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How to Deploy Oracle WebCenter Content on the Oracle ZFS Storage Appliance

ORACLE

Overview

Oracle WebCenter Content is a highly integrated Enterprise Content Management (ECM) platform allowing the consolidation of unstructured content in a flexible and secure management system. Oracle WebCenter Content allows the management of content as a strategic asset and the integration of enterprise applications and business processes.

The basic architectural features of Oracle ZFS Storage Appliance are designed to provide high performance, flexibility and scalability. Besides its easy-to-use interface and detailed metrics using its DTrace Analytics tool, Oracle ZFS Storage Appliance features a unique Oracle integration with Hybrid Columnar Compression that delivers 3x to 5x better storage efficiency for Oracle databases with in-database archiving.

By using the features of Oracle Database, Oracle Grid Infrastructure and Oracle ZFS Storage Appliance, a rapid deployment of a secure ECM environment is made possible.

This document describes the minimum steps required to deploy Oracle WebCenter Content using the Oracle ZFS Storage Appliance as the infrastructure for holding the back-end database.

NOTE: References to Sun ZFS Storage Appliance, Sun ZFS Storage 7000, and ZFS Storage Appliance all refer to the same family of Oracle ZFS Storage Appliance products. Some cited documentation or screen code may still carry these legacy naming conventions.

Oracle WebCenter Content is built on and integrates with Oracle Fusion Middleware components. Oracle WebCenter Content provides all the tools needed to create the back-end schema required to support the middleware applications.

Oracle WebLogic is the Oracle Fusion Middleware component set that controls and monitors Oracle WebCenter Content component applications. Oracle WebLogic also provides access to the back-end database through Open Database Connectivity (ODBC) libraries.

Oracle WebLogic is built on the concept of Oracle WebLogic server domains which contain one administration server and one or more managed servers (such as Oracle WebCenter.)

The steps to deploy Oracle WebCenter Content with an Oracle ZFS Storage Appliance infrastructure involve creating these middleware building blocks, as seen in the basic architecture shown in Figure 1.

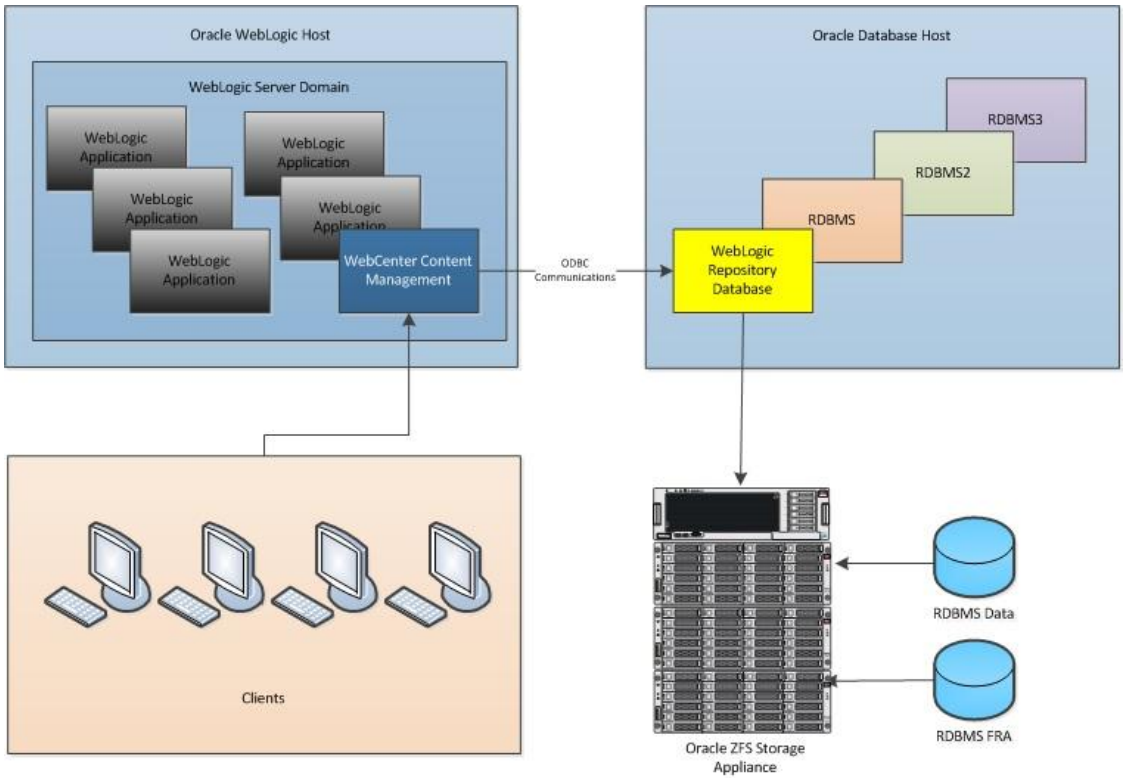

Figure 1. Logical architecture

The database and Oracle WebLogic hosts may be located on the server or, for performance or administration reasons, they may also be hosted on different hosts. In the example shown in this document, they are installed on the same host but their logical functions are still distinct.

Installing the correct versions of the individual components is very important. In order to ensure smooth deployment, the Oracle web site has the necessary links for the correct component version downloads at:

http://www.oracle.com/technetwork/middleware/webcenter/content/downloads/index.html

Prerequisite Setup

Note the following assumptions regarding existing setup upon which the WebCenter Content deployment steps depend:

- A known `root` password for the Oracle ZFS Storage Appliance exists.
- A known IP address or hostname of the Oracle ZFS Storage Appliance exists.
- A network used by the Oracle ZFS Storage Appliance that is already configured exists.
- Configured pools with sufficient free space available on the Oracle ZFS Storage Appliance exist.
- A known `root` password for the database and Oracle WebLogic server exists.
- Oracle Grid Infrastructure has been installed on the database server.
- Oracle Database has been installed on the database server.

Overview of Required Tasks

Deploying WebCenter Content requires configuration of four primary components of the architecture shown in figure 1: the Oracle ZFS Storage Appliance, the Oracle Database back-end, and the Oracle Fusion Middleware components – Oracle WebLogic management software, and within that, Oracle WebCenter Content. The following tasks are required to install and/or configure the components:

- Configuring the storage network infrastructure
    - Configuring the Oracle ZFS Storage Appliance

    - Presenting the required storage resources to the database server
    - Configuring the back-end Oracle Database – Creating the database for backend storage on the database server
- Configuring the Oracle WebLogic Repository
- Installing and configuring the Oracle Fusion Middleware components
    - Installing WebCenter Content
    - Configuring the Oracle WebLogic domain
        - Creating and assigning the middleware application servers
    - Starting the middleware application servers
- Performing the WebCenter Content configuration

Configuring the Storage Network Infrastructure

The choice of which block-level protocol and infrastructure to use depends on local policy and any existing connections between the Oracle ZFS Storage Appliance and the database host.

The Oracle ZFS Storage Appliance supports all major protocols, including CIFS (Common Internet File System), NFS (Network File System), FC (Fibre Channel), iSCSI (Internet Small Computer System Interface) and IB (Infiniband). The choice of storage network infrastructure is outside the scope of this document.

For the purposes of this document, the storage network infrastructure is assumed to be Fibre Channel and all the necessary zoning has been performed on the fabric switches.

Tutorials on creating iSCSI LUNs and Fibre Channel LUNs for use in Oracle Solaris, Oracle Linux or Microsoft Windows Server 2008 R2 environments are available at the Oracle Technology Network information web site, under Sun NAS Storage Documentation at:

http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/index.html

Configuring the Oracle ZFS Storage Appliance

The following tasks, depending on the implementation category, are required to configure the Oracle ZFS Storage Appliance. These steps need only be carried out once and can be omitted if successfully completed beforehand:

- Configure the FC targets.
- Configure the FC target group.

If no LUNs are being or have been presented to the database host, the following tasks are necessary:

- Determine the FC initiator Host Bus Adapter (HBA) World Wide Names (WWN).
- Configure the FC initiators.
- Configure the FC initiator group.

Perform the following steps whenever a new storage allocation will be made:

1. Create the LUN with the required attributes.

2. Present the LUN to the FC initiator group through the FC target group.

Configuring the Oracle ZFS Storage Appliance FC Targets

The FC targets are configured on the Oracle ZFS Storage Appliance to identify the appliance to the fabrics to which it will be attached.

The FC targets are defined by the HBA WWNs installed in the Oracle ZFS Storage Appliance. These FC targets are used not only within the Oracle ZFS Storage Appliance but also in any FC switches to provide the correct zoning information to ensure that only the appropriate devices can communicate. The method of zoning depends on the switch manufacturer. Reference the documentation provided by the manufacturer for details on required operations.

To configure the FC target, first establish a management session with the Oracle ZFS Storage Appliance.

1. Enter an address in the address field of a web browser that includes the IP address or hostname of the Oracle ZFS Storage Appliance:

   ```
   https://<ip-address or hostname>:215
   ```

   The login dialog window shown in Figure 2 is displayed.

Figure 2. Oracle ZFS Storage Appliance BUI login

2. Enter a **Username** and **Password** and click **LOGIN**.

Once you have successfully logged in to the BUI, identify the FC Target WWNs by navigating through the Configuration > SAN > FC Channel > Ports tabs, as highlighted in figure 3.

Figure 3. Identifying FC HBA WWNs in the Oracle ZFS Storage Appliance BUI

In the example, port 1 has the WWN `21:00:00:e0:8b:92:a1:cf` and port 2 has the WWN `21:01:00:e0:8b:b2:a1:cf`.

The FC channel ports should be set to Target in the dropdown box to the right of the individual FC port box. If this is not the case, the FC port may be in use for another purpose; do not change this setting until it has been investigated (a possible additional purpose may be for NDMP backups).

Configuring the Oracle ZFS Storage Appliance FC Target Group

The FC target group's purpose is to define upon which protocol and which interfaces LUNs will be presented and accessed. In order to create the FC target group, follow these steps:

1. While still in the Configuration > SAN > FC Channel > Ports display as shown in Figure 3, place the mouse pointer on one of the FC target ports. A 'move' icon appears to the left of the port box.
2. Click and hold the mouse button on the 'move' icon and drag the box to the Fibre Channel Target Groups area as shown in Figure 4.

Figure 4. Creating an FC target group in the Oracle ZFS Storage Appliance BUI

3. Drop the entry in the orange box to create a new target group. The group is created automatically and is given a name like '`targets-`*`n`*' where '*`n`*' is an integer. An example is shown in Figure 5.

Figure 5. Creating a target group in the Oracle ZFS Storage Appliance

Move the cursor over the entry for the new target group. Two icons appear to the right of the target group box as shown in Figure 5.

4. Click the Edit icon (✎) to display the dialog in Figure 6.

Figure 6. Renaming the FC target group in the Oracle ZFS Storage Appliance

5. Enter the name for the FC target group in the **Name** box. The example in figure 6 shows the newly entered name `FC-PortGroup`. At this point, you can also add any

additional FC target ports by selecting the checkbox to the left of the appropriate WWN. The FC port is added to the target group. In the example, the port `PCIe 1: Port 2` will be added to `FC-PortGroup`.

6. Click **OK** to save the changes.
7. Click **Apply** to commit all the changes made. Once the entries are successfully committed, the screen will resemble Figure 7.

Figure 7. Completed FC target group in the Oracle ZFS Storage Appliance

Determining the FC Initiator HBA WWNs

In order to properly configure the Oracle ZFS Storage Appliance FC initiators and initiator groups, you must know the HBA WWNs that will represent the database host.

The FC initiator HBA WWNs are used to define which hosts have access to volumes presented by the Oracle ZFS Storage Appliance. These HBA WWNs are also used in the fabric zoning to define which host can access the Oracle ZFS Storage Appliance at all.

SAN Best Practices state that the security model deployed should be the 'Least Access' one – that is, the least number of devices able to communicate. This is done not only to maintain data security and data integrity but also to reduce the amount of unnecessary FC traffic. In terms of data integrity, unless a clusterable (or shared) filesystem or volume manager is being used (such as Oracle ASM), if more than one host writes to a given volume concurrently, inconsistencies may occur in the in-core filesystem caches in the hosts. Those inconsistencies may ultimately lead to corruption of the on-disk image or a server crash.

The method for gathering the WWNs depends on the operating system of the database host. The following shows methods for Oracle Solaris and Oracle Linux.

Determining the FC Initiator HBA WWNs under Oracle Solaris 11

Logging on under a terminal session to the Oracle Solaris 11 host, become root and issue the following command:

```
sol11host # fcinfo hba-port
HBA Port WWN: 230000144fb8130c
        OS Device Name: /dev/cfg/c1
        Manufacturer: QLogic Corp.
        Model: 2200
        Firmware Version: 02.01.145
        FCode/BIOS Version: ISP2200 FC-AL Host Adapter Driver: 1.15
        Serial Number: not available
        Driver Name: qlc
        Driver Version: 20090929-2.32
        Type: L-port
        State: online
        Supported Speeds: 1Gb
        Current Speed: 1Gb
        Node WWN: 220000144fb8130c
HBA Port WWN: 210000e08a91bf8e
        OS Device Name: /dev/cfg/c12
        Manufacturer: QLogic Corp.
        Model: 375-3294-01
        Firmware Version: 05.01.02
        FCode/BIOS Version:  BIOS: 1.04; fcode: 1.11; EFI: 1.00;
        Serial Number: 0402R00-0633171958
        Driver Name: qlc
        Driver Version: 20090929-2.32
        Type: N-port
        State: online
        Supported Speeds: 1Gb 2Gb 4Gb
        Current Speed: 4Gb
        Node WWN: 200000e08a91bf8e
HBA Port WWN: 210100e08a91bf8e
        OS Device Name: /dev/cfg/c13
        Manufacturer: QLogic Corp.
        Model: 375-3294-01
        Firmware Version: 05.01.02
        FCode/BIOS Version:  BIOS: 1.04; fcode: 1.11; EFI: 1.00;
        Serial Number: 0402R00-0633171958
        Driver Name: qlc
        Driver Version: 20090929-2.32
        Type: N-port
        State: online
        Supported Speeds: 1Gb 2Gb 4Gb
        Current Speed: 4Gb
        Node WWN: 200100e08a91bf8e
```

As can be seen from the previous code, there are three FC ports available. The first is the embedded FC controller. The remaining two FC ports are the ones of interest – port

WWNs `210000e08a91bf8e` and `210100e08a91bf8e`. These are the WWNs that will be needed for zoning and for defining the FC initiators in the Oracle ZFS Storage Appliance.

Determining the FC Initiator HBA WWNs under Oracle Linux

Logging on under a terminal session to the Oracle Linux host, become root and issue the following command:

```
[root@x4450-1 ~]# sysinfo -c fc_host -A port_name
Class = "fc_host"

  Class Device = "host10"
    port_name           = "0x2101001b322b5eb6"

    Device = "host10"


  Class Device = "host9"
    port_name           = "0x2100001b320b5eb6"

    Device = "host9"
```

Here, the WWNs of interest are `0x2101001b322b5eb6` and `0x2100001b320b5eb6`. These WWNs will be used to define the zoning on the FC switches and the FC initiators in the Oracle ZFS Storage Appliance.

Configuring the FC Initiators

The FC initiator serves to define the “host” to the Oracle ZFS Storage Appliance. In a traditional dual-fabric SAN, the host will be defined by at least two FC initiators. The FC initiator definition contains the host WWNs.

Using the example, identify the database host to the Oracle ZFS Storage Appliance by way of the FC initiator HBA WWNs discovered in the previous section.

1. Click Configuration>SAN>Fibre Channel to display the Storage Area Network (SAN) screen shown in Figure 8.
2. Select **Initiators** on the left panel as shown in Figure 8.

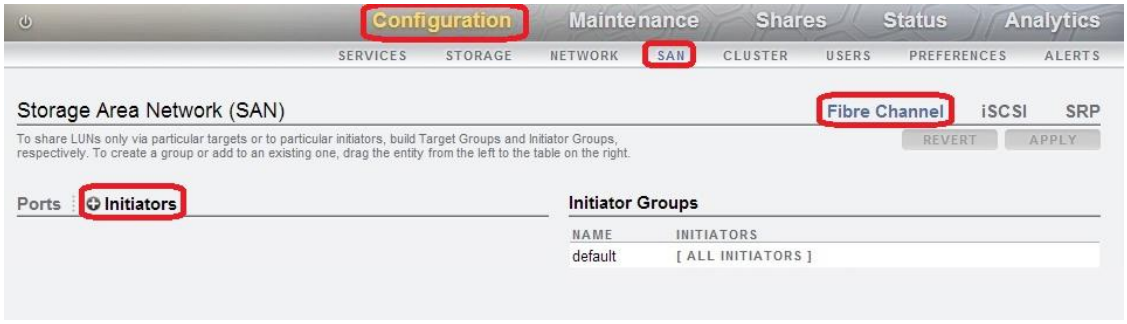

Figure 8. Selecting the SAN Configuration panel

3. Click the ⊕ icon to the left of **Initiators** to display the New Fibre Channel Initiator dialog shown in Figure 9.
4. If the zoning has been configured on the FC switches, the WWNs of the Oracle Solaris host should be displayed (assuming they have not been assigned to an alias already).
5. Click on one of the WWNs (if displayed at the bottom of the dialog box) to prepopulate the World Wide Name or type the appropriate WWN in to the World Wide Name box.
6. Enter a more meaningful symbolic name as the **Alias**.

