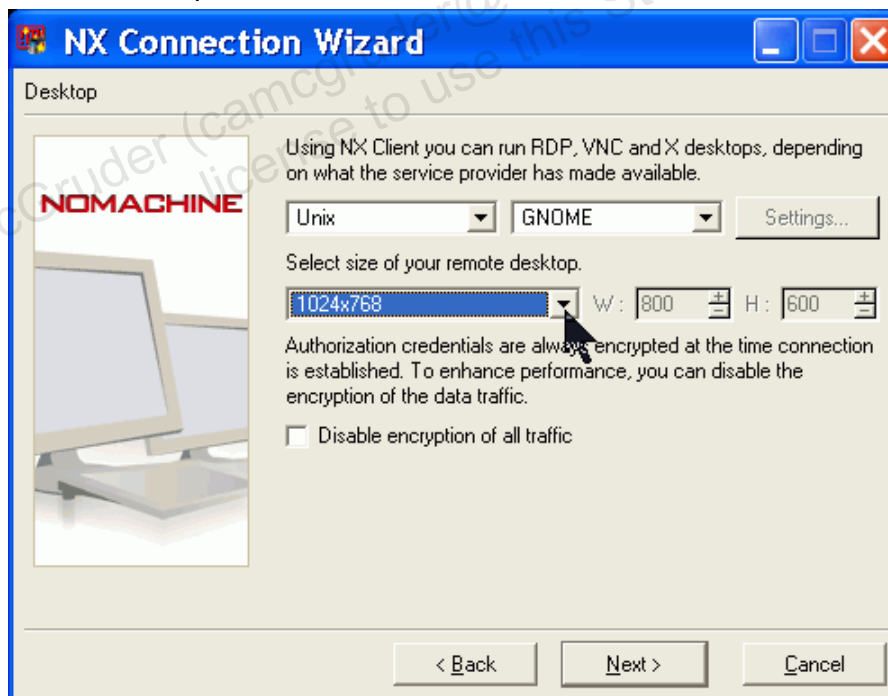
8. Click **Finish**. This creates a desktop shortcut and starts the client.

9. Enter your username and password as given to you by your instructor. The drop-down menu should have the Session name you picked earlier—for example, **WLS-Labs**. Click Login. A series of screens appear as the client contacts the remote desktop.

10. After you have connected to the remote desktop, you may want to set up the remote desktop for your labs.

   a. You will notice four palettes at the bottom right of your remote machine. Each of them represents a virtual desktop on the remote machine.
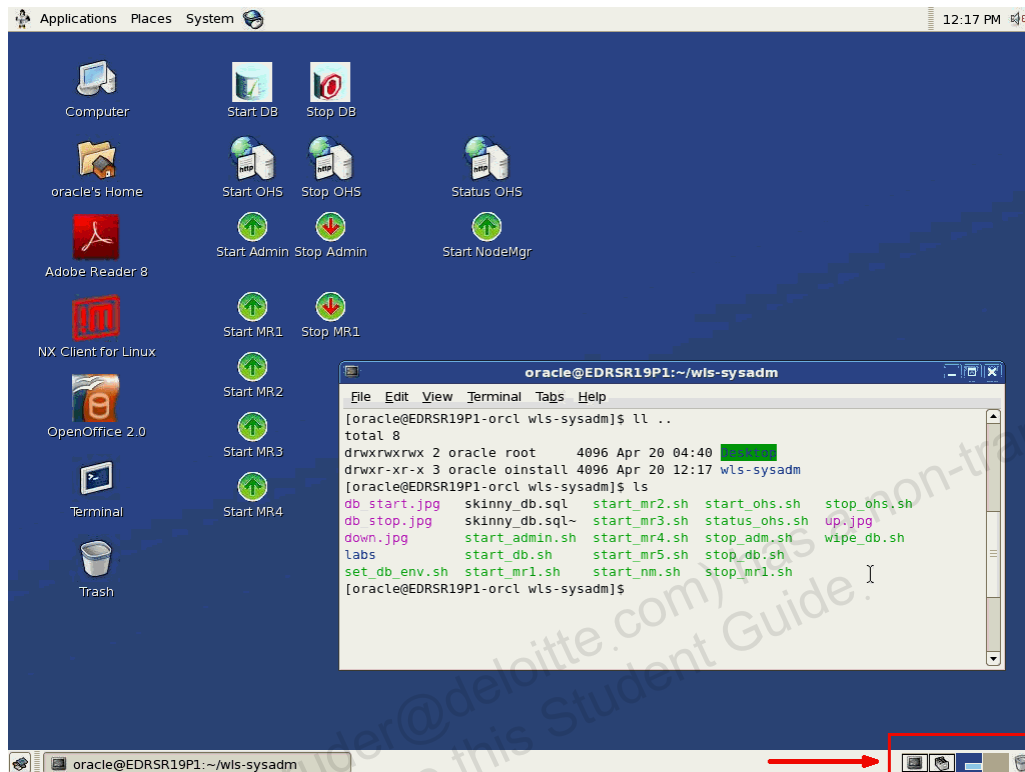
   b. For your convenience, you can invoke different applications to full screen on each desktop appropriately.

   c. You can invoke a Gnome terminal on the first desktop by using the Terminal icon on the desktop, or by right-clicking an empty spot on the desktop.
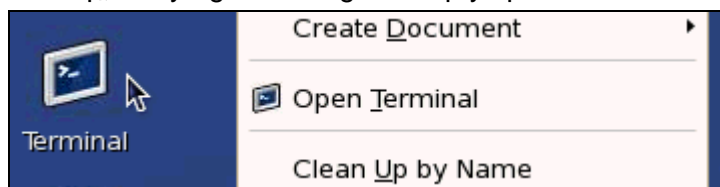
   d. Invoke a Web browser on the second desktop by using the globe icon on the menu bar.
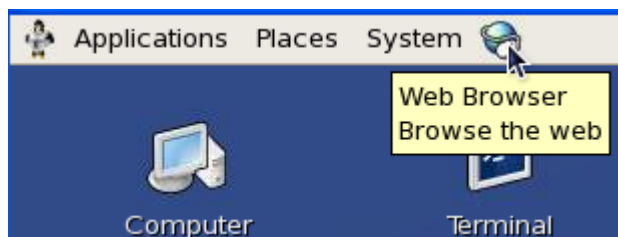
   e. Invoke a file browser in the third desktop by using Applications > System Tools > File Browser.

Practices for Lesson 2
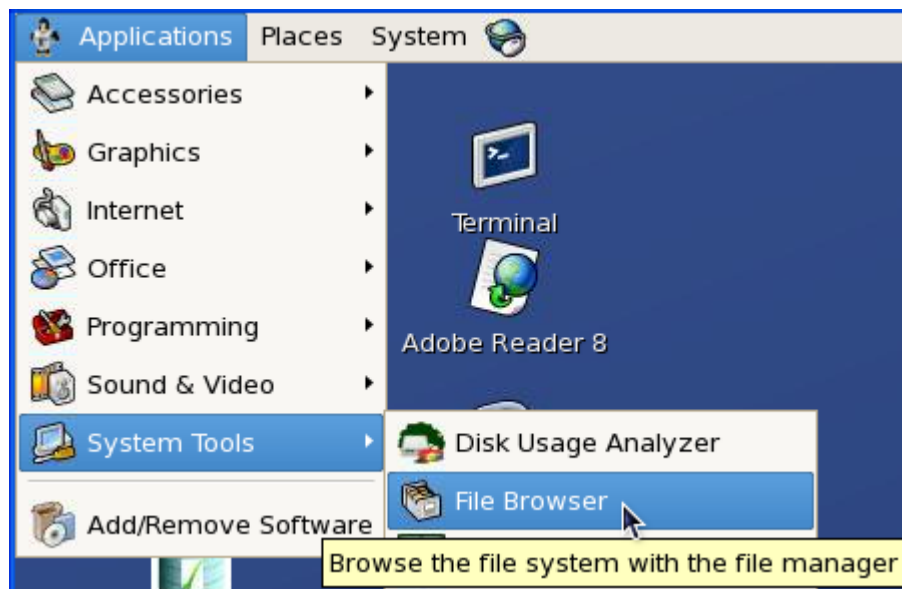
11. Oracle Database 11*g* and Oracle HTTP Server 11*g* have already been installed and configured in your remote machine. Using the File Browser desktop on the remote machine, navigate through the installation and configuration directories.

    a.   On the desktop, with File Browser, navigate the File System tree to the /u01/app/oracle/Database/11.2.0/orcl folder. This folder is the ORACLE_HOME folder for the database. The database executables are in this folder.
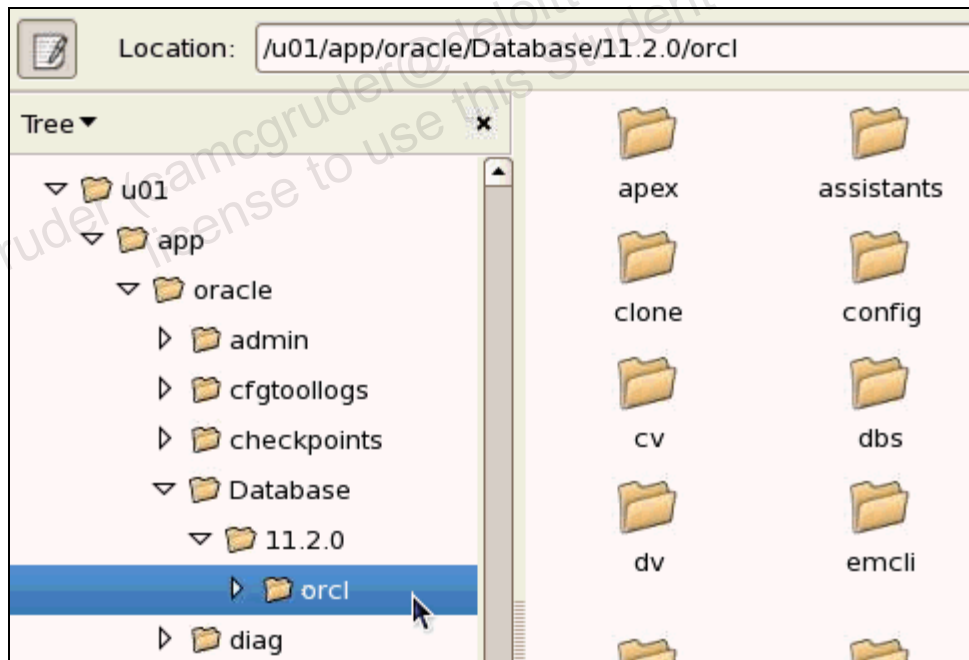
    b.   Now navigate to /u01/app/oracle/Middleware/11.1.1/webtier. This folder contains the installed binaries for the Oracle Fusion Middleware Web Tier components.

Practices for Lesson 2
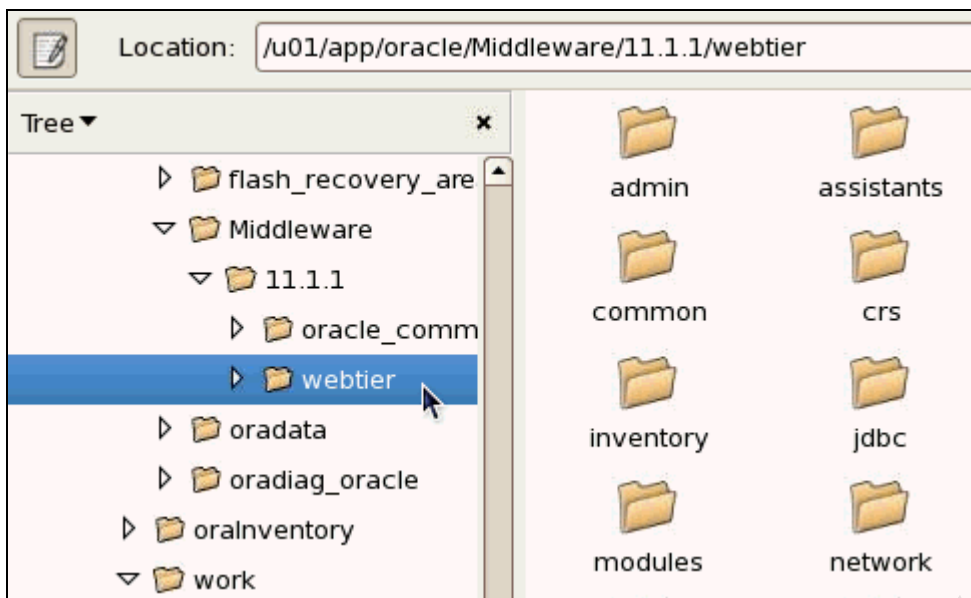
c. Navigate to the `/u01/app/work/instances/config/OHS/ohs1` folder. This folder contains the Oracle HTTP Server (OHS), part of the Web Tier configured in this machine. You will be using OHS later in your practices.
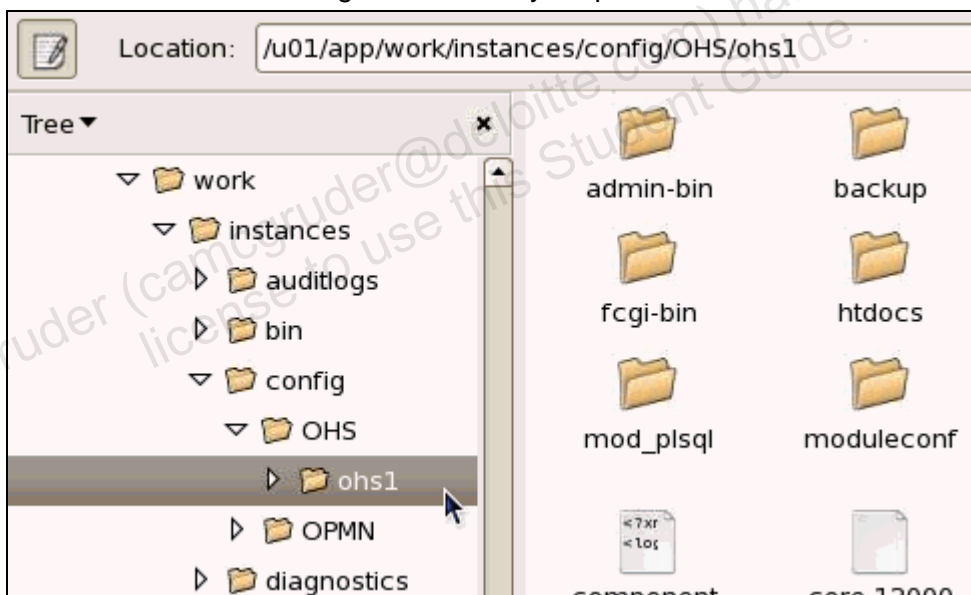
12. Using the Gnome terminal session, perform the following steps to get familiar with the scripts that you will use in the practices.

   a. The wls-sysadm folder contains all the scripts and applications that you will use in the practices for this course. Navigate to the wls-sysadm subfolder in your $HOME folder (`/home/oracle`) and list the files in this folder. Most of the shell scripts correspond to desktop icons.

   ```
   $> cd /home/oracle/wls-sysadm
   $ wls-sysadm> ls
   ```

Practices for Lesson 2

```
oracle@EDRSR19P1:~/wls-sysadm

File  Edit  View  Terminal  Tabs  Help

[oracle@EDRSR19P1-orcl ~]$ cd /home/oracle/wls-sysadm/
[oracle@EDRSR19P1-orcl wls-sysadm]$ ls
db_start.jpg    skinny_db.sql   start_mr3.sh    status_ohs.sh   up.jpg
db_stop.jpg     start_admin.sh  start_mr4.sh    stop_adm.sh     wipe_db.sh
down.jpg        start_db.sh     start_mr5.sh    stop_db.sh
labs            start_mr1.sh    start_nm.sh     stop_mr1.sh
set_db_env.sh   start_mr2.sh    start_ohs.sh    stop_ohs.sh
[oracle@EDRSR19P1-orcl wls-sysadm]$
```

b. Execute the `ps` command to check whether the database is running. If it is not running, use the `start_db.sh` desktop icon or script to start the database.

    `$> ps -ef | grep pmon`

c. If the preceding command returns two rows in response as follows, the database is running (your values for PID, for example 24542 and so on, will be different).

```
[oracle@edvmr1p0 wls-sysadm]$ ps -ef | grep pmon
oracle    24542     1  0 15:30 ?        00:00:00 ora_pmon_orcl
oracle    24584  8614  0 15:31 pts/0    00:00:00 grep pmon
[oracle@edvmr1p0 wls-sysadm]$
```

d. If the preceding command does not return the `ora_pmon_orcl` row, you need to start the database using the `start_db.sh` script in the ~/wls-sysadm subfolder:

    `$ wls-sysadm> ./start_db.sh`

13. Close the NX Client window. Click Disconnect. This allows you to resume where you left off the next time. Note that if you click Terminate, you may have to set up your remote desktop environment (in the preceding step 10) again.

14. In later labs, you will be able to use the local Web browser as well as the remote Web browser for accessing the WebLogic Server Administration Console.

Practices for Lesson 3

Chapter 3

Practices for Lesson 3

Practices for Lesson 3

Practices for Lesson 3

There are no practices for Lesson 3.

Practices for Lesson 3

Practices for Lesson 4

Chapter 4

Practices for Lesson 4

Practices for Lesson 4

Practices Overview

Installing Oracle WebLogic Server 11*g*

As the administrator of middle-tier computing for The Example Corp, you install Oracle WebLogic Server on a single Linux machine using many of the default options to test the basic functionality of simple configurations.

The key tasks in this practice session are:

- Installing Oracle WebLogic Server with JRockit as the Java Virtual Machine
- Navigating the installed WebLogic Server folder structure

Successful completion of this practice is essential for performing subsequent practices.

Big Picture:

Location: /u01/app/oracle/Middleware/11.1.1/wlserver_10.3

Tree	Name
▽ u01	▷ common
▽ app	▷ inventory
▽ oracle	▷ L10N
▷ admin	▷ server
▷ cfgtoollogs	▷ sip
▷ checkpoints	▷ uninstall
▷ Database	
▷ diag	
▷ flash_recovery_area	
▽ Middleware	
▽ 11.1.1	
▷ coherence_3.5	
▷ jrockit_160_17_R28.0.0-679	
▷ logs	
▷ modules	
▷ oracle_common	
▷ utils	
▷ webtier	
▷ wlserver_10.3	
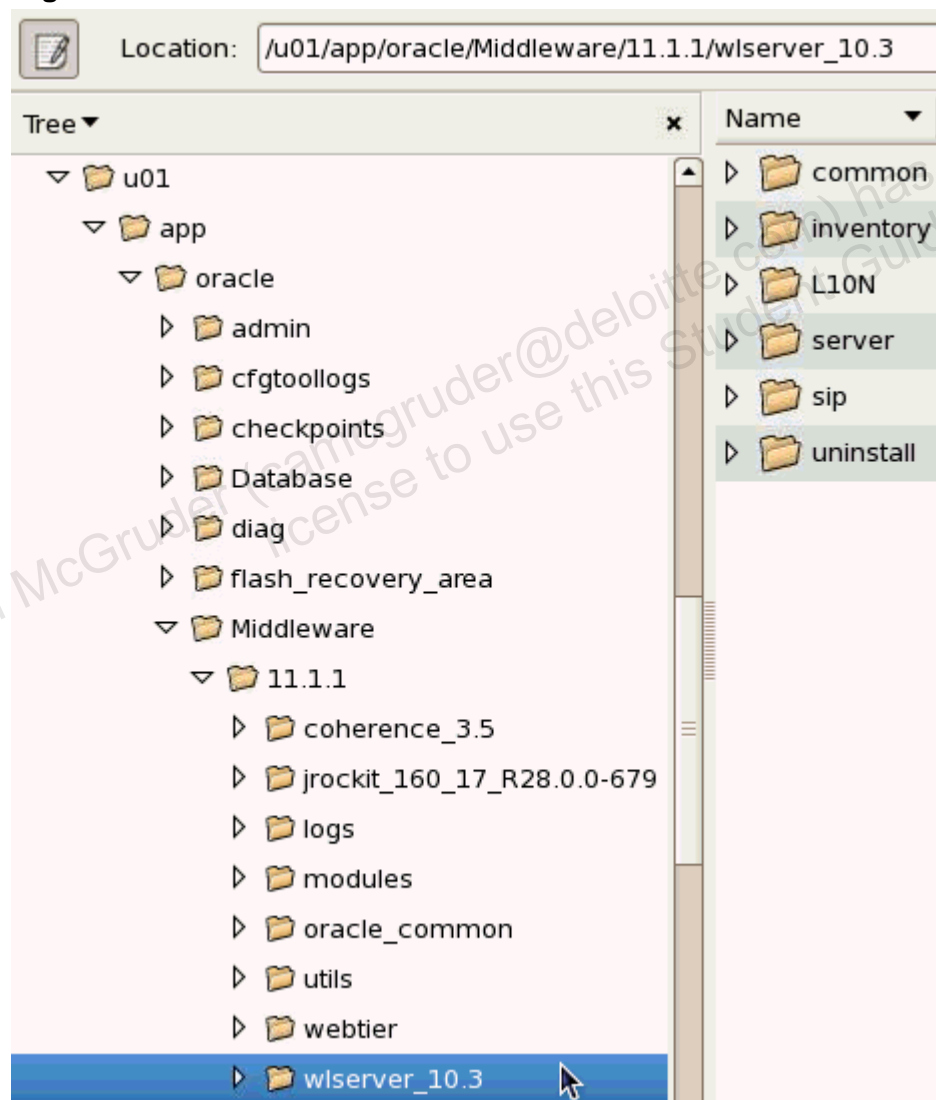
Practice 4-1: Installing Oracle WebLogic Server

In this practice, you install Oracle WebLogic Server version 10.3.3 into an existing directory structure that contains, among other things, Oracle Database 11*g*. You install Oracle WebLogic Server bits only in this session, but configure a domain later on.

1. Log on to your remote Linux desktop as the **oracle** user.

2. Open a gnome-terminal using the Terminal icon on the Linux desktop, and navigate to the /modules/stage/WLS folder that contains the Oracle WebLogic Server installable.

3. Run the Linux 32-bit installer by entering (be mindful of the leading dot which you need to enter):

       $> ./wls1033_linux32.bin

4. Use the following table for installing Oracle WebLogic Server:

Step	Screen/Page Description	Choices or Values
a.	Welcome	Click Next.
b.	Choose Middleware Home Directory	Select "Create a new Middleware Home." In Middleware Home Directory, enter /u01/app/oracle/Middleware/11.1.1, or browse to it because it already exists. Click Next. When the Warning dialog box indicating that the directory is nonempty appears, click Yes to proceed.
c.	Register for Security Updates	Even though you would register in real life, for the lab, deselect the check box to opt out of the security updates. In the "Are you sure?" dialog box, click Yes. Click Next.
d.	Choose Install Type	Select Custom. Click Next.
e.	Choose Products and Components	Do not select Server Examples. Keep the other already-selected items. Click Next.
f.	JDK Selection	Select only Oracle JRockit 1.6.0_17 and click Next.
g.	Choose Product Installation Directories	Accept the defaults. Click Next.
h.	Installation Summary	Make sure that only one JDK (JRockit) is present. Click Next. The progress bar appears and displays the progress from 0 to 100%.
i.	Installation Complete	Deselect Run Quickstart and click Done.

Practice 4-2: Navigating the WLS Installation Directories

In this practice, you locate the key directories that are used in the later labs. You do not have to do anything with these files; just make a note of where you find them.

1. Note the WL_HOME (the location where WLS is installed) and explore some of the important folders and files in your WLS installation.

    a. Using the File Browser on the remote desktop, navigate to the folder (u01 > app> oracle > Middleware > 11.1.1 > wlserver_10.3) where you have installed WLS.

    b. Locate the templates in <WL_HOME> common > templates > applications.
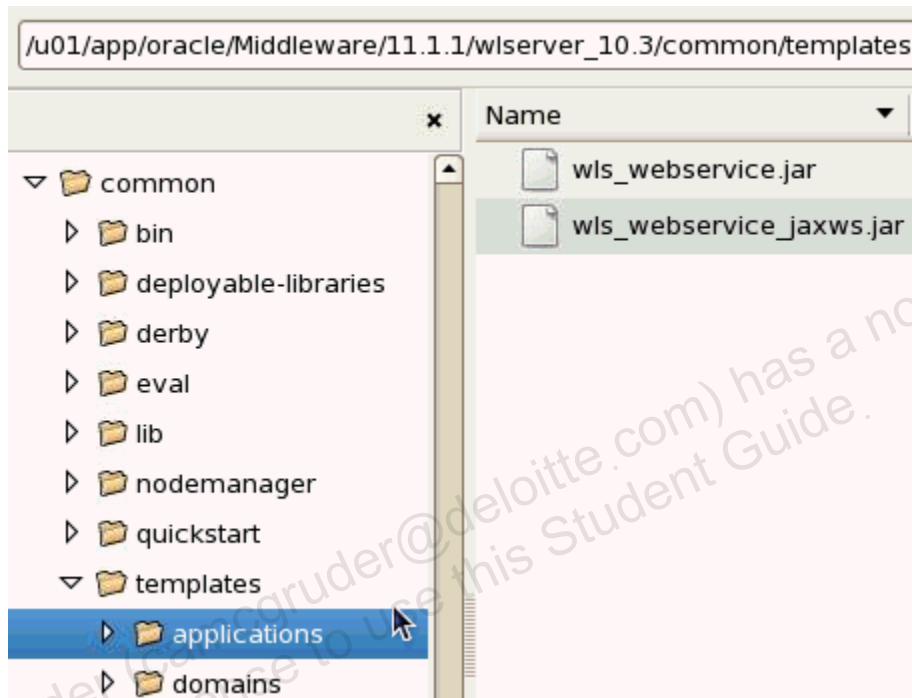
    c. Similarly, locate common > bin in <WL_HOME> and view the list of configuration scripts.

2. Using the gnome-terminal on the remote desktop, view the `setWLSEnv.sh` script to see which environment variables are set. Then run the script and verify that the variables are appropriately set.

    a. Look at the comments in the `setWLSEnv.sh` file in
        `/u01/app/oracle/Middleware/11.1.1/wlserver_10.3/server/bin`:

```
[oracle@EDRSR19P1-orcl ~]$ cd
/u01/app/oracle/Middleware/11.1.1/wlserver_10.3/server/bin/
[oracle@EDRSR19P1-orcl bin]$ more setWLSEnv.sh
#!/bin/sh
#*******************************************************************************
# This script is used to set up your environment for development with WebLogic
# Server.  It sets the following variables:
#
# WL_HOME         - The root directory of your WebLogic installation
# JAVA_HOME       - Location of the version of Java used to start WebLogic
#                   Server. This variable must point to the root directory of a
#                   JDK installation and will be set for you by the installer.
#                   See the Oracle Fusion Middleware Supported System Config page
```

```
#                 (http://www.oracle.com/technology/software/products/ias/files
/fusion_certification.html)
#                 for an up-to-date list of supported JVMs on your platform.
# PATH          - Adds the JDK and WebLogic directories to the system path.
# CLASSPATH     - Adds the JDK and WebLogic jars to the classpath.
#
# Other variables that setWLSEnv takes are:
#
# PRE_CLASSPATH  - Path style variable to be added to the beginning of the
#                  CLASSPATH
# POST_CLASSPATH - Path style variable to be added to the end of the
#                  CLASSPATH
```

b. Run the following script: (Use `source` to ensure that the variables are set for the entire session and not just within the script shell itself.)

```
$> source ./setWLSEnv.sh
```

c. Verify the values of the new environment variables by entering:

```
echo $WL_HOME
echo $MW_HOME
echo $JAVA_HOME
echo $ANT_HOME
```

```
[oracle@edvmr1p0 bin]$ echo $WL_HOME
/u01/app/oracle/Middleware/11.1.1/wlserver_10.3
[oracle@edvmr1p0 bin]$ echo $MW_HOME
/u01/app/oracle/Middleware/11.1.1
[oracle@edvmr1p0 bin]$ echo $JAVA_HOME
/u01/app/oracle/Middleware/11.1.1/jrockit_160_17_R28.0.0-679
[oracle@edvmr1p0 bin]$ echo $ANT_HOME
/u01/app/oracle/Middleware/11.1.1/modules/org.apache.ant_1.7.1
[oracle@edvmr1p0 bin]$
```

This makes navigating the directories much faster and less prone to typographical errors. You use this script to set your environment variables for every lab from this point forward. It needs to be done only once per session.

