Oracle® Enterprise Manager

Enterprise Manager for Oracle Utilities

Administrative Guide

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Enterprise Manager for Oracle Utilities extends Oracle Enterprise Manager Cloud Control to allow monitoring and management of Oracle Utilities Application Framework-based products on remote servers.

When Enterprise Manager for Oracle Utilities is deployed, the following features and capabilities are available:

- Product discovery
- Target monitoring
- Environment assessment
- Environment cloning
- Patch identification and installation
- Patch migration from one environment to another
- View product configuration files

This document describes the various configuration and operational activities available to administrators of Enterprise Manager for Oracle Utilities.

NOTE: Prior versions of this product were released as Application Management Pack for Oracle Utilities. Please note that any references to Application Management Pack for Oracle Utilities that may occur within this document or in images within this document refer instead to the product's new name, Enterprise Manager for Oracle Utilities.

Related Documentation and Resources

The **Help** menu provides links to **Enterprise Manager Help**, **Oracle Online Documentation**, **Oracle Online Forums**, and the **Oracle Technology Network (OTN)**, where the complete documentation for Oracle Enterprise Manager 12*c* is available.

This document and other Enterprise Manager for Oracle Utilities-specific documentation is available on the Oracle Utilities section of the **Oracle Technology Network (OTN)** documentation site.

Additional information on Oracle Enterprise Manager-specific features and functionality relating to this product is available in the Enterprise Manager Cloud Control Documentation (http://docs.oracle.com/en/enterprise-manager/).

NOTE: The documentation that accompanies this product is subject to revision and updating. Additional information that may relate to the functionality and features in this product may be found on My Oracle Support (MOS) at https://support.oracle.com (sign-in required). To find all articles relating to this product, enter the search term "Enterprise Manager for Oracle Utilities" (or for related articles, search on the product's previous name, "Application Management Pack for Oracle Utilities").

Architecture

Plug-in Architecture

The following diagram illustrates the Enterprise Manager for Oracle Utilities architecture.

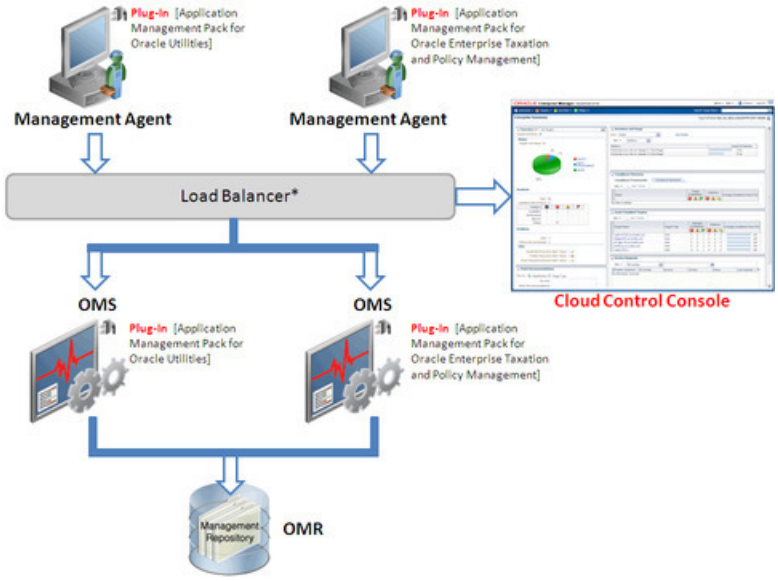


Figure 1: Architecture

NOTE: * The load balancer and multiple OMSes depicted in the diagram above are included only to indicate how a sample Enterprise Manager Cloud Control architecture would look in a large organization. They are not a prerequisite or a requirement for an Enterprise Manager system installation. If you do not have a load balancer, then the Management Agents communicate directly with the OMSes.

Plug-in Functionality

Product Discovery

Any manageable entity is of a *target type*. A specific instance of a target type is a target. For example, *sf-sunapp-00.us.oracle* would be a target of target type *host*; *sf-mydb-00:1521/CD0000SF* would be a target of target type *database*.

For extensibility purposes, Enterprise Manager for Oracle Utilities provides a discovery framework and the functionality to monitor an Oracle Utilities Environment system target type with target members of type web application, web services, batch server and ouaf

home. This models an installation of the Oracle Utilities Application Framework (OUAF) containing the software binaries and runtime components.

High-Level View of the Discovery Process

The discovery process involves Oracle Utilities Application Framework (OUAF)-based products. Each environment comprises the files necessary for the operation of the web application, the database, and the threadpool worker. Thus, each OUAF-based environment and its runtime components can be modeled as an Enterprise Manager target that contains information about the following:

- Host (the machine on which the application server runs)
- Installed products and releases
- Web applications
- Database host (the machine on which the database runs)
- Database
- Batch servers and threadpool workers

This release of Enterprise Manager for Oracle Utilities is based on Java and offers tighter integration with the application server and enhanced features. To leverage some of these features, as well as to accommodate the some of the newer features of Oracle Utilities Application Framework, Enterprise Manager for Oracle Utilities offers a new target model with new target types: System Environment, Web Application, Web Services, Batch Server and Oracle Utilities Home.

The Web Application and Web Services target types are closely modeled on the Application Deployment type offered by Fusion Middleware and use some of the regions already developed by the Fusion Middleware Enterprise Manager Plug-in. In addition, these two models use Java Management eXtension (JMX) MXBeans (such as JVMSystems, PerformanceStatistics) that are used for discovery and to collect metrics.

Batch Server is a standalone JVM that uses MXBeans for discovery and monitoring.

In addition to these target types, a typical OUAF-based environment is modeled as a system target. This system environment has as members the other new target types as well as the application server, where the Web Application Server and the Service Application Server are deployed and to which the OEM database instance connects.

The OUAF home target type page models the installation directory, also referred to as **SPLEBASE**. Given extensive use of JMX, it must be configured properly in the OUAF environment for discovery and performance monitoring to operate correctly.

Environment Discovery

In order for a target to be monitored, it must first be discovered and promoted. Discovery is the process of making a target instance known to OEM. Once this has been done, the target needs to be promoted from an unmanaged to a managed state. This process requires some prerequisite steps.

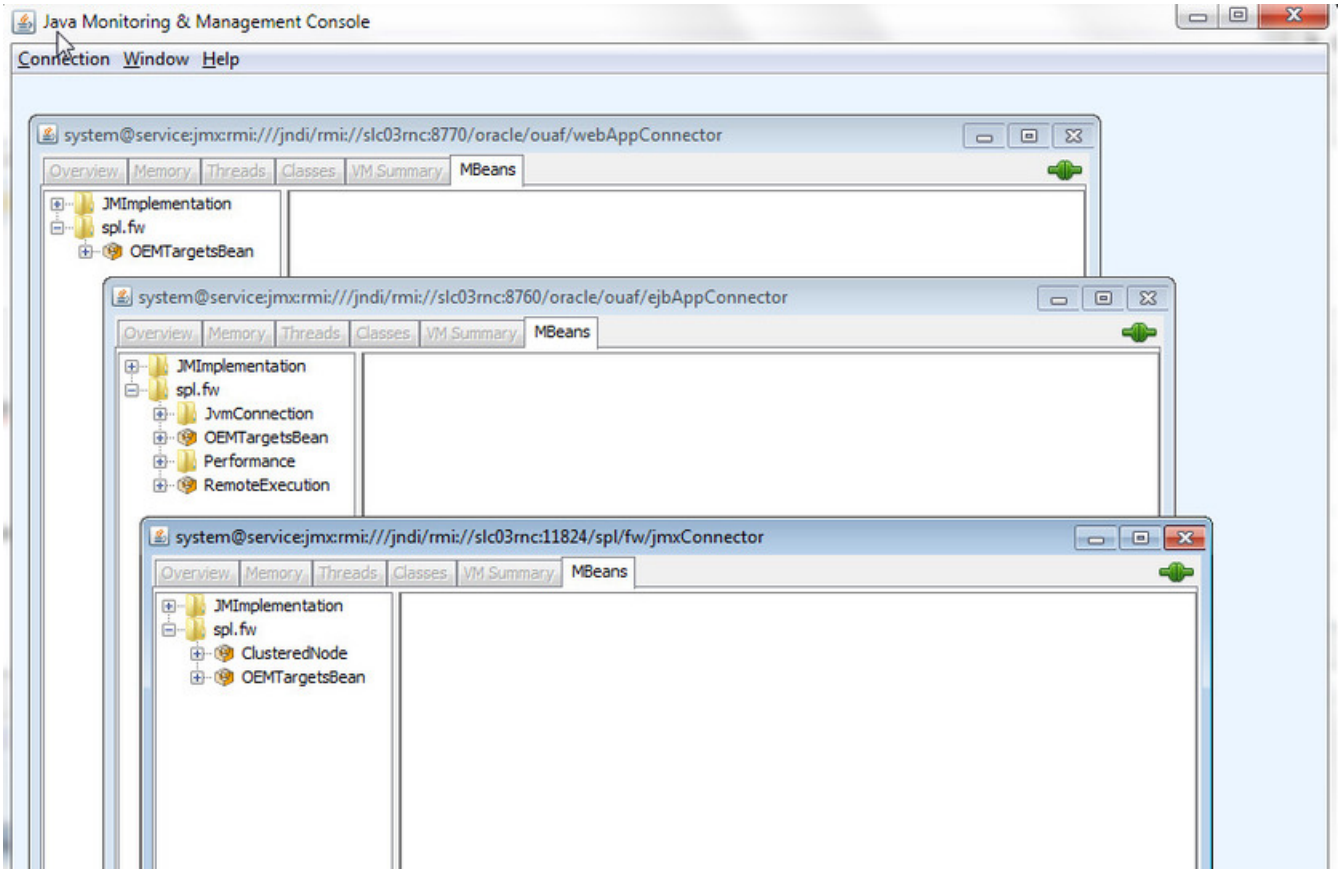
1. All components of the environment should be up, namely, the web application, the web service and batch servers.
2. JMX should be configured on the target environment. To test this, use jconsole and connect to the JMX servers using the JMX URLs. You can search the WebLogic log for the Web and EJB JMX URLs. Examples:

```
service:jmx:rmi:///jndi/rmi://{host}:{ejbJmxPort}/oracle/ouaf/
ejbAppConnector
service:jmx:rmi:///jndi/rmi://{host}:{webJmxPort}/oracle/ouaf/
webAppConnector
```

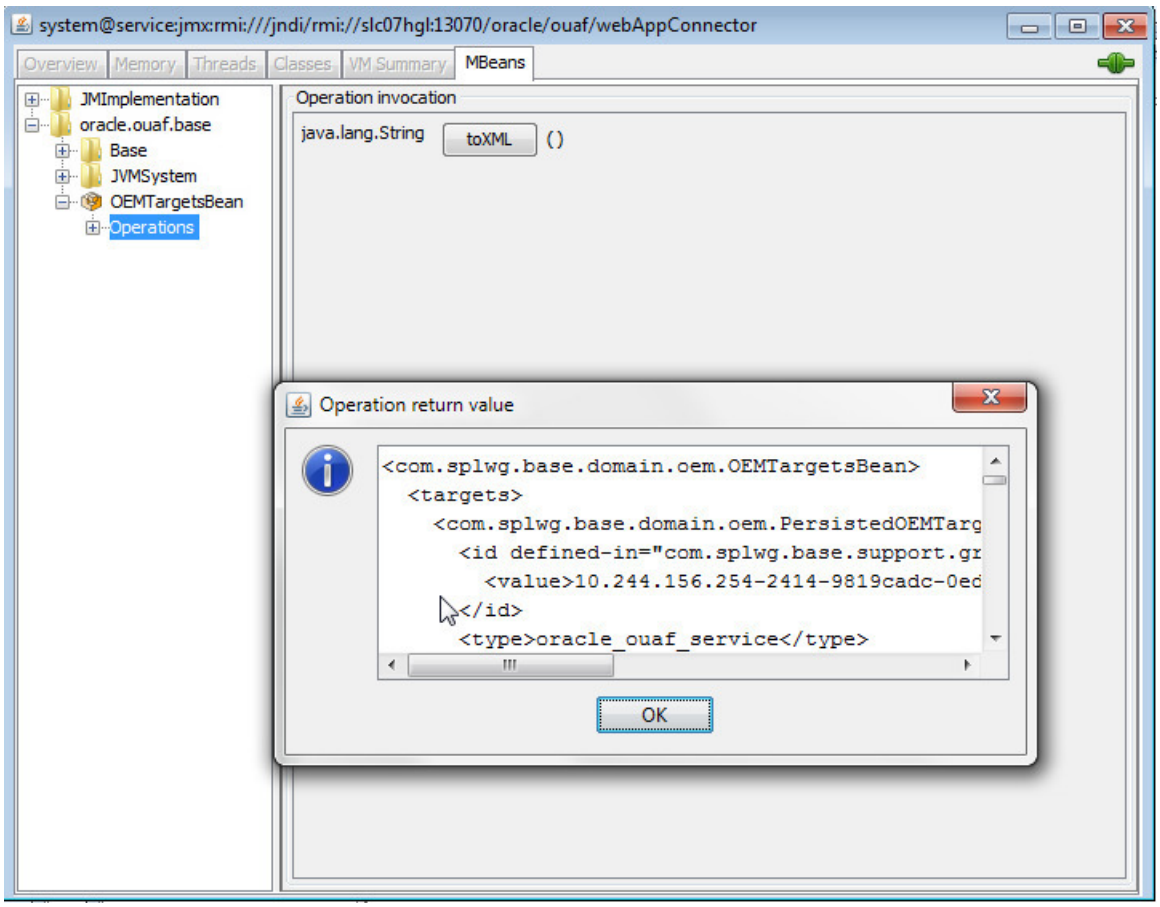
The threadpoolworker logs would have the batch JMX URLs. For example, `service:jmx:rmi:///jndi/rmi://{host}:{batchJmxPort}/oracle/ouaf/batchConnector`

In FW 2.2, this would be `service:jmx:rmi:///jndi/rmi://{host}:{batchJmxPort}/spl/fw/jmxConnector`

Make sure you can connect to the URLs and that the OEMTargetsBean is present, as illustrated in the following image:

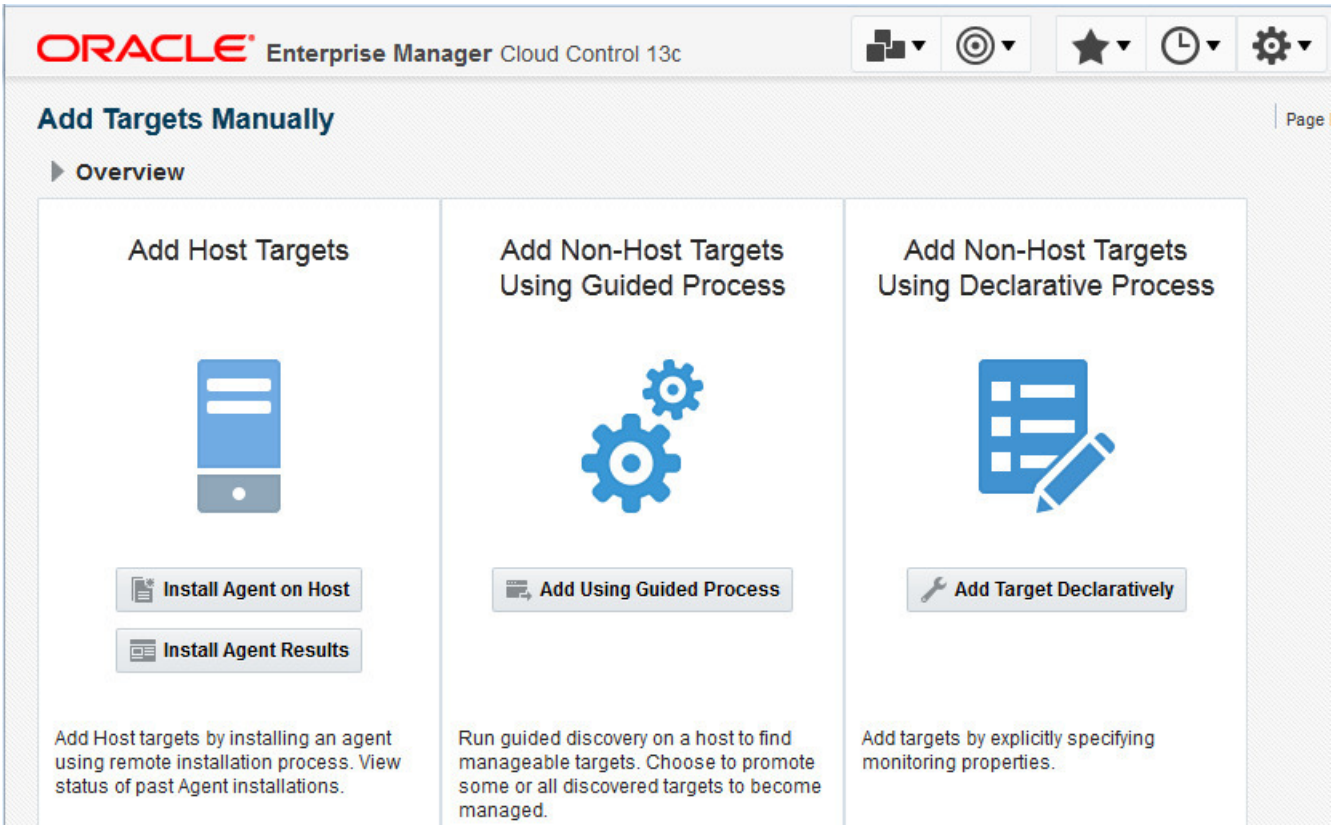


Expand the OEMTargetsBean, click **Operations**, then click the **toXML** button. A window should popup and return the XML of the targets that will be discovered. Do this for each JMX connection.



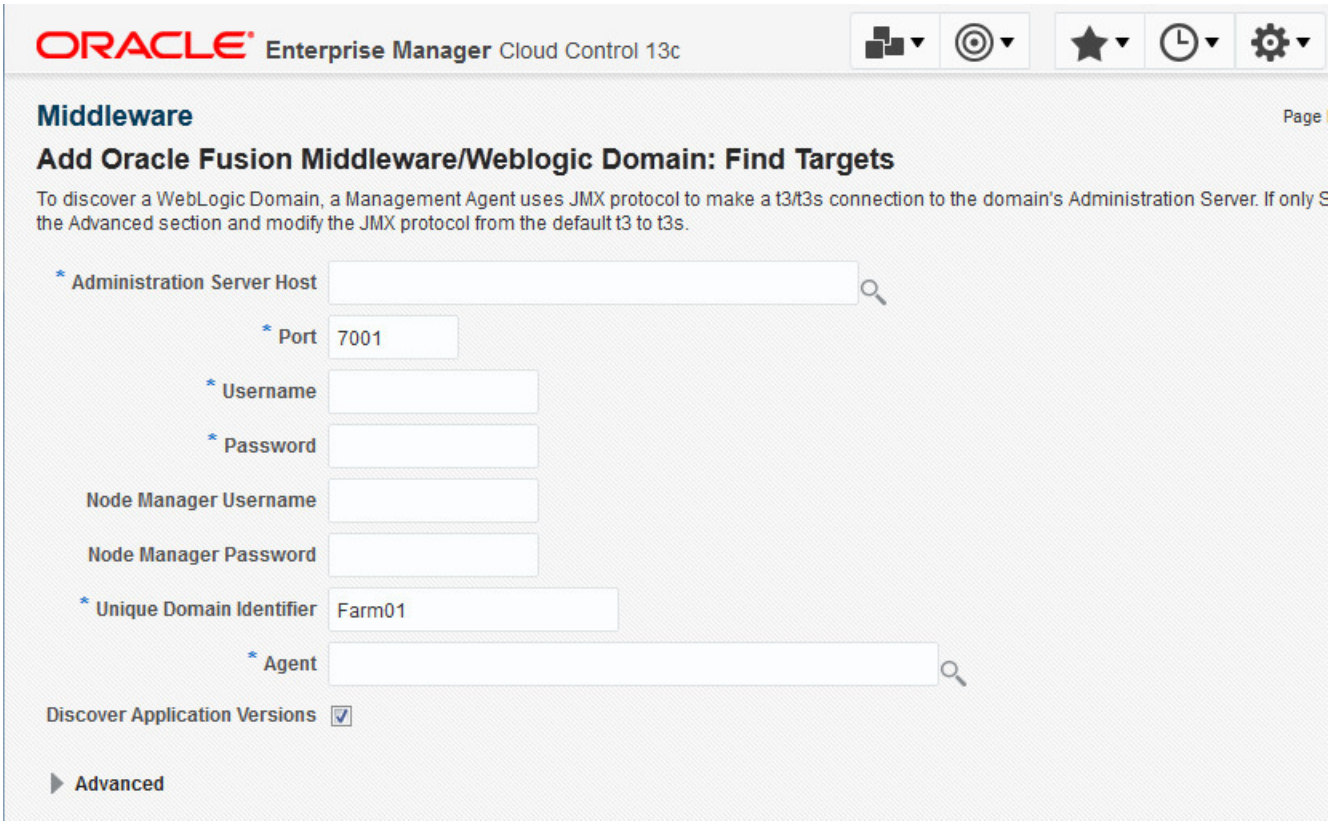
3. The WebLogic domain/Fusion middleware must be discovered. To do this, perform the following:

   - The WebLogic admin server must be started. Verify that it is by logging into the WebLogic console.
   - Discover the WebLogic domain and Fusion middleware using guided discovery. On the grid console, go to **Setup** > **Add Targets** > **Add Targets Manually**. Select the following options on the page:



- Click **Add Using Guided Process**, enter the entries for the WebLogic admin server, then continue until the WebLogic domain/Fusion middleware is discovered.

  If WebLogic is configured with SSL, use the **t3s** protocol.



To discover OUAF target environments:

1. Log in to Enterprise Manager.
2. Choose **Setup** > **Add target** > **Configure Auto Discovery**.

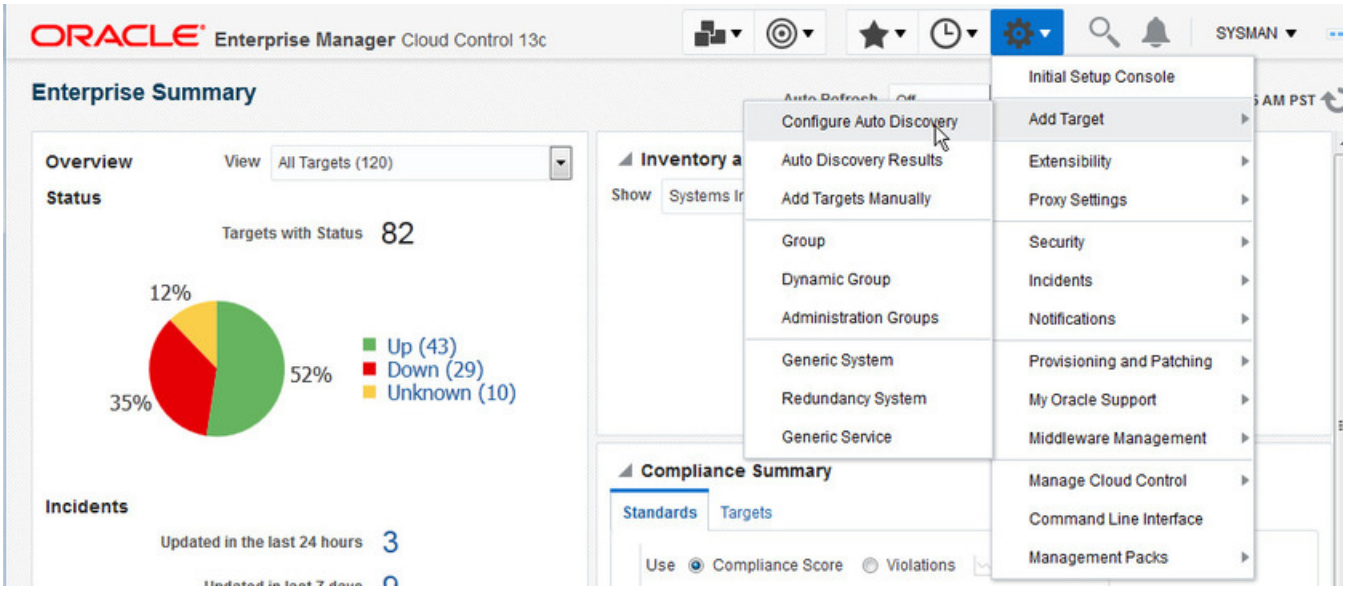


Figure 2: Selecting Auto Discovery

3. On the **Setup Discovery** page, click the host where discovery is to be run, then click the **Discovery Modules** button.

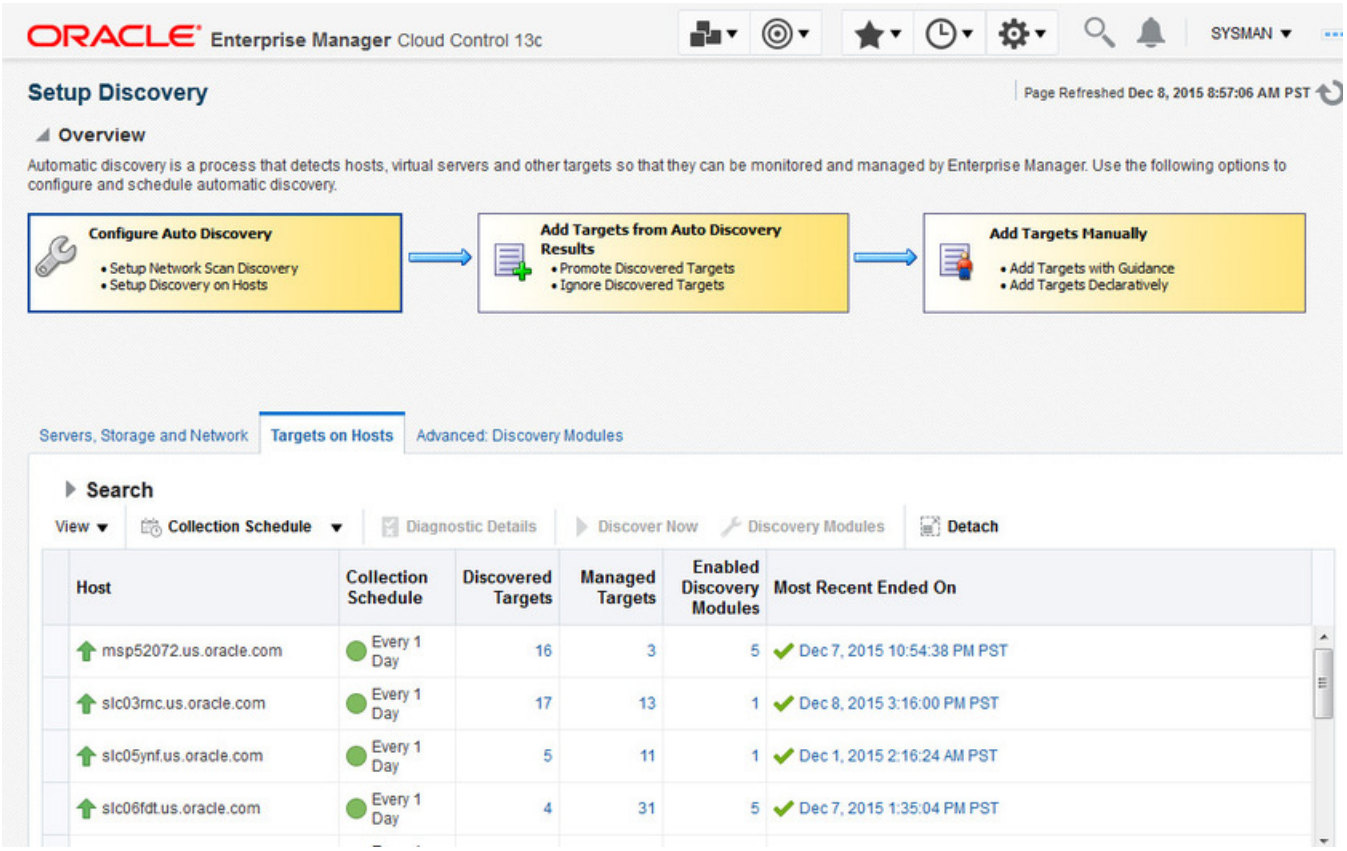


Figure 3: Setup Discovery

4. Ensure that the **Enterprise Manager for Oracle Utilities** module is on the**Discovery Module** list.

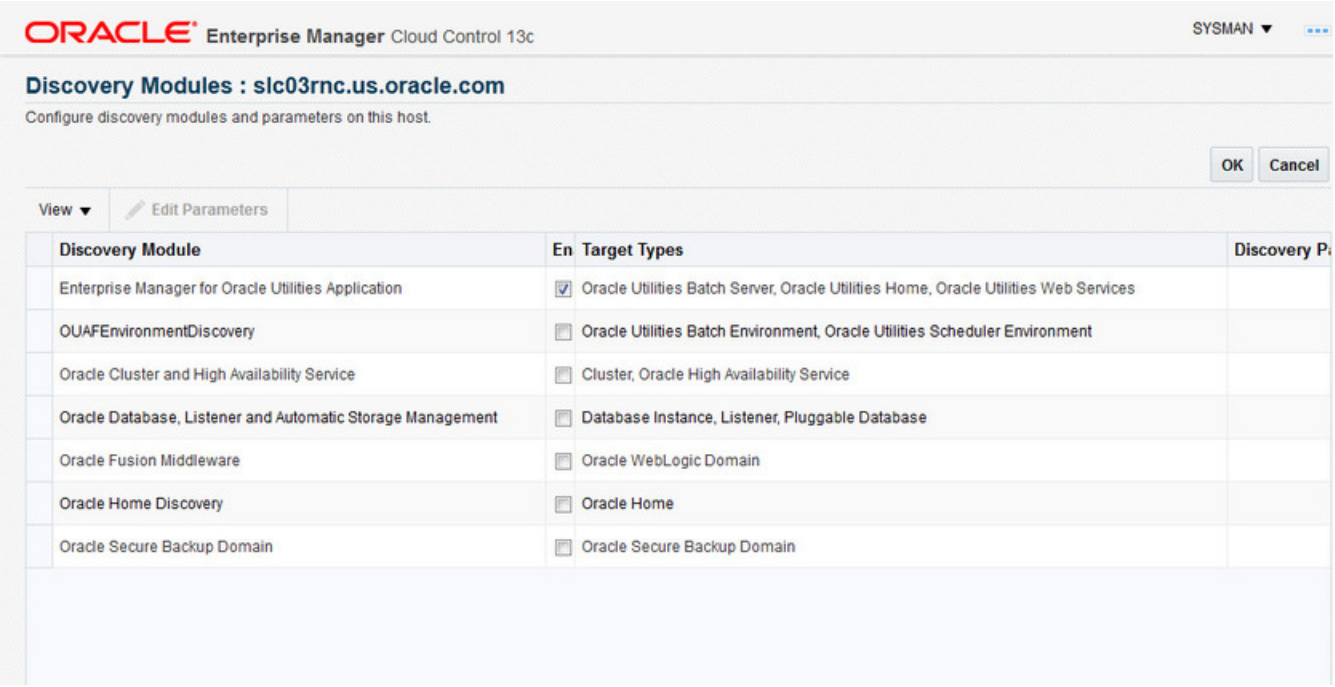


Figure 4: Verifying the module

5. Once back on the **Setup Discovery** page, select the host again to enable the buttons at the top. When the desired host is selected, click the **Discover Now** button.