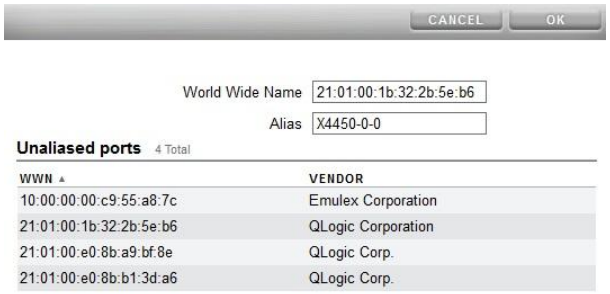

Figure 9. Creating the FC initiator group

7. Click **OK**.
8. Repeat steps 3 – 7 for the other WWNs that refer to the database host.

Configuring the FC Initiator Group

Related FC initiators are combined into logical groups to allow single commands to be executed on multiple FC initiators, such as assigning LUN access to all FC initiators in a group. For this example, the FC initiator group will contain two initiators. In a cluster,

where multiple servers are treated as a single logical entity, the initiator group may contain many more initiators.

To create an FC initiator group, complete these steps:

1. Select Configuration > SAN to display the Storage Area Network (SAN) screen.
2. Select the Fibre Channel tab at the right and then click **Initiators** on the left panel.
3. Place the cursor over the entry for one of the FC initiators created in the previous section. The Move icon ⌖ appears to the left of the entry as shown in Figure 10.

Figure 10. Displaying the Move icon for the new FC initiator

4. Click the ⌖ icon and drag it to the Initiator Groups panel on the right. A new entry appears at the bottom of the Initiator Groups panel as shown in Figure 11 (highlighted in yellow).

Figure 11. Creating the FC initiator group

5. Move the cursor over the new entry box and release the mouse button. A new FC initiator group is created with a name `initiators-`*n*, where *n* is an integer as shown in Figure 12.
6. Move the cursor over the entry for the new initiator group. Several icons appear to the right of the target group box as shown in Figure 12.

Figure 12. Selecting the FC initiator group

7. Click the Edit icon (✎) to display the dialog in Figure 12.

8. In the **Name** field, replace the default name with the name to be used for the FC initiator group and click **OK**. For this example, the name `ucm-dbserver` is used.

9. Additionally, the other FC initiator(s) can be added to the group at this time by clicking in the check box to the left of the WWN as seen in Figure 13.

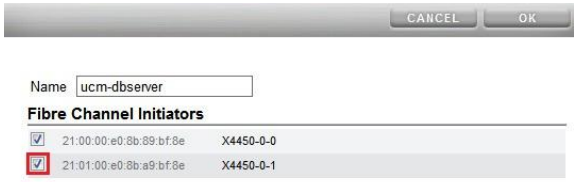

Figure 13. Renaming and completing the FC initiator group

10. Click APPLY on the SAN configuration screen to confirm all the modifications as shown in Figure 14.

Figure 14. FC initiator configuration complete

Configuring the Required Storage for the Database

Still logged in to the Oracle ZFS Storage Appliance BUI, you now create the LUNs that will be presented to the database host. The first step for this operation is to create a project. Projects are used to group related filesystem and/or block-access LUNs for administrative purposes such as space management and common settings. Once the project is created, the storage required for the database host use will be allocated.

Defining an Oracle ZFS Storage Appliance Project

To create a project, complete the following steps:

1. Select Shares > Projects to display the Projects screen as shown in Figure 15.

Figure 15. Viewing a project

Click the + icon to the left of Projects at the top of the left panel to display the Create Project dialog window shown in Figure 16.

Figure 16. Create Project dialog window

2. To create a new project, enter a Name for the project and click APPLY. A new project appears in the Projects list in the left panel.

Select the new project to view the components that comprise the project, as shown in Figure 17.

Figure 17. Displaying the new project UCM

Creating the LUNs for the Database Host

LUNs will now be created from the existing pool of storage resources. These LUNs will hold not only the data files for the WebCenter Content Manager backend database but also a flash recovery area (FRA) as required by Oracle Database configuration best practices.

To obtain optimal performance for the database access, the LUNs should be created with a block size of 64K and provisioned from a RAID-1 pool, as the database serving WebCenter Content Manager can be viewed as a general purpose database.

One difference from the recommendations provided in the listed document is that there will be no segregation of redo and archive logs; Oracle Automatic Storage Management (ASM) will provide the volume and placement management of the database components.

To create the LUNs, follow these steps:

1. Select the Shares > Projects tabs and click the 'UCM' project name as shown in Figure 18.
2. Click on the LUNs title.

Figure 18. Selecting the project to add a LUN

3. Click the icon to display the Create LUN dialog window shown in Figure 19.
4. Enter the values appropriate for the data LUN. In the example, the Name is set to `data01`, the Volume size to 64GB, and the check box next to 'Thin-provisioned' is not checked. The Target Group should be set to `FC-PortGroup` and the Initiator Group to `ucm-dbserver`.

   The Volume block size should be set to 64K as described for the example.

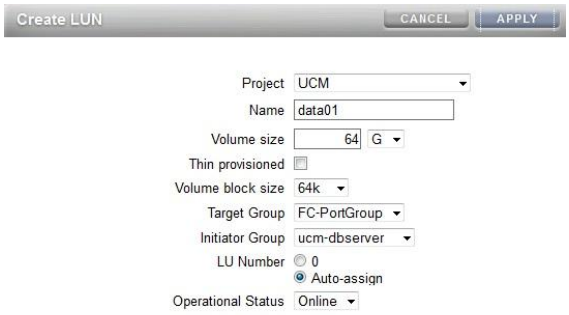

Figure 19. New LUN dialog window

Click Apply to create the LUN and to make it available to the database host. The BUI panel should look similar to Figure 20.

Figure 20. Newly created data LUN

5. Repeat steps 2 – 4 for the FRA LUN. In this example, the Name is `fra01`, and the Volume size is 128GB. All the other details should be the same.

   Once completed, the LUNs panel should look like Figure 21.

Figure 21. Newly created FRA and data LUNs

Creating the Oracle WebLogic Repository on the Database Host

Once the necessary system administration tasks have been completed to access the allocated LUNs on the database host (enabling access for the `oracle` user, for example), the next step is to configure the LUNs as ASM disk groups and then create the database on the ASM disk groups.

Creating the ASM Disk Groups

1. Log on to the database host as the user `oracle` in a GUI session capable of running the GUI-based ASM Configuration wizard '`asmca`'.
2. Set the Oracle SID by running '`. oraenv`' as seen in the following example. Typically you will use '`+ASM`' to access the ASM utilities.

```
{oracle!x4450 }$ . oraenv

ORACLE_SID = [oracle] ? +ASM
```

3. Run '`asmca`'. The ASM configuration wizard will be displayed as shown in Figure 22.

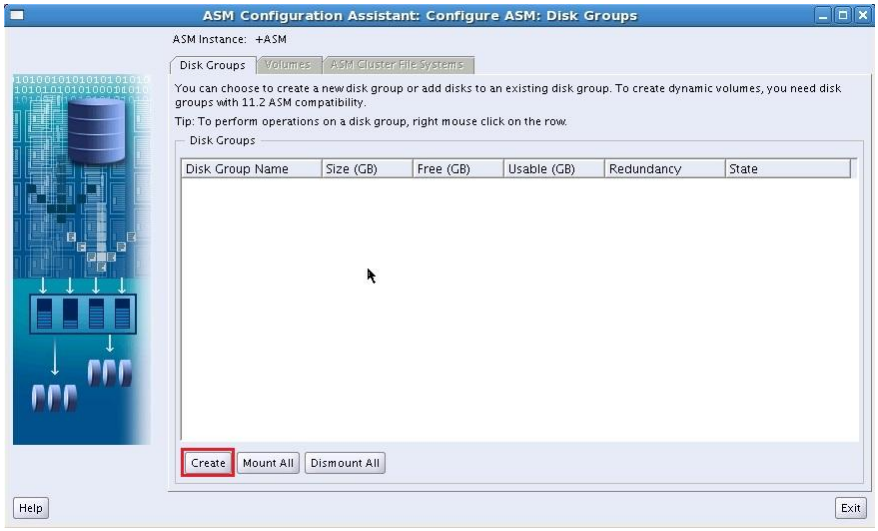

Figure 22. ASM configuration wizard

4. Click Create. The 'Create Disk Group' wizard will be shown as in Figure 23.

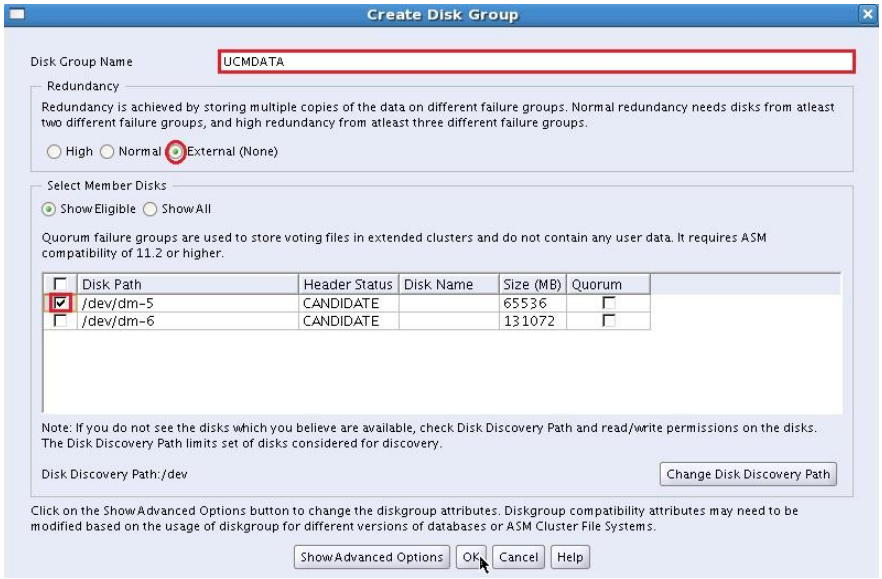

Figure 23. ASM Create Disk Group wizard

5. Enter the Disk Group Name, which in the example is '`UCMDATA`'. Ensure that the Redundancy check box is set at 'External (None)', as the data protection will be carried out by the Oracle ZFS Storage Appliance RAID-1 pool. Since a 64GB LUN was allocated for data, choose that volume (shown in the example as '`/dev/dm-5`') by selecting the check box to the left of that volume, as shown in Figure 23.
6. Click **OK**. A "DiskGroup: Creation" progress bar will be shown, followed quickly by a successful creation notification.
7. Click **OK.**
8. Repeat steps 4 - 7 for the disk group `UCMFRA` which will contain the Flash Recovery Area for the UCM database using the 128GB volume (`/dev/dm-6` in the example).

Once these steps are completed, the initial ASM Configuration Assistant screen will once again be displayed, with the disk groups `UCMDATA` and `UCMFRA` listed.

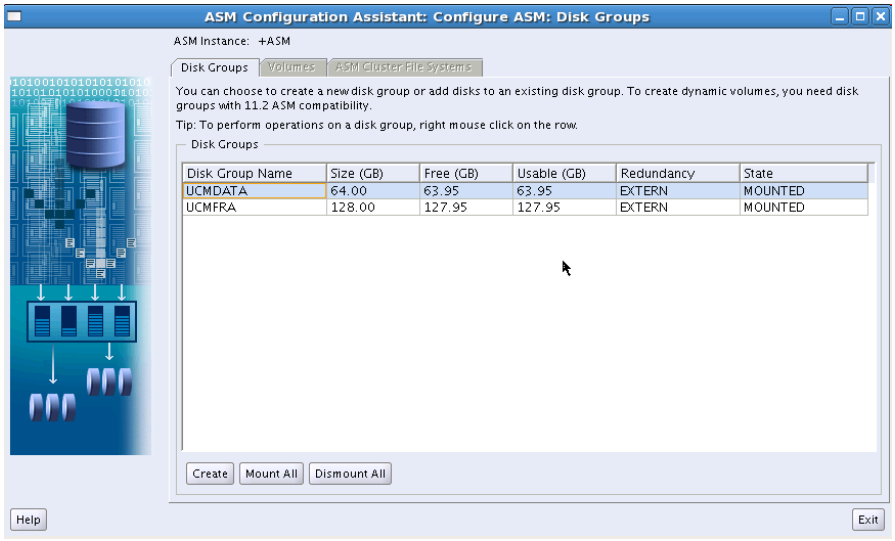

Figure 24. ASM disk groups completed

Creating the Database on the ASM Disk Groups

Now that the ASM disk groups are in place, you can create the Oracle Database using the standard Oracle tools.

The next steps will create the database to allow the WebLogic Repository Configuration Utility to create the necessary structures for WebCenter Content Manager.

1. Log on to the database host as the user `oracle` in an X session.
2. Change directory to the Oracle Database home directory and run '`bin/dbca`'. The Database Configuration Assistant (DBCA) will be displayed as shown in Figure 25.

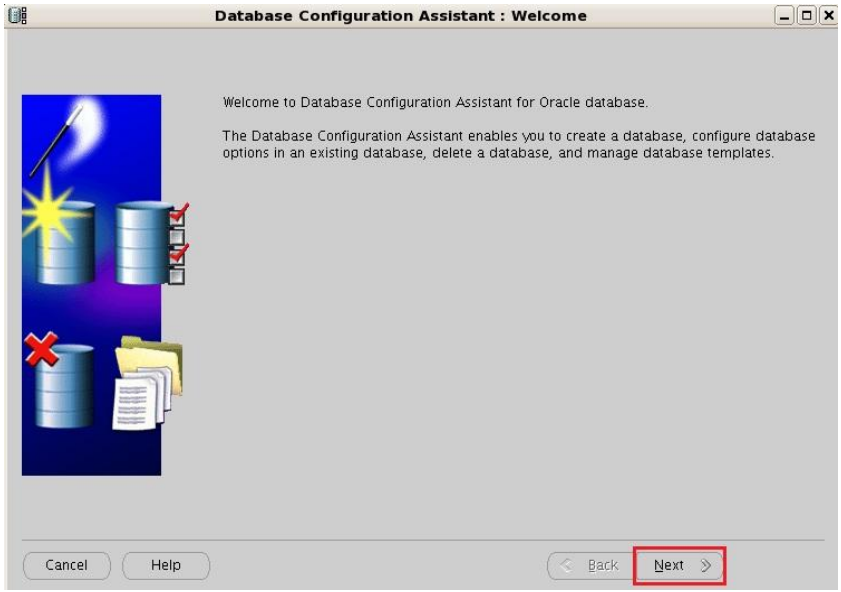

Figure 25. DBCA Welcome screen

3. Click **Next.**

4. Ensure ‘Create a Database’ is selected and click Next. The Database Identification dialog will be shown as in Figure 26.

5. Enter the Global Database Name. In the example, it is `UCMDATA.example.com`.

   The SID will be automatically populated from the Global Database Name, as seen in Figure 26.

6. Click **Next**.

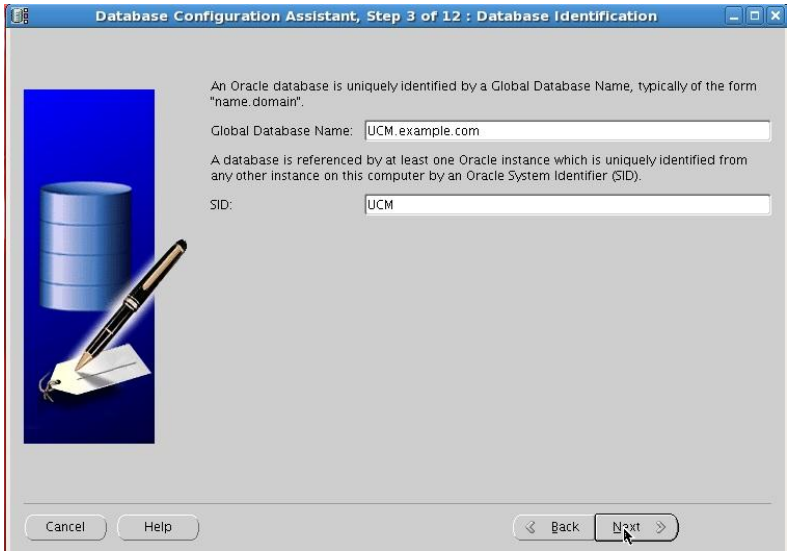

Figure 26. DBCA Database Identification screen

7. The DBCA Management Options dialog will now be shown. In the example, in order to enable a daily disk backup to the FRA at 02:00 AM, the 'Enable Daily Disk Backup to Recovery Area' checkbox is checked and the '`oracle`' username and password are entered, as shown in Figure 27.
8. Click **Next**.