Practices for Lesson 5

Chapter 5

Practices for Lesson 5

Practices for Lesson 5

Practices Overview

Configuring a Domain

As the administrator of the middleware, you name the domains and servers. The application is a Medical Records system for a doctor's office, so you decide on a "MedRec" prefix for most names. The application is from a fictitious software company named Avitek, so you will see that name appear on Web page banners. This system uses Web clients and a back-end database. Your first task is to create the total application environment, a "domain." The domain references the database, but does not include the database. All domains require some common elements, so if the creation of a domain can also make those other pieces (servers of various sorts), then you choose time-saving procedures. Besides, you can always come back later and either modify the servers created at this time or create other servers at a later date. The key tasks are:

- Creating a minimal domain from scratch
- Creating a domain to support a particular application template
- Starting the administration server
- Stopping the administration server

Big Picture:
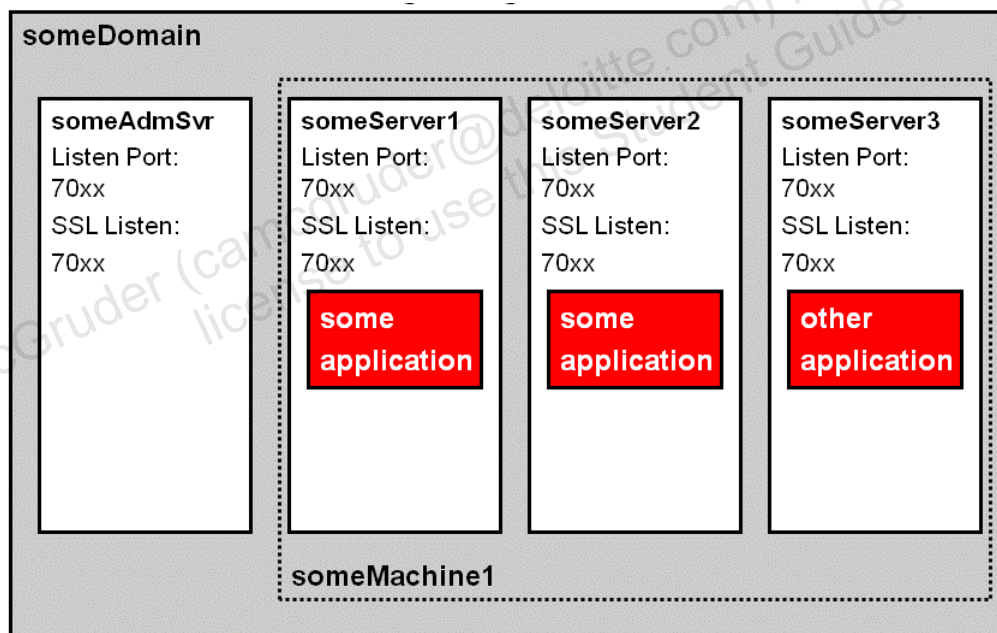
Practice 5-1: Creating a Minimal Domain from the Beginning

In this practice, you make a simple domain named `test` as an experiment. After you prove that this works, you will not use this `test` domain any more. The purpose of this lab is to see the Configuration Wizard screens for the first time and their default values.

Big Picture:
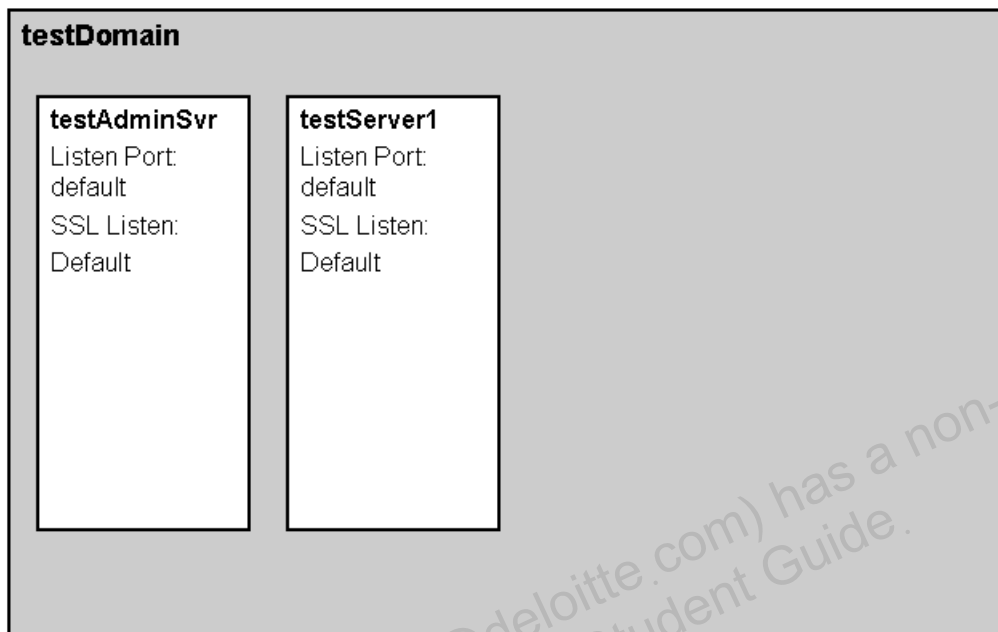
1. Using the Configuration Wizard, configure a domain with the following parameters:

Screen/Page Description	Choices or Values
Domain Name	`testDomain`
Location	`/u01/app/work/domains/`
Administrative User name / password	`weblogic/Welcome1`
Start Mode / JDK	Production Mode/JRockit
Name of Administration Server	`testAdminSvr`
Managed Servers	`testServer1`

a. In a gnome-terminal session of the remote machine, navigate to the common binaries subfolder of your WebLogic Server installation and run the configuration assistant:

```
$> cd /u01/app/oracle/Middleware/11.1.1/wlserver_10.3/common/bin
$>./config.sh
```

b. Specify the following values on the Configuration Wizard pages. Note that most values are case-sensitive:

	Screen/Page Description	Choices or Values
a.	Welcome	Select "Create a new WebLogic domain." Click Next.

	Screen/Page Description	Choices or Values
b.	Select Domain Source	Do not select any other component. Basic WebLogic Server Domain is already selected and disabled. Click Next.
c.	Specify Domain name and Location	In Domain name, enter **testDomain**. All names are case-sensitive. In the Domain location, change it to /u01/app/work/domains. The idea is to separate configuration data from the executables. If the directory does not exist, then create it.
d.	Configure Administrator User name and Password	User name: **weblogic** User Password: **Welcome1** Confirm password: **Welcome1** Description: (leave the default) Click Next.
e.	Configure Server Start Mode and JDK	Select Production Mode. Click Next.
f.	Select Optional Configuration	Select Administration Server and Managed Servers, Clusters and Machines. Click Next.
g.	Configure the Administration Server	Change the name to **testAdminSvr**. Click Next.
h.	Configure Managed Servers	Click Add. Change the name to **testServer1**. Click Next.
i.	Configure Clusters	There will not be any clusters on this simple domain. Click Next.
j.	Configure Machines	There will not be any machines on this simple domain. Click Next.
k.	Configuration Summary	Notice the two servers that you renamed. Everything should have a prefix of test. See the following screenshot. Click Create. Domain Summary Summary View: Deployment testDomain (/u01/app/work/domains/testDomain) └ Server 　├ testAdminSvr 　└ testServer1
l.	Creating Domain	After the domain is created successfully, click Done.

2. View the configuration details of the domain that you have created:

a. Navigate to the folder of the domain that you just created. List the files and folders just created:

```
$> cd /u01/app/work/domains/testDomain
$> ls -l
```

b. View `config.xml` in the config subfolder. This file contains the specifications for the domain that you just configured. Look for the names `testDomain`, `testAdminSvr`, and `testServer1`. Note the listen ports and the encrypted password values.

3. Start and stop the administration server for the domain.

a. Navigate to the `testDomain` folder and run `./startWebLogic.sh` to start the administration server. The username is `weblogic` and the password is `Welcome1`. (Note the "one" at the end of the password is a number and not the letter L.) The password will not be displayed. Make sure that the last message is

    `<Server started in RUNNING mode>`.

b. From a new terminal session, stop the administration server by running `stopWebLogic.sh` from the bin folder of the domain.

    ```
    $> cd /u01/app/work/domains/testDomain/bin
    $> ./stopWebLogic.sh
    ```

    Note that the default password suggested by the stop script is lowercase `welcome1`, which is not correct; you need to type in the correct mixed case `Welcome1`.

c. You have now finished creating the `testDomain`, and you will not need it for the rest of the class.

Practices for Lesson 5

Practice 5-2: Creating a Functional Domain

In this practice, you create a domain to support the Medical Records (Medrec) application. You create the domain and later extend it using the application template. **Successful completion of this lab is a prerequisite for the remaining labs.**

Big Picture:
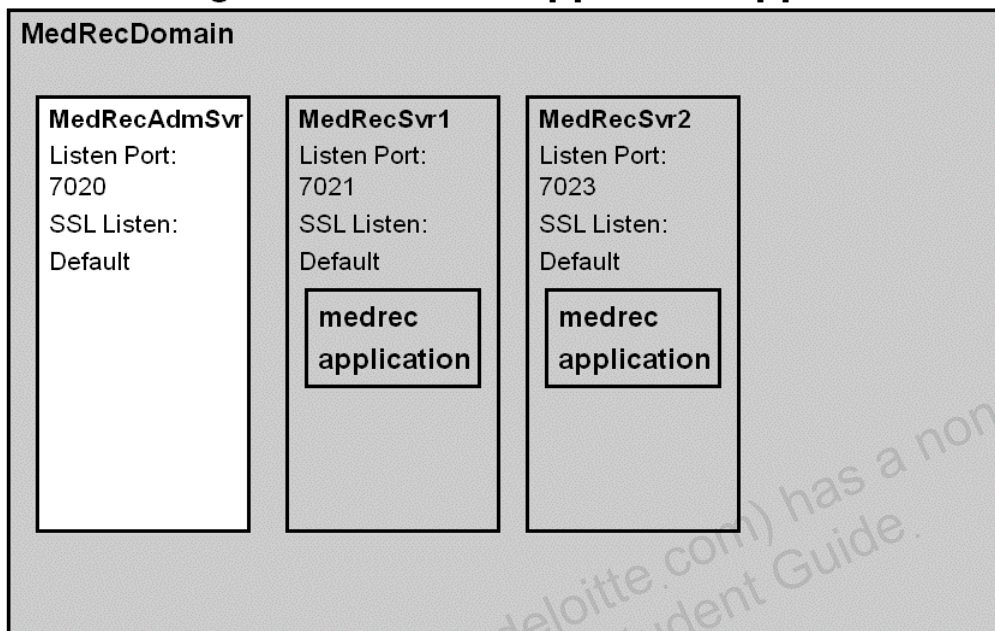
```
MedRecDomain
┌──────────────────────────────────────────────────────────────┐
│                                                                │
│  ┌───────────────┐  ┌───────────────┐  ┌───────────────┐      │
│  │ MedRecAdmSvr  │  │ MedRecSvr1    │  │ MedRecSvr2    │      │
│  │ Listen Port:  │  │ Listen Port:  │  │ Listen Port:  │      │
│  │ 7020          │  │ 7021          │  │ 7023          │      │
│  │ SSL Listen:   │  │ SSL Listen:   │  │ SSL Listen:   │      │
│  │ Default       │  │ Default       │  │ Default       │      │
│  │               │  │ ┌───────────┐ │  │ ┌───────────┐ │      │
│  │               │  │ │  medrec   │ │  │ │  medrec   │ │      │
│  │               │  │ │application │ │  │ │application │ │     │
│  │               │  │ └───────────┘ │  │ └───────────┘ │      │
│  │               │  │               │  │               │      │
│  └───────────────┘  └───────────────┘  └───────────────┘      │
│                                                                │
└──────────────────────────────────────────────────────────────┘
```

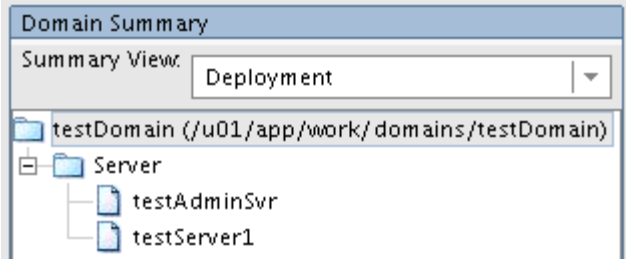1. Using the Configuration Wizard, configure a domain with the following parameters:
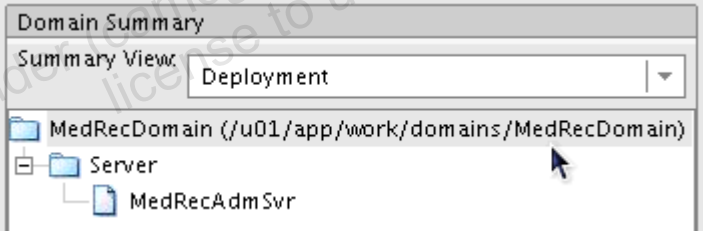
Screen/Page Description	Choices or Values
Domain Name	`MedRecDomain`
Location	`/u01/app/work/domains/`
Administrative User name / password	`weblogic/Welcome1`
Start Mode / JDK	Production Mode/JRockit
Administration Server	`MedRecAdmSvr Port 7020`
Managed Servers	
Machines	

a. In a gnome-terminal session on the remote desktop, navigate to the common binaries subfolder of your WebLogic Server installation and run the configuration assistant:

```
$> cd $WL_HOME/common/bin
$> ./config.sh
```

2. Specify the following values on the Configuration Wizard pages:

Step	Screen/Page Description	Choices or Values
a.	Welcome	Select "Create a new WebLogic domain." Click Next.

Step	Screen/Page Description	Choices or Values
b.	Select Domain Source	Do not select any other component. Basic WebLogic Server Domain is already selected and disabled. Click Next.
c.	Specify Domain Name and Location	In Domain name, enter **MedRecDomain**. All names are case-sensitive. In the Domain location, change it to `/u01/app/work/domains`. Click Next.
d.	Configure Administrator User name and Password	User name: **weblogic** User Password: **Welcome1** Confirm password: **Welcome1** Description: (leave the default) Click Next.
e.	Configure Server Start Mode and JDK	Select Production Mode. Click Next.
f.	Select Optional Configuration	Select Administration Server and click Next.
g.	Configure the Administration Server	Change the name to **MedRecAdmSvr**. Change the Listen port to **7020**. Leave SSL disabled. Click Next.
h.	Configuration Summary	Notice the administration server. Everything should have a prefix of MedRec. Click Create.
i.		
j.	Creating Domain	After the domain is created successfully, click Done.

3. Navigate to the domain that you just created. List the files and folders just created:

    $> cd /u01/app/work/domains/MedRecDomain

    $> ls -l

4. View the config.xml file in the config subfolder. This file contains the specifications for the domain that you just configured. Look for the names MedRecDomain and MedRecAdminSvr. Note the listen ports and the encrypted values.

```
<domain
...parts not shown...>
  <name>MedRecDomain</name>
  <domain-version>10.3.3.0</domain-version>
  <security-configuration
```

```
xmlns:xacml="http://xmlns.oracle.com/weblogic/security/xacml"
xmlns:pas="http://xmlns.oracle.com/weblogic/security/providers/passwordvalidat
or">
    <name>MedRecDomain</name>
    <realm>
...parts not shown...
    </realm>
    <default-realm>myrealm</default-realm>
    <credential-
encrypted>{AES}qegpJh3G3fJOR4WU0B100sXXnAW15nnfGqrBiUlwURqCEKo1t2kn/FGvcJ98JlJ
SeUvrfGoYLETi2ZTSo2tqjI07KjAdxYrzamkY8OlTPBCEpIfN

KtLCnblUP8pFVDjQ</credential-encrypted>
    <node-manager-username>JiaaDuiQ0S</node-manager-username>
    <node-manager-password-
encrypted>{AES}RpRaF3TEzvTNQ2vMAZyA0NoUmMW8UqsEoAh8nGHR7Co=</node-manager-
password-encrypted>
  </security-configuration>
  <server>
    <name>MedRecAdmSvr</name>
    <listen-port>7020</listen-port>
    <listen-address/>
  </server>
  <production-mode-enabled>true</production-mode-enabled>
  <embedded-ldap>
    <name>MedRecDomain</name>
    <credential-
encrypted>{AES}WNday7SlJO3fgg09VtABcKqNt+Z6MSagbE2bRGVI+qYTvjlfDSzmccxeuGMly/4
r</credential-encrypted>
  </embedded-ldap>
  <configuration-version>10.3.3.0</configuration-version>
  <admin-server-name>MedRecAdmSvr</admin-server-name>
</domain>
```

5. Start the administration server to test that it starts correctly.

    a. You can use the Start Admin icon. Alternatively, in your gnome-terminal session, navigate to the domain folder (u01/app/work/domains/MedRecDomain) and execute the ./startWebLogic.sh command.

    b. Enter the username weblogic and password Welcome1 when prompted. The password will not be displayed, and the password is case-sensitive.

    c. Make sure that the last message on the gnome-terminal session is

        <Server started in RUNNING mode>.

6. Stop the administration server process by using the stopWebLogic.sh script in the bin subfolder of your domain. You are going to add more functions to this domain during the rest of the labs.

    ```
    $> cd /u01/app/work/domains/MedRecDomain/bin
    $> ./stopWebLogic.sh
    ```

    From now on, you can start and stop the MedRecAdmSvr using the desktop icons if you wish. They invoke the same scripts you just did here.

Practices for Lesson 5

Practices for Lesson 5

Practices for Lesson 6

Chapter 6

Practices for Lesson 6

Practices for Lesson 6

Practices Overview

Extending Domains Using Templates

The application programmers have created a custom application template for you to do this. This will be similar to the previous lab titled "Creating a Minimal Domain from the Beginning," but with more options selected. Although it is possible to create a domain template, you only have an application template. So you need to create the domain itself and then come back and extend the domain with the application template in the next lab. The key tasks are:

- Identifying the domain to be extended
- Identifying the template with which to extend the domain
- Running the Configuration Wizard to do the extension

Big Picture:
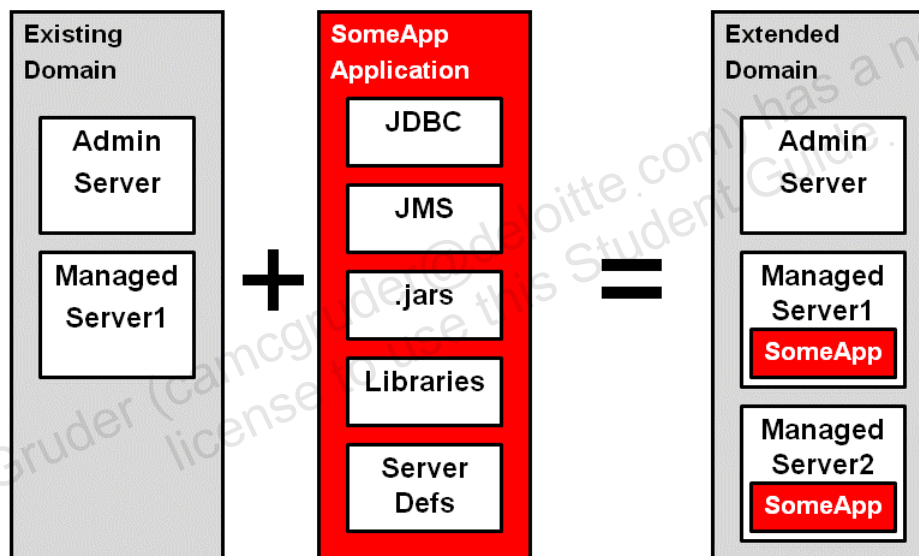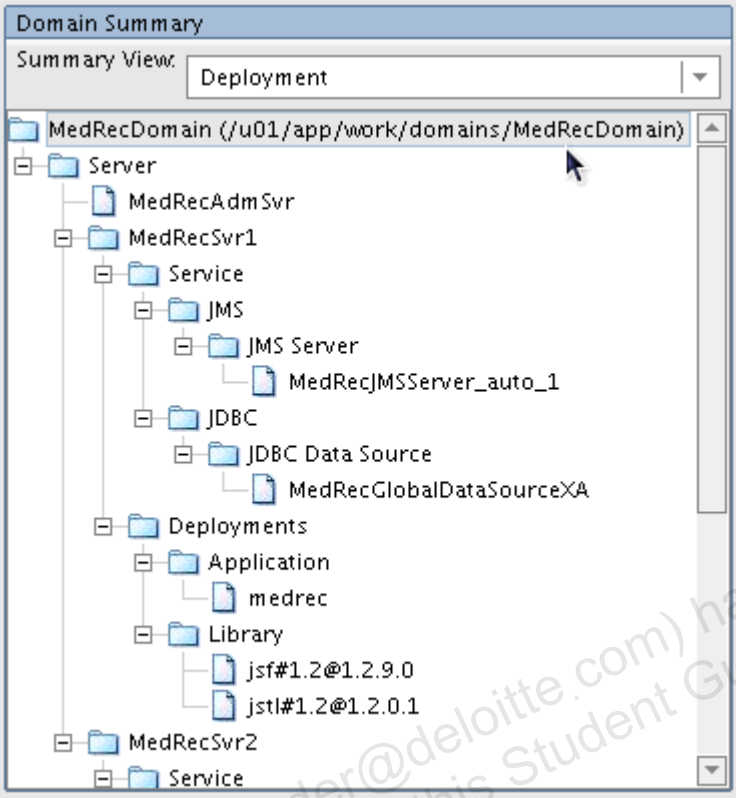
Practice 6-1: Extending Domains by Using Templates

In this practice, you extend the existing domain with an application template. The domain itself (for example, the administration server and managed servers) does not change; this simply adds more functions as specified by the application developer.

1. Make sure the database is started. Double-click the Start DB icon on the desktop. There is no harm in trying to start it twice if it is already started. The database should stay running the entire class. You should not need to ever restart it. The database is the back-end for the JDBC data sources.

2. Navigate to `$WL_HOME/common/bin`. Start the Configuration Wizard the same way you did in the previous lab, but this time for the application part of the domain. Enter

   `./config.sh`

3. Specify the following values in the Configuration Wizard pages:

Step	Screen/Page Description	Choices or Values
a.	Welcome	Select "Extend an existing WebLogic domain." Click Next.
b.	Select a WebLogic Domain Directory	Navigate to `/u01/app/work/domains/MedRecDomain`. Note that the valid targets have a blue jar icon on the folders. Click Next.
c.	Select Extension Source	Select "Extend my domain using an existing extension template." Enter `/home/oracle/wls-sysadm/labs/Lab06/MedRecResources.jar` as the template location (or you can browse to it). Click Next.
	If you get Conflict Detected	(You may not see this.) Select "Keep existing component." Select "Apply this selection if further conflicts are detected." Click OK.
d.	Specify Domain name and Location	Keep the "Domain name" and "Domain location" as their defaults. These fields may be disabled and not changeable anyway. Change the "Application location:" to `/u01/app/work/applications`. Click Next.
e.	Configure JDBC Data Sources	Accept the defaults and click Next. Ensure that the database is running.
f.	Test JDBC Data Sources	If the test is successful, click Next. (If not successful, make sure the database is started.)
g.	Select Optional Configuration	These are the same screens you saw earlier when you created MedRecDomain, so there is no need to do anything additional. Click Next.
h.	Configuration Summary	The Deployment view shows all the applications and libraries that have been deployed. The administrator did not have to know anything about them; it was all included in the template. Click Extend.

Step	Screen/Page Description	Choices or Values

Step	Screen/Page Description	Choices or Values
i.	Creating Domain	When the Progress bar reaches 100%, click Done.

4. Use the Start Admin icon on the desktop to start the administrative server of MedRecDomain. Enter the username (`weblogic`) and password (`Welcome1`) in the Admin Server terminal window. Make sure that the last message in the console is `<Server started in RUNNING mode>`.

5. Stop the administration server by running `stopWebLogic.sh` from the bin folder of the domain.

```
$> cd /u01/app/work/domains/MedRecDomain/bin
$> ./stopWebLogic.sh
```

Practices for Lesson 6

Practices for Lesson 7

Chapter 7

Practices for Lesson 7

Practices for Lesson 7

Practices for Lesson 7

Practices Overview

Using the Administration Console and WLST

There are two main interfaces to configure the managed servers:

- Web-based graphical user interface, namely the Administration Console
- Command-line interface, namely WebLogic Scripting Tool (WLST)

The key tasks covered in this practice include:

- Signing on to the Administration Console
- Making configuration changes using the Administration Console
- Invoking WLST and connecting to a domain
- Making configuration changes using WLST

Big Picture:
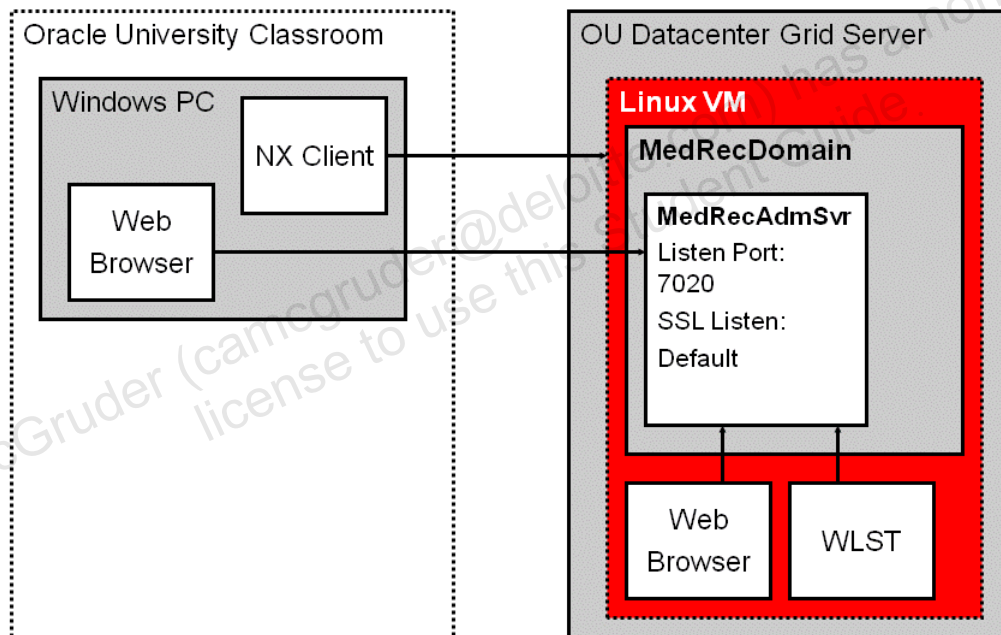
Practice 7-1: Getting Familiar with the Administration Console

In this practice, you navigate the Administration Console using a Web browser. The main skills you learn are the terminology and the shortcuts.

1. Use the Start Admin icon on the desktop to start the administration server of MedRecDomain. Enter the username (`weblogic`) and password (`Welcome1`) in the Admin Server terminal window. Make sure that the last message is

   ```
   <Server started in RUNNING mode>.
   ```

2. In the Web browser from the Linux desktop, access the URL:

   http://wls-sysadm:7020/console

   a. Bookmark this page.
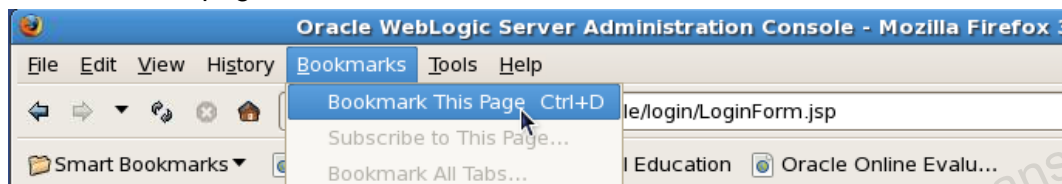
   b. Log on with **weblogic** as the username and **Welcome1** as the password. If the browser offers to remember the password, click Yes.

3. In a gnome terminal session, use the `/sbin/ifconfig` command to find the IP address assigned to the Ethernet adapter 0. It should be a private address in the form 10.*x.y.z*. For example:

4. On the Windows (local) desktop, open a Web browser (you can use Internet Explorer or Firefox or Chrome) and access the URL http://10.*x.y.z*:7020/console, where 10.*x.y.z* is the address you found in the previous step. You cannot use the hostname from the Windows PC as DNS is not set up for that. Log on with **weblogic** as the username and **Welcome1** as the password. If the browser offers to remember the password, click Yes. Bookmark this page. Note that two people can sign on at the same time with the same username.