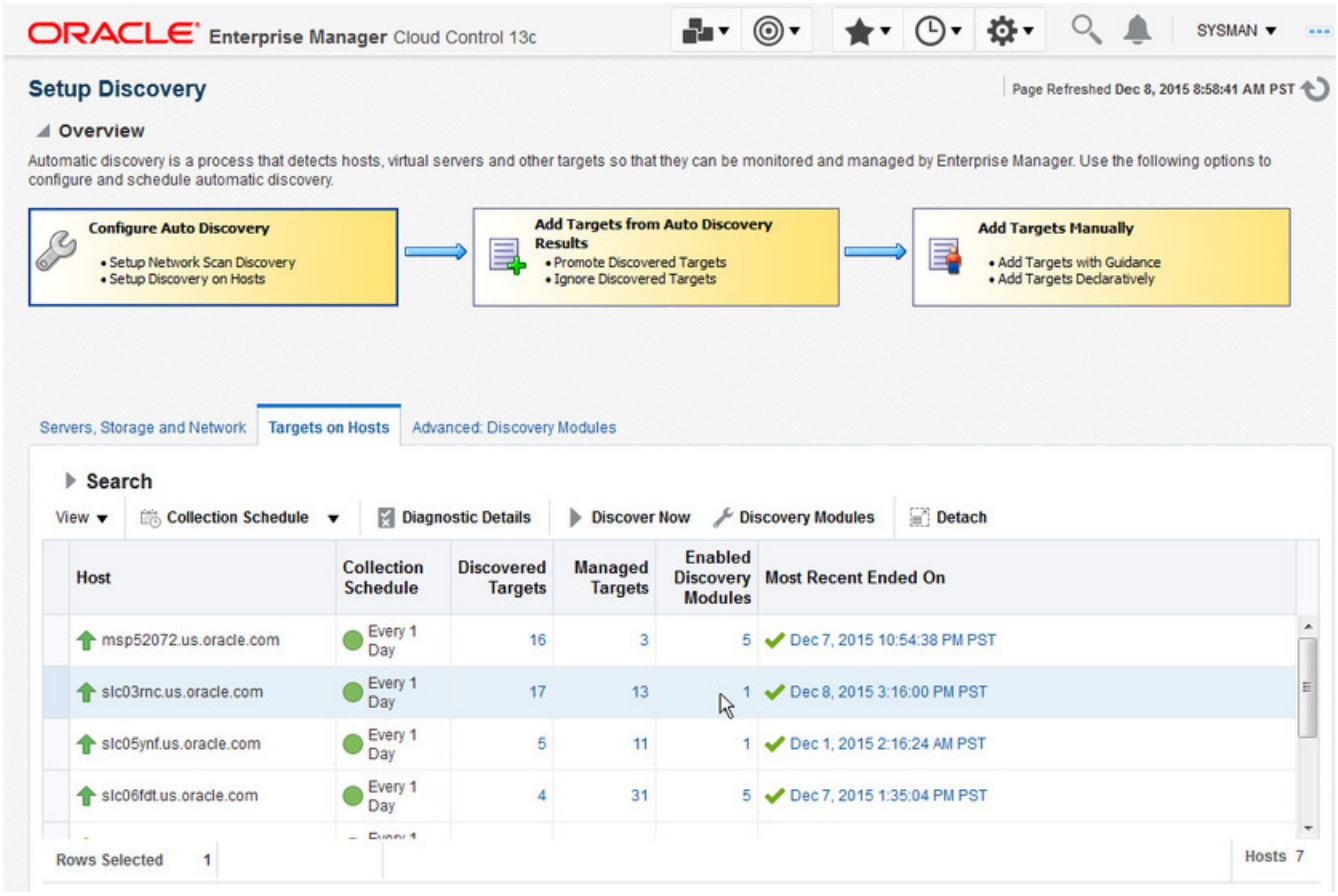


Figure 5: Running the discovery

The **Target Discovery (Agent Based)** window opens.

6. Click **OK** in the **Discover Now** dialog to confirm that you want to run the discovery.

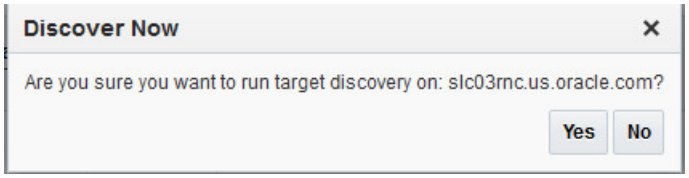


Figure 6: Confirming the discovery

7. A confirmation dialog appears on successful discovery of the host. Click **Close** to dismiss the confirmation dialog.

Figure 7: Host discovery confirmation dialog

Promoting Targets

To promote targets so they can be managed:

1. Log in to Enterprise Manager.
2. Choose **Setup** > **Configure Auto Discovery.**

   The **Setup Discovery** window opens. Go to the **Targets on Hosts** tab.

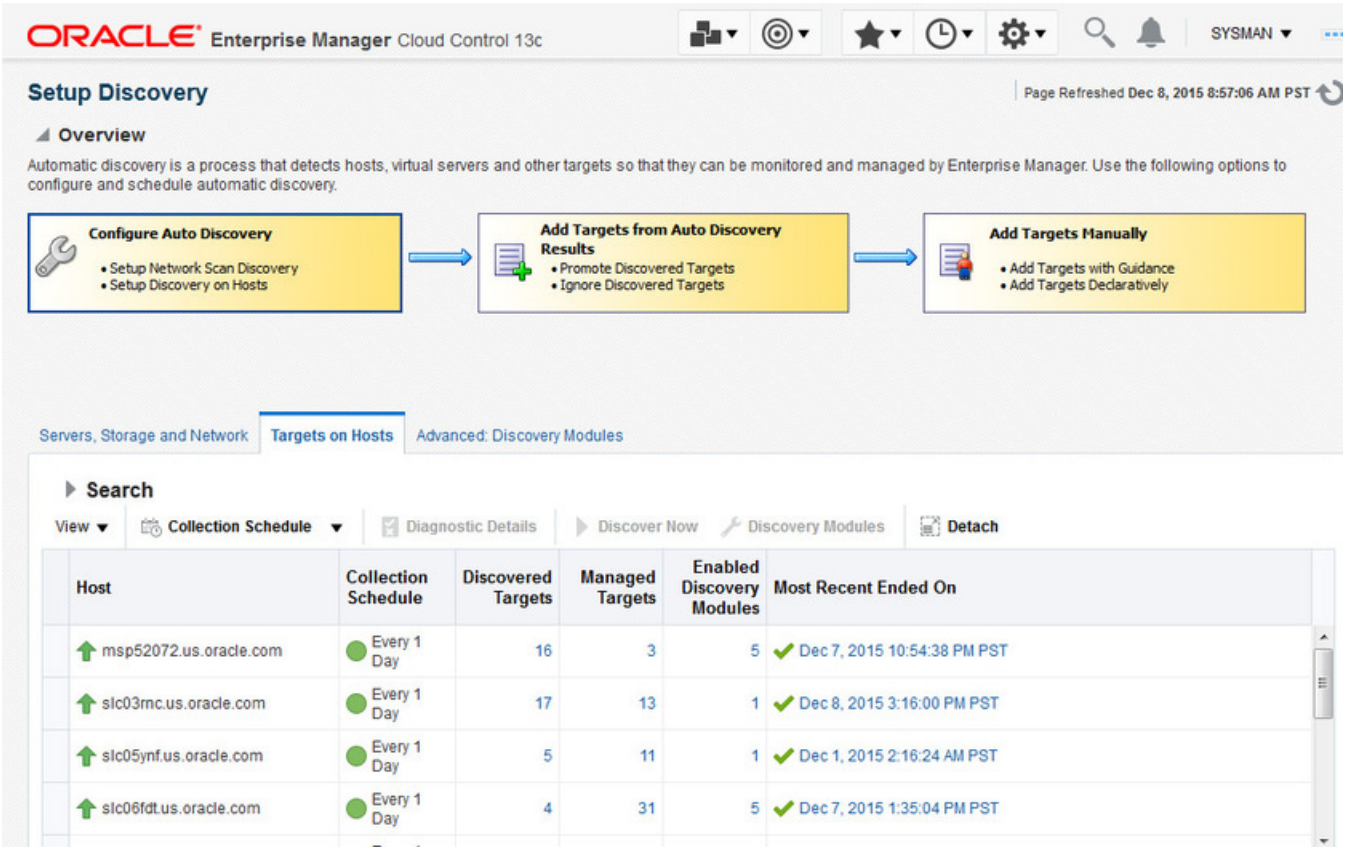


Figure 8: Setup Discovery window

3. For the host on which the discovery was run, click on the number that is in the **Discovered Targets** column.

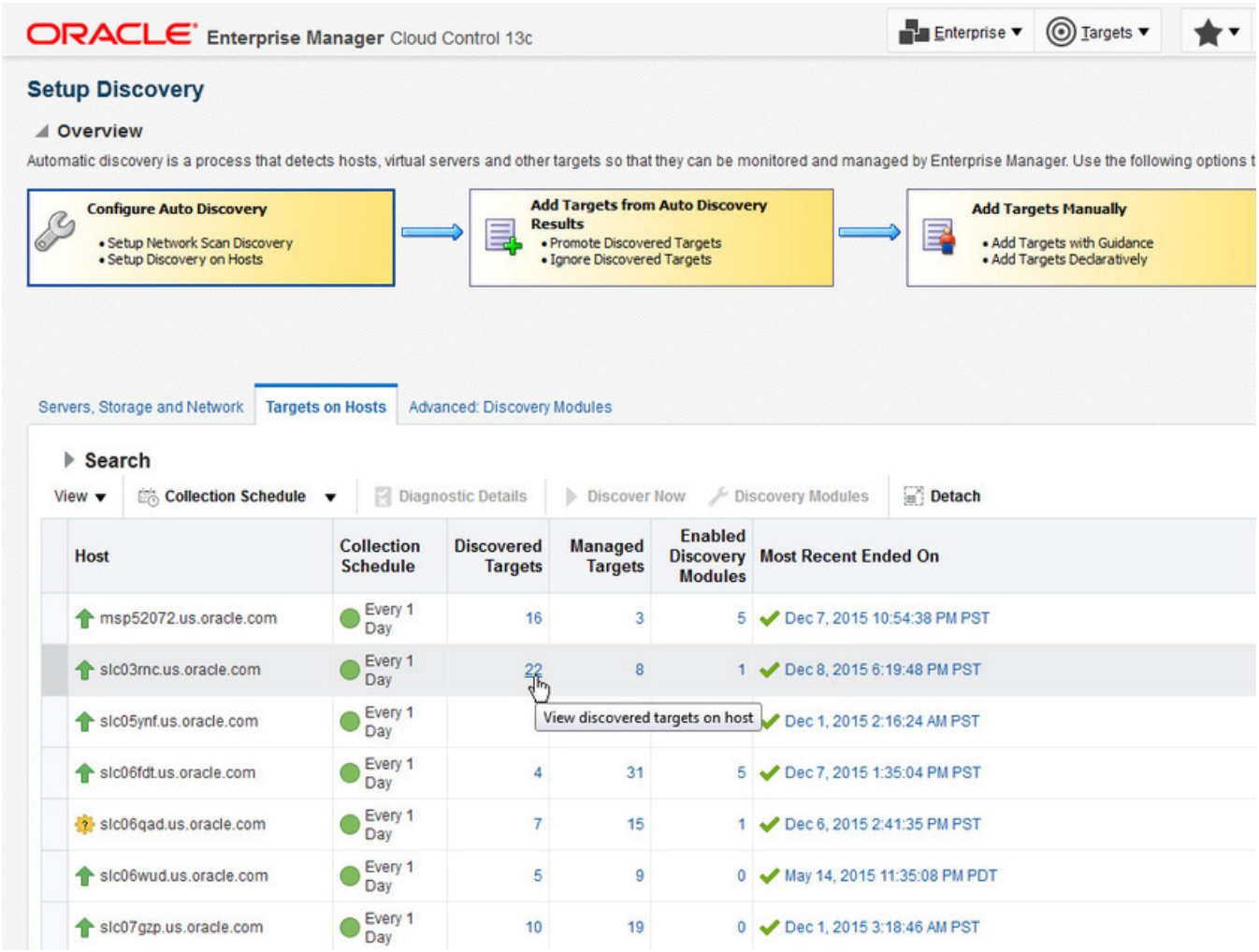


Figure 9: Choosing a target

4. A list of targets that were discovered but not yet promoted is displayed. Select the target you want to promote, then click the**Promote** button.

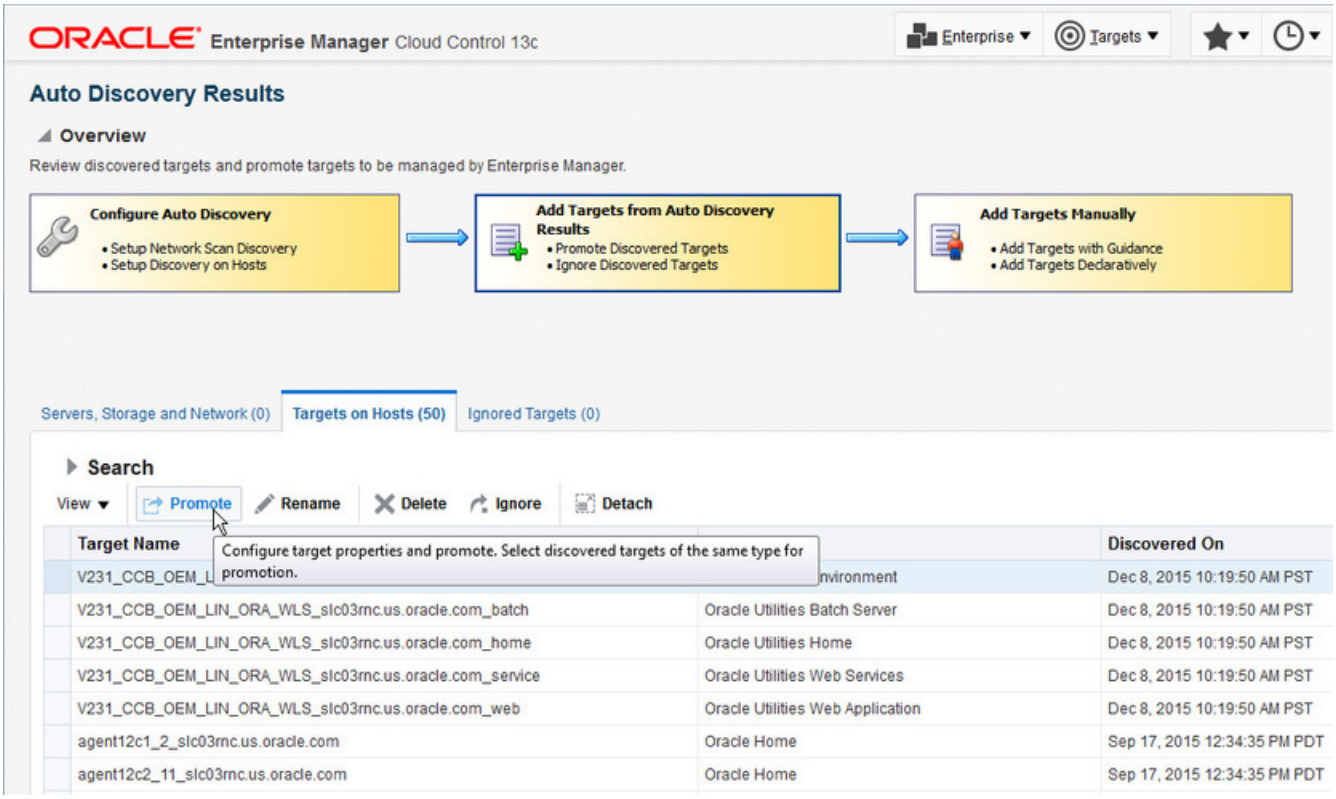


Figure 10: Promoting the target

5. All related members of the target system are shown and promoted at the same time. Click the **Promote** button.

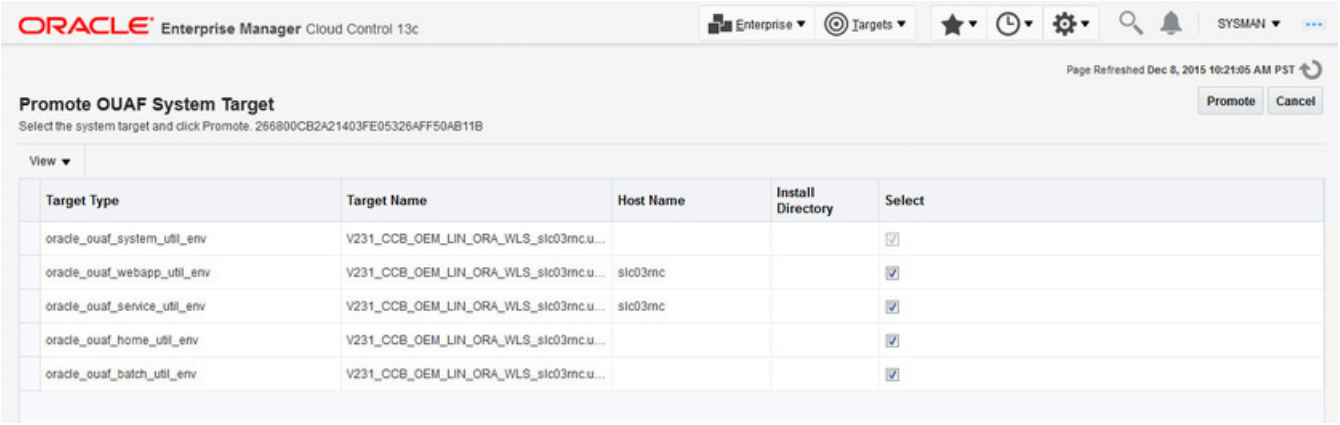


Figure 11: Unmanaged system targets

6. A confirmation dialog appears when the promotion is successful.

Figure 12: Confirmation dialog

7. Click **Close** to dismiss the confirmation dialog.
8. If any changes are made to the environment configuration using the command-line utilities (e.g., `configureEnv.sh/cmd`), the corresponding changes must also be made to the target properties. The quickest way to do this is to remove the target and perform the discovery and promotion process. You can also make changes by choosing **Target** > **Setup** > **Monitoring Configuration** and making the appropriate updates on the UI page.

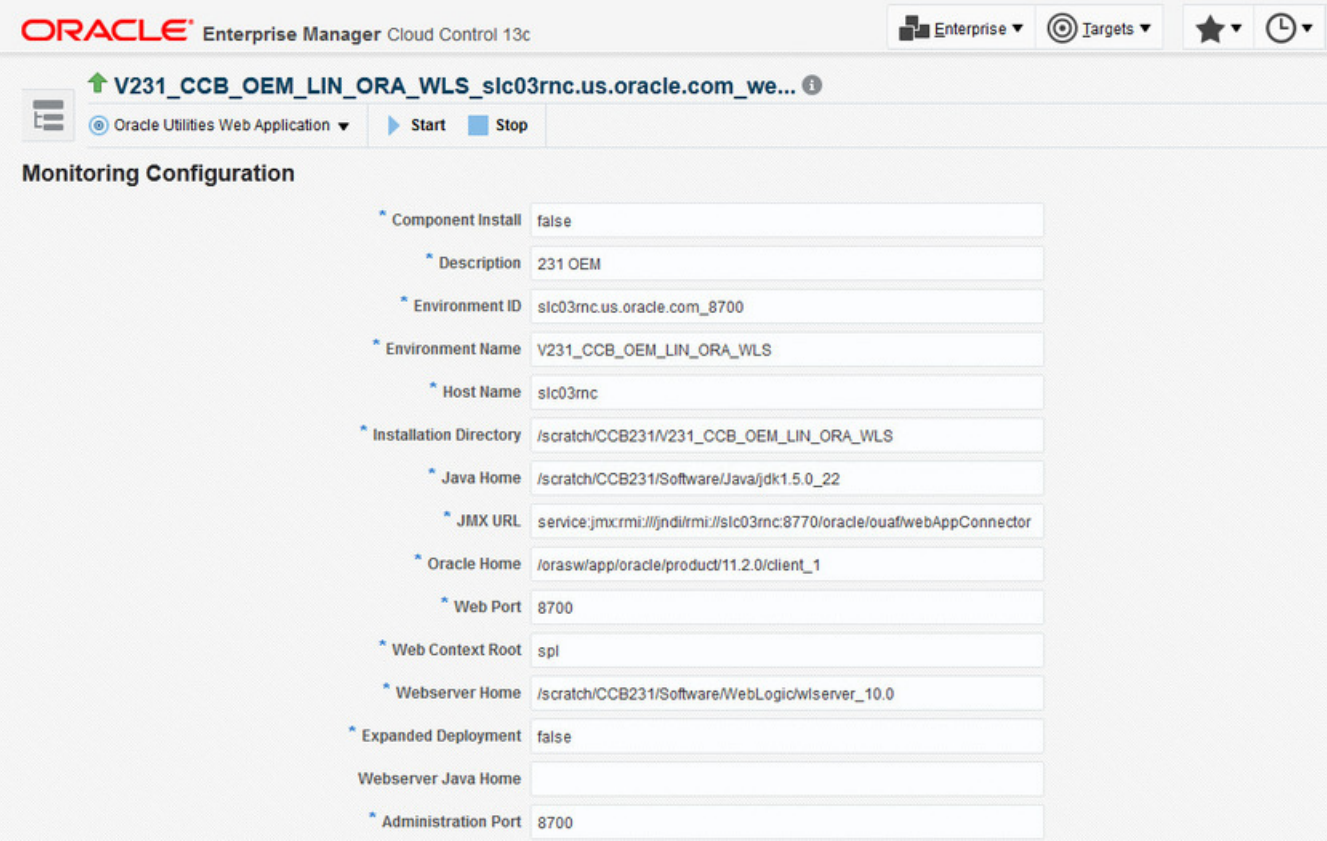


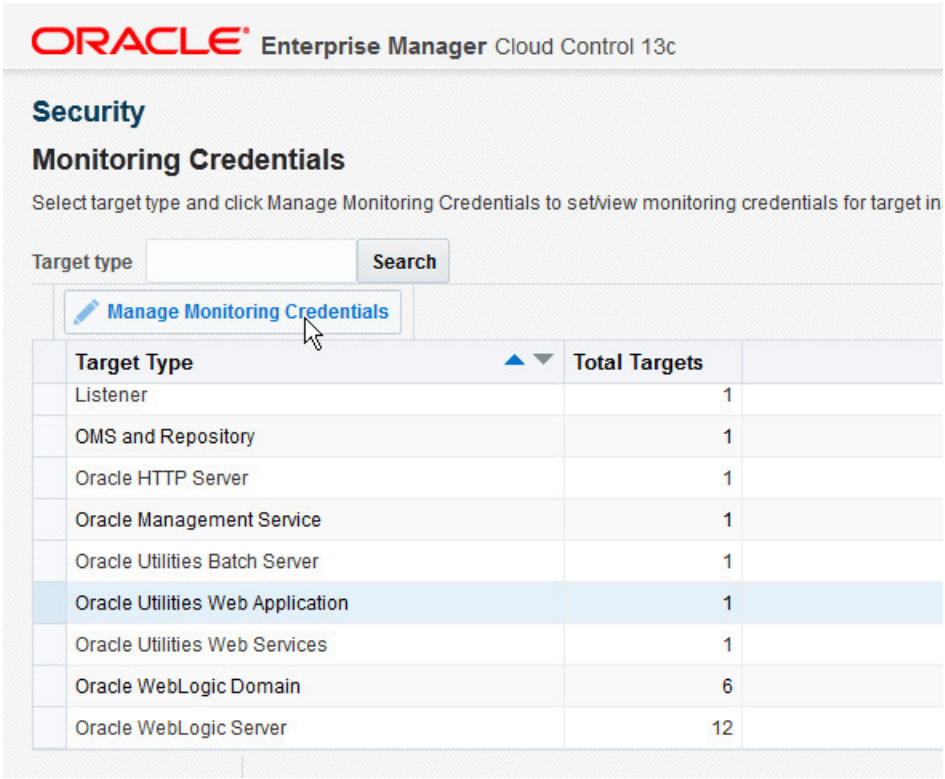
Figure 13: Monitoring Configuration page

Post-Promotion Tasks

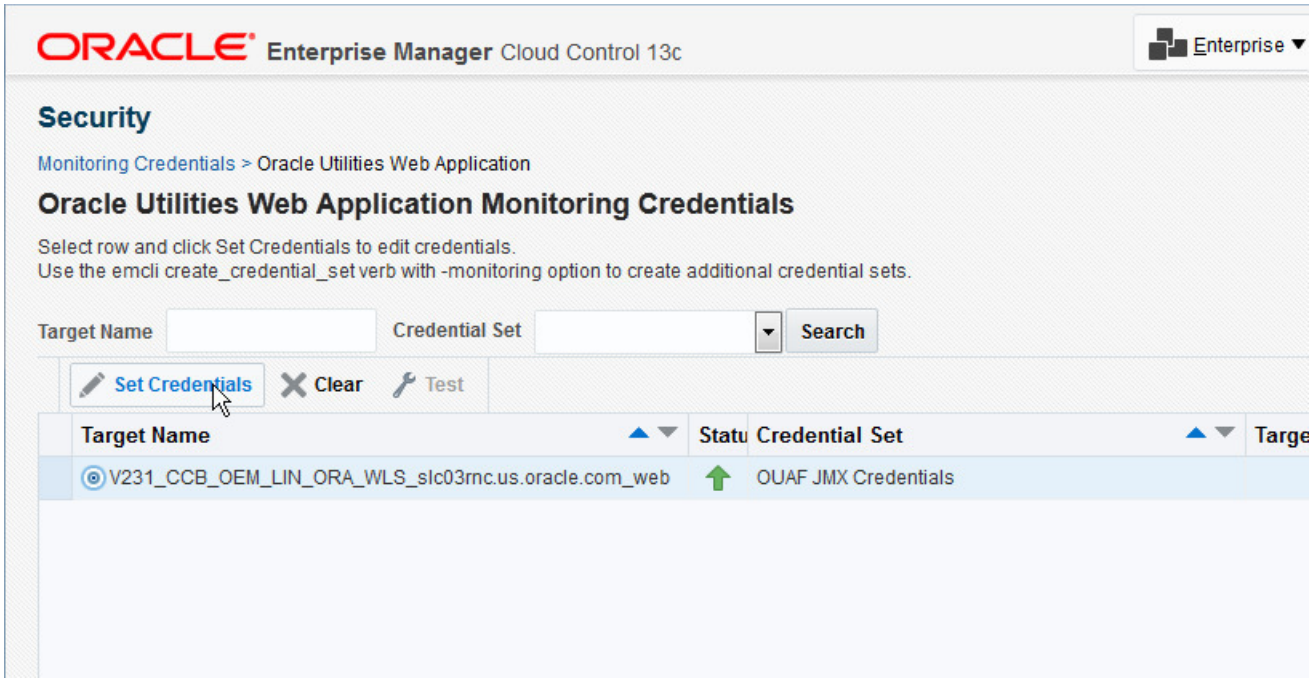
The following tasks are required after a target is promoted.

1. **Configure monitoring credentials**. This task creates the monitoring credentials for the web application, web services, and batch server targets. It involves navigating to **Setup** > **Security** > **Monitoring Credentials** and enter the JMX credentials for all three target types. For example, the following steps configure the credentials for the batch server. Follow the same steps for the web application and web services targets.

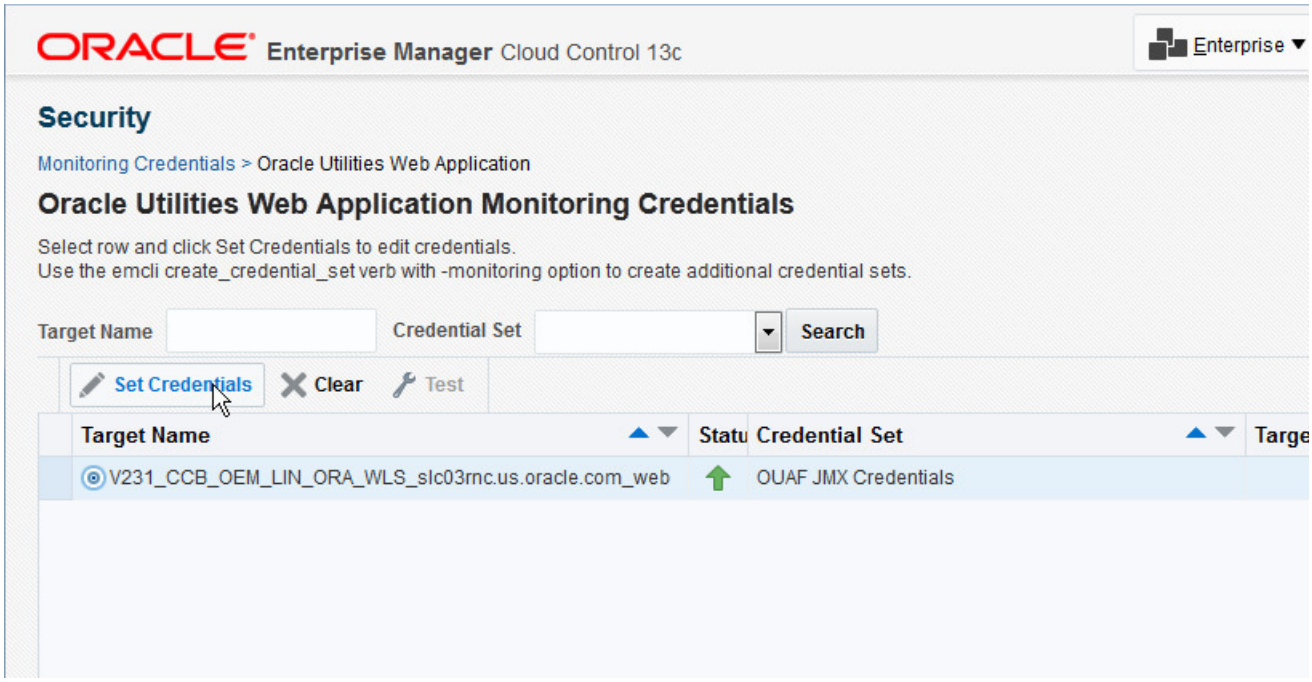
   a) Select the target type and click the **Manage Monitoring Credentials** button.



b) Select the target and click the **Set Credentials** button.



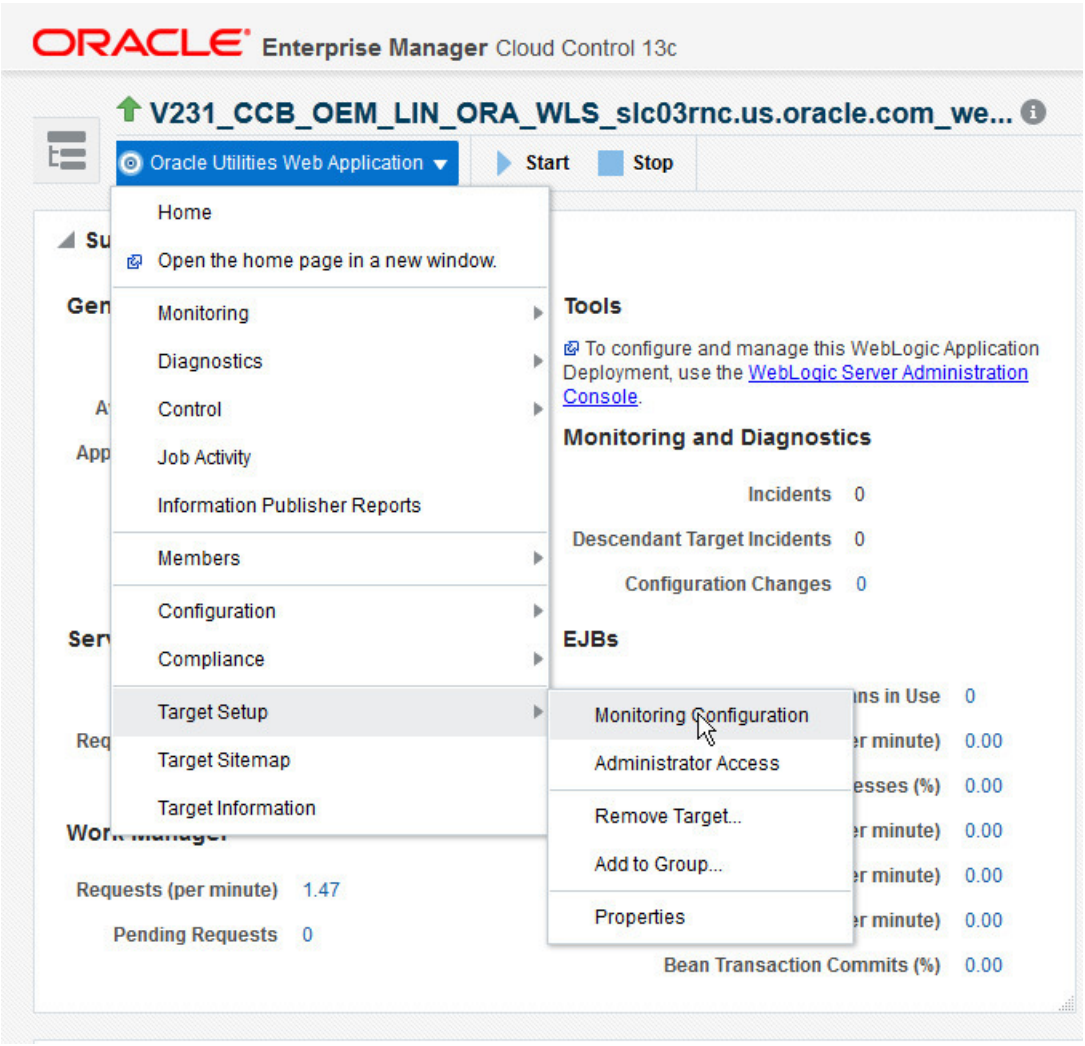
c) Enter the JMX credentials. This should match the JMX credentials of the OUAF environment.