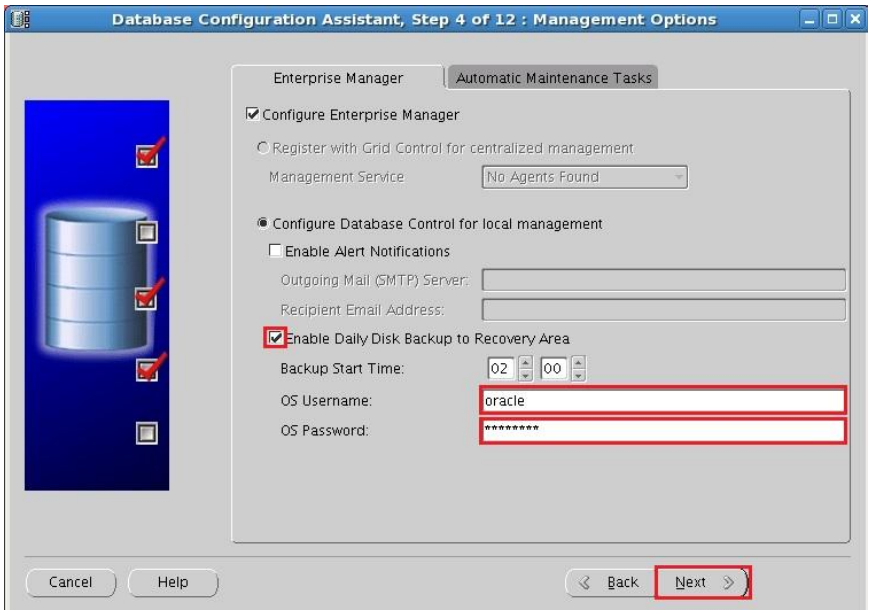

Figure 27. DBCA Management Options screen

9. The Database Credentials dialog window is shown. The allocation of passwords is usually defined by local security policy but in the example, the same password is used for all accounts. This is not recommended for a production installation.
10. Enter the Password and re-enter in the Confirm Password field as shown in Figure 28.
11. Click **Next**.

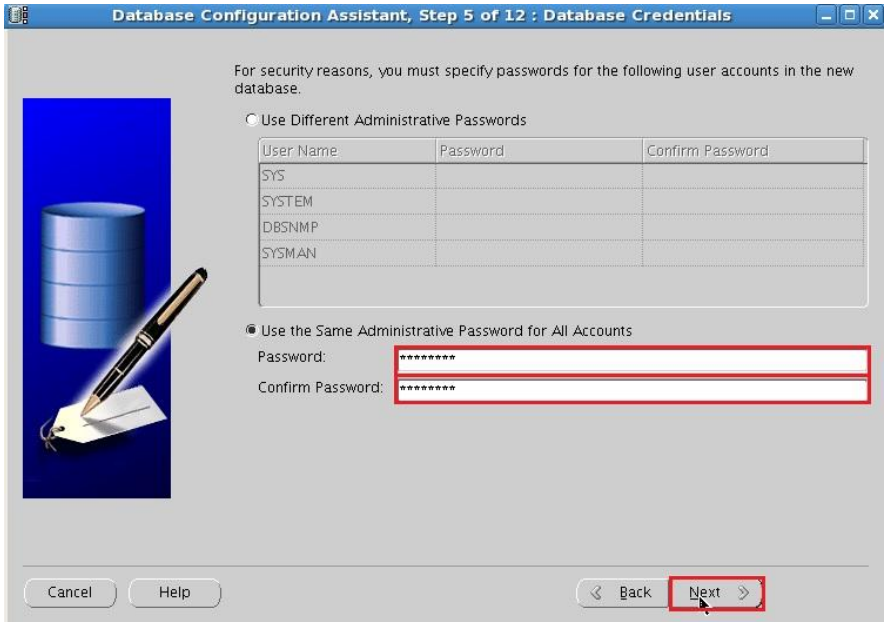

Figure 28. DBCA Database Credentials

12. Next, define the Database File Locations. Since Oracle-managed files will be used, select Automatic Storage Management (ASM) from the Storage Type drop-down menu, and ensure that the radio-button beside Use Oracle-Managed Files is selected. Enter the data ASM Disk Group name in the Database Area field – in this example, it is `+UCMDATA`. Figure 29 shows these settings.
13. Click **Next**.

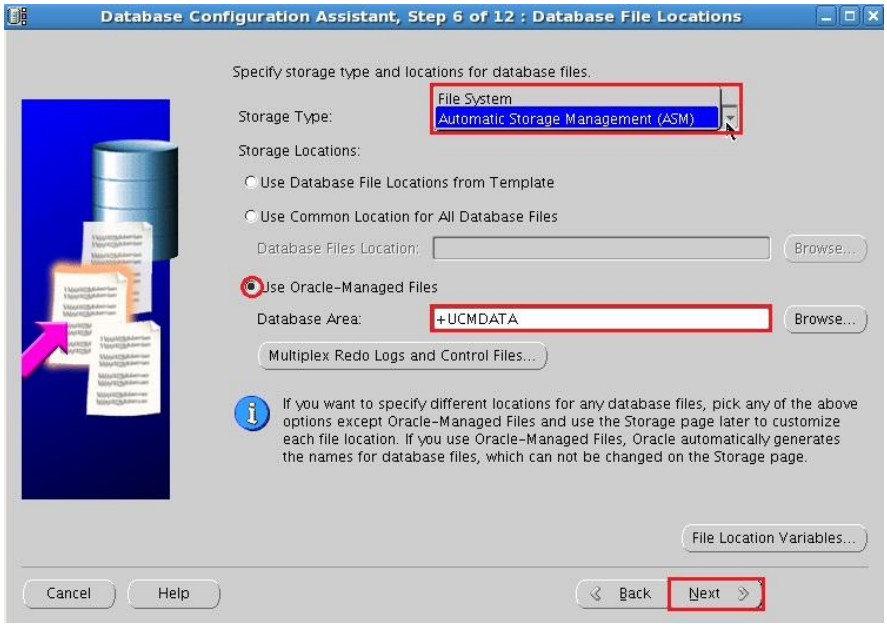

Figure 29. DBCA Database File Locations screen

14. The Wizard will then prompt for the password specific to ASM, as shown in Figure 30. Enter the password and click **OK**.

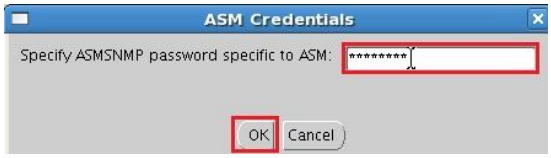

Figure 30. DBCA ASM Credentials

15. The Recovery Configuration dialog will then be shown, as in Figure 31. Since the FRA is defined in the example, you can specify the Flash Recovery Area by selecting the checkbox to the left and entering the FRA ASM Disk Group name in the Flash Recovery Area. In the example, this is `+UCMFRA`.

    It is good practice to have Archiving enabled to archive Redo Log files, so ensure that the Enable Archiving checkbox is set.

16. Click **Next**.

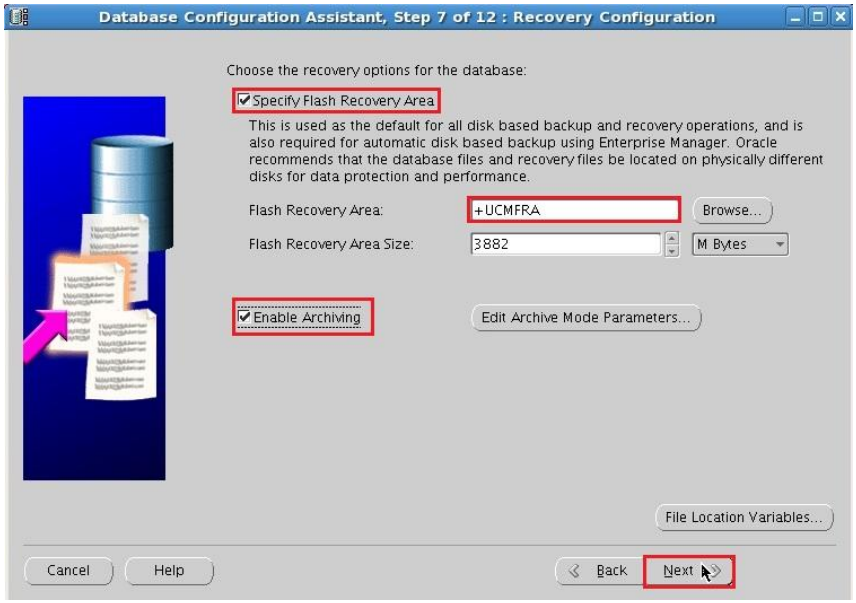

Figure 31. DBCA Recovery Configuration

17. The Wizard will prompt for whether you want to add sample schemas to the database content. Since you will use the WebLogic Repository Configuration Utility to ensure that the database content is as required for WebCenter Content Management, you do not want sample schemas in the database content. Click Next.
18. The Database Initialization Parameters dialog will then be shown as in Figure 32. Local Database Policy should define what memory size to allocate to the UCM repository. The example accepts the suggested SGA and PGA combined size and uses Automatic Memory Management. For this example, all default settings except the Character Sets setting, which will be changed in the next step, are unchanged.
19. Click the Character Sets tab.

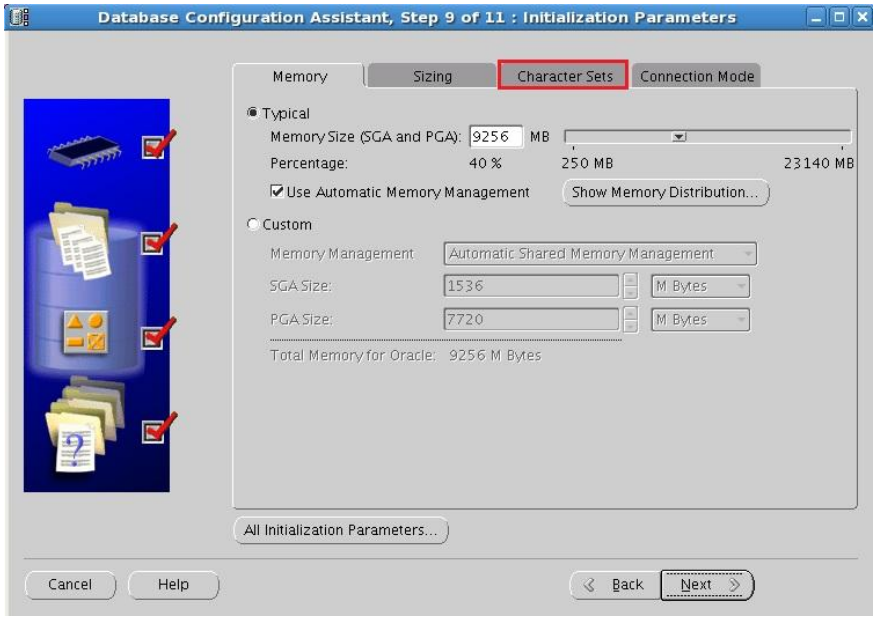

Figure 32. DBCA Initialization Parameters

20. Set the default database character set to Unicode (AL32UTF8) for the Repository Creation Utility, as shown in Figure 33.

21. Click **Next**.

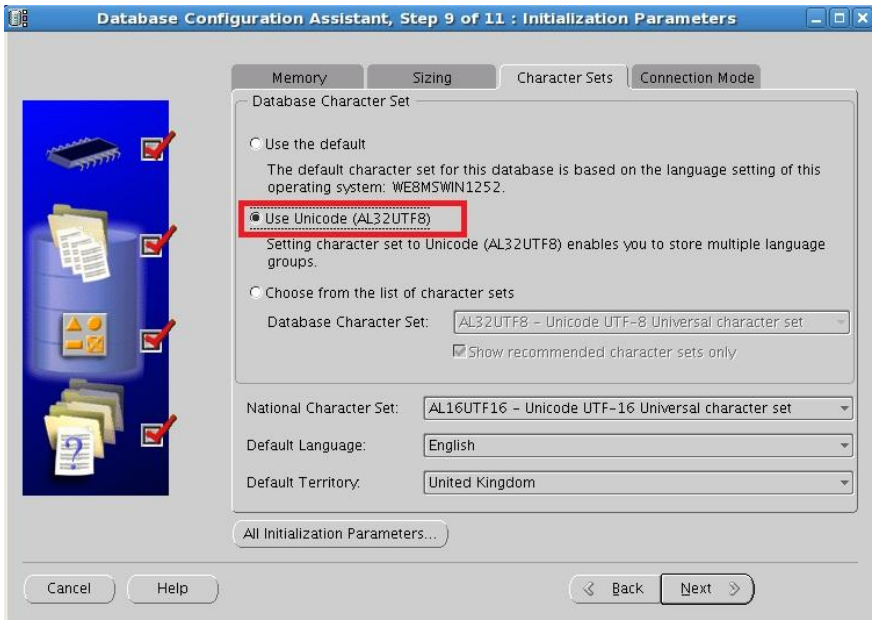

Figure 33. Defining the database character set in DBCA Initialization Parameters

22. The Database Storage dialog is then shown as depicted in Figure 34. Click **Next**.

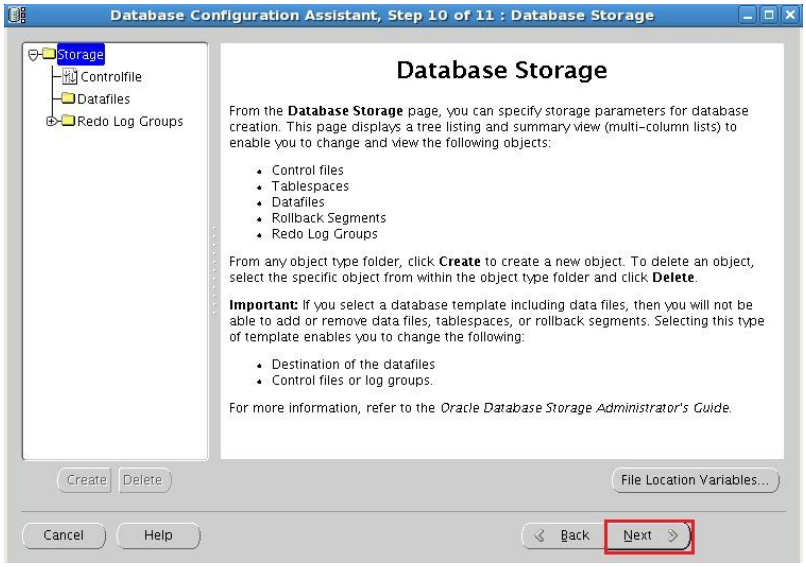

Figure 34. DBCA Database Storage screen

23. Finally, the last screen is shown with the option to Save as a Database Template and/or generate Database Creation Scripts. Local administration policy should dictate if these are required. None of these options are selected in the example. Click **Finish** as shown in Figure 35.

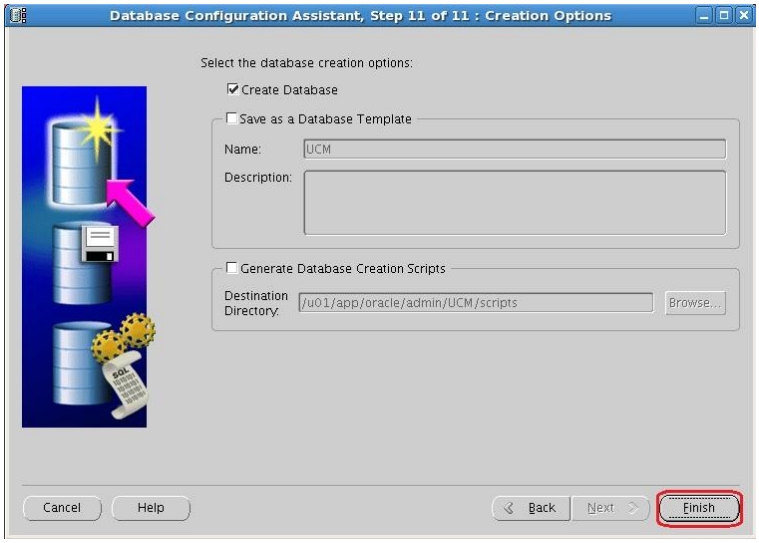

Figure 35. DBCA Creation Options screen

24. A Confirmation dialog is displayed with the option to save the configuration information as an HTML file. Click **OK**.

A progress dialog is then shown – as seen in Figure 36.

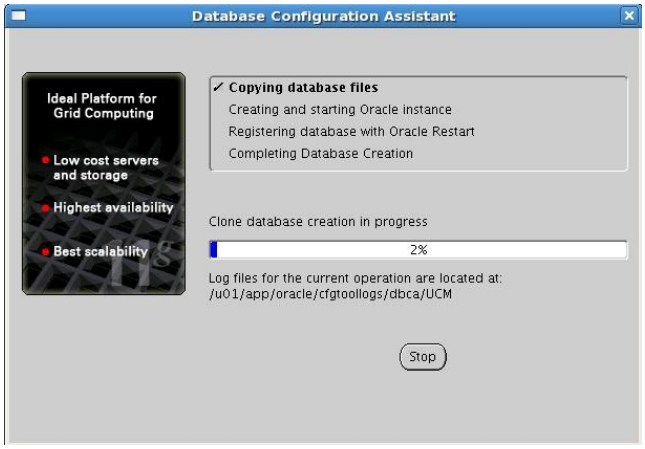

Figure 36. DBCA progress dialog screen

On successful completion of the tasks, the completion screen shown in Figure 37 will be displayed.