5. The main navigation is by expanding the plus ⊞ or collapsing the minus ⊟ icons in the Domain Structure on the left of the browser.
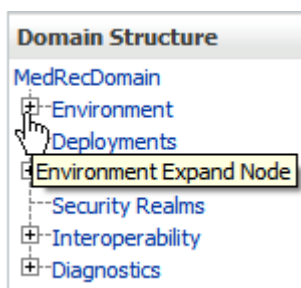
For example, click ⊞ next to Environment (it will turn into ⊟), then click Servers, and you should see that the MedRecAdmSvr is RUNNING. If it were not running, you would not have any Administration Console! Note that the New, Clone, and Delete options are disabled.

Alternatively, you can collapse all levels, click Environment (still showing ⊞), and then click Servers in the table at the right under Summary of Environment. This is one way to display the Summary of Servers table.

6. After you have gone to several pages in the Administration Console, you can see the locator links on the top showing the items you have navigated to. It looks like:

Home >Summary of Servers >Summary of Environment >**Summary of Servers**

It is historical, not hierarchical. The same menu item could be in there multiple times. Clicking one of those entries will take you back to that item, but with refreshed data.

7. Click WebLogic Server Administration Console Home.

🏠 Home Log Out Preferences 📷 Record Help

WebLogic Server Administration Console Home
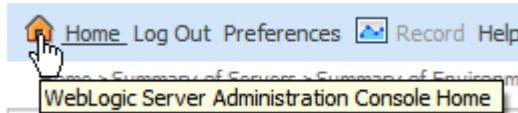
The Home page gives yet another way to get to the same "Summary of Servers" page. Click Servers in the middle of the Home page.

8. You can refresh the entire Web page just as you would with any browser, or you can set some tables to autorefresh. On the "Summary of Servers" table, there is a cycle symbol ↻ that will make the table refresh repeatedly. Click the symbol. While refreshing, the cycle icon spins and the last refresh date/time is displayed. Click it again to make it stop.

9. In the Domain Structure, click MedRecDomain. There are two levels of tabs shown (for example, Configuration, Monitoring, Control, and so on, and General, JTA, EJBs, and so on.)

Click the Lock & Edit button to modify, add or delete items in this domain.

Lock & Edit

Release Configuration

Domain Structure

MedRecDomain
⊞-Environment
⋮--Deployments

Home >MedRecDomain

Settings for MedRecDomain

| Configuration | Monitoring | Control | Security | Web Service Security | Notes |

| General | JTA | EJBs | Web Applications | Logging | Log Filters |

Click the *Lock & Edit* button in the Change Center to modify the settings on this page.

Save

If you shrink the browser window width so that the tabs would be impacted, they wrap to the next line and there is a blue bar to separate the upper- and the lower-level tabs. As you select different upper tabs, the lower tabs change. The Notes tab enables you to document configuration changes.

10. Scroll down in the Settings for MedRecDomain > Configuration > General. At the bottom of many pages is an Advanced toggle ▷ Advanced. By clicking it, you can see an additional set of configuration parameters. Clicking it again will hide the advanced options. You can specify to always Show Advanced Sections in Preferences.

Practice 7-2: Making Configuration Changes

In this practice, you make changes to the active configuration. At this point, the change will be trivial. You are going to change the Administration Servers Logging Rotation file size from 5000 to 5001.

1. Change the Administration Servers Logging Rotation file size from 5000 to 5001.

   a. Navigate to the Summary of Servers table from the previous practice and click MedRecAdmSvr (admin).

   b. Click the Logging tab. Note that the Rotation file size 5000 is disabled.

   c. In the Change Center, click Lock & Edit.
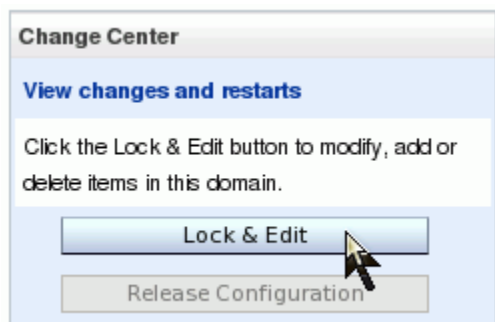
   Note: Now the Rotation file size 5000 (as well as all the other options) becomes enabled. If you made a mistake, you can click Release Configuration, and it goes back the way it was, similar to Cancel. The Lock must be done before most configuration changes.

   d. Change the Rotation file size 5000 to **5001**. Click Save.

   e. In the Change Center, click Activate Changes.

   Note: Read the Messages panel at the top. It indicates that no restarts are necessary. Some changes may be effective only when the server is restarted. In this case, nothing needed to be restarted.
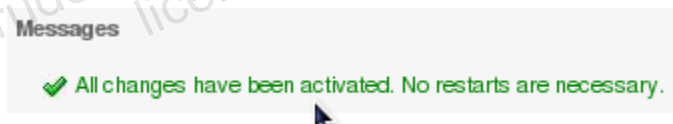
   Note: Activate Changes also releases the lock.

2. In the Change Center, click Lock & Edit again. Change the Rotation file size 5001 back to **5000**. Click Save. Do *not* activate anything.

3. In the Change Center, click "View changes and restarts." Here, you can activate or undo changes. Click Undo All Changes. **Note:** Even though there are checkboxes, it is all or nothing: you cannot selectively activate nor undo one and not another from the list.

Practice 7-3: Using WLST

In this practice, you use the WebLogic Scripting Tool (WLST) to get some status information from the running domain. Because it is a script, it can be saved and run over and over again as well as scheduled to run at specified times (such as the `cron` job in Linux).

1. Create a WLST script to change the value for the log rotation file size from 5001 to 5002.

   a. Open a terminal session on the Linux desktop. To ensure that the environment variables are set, run the `setWLSEnv.sh` script from your `$WL_HOME/server/bin` folder. There is no harm in running it twice if you had run it before.

   ```
   $ cd /u01/app/oracle/Middleware/11.1.1/wlserver_10.3/server/bin
   $ source ./setWLSEnv.sh
   ```

   b. Invoke WLST as follows: (Remember that the Java executables are case-sensitive.)

   ```
   $ java weblogic.WLST
   ```

   Note: Steps 1.a. and 1.b. could be combined by running `wlserver_10.3/common/bin/wlst.sh`, they both accomplish the same thing.

   c. Connect to the running administration server by entering:

   ```
   wls:/offline> connect('weblogic','Welcome1','t3://wls-sysadm:7020')
   ```

   d. Browse using UNIX-like commands. You should see the administration server and the two managed servers:

   ```
   wls:/MedRecDomain/serverConfig> cd('Servers')
   wls:/MedRecDomain/serverConfig/Servers> ls()
   dr--    MedRecAdmSvr
   dr--    MedRecSvr1
   dr--    MedRecSvr2

   wls:/MedRecDomain/serverConfig/Servers>
   ```

   e. Back up a level and see what else is at the same level as Servers. You will see several items. Scroll to look at the list. Items flagged with a leading "d" are directories that you can cd (change dir) to. Items flagged with "r" are readable attributes that you can view:

   ```
   wls:/MedRecDomain/serverConfig/Servers> cd ('../')
   wls:/MedRecDomain/serverConfig> ls()
   dr--    AdminConsole
   dr--    AppDeployments
   dr--    BridgeDestinations
   dr--    Clusters
   dr--    CustomResources
   dr--    DeploymentConfiguration
   …
   ```

   f. Get the status of MedRecSvr2 Startup Mode. It should say RUNNING. This does not mean that it *is* running, but *when* it starts it will be running (as opposed to just an administrative state.) You can retrieve other information from this server.

```
wls:/MedRecDomain/serverConfig> cd ('Servers/MedRecSvr2')
wls:/MedRecDomain/serverConfig/Servers/MedRecSvr2>
get('StartupMode')
'RUNNING'
wls:/MedRecDomain/serverConfig/Servers/MedRecSvr2>
```

2. Change the value of the Rotation file size from 5001 to **5002** using WLST.

    a. Use the following WLST commands sequence: (Note the use of directory paths.)

```
edit()
startEdit()
cd('/Servers/MedRecAdmSvr/Log/MedRecAdmSvr')
get('FileMinSize')
cmo.setFileMinSize(5002)
get('FileMinSize')
save()
activate()
disconnect()
exit()
```

If you disconnected before saving, the change is not committed. The steps—save, activate, disconnect, and exit—are common to all configuration scripts.

```
wls:/MedRecDomain/serverConfig/Servers/MedRecSvr2> edit()
Location changed to edit tree. ...

wls:/MedRecDomain/edit> startEdit()
Starting an edit session ...
wls:/MedRecDomain/edit !>
cd('/Servers/MedRecAdmSvr/Log/MedRecAdmSvr')
wls:/MedRecDomain/edit/Servers/MedRecAdmSvr/Log/MedRecAdmSvr !>
get('FileMinSize')
5001
wls:/MedRecDomain/edit/Servers/MedRecAdmSvr/Log/MedRecAdmSvr !>
cmo.setFileMinSize(5002)
wls:/MedRecDomain/edit/Servers/MedRecAdmSvr/Log/MedRecAdmSvr !>
get('FileMinSize')
5002
wls:/MedRecDomain/edit/Servers/MedRecAdmSvr/Log/MedRecAdmSvr !>
save()
Saving all your changes ...


wls:/MedRecDomain/edit/Servers/MedRecAdmSvr/Log/MedRecAdmSvr !>
activate()
Activating all your changes, this may take a while ...
```

Practices for Lesson 7

```
wls:/MedRecDomain/edit/Servers/MedRecAdmSvr/Log/MedRecAdmSvr>
disconnect()
Disconnected from weblogic server: MedRecAdmSvr
wls:/offline> exit()
```

Practices for Lesson 7

Practices for Lesson 8

Chapter 8

Practices for Lesson 8

Practices for Lesson 8

Practices Overview

Configuring Servers

The key tasks covered in this practice include:

- Creating and deleting managed servers
- Starting and stopping managed servers
- Monitoring managed servers

Big Picture:

MedRecDomain

MedRecAdmSvr	MedRecSvr1	MedRecSvr2	MedRecSvr3
Listen Port: 7020	Listen Port: 7021	Listen Port: 7023	Listen Port: 7025
SSL Listen: Default	SSL Listen: Default	SSL Listen: Default	SSL Listen: Default
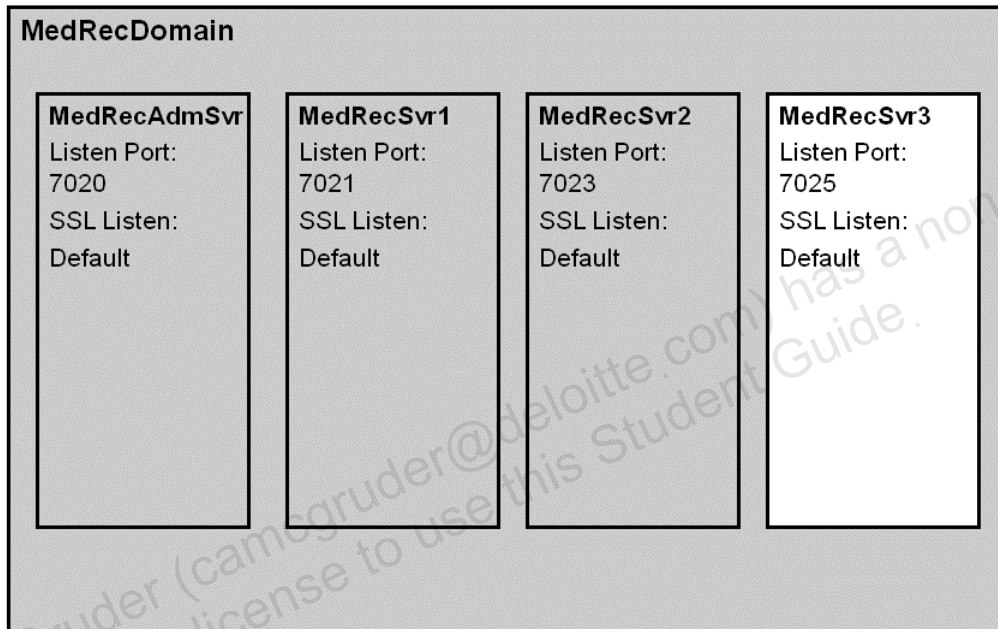
Practice 8-1: Managing Managed Servers by Using the Administration Console

In this practice, you create, delete, start, stop, and monitor managed servers using the Web browser interface. You currently have two managed servers. You add a third managed server (which you will keep). Then you add a fourth managed server (which you will not keep) and delete the fourth server.

1. Using the Administration Console, create a new managed server with the following properties:

Step	Property Name	Choices or Values
a.	Server Name	**MedRecSvr3**
b.	Server Listen Address	*(leave it blank)*
c.	Server Listen Port	**7025**
d.	Cluster	None (Standalone)

   a. Log in to the Administration Console at http://wls-sysadm:7020/console using **weblogic** as the username and **Welcome1** as the password.
   b. In the Change Center, click Lock & Edit.
   c. In the Domain Structure, navigate to Environment > Servers.
   d. In the Servers table, click New.
   e. Specify the following values in the "Create a New Server" pages:

Screen/Page Description	Choices or Values
Server Properties	Server Name: **MedRecSvr3** Server Listen Address: *(leave it blank)* Server Listen Port: **7025** Select No, stand-alone server. Click Next.
Review Choices	Click Finish.

   By leaving Listen Address blank, you can use any name in a URL that resolves to the same host regardless of the IP address. For example, localhost and wls-sysadm are two different IP addresses for the same host. Also, wls-sysadm.example.com and the alias wls-sysadm are two different names for the same host.

   f. In the Change Center, click Activate Changes.

2. Similarly, create the MedRecSvr4 managed server using the Administration Console with the following properties:

Property Name	Choices or Values
Server Name	**MedRecSvr4**
Server Listen Address	*(leave it blank)*
Server Listen Port	**7027**
Cluster	None (Standalone)

   a. In the Change Center, click Lock & Edit.

b. In the Servers table, click New.

c. Specify the following values on the Create a New Server pages:

Screen/Page Description	Choices or Values
Server Properties	Server Name: **MedRecSvr4** Server Listen Address: *(leave it blank)* Server Listen Port: **7027** Select No, stand-alone server. Click Next.
Review Choices	Click Finish.

    d. In the Change Center, click Activate Changes.

3. Delete the MedRecSvr4 managed server.

    a. In the Change Center, click Lock & Edit.

    b. Select the check box next to MedRecSvr4. Click Delete. Click Yes in the "Are you sure?" dialog box.

    c. In the Change Center, click Activate Changes.

4. The managed servers cannot be started from the Administration Console yet because the Node Manager has not been configured yet. To simplify your starting the different servers in MedRecDomain in their own terminal sessions, shell scripts have been created in the /home/oracle/wls-sysadm folder.

    a. View the following scripts and use them to start MedRecSvr1, MedRecSvr2, and MedRecSvr3. You can also use the desktop icons for starting these servers.

```
$> /home/oracle/wls-sysadm/start_mr1.sh
$> /home/oracle/wls-sysadm/start_mr2.sh
$> /home/oracle/wls-sysadm/start_mr3.sh
```

Remember that if you are signed in as user oracle, then you can use a tilde "~" as a shortcut for /home/oracle, so the command might look like:

```
~/wls-sysadm/start_mr1.sh
```

    b. Each server session prompts for the username and password. Enter the values, and then each session should eventually indicate that the corresponding server is running as the message

```
<Server started in RUNNING mode>
```

appears.

    c. Back in the Administration Console, refresh the Summary of Servers table and verify that MedRecAdmSvr, MedRecSvr1, MedRecSvr2, and MedRecSvr 3 are all RUNNING, and Health is OK.

Servers (Filtered - More Columns Exist)

Click the **Lock & Edit** button in the Change Center to activate all the buttons on this page.

| New | Clone | Delete | | | | | Showing 1 to 4 of 4 Previous | Next |

☐	Name ⌃	Cluster	Machine	State	Health	Listen Port
☐	MedRecAdmSvr(admin)			RUNNING	✔ OK	7020
☐	MedRecSvr1			RUNNING	✔ OK	7021
☐	MedRecSvr2			RUNNING	✔ OK	7023
☐	MedRecSvr3			RUNNING	✔ OK	7025

| New | Clone | Delete | | | | | Showing 1 to 4 of 4 Previous | Next |

5. Shut down MedRecSvr2 from the command line and MedRecSvr3 by using the Administration Console

a. In your gnome terminal, navigate to the bin folder of your domain and run `stopManagedWebLogic.sh` as follows:

`$> cd /u01/app/work/domains/MedRecDomain/bin`

`$> ./stopManagedWebLogic.sh MedRecSvr2`

Make sure you change the default WLST password to the correct one: `Welcome1`.

b. In the Administration Console, access the Summary of Servers page. Click the Control tab.

c. Select MedRecSrv3. Click Shutdown, and then from the drop-down menu, select Force Shutdown Now. Acknowledge you want to do this by clicking Yes.

d. Check the tab/window running the process for MedRecSvr3. It should have stopped.

e. Refresh the Summary of Servers table and now MedRecSvr1 should still be RUNNING, and MedRecSvr2 and MedRecSvr3 should both be SHUTDOWN. Notice that the System Status (lower left) does not consider SHUTDOWN to be a warning.

Servers(Filtered - More Columns Exist)

| Start | Resume | Suspend ∨ | Shutdown ∨ | Restart SSL | Showing 1 to 4 of 4 Previous | Next |

☐	Server ⌃	Machine	State	Status of Last Action
☐	MedRecAdmSvr(admin)		RUNNING	None
☐	MedRecSvr1		RUNNING	None
☐	MedRecSvr2		SHUTDOWN	None
☐	MedRecSvr3		SHUTDOWN	TASK COMPLETED

| Start | Resume | Suspend ∨ | Shutdown ∨ | Restart SSL | Showing 1 to 4 of 4 Previous | Next |

Practices for Lesson 8

Practice 8-2: Adding Managed Servers by Using WLST

In this practice, you add a fourth managed server by using WLST. Using the Administration Console, verify that the server is created. Finally, delete the server by using WLST.

1. Create a managed server with the following properties:

Property Name	Choices or Values
Server Name	**MedRecSvr4**
Server Listen Address	*(leave it blank)*
Server Listen Port	**7027**
Cluster	None (Standalone)

a. In your gnome terminal session, ensure that the environment variables have been set. You make a quick check using the following command:

```
$> env | grep JAVA
JAVA_USE_64BIT=false
JAVA_OPTIONS= -Xverify:none
JAVA_VENDOR=Oracle
JAVA_HOME=/u01/app/oracle/Middleware/11.1.1/jrockit_160_17_R28.0
.0-679
JAVA_VM=-jrockit
```

If JAVA parameters do not appear, you can execute the source ./setWLSEnv.sh command to set the environment variables.

b. Enter the following code in the terminal session to create the managed server:

```
java weblogic.WLST
connect('weblogic','Welcome1','t3://wls-sysadm:7020')
edit()
startEdit()
cmo.createServer('MedRecSvr4')
cd('/Servers/MedRecSvr4')
cmo.setListenAddress('wls-sysadm')
cmo.setListenPort(7027)
activate()
disconnect()
exit()
```

Note: Steps 1.a. and the first line of 1.b. launching WLST could be combined by running wlserver_10.3/common/bin/wlst.sh, they both accomplish the same thing.

2. In the Administration Console, in Domain Structure, navigate to MedRecDomain > Environment > Servers, and you should see MedRecSvr4.

Servers(Filtered - More Columns Exist)

	Server ⌃	Machine	State	Status of Last Action
☐	MedRecAdmSvr(admin)		RUNNING	None
☐	MedRecSvr1		RUNNING	None
☐	MedRecSvr2		SHUTDOWN	None
☐	MedRecSvr3		SHUTDOWN	TASK COMPLETED
☐	MedRecSvr4		SHUTDOWN	None

Showing 1 to 5 of 5   Previous | Next

3. Delete MedRecSvr4 by using WLST.

    a. In the gnome terminal session, enter the following code to delete the MedRec4 managed server:

```
java weblogic.WLST
connect('weblogic','Welcome1','t3://wls-sysadm:7020')
edit()
startEdit()
cd('/Servers')
ls()
delete('MedRecSvr4')
activate()
disconnect()
exit()
```

4. Back in the Administration Console, in Domain Structure, navigate to MedRecDomain > Environment > Servers. You should see that MedRecSvr4 is deleted.

Servers(Filtered - More Columns Exist)

	Server ⌃	Machine	State	Status of Last Action
☐	MedRecAdmSvr(admin)		RUNNING	None
☐	MedRecSvr1		RUNNING	None
☐	MedRecSvr2		SHUTDOWN	None
☐	MedRecSvr3		SHUTDOWN	TASK COMPLETED

Showing 1 to 4 of 4   Previous | Next

Practices for Lesson 8

Practices for Lesson 9

Chapter 9

Practices for Lesson 9

Practices for Lesson 9

Practices Overview

Configuring the Node Manager

The Node Manager operates on machines. A machine is a logical construct that contains a group of servers. Usually, there is only one machine per computer. One of the main purposes of the Node Manager is to allow you to remotely start a managed server via the Administration Console. The key tasks are:

- Adding a machine and assigning servers to it
- Connecting to the Node Manager
- Connecting the Node Manager to the managed servers
- Invoking the Node Manager to start a managed server via the command line
- Invoking the Node Manager to start a managed server via the Administration Console

Big Picture:

MedRecDomain

Machine

MedRecAdmSvr	MedRecSvr1	MedRecSvr2	MedRecSvr3
Listen Port: 7020	Listen Port: 7021	Listen Port: 7023	Listen Port: 7025
SSL Listen: Default	SSL Listen: Default	SSL Listen: Default	SSL Listen: Default

NodeManager   MedRecMch1, port: 5556
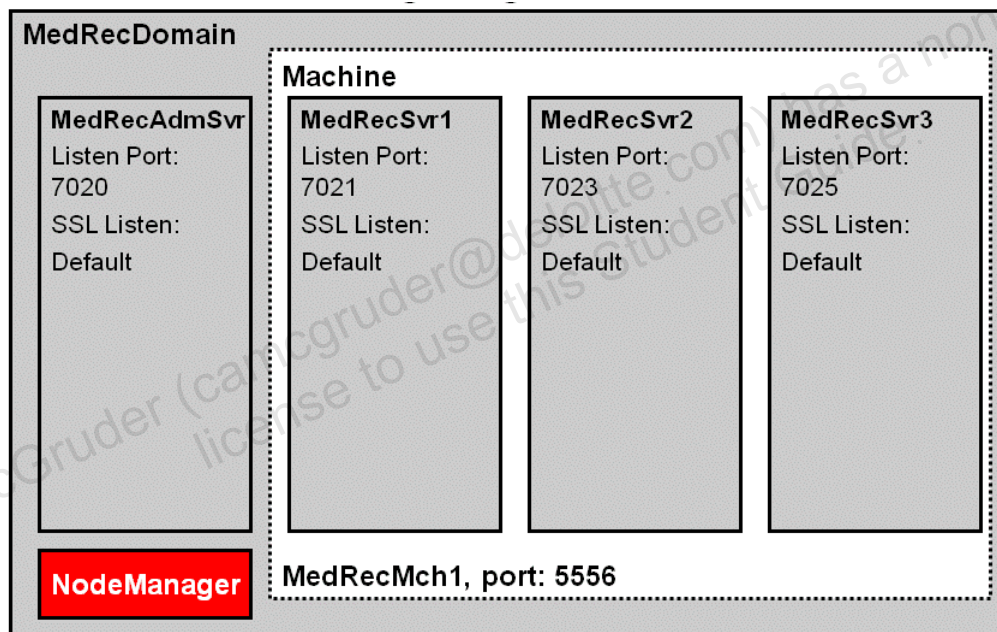
Practice 9-1: Adding Machines and Assigning Servers

In this practice, you add a machine to the domain: MedRecMch1. Then you assign managed servers to this machine. Note that the servers have to be stopped before they can be added to a machine. Generally, you do not assign the administration server to any machine. Later on, you will manage the servers using the Node Manager.

1. In MedRecDomain, create a machine: MedRecMch1. Assign MedRecSvr1, MedRecSvr2, and MedRecSvr3 to MedRecMch1.

    a. If the MedRecAdmSvr server is not running, start it by using the Start Admin icon on the desktop. If any of the managed servers are running, stop them by using the Console or `stopManagedWebLogic` as covered in the previous lab.

    b. In the Administration Console, in the Change Center, click Lock & Edit. You will need to click Lock & Edit each time before any change to the configuration.

    c. In Domain Structure, navigate to MedRecDomain > Environment > Machines. Click New.

    d. In Name, enter **MedRecMch1**. In Machine OS, select Unix from the drop-down menu. Click OK.

    e. On Summary of Machines, click MedRecMch1. Click the Configuration > Servers tab. Click Add.

    f. On the Identify Server page, from the "Select a server" drop-down list, select MedRecSvr1 and click Next.

    g. On the Summary of Machines page, click Add. On the Identify Server page, from the "Select a server" drop-down list, select MedRecSvr2 and click Next.

    h. On the Summary of Machines page, click Add. On the Identify Server page, from the "Select a server" drop-down list, select MedRecSvr3 and click Finish.

    i. In the Change Center, click Activate Changes. This adds the servers to a new machine.

    j. In the Administration Console, refresh the "Summary of Servers" table. Now all managed servers should be associated with a machine.

Servers (Filtered - More Columns Exist)

Click the *Lock & Edit* button in the Change Center to activate all the buttons on this page.

| New | Clone | Delete | | | Showing 1 to 4 of 4 Previous | Next |

	Name ⌃	Cluster	Machine	State	Health	Listen Port
☐	MedRecAdmSvr(admin)			RUNNING	✔ OK	7020
☐	MedRecSvr1		MedRecMch1	SHUTDOWN		7021
☐	MedRecSvr2		MedRecMch1	SHUTDOWN		7023
☐	MedRecSvr3		MedRecMch1	SHUTDOWN		7025

Practice 9-2: Connecting to the Node Manager

In the classroom environment, the administration server and the managed servers are all on the same physical computer. This would not normally be the case in production. Because the servers would probably be on different computers, the administration server needs to know the `JAVA_HOME` and `CLASSPATH` on the *managed servers'* machines, which may be different from its own classpath and Java home. In this environment though you can take an easier approach.

In this practice, you start the Node Manager for the MedRecMch1 machine. This must be done using the command line.

1. By default, the Node Manager communicates with the administration server over Secure Sockets Layer (SSL) connections. However, the administration server is not yet configured with secured connections. So reconfigure the Node Manager to use plain communication.

   a. In the Change Center, click Lock & Edit. Then navigate to MedRecDomain > Environment > Machines. Click MedRecMch1.

   b. Click the Node Manager tab and select Plain from the Type drop-down list. Set Listen Address to `wls-sysadm` and click Save. Even though the Node Manager and administration server are on the same machine, the default Listen Address of `localhost` will not work.
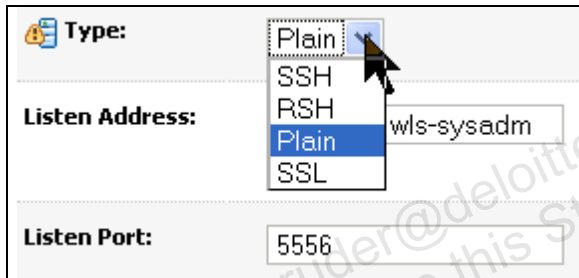
   c. Click Activate Changes.

2. Create the `nodemanager.properties` file in the $WL_HOME/common/nodemanager folder for starting the Node Manager.

   a. The file you need to edit does not exist yet. You can verify this by listing the files in $WL_HOME/common/nodemanager. Note that the properties file is *NOT* there yet.

   b. Start the Node Manager by navigating to $WL_HOME/server/bin and using the following command:

   ```
   $> ./startNodeManager.sh wls-sysadm 5556 .
   ```

   Wait until the console says `<Secure socket listener started on port 5556>`.