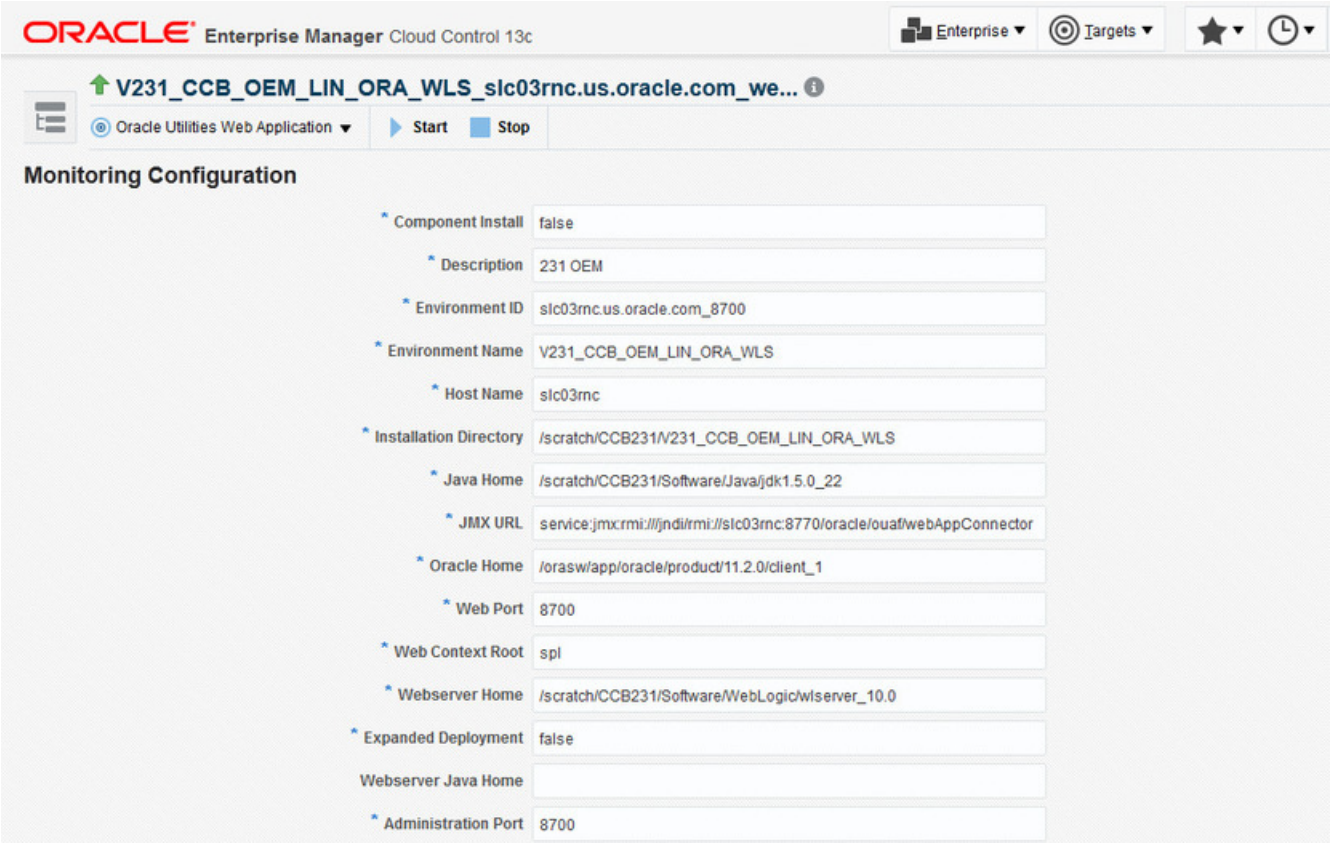
d) Repeat for the Web application and Web services targets.

2. **Set up monitoring configuration**. For all Framework version 2.2.0-based environments, ensure that the target monitoring configuration contain the appropriate settings for Java Home and Oracle Home, Web Server Home and Web Server Java Home values. These are the environment variables that are set in the host before you run splenviron.cmd/sh. Note that Web Server Home is the location on which the WebLogic software is installed (e.g., `/spl/middleware10.3.3./wlserver_10.3`). Web Server Java Home is the Java location that is used as JAVA_HOME by the Web Server. For WebLogic servers on Linux, it is same value as JROCKIT_HOME. Set up monitoring configuration for all target types.

   a) For example, to setup the monitoring configuration for the batch server, first click on the target dropdown on the upper left, then choose**Target Setup** > **Monitoring Configuration.**



b) Then enter the appropriate information:



c) Repeat for the Web application and Web services targets.

Viewing a Target's Home Page

To view a target's home page:

1. Log in to Enterprise Manager.
2. Click **Targets** > **All Targets.**

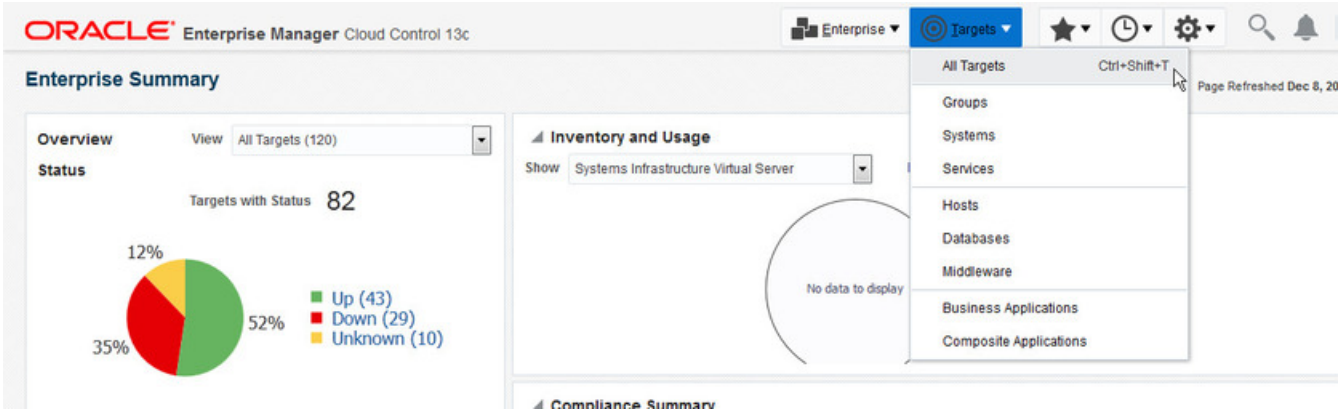


Figure 14: Viewing all targets

3. To view its home page, locate and double-click a target from the sortable and searchable**All Targets** list.

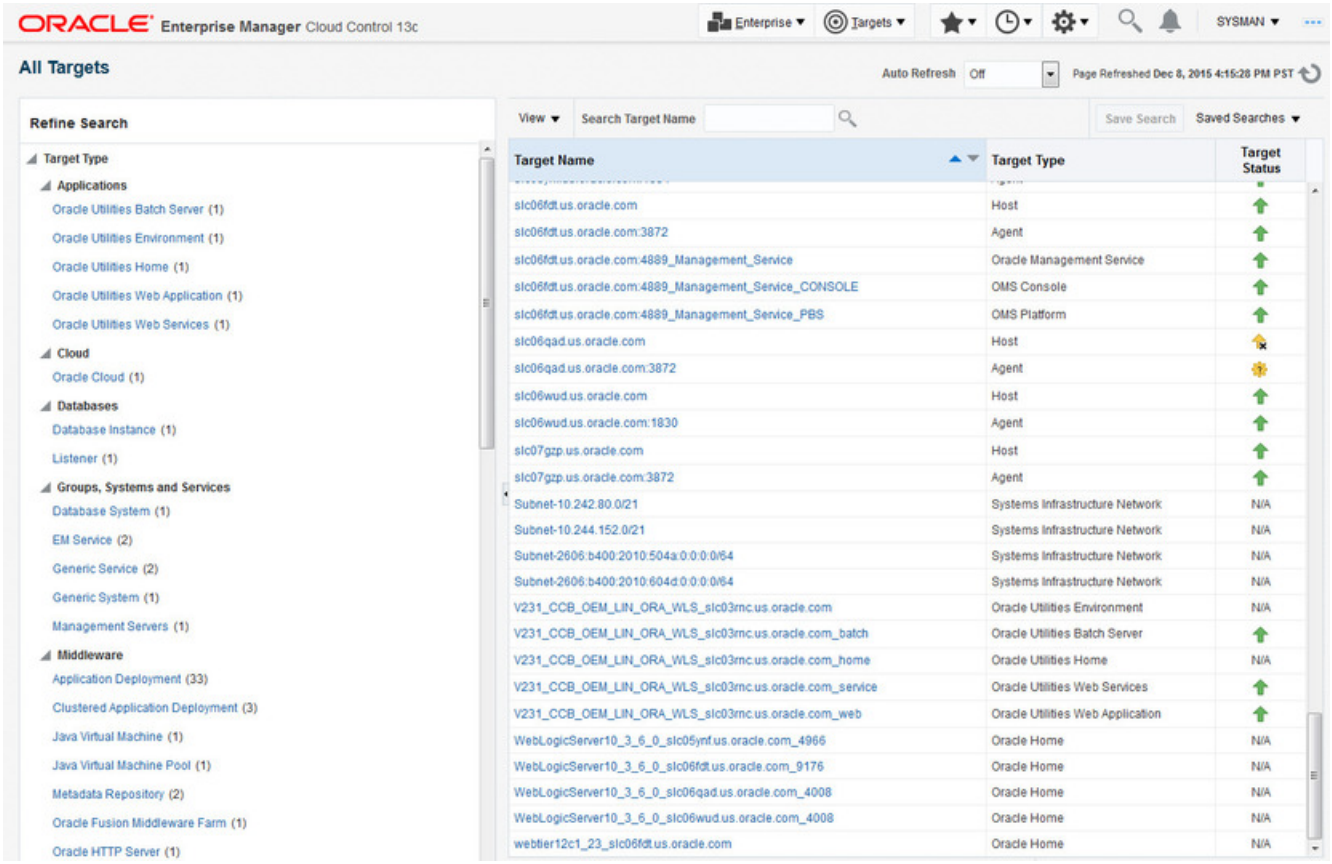


Figure 15: All Targets list

Environment Target Home Page

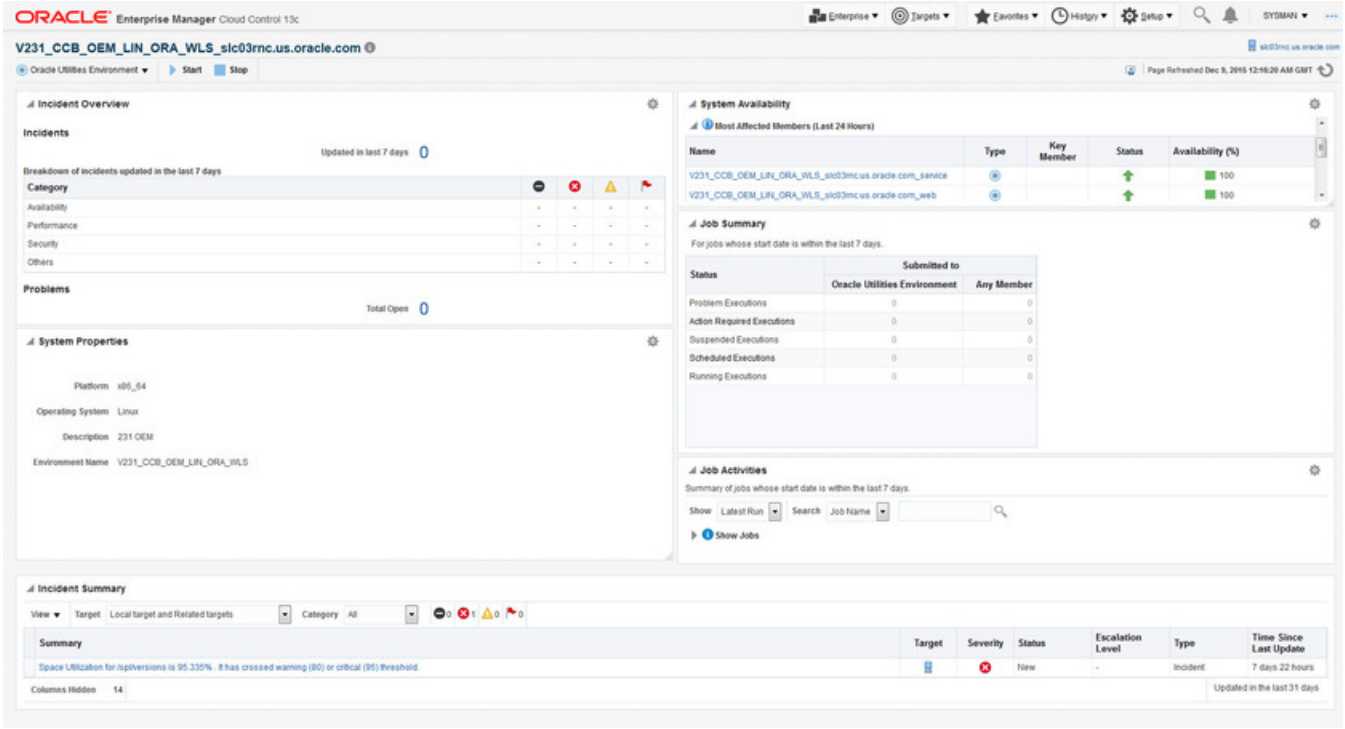


Figure 16: Environment Target Home Page

In the **All Targets** list under **Applications** you can find the target type **Oracle Utilities Environment** targets. This is a system target whose members comprise other targets that make up the. The page is divided into five regions. The regions are:

- **System Properties**. Contains basic information about the system.
- **System Availability**. Contains a list of all members of the system including availability.
- **Job Summary**. Contains summary information about job executions. This includes counts of all target members of the system.
- **Job Activity**. This region lists all submitted jobs.
- **Incidents & Problems**. *Problems* are classified as issues that cause the plug-in to malfunction or throw errors and exceptions. *Incidents* are issues that need not necessarily impact plug-in operations, but are related to the target being monitored. Most incidents are thrown when certain defined criteria, such as thresholds, are met. If, for example, the administrator sets a threshold of 95 percent for disk space usage, an incident is reported when that level of usage is exceeded.

Oracle Utilities Application Framework Target Home Page

The OUAF target home page models the installation directory, also referred to as **SPLEBASE**. There is no system availability as this metric is not applicable to directories. It contains the following regions.

- **System Properties**. Contains basic information about the ouaf home directory.
- **Job Summary**. Contains summary information about job executions.
- **Job Activity**. This region lists all submitted jobs.
- **Incidents & Problems**. *Problems* are classified as issues that cause the plug-in to malfunction or throw errors and exceptions. *Incidents* are issues that need not necessarily impact plug-in operations, but are related to the target being monitored. Most incidents are thrown when certain defined criteria, such as thresholds, are met. If, for example, the administrator sets a threshold of 95 percent for disk space usage, an incident is reported when that level of usage is exceeded.
- **Incident Summary**. Summary information and messages regarding incidents recorded.

Ensure Collection of Installed Product Configuration Information

Many of the features in this product rely on information about products that have been installed. This is collected as part of the Enterprise Manager's Metric Configuration Collection. To ensure that this has been collected (and to avoid execution errors on certain features), go to **Target** > **Configuration** > **Last Collected** from the **Target Home** page, then choose **Actions** > **Refresh.** This action triggers a refresh of the configuration metrics so that the common information region is complete.

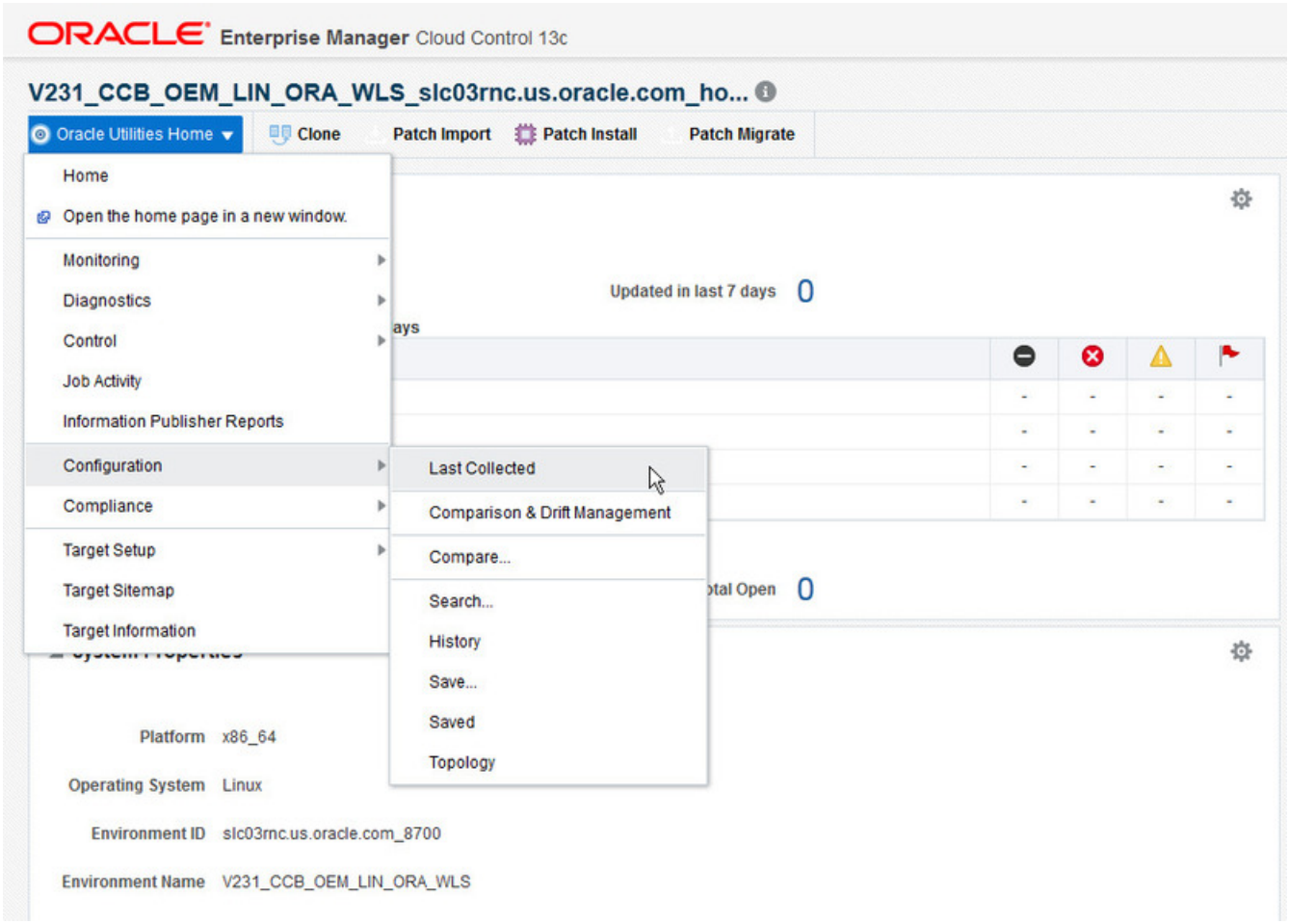


Figure 17: Collecting Target Configuration

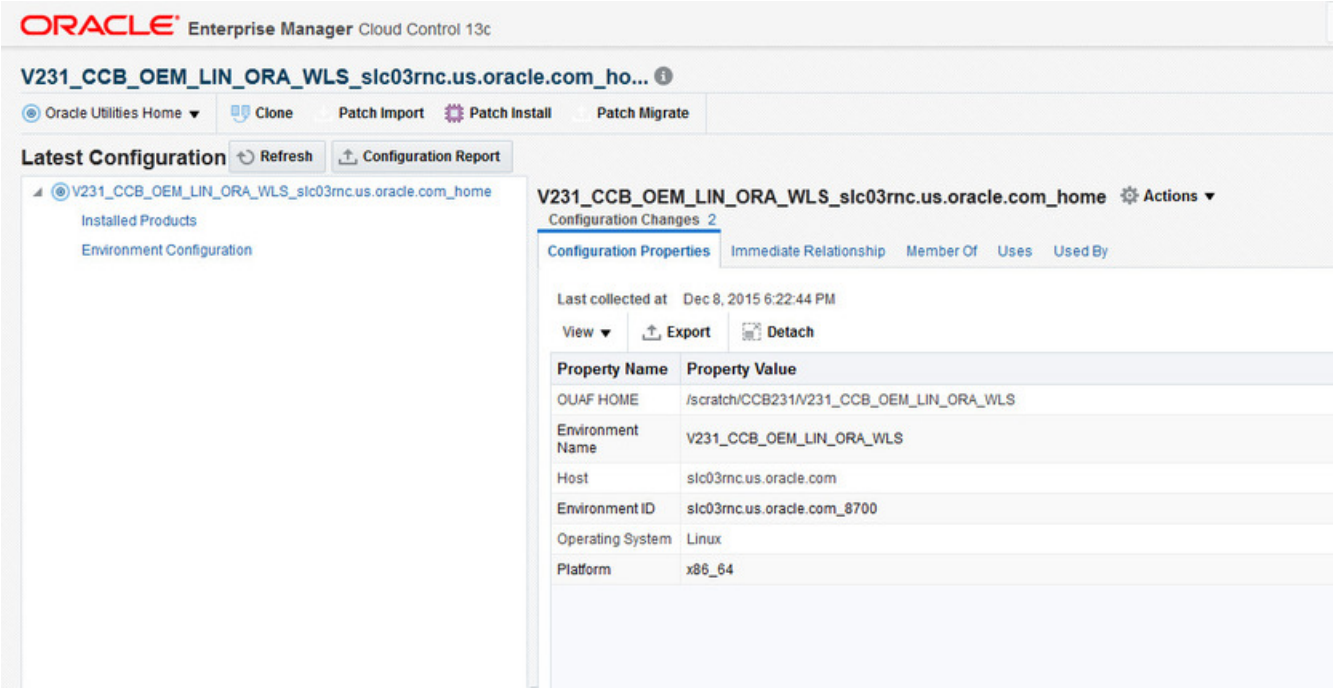


Figure 18: Configuration Properties

Target Home and Performance Monitor Pages

The system members that gather performance information are the runtime targets with target type web application, web services, and batch server. Their target home pages contain performance metrics and other information pertinent to the particular target type.

About Performance Monitors

Application deployments that are available for discovery in Enterprise Manager for Oracle Utilities include managed beans (MBeans) that are accessed with Java Management Extensions (JMX) to retrieve metrics and measurements for batch and application-level performance monitoring.

Three target types—Web Application, Web Services, and Batch Server—contain the connection information among their properties to allow collection of detailed statistics over JMX.

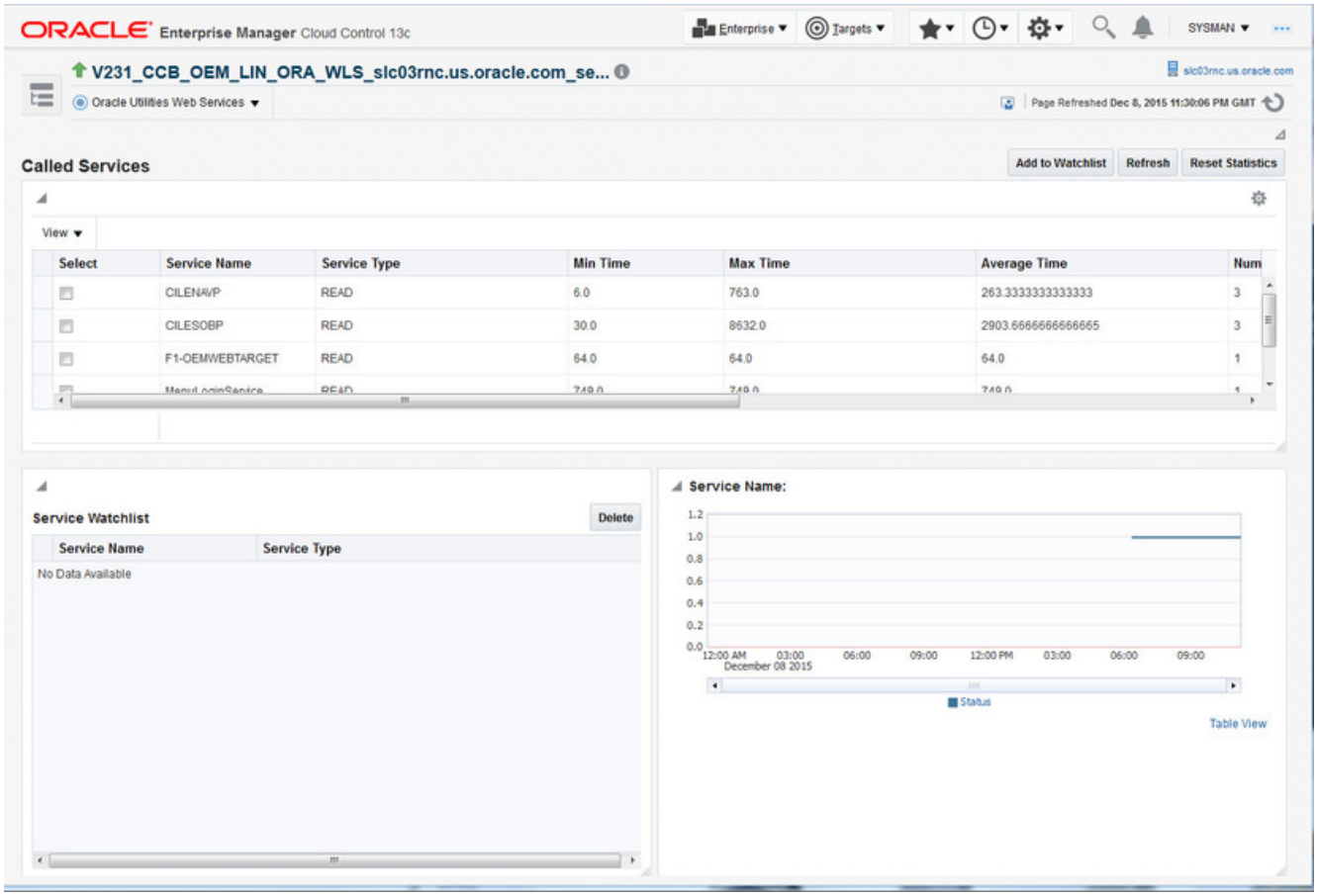
The Web Services Home Page

The Web Services Home page comprises five regions:

- **Called Services**: This region lists the services that were called along with such metrics as Minimum, Maximum, and Average execution times, number of times called, and information about the last call. It also has the following three command buttons:
  - **Add to Watchlist**: You can select certain services to watch and click the "Add to Watchlist" button to add it to the **Service Watchlist** area.
  - **Refresh**: Refreshes the **Called Services** table from the server.

- **Reset Statistics**: Resets all the counters to zero; it will also re-initialize the **Called Services** list.

- **Service Watchlist**: This table displays the list of services that you would like to watch. It supports a **Delete** button to remove the service from the watchlist.
- **Graph Area**: Displays the **Status** of the service. This is a customizable area in which the customer can add various monitoring charts. By default it displays the **Status** of the Business Application Service.



Like other monitoring pages in this release, this UI is customizable. The user can customize the UI by clicking the **Customize** icon at the top right hand corner:

Both the layout and content of the page can be changed.

Web Application Home Page

The Web Application target type uses the JVMSystems MBean's ThreadMXBean and MemoryMXBean to retrieve the following performance metrics:

- **From ThreadMXBean**:
  - ThreadCount
  - PeakThreadCount
  - DaemonThreadCount

    - CurrentThreadCPUTime
    - CurrentThreadUserTime
- **From MemoryMXBean**:
    - HeapMemoryUsage(init)
    - HeapMemoryUsage(max)
    - HeapMemoryUsage(used)
    - NonHeapMemoryUsage(init)
    - NonHeapMemoryUsage(max)
    - NonHeapMemoryUsage(used)

The Web Application Server Home page comprises four regions:

- **General Information Region**: This is the summary of the overall status of the Web Application. It tracks close to the General Information Region in the J2EE Application Server target home. The information is extracted from **ServerRuntimeMBean**. This region reuses the Deployment Summary Region provided by the Fusion Middleware Plug-in.
- **Response And Load** shows a simple graphic indicating historic availability and load.
- **Performance Region**: This region contains performance information collected from ServletRuntimeMBean, WsseOperationRuntimeMBean, and WebAppComponentRuntimeMBean for various JSP pages. This region reuses the Most Requested Region provided by the Fusion Middleware Plug-in.
- **JVM Statistics Region**: This region displays a set of standard JVM statistics acquired from JVMSystems MBeans in a chart format. The user can customize these graphs to display any of the other metrics that are collected.

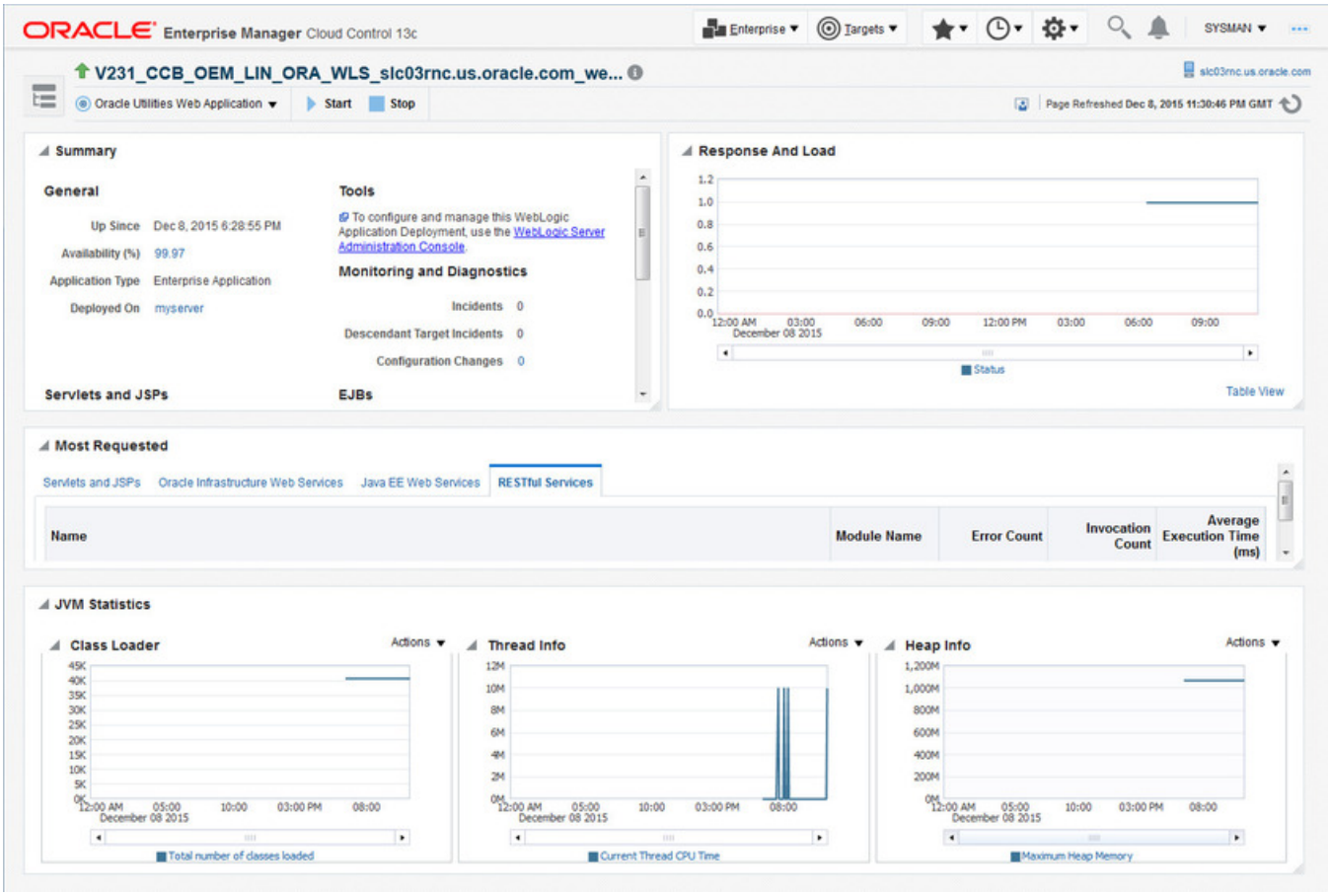


Figure 19: Web Application Home page

Like other monitoring pages in this release, this UI is customizable. The user can customize the UI by clicking the **Customize** icon in the top right-hand corner:

Both the layout and content of the page can be changed.