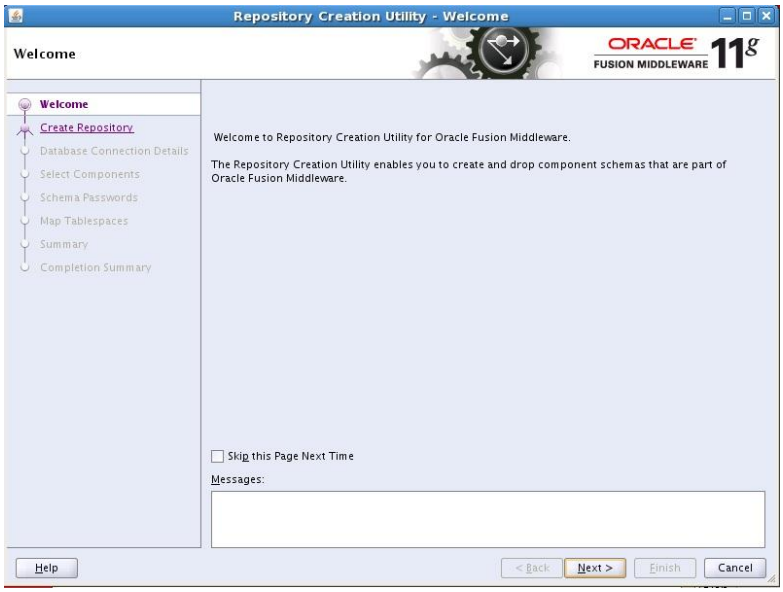

Figure 37. DBCA Completion screen

The database is now in place and ready to be set up for the WebCenter Content management application.

Installing the Oracle Fusion Middleware Components

The tasks required to install the Oracle Fusion Middleware components include creating the Oracle Fusion Middleware Repository, then installing Oracle WebLogic and WebCenter Content management software.

Creating the Oracle Fusion Middleware Repository

The Oracle Fusion Middleware Repository Creation Utility (RCU) is used to create the appropriate structures in the nominated database to ensure that the Oracle Fusion Middleware components are able to install and configure their own particular data and settings. The RCU can be downloaded from the Oracle web site.

Follow these steps to create the repository in the database:

1. Log on to the WebLogic host as the user '`oracle`' in an X-based session.
2. Change directory to where the Oracle Fusion Middleware RCU has been unzipped. In the example, this is `/stage/rcu`.
3. Run `rcuHome/bin/rcu`.
4. The screen as shown in Figure 38 will be displayed. Click **Next**.

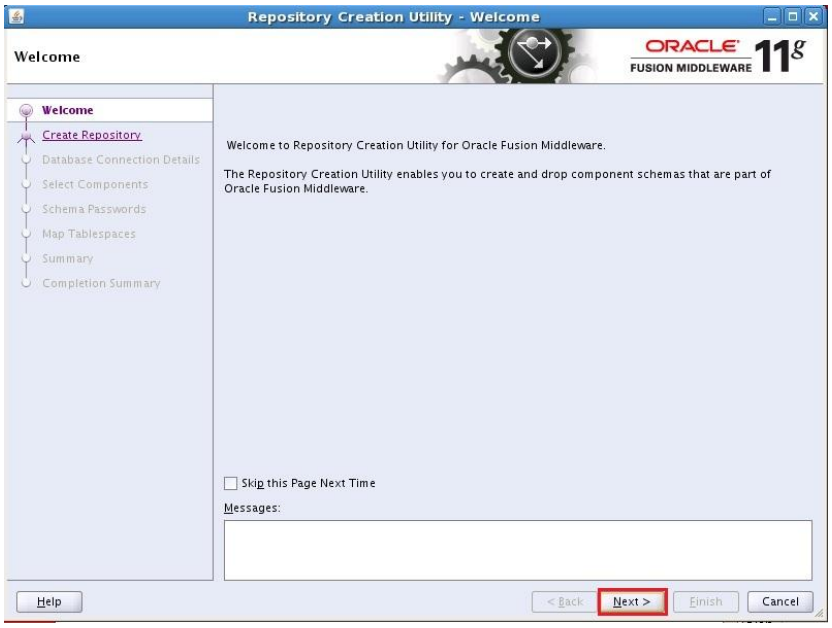

Figure 38. RCU Welcome screen

5. Ensure the 'Create' option is chosen by clicking on the radio-button, as shown in Figure 39, and Click **Next**.

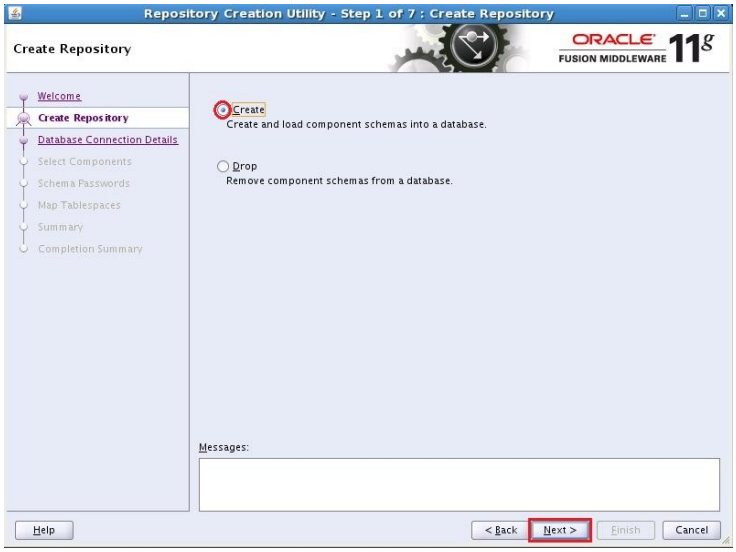

Figure 39. Repository creation

6. In the next step, specify the details for the database just created in the previous section, and apply by clicking on **Next**.

In the example shown in Figure 40, the database host is `x4450-1` and the database listener is sitting on port `1521`. The service name (the full name of the database) is `UCM.example.com`. The user with '`sysdba`' privileges is '`sys`' and the example uses the `SYSDBA` role.

Figure 40. RCU Database Connection Details screen

7. The RCU will then perform a check for prerequisite conditions and will display a progress dialog, like the example in Figure 41. Click **OK**.

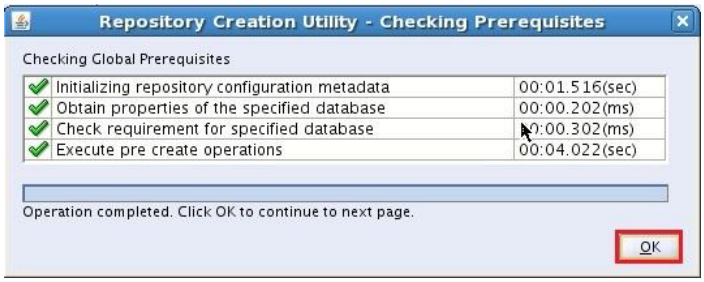

Figure 41. RCU prerequisite checks

8. Next, select the components that will be installed. During this step, you can change the prefix for the schema owners if required by local administration policy. In this example, no changes are made.

9. Ensure that WebCenter Content is selected by clicking in the checkbox to the left of the title as shown in Figure 42, and then select **Next**.

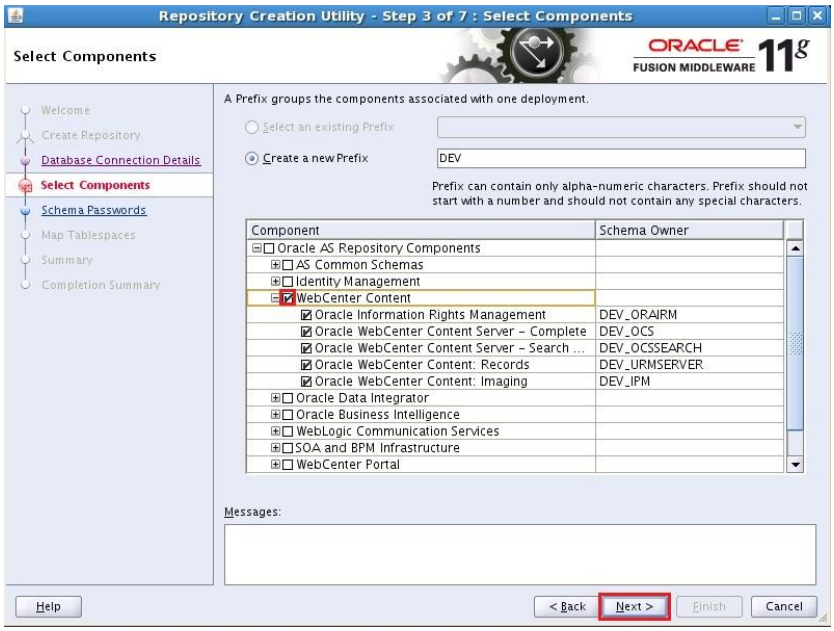

Figure 42. RCU component selection screen

10. The utility will perform a further check for component-specific prerequisites and display the results in a progress dialog window, as shown in Figure 43. Click **OK** to proceed.

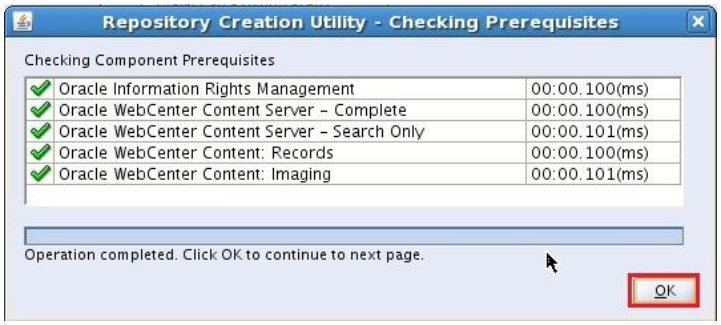

Figure 43. RCU component prerequisite check

The RCU will prompt for the schema passwords. In the example, the same password is used for all schemas, but the choice should be defined in the local database security policy.

11. Enter the password and re-enter in the Confirm Password field, if using the same password for all schemas, or fill in the details appropriate to local security policy, and Click **Next**.

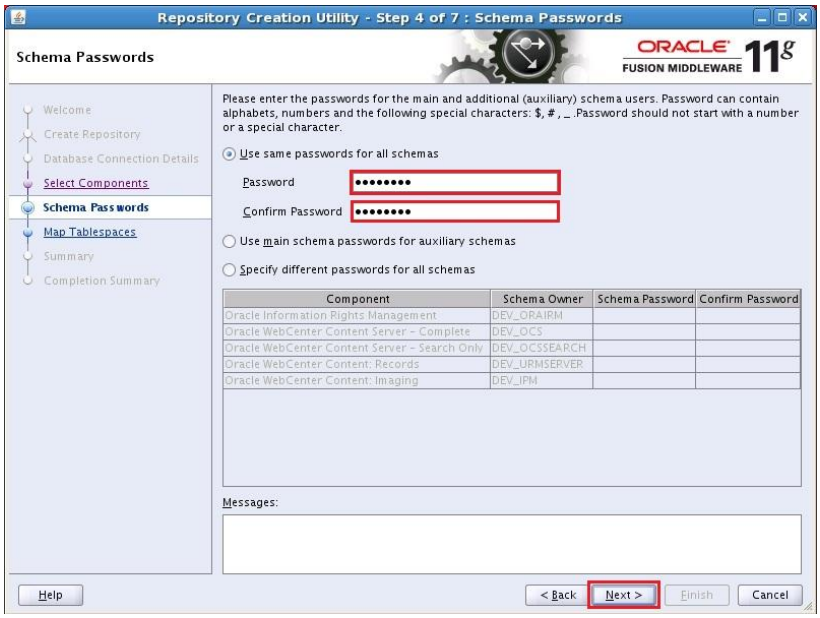

Figure 44. RCU Schema Passwords screen

12. The tablespace map can then be customized to conform to local administration policy. In the example, the default mappings are accepted as shown in Figure 45 by clicking **Next**.

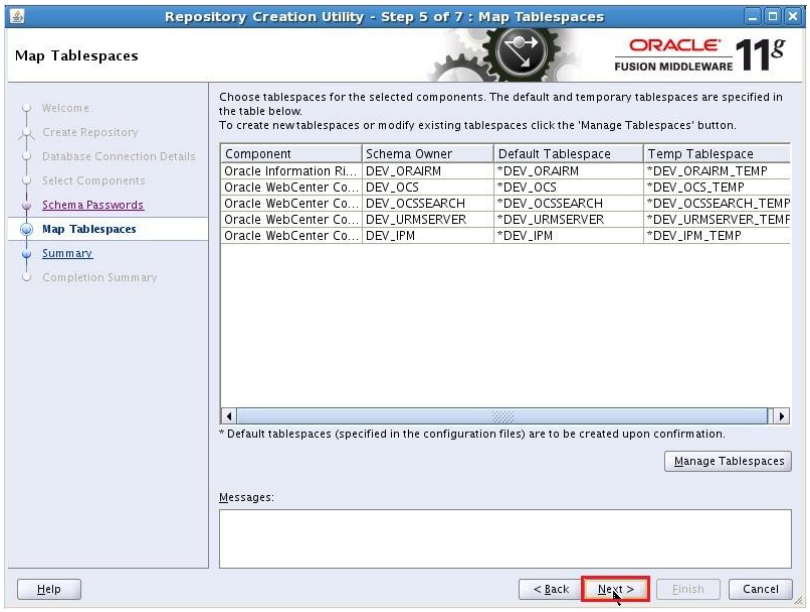

Figure 45. RCU Map Tablespaces displayed

13. A confirmation screen to indicate you want to proceed provides the option to return to the wizard and amend the tablespace map, as seen in Figure 46. Assuming you wish to continue with the tablespace creation, click **OK**.

Figure 46. RCU Confirmation screen

14. The RCU wizard will then create and validate the tablespaces in the nominated database. A progress dialog window, seen in Figure 47, will be displayed. Once the tablespaces have been created, click **OK** to continue.

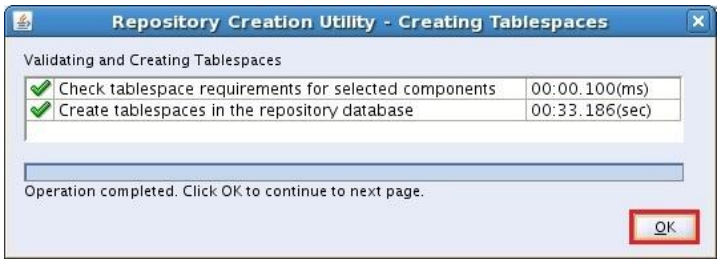

Figure 47. RCU Tablespace Creation

15. Next a summary screen like the one shown in Figure 48 will be displayed. Click **Create** to continue the operation.

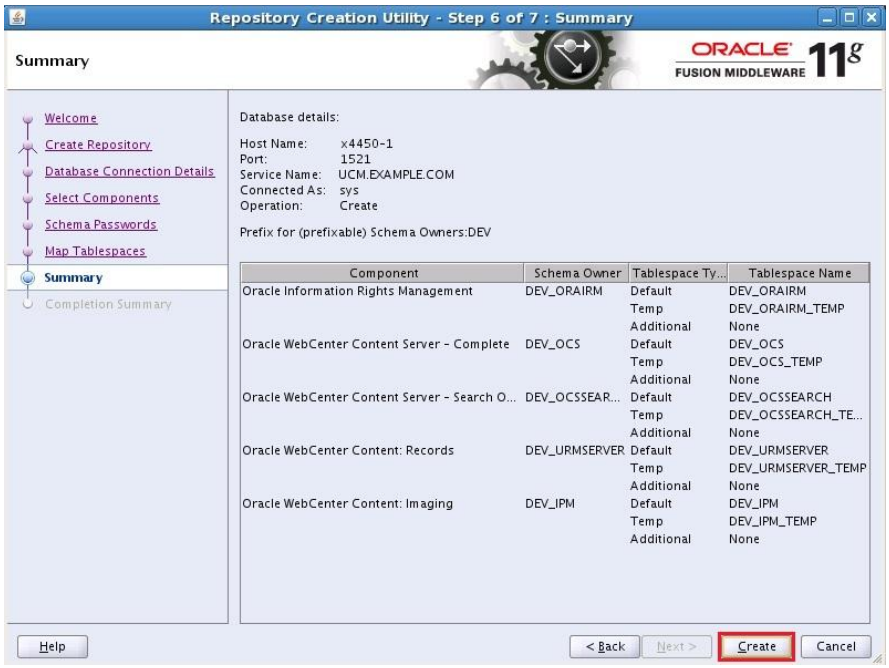

Figure 48. RCU Summary

Finally, a completion summary will be displayed. Click **Close** to finish.