   Press Ctrl + C to stop the Node Manager. This step created the `nodemanager.properties` file. However, it defaults to SSL (secure), and you want to use Plain. Also it is expecting Java path and user/password information that was not supplied to the administration server.

   c. Instead of supplying the Java path and password values, configure the Node Manager to get that information from the `startWebLogic.sh` script. In the gnome terminal session, navigate to the $WL_HOME/common/nodemanager folder and edit `nodemanager.properties`. Set the `SecureListener` parameter to **false** (that is, "plain") and `StartScriptEnabled` to **true** and `StopScriptEnabled` to **true**:

   ```
   ...
   9 LogLevel=INFO
   ```

```
10 DomainsFileEnabled=true
11 StartScriptName=startWebLogic.sh
12 ListenAddress=localhost
13 NativeVersionEnabled=true
14 ListenPort=5556
15 LogToStderr=true
16 SecureListener=false
17 LogCount=1
18 StopScriptEnabled=true
19 QuitEnabled=false
20 LogAppend=true
21 StateCheckInterval=500
22 CrashRecoveryEnabled=false
23 StartScriptEnabled=true
24 LogFile=/u01/app/oracle/Middleware/11.1.1/wlserver_10.3/
   ...
```

3. Start the Node Manger because you have reconfigured it using plain mode of communication.

   a. In a gnome terminal session, go to $WL_HOME/server/bin and start the Node Manager using the following command (all on one line):

   ```
   $> gnome-terminal --title "Node Manager" -e
   "./startNodeManager.sh wls-sysadm 5556"
   ```

   This brings up the Node Manager in a separate window. Now it should say

   `<Plain socket listener started on port 5556>`.

4. Verify that the Node Manager is reachable. Go to the Administration console, and navigate the Domain Structure to Environment > Machines > MedRecMch1 > Monitoring > Node Manager Status to see if Status is Reachable. If it is Inactive then you have a problem with your Node Manager configuration or with your Machine configuration, which should be fixed before you go on with the next step. If you try to proceed anyway while the Node Manager is unreachable, you will get the following message when you try to start or stop a server:

   Messages

   Warning! For server MedRecSvr2, the Node Manager associated with machine MedRecMch1 is not reachable.

   Warning! All of the servers selected are currently in a state which is incompatible with this operation or are not associated with a running Node Manager or you are not authorized to perform the action requested. No action will be performed.

5. It is possible for a single Node Manager to manage multiple domains on a single computer. List the contents of nodemanager.domains to see the domains that could be supported from this Node Manager. At a terminal session, type:

   more $WL_HOME/common/nodemanager/nodemanager.domains

   At least MedRecDomain should be in the list, there may be other domains as well.

Practices for Lesson 9

Practice 9-3: Starting Managed Servers by Using the Node Manager

In this practice, you start one managed server via the Administration Console and the other managed server via WLST.

1. Using the Administration Console, start the MedRecSvr1 server.

   a. In the Administration Console, navigate to MedRecDomain > Environment > Servers and click the Control tab.

   b. (Watch the Node Manager console while you do this next step.) Select MedRecSvr1 and click Start. Click Yes to start the server. The State changes from UNKNOWN to STARTING. You can refresh the table by clicking the cycle ⟳ icon or by selecting MedRecDomain > Environment > Servers.

   c. Note that you no longer have a terminal session displaying the server log. Note that the Node Manager terminal output indicated that it was creating several directories and files for the managed server MedRecSvr1 (you can scroll back on the Node Manager console to see the past actions).

2. Using WLST, start the MedRecSvr2 server.

```
$> java weblogic.WLST
connect('weblogic','Welcome1','wls-sysadm:7020')
cd('/Servers')
ls()
start('MedRecSvr2')
exit()
```

   You should see a series of dots as a progress bar. . . . ., and then the message:

   `Server with name MedRecSvr2 started successfully`

3. Verify that the MedRecSvr1 and MedRecSvr2 servers are started properly by viewing their State in the Administration Console. The State should be RUNNING and Health should be OK.

Practices for Lesson 9

Practices for Lesson 10

Chapter 10

Practices for Lesson 10

Practices for Lesson 10

Practices Overview

Configuring Logging

Each server (both the administration and managed varieties) generates logs of activity. In addition to the server logs, there are HTTP logs, JMS logs, JDBC logs, and application logs. The server logs are stored locally and some of the information can also be forwarded to a domain log at the administration server. You filter the traffic from MedRecSvr1 to only send more severe JDBC errors. Lastly, you look at the kinds of logs available and look at the domain log in particular. The key tasks are:

- Configuring logging parameters
- Examining log entries

Big Picture:
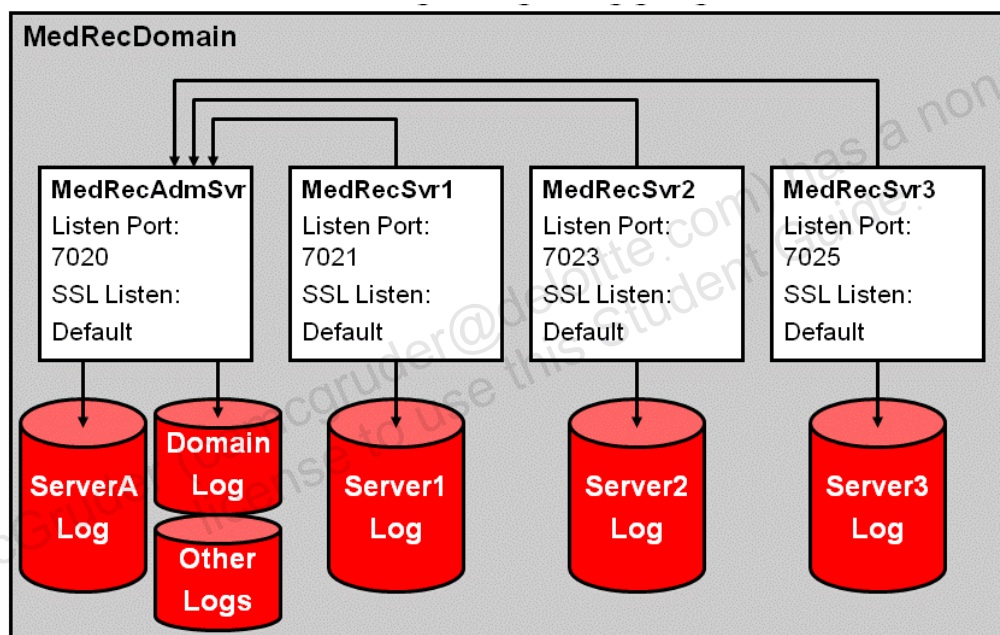
Practice 10-1: Configuring Logging Parameters

In this practice, you configure MedRecSvr1 to forward only severe JDBC errors by the use of filters. The default configuration for MedRecSvr2 will forward all errors. The filters are created at the domain side, but applied at the server side.

1. Start the Administration Server and the Node Manager, if they have not already been started. Then start the MedRecSvr1 and MedRecSvr2 servers.

   a. Use the Start Admin icon to start the administration server.

   b. Use the Start NodeMgr icon or the start_nm.sh script in a gnome terminal to start the Node Manager.

   c. Using the Administration Console, start MedRecSvr1 and MedRecSvr2.

2. In the Administration Console, in Change Center, click Lock & Edit. In Domain Structure, navigate to MedRecDomain. In the tabs, navigate to Configuration > Log Filters. Click New.

3. Enter the following values on the Create a New Log Filter pages:

Step	Screen/Page Description	Choices or Values
a.	Log Filter Properties	Name: **SevereJDBC**. Click OK.
b.	Log Filters	Click SevereJDBC.
c.	Config Log Filter Expressions	Click Add Expressions.
d.	Add Expression (By default Notice and Warning, messages are also logged. Using this filter you restrict the amount and kind of messages forwarded.)	Message Attribute: SEVERITY Operator: = Value: **ERROR** Click OK.
e.	Config Log Filter Expressions	Click Add Expressions.
f.	Add Expression	Message Attribute: SUBSYSTEM Operator: = Value: **JDBC** Click OK.
g.	Save expressions	Click Save.

Note that the two expressions are conjugated with "OR" by default. You can change the conjugation to "AND" to get only ERROR messages from the JDBC subsystem.

4. In Change Center, click Activate Changes.

5. Click Lock & Edit again and navigate to MedRecDomain > Servers. In the Servers table, click MedRecSvr1 and navigate tabs to Logging > General. Click Advanced.

6. Note that there are four "Message destination(s)" sections that look similar. In the "Domain log broadcaster" section, change Filter to SevereJDBC. The other three filters should say None.
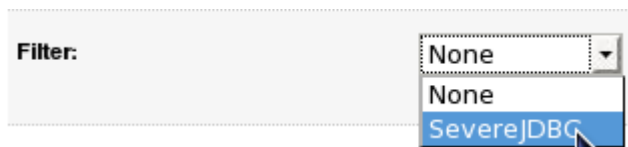
7. Click Save, and then click Activate Changes. This should now prevent trivial messages from being forwarded and logged at the Admin Server from managed server MedRecSvr1.

However, the trivial messages are still being logged locally at managed server MedRecSvr1.

Practice 10-2: Examining Log Entries

In this practice, you look at the log files using the Administration Console and the raw file itself.

1. Using the Administration Console, view ServerLog, and DomainLog for MedRecDomain, and note the significant properties.

    a. In the Domain Structure, navigate to MedRecDomain > Diagnostics > Log Files. Sort the list by type and list the types of logs that you find:

Type of Logs	Type of Logs

    b. To examine ServerLog for MedRecSvr1, select ServerLog for MedRecSvr1 and click View. It is possible that ServerLog will not display anything. Does that mean that it is empty? **Hint:** See what you can customize on this table.

    c. Similarly, examine DomainLog for MedRecAdmSvr. For the first entry, select it and click View for a different format. There is no additional information (though columns from the table may have been suppressed). The View is mostly for a better format or layout of the message.

2. View the log files in a text editor and note the significant properties.

    a. In a terminal session, navigate to

        `/u01/app/work/domains/MedRecDomain/servers/MedRecAdmSvr/logs`.

    b. Examine the domain log. Most of the messages are related to the starting and stopping of the servers and are of the severity "Notice." The empty brackets <> <> are placeholders for null columns. Still, there seems to be many more lines in the file than on the Administration Console. Why?

3. In the Administration Console, change the time interval for logging and verify the logs.

    a. Back in the Administration Console, view the Domain Log again. Click "Customize this table." Change the Filter Time Interval from the default "Last 5 minutes" to "Last 1 week(s)." Click Apply.

    b. Now there should be several more entries to look at.

    c. See if this time filter change altered the number of entries shown on ServerLog as well. You need to set the filters for each log you want to change.

Practices for Lesson 11

Chapter 11

Practices for Lesson 11

Practices for Lesson 11

Practices for Lesson 11

There are no practices for Lesson 11.

Practices for Lesson 12

Chapter 12

Practices for Lesson 12

Practices for Lesson 12

Practices for Lesson 12

Practices Overview

Deploying Applications

You are going to deploy two applications: Benefits and Medrec.

Benefits is very simple and does not use any extra services, and Medrec requires two libraries and uses many services, such as JMS and JDBC. These services are covered in later labs. For the moment, you just install them as a "black box."

The key tasks are:

- Deploying prerequisite libraries
- Deploying applications
- Starting and stopping applications
- Testing applications
- Deleting applications
- Front-ending applications with a Web server, such as Oracle HTTP Server

Big Picture:

MedRecDomain

MedRecAdmSvr	MedRecSvr1	MedRecSvr2
Listen Port: 7020	Listen Port: 7021	Listen Port: 7023
SSL Listen: 70xx	SSL Listen: 70xx	SSL Listen: 70xx
	MedRec application	Benefits application
	jsf + jstl libraries	jsf + jstl libraries

MedRecMch1
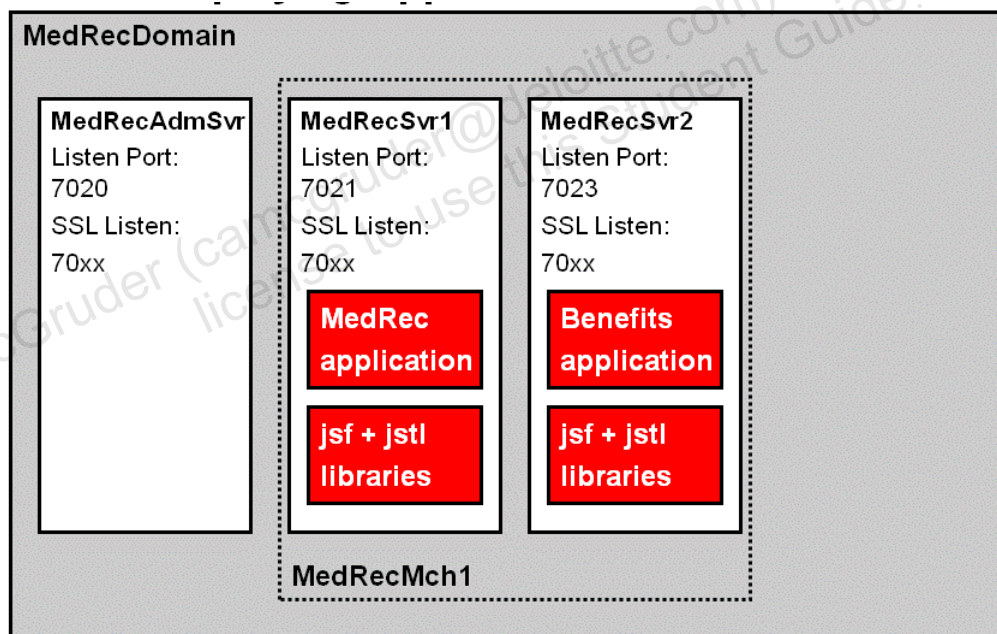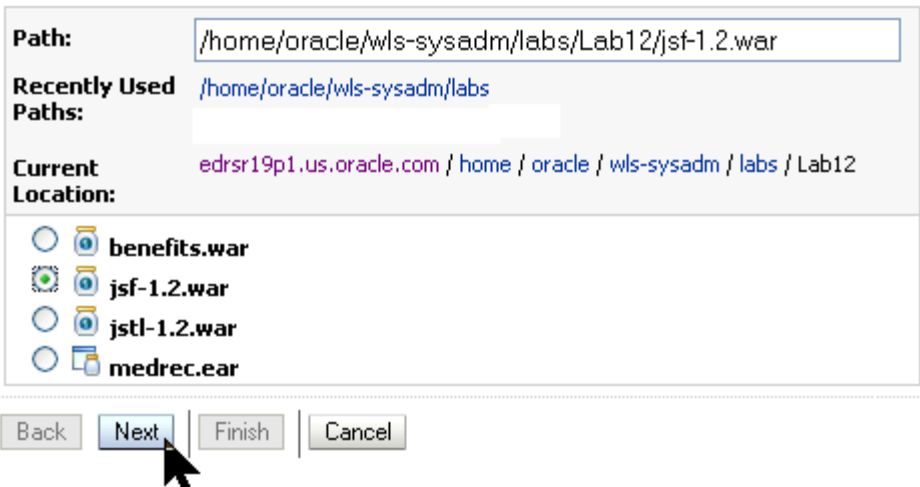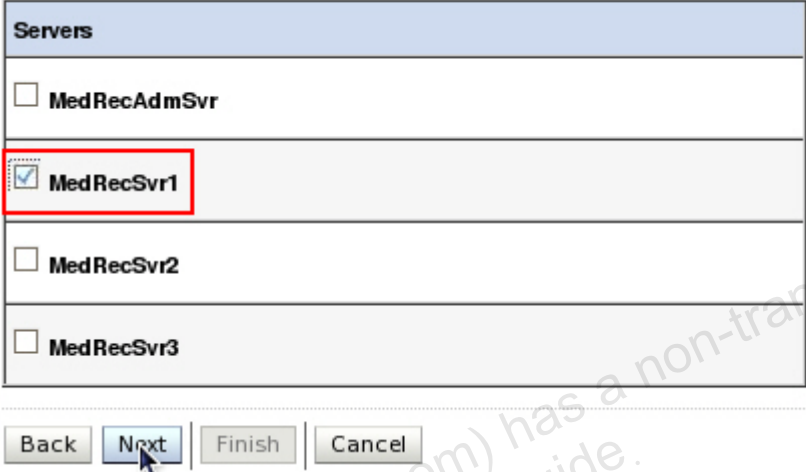
Practice 12-1: Deploying Libraries

Often, many applications use the same set of library classes. These classes might be ones that you write or ones that are part of a larger framework, such as JavaServer Faces. Rather than duplicate those classes in each application, you can store the common classes in a library that many applications can use. In this practice, you deploy two libraries on all the servers that will be used by (at least) the Medrec application (and potentially by other applications as well).

1. Start up the administration server and the Node Manager if they have not already been started. Then start the MedRecSvr1 and MedRecSvr2 servers.

    a. Use the Start Admin desktop icon to start the administration server.

    b. Use the Start NodeMgr icon or `start_nm.sh` script in a gnome terminal to start the Node Manager.

    c. Using the Administration Console, start MedRecSvr1 and MedRecSvr2.

2. Clear out any deployments in MedRecDomain to start with a clean slate. (If nothing is currently deployed, skip the rest of this step.)

    a. In the Administration Console, navigate to MedRecDomain > Deployments.

    b. In Change Center, click Lock & Edit. In Deployments, select all the deployments by selecting the check box at the top next to Name. That should select everything.

    c. Select Stop > Force Stop Now. Click Yes to stop everything. Note the message that the libraries will not be stopped.

    d. Select the check box at the top next to Name again, and click Delete. Click Yes to delete everything.

    e. Click Activate Changes. You should now have a clean set of servers to work with.

3. Deploy the two required library files for the MedRec application using the following steps:

    a. In Change Center, click Lock & Edit. In Deployments, click Install.

    b. In the Install Application Assistant, complete the following steps for deploying a JSF library class:

Step	Screen/Page Description	Choices or Values
a.	Locate deployment to install and prepare for deployment	Navigate to /home/oracle/wls-sysadm/labs/Lab12. Select jsf-1.2.war. Click Next.

Step	Screen/Page Description	Choices or Values
b.	Choose targeting style	Note that the Assistant knows that jsf is a library, and not an application. Click Next.
c.	Select deployment targets	Select the MedRecSvr1 server as the target. Click Next.
–		
d.	Optional Settings	You can override anything in the deployment plans or you can accept the defaults. Click Next to accept the defaults.
	The dashed lines at the bottom of the page in the Source accessibility section are not aligned with the options in an obvious way. For instance, "Use the defaults" is the "Recommended selection" even though it appears to be associated with "Copy this application."	
e.	Review your choices	Select "Yes, take me to the deployment's configuration screen." Click Finish.
f.	Settings for jsf	You can use the Notes tab to document who did the implementation, when, why, and so on.
g.	Final step	Click Save. Click Activate Changes.

c. In Domain Structure, click Deployments. In Change Center, click Lock & Edit. Click Install.

d. In the Install Application Assistant, complete the following steps for deploying the JSTL library class:

Step	Screen/Page Description	Choices or Values
a.	Locate deployment to install and prepare for deployment	Navigate to /home/oracle/wls-sysadm/labs/Lab12. Select jstl-1.2.war. Click Next.
b.	Choose targeting style	Note that the Assistant knows that jstl is a

Step	Screen/Page Description	Choices or Values
		library, and not an application. Click Next.
c.	Select deployment targets	Select MedRecSvr1. Click Next.
d.	Optional Settings	You have already seen the screens here and you need not change anything. As a shortcut, click Finish to accept the defaults.
e.	Settings for jstl	If you are not going to add any notes, you do not have to save. Note at the bottom of the page that no applications reference this library yet.
f.	Final step.	Click Activate Changes.

4. On the Deployments page, you should now see jsf and jstl deployed and are active. Unlike application deployments, libraries do not need to be started; they are always started. To verify this, select jsf and select Start > Servicing all requests. A warning message appears indicating that this is not necessary and will be ignored.

Practice 12-2: Deploying Applications

In this practice, you deploy two applications: MedRec and Benefits. Deploy MedRec on MedRecSvr1 and Benefits on MedRecSvr2.

1. Deploy a Java EE application named MedRec on the MedRecSvr1 server.

   a. In the Administration Console, in Domain Structure, navigate to Deployments. In Change Center, click Lock & Edit. In Deployments, click Install.

   b. In the Install Application Assistant, complete the following steps for deploying Medrec applications:

Step	Screen/Page Description	Choices or Values
a.	Locate deployment to install and prepare for deployment	Navigate to /home/oracle/wls-sysadm/labs/Lab12. Select medrec.ear. Click Next.
b.	Choose targeting style	Note that the Assistant knows that Medrec is an application versus a library. This is different from jsf and jstl that you created previously. Click Next.
c.	Select deployment targets	Select MedRecSvr1. Click Next.
d.	Optional settings	You have already seen the screens here and you need not change anything. As a shortcut, click Finish to accept the defaults. Note that State is "distribute Initializing."
e.	Change Center	Click Activate Changes. Note that State is now Prepared.

2. Optionally, you can click the plus ⊞ next to Medrec and see the pieces of the EAR that were deployed. Click the minus sign to shrink it.

3. Deploy the Benefits application on MedRecSvr2.

   a. In the Administration Console, in Domain Structure, navigate to Deployments. In Change Center, click Lock & Edit. In Deployments, click Install.

   b. In the Install Application Assistant, complete the following steps for the Benefits deployment:

Step	Screen/Page Description	Choices or Values
a.	Locate deployment to install and prepare for deployment	Navigate to /home/oracle/wls-sysadm/labs/Lab12. Select benefits.war. Click Next.
b.	Choose targeting style	Note that the Assistant knows that Benefits is an application versus a library. Click Next.
c.	Select deployment targets	Select MedRecSvr2. You are allowed to have more than one application per server, and more than one server per application, but for this lab, you are spreading them around. Click Next.
d.	Optional settings	You have already seen the screens here and you need not change anything. As a shortcut,

Step	Screen/Page Description	Choices or Values
		click Finish to accept the defaults. Note that the State is "distribute Initializing."
e.	Change Center	Click Activate Changes. Note that State is now Prepared.

4. Optionally, you can click jsf and observe that at the bottom, there is a list of dependent applications that reference this library. Medrec does require the jsf library, whereas Benefits does not ever need the jsf library. There is a bug in some versions of 10.3.3 where the library such as jsf currently does not display the application dependency.

Practices for Lesson 12

Practice 12-3: Performing Life Cycle Management of Applications

In this practice, you start, stop, update (refresh/redeploy), and delete applications. There is a more advanced way of doing the update, which is covered in the next lab.

1. Start the two applications that you have deployed.

   a. In Deployments, select benefits and medrec.

   b. Select Start > Servicing all requests. Click Yes to start both deployments. State should now be Active for all deployments.

2. Test these applications by using their individual URLs.

   a. Open a new browser tab and use the URL:

      `http://wls-sysadm:7021/medrec`

   b. It displays the application on MedRecSrv1. You should see a welcome page from Avitek Medical Records Sample Application.

   c. To test the application, click "Start using MedRec."
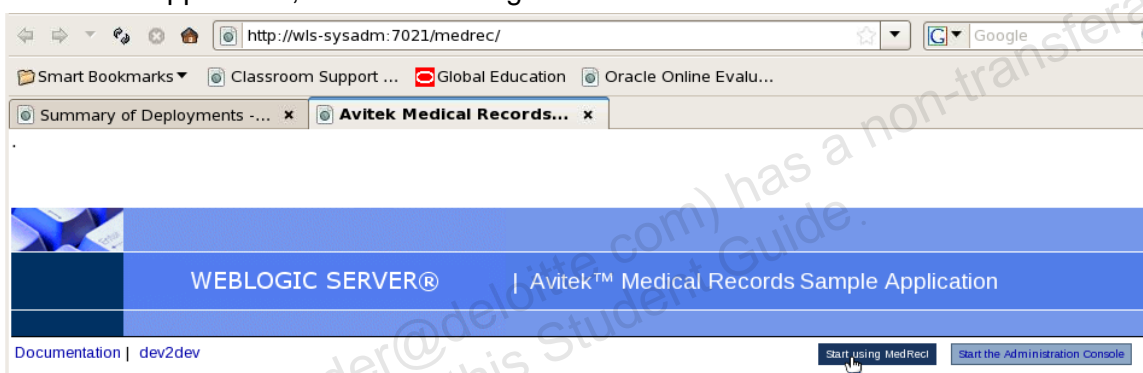
   d. Click Login under Administrator. In email, enter admin@avitek.com with a password of `Welcome1`. Click Submit.
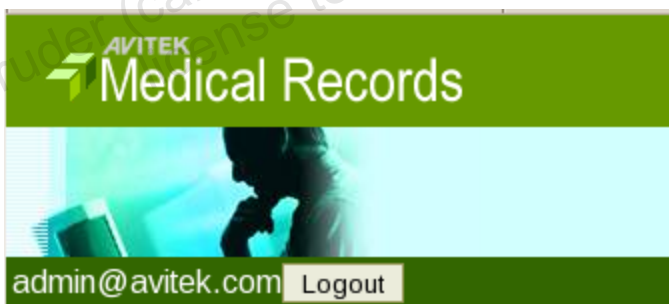
   Do not spend more than a minute here because several key components are not implemented yet. Bookmark this URL as you will come back to here shortly.

   e. To test the Benefits application, open another browser tab and enter the following URL: `http://wls-sysadm:7023/benefits`. You should see Welcome to MedRec Black and have the option to view several HR-related pages.

3. Monitor the two applications by using the Administration Console.

Practices for Lesson 12

a. In the Administration Console, in "Summary of Deployments," click the Monitoring tab. You should see both Medrec and Benefits running with some sessions.

4. Suppose a new version of the Benefits application is released. Deploy the new version of the Benefits application.

If the server was in Development mode and Autodeploy was active (neither of which is the case here), this change of time stamp would be enough to trigger a redeployment. For your environment, you must explicitly redeploy.

a. Go to a Linux terminal session and navigate to `~/wls-sysadm/labs/Lab12`, and enter `touch benefits.war` to change the time stamp to now.

b. In the Administration Console, in Change Center, click Lock & Edit.

c. In Domain Structure, navigate to MedRecDomain > Deployments. Select benefits and click Update.

d. Click Finish.

If you had the old and new WAR files in the `/old` and `/new` directories, you could change the paths here. In your case, nothing has moved. State is now "deploy Initializing."

e. In Change Center, click Activate Changes. State is now Active.

This was a rather ungraceful way of performing an update. It knocked off anyone who was in session on Benefits. Perhaps more graceful would be to stop the Benefits application first and then update. You can choose Force Stop Now or when work completes, depending on your situation.