Batch Server Home Page

The Batch Server Home Page allows you to monitor thread pools, nodes, and batch process details.

Batch processes are monitored using Java Management Extensions (JMX), which is provided by the Oracle Utilities Application Framework (OUAF), and performance monitoring is supported only for products that are based on OUAF 2.2 or later.

In addition to monitoring batch processes, this feature can shut down thread pools, cancel thread operations, and provides an option to set alerts based on batch metrics.

Configuring and Connecting to JMX on an OUAF-based Product

Use this procedure only for monitoring performance for products that are based on OUAF 4.2 or later. Using it for other products will cause the process to abort with an "Operation not supported" error.

1. Obtain BATCH_RMI_PORT and other variables from the ENVIRON.INI file as described in the following table.

Table 1: Common Information for JMX Connections

Field	Comment	Source
Batch Mode	Execution Mode	BATCH_MODE (ENVIRON.INI)
Cluster Address	Cluster Address	COHERENCE_CLUSTER_ ADDRESS (ENVIRON.INI)
Cluster Port	Cluster Port	COHERENCE_CLUSTER_PORT (ENVIRON.INI)
Batch JMX Port	RMI Port for connection	BATCH_RMI_PORT (ENVIRON.INI)
Online Batch Enabled	Whether Online Batch is enabled	BATCHENABLED (ENVIRON.INI)
Online Batch Threads	Number of threads allocated to DEFAULT threadpools	BATCHTHREADS (ENVIRON.INI)
Online Batch Daemon	Whether Online Batch Daemon is enabled	BATCHDAEMON (ENVIRON.INI)

2. Obtain the JMX user name and password from the following files contained in `SPLEBASE/scripts`:
   - **Access file**: `ouaf.jmx.access.file`
   - **Encrypted password file**: `ouaf.jmx.password.file`.
3. Connect to JMX using the Java API class `javax.management.remote (JMXConnector, JMXServiceURL)`.
   - If connecting to a batch server target, use the URL:

     ```
     jmx:rmi:///jndi/rmi://server:port/spl/fw/jmxConnector
     ```

   - If connecting to a web application target, use the URL:

     ```
     jmx:rmi:///jndi/rmi://server:port/oracle/ouaf/webAppConnector
     ```

   - If connecting to a web services target, use the URL:

     ```
     jmx:rmi:///jndi/rmi://server:port/oracle/ouaf/ejbAppConnector
     ```

   If BATCH_RMI_PORT is not available, the error message "JMX support not configured" is issued. If a connection is not available, the error message "JMX Service not available" is issued.
4. Use the following stub/beans to obtain values from the server:
   - `com.splwg.base.support.batch.management.ActiveBatchMBean`
   - `com.splwg.base.support.batch.management.ActiveBatchJobMBean`
   - `com.splwg.base.support.batch.management.ActiveClusteredNodeMBean`
   - `com.splwg.base.support.batch.management.ActiveCobolBatchThreadMBean`
   - `com.splwg.base.support.batch.management.ActiveGridNodeMBean`
   - `com.splwg.base.support.batch.management.ActiveJavaBatchThreadMBean`

Viewing and Managing Batch Processes

The Batch Monitor page comprises four sections:

- Common Information
- Threadpool Summary
- Active Batch Jobs
- Batch Details

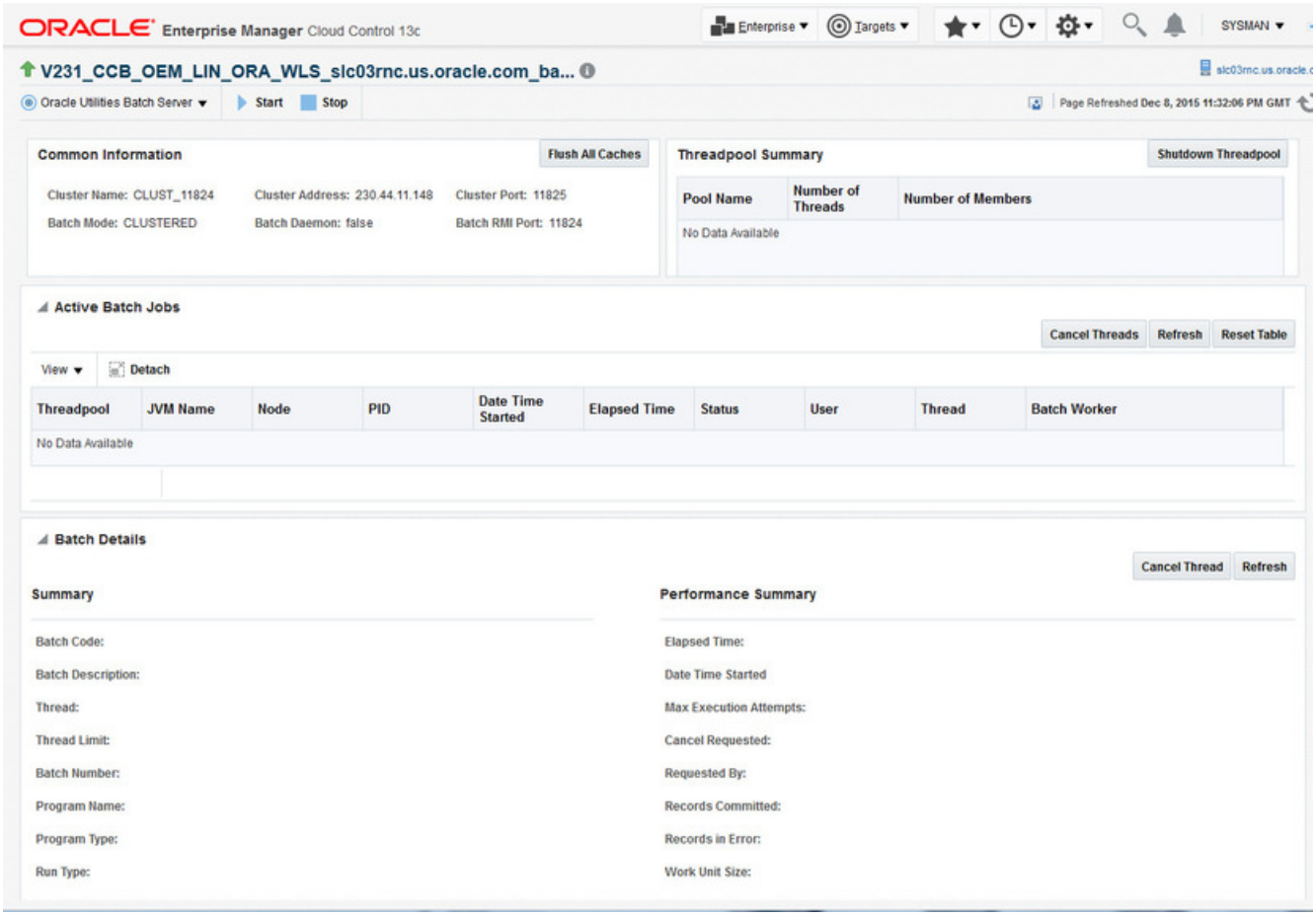


Figure 20: Batch Monitor page

Common Information

This section displays information about the cluster you are connected to. It includes the **Cluster Name**, **Cluster Address**, and **Cluster Port**. The section is populated automatically when the page is loaded. **Flush All Caches** flushes all Cache information within the cluster.

Threadpool Summary

This section displays the individual threadpool workers that are up and running and which belong to this cluster.

The following table describes each of the columns in the summary.

Table 2: Threadpool Summary

Field	Comment	Attribute
ThreadPool	Name of Thread pool	Name
Available Threads	Available number of Threads	AvailableThreads
Members	Number of Active Members	NumberOfMembers

The section also offers a button to shut down a selected threadpool worker.

Active Batch Jobs

The Active Batch Jobs section displays all currently active batch jobs. This is displayed in the form of a table with the following fields:

Table 3: Batch Bean

Field	Comment	Source
Thread Pool	Name of Threadpool	DistThreadPool
JVM Name	Name of JVM	Inherited from previous call
Node	Node running on	Inherited from previous call
Thread	Thread Number	ThreadNumber
Batch Number	Batch Run Number	BatchNumber
Date Time Started	Date Time Job Started	DateTimeStarted
Elapsed Time	Elapsed time since job started	ElapsedTime
Status	Status of Job	Status
User	User used to run job	UserId

When you click on an active batch job, its details populate in the **Batch Details** section.

This section also supports the following actions via buttons:

- **Cancel Threads**: Kills the selected batch job.
- **Refresh**: Refreshes the list of active batch jobs.
- **Reset Table**: Same as Refresh, except it cleans up the list and reloads it.

Batch Details

This section displays all details about the batch job selected in the **Active Batch Job** section. The following table describes the displayed fields:

Table 4: Batch Detail

Field	Comment	Source
Summary		
Batch Code	Batch Control Id	BatchCd
Thread	Thread Number	ThreadNumber
Thread Limit	Max number of threads	ThreadCount
Batch Number	Batch Run Number	BatchNumber
Program Name	Program running	ProgramName
Run Type	Type of Run	RunType
Execution Strategy	Execution Commit Strategy	ExecutionStrategyClass
Common Parameters		
Language	Language Code used	LanguageCd
Maximum Commit Records	Commit Frueqency	MaximumCommitRecords
Maximum Timeout (min)	Commit Timeout	MaximumTimeoutMinutes
Business Date	Business Date used for job	ProcessDate
ReRun Number	Rerun Number for reruns	RerunNumber
Thread Pool	Thread Pool allocated to	DistThreadPool
Name	JVM Name	
UserId	User Running Job	UserId
Trace Program Start	Is Tracing on for Start of job?	TraceProgramStart
Trace Program End	Is Tracing on for End of job?	TraceProgramEnd
Trace SQL	Is Tracing on for all SQL in job?	TraceSQL
Trace Standard Out	Is Tracing on for debug messages for job?	TraceStandardOut
Performance Summary		
Elapsed Time	Elapsed Time since start	ElapsedTime
Date Time Started	Date Time Job started	DateTimeStarted
Max Execution Attempts	Number of executions	MaxExecutionAttempts
Cancel Requested	If job has been cancelled recently	CancelRequested
Requested By	If CancelRequested = true then OS userid of person who requested the cancel	CancelRequestedBy
Records Committed	Number of records processed so far	RecordsCommitted
Records in Error	Number of records in Error so far	RecordsInError
Work Unit Size	Size of Work unit within Execution Strategy	WorkUnitSize
Work Unit Size This Run	Work Unit used for this run	WorkUnitSizeThisRun
Work Units Committed	Work Units Committed so far	WorkUnitsCommitted
Work Units In Error	Work Units errored so far	WorkUnitsInError

Field	Comment	Source
Work Units Processed	Work Units processes so far	WorkUnitsProcessed
Additional Parameters (List of parameters from SoftParameters)		
Parameter	Parameter Name	Element before = in array
Value	Parameter Value	Element after = in array

The thread details are part of default collections, and only when a **Refresh** button is clicked will the details be refreshed by calling a job or by getting the latest information from the default collections.

Target Control Operations

The target controls provide access to common operations performed by the administrator. It includes buttons to start and stop the application server and batch server. These buttons are available on the applicable target home page and on the target control submenu.

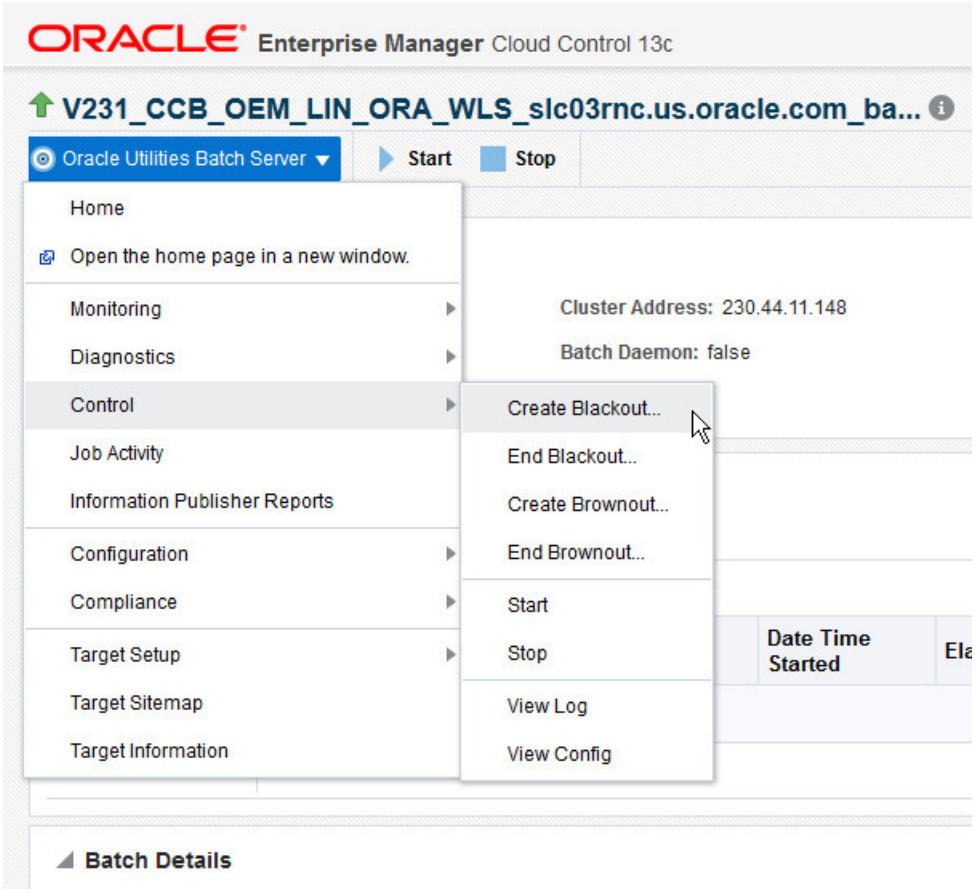


Figure 21: Common Target Controls

Based on the target type, you can view log and configuration files, assess a target, clone an ouaf home target (application server only), or manage the installation or migration of patches. These features can be found on the target control submenu.

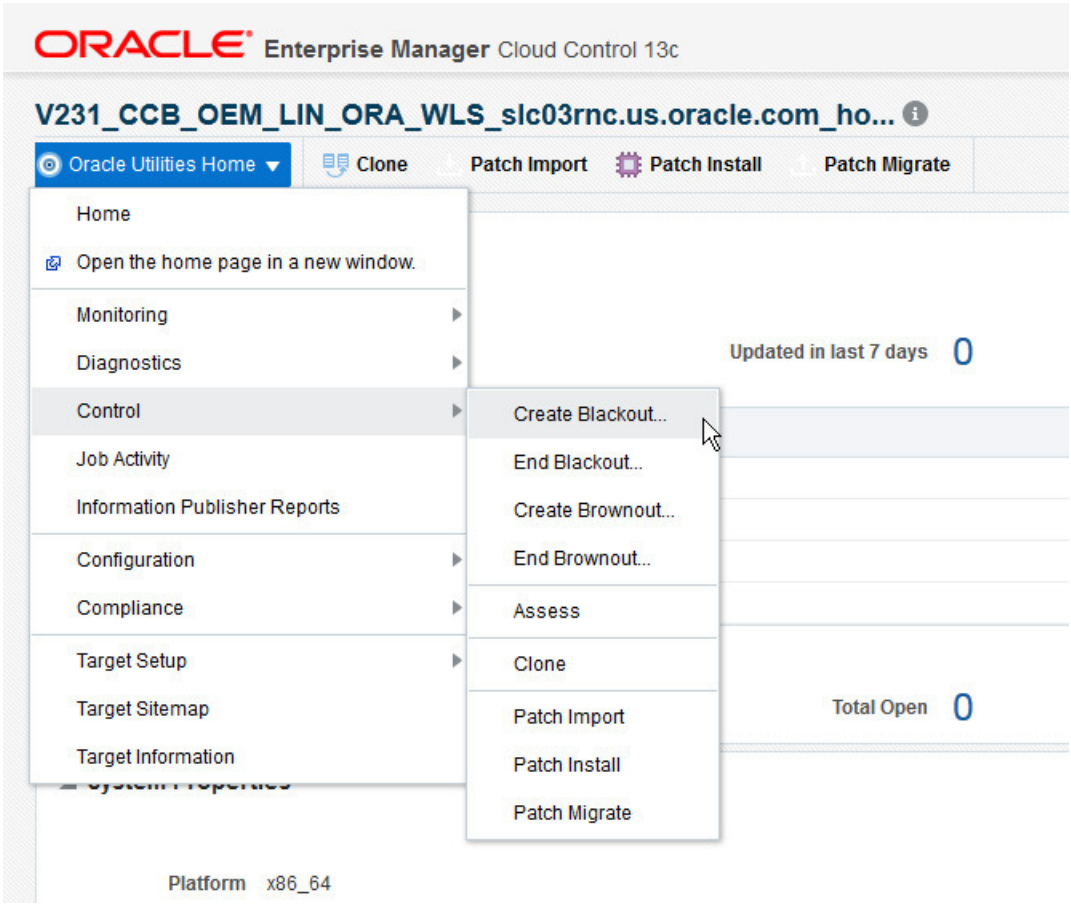


Figure 22: Procedure-based Target Control Operations

These are job-based or deployment procedure-based operations that run the appropriate utilities that an administrator would normally submit from the command line. As such, it is the administrator's responsibility to ensure that jobs submitted do not conflict with each other. For example, during patch installation, the Start button will still be available, so if a start job is submitted, that operation will interfere with the running patch process (and vice-versa).

The following sections describe the various features available using start/stop and the target controls.

Start/Stop

Start and Stop allows the operator to start or stop a given target. The start/stop buttons are prominently displayed on the target home page.

View Logs

The View Logs feature allows the operator to view the contents of log files generated at the application server level.

View Configuration Files

The View Configuration Files function lets the operator view the contents of configuration files used by the application server.

Clone

The Clone function lets the operator clone the current environment (application server only).

Assess

The Assess function assesses an environment's configuration.

Import Patches

Patching an environment involves three steps:

1. Download the patches from My Oracle Support (performed manually outside of Enterprise Manager for Oracle Utilities).
2. Import the patches into Enterprise Manager for Oracle Utilities (via the **Import Patches** button on the **Common Operations** panel).
3. Install/Migrate the patches.

The Import Patches function must be used for the second step. This function is required for patch installs and patch migration within the Enterprise Manager for Oracle Utilities plug-in.

Install Patches

The Install Patches function is used to install patches that have already been imported into the Enterprise Manager for Oracle Utilities plug-in in the current environment.

Migrate Patches

The Migrate Patches function is a special form of patch installation wherein a source environment is compared to a destination environment. The source environment is used to identify patches that the administrator intends to install in the current/destination environment. The identified patches should have been imported previously for the current target's product, release and platform.

Detailed Description of Target Control Operations

Start/Stop

As mentioned earlier, start/stop allows operators to startup/shutdown a target. In a way, it also confirms that the environment is properly installed by checking that the configuration files contain all the values necessary to bring up/down the environment. These are available on the target home pages for the web application, web services, and batch server target types.

These buttons open a dialog in which the administrator enters the credentials to connect to the server for the purpose of either starting or stopping the target.

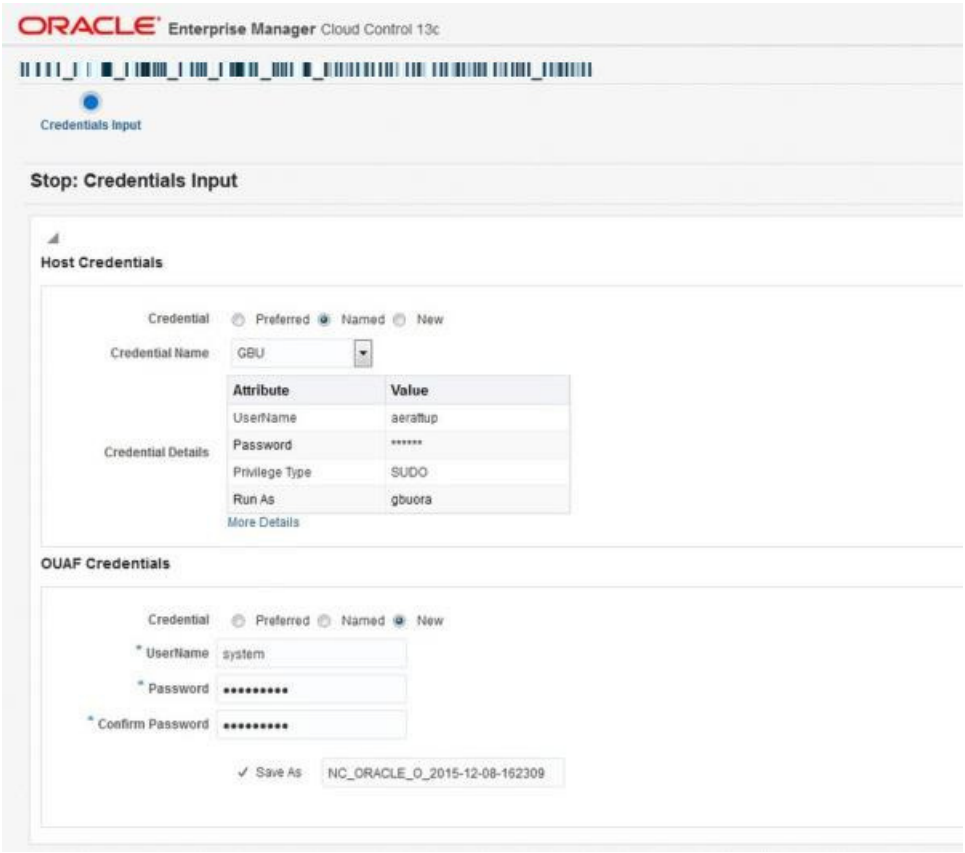


Figure 23: Credentials Input

The types of credentials that can be selected are:

- Credentials to connect to the host on which environment is running (e.g., `cissys` or `oracle`)
- Credentials that were used to configure the environment (e.g., `cissys`)

You can either enter these values or select a saved credential.

When credentials are entered, clicking **OK** executes the selected command (**Start** server or **Stop** server). Clicking **Cancel** or closing the dialog exits without starting (or stopping) the server.

> **NOTE:** The **Start**/**Stop** buttons submit jobs that perform the same function provided by the `spl.sh`/`spl.cmd` start/stop command-line utility. Thus, the environment in which you are working must be set up so that these utilities are available and properly functioning.

Environment Assessment

Environment assessment allows administrators to perform basic validation of correct installation of Oracle Utilities Application Framework Home target page.

The following files, settings, and definitions are checked:

- Correct positioning of key files
- Key configuration settings

- Correct setting of security definitions
- Patch validation

To assess the current environment:

1. Open the Oracle Utilities Application Framework Home target page. On the **Target** dropdown, choose **Control** > **Assess.**

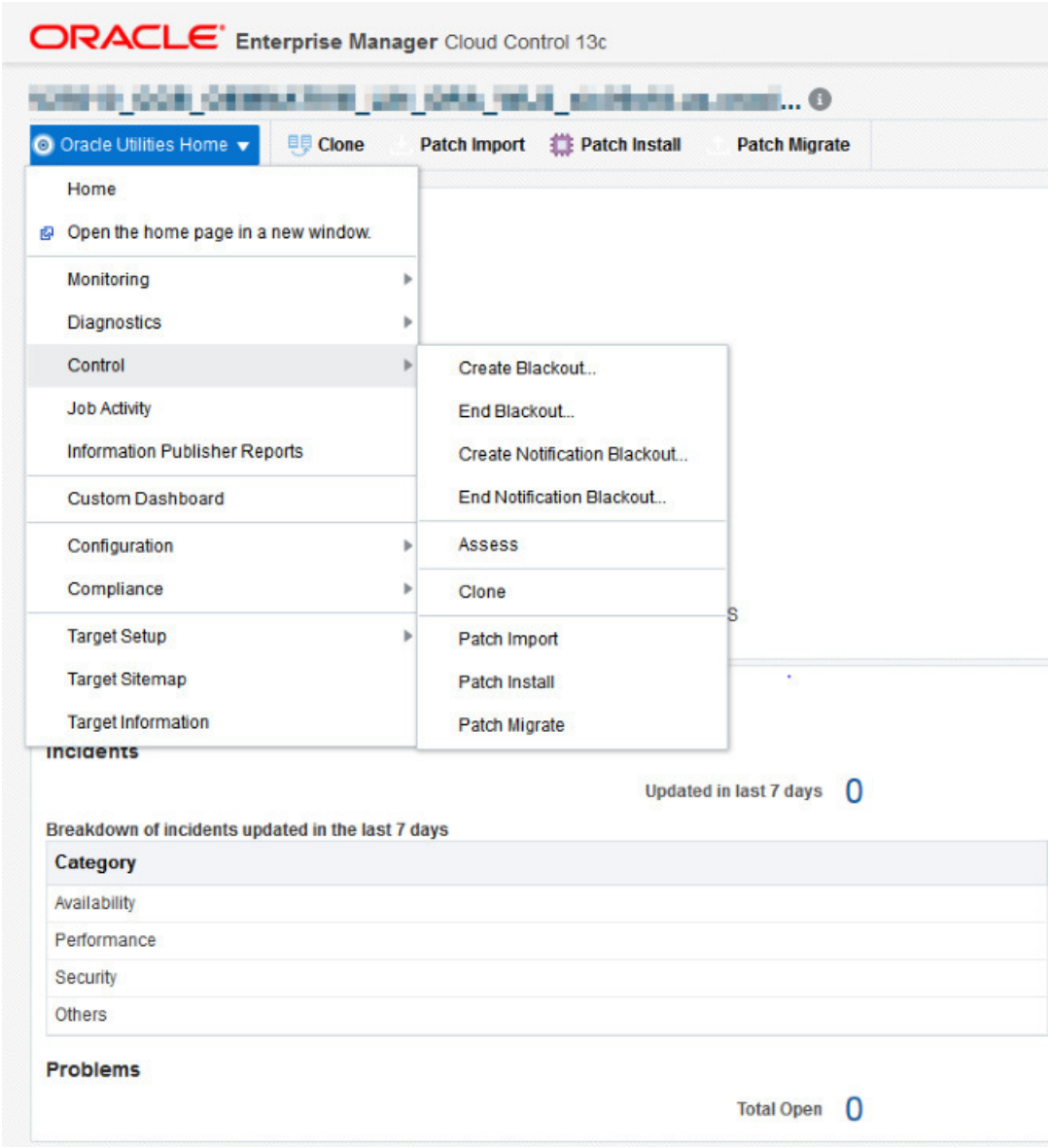


Figure 24: OUAF Home Target page: Assess

2. On the **Credentials** page, choose a set of saved credentials or enter your user name and password, then click **Next** to proceed.

3. You will be directed to the **Job Activity** page, where you can view the results of the assessment job.

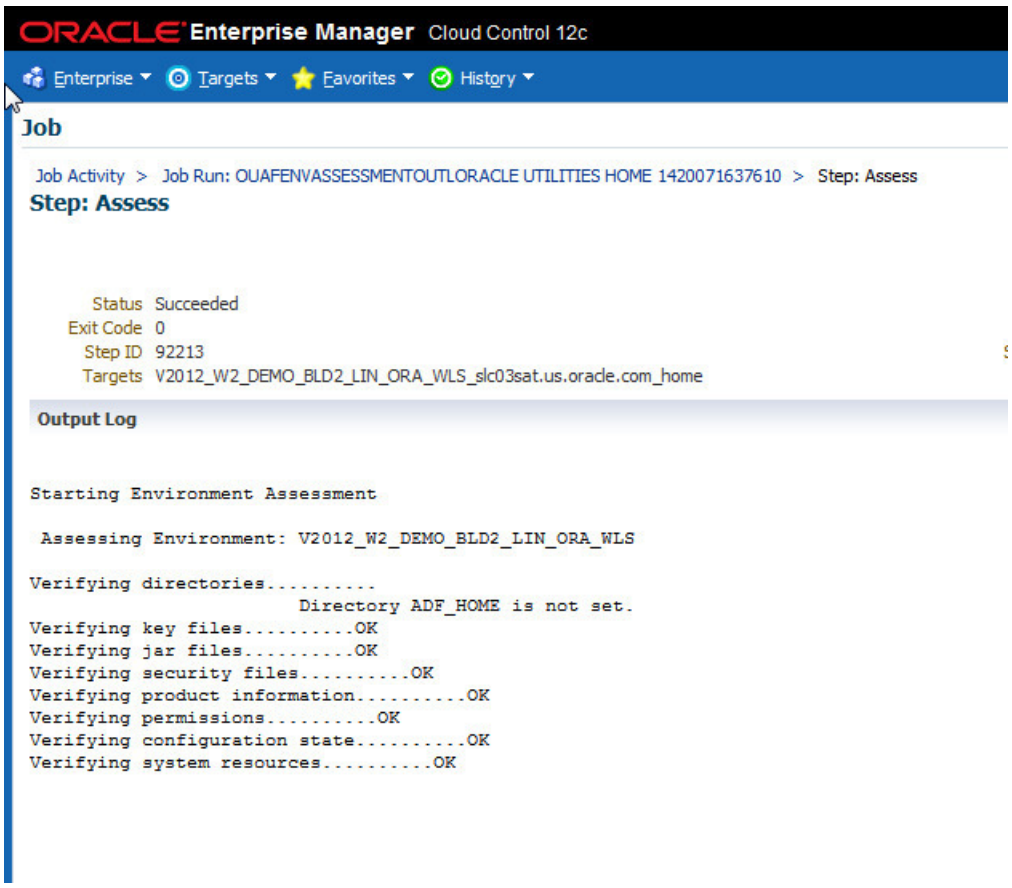


Figure 25: Environment Assessment: Result

4. Click **Finish** to return to the Oracle Utilities Application Framework Home target page.

Environment Cloning

Environment cloning allows operators or administrators to duplicate the application server portion of any Oracle Utilities Application Framework-based environment, creating new environments using the same software and definitions that exist on the source server.

Two cloning options are available:

- **Simple** cloning copies software and existing parameters to a target environment using minimal specifications. It can be particularly useful for backing up an existing environment prior to applying patches.
- **Advanced** cloning lets you modify configuration information—memory arguments, installation software locations, batch configurations for coherence settings, etc.—to create new environments with new characteristics. Other configuration changes, such as web application server-related credentials, must be changed after the cloning operation is complete by running the `configureEnv` command line utility.