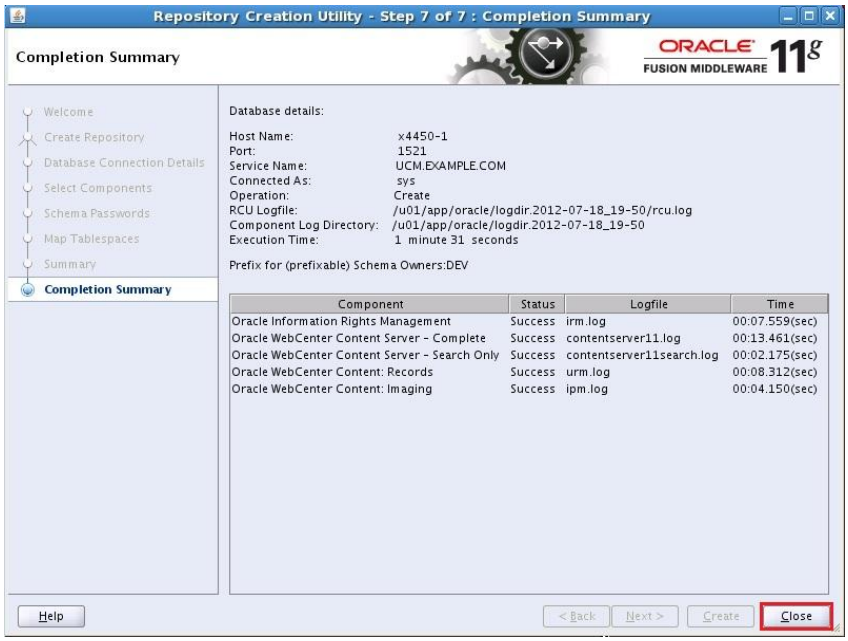

Figure 49. RCU Completion Summary

The RCU has successfully completed at this point, so the database contains all the necessary components that Oracle Fusion Middleware requires for WebCenter Content management.

Installing Oracle WebLogic

The next step is installation of Oracle Fusion Middleware WebLogic Server, which has been downloaded as a 'bin' file and stored on the WebLogic host.

1. Log on to the WebLogic host.
2. Change directory to the download area where the WebLogic Server package has been stored. Figure 50 shows the `/stage` directory, which in this example contains the downloaded packages. Click **Next** to continue.

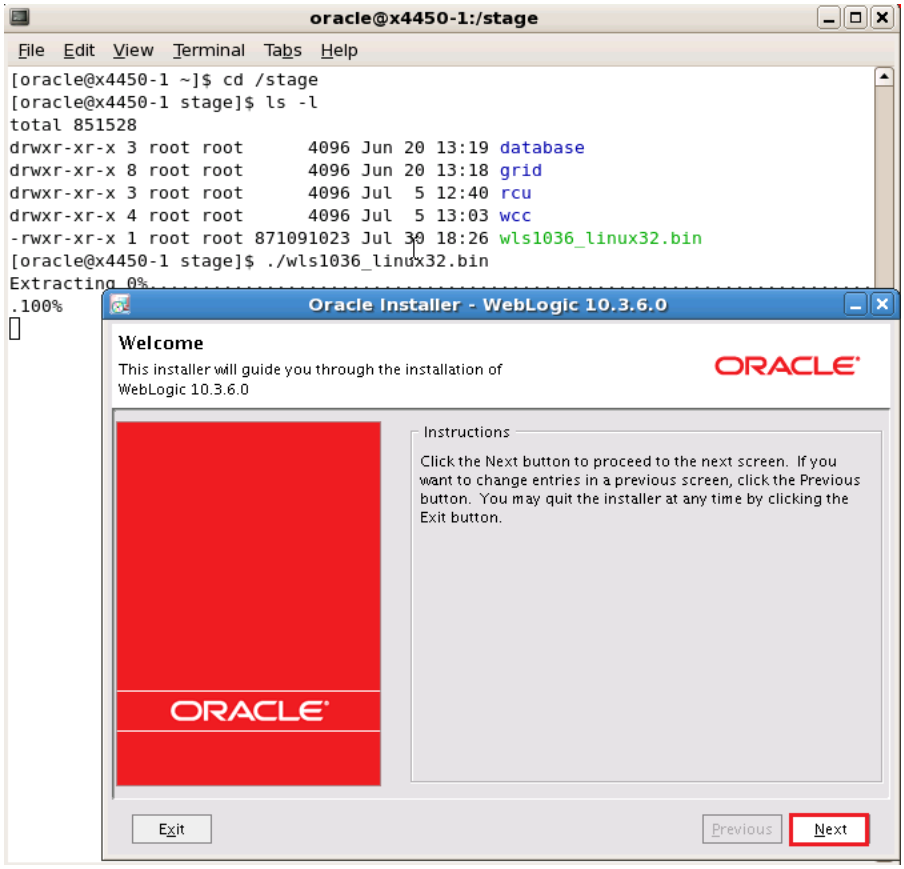

Figure 50. WebLogic installation welcome screen

The Installer will then prompt for whether you are using an existing Middleware Home or creating a new one. In the example, this is the first WebLogic installation, so the Installer will show the steps for creating a new one.

3. Choose the Home Directory, either by clicking on an existing installation directory or creating a new one, as seen in Figure 51, and click **Next** to continue.

   In the example, the new Middleware Home Directory is `/u01/middleware`.

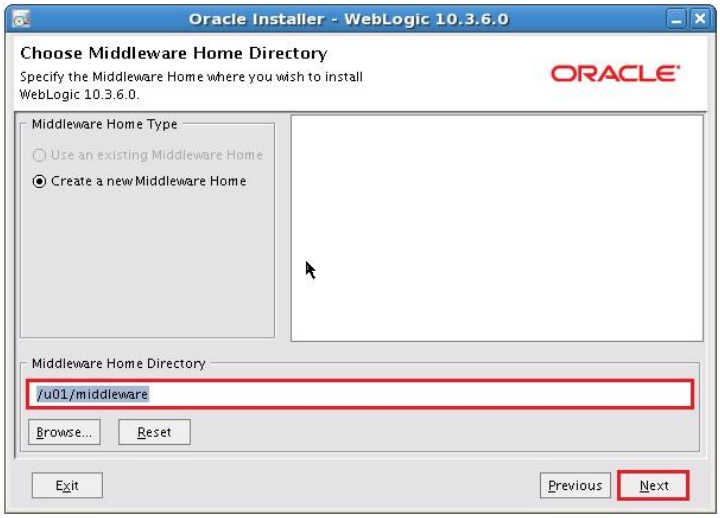

Figure 51. WebLogic new or existing home directory

4. The Installer provides the option to Register for Security Updates in the next screen. It is highly recommended that you take this option and enter your pre-registered email address for My Oracle Support and your Password in the appropriate fields. Figure 52 shows an example. Click **Next** to continue.

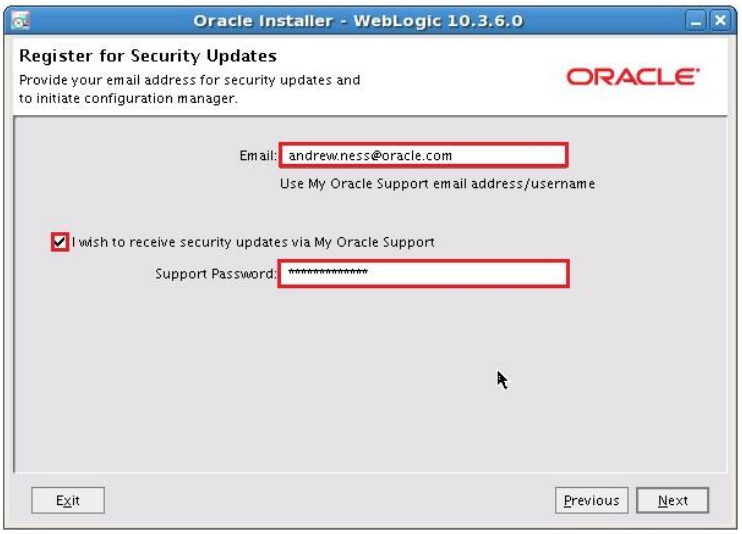

Figure 52. WebLogic Register For Security Updates screen

5. Next, choose an install type. If you are unfamiliar with WebLogic installations, choosing the Typical option is recommended. Do so by clicking the radio button and click **Next** to continue.

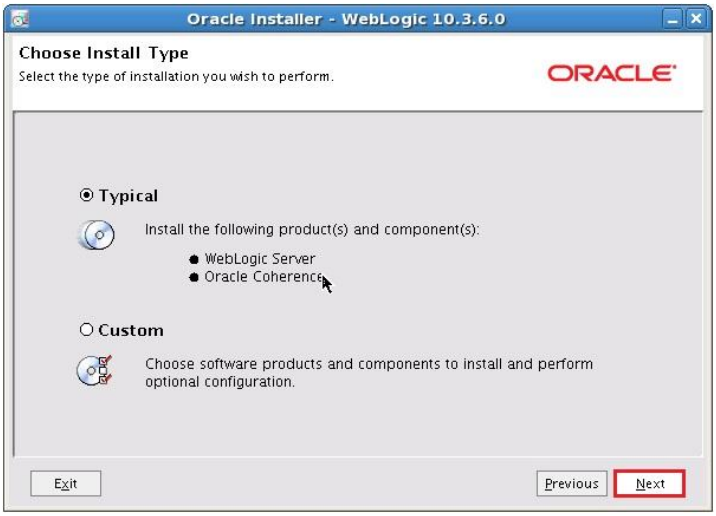

Figure 53. Choosing a WebLogic installation type

6. The Oracle Installer will then display a dialog showing the installation directories of the products being installed. It is highly recommended that these directories be left at the default values. Click **Next** to continue.
7. The Oracle Installer will then provide a summary of installations to be carried out. Click **Next** to continue.

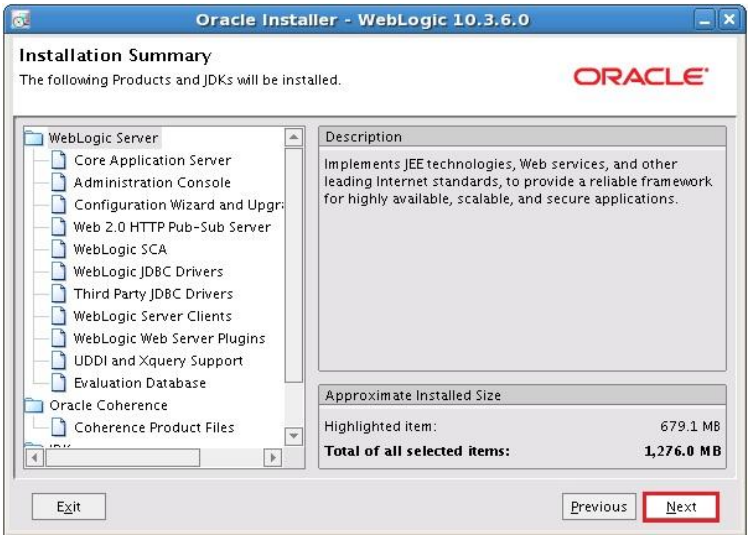

Figure 54. WebLogic Installation Summary screen

8. The Oracle Installer will show a progress screen, and upon successful completion, a confirmation screen, as seen in Figure 55. The example shows a highlighted checkbox next to Run Quickstart which, in this example, will not be run. Clicking the checkbox ensures that it is unset. Click **Done** to end the installation procedure.

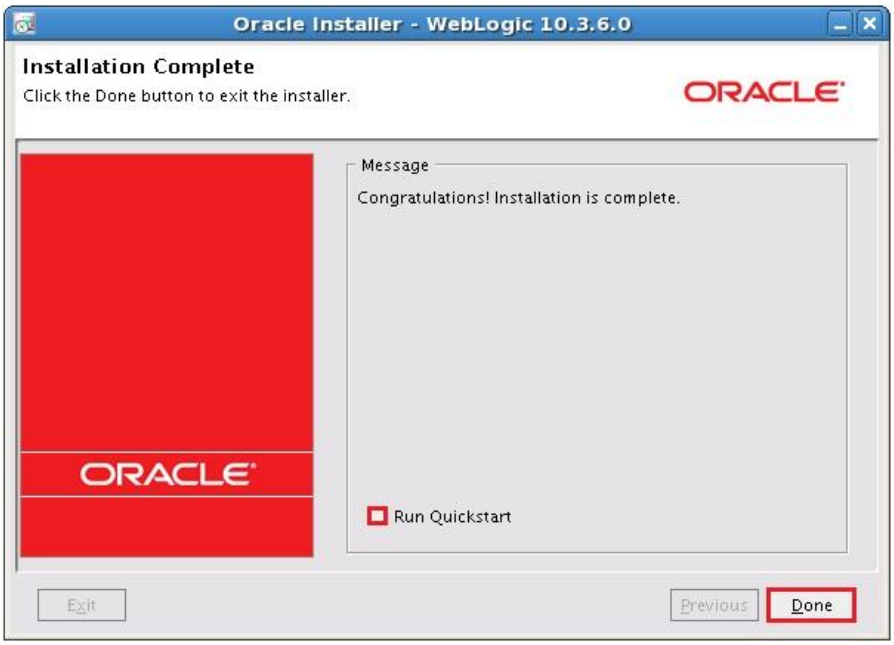

Figure 55. WebLogic Installation Complete screen

With the installation of WebLogic Server completed, you can now move on to installing WebCenter Content.

Installing WebCenter Content

Like the WebLogic server, WebCenter Content will have been downloaded and unpacked on the WebLogic host already. The following steps show how this application is installed.

1. Log on to the WebLogic host as the `oracle` user and change directory to the place where WebCenter Content has been unpacked. In the example, this is `/stage`.
2. Run the installer by changing to the directory `Disk1`.
3. The Installer will then prompt for the JRE or JDK location. In the example, highlighted in a red box, `/usr/java` is typed.

4. The Installation welcome screen will appear, as shown in Figure 56. Click **Next** to continue.

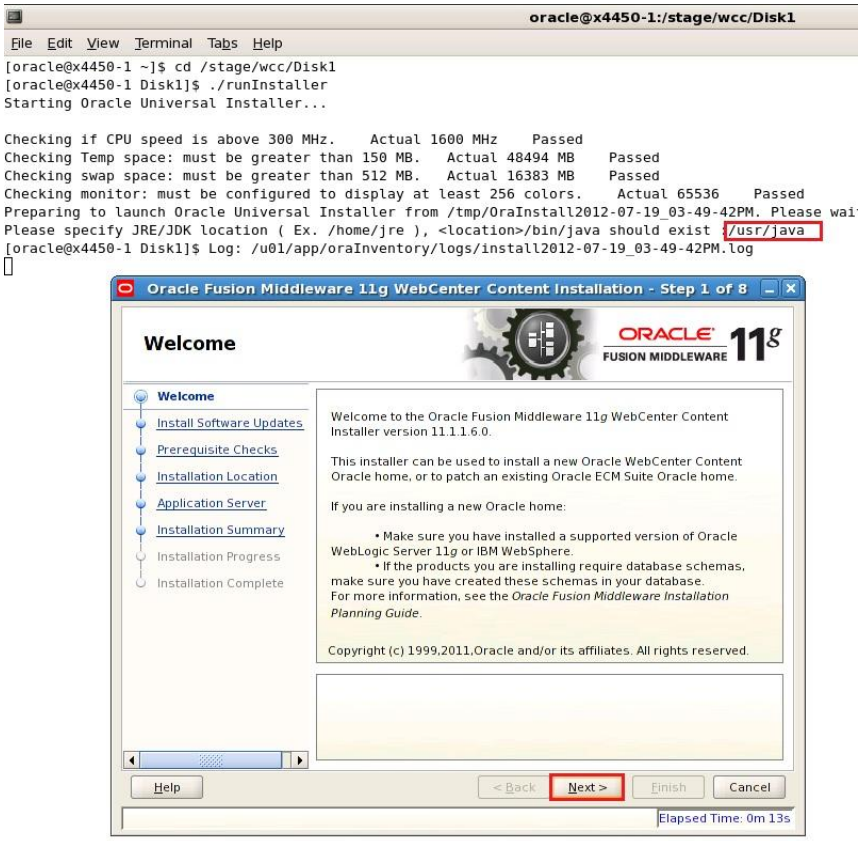

Figure 56. WebCenter Content Installation window

5. The Installer will then prompt for whether you want to search for any software updates on My Oracle Support. It is recommended that you run this check by selecting the Search My Oracle Support for Updates radio button, entering your MOS User Name, your MOS Password and clicking Search For Updates.

   An example of this search result is shown in Figure 57.

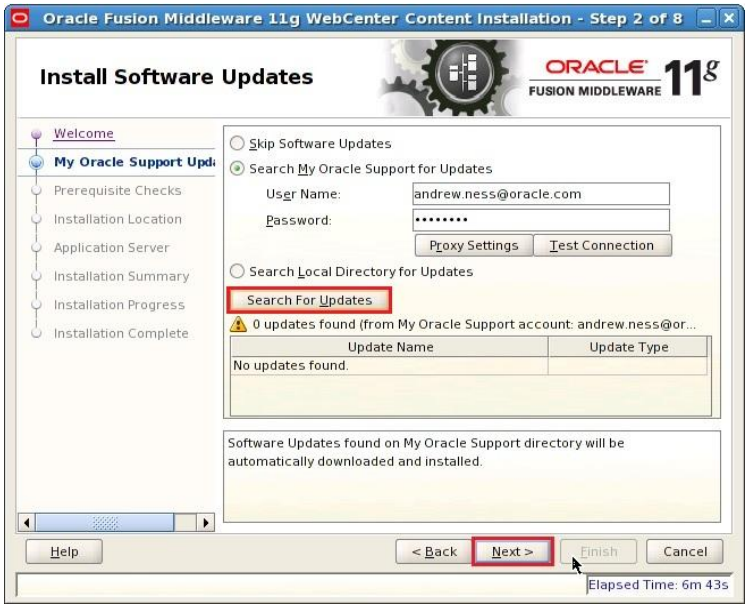

Figure 57. Results for WebCenter Content update search

6. Click **Next**. The installer will then run prerequisite update checks. If any checks fail, you must take the suggested remedial action and re-run the checks until all pass.
7. An example of a clean check run is shown in Figure 58. Click **Next** to continue.