Practices for Lesson 12

Practice 12-4: Enabling OHS as the Front End of Applications

In this practice, you redirect requests for the Benefits and Medrec applications via a Web server. Instead of the explicit URLs used before (which will still work), all references to those applications will be routed through Oracle HTTP Server. By configuring mod_wl_ohs.conf, you will be redirecting the following addresses:

- http://wls-sysadm:7777/medrec to http://wls-sysadm:7021/medrec
- http://wls-sysadm:7777/benefits to http://wls-sysadm:7023/benefits

In real life, the OHS, medrec, and benefits servers may be on different hosts.
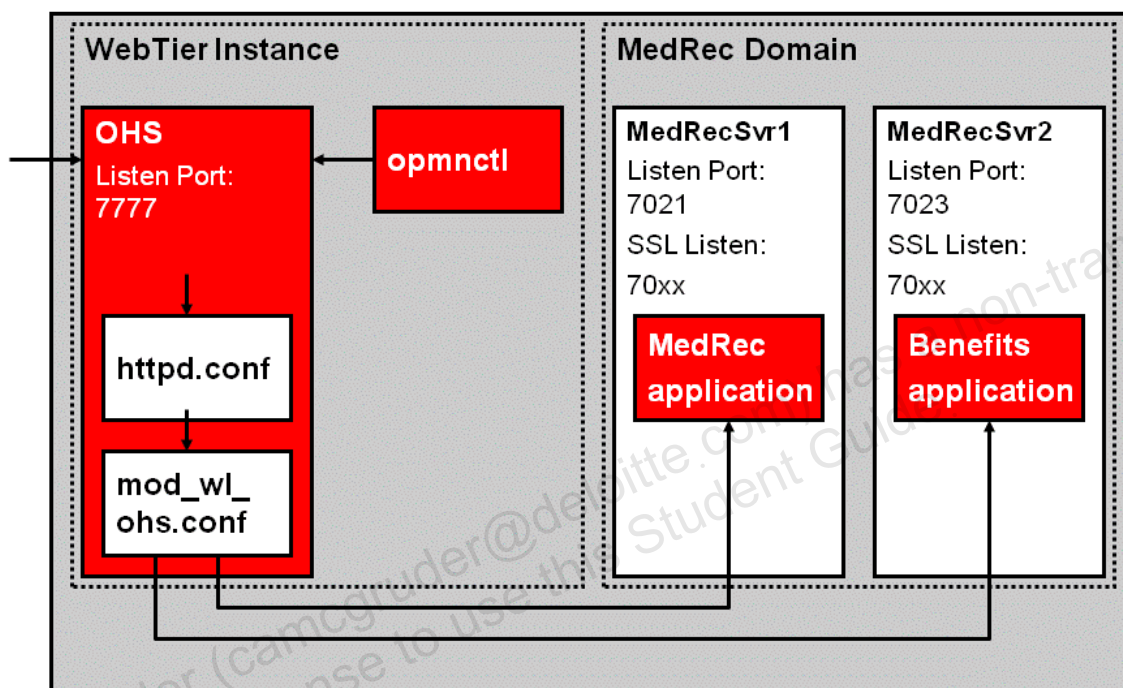
1. Start Oracle HTTP Server that is installed and configured, and note the port number for Oracle HTTP Server.

   a. Click the Start OHS icon on your desktop.

   b. Run the status_ohs.sh script in the ~/wls-sysadm folder and note the port beside http in the last line:

```
[oracle@edvmr1p0 wls-sysadm]$ ./status_ohs.sh

Processes in Instance: webtier
--------------+--------------+-------+--------+-----------+---------+---------
+------
ias-component | process-type |   pid | status |       uid | memused |  uptime
| ports
--------------+--------------+-------+--------+-----------+---------+---------
+------
ohs1          | OHS          | 12461 | Alive  | 925773435 |  347092 | 0:10:43
| https:9999,https:4443,http:7777

[oracle@edvmr1p0 wls-sysadm]$
```

   c. Access OHS (http://<your server>:<http-port>) in the browser:
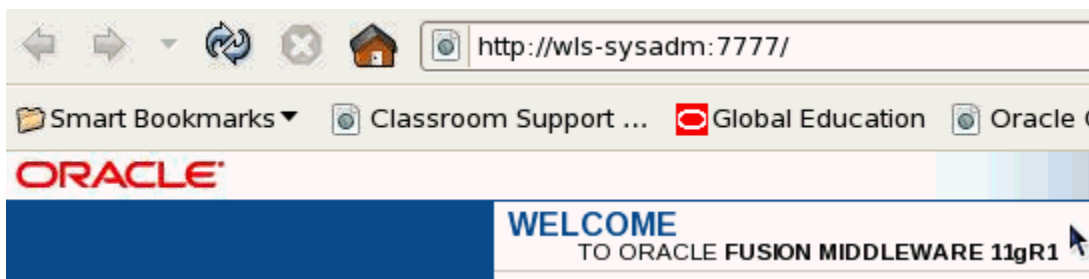
2. Reconfigure `mod_wl_ohs.conf` to route Benefits requests to MedRecSvr2 and Medrec requests to MedRecSvr1

   a. In a gnome terminal session, change directory to the OHS instance configuration folder (/u01/app/work/instances/config/OHS/ohs1).

   b. Copy the `mod_wl_ohs.conf` file to `mod_wl_ohs.bak`. Then edit `mod_wl_ohs.conf` so that it appears as in the following:

```
# NOTE : This is a template to configure mod_weblogic.


LoadModule weblogic_module    "${ORACLE_HOME}/ohs/modules/mod_wl_ohs.so"


# This empty block is needed to save mod_wl related configuration from EM to
this file when changes are made at the Base Virtual Host Level
<IfModule mod_weblogic.c>
#       WebLogicHost <WEBLOGIC_HOST>
#       WebLogicPort <WEBLOGIC_PORT>
#       Debug ON
#       WLLogFile /tmp/weblogic.log
#       MatchExpression *.jsp
</IfModule>


<Location /benefits>
        WebLogicHost wls-sysadm
        WebLogicPort 7023
        SetHandler weblogic-handler
#       PathTrim /weblogic
#       ErrorPage  http:/WEBLOGIC_HOME:WEBLOGIC_PORT/
</Location>
<Location /medrec>
        WebLogicHost wls-sysadm
        WebLogicPort 7021
        SetHandler weblogic-handler
#       PathTrim /weblogic
#       ErrorPage  http:/WEBLOGIC_HOME:WEBLOGIC_PORT/
</Location>
```

   If you do not like editing the file, you can copy the `mod_wl_ohs.conf` file from the `~/wls-sysadm/labs/Lab12` folder to `/u01/app/work/instances/config/OHS/ohs1`.

3. Verify accessing Medrec and Benefits applications through OHS.

   a. Stop and start OHS by using the Stop OHS and Start OHS icons on the desktop to give effect to the changed `mod_wls_ohs` configuration.

Practices for Lesson 12

b. Then verify accessing the Medrec application through OHS.
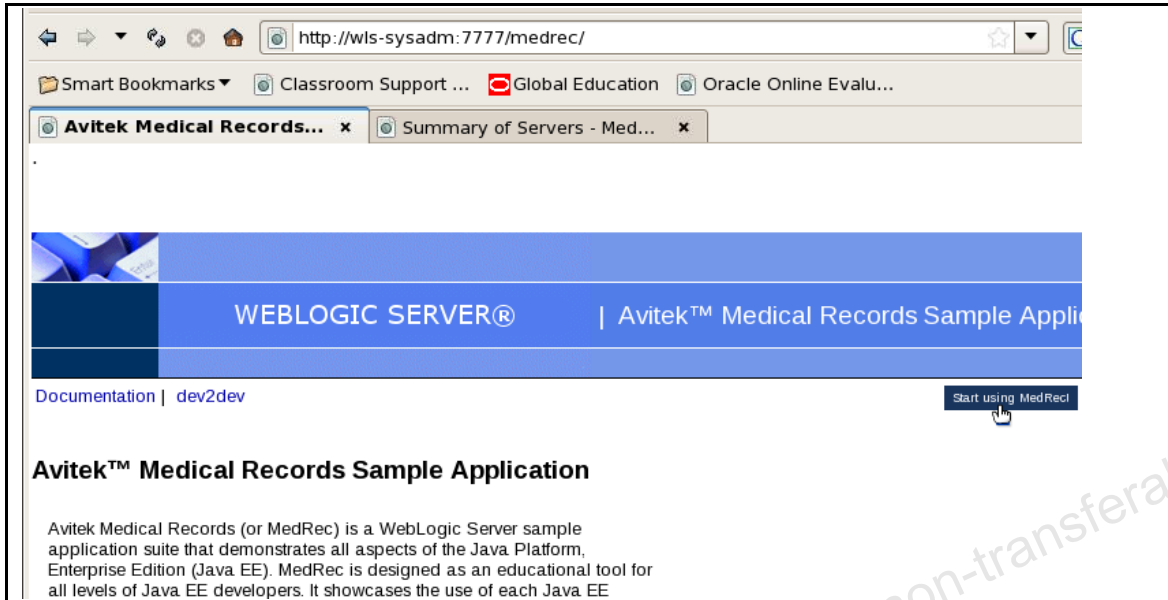
c. Then verify accessing the Benefits application through OHS at:

`http://wls-sysadm:7777/benefits`

Note that you are accessing two different back-end application servers using a single front-end OHS. The original application URLs on ports :7021 and :7023 still work as well.

4. Now due to application lifecycle business requirements, delete the Benefits application.

a. In Change Center, click Lock & Edit. Then navigate to the Deployments page.

b. Select the Benefits application and try to delete it while it is still in an active state. This will fail. You are warned that you cannot delete an application while it is running (active).

c. Select benefits again, select Stop > Force Stop Now, and click Yes.

d. Select benefits now and click Delete. Click Yes to delete Benefits.

e. In the Change Center, click Activate Changes. Benefits should now be deleted.

5. Suppose you want to remove jsf. (Note that a library cannot be stopped.)

    a. In Change Center, click Lock & Edit. Select jsf and click Delete and then Yes. It appears to be working so far, but wait… Now click Activate Changes. This will fail because of dependencies. The warning message tells you that you cannot do that because one or more applications still reference this library. The Delete is ignored. Click Undo All Changes to roll back to the way it was.

    b. The only way to remove jsf is to remove Medrec first, or to remove both jsf and Medrec at the same time. Leave them both there for now.

Practices for Lesson 12

Practices for Lesson 13

Chapter 13

Practices for Lesson 13

Practices for Lesson 13

Practices for Lesson 13

Practices Overview

Advanced Deployment for the Web

The Benefits application is targeted for MedRecServer2. As the developers worked on that application, it has gone through four versions. Rather than number them 1, 2, 3, 4, or 1.1, 1.2, 1.3, 1.4, the developers chose to version according to a color scheme. The version chronology is Black, then Blue, then Green, and then Red. You can tell which application is which because the title on the pages says "MedRec *Color*" where *Color* is either Black, Blue, Green, or Red. The first two iterations, Black and Blue, do not have versioning enabled in the .war manifest. The last two iterations, Green and Red, do have versioning enabled in the manifest.

The key tasks in this lab are the following:

- First, you deploy the Black version.

- Then upgrade to the Blue version. In this step, Blue version replaces the Black application in the middle of what you were doing, and this can cause brief application downtime.

- Then you undeploy (unversioned) Blue to deploy the versioned Green.

- Finally, you deploy the upgrade to Red and verify that the two versions, Red and Green, coexist in parallel for a brief time (without the application downtime).

Big Picture:

MedRecDomain

MedRecAdmSvr	MedRecSvr1	MedRecSvr2
Listen Port: 7020	Listen Port: 7021	Listen Port: 7023
SSL Listen: 70xx	SSL Listen: 70xx	SSL Listen: 70xx
	MedRec application	Benefits application / Benefits application

MedRecMch1
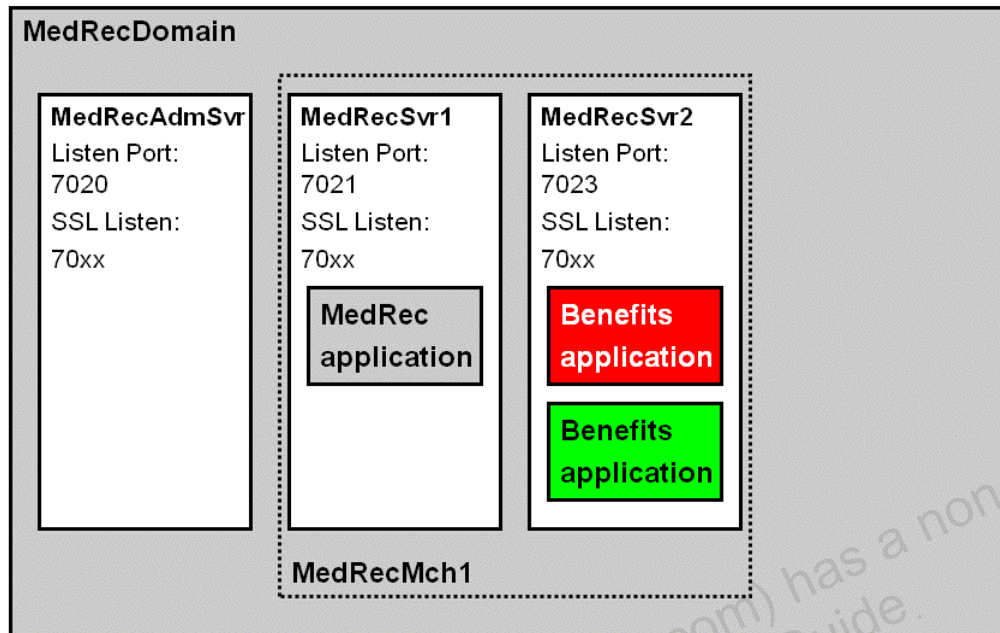
Practice 13-1: Redeploying Unversioned Applications

In this practice, you deploy two iterations of the benefits package: the Black and the Blue. (They are referred to as iterations so as to not imply any kind of version control.) A potential complication to the lab is that the browser will try to be helpful and cache pages it thinks it has seen before. This may cause the old iteration to show even after the new iteration has been replaced. You may have to close the Web browser to clear its cache.

1. Open a Linux terminal session and make sure that the environment variables are set.

   ```
   cd /u01/app/oracle/Middleware/11.1.1/wlserver_10.3/server/bin
   source ./setWLSEnv.sh
   ```

2. Navigate to `~/wls-sysadm/labs/Lab13` and copy `benefits.war.Black` to `benefits.war`.

3. You cannot redeploy an application with the same name from two different locations such as /Lab12 and /Lab13, so you need to undeploy the old benefits that was from /Lab12. This may already be done. If not, type all on one line (with no line breaks):

   ```
   java weblogic.Deployer -adminurl t3://wls-sysadm:7020
      -username weblogic -password Welcome1 -name benefits
      -undeploy
   ```

4. Deploy the application using WLST by entering the following without any line breaks:

   ```
   java weblogic.Deployer -adminurl t3://wls-sysadm:7020
      -username weblogic -password Welcome1 -name benefits
      -deploy benefits.war -targets MedRecSvr2
   ```

   When you use the Deployer, it sets up Edit and Activate internally.

5. Open a Web browser and clear its cache by going to Tools > Clear Private Data. Deselect Browsing History and select Cache and Authenticated Sessions. Click Clear Private Data Now.
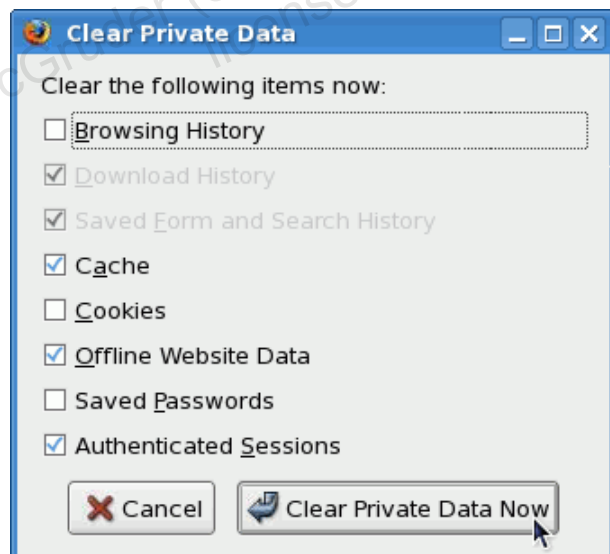
6. Test the application by using the Web browser. Use the URL:

   ```
   http://wls-sysadm:7023/benefits
   ```
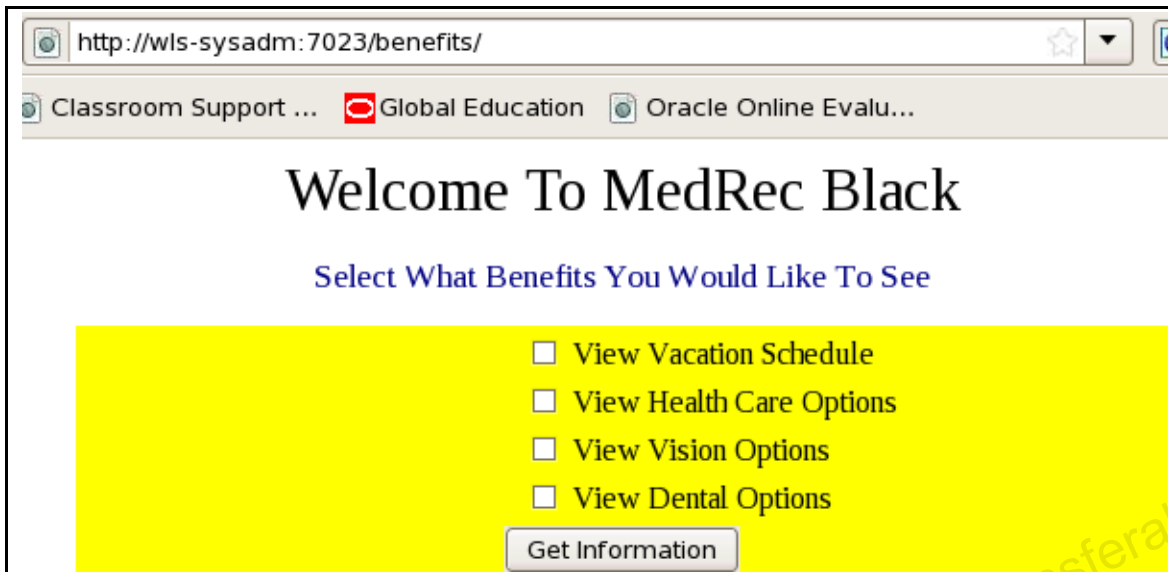
a. Note that the title contains "Black" in a black font.

b. View all the pages by selecting all the check boxes and clicking Get Information. They too should all say "MedRec Black" and be in a black font.
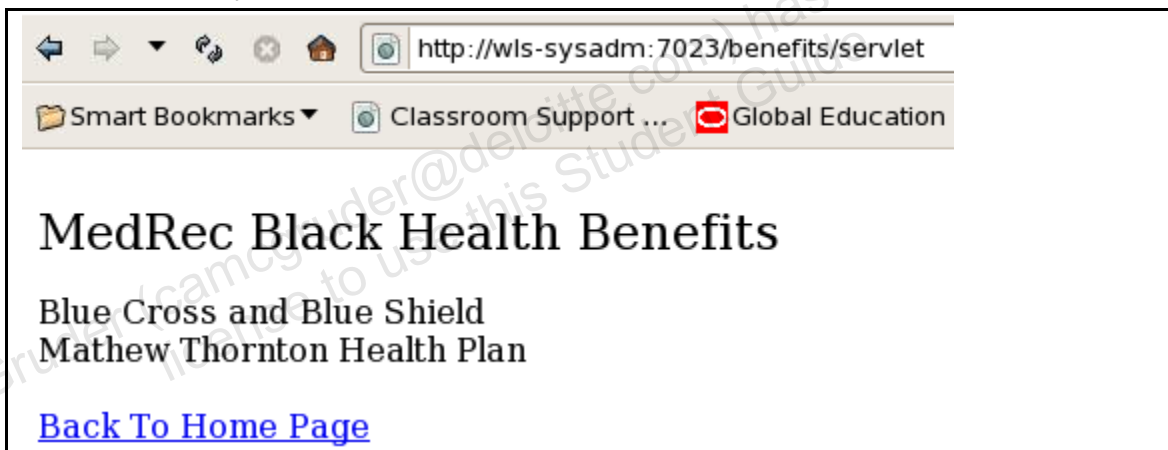
c. Go back to the Benefits home page and clear the cache again. Leave this page displayed.

7. Update the Benefits application to use blue fonts.

a. In the gnome terminal session, copy the Blue benefits onto the current Benefits application by entering:

    cp benefits.war.Blue benefits.war

b. In a tab of the browser, access the Administration Console.

c. In Domain Structure, navigate to MedRecDomain > Deployments.

d. In Change Center, click Lock & Edit.

e. In the Deployments table, select benefits and click Update.

f. The changes are all internal to the WAR file, so you do not need to change any paths. Click Finish.

g. The State is "deploy Initializing." During this time, the application is unavailable (but do not try it). In Change Center, click Activate Changes. State changes to Active.

8. Verify that the changes have become effective.

a. In the Benefits tab of the browser, clear the cache again, and then select Vacation or Vision or any of the other pages.

b. You should see that the headings now say, "MedRec Blue" in a blue font.
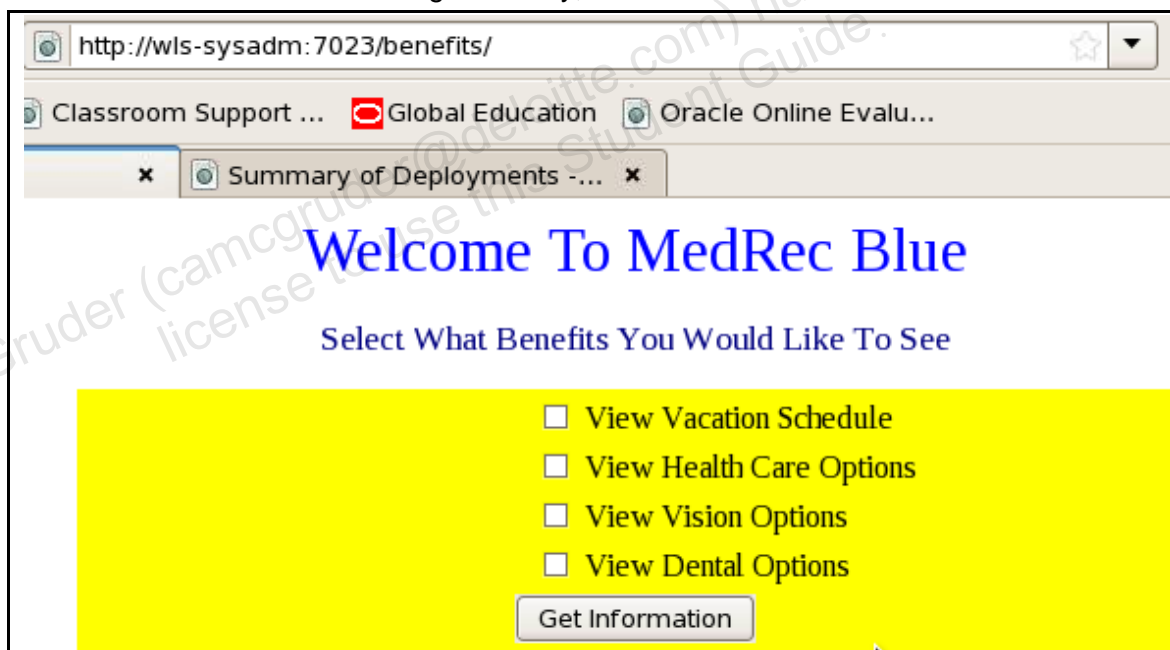
In some cases, the page from the previous version may be rendered in the browser from its local cache. To completely ensure that only new edition of a nonversioned application is deployed, you can stop the application, undeploy and delete it, then deploy the newer edition of the application. Where such a disruption of service is not acceptable, you can use the WLS capability to handle versioned application. For further information, refer to the next section of this practice.

Practice 13-2: Redeploying Versioned Applications

In this practice, you deploy two versions of the benefits package: the Green version and the Red version. They are versioned using the `manifest.mf` file that has a `WebLogic version` line in it. This allows existing sessions using the Green version to complete gracefully while new sessions connect to the Red version. When the Green version is completely quiet for some time (default one hour), it will change its state to retired.

1. Attempt to update the Benefits application to use green fonts without stopping the blue version. When it fails, stop and delete the blue version of the Benefits application.

   a. In the gnome terminal session, copy the Green benefits onto the current Benefits application by entering:

      `cp benefits.war.Green benefits.war`

   b. In a tab of the browser, access the Administration Console.

   c. In Domain Structure, navigate to MedRecDomain > Deployments.

   d. In Change Center, click Lock & Edit.

   e. Select benefits and click Update to update the existing Blue version with the new Green version without stopping the application.

   f. Nothing about the paths has changed. Click Finish. It will fail. Note that you cannot replace a nonversioned application with a versioned one. You need to delete the old application. Click Cancel.

   > **Messages**
   >
   > ⊗ weblogic.management.ManagementException: [Deployer:149081]You cannot deploy application, 'benefits', with version 'Green'. The application was previously deployed without version.
   >
   > ⊗ Update operation failed - no deployments changed.

   g. Select benefits and then select Stop > Force Stop Now. Click Yes to stop the Blue version. State changes to Prepared.

   h. Select benefits and click Delete. Click Yes to delete the Blue benefits deployment. Click Activate Changes.

2. Now deploy the green version of the Benefits application to MedRecSvr2.

   a. In Change Center, click Lock & Edit. In the Deployments table, click Install.

   b. Select `benefits.war` (in `/home/oracle/wls-sysadm/labs/Lab13`, which is the Green version) and click Next.

   c. The Install Application Assistant knows that this is an application (versus a library), so click Next.

   d. Select MedRecSvr2 as the target and click Next.

   e. Note that Archive Version (from the `manifest.mf` file) displays Green. You can change it here if you want to. Accept the defaults and click Finish.

- What do you want to name this deployment?
- Name: benefits
- Archive Version: Green (highlighted with red box)
- Deployment Plan Version: (empty field)

f.   In Change Center, click Activate Changes. Note on the Deployments table that this is the (Green) version.

g.   Select benefits and then select Start > Servicing all requests. Click Yes to start the deployment.

3.   Clear the browser cache again. In the Web tab, `http://wls-sysadm:7023/benefits` should now show Green.


```
http://wls-sysadm:7023/benefits/
Classroom Support ...   Global Education   Oracle Online Evalu...
    ×      Summary of Deployments -...   ×
```

Welcome To MedRec Green
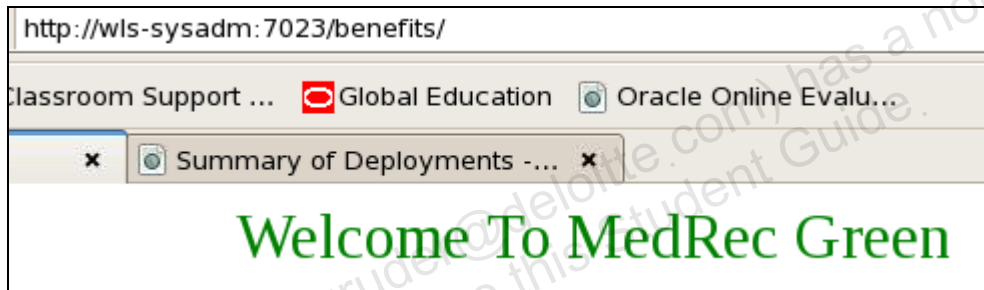
4.   Now update the application with the Red version, and this time, you can install the new version of the application while the previous version is running, and then retire the older version.

a.   Leave the Green version Web tab running, do not close it!

b.   In the Linux terminal session, copy the Red (final) benefits onto the current Benefits application

   `$> cp benefits.war.Red benefits.war`

c.   In the Administration Console tab, in Change Center, click Lock & Edit. In Deployments, click Install.

d.   Select benefits.war (which is the Red version) and click Next.

e.   The Install Application Assistant knows that this is an application, so click Next.

f.   Select MedRecSvr2 as the target and click Next.

g.   Note that Archive Version (from the `manifest.mf` file) displays Red. Accept the defaults and click Finish.

— General —

What do you want to name this deployment?

Name: benefits

Archive Version: Red

Deployment Plan Version:

h. In Change Center, click Activate Changes. Note that there are now two versions of the Benefits application: the older Green version (Active) and the newer Red version (Prepared).

Deployments

| Install | Update | Delete | Start ˅ | Stop ˅ |

	Name ⌃	State	Health
☐	⊞ benefits (Green)	Active	✔ OK
☐	⊞ benefits (Red)	Prepared	✔ OK

i. Select the benefits (Red) and then select Start > Servicing all requests. Click Yes to start the deployment. The older Green version changes State from Active to "stop Running."

	Name ⌃	State	Health	Type	Deployment Order
☐	⊞ benefits (Green)	stop Running	✔ OK	Web Application	100
☐	⊞ benefits (Red)	Active	✔ OK	Web Application	100

j. Click "stop Running" or Retired to see the time that the state changed.

5. Start a new Web browser on a different PC. (It cannot be a tab in an existing Web browser.) If your previous browser was on the Windows desktop, start one on the Linux desktop; or if you started the previous browser on the Linux desktop, start a Web browser on the Windows desktop. Access the benefits URL http://VX*nnnn*:7023/benefits, where *nnnn* is the number the instructor gave you of your Linux host. It should now show the new "MedRec Red" while the other Web browser continues to show the old "MedRec Green."

6. Close the Green browser tab. It could take as long as 60 minutes from the last sign-off of Green for the Deployment State to switch from "stop Running" to Retired. The Session Timeout time is configurable, under benefits > Configuration > General. The default is 3600 seconds.