NOTE:

- To minimize performance issues, the clone of an environment must be on the same host as the original environment. Only the application server is cloned, not the database.
- Immediately after cloning, ensure that the application server clone is connecting to the new database/schema. If the database/schema is not shared by other application server components, clear the F1_TSPACE_ENTRY table entries in the new database/schema as follows:

  1. Shut down the environment.
  2. Connect to the database with sqlplus or similar utility and run the following SQL statement:

     ```
     delete * from F1_TSPACE_ENTRY where TSPACE_ENTRY_TY='OEM_TARGET'
     ```

  3. Restart the environment.

Environment Cloning: Simple Clone

To clone an environment using the simple method:

1. Open the **Target UI Home Page** dropdown list and choose **Control** > **Clone.**

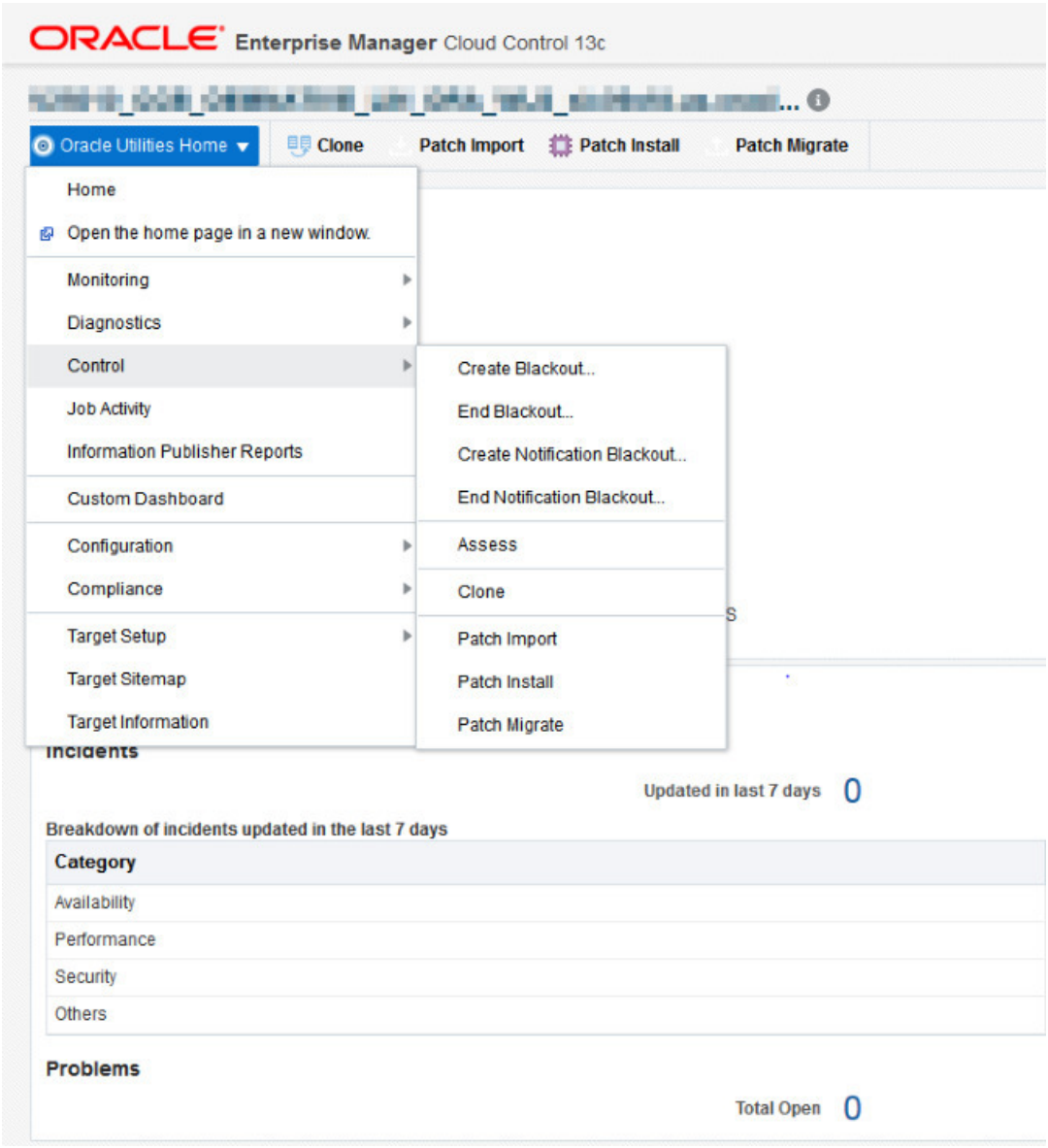


Figure 26: Simple Cloning: Select Clone

2. On the **Clone Type** page, choose **Simple Clone** from the dropdown list, then click **Next** to proceed.

Figure 27: Simple Cloning: Select Clone Type

3. On the **Credentials** page, choose a set of saved credentials or enter your user name and password, then click **Next** to proceed.

Figure 28: Simple Cloning: Enter Credentials

4. On the **Details** page, provide the name and mount point for the new environment, a description of the environment, and the listed port numbers according to the screen. Other options on the target environment will match the source environment. Select the first check box if you want to restart the source environment. Select the second checkbox if you want to generate a new environment ID for the clone environment.

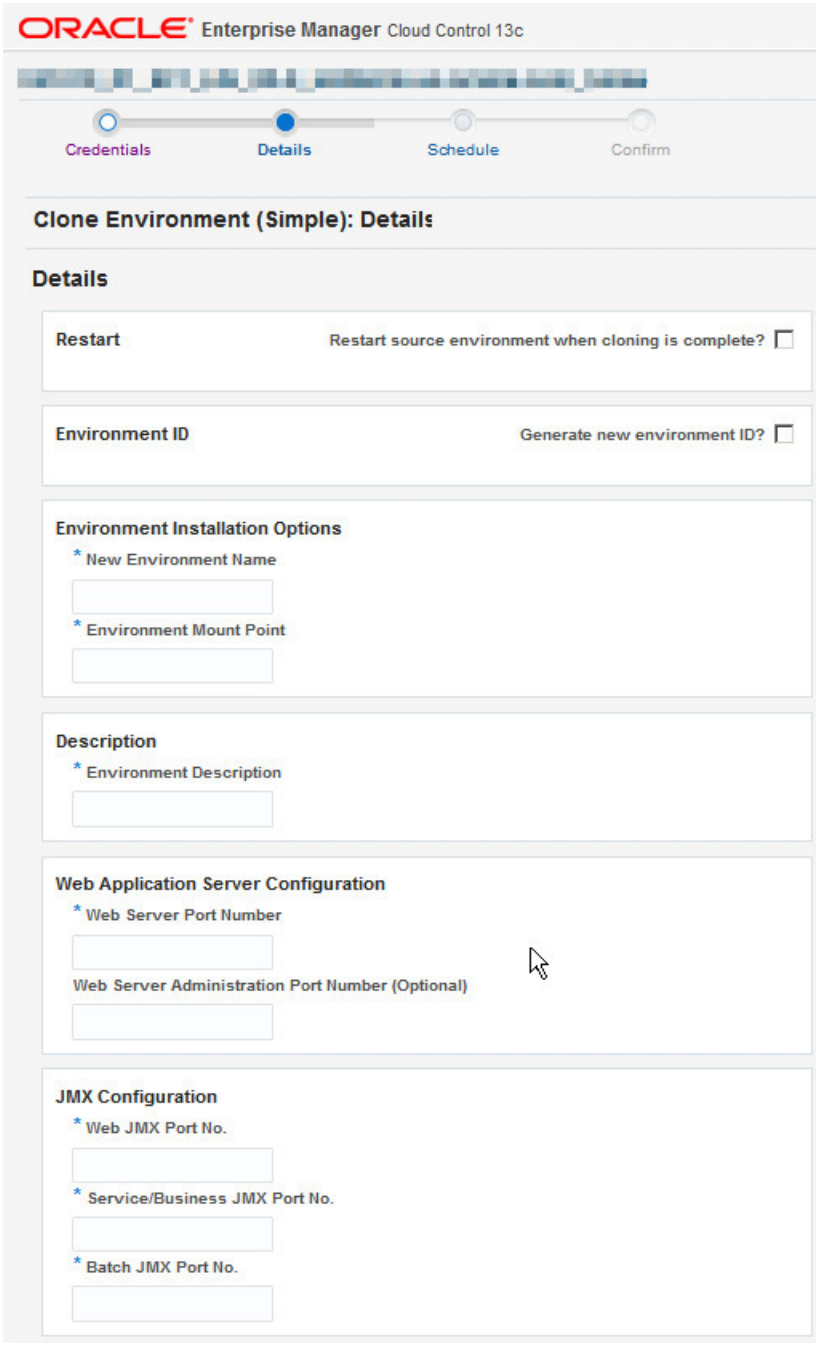


Figure 29: Simple Cloning: Enter Details for Web and Batch Targets

If the source environment has both web and batch targets, you must also enter the Web Server Port Number, Web JMX Port Number, Batch JMX Port Number, Service/Business JMX Port Number, and an optional Web Server Administration Port Number.

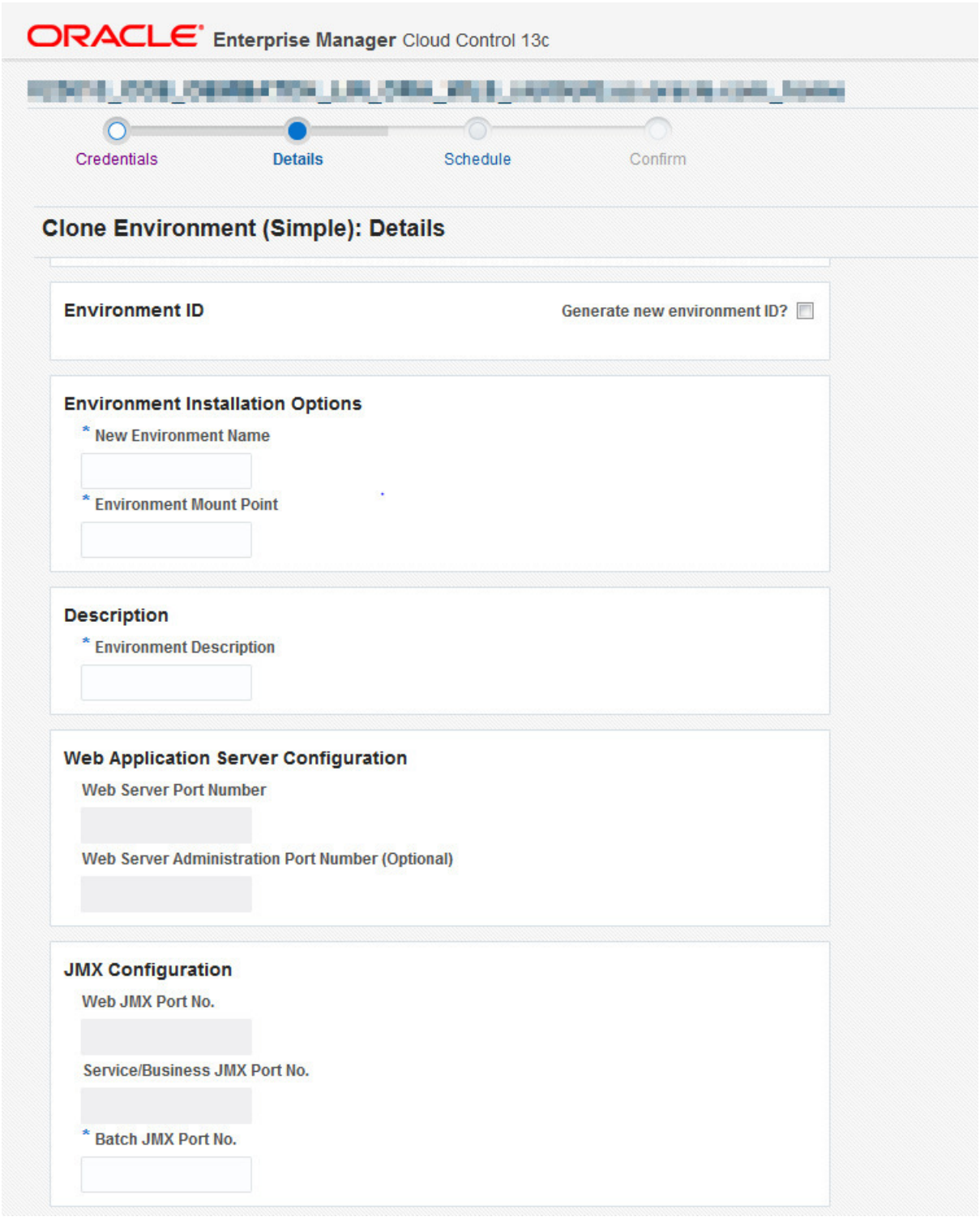


Figure 30: Simple Cloning: Enter Details for Batch-Only Target

If the source environment has only a batch target, the Web Server Port Number, Web JMX Port Number, Service/Business JMX Port Number, and the optional Web Server Administration Port Number are disabled, and you need only provide the Batch JMX Port Number.

Click **Next** to proceed after all required details are entered.

5. On the **Schedule** page, choose to either perform the clone operation **Now** or **Later**. Click **Schedule** to complete the process and submit the cloning job.

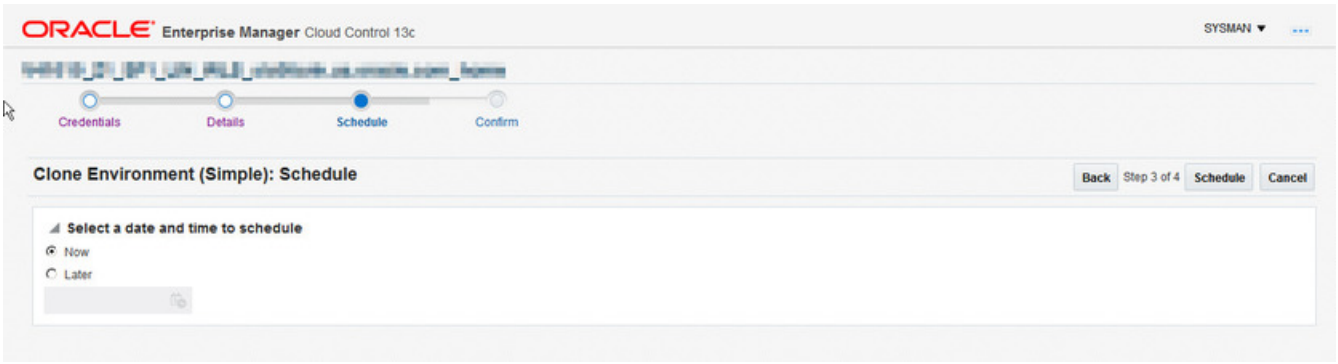


Figure 31: Simple Cloning: Scheduling

If the source environment has both web and batch targets, the dialog box will prompt you to run `iwsdeploy.sh` manually after cloning to deploy IWS if and *only* if Web services have been enabled in the source environment.

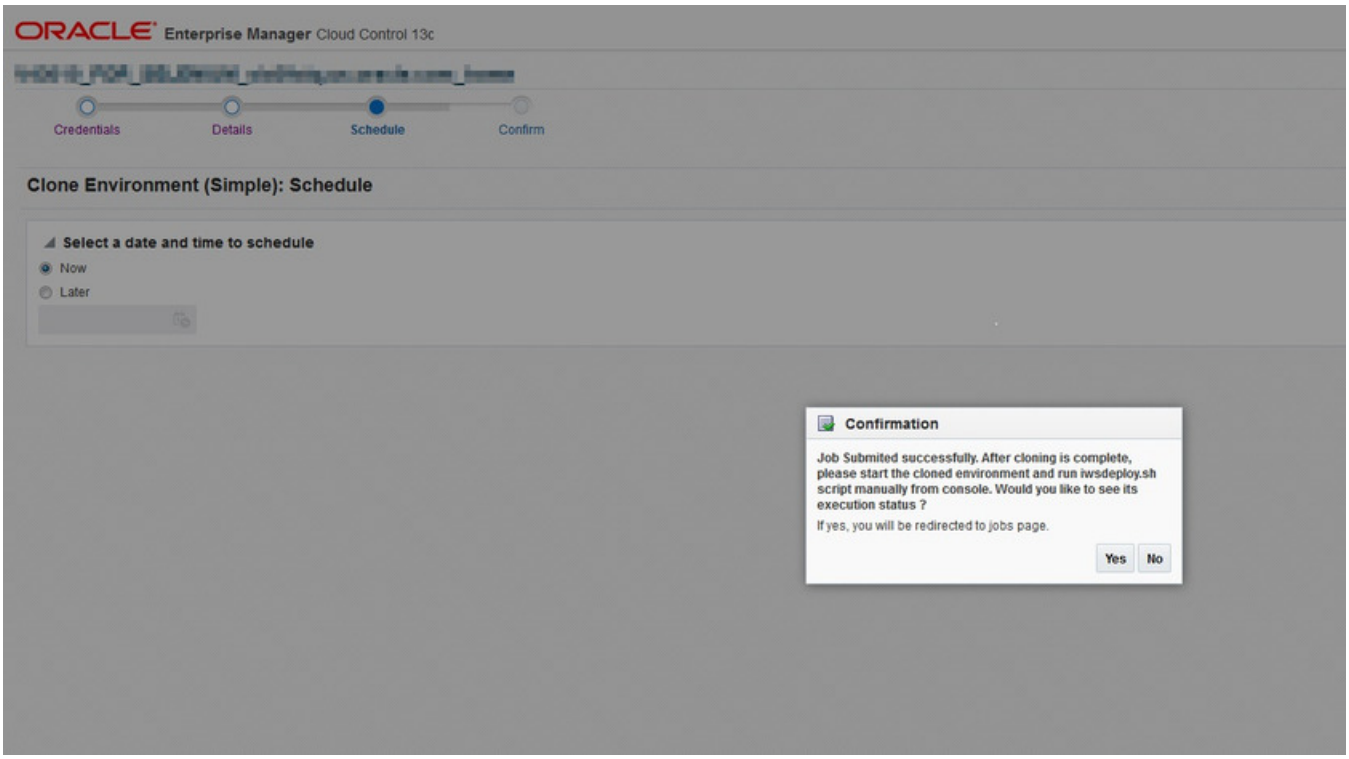


Figure 32: Simple Cloning: Confirmation Dialog for Web and Batch Targets

If the source environment has only a batch target, the dialog box will simply ask you if you want to view the execution status.

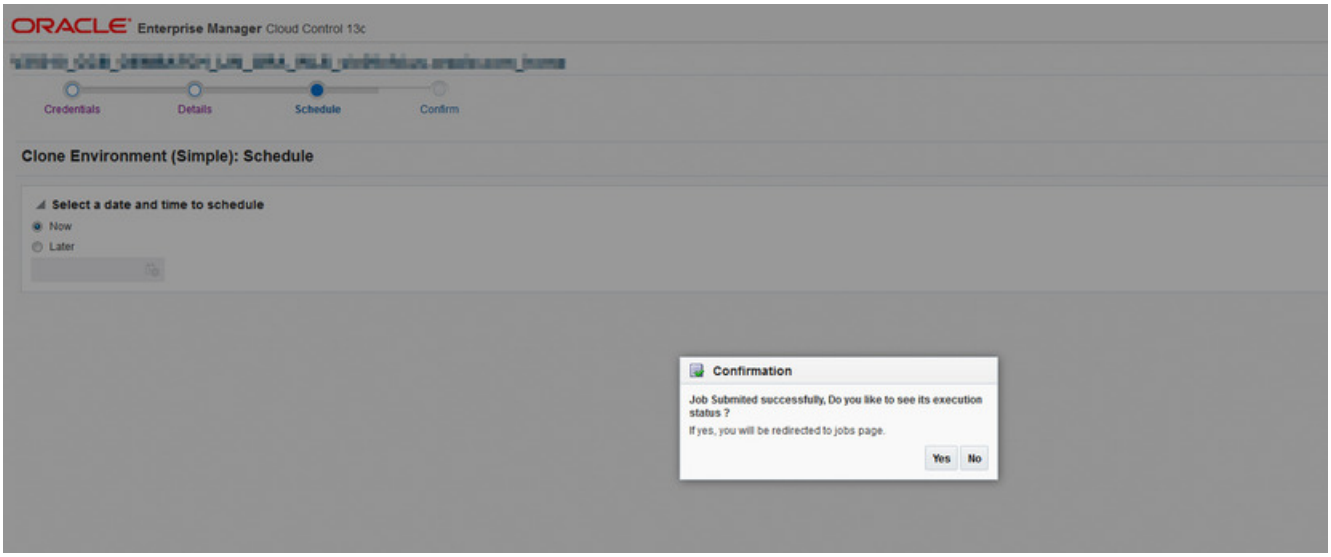


Figure 33: Simple Cloning: Confirmation Dialog for Batch-Only Target

Simple cloning allows you to create a copy of an environment and start it for testing (since you can change the web port number). In order to make more complex configuration changes after creating a simple clone, the operator must set the appropriate values on the target environment by running the `configureEnv.sh` command-line utility. The operator must, for example, ensure that coherence settings are properly set up if clustered mode is being used.

NOTE:
After creating a clone, be sure to perform all the steps necessary to discover and promote the clone.

Environment Cloning: Advanced Method

To clone an environment using the advanced method:

1. Open the **Target UI Home Page** dropdown list and choose **Control** > **Clone.**

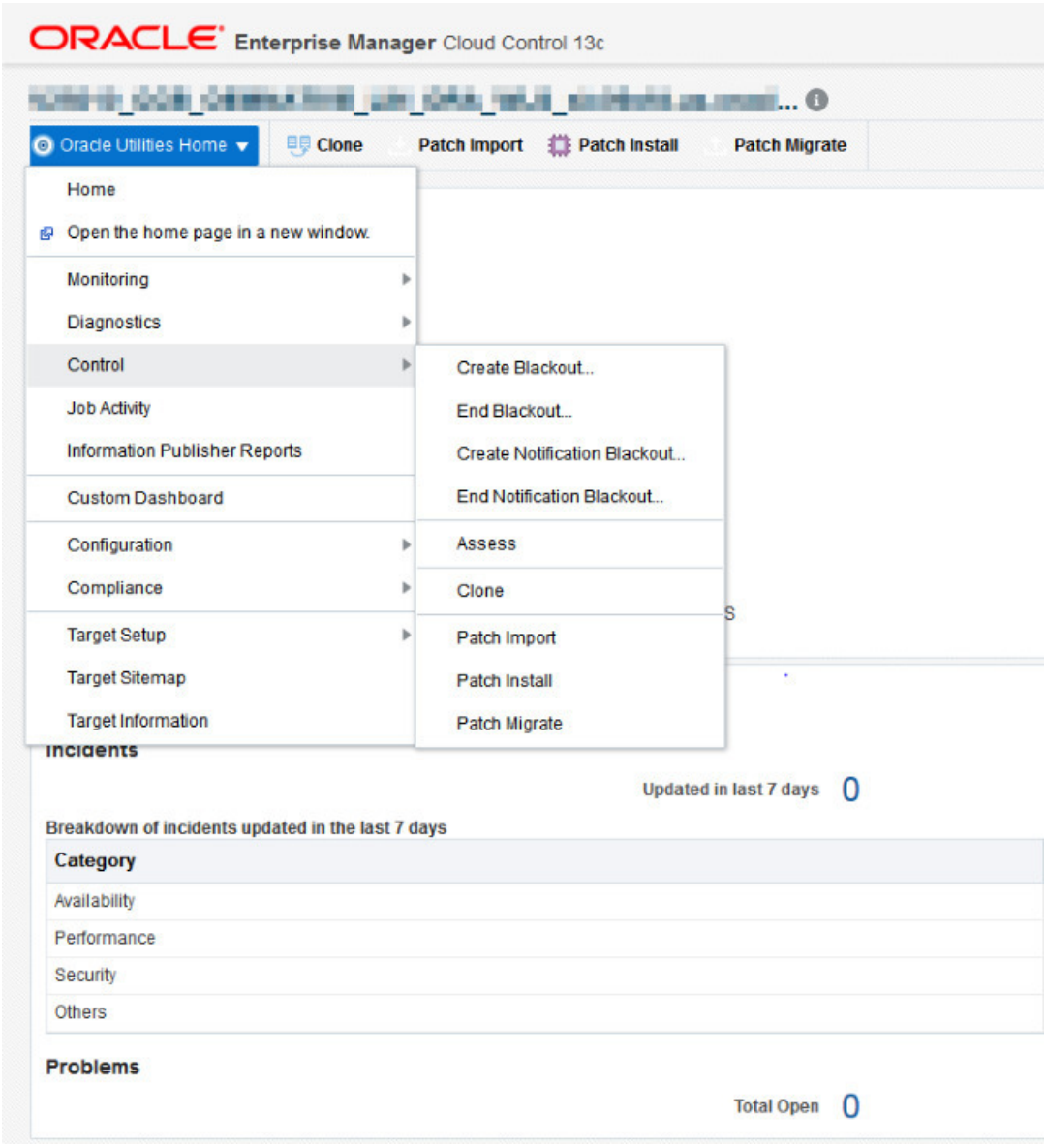


Figure 34: Simple Cloning: Select Clone

2. On the **Clone Type** page, choose **Advanced Clone** from the dropdown list, then click **Next** to proceed.

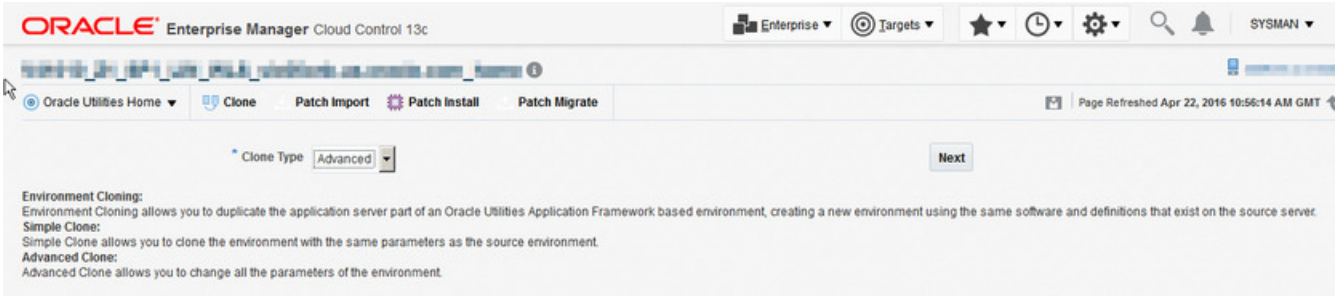


Figure 35: Advanced Cloning: Select Clone Type

3. On the **Credentials** page, choose a set of saved credentials or enter your user name and password, then click **Next** to proceed.

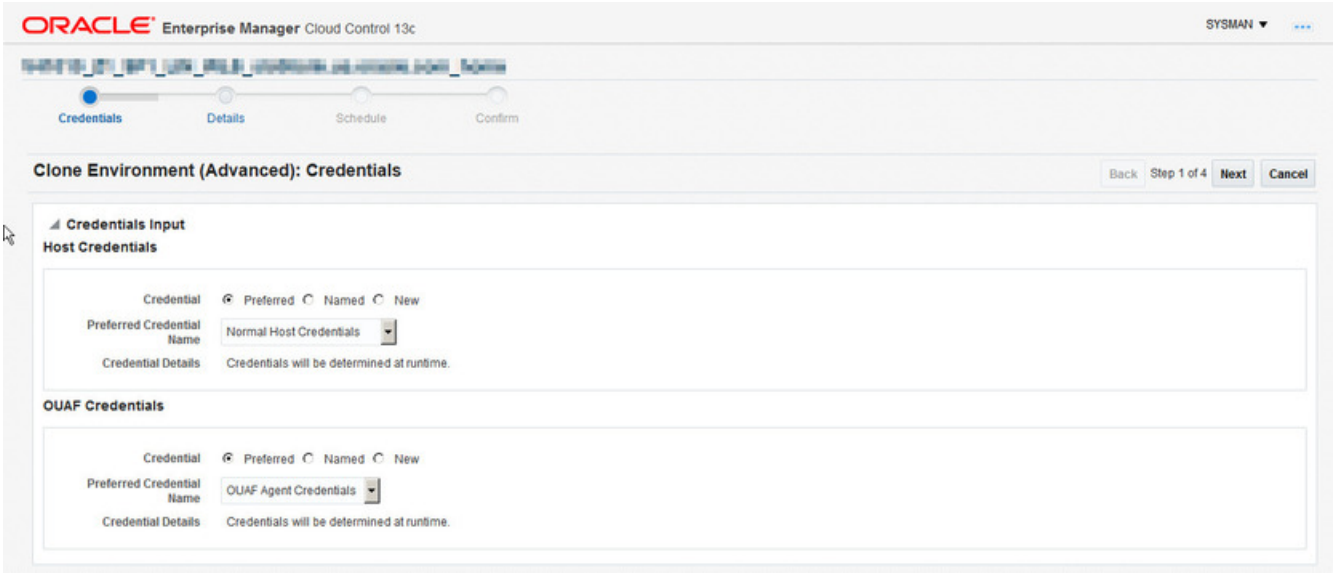


Figure 36: Advanced Cloning: Entering Credentials

4. The **Progress** page lets you know that required details are being collected from the source environment.

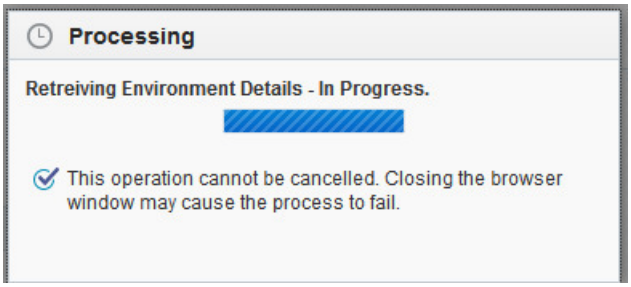


Figure 37: Advanced Cloning: Retrieving Details

IMPORTANT: The details collection process cannot be interrupted, and will continue even if the browser window is closed.

After retrieving the source environment details, the page automatically advances to the **Details** page.

5. Use the **Details** page to make any necessary adjustments to the collected information. Select the first checkbox if you would like to restart the source environment. Select the second checkbox if you want to generate a new environment id for the clone environment. Click **Next** to proceed.

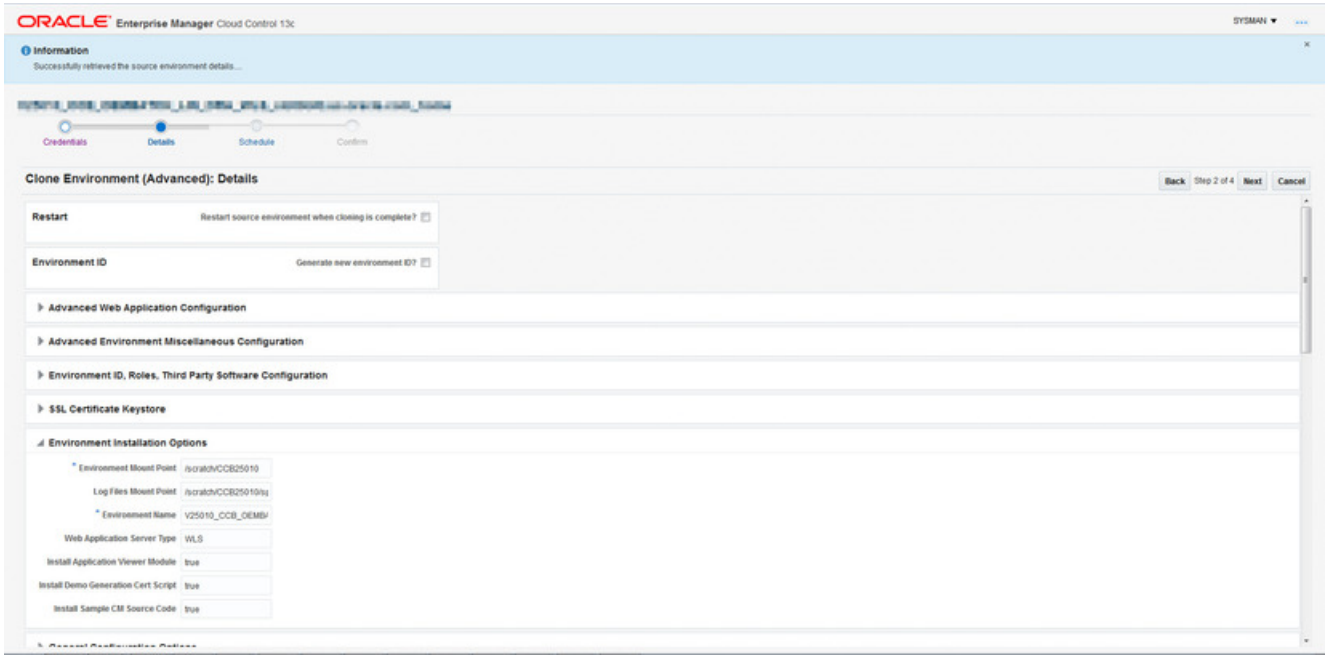


Figure 38: Advanced Cloning: Entering Details

6. On the **Schedule** page, choose to either perform the clone operation **Now** or **Later**. Click **Schedule** to complete the process and submit the cloning job.

Figure 39: Advanced Cloning: Scheduling

If the source environment has both web and batch targets, the dialog box will prompt you to run `iwsdeploy.sh` manually after cloning to deploy IWS if and only if Web services have been enabled in the source environment.