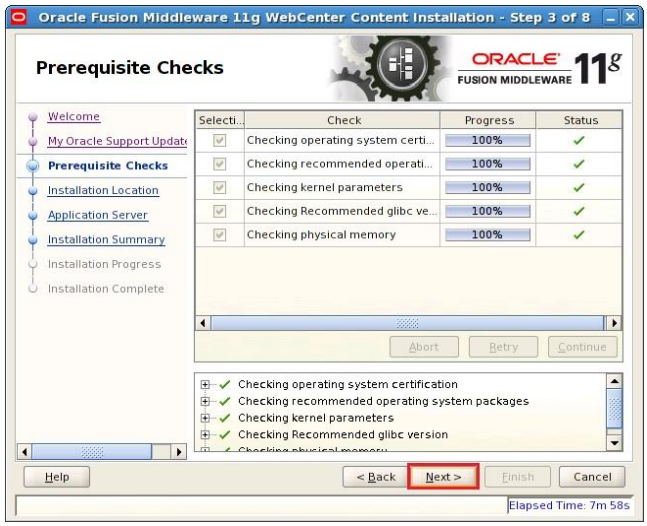

Figure 58. WebCenter Content Prerequisite Checks showing a clean run

8. The Installer will then prompt for the Oracle Middleware Home where the WebCenter Content application will be installed. Choose the Home from the dropdown box and enter the Home Directory if the populated entries need modification. The example Oracle Middleware Home and Oracle Home Directory are shown in Figure 59. Click **Next** to continue.

Figure 59. Specifying installation location for WebCenter Content

9. The Installer will then determine which application server installations are available and, if appropriate, prompt for which one will be hosting WebCenter Content – either WebLogic Server or WebSphere. Select the appropriate application server by clicking the radio button next to the name. Click **Next** to continue.

In the example, only WebLogic Server is available, so WebSphere is not selectable, as seen in Figure 60.

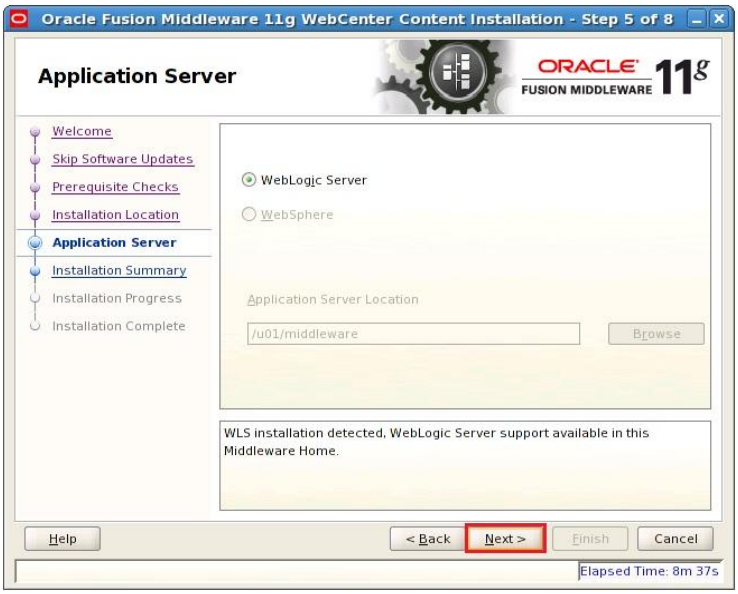

Figure 60. Choosing a WebCenter Content Application Server

10. The Installer will then show an Installation Summary screen. The details can be saved in a response file should it be required for administrative purposes. Click **Install** to continue. The example installation summary is shown in Figure 61.

Figure 61. WebCenter Content Installation Summary

11. The Installer now shows an Installation Progress screen which, when complete, will allow you to click **Next** to continue. The example Installation Progress screen is shown in Figure 62.

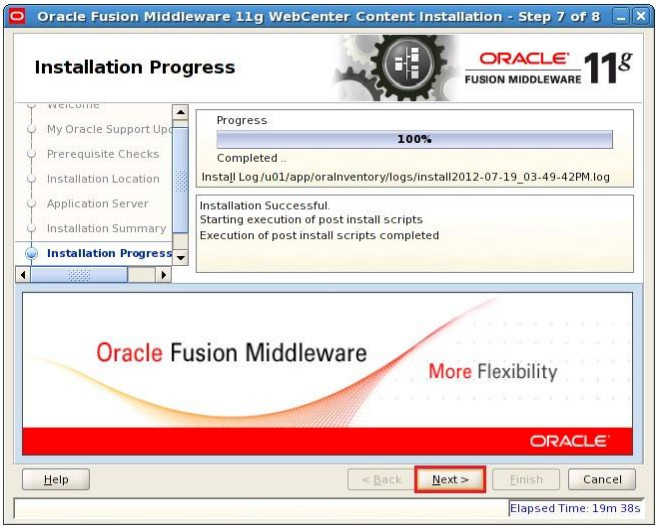

Figure 62. WebCenter Content Installation Progress display

12. The Installer will then show the Installation Complete confirmation and provide the option to save Installation Details as seen in Figure 63. Click **Finish** to exit the Installer.

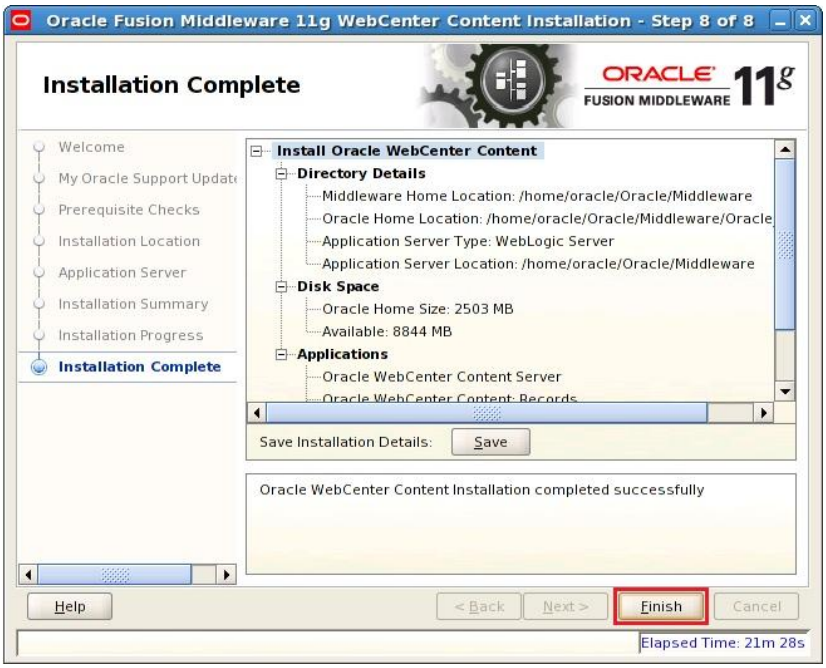

Figure 63. WebCenter Content Installation Complete screen

Configuring the Oracle WebLogic Domain

Now that the installation of the components is completed, you must perform some basic configuration.

Log on to the Oracle WebLogic host in an X-session as the `oracle` user and change directory to the Middleware Home Directory. In the example, this is `/u01/middleware`. Under this directory, you should find the WebCenter Content home directory specified in Figure 59 which, in the example, is `Oracle_ECM1`.

Change to this directory and then change to the directory `common/bin`. (In the provided example, the full directory is `/u01/middleware/Oracle_ECM1/common/bin`.)

The following steps will now configure the Oracle WebLogic domain.

1. Run `./config.sh` to start the Fusion Middleware Configuration Wizard.
2. After a brief splash screen, you are given the option of creating a new WebLogic domain or extending an existing WebLogic domain. Choose the appropriate option by clicking the corresponding radio button and click **Next** to continue.

   Continuing with the example, this is a new installation, so 'Create a new WebLogic domain' is selected, as seen in Figure 64.

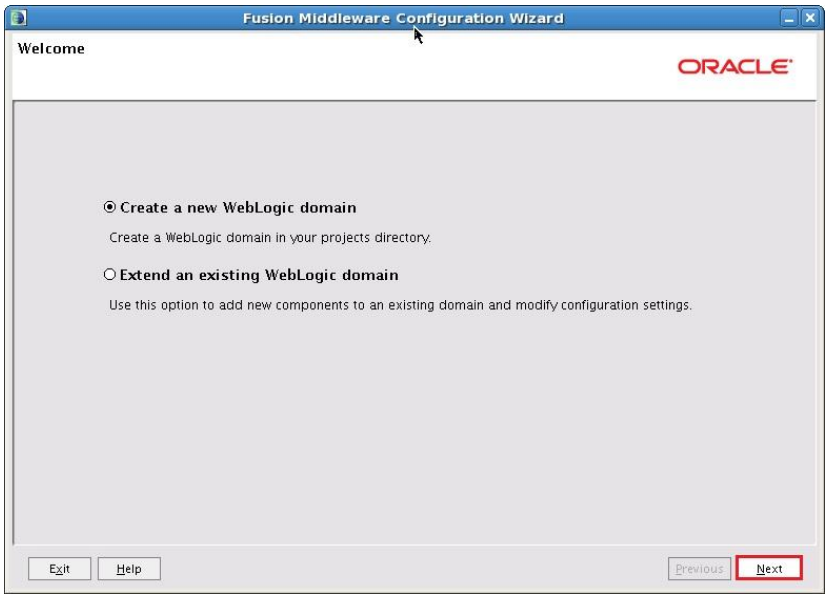

Figure 64. Choosing the WebCenter Content domain

3. The Configuration Wizard then provides a list of the products that will be supported by this domain. Click the checkbox next to the products you require. Click **Next** to continue.

The example in Figure 65 shows the following chosen:

- Oracle Universal Content Management – Inbound Refinery
- Oracle Universal Content Management – Content Server

Note that the Wizard may automatically choose other options (such as Oracle JRF) that are required to support the products you choose.

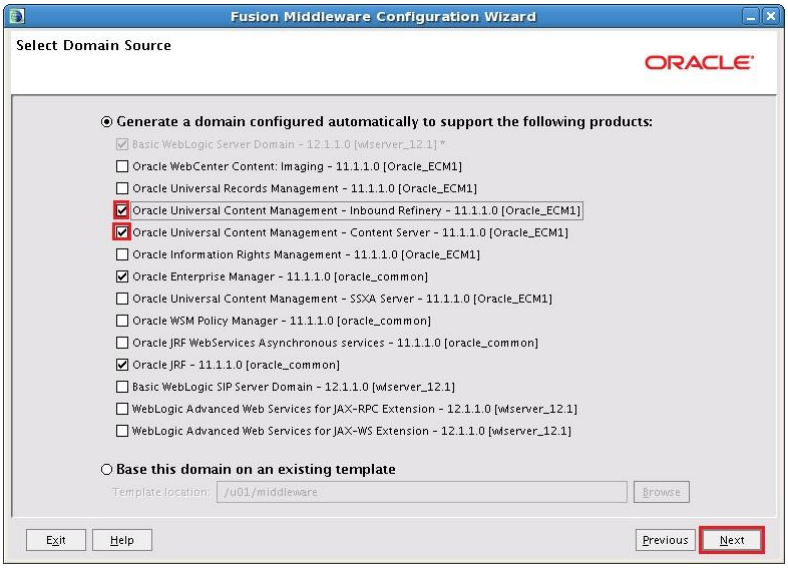

Figure 65. WebCenter Content product selection

4. The Wizard will now prompt for a domain name, location, and the location for the applications within the domain. In the example, shown in Figure 66, the default choices will be kept for simplicity. Click **Next** to continue.

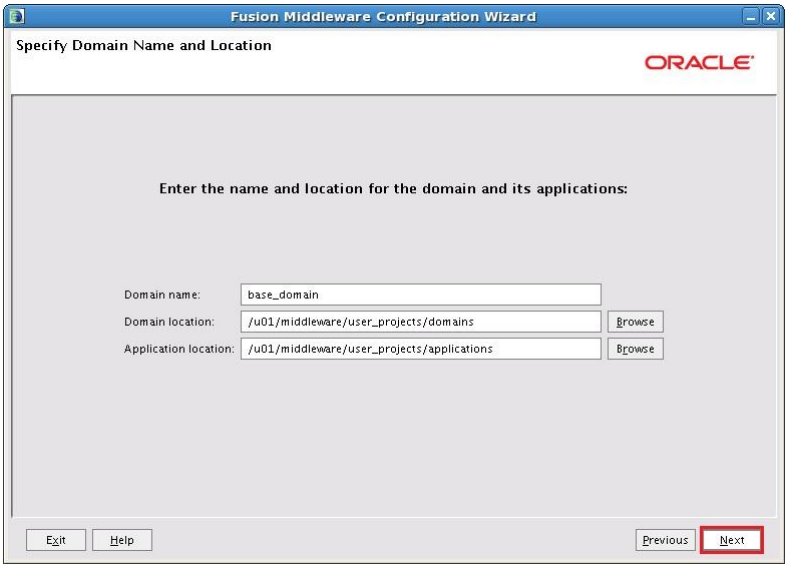

Figure 66. WebCenter Content domain details

5. The Wizard then prompts for the WebCenter Content administrator name and user password. After entering them, click **Next** to continue.

   Local administration policy may determine what the username and passwords should be set to. In the example in figure 67, the default name is `weblogic` and user password is `oracle4u`. The same password is entered in the Confirm user password.

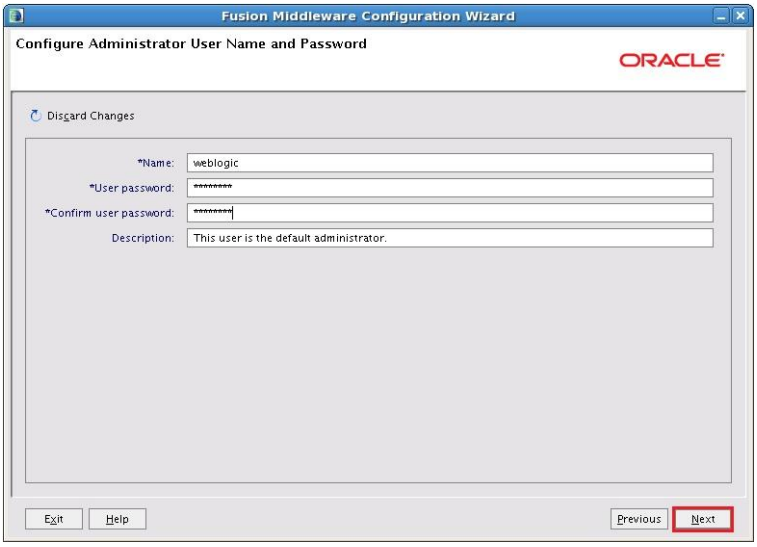

Figure 67. Entering the WebCenter Content administrator user name and password

6. The Configuration Wizard then prompts for which JDK and Development mode you wish to use. If this is a development installation, then startup performance may be the priority. If so, choose the Sun SDK that is supplied in the window. Conversely, the

WebLogic JRockit SDK provides better performance for runtime and management, so it is better suited to Production mode.

Choose the deployment mode by clicking the radio button next to either Development Mode or Production Mode, and the JDK by selecting the appropriate option from the list of Available JDKs. Then click **Next** to continue.

The example is a development deployment, so the default Sun SDK is chosen, as seen in Figure 68.

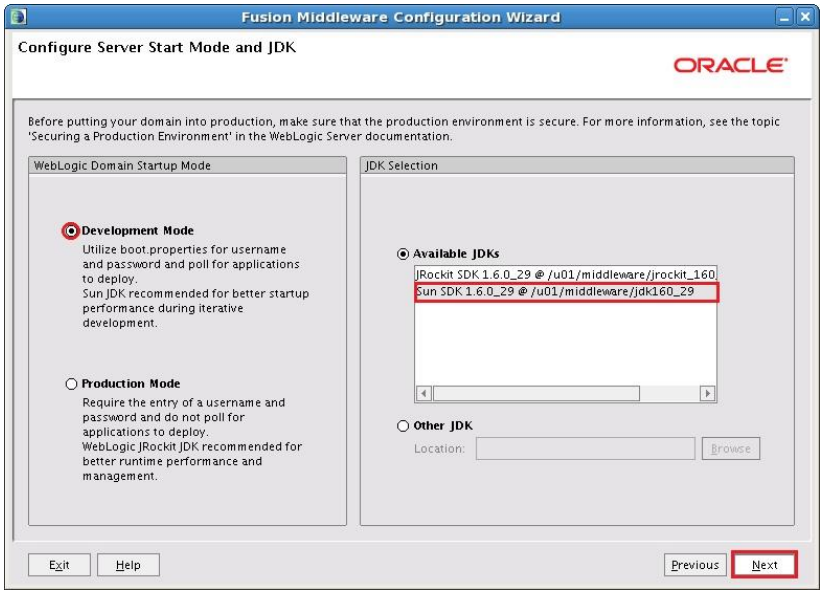

Figure 68. WebCenter Content deployment mode and selected JDK

7. The Configuration Wizard will now prompt for the JDBC Component Schema details. This will require the database details as specified in Figure 40 when creating the RCU. Select each component entry pane in turn and enter the appropriate details for DBMS, Host Name, Port, Schema Owner and Schema Password, as seen in Figure 69, and click **Next**.