	Name ∧	State	Health
☐	⊞ benefits (Green)	Retired	
☐	⊞ benefits (Red)	Active	✔ OK

Practices for Lesson 13

Practices for Lesson 13

Practices for Lesson 14

Chapter 14

Practices for Lesson 14

Practices for Lesson 14

Practices for Lesson 14

Practices Overview

Configuring JDBC

Your developers have written a small program that will assist them in testing their JDBC connections. The program prompts for a data source, a table name, and a user/password, and then the application dumps the table to the browser by issuing the following SQL:

```
SELECT * FROM table_name;
```

to the data source. The schema you can query against is the MEDREC schema, and the tables are ADMINISTRATORS, PATIENTS, PHYSICIANS, PRESCRIPTIONS, and RECORDS. The key tasks are:

- Creating JDBC modules (via GUI and WLST)
- Deploying JDBC modules
- Testing JDBC modules

Big Picture:
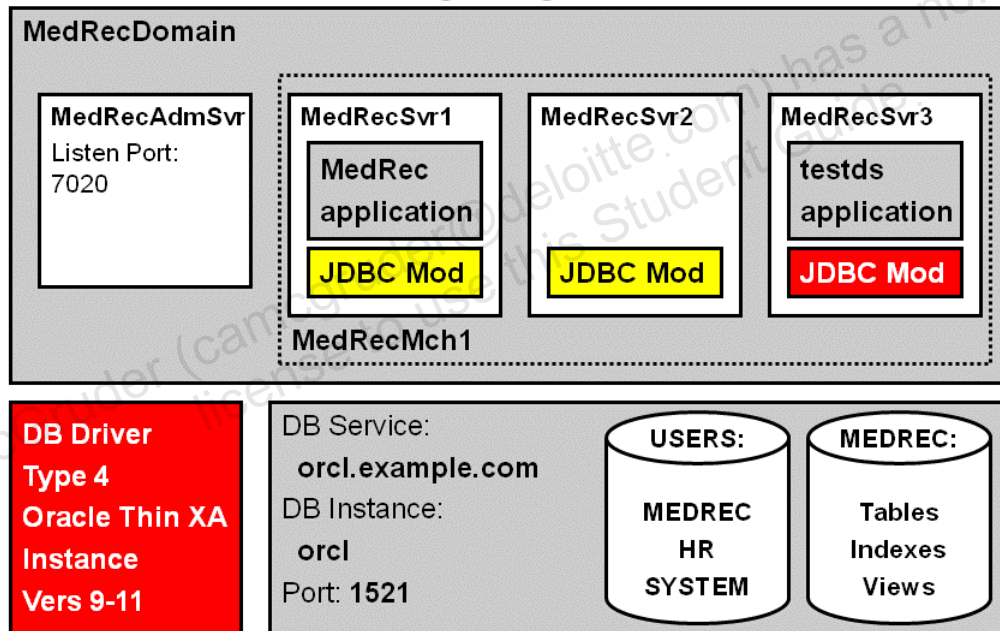
Practice 14-1: Creating JDBC Modules

In this practice, you create the data source for project XYZ under department ABC. The name does not need to match anything in the application; it is a parameter passed into the application (that lack of matching would be unusual in production).

1. Using the Administration Console, create a data source that can be used by the applications deployed in your domain. Ensure that the data source connection pools have a minimum of 5 and a maximum of 25 connections with increments of 5. Also, the connection pool should check for a need to increase every three minutes (180 seconds), and check for a need to shrink every ten minutes (600 seconds).

   a. Sign on to the Administration Console, and in Change Center, click Lock & Edit.

   b. In Domain Structure, navigate to MedRecDomain > Services > JDBC > Data Sources. Then click New.

   c. Enter the following values in the Create a New JDBC Data Source pages:

Step	Screen/Page Description	Choices or Values
a.	JDBC Data Source Properties	Name: **testSample** JNDI Name: **abc.xyz.testSample** Database Type: Oracle Click Next.
b.	JDBC Data Source Properties	Database Driver: Oracle's (Thin XA) for Instance connections; Versions: ... 11 Look at the other database choices and then click Next.
c.	Transaction Options	Because you selected an XA driver, there is nothing to do here. Click Next.
d.	Connection Properties	Database Name: **orcl** Host Name: **wls-sysadm** Port: **1521** Database User Name: **weblogic** Password and Confirm Password: **Welcome1** Click Next.
e.	Test Database Connection	Click Test Configuration. Messages should say, "Connection test succeeded." Click Finish.
f.	Summary of JDBC Data Sources	Click testSample.
g.	Settings for testSample	Navigate to the Configuration > Connection Pool tab.
h.	Configuration > Connection Pool	Initial Capacity: **5** Maximum Capacity: **25** Capacity Increment: **5** Click Save. Click Advanced.
i.	Advanced	Test Frequency: **180**

Step	Screen/Page Description	Choices or Values
		Shrink Frequency: 600
		Both values are in seconds. Click Save.
j.	Change Center	Click Activate Changes.

Practice 14-2: Deploying JDBC Modules

In this practice, you deploy the data source module you just created to MedRecSvr3 and an application `testds` to MedRecSvr3 to test the data sources.

1. Deploy the data source module you just created to MedRecSvr3 and an application `testds` to MedRecSvr3 to test the data sources.

    a. If MedRecSvr3 has not yet been started, start it using the Start MR3 desktop icon.

    b. In the Administration Console, in Change Center, click Lock & Edit.

    c. In Domain Structure, navigate to MedRecDomain > Deployments. Click Install.

    d. Specify the following values on the Install Application Assistant pages:

Step	Screen/Page Description	Choices or Values
a.	Locate deployment to install and prepare for deployment	Path: **/home/oracle/wls-sysadm/labs/Lab14** Select **testds.war**. Click Next.
b.	Choose targeting style	Accept the default of "Install this deployment as an application." Click Next.
c.	Select deployment targets	Select MedRecSvr3. Click Next.
d.	Optional Settings	Accept all the defaults. Click Finish.
e.	Change Center	Click Activate Changes.
f.	Summary of Deployments	Select testds (check box). Click Start and select "Servicing all requests."
g.	Start Deployments	Click Yes. The State should now show as Active

    e. In Domain Structure, navigate to MedRecDomain > Services > JDBC > Data Sources and click testSample.

    f. Click the Targets tab.

    g. In Change Center, click Lock & Edit.

    h. Select MedRecSvr3. Click Save.

    i. In Change Center, click Activate Changes.

    j. In Domain Structure, navigate to MedRecDomain > Services > JDBC > Data Sources to view your deployment status in Summary of Data Sources. Note that it is now associated with MedRecSvr3. This JDBC Module testSample could also be associated with another server such as MedRecSvr1 whether the module is being used by an application or not. For instance, the MedRec application has a JDBC data source MedRecGlobalDataSourceXA that is associated with both MedRecSvr1 and MedRecSvr2.

Practice 14-3: Testing JDBC Modules

In this practice, you test your data sources and test the tables that are accessible through it.

1. In Domain Structure, navigate to MedRecDomain > Services > JDBC > Data Sources. In Summary of Data Sources, click testSample.

2. Click the Monitoring > Testing tabs.

3. Select MedRecSvr3. Click Test Data Source. The message in green at the top of the table should say, "Test of testSample on MedRecSvr3 was successful."

4. In Domain Structure, navigate to MedRecDomain > Environment > Servers. Click MedRecSvr3.

5. Click View JNDI Tree. It opens up a new browser window or tab. (JNDI is a little hard to find on the screen. See the hand pointer on the screen capture below.

   Hint: The browser Find command, Ctrl + F, can be helpful for busy screens. It highlights the word you are looking for—in this case, JNDI—making it easier to spot.)
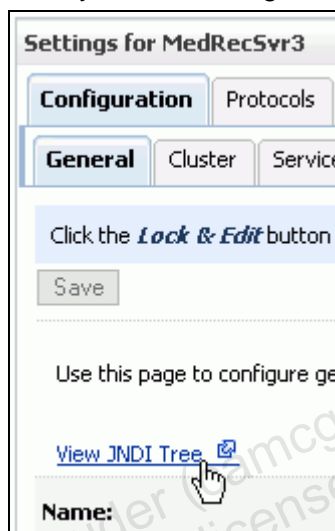
6. Click the plus ⊞ to expand abc. Click the plus ⊞ to expand xyz. Click testSample. There is nothing to modify in the Overview tab, but there are some options in the Security tab. Just look, do not change anything.

7. Close the JNDI Tree Browser window or tab.

8. Open a new browser window or tab and access the URL http://wls-sysadm:7025/testds.

MedRec Test Data Source

MedRec IT Dept Testing Center

Data Source Name	testSample
Table Name	medrec.yourtable
Username	yourname
Password	yourpswd
	Test Data Source

9. In the application, try using the following values (it will fail):

Field Name	Value
Data Source Name	`testSample`
Table Name	`medrec.patients` or `medrec.physicians` or `medrec.prescriptions`
Username	`weblogic`
Password	`Welcome1`

Note the error message.

```
javax.naming.NameNotFoundException: Unable to resolve
'testSample'. Resolved ''; remaining name 'testSample'
```

10. Click Back in the browser (to save typing) and change the Data Source Name to **abc.xyz.**testSample and click Test Data Source. It should now work and list a few data rows.

11. Click Back in the browser (to save typing) and change the Data Source Name to **ABC.XYZ.**testSample and click Test Data Source. It should fail because the JNDI name is case-sensitive.

12. Click Back in the browser (to save typing) and change the Username to medrec and password to Welcome1. This has been GRANTed from the database's security point of view, but the testDS application will fail to authenticate medrec within WLS. You will get an error message:

```
Error: User: medrec, failed to be authenticated.
```

If you want to prove it to yourself, from a terminal session, type:

```
sqlplus medrec/Welcome1
select * from medrec.patients;
```

Of course user medrec should be able to select their own tables, but not through WLS (yet). In a later Security lab, you can add user medrec to the realm of authorized users (for example, weblogic), and then optionally come back and retry this lab.

Practices for Lesson 14

Practice 14-4: Creating JDBC Modules by Using Scripts

In this practice, you create the JDBC module for the Medrec application. It is possible to have this JDBC module precreated and deployed as part of the application template that extended the domain, or you can create it separately after deploying the application by itself. Rather than use the GUI as you did for the `testds` application, this time the JDBC module will be created using the WLST script.

1. In the Administration Console, in Domain Structure, navigate to MedRecDomain > Services > JDBC > Data Sources.

2. If MedRecGlobalDataSourceXA already exists, delete it because you are going to add it using a script. In Change Center, click Lock & Edit, select MedRecGlobalDataSourceXA, and click Delete. Click Yes to delete the data source. Click Activate Changes.

   Note that unlike the jsf and jtsl libraries you deployed earlier, WebLogic Server will let you delete a data source even though there are applications dependent on it.

3. Go to a Linux terminal session and make sure that the environment variables are set by running `setWLSEnv.sh`. Navigate to `~/wls-sysadm/labs/Lab14`.

4. Look at the contents of the `createDataSource.py` script. You should recognize all the commands from the screens you just completed for `testds`. Should you be able to sit down with a blank editor and write that? Probably not (yet). Should you be able to modify it to suit your purposes? Probably yes. Should you be able to run a Record session ☒ Record to capture those steps from the GUI? Absolutely.

5. You can run the script by entering:

   ```
   java weblogic.WLST createDataSource.py
   ```

6. Verify that the script worked by going back to the Administration Console and checking that the new data source is there.

   a. In the Administration Console, in Domain Structure, navigate to MedRecDomain > Services > JDBC > Data Sources.

   b. Verify that MedRecGlobalDataSourceXA has been recreated on MedRecSvr1.

Practices for Lesson 15

Chapter 15

Practices for Lesson 15

Practices for Lesson 15

Practices Overview

Configuring JMS (Java Message Service)

A JMS server implements the JMS infrastructure on a WebLogic server. Destinations (queues or topics) are targeted to a WebLogic server when the JMS server is targeted to the WebLogic server.

In this practice, you configure:

- JMS server
- JMS module
- Queue
- Topic

You then post messages to the queue and topic and monitor them in the Administration Console.

Right now, you will not have any consumers; you will simply be posting the messages and getting familiar with monitoring the message statistics in the Administration Console.

Big Picture:
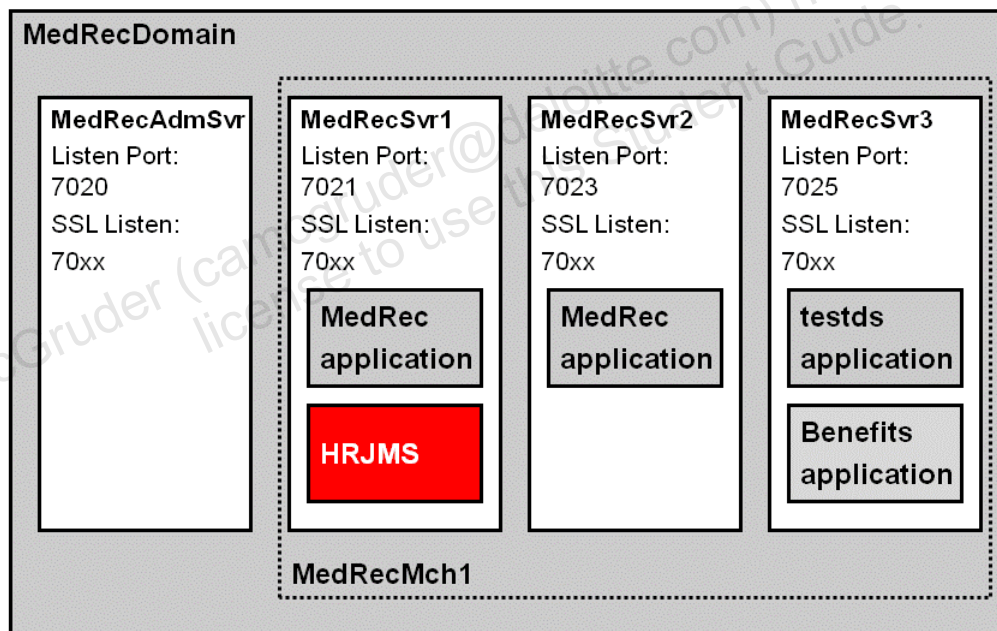
Practice 15-1: Configuring JMS Resources and Deploying the JMS Application

In this practice, you configure a JMS server, a queue, and a topic. You then post messages to the queue and topic and monitor them in the Administration Console.

1. Verify that JMS Servers and Modules have been already created.

   a. Ensure that the `orcl` database, MedRecAdmSvr, and MedRecSvr1 are running.

   b. Navigate to MedRecDomain > Services > Messaging > JMS Servers. You should see two JMS Servers. These were configured when you extended the domain with a template.

   JMS Servers(Filtered - More Columns Exist)

   Click the *Lock & Edit* button in the Change Center to activate all the buttons on this page.

New	Delete			Showing 1 to 2 of 2 Previ
☐	**Name** ⌄	**Persistent Store**	**Target**	**Current Server**
☐	MedRecJMSServer_auto_1		MedRecSvr1	MedRecSvr1
☐	MedRecJMSServer_auto_2		MedRecSvr2	MedRecSvr2
New	Delete			Showing 1 to 2 of 2 Previ

   c. Navigate to MedRecDomain > Services > Messaging > JMS Modules. Note that a JMS module has also been created.

   JMS Modules

   Click the *Lock & Edit* button in the Change Center to activate all the buttons on this page.

New	Delete	Showing 1 to 1 of 1 Previous	Next
☐	**Name** ⌄	**Type**
☐	MedRec-jms	System
New	Delete	Showing 1 to 1 of 1 Previous	Next

   d. Click MedRec-jms to see the resources (Queues/Topics) created.

	Name ⌄	**Type**	**JNDI Name**
☐	PatientNotificationQueue_auto_1	Queue	com.bea.medrec.jms.PatientNotificationQueue
☐	PatientNotificationQueue_auto_2	Queue	com.bea.medrec.jms.PatientNotificationQueue
☐	RecordToCreateQueue_auto_1	Queue	com.bea.medrec.jms.RecordToCreateQueue
☐	RecordToCreateQueue_auto_2	Queue	com.bea.medrec.jms.RecordToCreateQueue
☐	WSRMDefaultQueue_auto_1	Queue	weblogic.wsee.DefaultQueue
☐	WSRMDefaultQueue_auto_2	Queue	weblogic.wsee.DefaultQueue

2. Configure a JMS Server with the name **HRJMSServer** and no persistent store.

a. Ensure that the `orcl` database, MedRecAdmSvr, and MedRecSvr1 are running.

b. Navigate to MedRecDomain > Services > Messaging > JMS Servers. Then click Lock & Edit to configure a resource.

c. Click New under the JMS Servers table and specify the following properties:
    Name: **HRJMSServer**, and Persistent Store: (**none**)

🔧 * Name:	HRJMSServer
Specify persistent store for the new JMS Server.	
Persistent Store:	(none) ▾

d. Click Next and target the JMS server to MedRecSvr1. Click Finish.

e. Click Activate Changes and confirm that all changes have been activated.

3. Configure a JMS module and add a queue and a topic to the JMS module according to the following specifications:

Resource	Parameter	Choices or Values
JMS Module	Name	`HRModule`
	Descriptor File Name	`HRModule`
	Target	`MedRecSvr1`
Sub Deployment	Name	`HRSubDeployment`
	Targets	`HRJMSServer`
Queue	Name	`HRQueue`
	JNDI Name	`HRQueue`
	Template	`None`
	Target	`HRJMSServer`
Topic	Name	`HRTopic`
	JNDI Name	`HRTopic`
	Template	`None`
	Target	`HRJMSServer`

a. Navigate to MedRecDomain > Services > Messaging > JMS Modules in the Administration Console. Click Lock & Edit to enable configuring resources.

b. Click New in the JMS Modules table and specify Name: `HRModule` and Descriptor File Name: `HRModule`, and click Next.

c. Select MedRecSvr1 as the target managed server.

d. Click Next and select "Would you like to add resources to this JMS system module?" and then click Finish.

e. On the Settings for HRModule page, click the Subdeployments tab. In the Subdeployments table, click New to create a subdeployment.

f. Enter `HRSubDeployment` as the subdeployment name and click Next.

g. On the Targets page, select the HRJMSServer as the target under the JMS Servers table. Click Finish.

h. Click the Configuration tab. In the Summary of Resources table on the Settings for HRModule page, click New to configure a new JMS queue for the JMS module.

i. On the Create a New JMS System Module Resource page, under the heading "Choose the type of resource you want to create," select Queue and click Next.

j. In JMS Destination Properties, specify the parameters—Name: `HRQueue`, JNDI Name: `HRQueue`, Template: None—and click Next.

k. Select HRSubDeployment from the subdeployments list. The Targets will become prepopulated with HRJMSServer. Click Finish.

l. In the Summary of Resources table on the Settings for HRModule page, click New to configure a new JMS topic for the JMS module.

m. On the Create a New JMS System Module Resource page, under the heading "Choose the type of resource you want to create," select Topic. Click Next.

n. In JMS Destination Properties, specify the parameters—Name: `HRTopic`, JNDI Name: `HRTopic`, Template: None. Click Next.

o. Select HRSubDeployment from the subdeployments list. Click Finish.

p. Activate the changes. You should be able to see JNDI entries on the MedRecSvr1 managed server called HRQueue and HRTopic.

```
JNDI Tree Structure

MedRecSvr1
⊞-com
  ---HRQueue
  ---HRTopic
⊞-javax
⊞-jdbc
  ---medrecmedrec-facade_jarRmiPatientFacadeI
  ---medrecmedrec-facade_jarRmiPatientFacadeI
⊞-weblogic
```
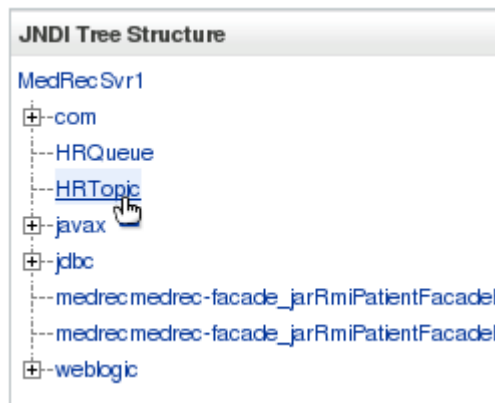
4. Deploy the Web application `messaging.war`, which you use to post messages to the queue or the topic.

   a. Navigate to MedRecDomain > Deployments. Click Lock & Edit.

   b. Select Install, navigate to /home/oracle/wls-sysadm/labs/Lab15, and select `messaging.war`. Click Next and accept all the defaults and click Next again. Target the application to MedRecSvr1.

   c. Click Next and accept all the defaults. Click Finish. Click Activate Changes.

   d. Start the application by selecting the check box against the application name under the Deployments table. Select Start > Servicing all requests.

   e. Click Yes to confirm starting the application.

5. Verify that the Web application has deployed correctly by navigating to http://wls-sysadm:7021/messaging in a Web browser and posting messages to either the queue or the topic using the deployed Web application.

   a. If not already open, open a new Web browser tab or window and navigate to:

      `http://wls-sysadm:7021/messaging`

   b. Using the application, post a few messages to the queue and to the topic. **Do not post any message to the distributed queue**.

   c. In the Administration Console window or tab, navigate to MedRecDomain > Services > Messaging > JMS Modules. In the JMS Modules table, click HRModule. On the Summary of Resources page, click HRQueue, and then click the Monitoring tab. This will show the number of messages that have been posted into HRQueue.

   d. Select HRModule!HRQueue and click Show Messages.

▷ **Customize this table**

Destinations(Filtered - More Columns Exist)

Show Messages

	Name ⌃	Messages Current	Messages Pending	Messages Total
☑	HRModule!HRQueue	2	0	2

Show Messages
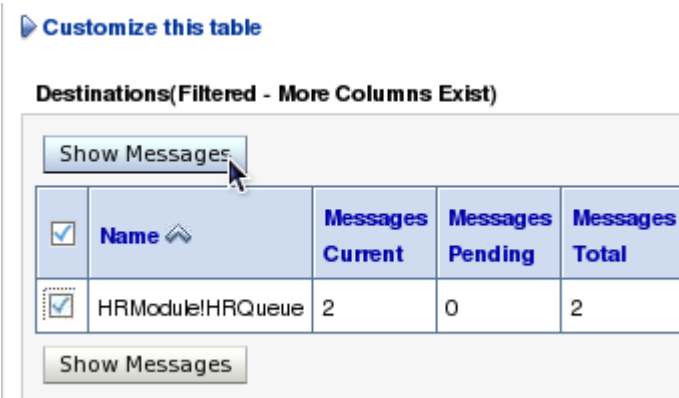
   e. At the bottom of the Summary of Messages page, click the Message ID link in the table to see the message details.

Practices for Lesson 15

JMS Message Detail

Message ID:	ID:<580988.1240354897605.(
Type:	(No value specified)
Timestamp:	Tue Apr 21 19:01:37 EDT 200'
Priority:	4
Delivery Time:	(No value specified)

Delivery Mode:	Persistent
Correlation ID:	(No value specified)
Expiration:	(No value specified)
Redelivered:	false
Redelivery Limit:	-1

Properties:

key	value	type
JMSXDeliveryCount	0	java.lang.Integer

Text:

Message1

Note: In the topic (unlike the queue), messages do not appear to be getting stored. This is because you do not have any durable subscribers registered for this topic.

Practices for Lesson 16

Chapter 16

Practices for Lesson 16

Practices for Lesson 16

Practices for Lesson 16

There are no practices for Lesson 16.

Practices for Lesson 16

Practices for Lesson 16

Practices for Lesson 17

Chapter 17

Practices for Lesson 17

Practices for Lesson 17

Practices for Lesson 17

Practices Overview

Configuring Clusters

In this practice, you create a cluster and assign two servers to the cluster. You also make the preliminary check on the port and status of Oracle HTTP Server. In the next practice, you configure Oracle HTTP Server to function as the Web tier front end for the cluster. Note that Benefits is only deployed to one server: MedRecSvr2

Big Picture:

MedRecDomain

MedRecAdmSvr
Listen Port:
7020
SSL Listen:
70xx

OHS – ohs1
Listen Port:
7777

/benefits

MedRecSvr2
Listen Port:
7023
SSL Listen:
70xx

MedRec

Benefits

MedRecSvr3
Listen Port:
7025
SSL Listen:
70xx

testds

MedRecCluster
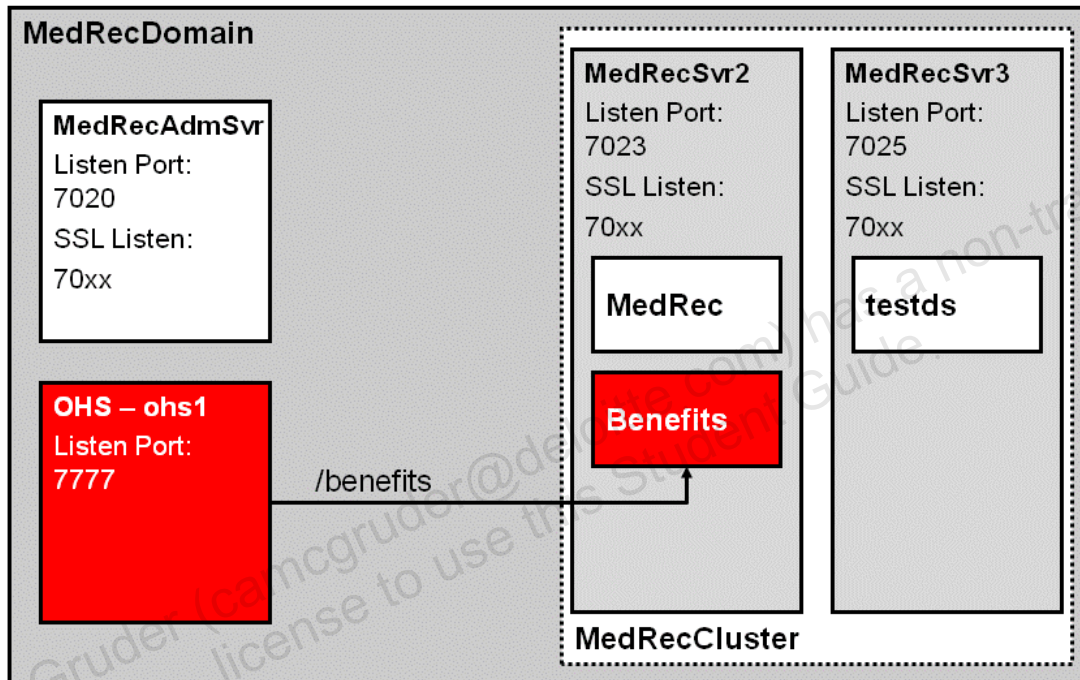
Practice 17-1: Initiating Clusters

In this practice, you create a cluster that uses the default Unicast messaging mode and assign two managed servers to the cluster.

1. Create a new cluster with the following properties:

Parameter	Choices or Values
Name	MedRecCluster
Messaging Mode	Unicast (default)
Servers	MedRecSvr2 and MedRecSvr3

a. Ensure that MedRecAdmSvr is running. If the MedRecSvr2 and MedRecSvr3 managed servers are already running, stop them.

```
$> /home/oracle/wls-sysadm/start_admin.sh
```

b. Log in to the Administration Console, and navigate to MedRecDomain > Environment > Clusters. Click Lock & Edit.

c. Create a new cluster with the name and properties listed in the preceding table. Then click OK.

d. Go back to MedRecCluster and navigate to the Configuration > Servers tab.

Settings for MedRecCluster

| Configuration | Monitoring | Control | Deployments | Services | Notes |

| General | Messaging | **Servers** | Replication | Migration | Singleton Services |
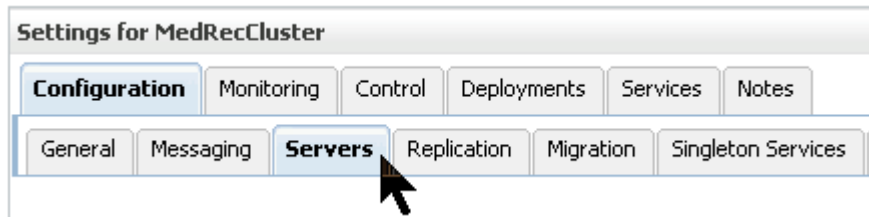
e.   Click Add, then select an existing server MedRecSvr2, and click Next. Again click Add and select MedRecSvr3, and then click Finish. Click Activate Changes.

Add a Server to Cluster

| Back | Next | Finish | Cancel |

Identify Server

Identify the server to be added

How would you like to proceed?