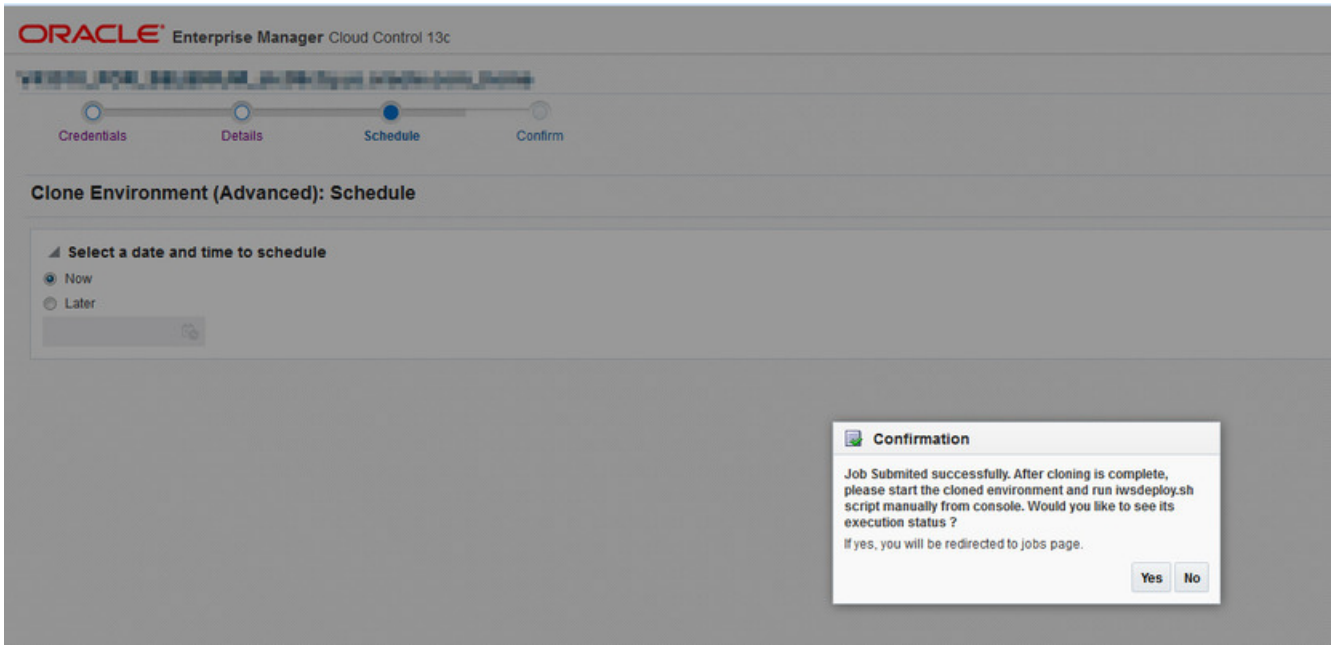


Figure 40: Simple Cloning: Confirmation Dialog for Web and Batch Targets

If the source environment has only a batch target, the dialog box will ask you if you want to view the execution status.

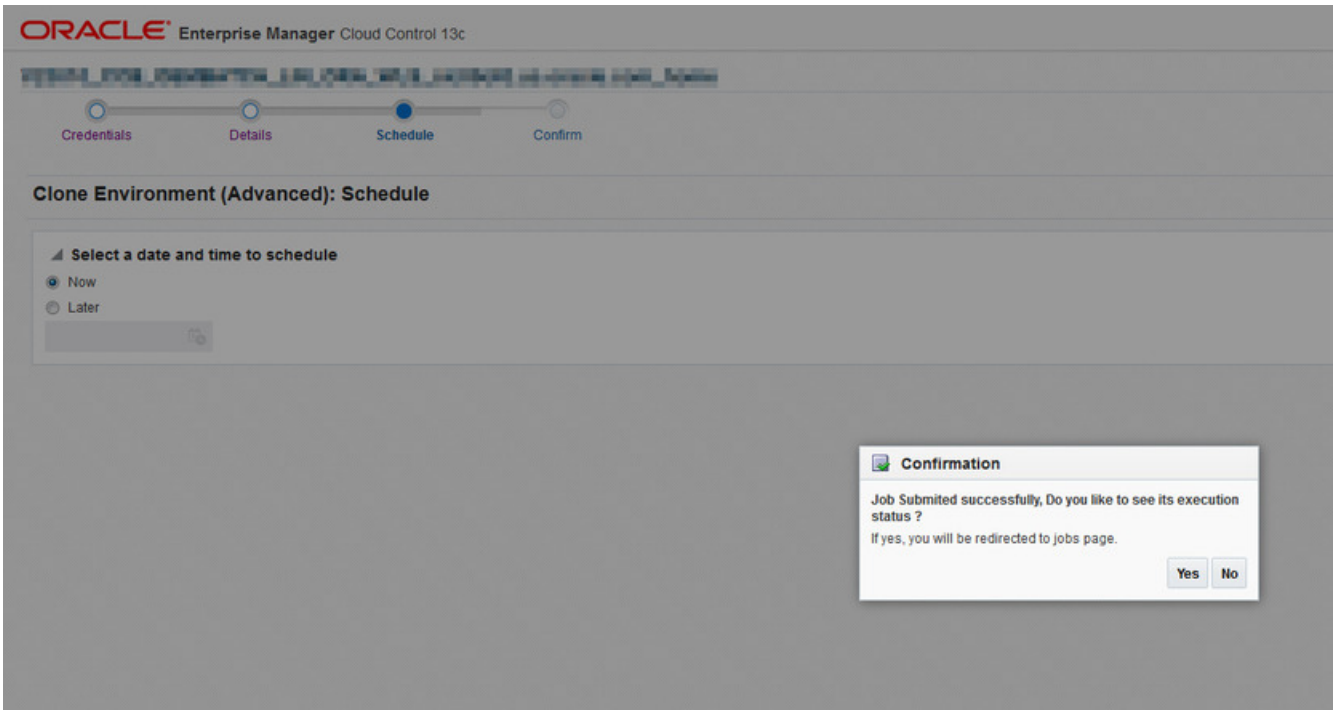
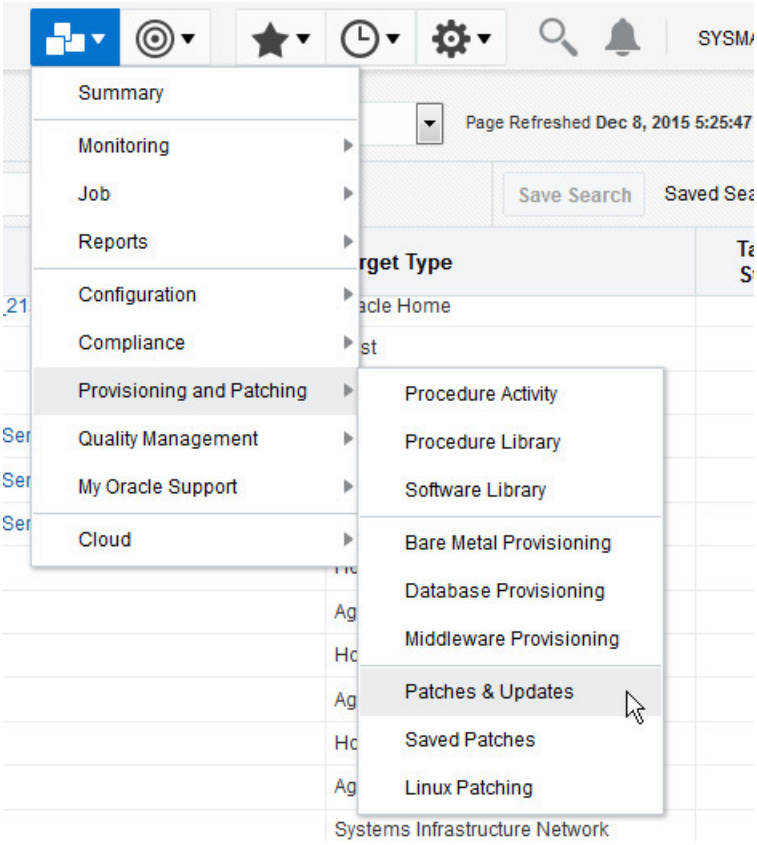


Figure 41: Simple Cloning: Confirmation Dialog for Batch Target Only

Patch Import and Installation

Patching is a three-step process*:

1. **Download** patches from My Oracle Support (MOS): This step is performed through the **My Oracle Support Plug-in** within Oracle Enterprise Manager from the top-level menu, choose **Enterprise** > **Provisioning and Patching** > **Patching & Updates**.



2. **Import** the downloaded patches: This process allows you to import downloaded patches which are subsequently unpackaged into a format that is compatible with Enterprise Manager for Oracle Utilities's installation process.
3. **Install** the imported patches: This process allows you to import downloaded patches and install them into a target environment, updating relevant files in `$SPLEBASE`. If you deploy manually to the web server, you must perform this step after the installation process completes.

Patch Import/Installation Notes

- In addition to the procedures described in this topic, follow the steps in the Patching Prerequisite topic before installing patches in Enterprise Manager for Oracle UtilitiesRelease 13.4.1.0.0 and later.

  IMPORTANT: Installation of Service Packs for OUAF products is supported in this release. Review the document *Whitepaper: Service Pack Compliance*

before installing any service pack to make sure the service pack is packaged in a compliant manner.

- Read-write access to the download directory is required.
- For patches containing single fixes and hot fixes: Application server patch components are installed using the standard patch install script. Database patch components are installed using a Java version of the standard `CDXPatch.exe` utility.
- Patches containing service packs using the new SP model are now supported. These type of patches contain a file called Metadata.xml, which is used by the plug-in to install the service pack.
- During patch installation and patch migration, the installation job copies the individual patch directories from the download staging directory to a directory on the target environment (`$SPLEBASE/oem/patch/install/tmp/YYYY-MM-DD-HH-MI-SS`). The subdirectories are sorted by install sequence, e.g., `001-gf`, `002-gf`, `003-sfs`. The job output clearly states the directories from which patch installation occurs.
- During service pack installation, make sure the service pack zip file is the sole content of the download directory.
- During any installation process—service pack, single fixes, rollups—WebLogic environments are shut down automatically using the command-line utility `spl.sh/spl.cmd`. Non-WebLogic environments must be shut down manually.
- Due to packaging differences, only standard single fixes, group fixes and service packs using the new service pack model are supported. An error is generated if you choose an old service pack or rollup for import, or if the single fix or group fix is packaged in a non-standard manner.

Patching Prerequsite

As of Enterprise Manager for Oracle UtilitiesRelease 13.4.1.0.0, OUAF database credentials are Enterprise Manager for Oracle Utilities stored as a named credential and referenced by the patching procedures. Before patching an OUAF Home target, you must create the OUAF database credentials.

To set up the OUAF database credentials:

1. Navigate to **Setup** > **Security** > **Named Credentials.**

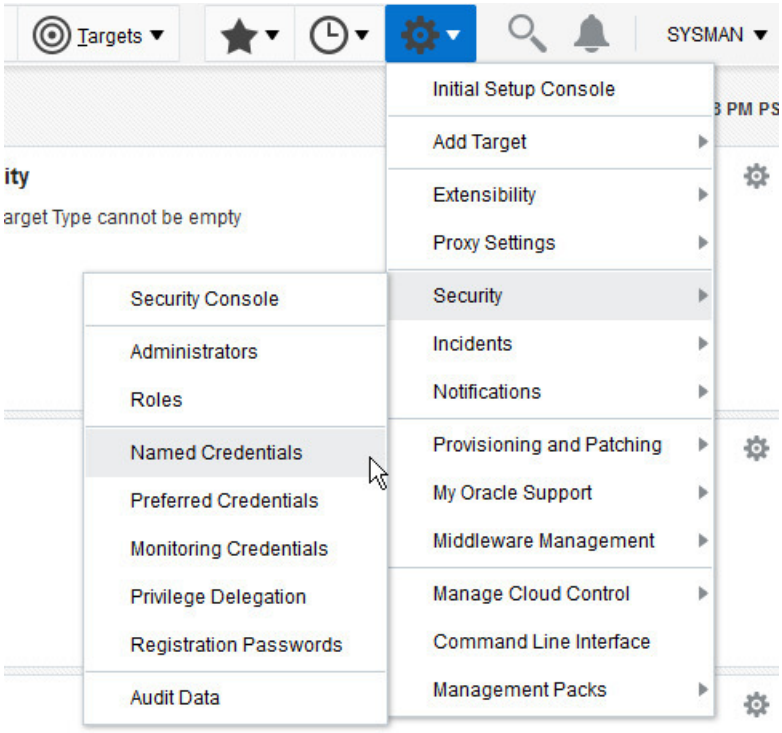


Figure 42: Navigating to Named Credentials

2. Click the **Create** button.

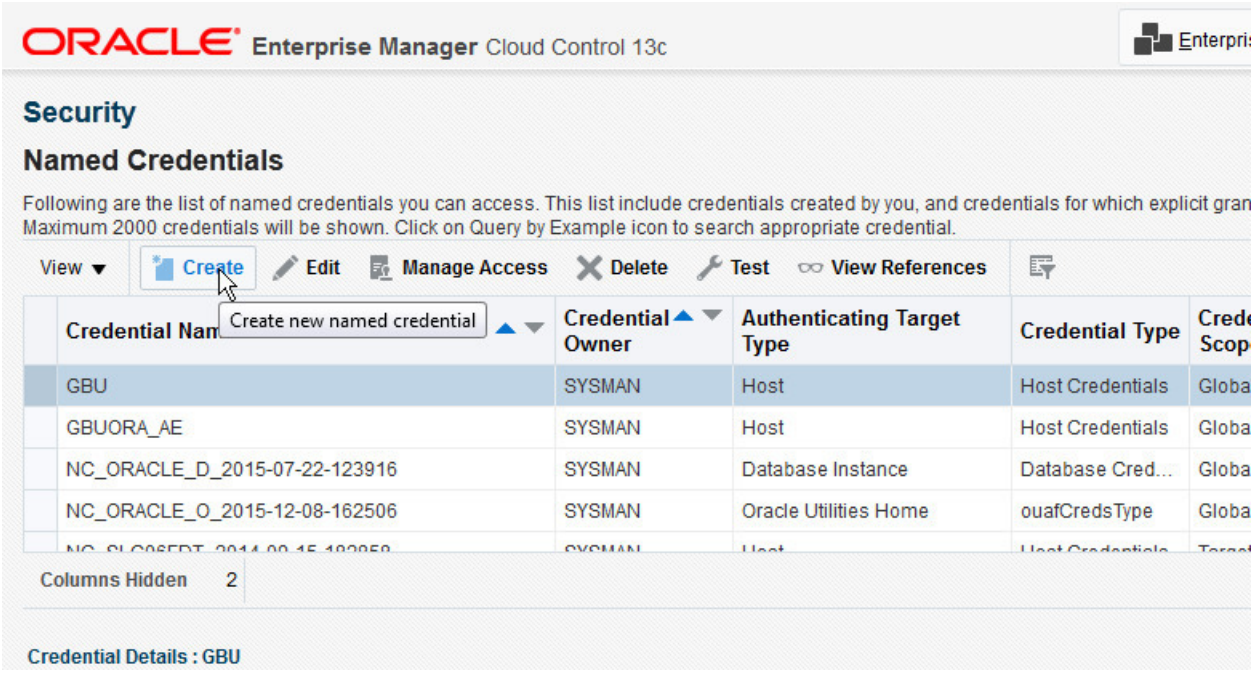


Figure 43: Creating Credentials

3. Enter the appropriate credential information. Set the **Scope** to **Global**. Do not enter a target type or target. When the credentials and **Scope** are set, click **Save**.

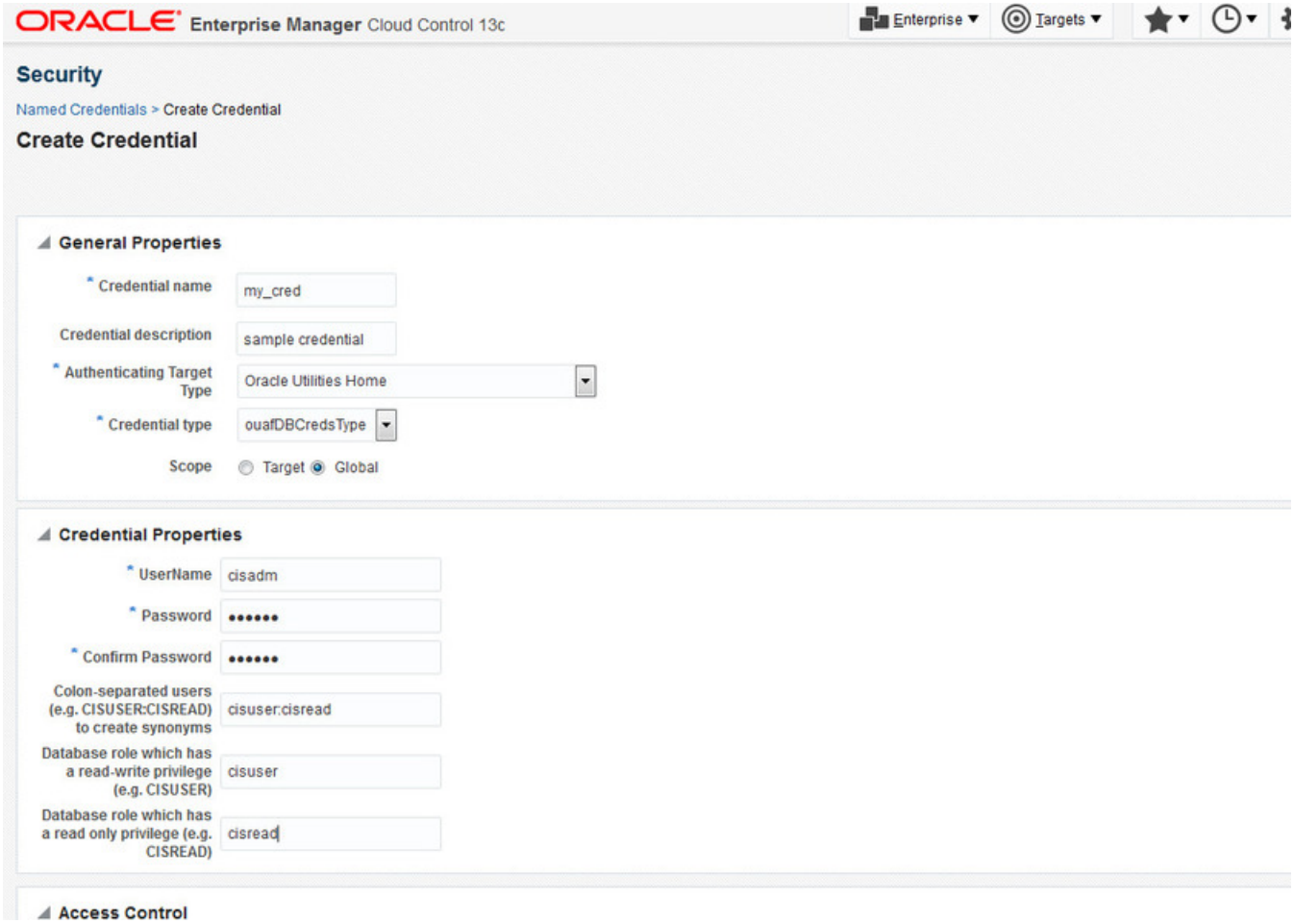


Figure 44: Entering Credentials

Patch Import

To import patches:

1. Open the **OUAF Home Target Home page** and click the **Patch Import** button.

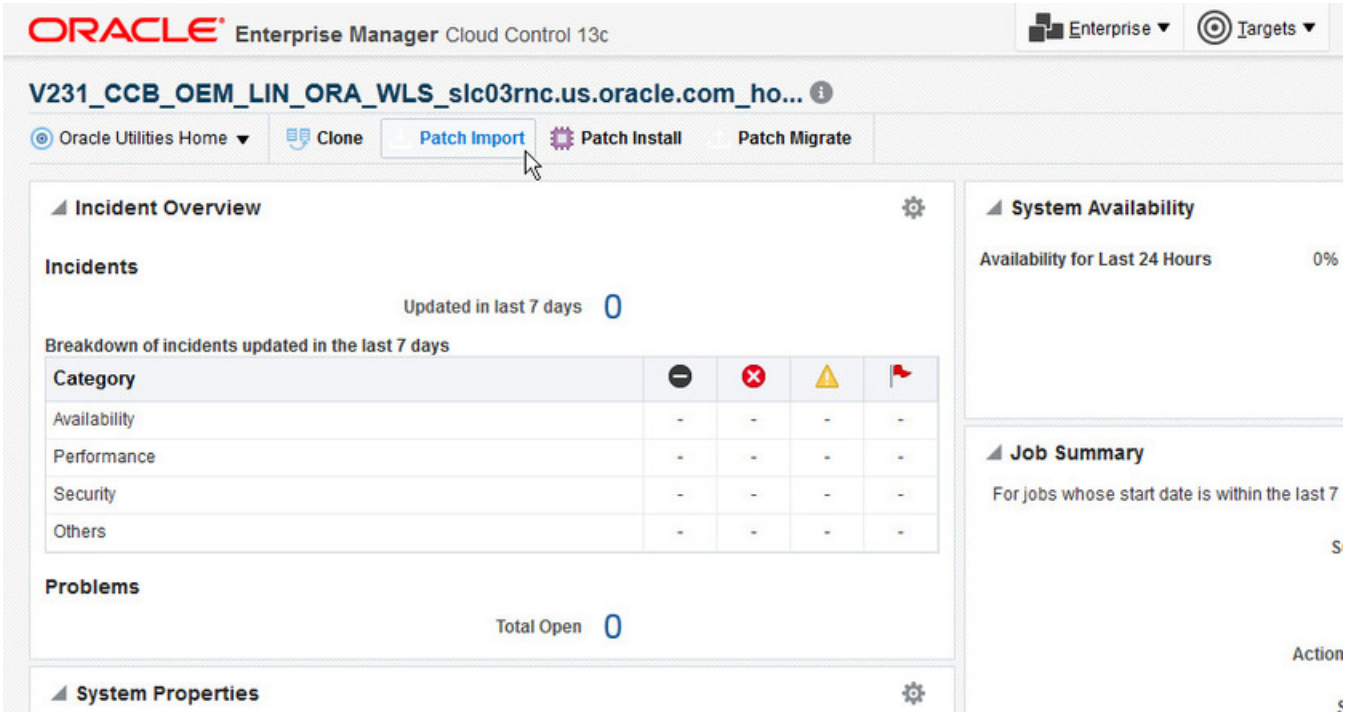


Figure 45: Starting the Patch Import Process

2. On the first page of the **Import Patches** walk-through, enter the download directory (the directory on the server where the downloaded zip files are stored when you manually downloaded them from My Oracle Support). The path entered here should be accessible from the server on which the target environment is hosted. After entering the path, click **Next.**

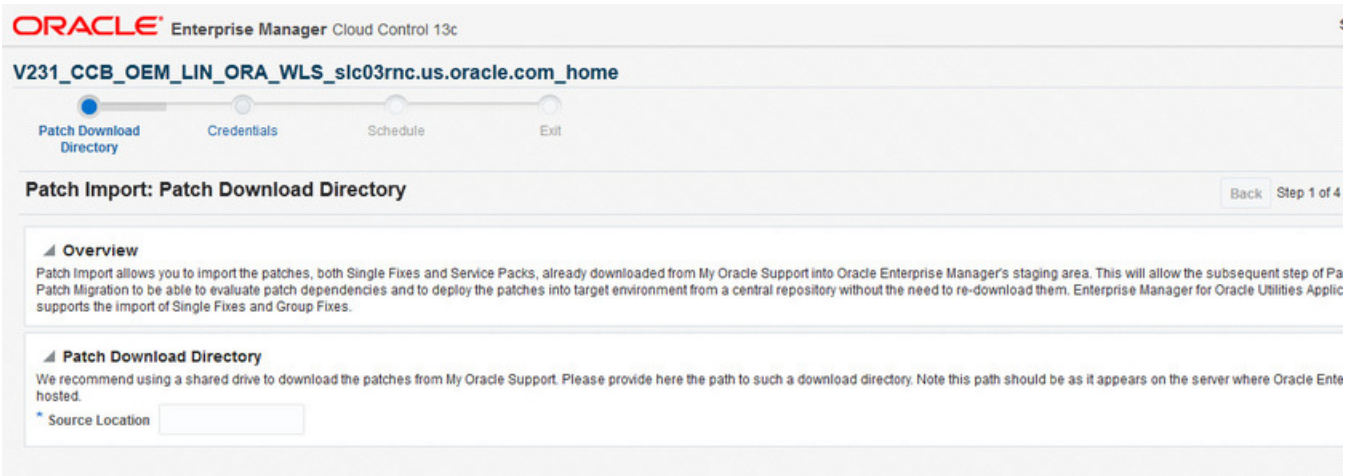


Figure 46: Entering the Patch Path

3. On the `Credentials` page, choose a set of saved credentials or enter your user name and password, then click `Next` to proceed.

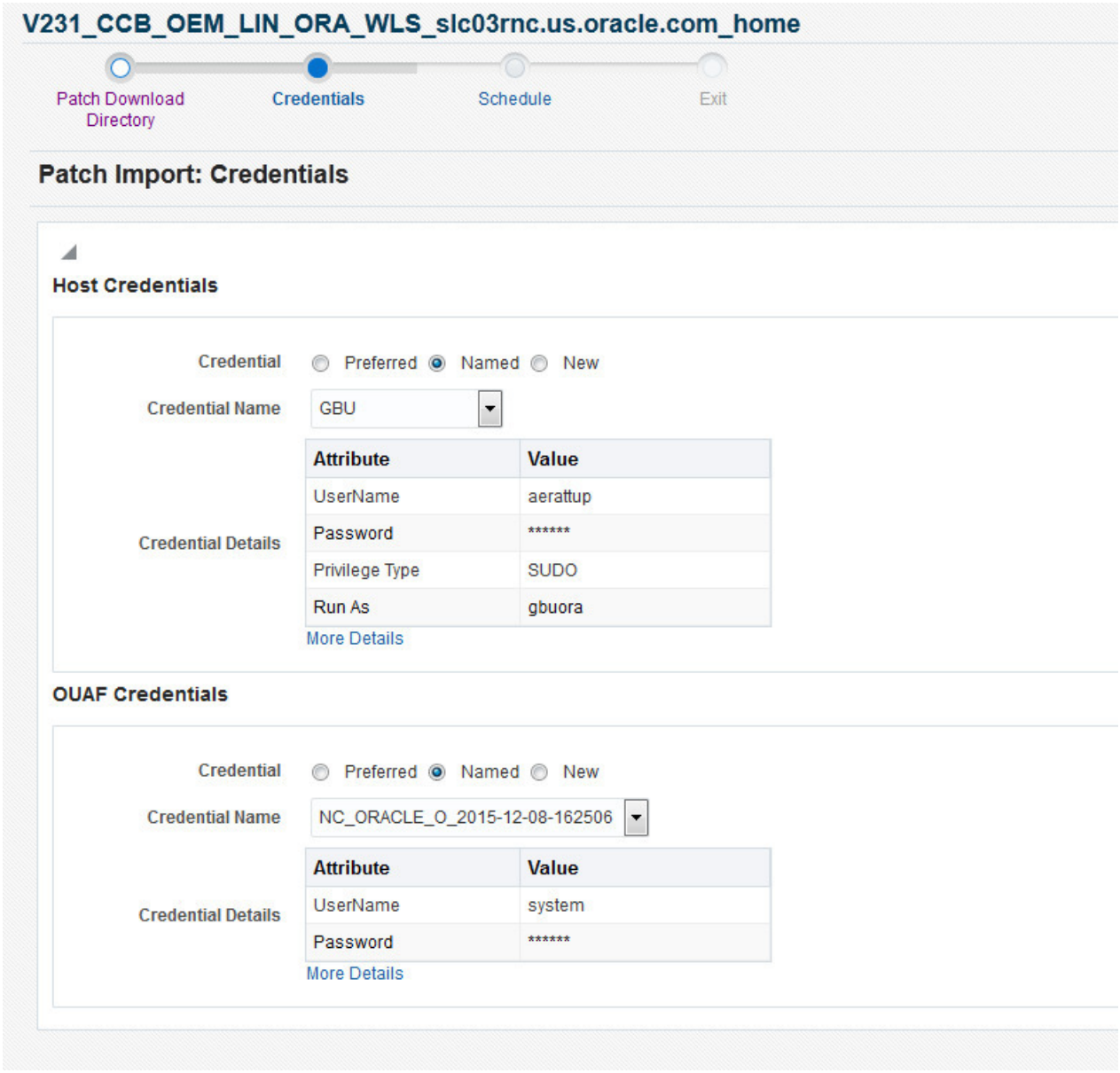


Figure 47: Patch Import Credentials

4. On the **Schedule** page, choose to either perform the import operation **Now** or **Later**. If set for **Later**, click **Schedule** to complete the process and schedule the deployment procedure.