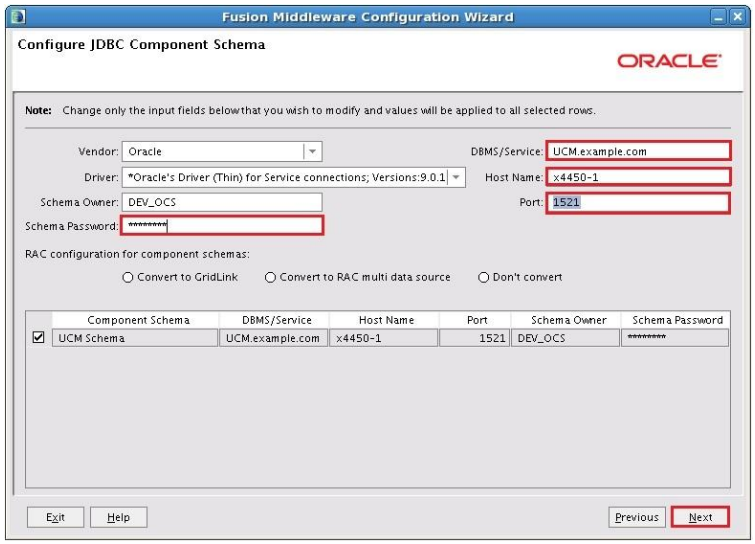

Figure 69. WebCenter JDBC Component Schema screen

8. The wizard will then run a connection test to ensure that the details are correct. This is shown in Figure 70. Once you have reviewed the results, click **Next** to continue.

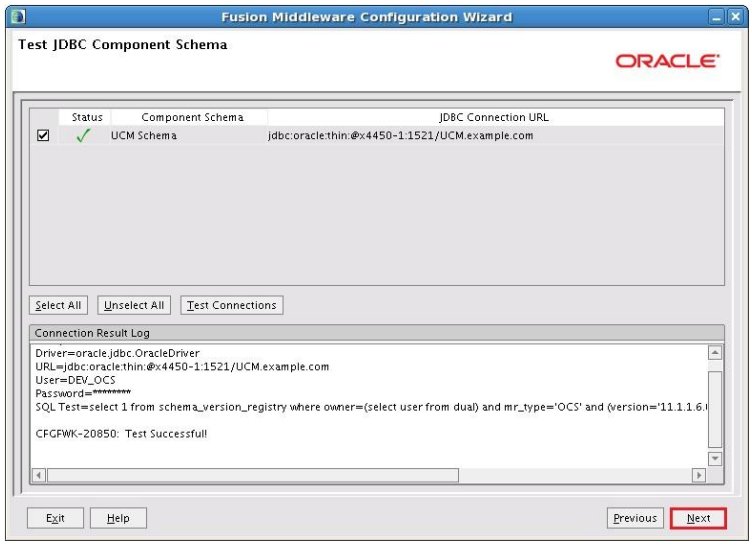

Figure 70. WebCenter Content Connection test and result log

9. Next, you are prompted for the Optional Configuration details, where you can create deployment servers, clusters and hosts. At a minimum, you must define a WebCenter Content host, which will also have the Administration Server attached to it. You will then deploy the applications to these hosts (or host). Click **Next** to continue with these operations.

The example in Figure 71 shows the ‘Managed Servers, Clusters and Machines’ and ‘Deployments and Services’ checkboxes marked.

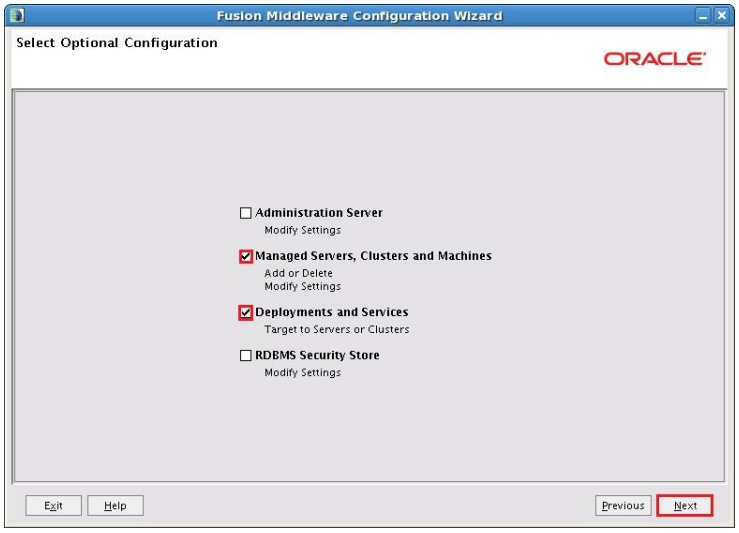

Figure 71. WebCenter Content Optional Configuration screen

At this point, your configuration may vary from the example, depending on which configuration options you chose. You should, however, see the following steps among those presented to you by the Configuration Wizard.

10. The wizard now presents the Configure Managed Servers screen, where you provide the Application Server instances’ names as well as define IP addresses on which the applications will listen, the Listen port and, if SSL is enabled, the SSL listen port. After making your entries, click **Next** to continue.

The example in Figure 72 shows the following choices: keeping the default server names, responding to all local IP addresses, setting the Listen port to the default of 16200 for UCM and 16250 for IBR, and SSL enabled with the default SSL listen ports selected.

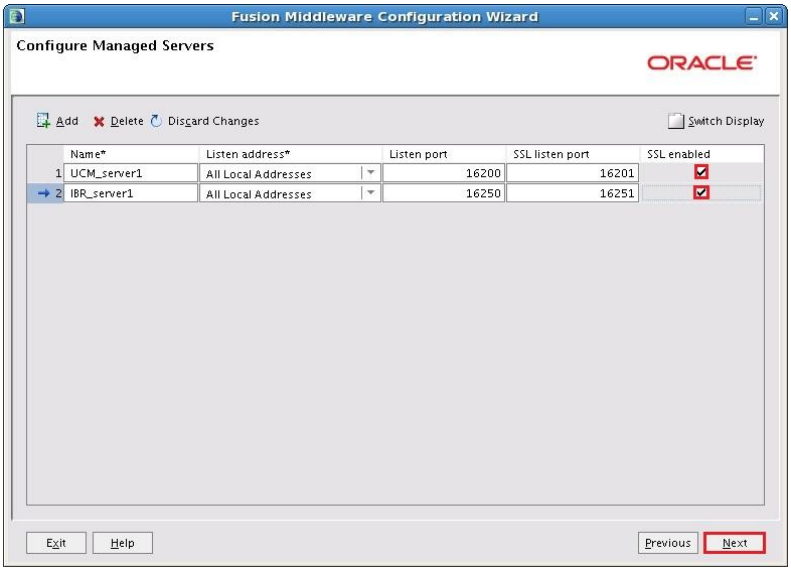

Figure 72. Configuring managed servers for WebCenter Content

11. The Configuration Wizard now prompts for any clustering configuration. Needed entries include: the cluster name, cluster messaging mode, if appropriate, multicast address and multicast port, and cluster address, should a cluster be deployed. After providing these entries, click **Next** to continue.

    There are no clusters in the example deployment, so no entries are made in the Configure Clusters screen in Figure 73.

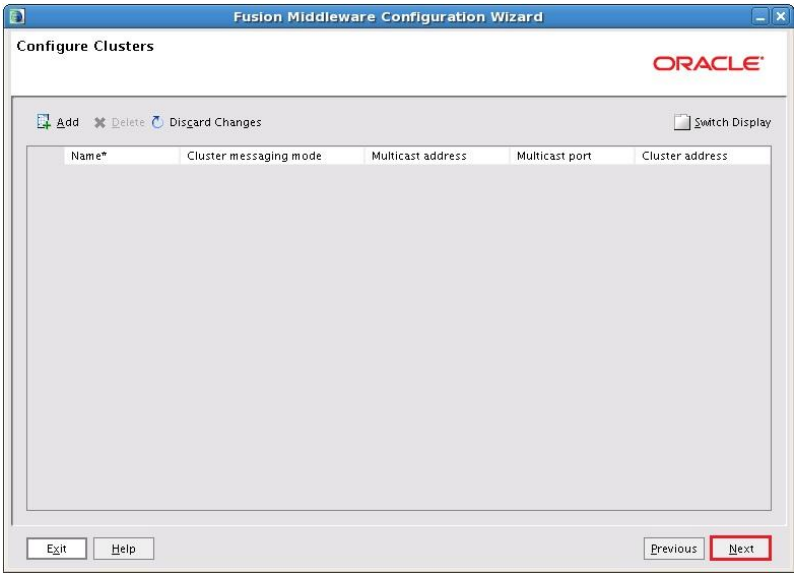

Figure 73. Configuring a cluster in the WebCenter Content Configuration Wizard

The next window is the Configure Machines screen, in which you define the machine that will host the applications.

In the example, a Linux server will be deployed, so in Figure 74, the Unix Machine tab is chosen.

12. After selecting your appropriate tab (Machine or Unix Machine), click on the Add menu item. Supply the Name of the Machine, and change any details that will differ from the defaults.

    You can set the application to run as any nominated user by selecting the 'Post bind UID enabled' checkbox and entering the username in the 'Post bind UID' field.

    Similarly, you can designate the application to run with a specific group ID by selecting 'Post bind GID enabled' and entering the group name in the 'Post bind GID' field.

    The Node Manager can restrict application access from the lost host only or from any network address by selecting the 'Node Manager Listen address'.

    Once this configuration is properly set up, click **Next** to continue.

    In the example, the defaults are accepted and only the name of the Unix machine needs to be changed, to `WCCmachine` as seen in Figure 74.

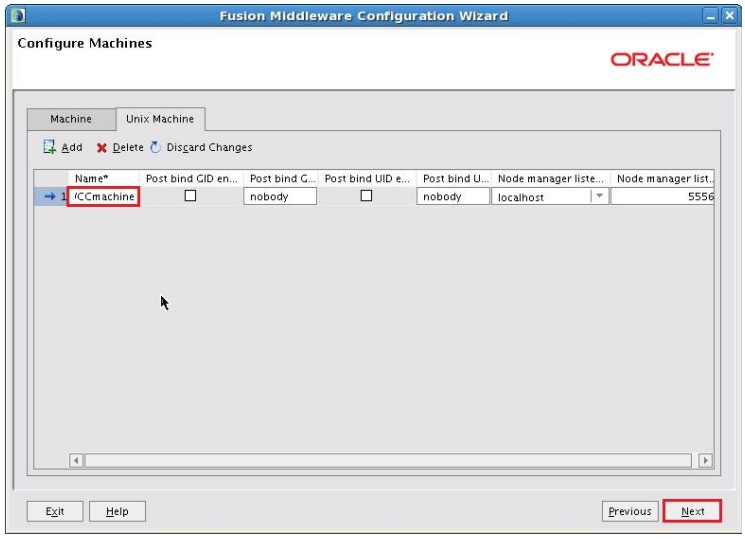

Figure 74. WebCenter Content Configure Machines window

13. The Configuration Wizard now presents the option to assign servers to machines. To do so, control-click on each server in turn and click the right-facing arrow in the middle of the display to assign each application to the machine. Click **Next** to continue.

    In the example in Figure 75, all the applications are assigned to the machine `WCCmachine` created in the previous step.

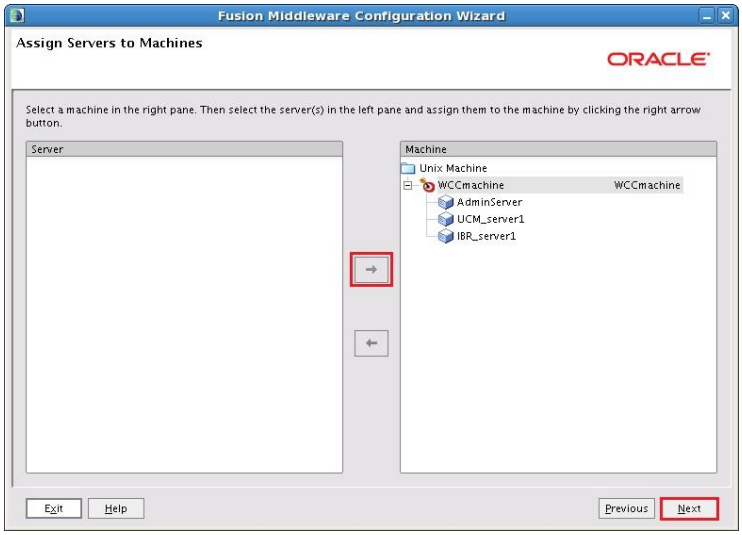

Figure 75. WebCenter Content Assign Servers to Machines window

14. The Configuration Wizard now presents a window to modify deployments for each application server. The application server runs multiple "serverlets" – seen in Figure 75 under `WCCmachine`. The deployments shown in Figure 76 for the example show the Admin server (`AdminServer`), a UCM server (`UCM_server1`) and an inbound repository server (`IBR_server1`). Unless there is a specific reason for doing so, do not modify these values. Click **Next** to continue.

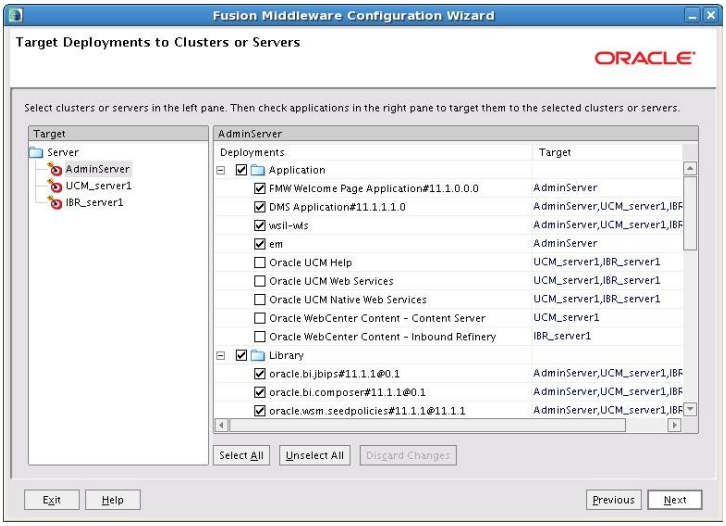

Figure 76. WebCenter Content deployment targeting window

15. Similarly to the previous step, the Configuration Wizard next provides the option of targeting services to clusters or servers. Again, unless there is a compelling reason to change these, leave the default values in place and click **Next** to continue.

Figure 77 shows the example default values.

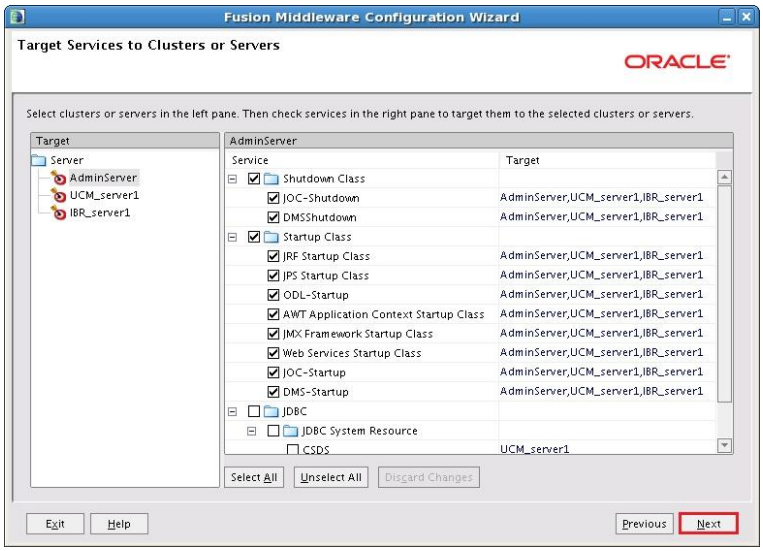

Figure 77. Configuration for WebCenter Content service deployment

16. The Configuration Wizard now displays the configuration summary, as seen in Figure 78. Click **Create** to continue.

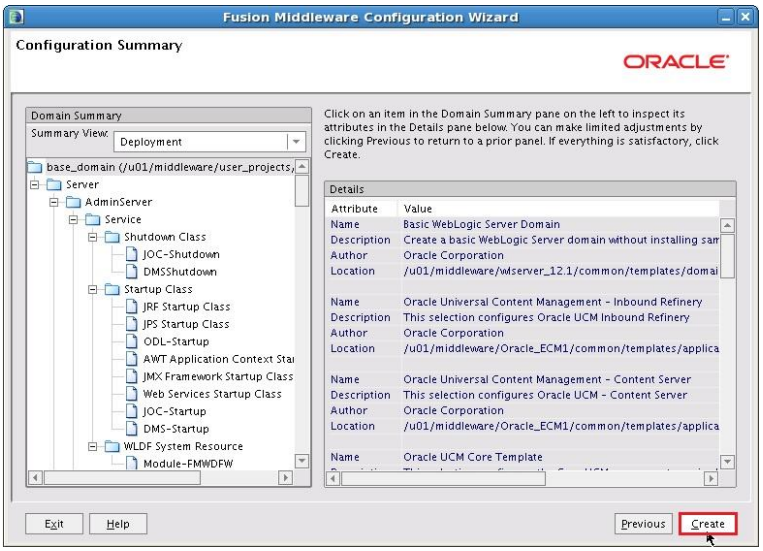

Figure 78. WebCenter Content Configuration Summary screen

17. The progress screen will then be shown. Upon completion, click the **Done** button, highlighted in Figure 79, to exit the Wizard.