⦿ **Select an existing server, and add it as a member of this cluster**

Select a server: MedRecSvr3 ▾

○ **Create a new server and add it to this cluster**

| Back | Next | Finish | Cancel |
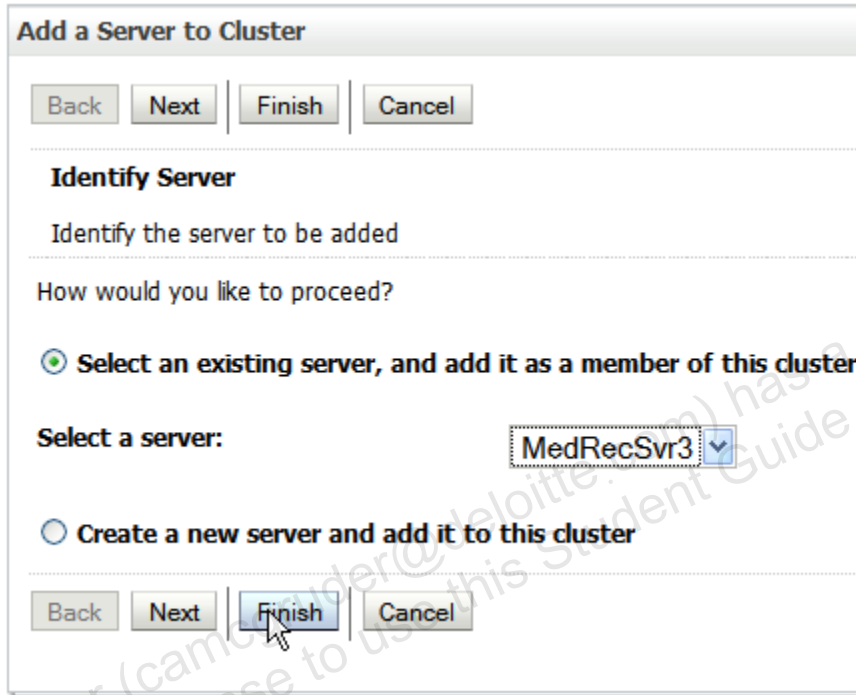
f.   Navigate to MedRecDomain > Environment > Servers and view the list of servers. Note that MedRecSvr2 and MedRecSvr3 are now part of the MedRecCluster.

	Name ⌃	Cluster	Machine	State	Health	Listen Port
☐	MedRecAdmSvr(admin)			RUNNING	✔ OK	7020
☐	MedRecSvr1		MedRecMch1	SHUTDOWN		7021
☐	MedRecSvr2	MedRecCluster	MedRecMch1	SHUTDOWN		7023
☐	MedRecSvr3	MedRecCluster	MedRecMch1	SHUTDOWN		7025

New   Clone   Delete   Showing 1 to 4 of 4 Previous | Next

2.   Start MedRecSvr3 using a Gnome terminal window and the command line script. (Do not you use Node Manager as you will miss seeing the messages in realtime.) Wait for it to come up. Then start MedRecSvr2 also using a terminal window and script. Watch each server as it tries to synchronize with other servers in the cluster and finally joins the cluster.

a.   Start the MedRecSvr3 server by using the start_mr3.sh shell script in the /home/oracle/wls-sysadm folder:

b. Watch the server start up in another terminal window. At some point, you should see it start listening for cluster announcement and waiting to synchronize with other servers in the cluster. Because the other servers have not started yet, there is nothing for it to synchronize with yet.

```
<Notice> <Cluster> <BEA-000197> <Listening for announcements
from cluster using unicast cluster messaging>
<Notice> <Cluster> <BEA-000133> <Waiting to synchronize with
other running members of MedRecCluster.>
```

c. Start the MedRecSrv2 server by using the start_mr2.sh shell script in the /home/oracle/wls-sysadm folder. (You could have started the managed servers using the Administration Console and Node Manager, but by using the command line you can see some startup messages that help understand the startup process of a clustered server.)

d. Watch the MedRecSvr2 server start up in the Gnome terminal window. As it is starts, it will synchronize with MedRecSvr3, which is the other server in the cluster, and will download the cluster JNDI tree. You may have to scroll up to see the message.

```
<Notice> <Cluster> <BEA-000133> <Waiting to synchronize with
other running members of MedRecCluster.>
<Notice> <Cluster> <BEA-000142> <Trying to download cluster JNDI
tree from server MedRecSvr3.>
<Notice> <Cluster> <BEA-000164> <Synchronized cluster JNDI tree
from server MedRecSvr3.>
```

3. Start Oracle HTTP Server, verify that OHS is running, and find its HTTP listen port.

a. View the start_ohs.sh script in the /home/oracle/wls-sysadm folder and note the relevant OPMNCTL command that is used to start OHS. Then run the script to start OHS. (You can also use the Start OHS icon on the desktop to start OHS.)

b. Run the status_ohs.sh script in the /home/oracle/wls-sysadm folder, and note the number beside http: in the response. For example, in the following case, OHS is running and its HTTP listen port is 7777:

```
[host]$ ~/wls-sysadm/status_ohs.sh


Processes in Instance: webtier
--------------+--------------+-------+-------+-----------+---------+-
--------+------
ias-component | process-type |  pid  | status |      uid  | memused |
 uptime | ports
--------------+--------------+-------+-------+-----------+---------+-
--------+------
ohs1          | OHS          | 13583 | Alive | 925773442 |  347104 |
1:05:01 | https:9999,https:4443,http:7777
```

c. Access the URL http://wls-sysadm:7777 in your Web browser.
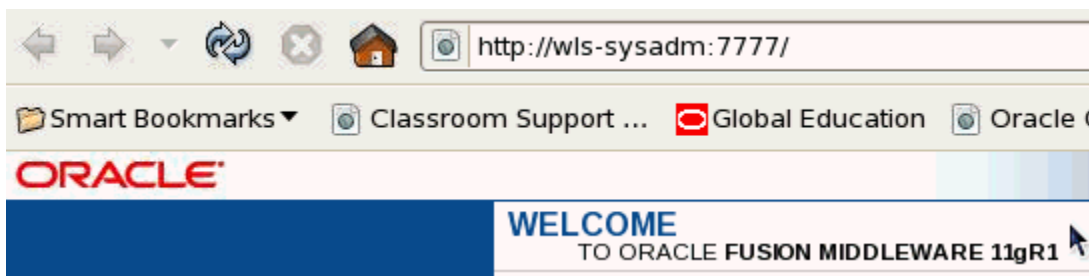
This is the splash screen for OHS.

4. Shut down OHS, and then configure mod_wl_ohs to enable routing requests to MedRecCluster.

   a. View the stop_ohs.sh script in the /home/oracle/wls-sysadm folder and note the relevant OPMNCTL command that is used to stop OHS and other WebTier components. Then run the script to stop OHS and the WebTier components. (You can also use the Stop OHS icon on the desktop to stop OHS.)

   b. In a gnome terminal session, change directory to the OHS instance configuration folder (/u01/app/work/instances/config/OHS/ohs1). Copy the mod_wl_ohs.conf file to mod_wl_ohs.bak17. Then edit mod_wl_ohs.conf so that it appears as in the following screenshot:

```
$> cd /u01/app/work/instances/config/OHS/ohs1
$> cp mod_wl_ohs.conf mod_wl_ohs.bak17
$> gedit mod_wl_ohs.conf
```

```
# NOTE : This is a template to configure mod_weblogic.

LoadModule weblogic_module    "${ORACLE_HOME}/ohs/modules/mod_wl_ohs.so"

# This empty block is needed to save mod_wl related configuration from EM to this
 file when changes are made at the Base Virtual Host Level
<IfModule mod_weblogic.c>
      WebLogicCluster wls-sysadm:7023,wls-sysadm:7025
</IfModule>

<Location /benefits>
      SetHandler weblogic-handler
</Location>
```

   Note: To simplify this task, you can copy the mod_wl_ohs.conf file in the ~/wls-sysadm/labs/Lab17 folder to /u01/app/work/instances/config/OHS/ohs1:

```
$> cp /home/oracle/wls-sysadm/labs/Lab17/mod_wl_ohs.conf
/u01/app/work/instances/config/OHS/ohs1
```

   Even though OHS is configured to send requests for /benefits to the cluster (both servers), /benefits is not deployed to both servers. This will cause unintentional behavior that will get fixed in the next lab.

5. Start OHS and verify that you can access the Benefits application through OHS (port 7777).

   a. Use the scripts available in the /home/oracle/wls-sysadm folder or the desktop icon and start OHS.

      `$> /home/oracle/wls-sysadm/start_ohs.sh`

   b. Access the Benefits (red) application through OHS by using URL:

```
http://wls-sysadm:7777/benefits
```
and note that you can access (have been redirected to) the Benefits application which is actually running on port 7023.

c. If you click refresh on the browser, you will see Error 404--Not Found:
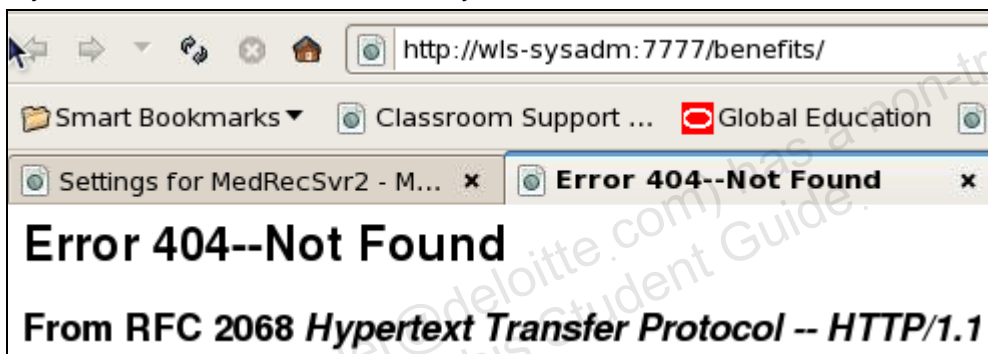
Click refresh again and it will work; click refresh a third time and it says, Not Found. Every time you click refresh WLS tries to load share the requests in a round-robin fashion among *all* the servers in the cluster, but /benefits is only deployed to one server in the cluster. The main cause of this behavior is that you took an existing deployment to a single server and made the server part of a cluster without reconfiguring the application's deployment to the cluster. This is considered a bad technique on the administrator's part, but it is permitted by WebLogic Server. This will be addressed in the next lab.

6. Stop the MedRecSvr2 server, clear the browser cache, and try to access the Benefits application through OHS. What happens?

a. You will not be able to access the application because even though you have created a cluster, the application was not targeted to cluster and, therefore, only MedRecSvr2 was serving requests to the Benefits application.

Practices for Lesson 17
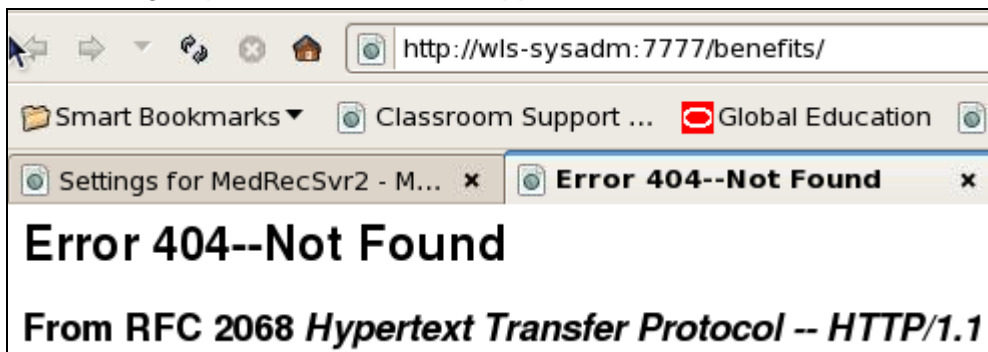
So as long as MedRecSvr2 is up running benefits, then you can access the application. However, in order to achieve the failover and load sharing features of clusters, the application needs to be deployed to (all the servers in) the cluster, not to just one server. This is what you will do in the next practice. Or, `mod_wl_ohs.conf` needs to route /benefits to just one server, which is what you did in Lab 12.

Practices for Lesson 17

Practices for Lesson 18

Chapter 18

Practices for Lesson 18

Practices for Lesson 18

Practices for Lesson 18

Practices Overview

Configuring Session Replication

In this practice, you perform the following tasks:

- Retargeting applications to a cluster
- Setting up in-memory session replication
- Deploying an application to a cluster
- Setting up in-memory session replication

Big Picture:
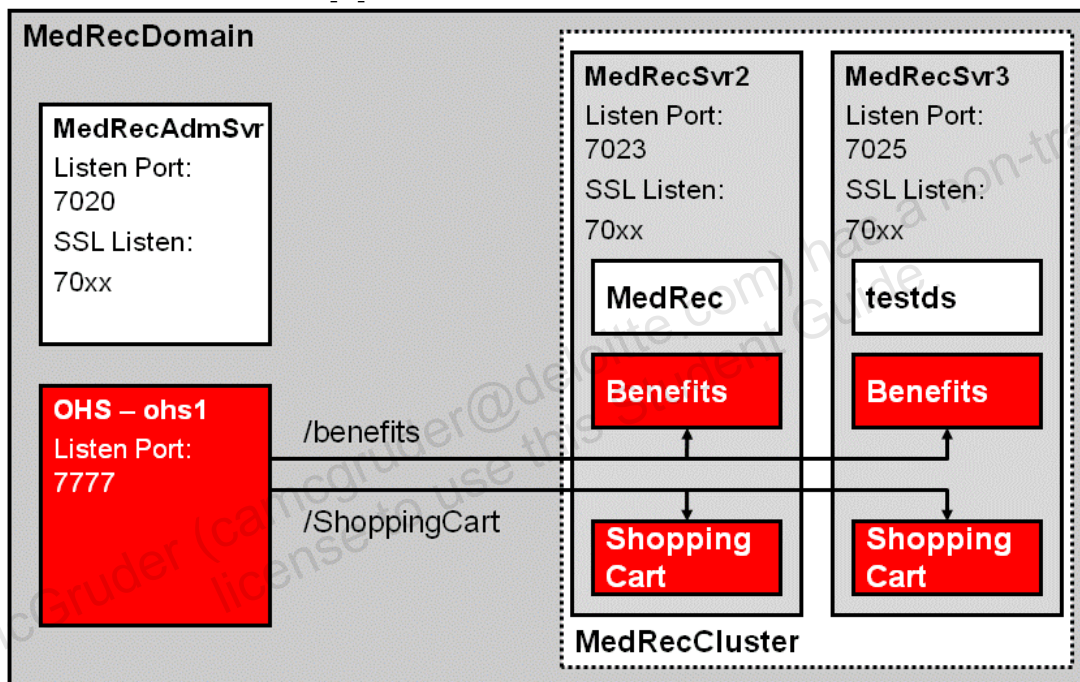
Practice 18-1: Targeting Applications to a Cluster

In this practice, you retarget an application to the cluster and see that it can be accessed using OHS as long as one server in the cluster is able to serve the request.

1. Ensure that MedRecSvr2 is started up. Then retarget the Benefits application to MedRecCluster (instead of just MedRecSvr3 server). Verify the access through OHS even after stopping MedRecSvr2—the server that initially was serving requests to the Benefits application.

   a. Start up the MedRecSvr2 server using either the desktop icon or the `start_mr2.sh` script in the ~/wls-sysadmin folder.

   b. In the Administration Console, navigate to MedRecDomain > Deployments.

   c. In the Deployments table, select benefits (Red) and select Stop > Force Stop Now. Click Yes in confirmation.

   d. Click Lock & Edit in Change Center. Then click benefits (Red) in the Summary of Deployments table.

   e. Click the Targets tab. In the Clusters section, select "All servers in the cluster" and click Save.

   f. Click Activate Changes in Change Center. Navigate back to the Summary of Deployments page and note that the application is in the Active state.

Deployments

	Name ⌃	State	Health	Type	Deployment Order
☐	⊞ benefits (Green)	Prepared	✔ OK	Web Application	100
☐	⊞ benefits (Red)	Active	✔ OK	Web Application	100

Install | Update | Delete | Start ∨ | Stop ∨ Showing 1 to 7 of 7 Previous | Next

   g. In another Browser window, access the Benefits application through OHS (URL: http://wls-sysadm:7777/benefits). Note that you are able to access the Benefits application.

http://wls-sysadm:7777/benefits/

Classroom Support ... Global Education Oracle Online Evalu...

ments -... ✖ | Staplerz Benefits ✖

Welcome To MedRec Red

Select What Benefits You Would Like To See

   h. Stop the MedRecSvr2 server, clear the browser cache, and try to access the Benefits application through OHS. You can continue to access the Benefits application because the application has been targeted to the cluster.

Welcome To MedRec Red

Select What Benefits You Would Like To See

Practices for Lesson 18

Practice 18-2: Configuring Session Replication by Using In-Memory Structures

You have set up a cluster with a proxy server and retargeted a simple Web application to the cluster. In this practice, you deploy a new session-enabled application to the cluster. The application uses sessions using shopping-cart information. You configure session replication using the cluster.

1. Create the following replication groups:

Server	Replication Group	Preferred Secondary
MedRecSvr2	RepGroupA	RepGroupB
MedRecSvr3	RepGroupB	RepGroupA

   a. Stop the MedRecSvr2 and MedRecSvr3 servers, if they are running.

   b. Navigate to MedRecDomain > Environment > Servers > MedRecSvr2> Configuration> Cluster. Click Lock & Edit to enable reconfiguration.

   c. Set the following properties:

   Replication Group: RepGroupA

   Preferred Secondary Group: RepGroupB

   d. Click Save and then click Activate Changes.

   e. Using the preceding steps, set up replication properties for MedRecSvr3 so that the Replication Group is RepGroupB and Preferred Secondary is RepGroupA.

   f. Start the MedRecSvr2 and MedRecSvr3 servers in separate terminal sessions (do not use Node Manager) so that you can see the console messages.

2. Verify that the Shopping Cart application can use in-memory session replication.

   a. Look at `~/wls-sysadm/labs/Lab18/In-Memory/ShoppingCart/WEB-INF/weblogic.xml` in an XML editor or text editor and note that the session-descriptor element is set.

```
<session-descriptor>
  <timeout-secs>300</timeout-secs>
  <invalidation-interval-secs>60</invalidation-interval-secs>
  <persistent-store-type>replicated_if_clustered
    </persistent-store-type>
</session-descriptor>
```

3. Package and deploy the ShoppingCart Web application.

   a. Change directory to `~/wls-sysadm/labs/Lab18/In-Memory/ShoppingCart` and package the Web application into a `.war` file by using the `jar` command:

      `$>jar -cf ./ShoppingCart.war *`

      (Remember that the `jar` command requires that "`source ./setWLSEnv.sh`" has already been run in the terminal to set the Java paths. This `jar` step has already been done for you and the resulting `ShoppingCart.war` is placed in the `~/wls-sysadm/labs/Lab18/In-Memory` folder.)

   b. Deploy the `ShoppingCart.war` application from the `~/wls-sysadm/labs/Lab18/In-Memory` folder.

Path:	/home/oracle/wls-sysadm/labs/Lab18/In-Memory/ShoppingCart.war
Recently Used Paths:	/home/oracle/wls-sysadm/labs/Lab18/In-Memory
	/home/oracle/wls-sysadm/labs/Lab17
	/home/oracle/wls-sysadm/labs/Lab15
	/home/oracle/wls-sysadm/labs/Lab14
Current Location:	edrsr19p1.us.oracle.com / home / oracle / wls-sysadm / labs / Lab18 / In-Memory

- ○ 📂 **ShoppingCart** (open directory)
- ⊙ 📄 **ShoppingCart.war**
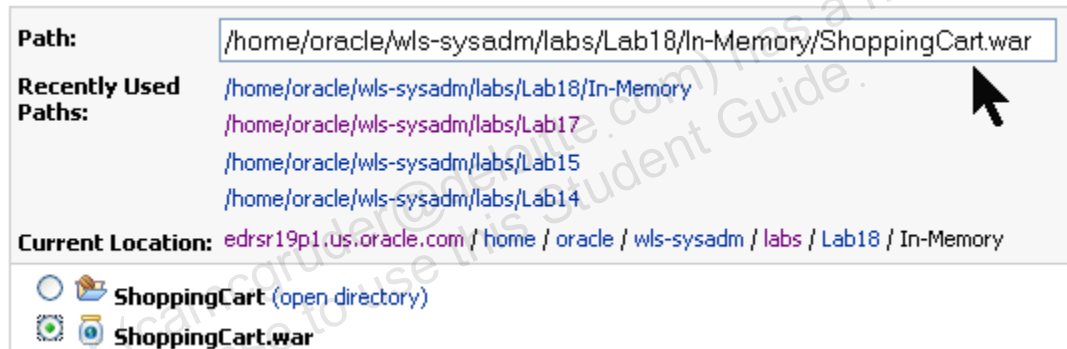
   Note: While it is fine to use the ~ for a shortcut for doing copies in the OS, you cannot use the ~ character inside of the Administration Console (for paths, and so on). You will need to provide the full path to the application or browse to it using the links provided.

   c. Target the application to all servers in MedRecCluster.

Clusters

☑ **MedRecCluster**
  - ⊙ **All servers in the cluster**
  - ○ **Part of the cluster**
    - ☐ **MedRecSvr3**
    - ☐ **MedRecSvr2**

[Back] [Next] [Finish] [Cancel]
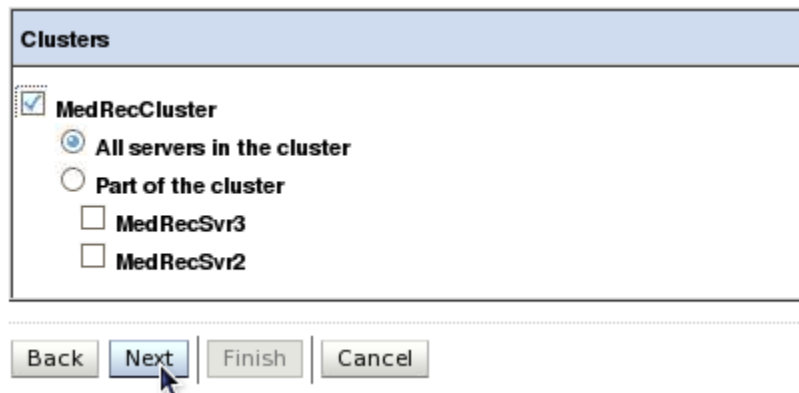
   d. Activate your changes and start the application to serve all requests.

4. Configure the new application in OHS.

   a. Stop OHS.

b. Edit the `mod_wl_ohs.conf` file in the
   `/u01/app/work/instances/config/OHS/ohs1` folder and include the
   `<Location>` element for `/ShoppingCart`. Finally, it should appear as follows:

```
# NOTE : This is a template to configure mod_weblogic.

LoadModule weblogic_module    "${ORACLE_HOME}/ohs/modules/mod_wl_ohs.so"

# This empty block is needed to save mod_wl related configuration from EM to this
 file when changes are made at the Base Virtual Host Level
<IfModule mod_weblogic.c>
     WebLogicCluster wls-sysadm:7023,wls-sysadm:7025
</IfModule>

<Location /benefits>
     SetHandler weblogic-handler
</Location>

<Location /ShoppingCart>
     SetHandler weblogic-handler
</Location>
```

c. Restart OHS using `stop_OHS.sh` and `start_ohs.sh` scripts or desktop icons.

5. Test the in-memory session replication by accessing the ShoppingCart application and
   adding a few items to cart. Identify which server is active for the request and shut down that
   server. Note that the request fails over to the other running server.

   a. Open a Web browser and navigate to (case-sensitive):
      `http://wls-sysadm:7777/ShoppingCart`

   b. Select Go Shopping and add an item to your shopping cart.

   > http://wls-sysadm:7777/ShoppingCart/addtocart?item=box of 12 p
   >
   > lassroom Support ... Global Education   Oracle Online Evalu..
   >
   > -... ×   Supply Categories   ×
   >
   > **Dizzyworld Store**
   >
   > added new element
   > box of 12 pens (blue)
   > Back To Home Page
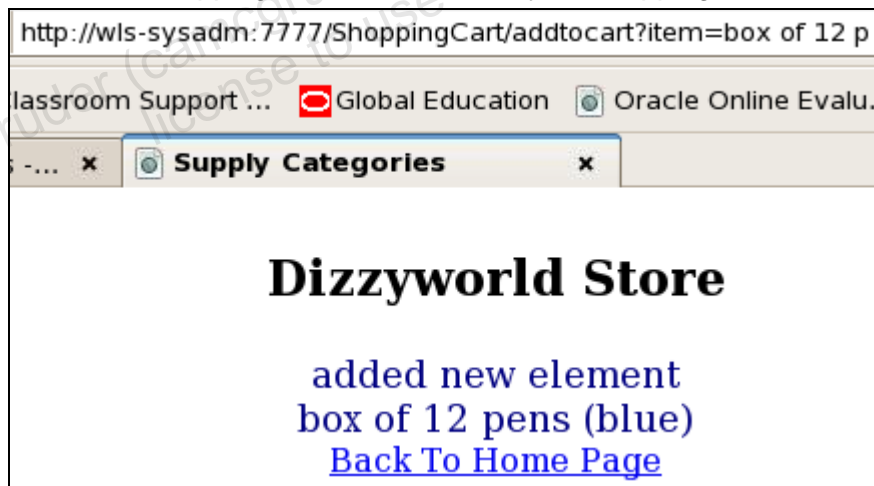
   c. Go back to the home page and view the items in your shopping cart.

   d. Check the gnome terminal session for MedRecSvr2 and MedRecSvr3. You will notice
      messages indicating addition of items in the one server that is handling the request.

```
<Apr 22, 2010 1:36:37 AM EDT> <Notice> <WebLogicServer> <BEA-000330> <Started WebLogic
Managed Server "MedRecSvr3" for domain "MedRecDomain" running in Production mode>
<Apr 22, 2010 1:36:37 AM EDT> <Notice> <WebLogicServer> <BEA-000365> <Server state
changed to RUNNING>
<Apr 22, 2010 1:36:37 AM EDT> <Notice> <WebLogicServer> <BEA-000360> <Server started in
RUNNING mode>
within welcome.jsp
```

```
within shoppingcart.jsp
within shopping cart servlet
added new element: box of 12 pens (blue)
```

e. To simulate a server failure, kill the server instance handling your requests by entering CTRL-C in the terminal window of that server.

f. Back in the application browser, continue shopping and add something else to your shopping cart.

g. View the shopping cart. All the items you added to the cart should be in the cart, having been replicated in-memory.

h. Check the server consoles to see which server is now handling the request. You should see the "within *something*" messages now on the other server.

i. Restart the server that was killed.

Practices for Lesson 18

Practices for Lesson 19

Chapter 19

Practices for Lesson 19

Practices for Lesson 19

Practices for Lesson 19

Practices Overview

Users and Groups

You need to create users and groups in your security realm to enable appropriate authentication for some applications.

In this case, you:

- Create new users using the Administration Console
- Create groups of employees and managers
- Assign groups to users
- Configure groups-to-role mapping
- Define resources that are protected by the security groups you have configured
- Verify that it is working

You use the `timeoff.war` Web application in this lab.

You configure security so that only users in a specific group can make requests on the URL pattern `/managers/*`.

Big Picture:
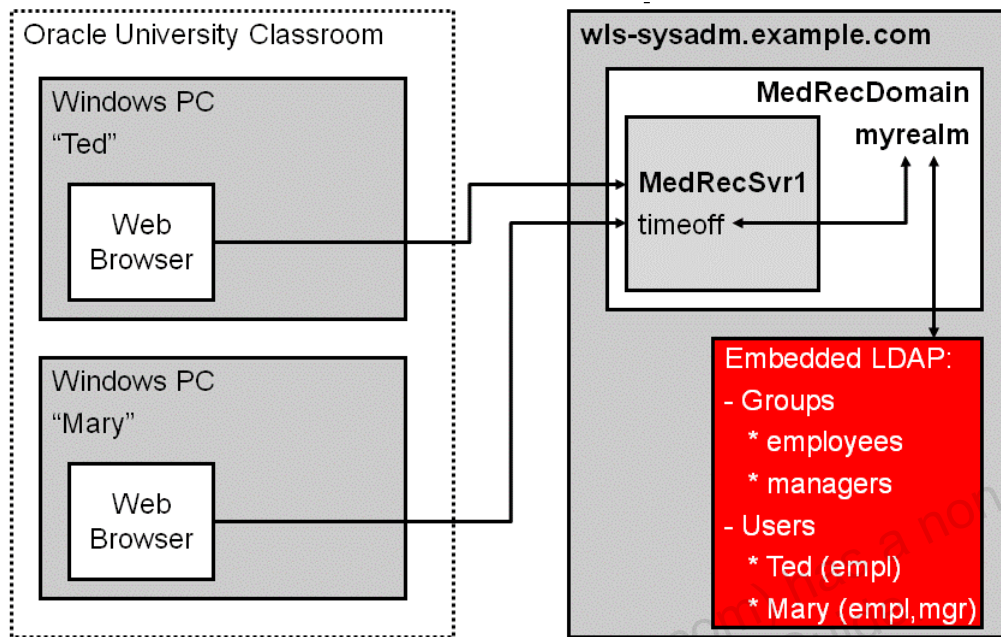
Practice 19-1: Managing Users and Groups

In this practice, you create a few users in your domain. These users are to be authenticated into the WebLogic Server environment. Each user is an employee of the company and belongs to the `employees` group. Additionally, some users belong to a group called `managers`.