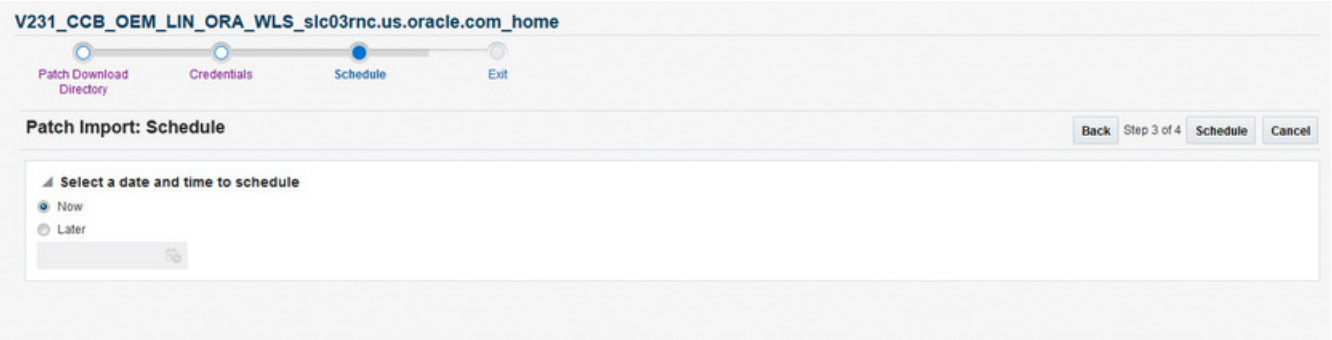


Figure 48: Scheduling the Patch Import

5. To check the output, go to **Enterprise** > **Provisioning and Patching** > **Procedure Activity.**

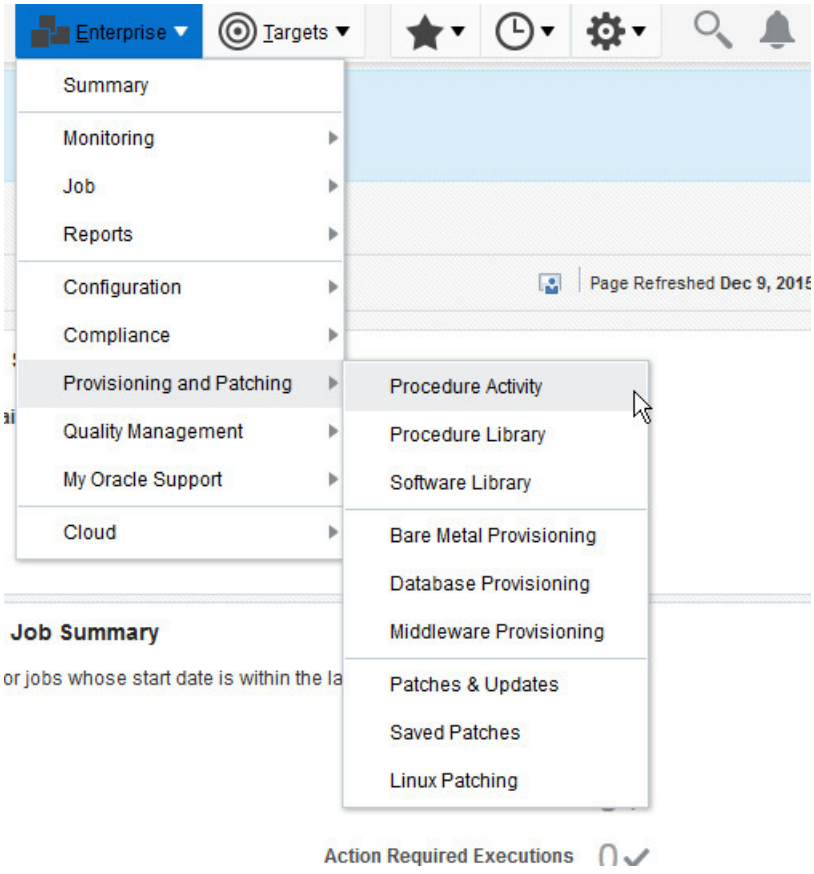


Figure 49: Import Patch Procedure Activity

6. Search the **Procedure Activity** list for the appropriate run item, and click the link.

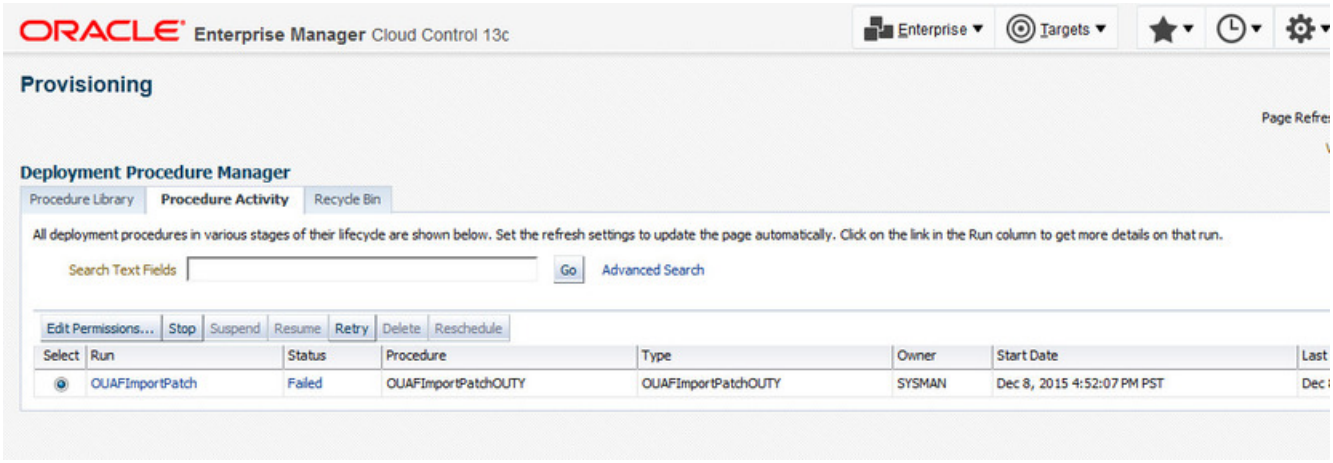


Figure 50: Checking a Patch Import

7. Expand the **Procedure Steps** on the left and review the **Import Patch Structuring / Step** to view the output.

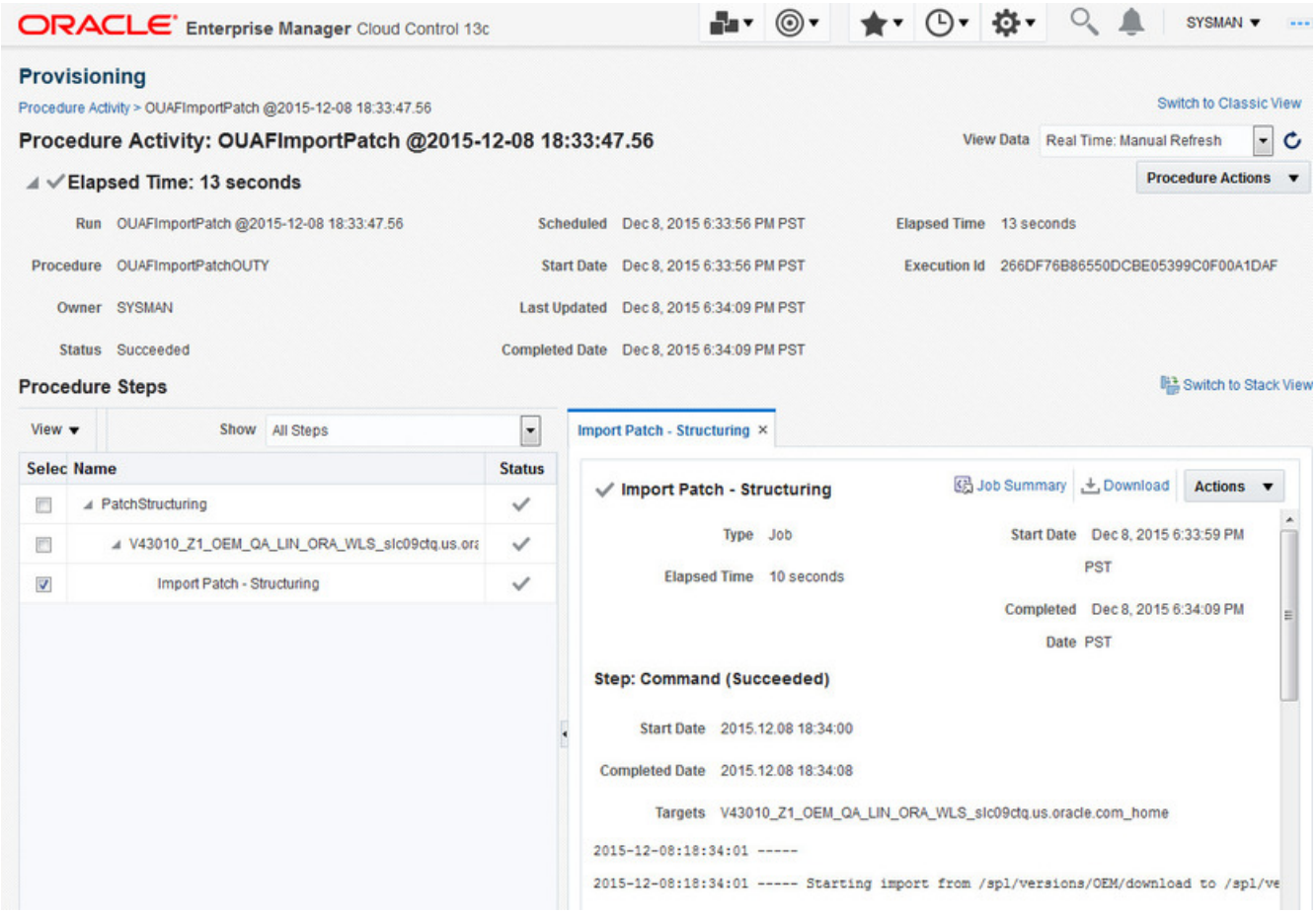


Figure 51: Patch Provisioning Procedure Activity page

On completion of the patch import job, the imported zip file is unpackaged in the appropriate staging directory and a `*.zip-unpacked` file is created.

Example: An FW V4.1.0 patch zip file called `p12548444_4100_Generic.zip` is imported and placed in `/tugbu_oem/download`. On completion of the import procedure, the following occurs:

1. `/tugbu_oem/download/p12548444_4100_Generic.zip-unpacked` is created. This prevents patches that have already been imported from being processed again. If you would like a patch to be re-imported, delete its `*.zip-unpacked` file.
2. For a single fix or hotfix, `/tugbu_oem/download/staging_directory/FW/V4.1.0/multiplatform/FW.V4.1.0-12548444/ 12548444_sf_patch_info.xml` is created. This file contains information about the patch. The contents of the file are also placed in the proper product, release, platform, and patch number directory.

   For a service pack containing the new SP model, the following file should be present: `/tugbu_oem/download/staging_directory/FW/SP/multiplatform/9999999/Metadata.xml`.

Patch Import Enhancements

Patch import also includes the identification of patch prerequisites and the ability to download and import them. This feature is available from OUAF release 4.3.0 Service Pack 1 and later. All environments on OUAF release 4.3.0 Service Pack 1 will have the old patch import flow.

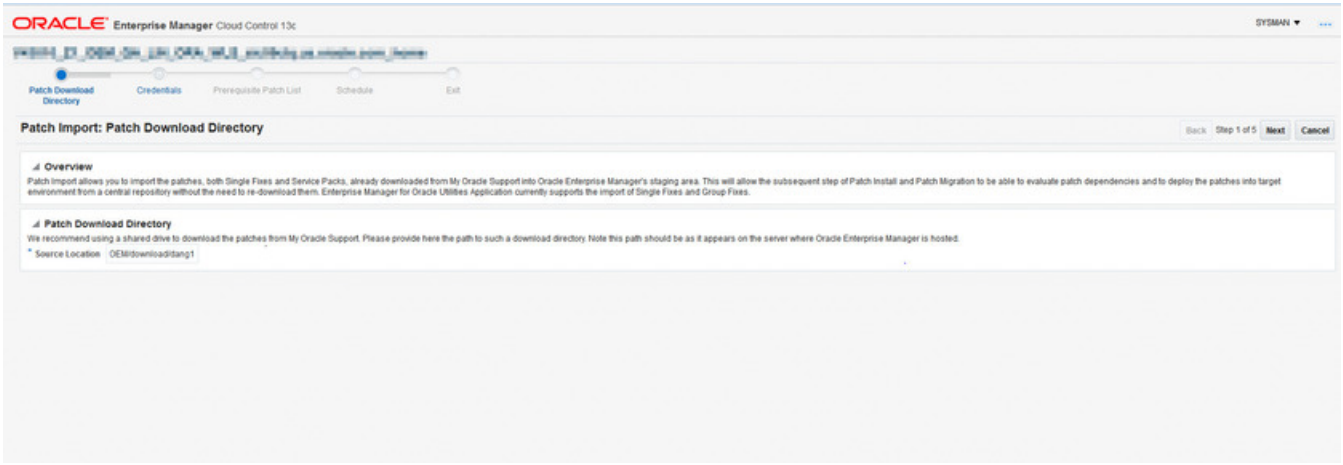


Figure 52: Source screen

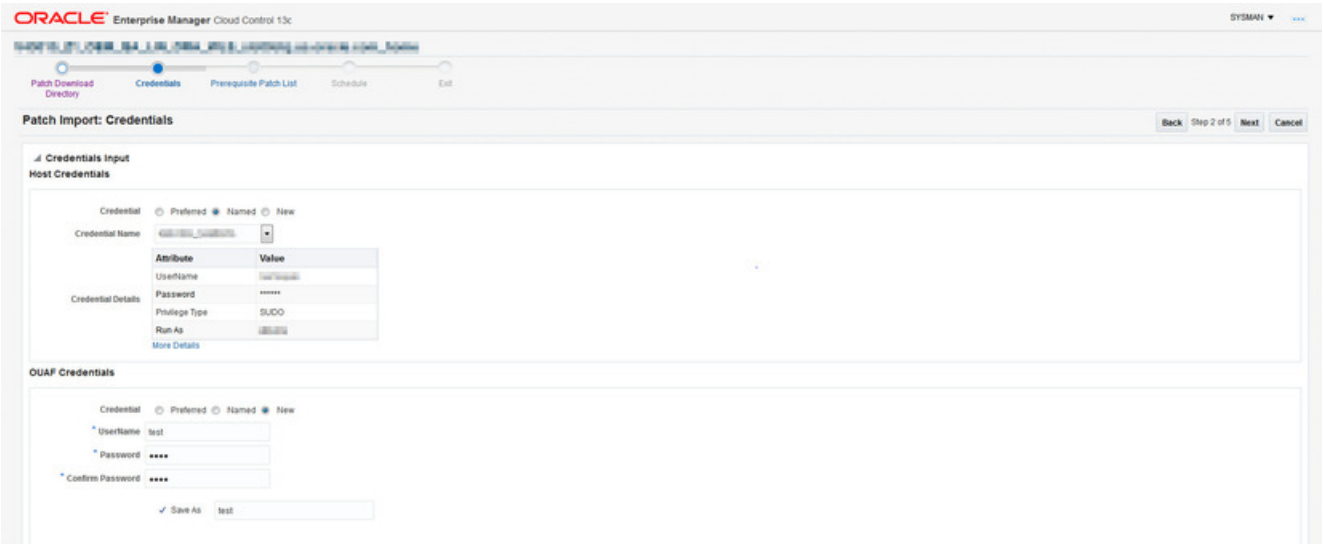


Figure 53: Credentials screen

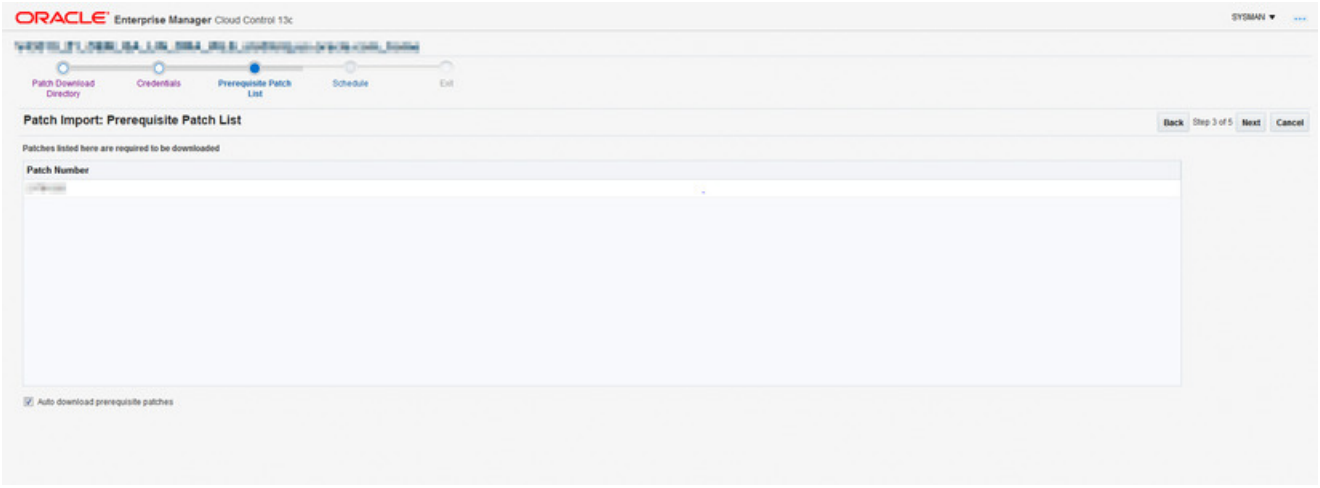


Figure 54: Prerequisite screen

The user can choose to download the prerequisite. If not, the user has to uncheck the auto download checkbox.

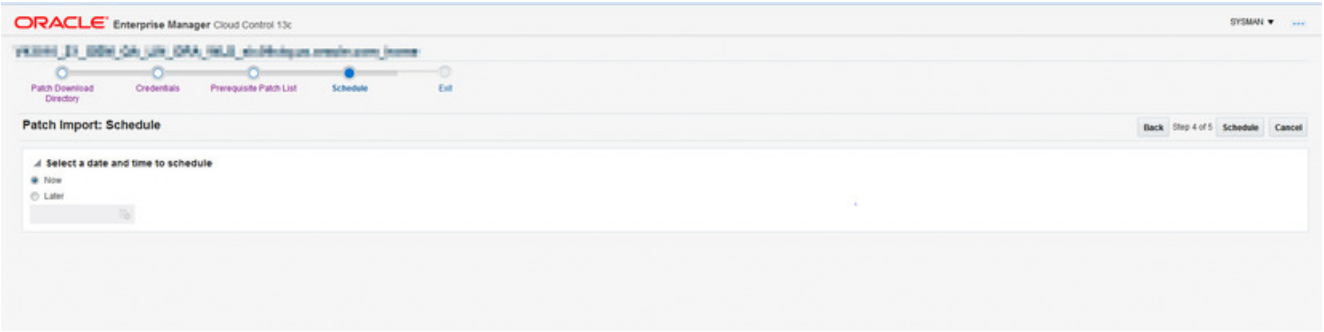


Figure 55: Schedule screen

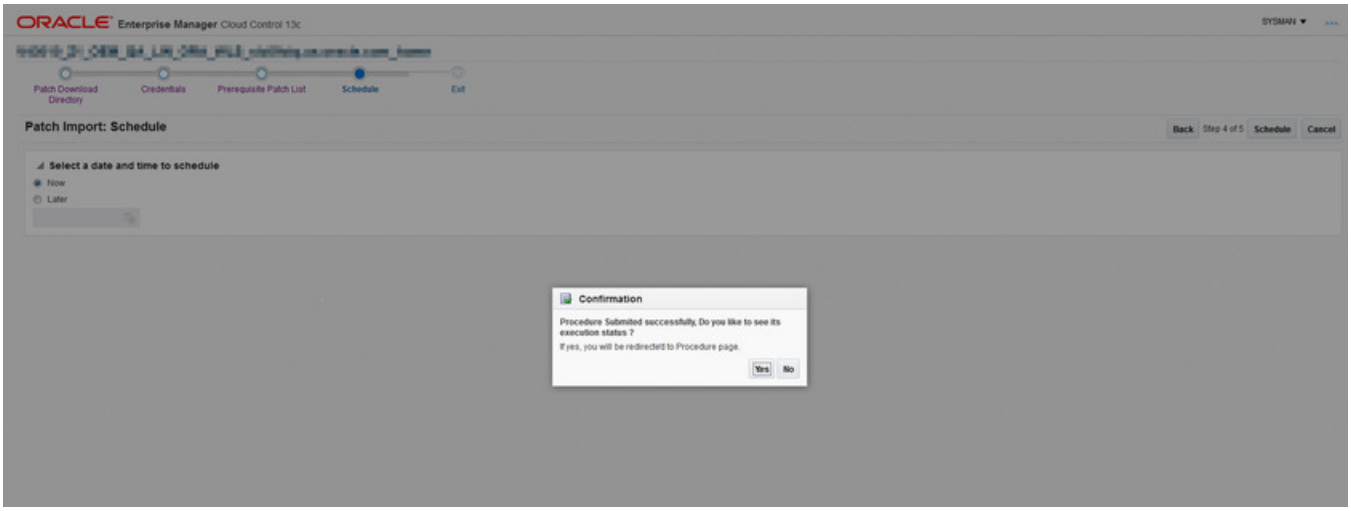


Figure 56: Confirmation box

Installing Patches

To install patches:

1. Open the **OUAF Home Target Home Page** and click the **Patch Install** button.

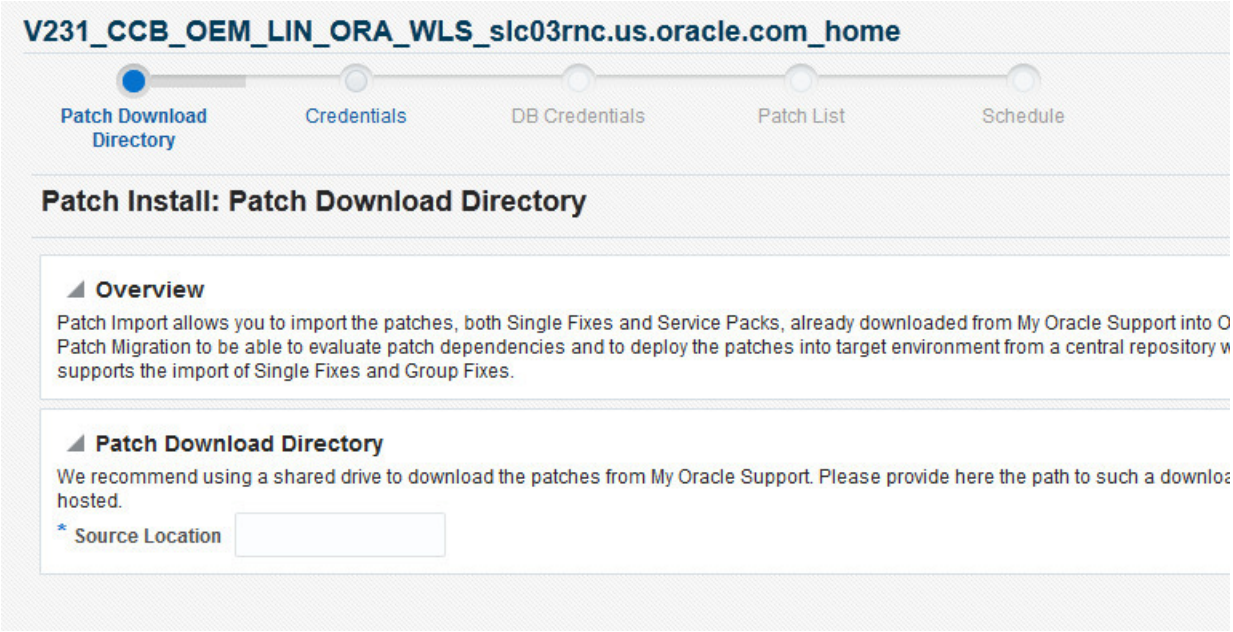


Figure 57: Starting the Patch Install process

2. The first page of the **Patch Install** walk-through appears. Enter the download directory used during patch import (relative to the target environment). After entering your selection, click **Next** to proceed.

Figure 58: Specifying the Install Directory

3. On the **Credentials** page, choose a set of saved credentials or enter the user name and password for the environment, then click **Next** to proceed.

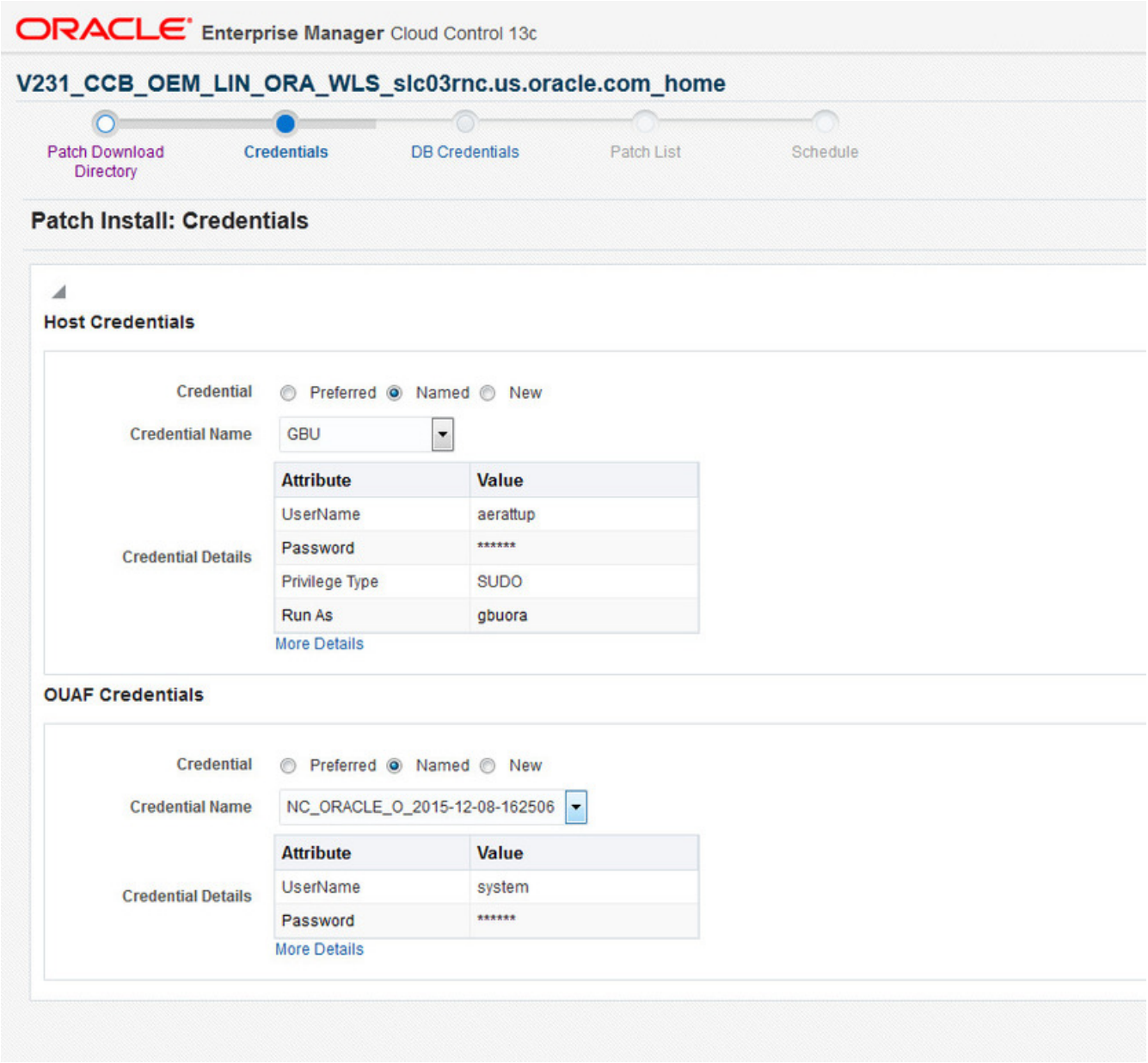


Figure 59: Specifying Install Credentials

4. Enter the ouaf database credentials on the next page. The credentials should have been created previously as a named credential (see the Patching Prerequisite topic for details). After entering the credentials, click **Next** to proceed.

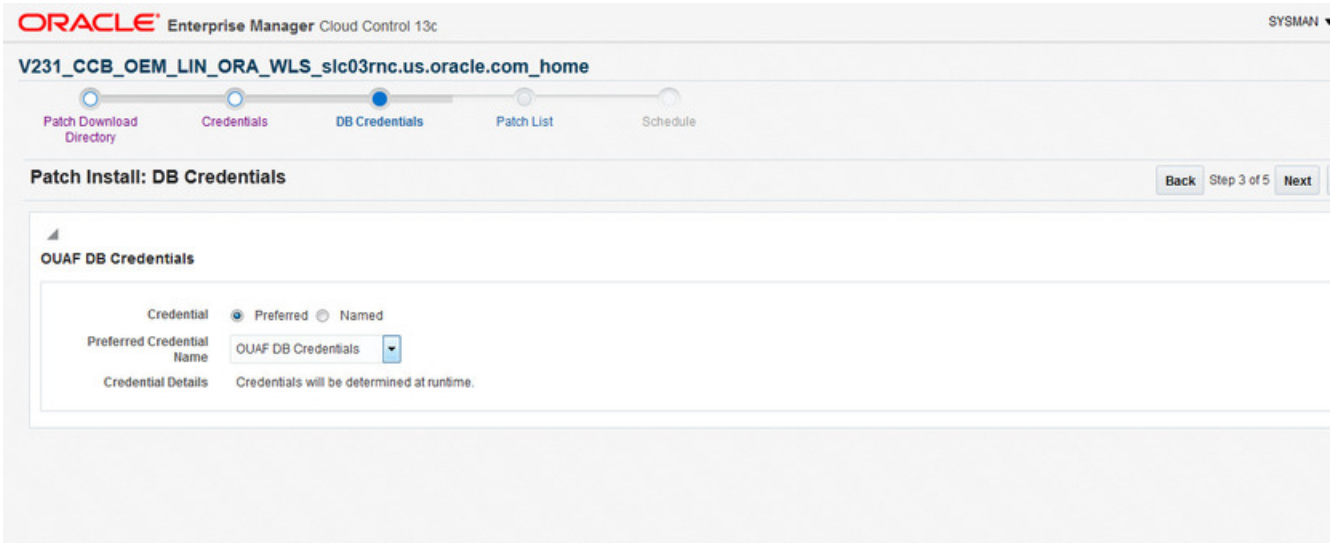


Figure 60: Specifying Database Credentials

5. The **Patches** page lists candidate patches. The list includes only patches that are valid for the target environment (based on product, release and platform), exist on the download directory, and have not yet been installed on the target environment. Select the patch or patches to be installed. Use `Control+Click` or `Shift+Click` to select multiple patches. After making your choice(s), click **Next** to proceed. Note that you cannot mix service packs and fixes. You also cannot install more than one service pack at a time, or the install job will fail.

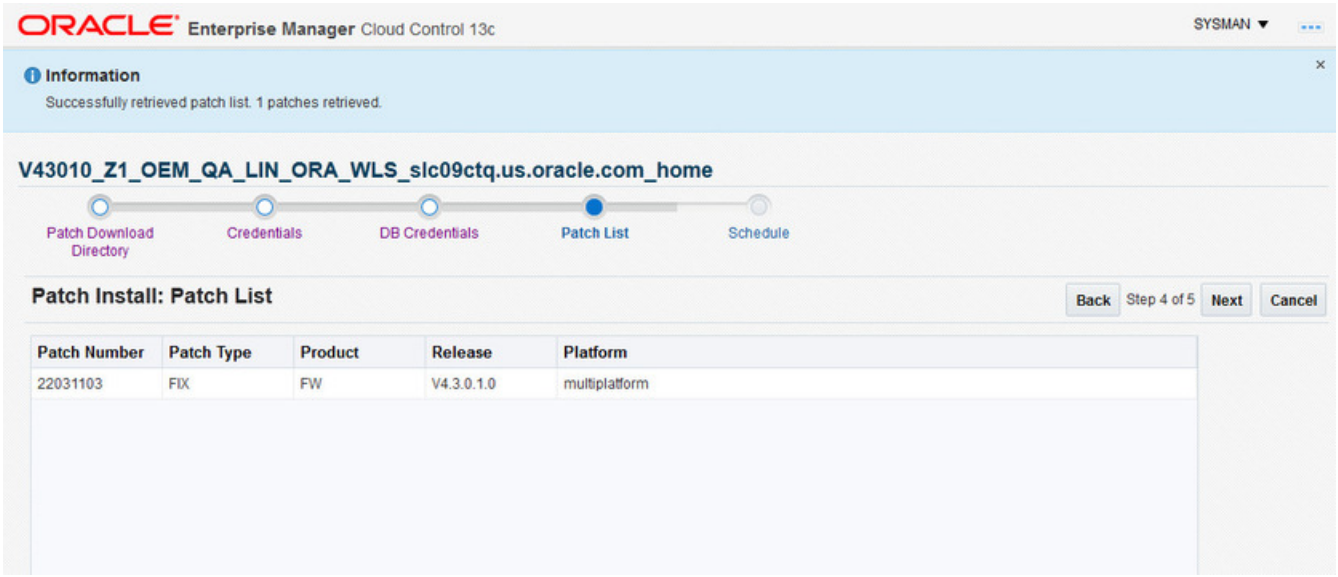


Figure 61: Selecting Patches

6. On the **Schedule** page, choose to either perform the installation operation **Now** or **Later**. If set for **Later**, click **Schedule** to complete the process and schedule the deployment procedure.

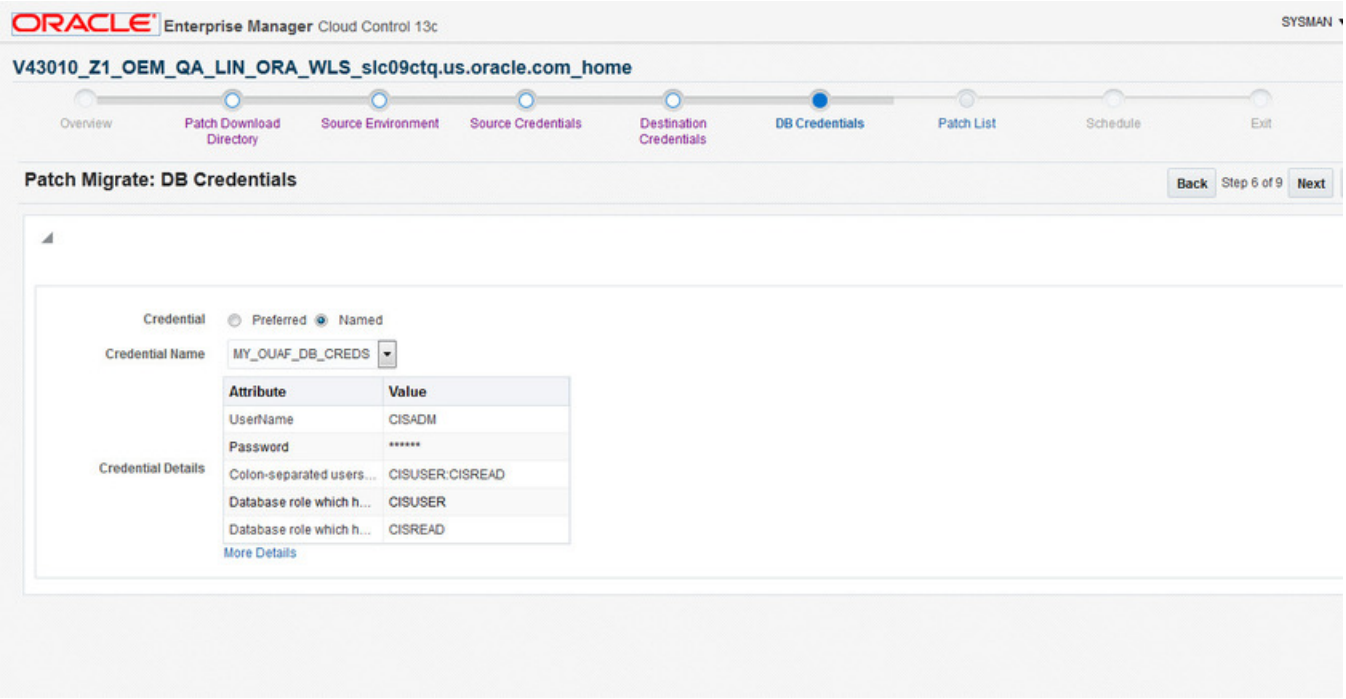


Figure 62: Scheduling the Patch Install

7. As with the patch import procedure, check the output by going to **Enterprise** > **Provisioning and Patching** > **Procedure Activity.** On the **Provisioning** page, search for the appropriate run and click on the link. To view the output, expand the **Procedure Steps** on the left to view the output.