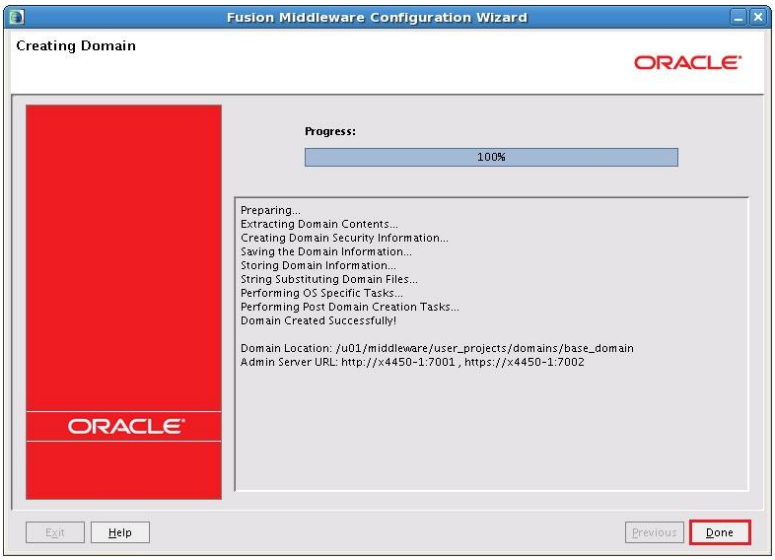

Figure 79. WebCenter Content configuration completed

Now that the configuration is completed, the next task is starting the necessary servers.

Starting the Administration Server / Oracle WebLogic

To start up WebCenter Content, it is necessary to start the Oracle WebLogic server first.

Change directory to the Middleware Home and locate the `user_projects/domains` directory. Within this directory will be a further directory named after the domain you created earlier – in the example, it is `base_domain`.

```
[oracle@x4450-1 ~]$ cd /u01/middleware/user_projects/domains/base_domain
```

Locate the script called `startWebLogic.sh` in this directory and execute it. The script only returns when the WebLogic server is shut down so you may want to run this script as a background job.

```
[oracle@x4450-1 base_domain]$ ./startWebLogic.sh &
```

After a lengthy display of logging information, the screen will display the string "`<Server started in RUNNING mode>`." Once this message is displayed, you can perform the next step in the configuration/startup procedure.

Starting the Node Manager

To avoid log messages becoming mixed together, open another window to start the Node Manager.

In the new window, change directory to the Oracle Fusion Middleware home directory, within which there is a directory tree `oracle_common/common/bin`. Change directory to this directory tree, find the script `setNMProps.sh` and execute it.

This script only needs to be run once but it does check that the work it needs to carry out is actually needed before performing any changes.

```
[oracle@x4450-1 middleware]$ cd /u01/middleware/oracle_common/common/bin
[oracle@x4450-1 bin]$ ./setNMProps.sh
Required properties already set. File nodemanager.properties not modified.
```

Now start the Node Manager process by changing to the Oracle WebLogic server installation directory (in the example, `/u01/middleware/wlserver_10.3/server/bin`).

```
[oracle@x4450-1 bin]$ cd /u01/middleware/wlserver_10.3/server/bin
[oracle@x4450-1 bin]$ ls
international  setWLSEnv.sh  startNodeManager.sh
[oracle@x4450-1 bin]$ ./startNodeManager.sh
+
CLASSPATH=/u01/middleware/patch_wls1035/profiles/default/sys_manifest_classpa
th/weblogic_patch.jar:/u01/middleware/jrockit_160_24_D1.1.2-
4/lib/tools.jar:/u01/middleware/wlserver_10.3/server/lib/weblogic_sp.jar:/u01
/middleware/wlserver_10.3/server/lib/weblogic.jar:/u01/middleware/modules/fea
tures/weblogic.server.modules_10.3.5.0.jar:/u01/middleware/wlserver_10.3/serv
er/lib/webservices.jar:/u01/middleware/modules/org.apache.ant_1.7.1/lib/ant-
all.jar:/u01/middleware/modules/net. sf.antcontrib_1.1.0.0_1-0b2/lib/ant-
contrib.jar::/u01/middleware
+ export CLASSPATH
+ export PATH
+ cd /u01/middleware/wlserver_10.3/common/nodemanager
+ set -x
…
```

[Logging output deleted]

```
…
<Jul 30, 2012 8:33:15 PM BST> <Info> <Security> <BEA-090906> <Changing the
default Random Number Generator in RSA CryptoJ from ECDRBG to FIPS186PRNG. To
disable this change, specify -
Dweblogic.security.allowCryptoJDefaultPRNG=true>
<Jul 30, 2012 8:33:16 PM> <INFO> <Secure socket listener started on port
5556>
Jul 30, 2012 8:33:16 PM weblogic.nodemanager.server.SSLListener run
INFO: Secure socket listener started on port 5556
```

Once the server displays the string “Secure socket listener started on port 5556”, you can open a Web browser instance to start up the WebCenter Content servers.

1. Open a Web browser to `http://<ip-address>:7001/console` to show the WebLogic Server login screen as shown in Figure 80. The default administrator name specified earlier and the associated password should be entered in the Username and Password fields. Click **Login** to continue.

Figure 80. WebLogic Server login screen

2. In the Domain Structure box on the left of the web page, expand the Environment tree by clicking on the + icon and click Servers as highlighted in Figure 81.

Figure 81. Expanding the Environment / Servers tree

3. The Summary of Servers table should appear to the right of the Domain Structure table. Click on the 'Control' tab and then select the check box to the right of `UCM_server1` and `IBR_server1` as shown in Figure 82.

4. Click **Start** to bring the servers online.

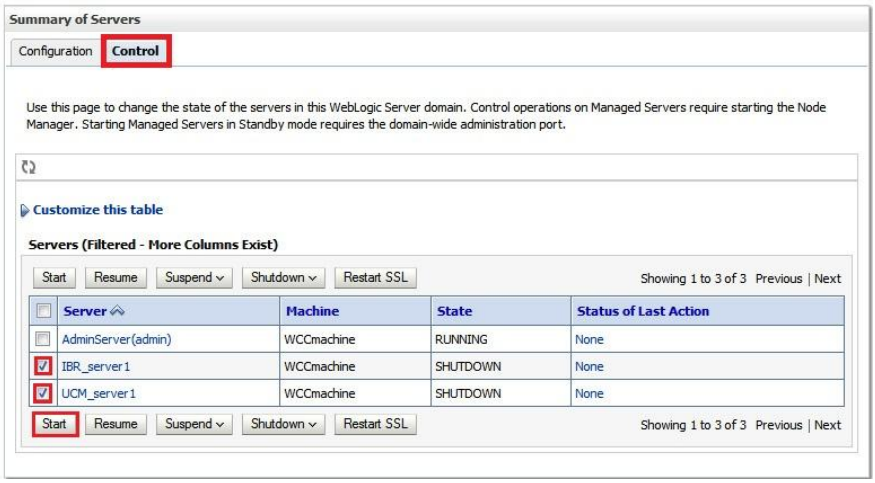

Figure 82. Starting the WebCenter Content servers

5. The servers will then begin their startup procedures, as shown in the Summary of Servers table. Initially, the Server table will appear as in Figure 83 with the state `STARTING` displayed.

Server	Machine	State	Status of Last Action
AdminServer(admin)	WCCmachine	RUNNING	None
IBR_server1	WCCmachine	STARTING	TASK IN PROGRESS
UCM_server1	WCCmachine	STARTING	TASK IN PROGRESS

Figure 83. Servers starting

Clicking the '🔄' icon will cause the table to automatically refresh. After the servers have started, the table will appear as in Figure 84 with the server states set to `RUNNING`.

Server	Machine	State	Status of Last Action
AdminServer(admin)	WCCmachine	RUNNING	None
IBR_server1	WCCmachine	RUNNING	TASK COMPLETED
UCM_server1	WCCmachine	RUNNING	TASK COMPLETED

Figure 84. Servers started

Performing Runtime Configuration of WebCenter Content

With the successful start of the UCM and IBR servers, it is necessary to perform one last configuration before you can start using WebCenter Content.

1. Open a web browser to the URL `https://<ip-addr>:16201/cs/` and enter the administrator username and password (in the example, `weblogic` and `oracle4u` respectively, as seen in Figure 85). Click **Sign In** to continue.

Figure 85. WebCenter Content console

2. The next screen will show the configuration options that can be set to customize this WebCenter Content server. Carefully consider the values for these parameters before making any changes to them. Click **Submit** to continue.

The continued example's parameters are shown in Figure 86.

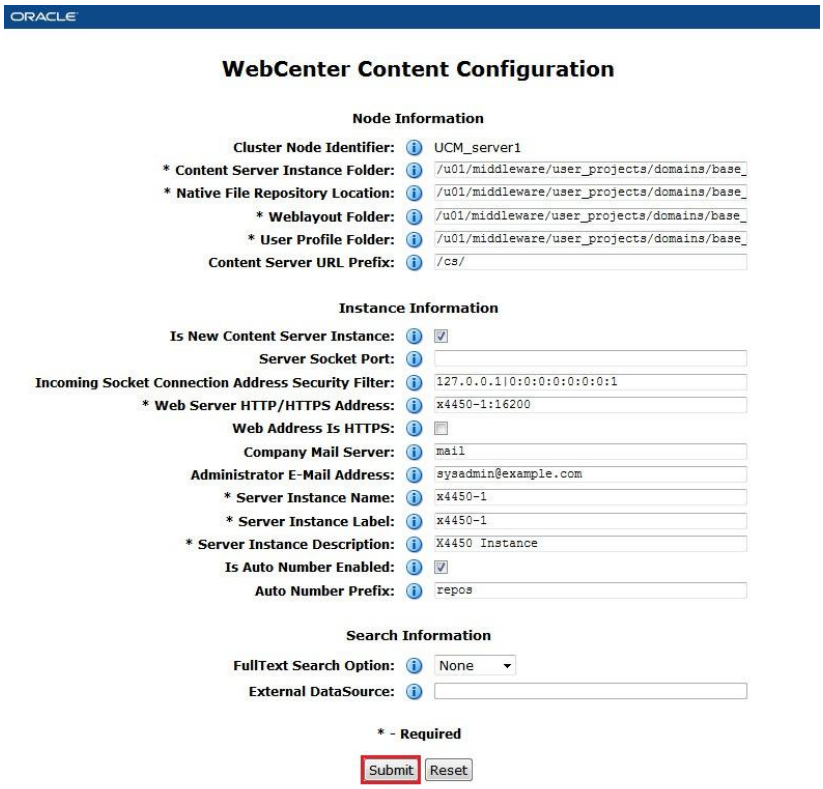

Figure 86. WebCenter Content parameters displayed

The WebCenter Content server will then display a page, seen in Figure 87, requesting that the node be restarted.

Figure 87. WebCenter Content parameter settings completed

3. Back in the Web browser opened earlier in Figure 82, select `UCM_server1` from the Summary of Servers table and click **Shutdown** and select **Force Shutdown Now**.

The example is shown in Figure 88.

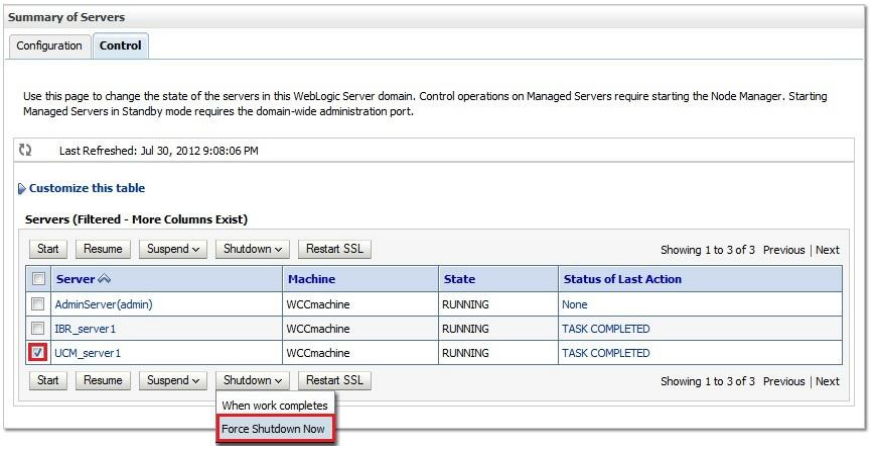

Figure 88. Stopping the WebCenter Content server

4. Once the State has changed to `SHUTDOWN` as seen in Figure 89, select the check box to the left of `UCM_server1` and click the **Start** button to restart the WebCenter Content server, as seen in Figure 90.

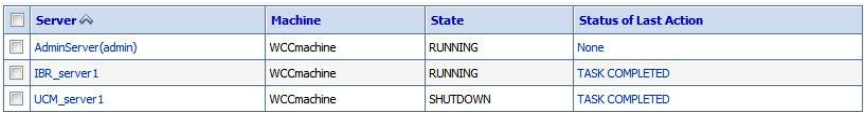

Figure 89. Waiting until the WebCenter Content server has shut down

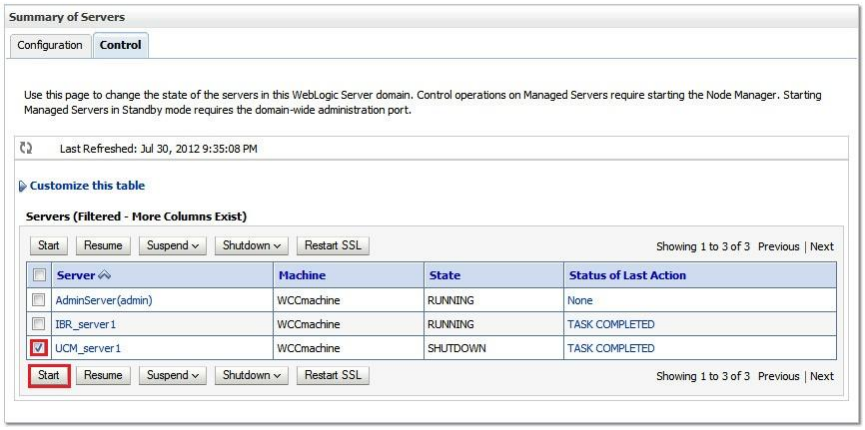

Figure 90. Restarting the WebCenter Content server

5. Wait until the server state changes to RUNNING. Then reopen the web browser to `https://<ip-addr>:16201/cs`. The WebCenter Content screen will now look different, as the WebCenter Content server is now fully installed and ready for local customizations. An example of the new layout is shown in Figure 91.

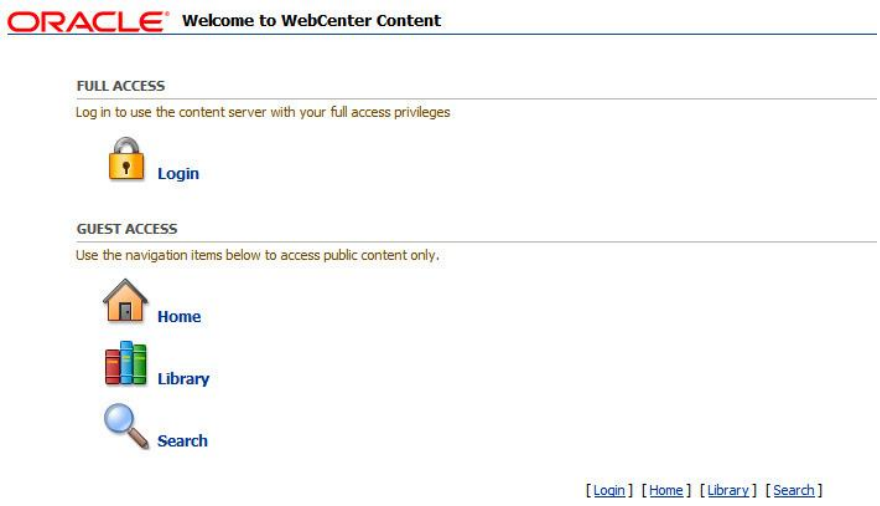

Figure 91. The WebCenter Content server welcome screen

WebCenter Content is now available to serve your business content needs.

Conclusion

WebCenter Content provides a highly customizable content management environment. It is highly extensible and allows the creation of content-enabled applications while maintaining the necessary content security and accessibility.

When WebCenter Content is deployed with Oracle Database on the Oracle ZFS Storage Appliance, the advanced performance features of the Oracle ZFS Storage Appliance are leveraged to provide a highly scalable platform on which to perform fileserver consolidation or sophisticated multisite web content management.

Together, these Oracle products provide a robust and secure platform on which to build, grow and utilize your business content.

References

Oracle ZFS Storage Appliance Documentation	http://www.oracle.com/technetwork/server-storage/sun-unified-storage/documentation/index.html
Oracle WebCenter Content Product Pages	http://www.oracle.com/technetwork/middleware/webcenter/content/overview/index.html
Oracle ZFS Storage Appliance Product Pages	http://www.oracle.com/us/products/servers-storage/storage/nas/overview/index.html
Oracle Database Product Pages	http://www.oracle.com/us/products/database/overview/index.html

How to Deploy Oracle WebCenter Content on the Oracle ZFS Storage Appliance

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