1. Create two groups in the security realm of your environments. Then create users and assign users to these groups as per the following table:

User	Password	Groups
John	Welcome1	Administrators
Joe	Welcome1	employees, managers
Ted	Welcome1	employees
Mary	Welcome1	employees, managers
Albert	Welcome1	employees

a. In the Administration Console, navigate to Security Realms. Click myrealm in the Realms table and click the Users and Group tab.

b. Click the Groups subtab and click New. (Notice Lock & Edit is not needed.)

c. On the Create a New Group page, specify the details for the employee group as shown in the following screenshot and click OK:

d. Similarly, create a new group called `managers`.

e. Then click the Users subtab and click New to create new users. The screen for creating the user Mary is shown here. Similarly, create other users as stated in the table at step 1.

f. Click each username in the Users table, on the "Settings for myrealm" page, and click the Groups subtab.

g. Select the groups from the Available list and click ⟩ to assign a group to the user and click Save. For example, group assignment for Mary is shown here:

Practices for Lesson 19

General | Passwords | Attributes | **Groups**

Save

Parent Groups:

Available:
- ☐ Administrators
- ☐ AppTesters
- ☐ CrossDomainConnectors
- ☐ Deployers
- ☐ Monitors
- ☐ Operators
- ☐ OracleSystemGroup

Chosen:
- ☑ **employees**
- ☑ **managers**
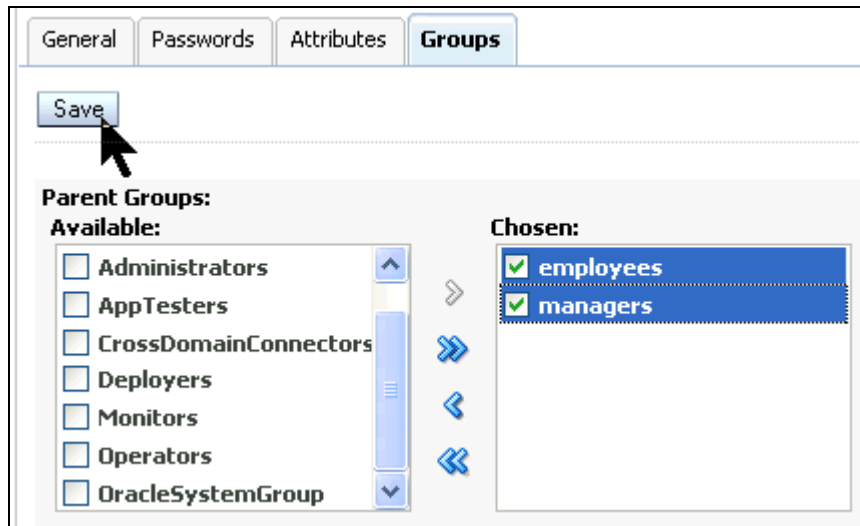
h.   Similarly, assign groups to other users as per the table in step 1.

Practices for Lesson 19

Practice 19-2: Securing WebLogic Server Resources

In this practice, you deploy a Web application and secure it using policies defined in the deployment descriptor.

1. Deploy the `timeoff.war` Web application and configure security settings for the Web application by selecting the following option while deploying the application:

Description	Choices or Values
Custom Roles	Use roles that are defined in the Administration Console; use policies that are defined in the deployment descriptor.
New Role:	
URL Patterns	/managers/* /officeclosing/*
Name	director
Provider Name	XACMLRoleMapper

   a. If not already running, start the MedRecAdmSvr and MedRecSvr1 servers. To save on resources, you can stop other servers 2 and 3, if they are running.

   b. Using the Administration Console, deploy the `timeoff.war` Web application located in the `/home/oracle/wls-sysadm/labs/Lab19` folder. Target the application to MedRecSvr1.

   c. On the Optional Settings page, in the Security section, select "Custom Roles: Use roles that are defined in the Administration Console; use policies that are defined in the deployment descriptor."

   d. Under "Source accessibility," select "Copy this application onto every target for me."

e. Click Finish and Activate your changes.

f. Navigate to MedRecDomain > Deployments and click timeoff in the Deployments table.

g. Navigate to Security > URL Patterns (subtab). Click New in the Stand-Alone Web Application URL Pattern Scoped Roles table.

h. Specify the URL Pattern: /managers/*, Name: director, Provider Name: XACMLRoleMapper, and then click OK.

Create a New Stand-Alone Web Application URL Pattern Scoped Role

OK | Cancel

Create a New Role URL Pattern

The following property will be used to identify your new Role URL pattern.

What would you like to name your new Role URL pattern?

URL Pattern: /managers/*

What would you like to name your new Role?

Name: director

What Role Mapper would you like to select?

Provider Name: XACMLRoleMapper

In the Stand-Alone Web Application URL Pattern Scoped Roles table, you should now see the URL pattern created and assigned to the director role.

i. Click director and click Add Conditions. Select Group from the Predicate List and click Next.

j. On the next screen, enter managers as Group Argument Name and click Add.

Group Argument Name: managers   Add

k. Click Finish. On the next page, click Save.

l. Repeat steps g through k above using "/officeclosing/" instead of "/managers/". Use the following values for a new URL pattern: /officeclosing/*, Name: director, Provider Name: XACMLRoleMapper, and Group Argument Name: managers. Note that the Group Argument is still managers for both URL patterns. The final result should look like:

Practices for Lesson 19

Settings for timeoff

| Overview | Deployment Plan | Configuration | **Security** | Targets | Control | Testing |

Application Scope | **URL Patterns**

Roles | Policies

Stand-Alone Web Application URL Pattern Scoped Roles

New | Delete

☐	URL Pattern ⌄	Name	Provider Name
☐	/managers/*	director	XACMLRoleMapper
☐	/officeclosing/*	director	XACMLRoleMapper
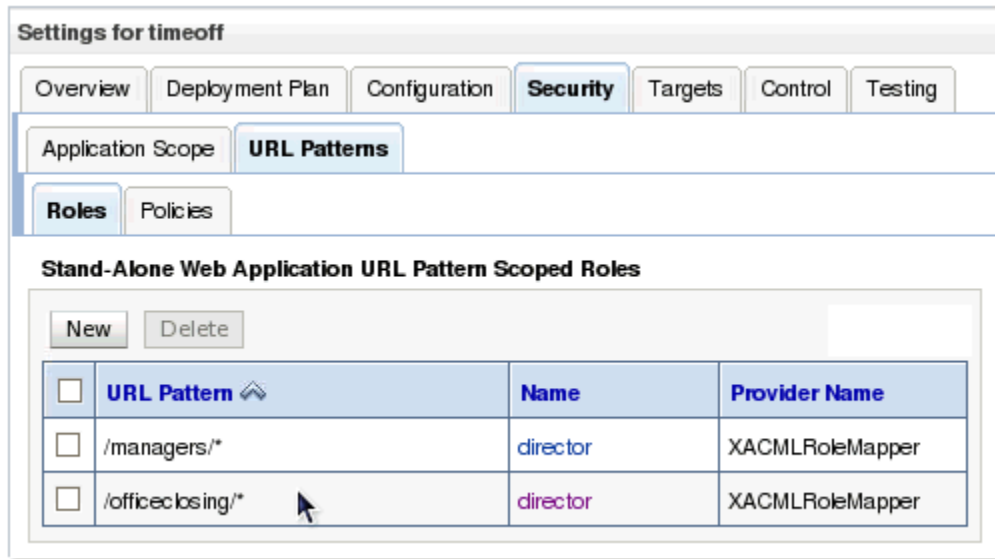
2. Start the `timeoff` application and verify the policy you have configured.

   a. In the Administration Console, navigate to the Deployments page. In the Deployments table, select the `timeoff` application and then select Start > Servicing all requests. Click Yes when prompted.

   b. Using another browser window or tab, navigate to the following URL:

      `http://wls-sysadm:7021/timeoff`

   c. Try closing the office by clicking Close An Office. (You may need to enter the username and password. Use the values specified in step 1 of Section 19-1)

   d. Log on as different users created in the previous lab. For example, Ted (who is *not* a manager but merely an employee) will be denied access:

Authentication Required

? A username and password are being requested by http://vx0305:7021. The site says: "default"

User Name: | Ted
Password: | ••••••••

OK | Cancel
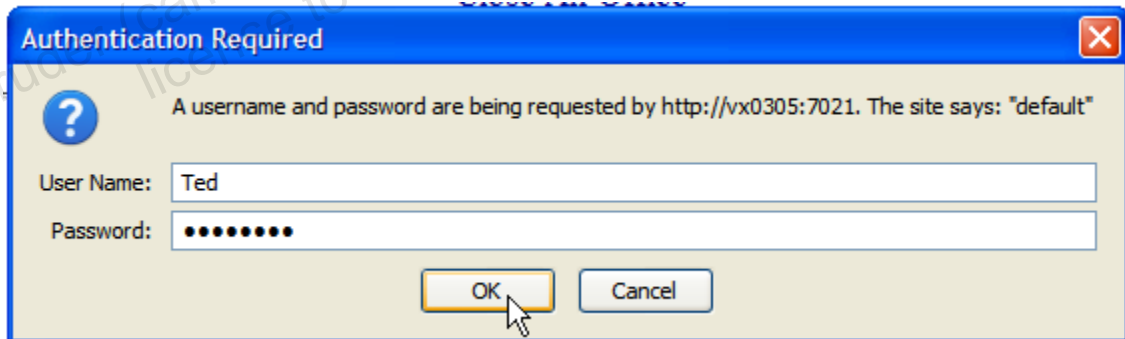
```
Error 403--Forbidden
From RFC 2068 Hypertext Transfer Protocol -- HTTP/1.1:
10.4.4 403 Forbidden

The server understood the request, but is refusing to fulfill
it.
```

   e. Joe or Mary (who are managers) will be granted access. **Note:** Clear the previous cached authentication information before logging on as another user.

Authentication Required

A username and password are being requested by http://vx0305:7021. The site says: "default"

User Name: Mary

Password: ••••••••

[OK] [Cancel]

Dizzyworld Office Closing Form

Date [ ]

Reason [ ]

[Submit Form]

Back To Home Page

Practices for Lesson 19

Practices for Lesson 20

Chapter 20

Practices for Lesson 20

Practices for Lesson 20

Practices Overview

Configuring SSL and Keystores

Many applications need the security of communicating over the secure sockets layer (SSL). This provides secure communications between the server and the client, or between two servers. Your company has decided to configure SSL for ensuring secure communications between a server and the client.

In this lab, you configure SSL and the keystores for the MedRecSv1 managed server in MedRecDomain.

In this practice, you perform the following tasks:

- Using `keytool` to generate an identity keystore that contains a private key and a self-signed public certificate
- Configuring keystores in the Administration Console
- Configuring SSL for a managed server

Big Picture:
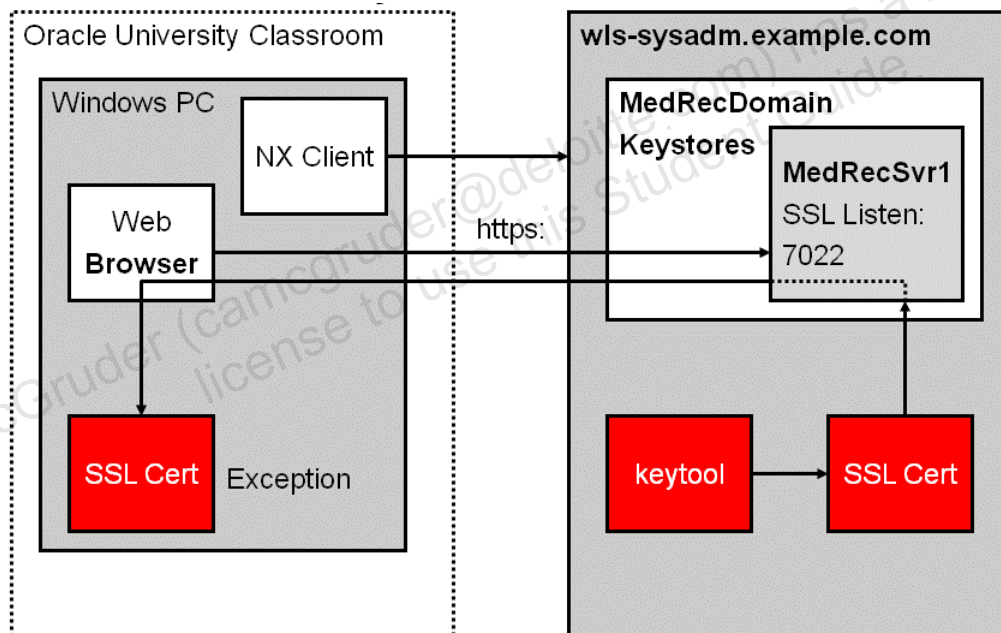
Practice 20-1: Configuring Keystores

In this practice, you generate a key, self-signed certificate, and identity keystore.

1. Using the Java `keytool` utility, create a key and copy the key to your domain folder.

   a. In your gnome terminal session, ensure that JAVA_HOME and the related environment variables have been set. (If they have not been set, run the `setWLSEnv.sh` script.)

   ```
   $> env | grep JAVA
   JAVA_USE_64BIT=false
   JAVA_OPTIONS= -Xverify:none
   JAVA_VENDOR=Oracle
   JAVA_HOME=/u01/app/oracle/Middleware/11.1.1/jrockit_160_17_R28.0
   .0-679
   JAVA_VM=-jrockit
   ```

   b. Navigate to the Lab20 subfolder under the `/home/oracle/wls-sysadm/labs` folder. Then run the `keytool` command as follows (all in one line). You can use the `genkey.sh` script in this folder for convenience.

   ```
   $> cd /home/oracle/wls-sysadm/labs/Lab20
   $> keytool -genkey -v -alias MRkey -keyalg RSA -keysize 512
        -sigalg MD5withRSA -dname "CN=wls-sysadm"
        -keypass MRkeypass -validity 365
        -keystore MR_identity.jks -storepass MRstorepass
   ```

   c. Copy the key file you generated to your domain folder.

   ```
   $> cp MR_identity.jks /u01/app/work/domains/MedRecDomain/
   ```

   d. Generate a Certificate Signing Request (CSR) using the key you have created. (You can use `certreq.sh` instead of entering the `keytool` command.)

   ```
   $> keytool -certreq -v -alias MRkey -file MR_cert_request.pem
        -keypass MRkeypass -storepass MRstorepass
        -keystore MR_identity.jks
   ```

   e. Copy the CSR you generated to your domain folder.

   ```
   $> cp MR_cert_request.pem /u01/app/work/domains/MedRecDomain/
   ```

   These copy steps are because you are more likely to back up your /domains (in the next lab) than you would be to back up the /labs directory. Nothing on the local server uses this CSR .pem file. In a real shop, this .pem would be forwarded to your CA.

   f. In the Administration Console, navigate to MedRecDomain > Environment > Servers > MedRecSvr1 > Configuration > Keystores. In Change Center, click Lock & Edit.

   g. On the Keystores page, specify the following properties and click Save.

Description	Choices or Values
Keystores	Custom Identity and Java Standard Trust
Custom Identity Keystore	MR_identity.jks
Custom Identity Keystore Type	JKS
Custom Identity Keystore Passphrase	MRstorepass

Description	Choices or Values
Java Standard Trust Keystore Passphrase	changeit

2. Configure MedRec Svr1 with SSL. Verify accessing the `timeoff` application by using HTTPS.

   a. In the Administration Console, navigate to MedRecDomain > Environment > Servers > MedRecSvr1 > Configuration > SSL.

   b. On the SSL page, specify the following properties and click Save.

- Identity and Trust Locations: Keystores
- Private Key Alias: MRkey
- Private Key Passphrase: MRkeypass

   c. Navigate to MRDomain > Environment > Servers > MedRecSvr1 > Configuration > General.

   d. Select the check box next to SSL Listen Port Enabled and set the SSL Listen Port as 7022. Then click Save.

   e. Click Activate Changes. Then stop the MedRecSvr1 server.

   f. Start the MedRecSvr1 server using the desktop icon or the script.

   g. In another browser window or tab, access the URL: https://wls-sysadm:7022/timeoff. (don't forget: http**S**). You may receive an error or warning.

Secure Connection Failed

wls-sysadm:7022 uses an invalid security certificate.

The certificate is not trusted because it is self signed.

(Error code: sec_error_ca_cert_invalid)

- This could be a problem with the server's configuration, or it could be someone trying to impersonate the server.
- If you have connected to this server successfully in the past, the error may be temporary, and you can try again later.

Or you can add an exception...

   h. Click the link to add an exception and click Add Exception (different Web browsers do this dialog slightly differently):

You should not add an exception if you are using an internet connection that you do not trust completely or if you are not used to seeing a warning for this server.

[Get me out of here!] [Add Exception...]
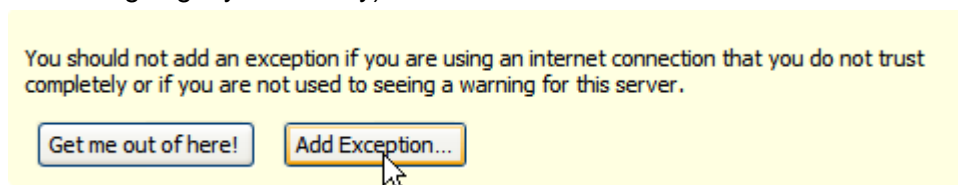
   i. Then click Get Certificate to add the server certificate to your browser.

Practices for Lesson 20
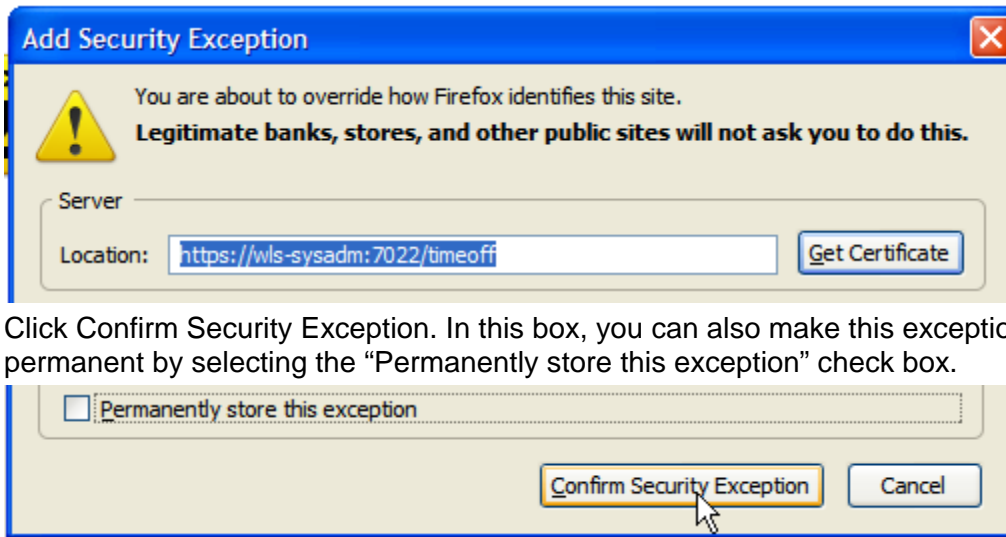
j. Click Confirm Security Exception. In this box, you can also make this exception permanent by selecting the "Permanently store this exception" check box.

k. Now, you can access the application on MedRecSvr1.

Practices for Lesson 20

Practices for Lesson 21

Chapter 21

Practices for Lesson 21

Practices for Lesson 21

Practices for Lesson 21

Practices Overview

Backup and Recovery

A full backup would obviously include the database. The procedures for doing hot (online, inconsistent) backups of the database use RMAN and are beyond the scope of this course. For this lab, you perform only backups of the Fusion Middleware components. Because of the nature of the lab environment, you are not going to do a full backup of Fusion Middleware, but only an incremental backup of the Middleware configuration components. Lastly, you enable the autobackup of the `config.xml` files in Change Center of the Administration Console. The key tasks are:

- Stopping everything
- Performing a full, cold (offline, consistent) backup
- Performing an incremental, cold backup
- Simulating a failure
- Stopping everything (all FMW recoveries are performed cold)
- Restoring the affected components
- Restarting everything

Big Picture:

Practices for Lesson 21
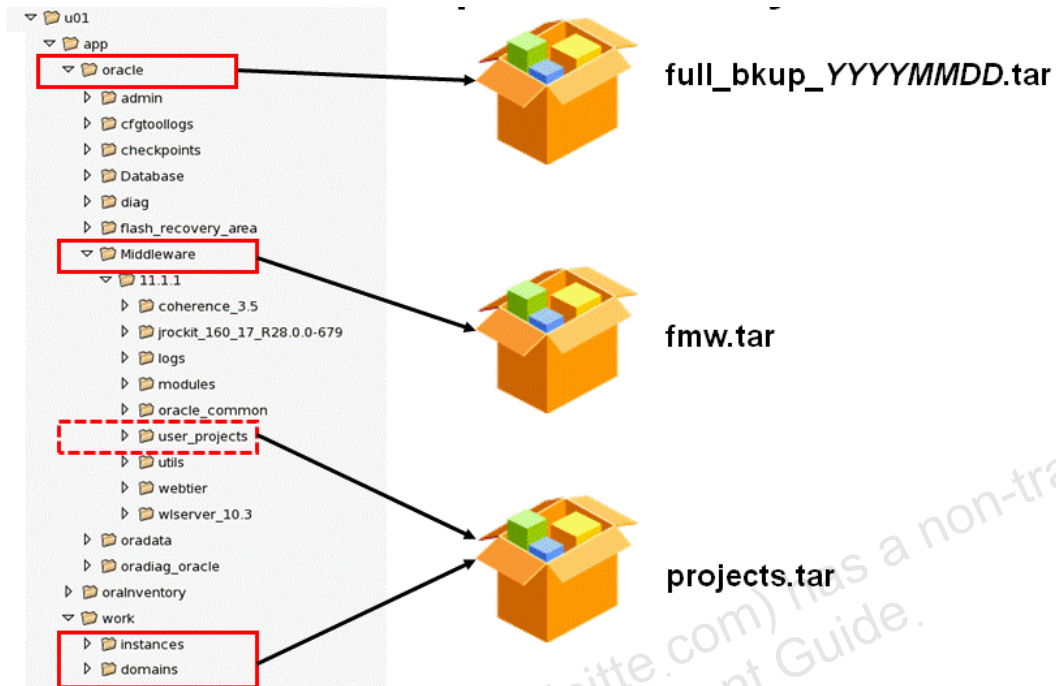
Practice 21-1: Backing Up the Configuration

In this practice, you stop all middleware processes and take a cold backup of the `domains` directory. In real life, you would back up the `Middleware` directory and the database as well. A backup of the `Middleware` directory is the same process except that it takes five times longer and does not demonstrate anything that you will not see on the shorter directory. A backup of the database is longer still and involves a tool called RMAN. The DBA usually handles that process (in fact, it is usually automatic). So in this lab, you will not back up the database.

Note: Node Manager configuration files are not stored with the domain by default, because they are potentially cross-domain. The Node Manager configuration files are stored under `Middleware/11.1.1/wlserver_10.3/common/nodemanager`, so this exercise will not back them up but a backup of `Middleware` would. Or, you can relocate the `nodemanager` directory under `work`.

1. Stop all the servers using any method you have learned. For example, you can change directory to `/u01/app/work/domains/MedRecDomain/bin/` and run `./stopManagedWebLogic.sh MedRecSvr1` to stop MedRecSvr1. Or you can stop them via the Administration Console. Similarly, stop MedRecSvr2 and MedRecSvr3.

   To stop the Administration Server, run `./stopWebLogic.sh`. Or it can also be stopped via the Administration Console.

2. Switch to the `root` user. As `root`, go to the `root` (`/`) directory and run the `tar` command.

   ```
   su – root
   cd /
   tar -czpvf /projects.tar /u01/app/work/domains/
   ```

   where `c` is create, `z` is zipped, `p` is preserve permissions, `v` is verbose messages, and f is file name. The resulting file should be about 37 MB.

3. Test the TAR file by using the –t option of the `tar` command

   ```
   tar -ztf /projects.tar
   ```

   You really want to test it now, so that there are no problems later. A successful test does not tell you anything about status, it simply displays the file names it has stored. If there was a problem, then the test would show the error.

4. Restart the administration server to make sure that it is functioning properly.

Practice 21-2: Enabling Autobackup of `config.xml`

In this practice, you enable the Administration Console to save a copy of `config.xml` and all of the related config files and directories each time any configuration parameter is changed. The number of copies to save on a rolling basis is configurable. The default of one copy is too few; ten is a reasonable number of copies because the file is relatively small.

1. Observe the state of the directories and files *before* the configuration archive is enabled. In a terminal session, change to directory `/u01/app/work/domains/MedRecDomain/` and note the *absence* of the following files and directories: `config.original.jar`, `config.booted.jar`, and `configArchive`.

2. In the Administration Console, click Lock & Edit in Change Center.

3. In Domain Structure, click MedRecDomain > Configuration > Advanced.

4. Select Configuration Archive Enabled. Change the Archive Configuration Count to 10 and click Save. Ten is not a fixed number; anything more than two will work; more than 50 is excessive; ten is a good middle ground balancing risk and convenience against space consumed.

5. In Change Center, click Activate Changes. This requires a restart of all WebLogic components. Click "View changes and restarts." Click the Restart Checklist tab. From here, you can stop and restart all resources *except* the administration server itself. Resources such as managed servers, applications, and so on can be restarted. It is possible that you have nothing else running other than the administration server. Use the top-left box to select all resources other than the administration server and stop and restart them. Click Restart. Click Yes to shut down the *other* (non-administration) servers if applicable.

6. Restart the administration server. You can do this using either the command `stopWebLogic.sh`, or using the desktop StopAdmin icon, or using the Administration Console > Servers > Summary of Servers > Control > Shutdown > Force, and then restart it from the desktop icons. For the purpose of this lab, there is no need to start any other servers.

7. Make a change to a managed server. For example, adding Notes to any of the settings documenting what you are doing is a good idea. Navigate Environment > Servers > Configuration > MedRecSvr1 > Notes, Lock & Edit, then type something in the Notes: area. Click Save and Activate Changes.

8. Go back to the terminal session and note the *presence* of the following files: `config.original.jar` and `config.booted.jar`.

9. Go back to the Administration Console and make a few more changes (something harmless is to add more notes, for example your name and timestamp, on the Notes tab to server settings), making sure that you click Save and Activate Changes in between each one. Now you should see a new directory `configArchive`.

    a. How many files are in `configArchive`? Make some more changes, note the new files.

    b. How many files are in `config-1.jar`?
    (You can use `unzip -t config-1.jar | wc -l`)

    c. Are any of the time stamps changing on `config.original.jar` or `config.booted.jar`?

10. Roll back to before you made these changes (the adding of notes).

    a. Stop the administration server.

    b. In a terminal session, go to `/u01/app/work/domains/MedRecDomain/config`.

c. You could either rollback everything:

```
unzip ../config-booted.jar
```

or you could pick an intermediate recovery point:

```
unzip ../configArchive/config-2.jar
```

or you could substitute any valid number for "2" from your archived savepoints.

d. Restart the administration server and verify that the notes you added have been reset.

Practice 21-3: Performing Recovery

In this practice, you simulate a media failure and then recover from it.

1. While the administration server is running, delete the directory that contains the configurations. As `root`, enter:

   ```
   rm -rf /u01/app/work/domains/MedRecDomain/servers/
   ```

   This deletes some (but not all) of the configuration files.

2. In the administration console, try to start MedRecSvr1. In the terminal session associated with the administration server, the standard out error messages should show a series of errors that say (among other things):

   ```
   <The file could not be found in the webapp directory or war.>.
   ```

   All copies that WLS knows about of the server configuration files are destroyed. You still have the `/projects.tar` backup from the first part of this lab. Shutdown the administration server by using Ctrl+C in the terminal window running that process that you used to start the administration server. You will see the following messages:

   ```
   <JVM called WLS shutdown hook. The server will force shutdown
   now> <Server shutdown has been requested by <WLS Kernel>>
   ```

   To make sure that WebLogic Server shut down cleanly, enter:

   ```
   ps -ef | grep java
   ps -ef | grep MedRec
   ```

   You should see no java nor MedRec processes running other than the grep itself. This ensures that nothing is left as a zombie (a process that won't be killed properly). If there are zombies, use the `kill -9` command on those process IDs.

3. As `root`, from the `root` directory, restore the configuration files. Even though you lost only part of `/domains`, the best practice is to restore the whole TAR file because there may be interdependencies.

   ```
   su - root
   cd /
   tar -zxvpf /projects.tar
   ```

4. Restart the administration server to ensure that it is functioning properly.