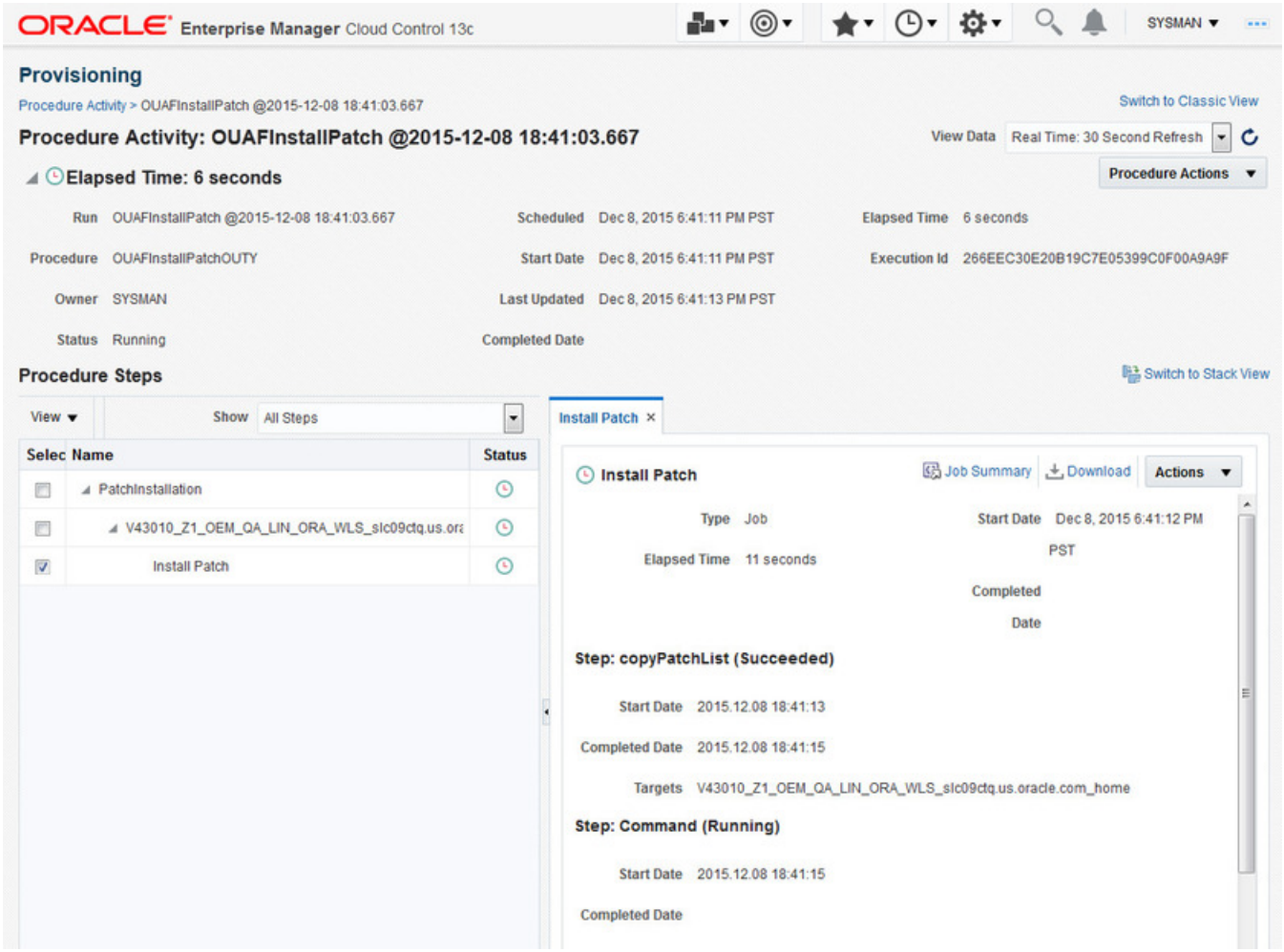


Figure 63: Install Patch Procedure Activity

Additional details regarding patch installations.

Installation occurs in the following sequence:

- Patches are copied from the download staging directory to a temporary directory on the target (`$SPLEBASE/oem/patch/tmp`).
- Patch installation is grouped by product, according to the order in which the products are listed in the `PRODUCT.txt` file.
- For single/hot fixes within a product, group fixes are installed first, in order of patch number. Single-fix patches are combined as a rollup, and a group install is performed. For each of these, the database components are installed first, followed by the application server component, and, finally, an error-checker is executed.
- For service packs, product versions are updated by the SP installation process. There can be a delay before this is reflected in the target home page. Refer to the section titled "Ensure Collection of Installed Product Configuration Information" for instructions on how to refresh this information.

Patch Install Enhancements

Patch installation functionality also includes the ability to identify patch prerequisites and notify the user of the requirement to download and import them. This functionality is available from OUAF release 4.3.0 Service Pack 1 and later. All environments on OUAF release 4.3.0 Service Pack 1 will have the old patch import flow.

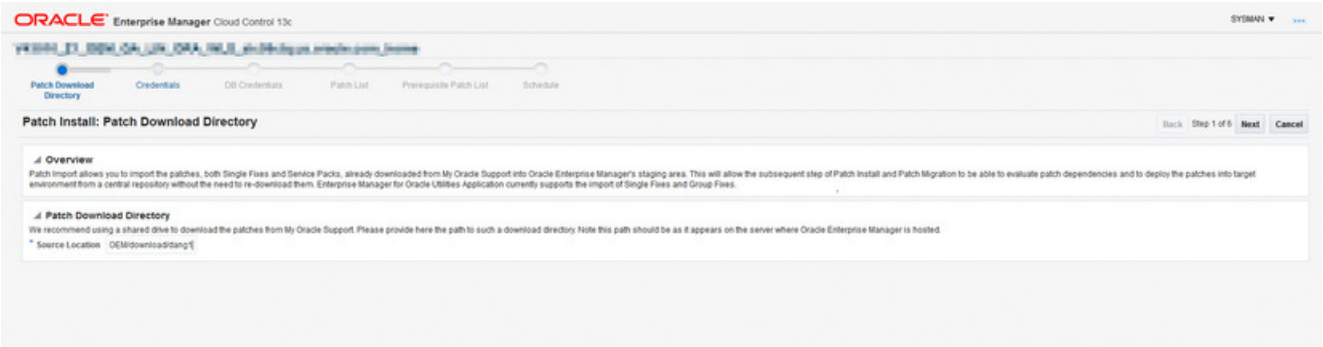


Figure 64: Source

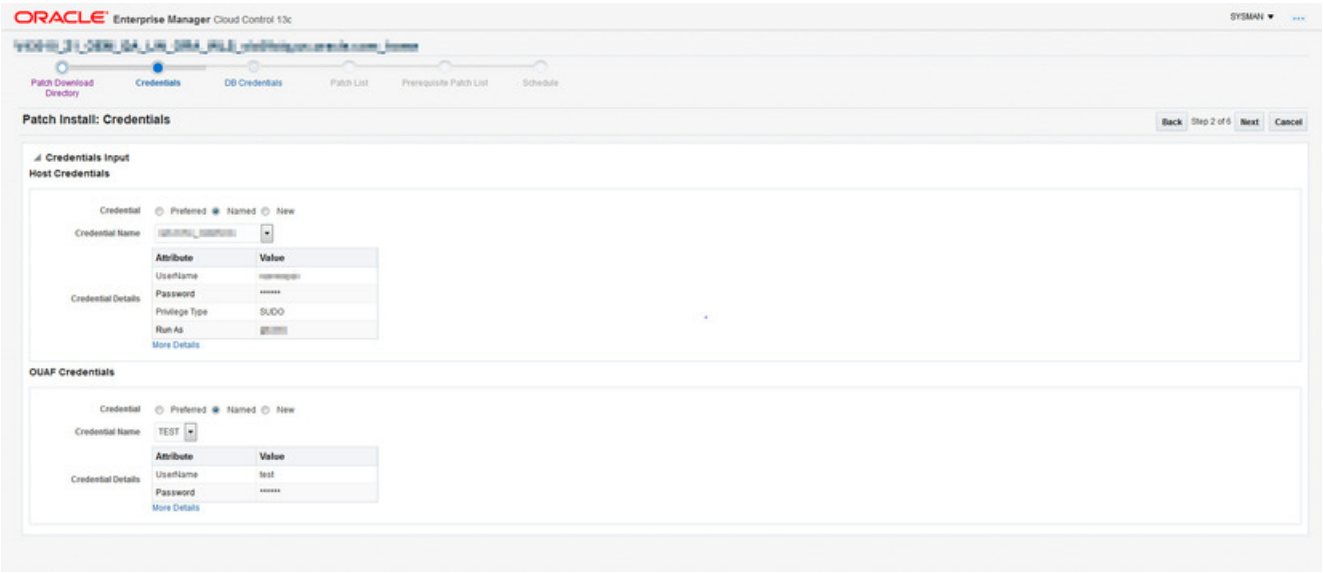


Figure 65: Credentials screen

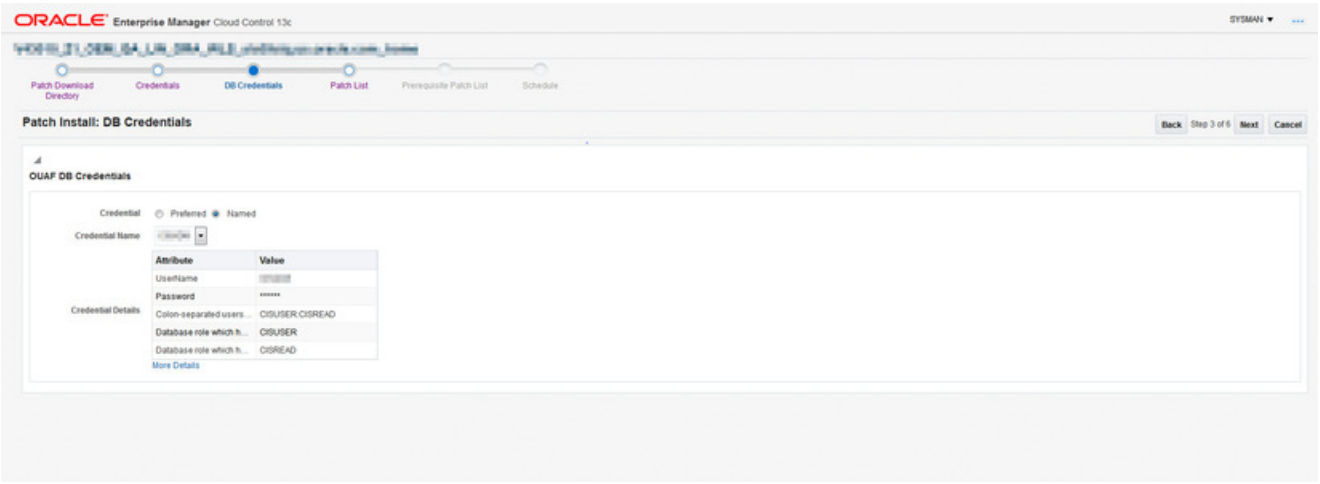


Figure 66: DB credentials

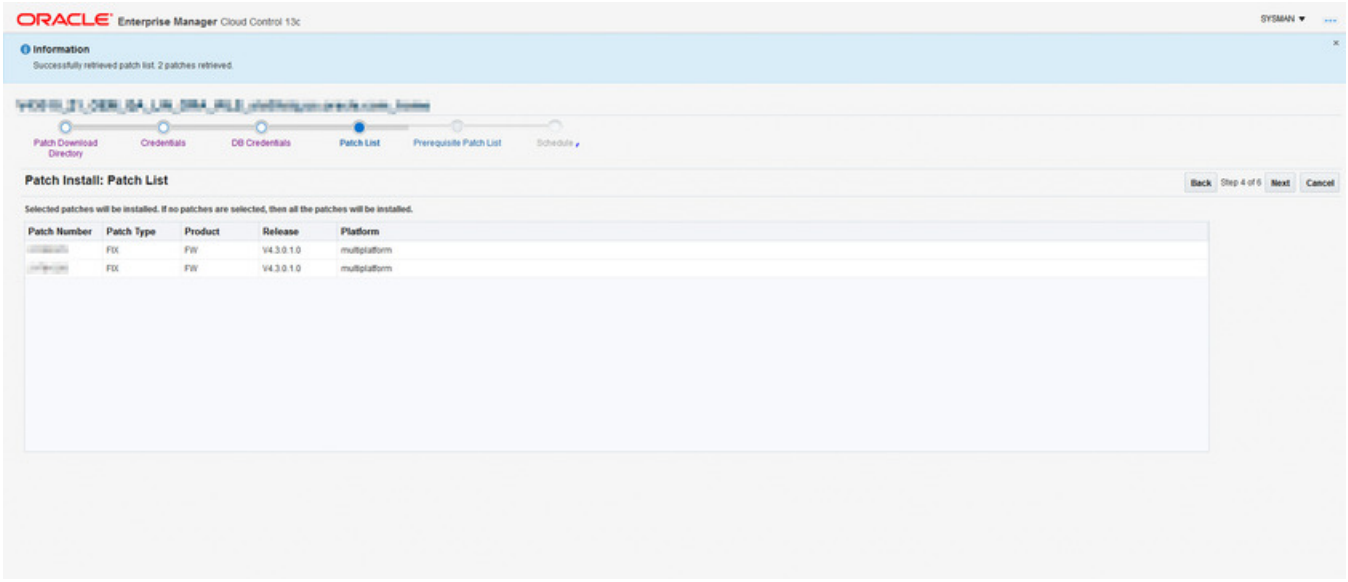


Figure 67: Patches screen

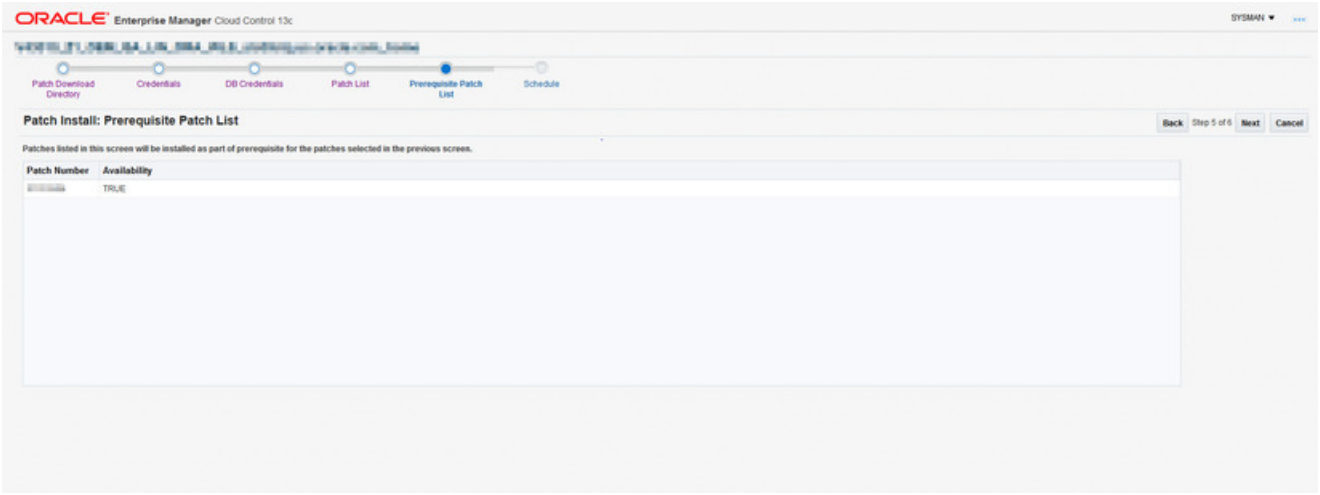


Figure 68: Prerequisite patches availability

If the prerequisite patches are not available, availability is set to *false*, the **Next** button is disabled, and a scheduling screen is made available to allow you to schedule downloading of the prerequisites.

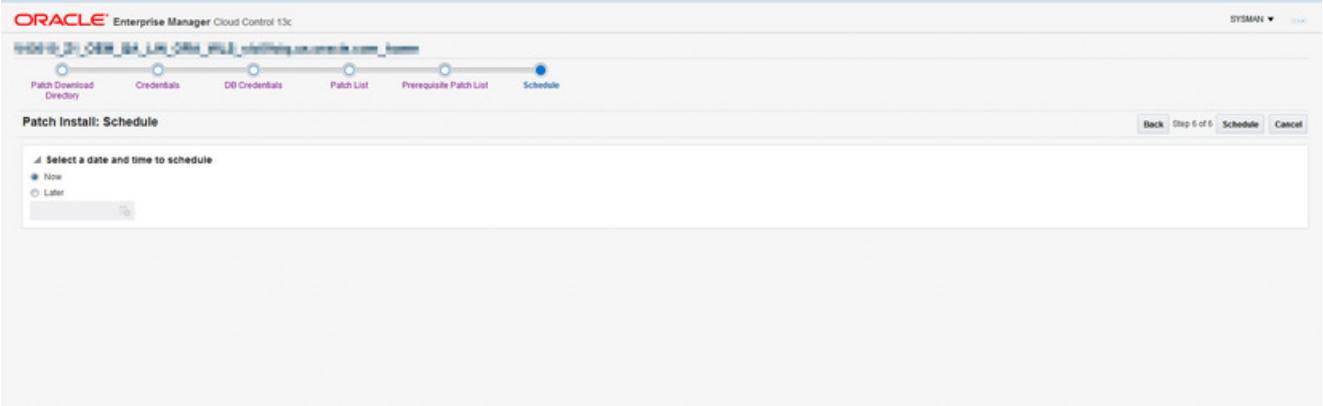


Figure 69: Schedule screen

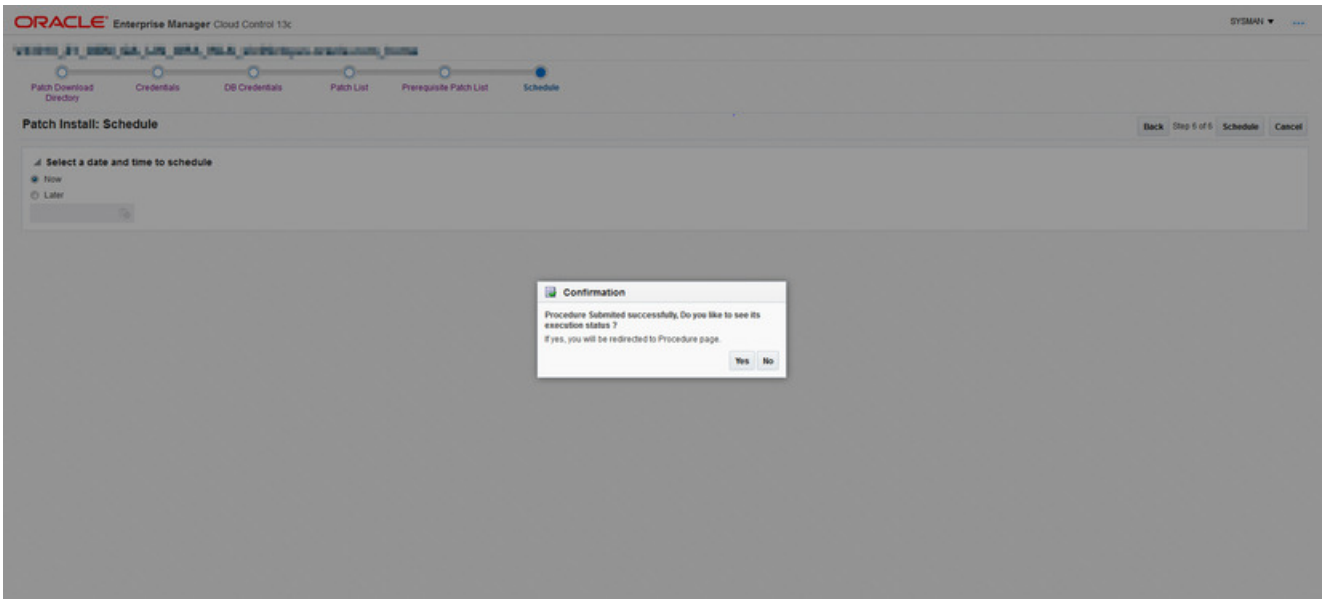


Figure 70: Confirmation Box

Patch Migration

During the product implementation lifecycle, patches are normally installed and tested on an environment, and the process is repeated on each environment. The patch migration feature in Enterprise Manager for Oracle Utilities allows administrators to migrate patches to all environments from a central location.

Patch migration is special form of patch installation wherein a source environment is compared to a destination environment. The source environment is used to identify patches that the administrator intends to install in the current/destination environment. The identified patches should have been imported previously for the current target's product, release and platform.

The workflow is as follows:

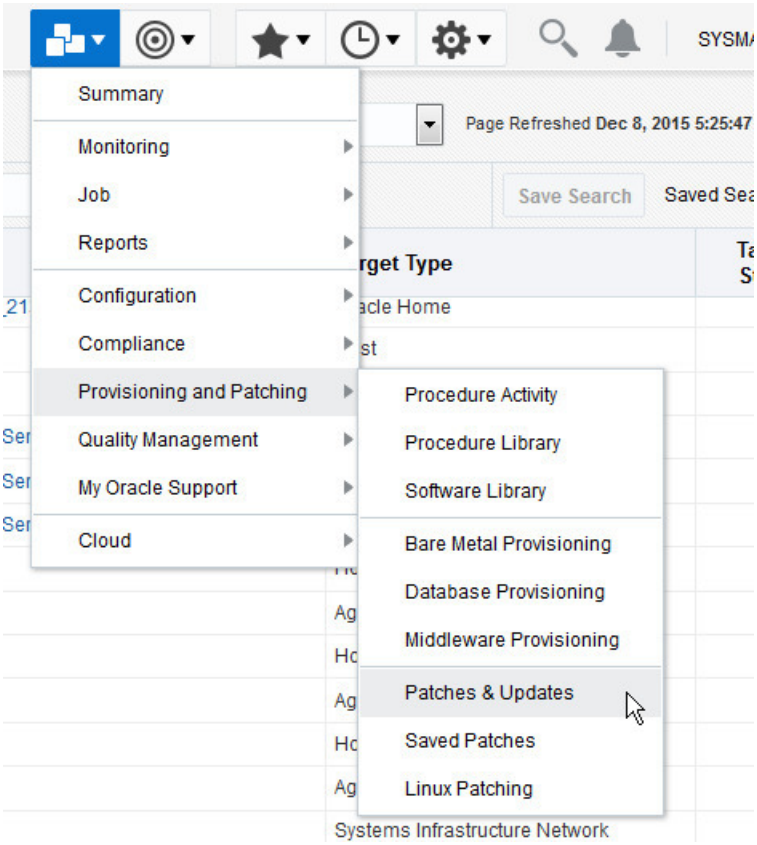
1. On the destination environment's target home page, click the **Migrate** button.

2. A source target containing the patches to migrate is selected from the dropdown list.
3. Existing patches installed on both targets are analyzed and a list of patches that are installed on the source (but not on the destination target) is created. This list is compared to the contents of the download staging directory and only the patches that have been previously imported are displayed for selection.
4. The selected patches are then installed by the patch installation job (the same one used in the patch installation process), updating relevant files in `$SPLEBASE`. If you deploy manually to the web server, you must perform this step after the installation process completes.

The Process

Patch migration is a three-step process:

1. **Download** patches from My Oracle Support (MOS): This step is performed through the **My Oracle Support Plug-in** within Oracle Enterprise Manager from the top-level menu, choose **Enterprise** > **Provisioning and Patching** > **Provisioning & Patching**.



2. **Import** the downloaded patches: This process allows you to import downloaded patches which are subsequently unpackaged into a format that is compatible with Enterprise Manager for Oracle Utilities's installation process.
3. **Migrate/install** the imported patches.

NOTE: Application server patch components are installed using the standard patch install script. Database patch components are installed using a Java version of the standard `CDXPatch.exe` utility. Note that patches using the database upgrade-install

utility `cdxdbi.exe` are *not* supported and the database component of the patch will not be installed.

Migrating Patches

To migrate patches:

1. Open the **OUAF Home Target Home Page** and click the **Migrate Patches** button to open the **Migrate Patches** walk-through.

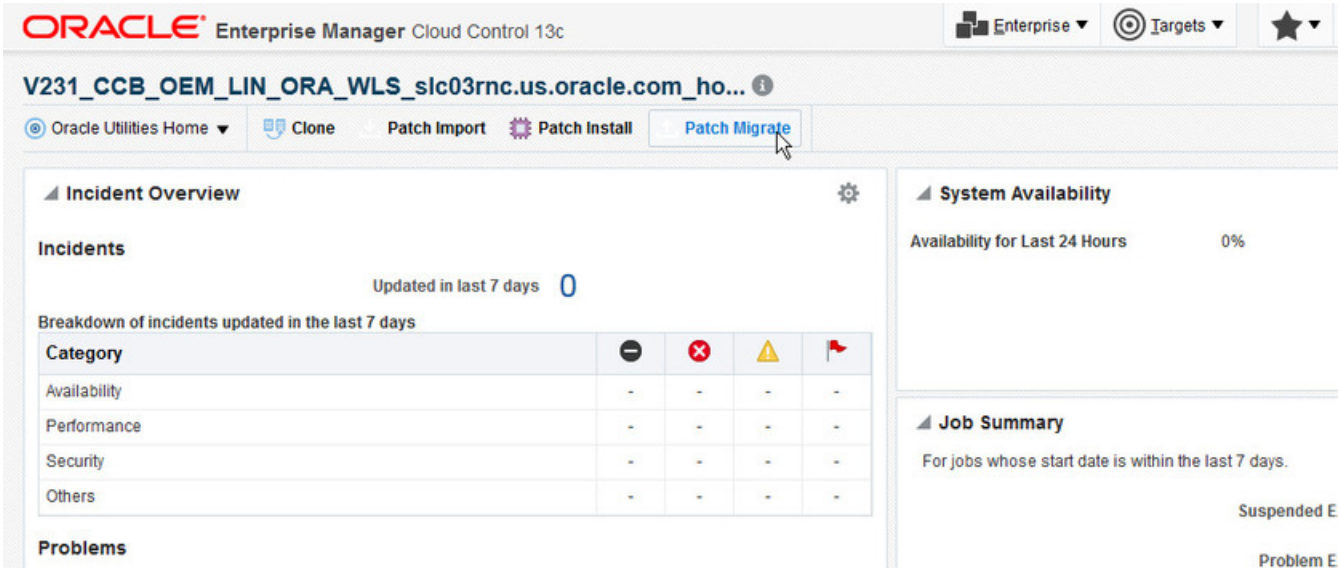


Figure 71: Starting a Patch Migration

2. On the **Download Directory** page, enter the download directory used during patch import (relative to the destination environment). After entering your selection, click **Next** to proceed.

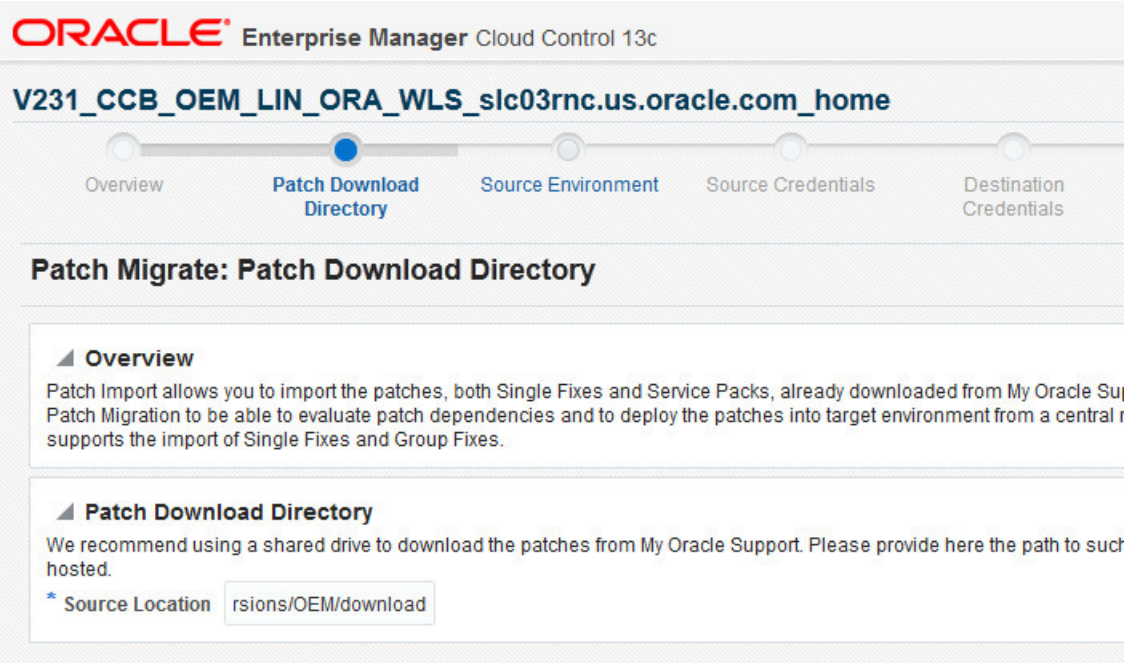


Figure 72: Specifying the Download Directory

3. On the **Source** page, choose the source target environment from the dropdown list. Note that only targets with identical product/version combinations are in included in the list. After making your selection, click **Next** to proceed.

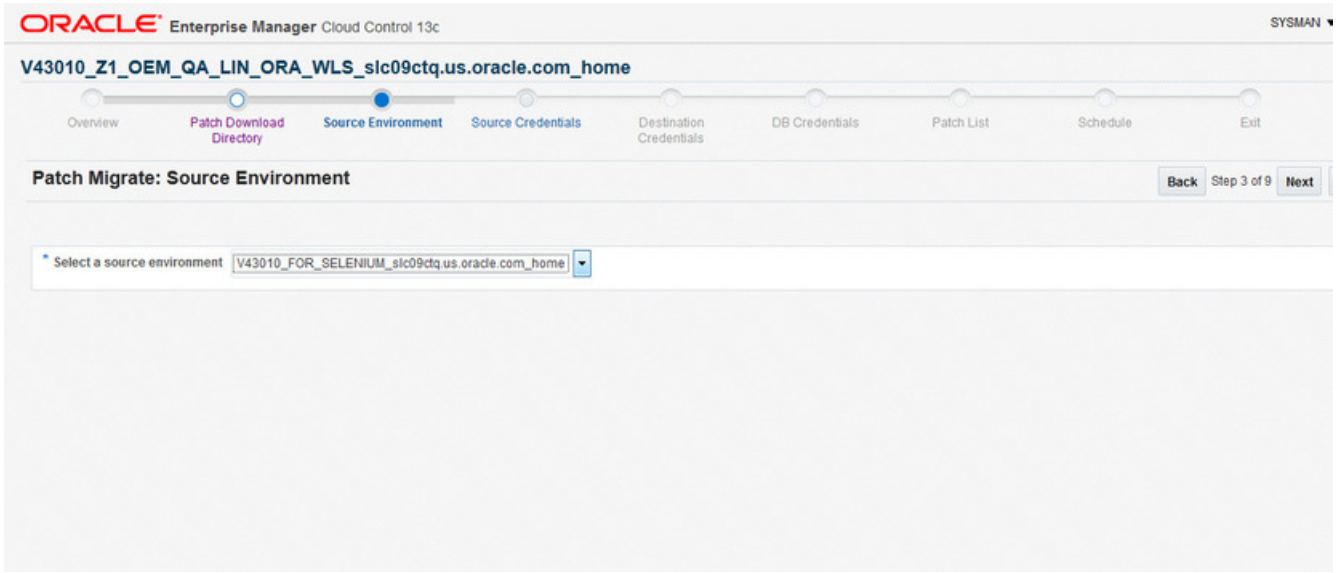


Figure 73: Choosing a Source Environment

4. On the **Source Credentials** page, choose a set of saved credentials or enter the user name and password for the source environment, then click **Next** to proceed.

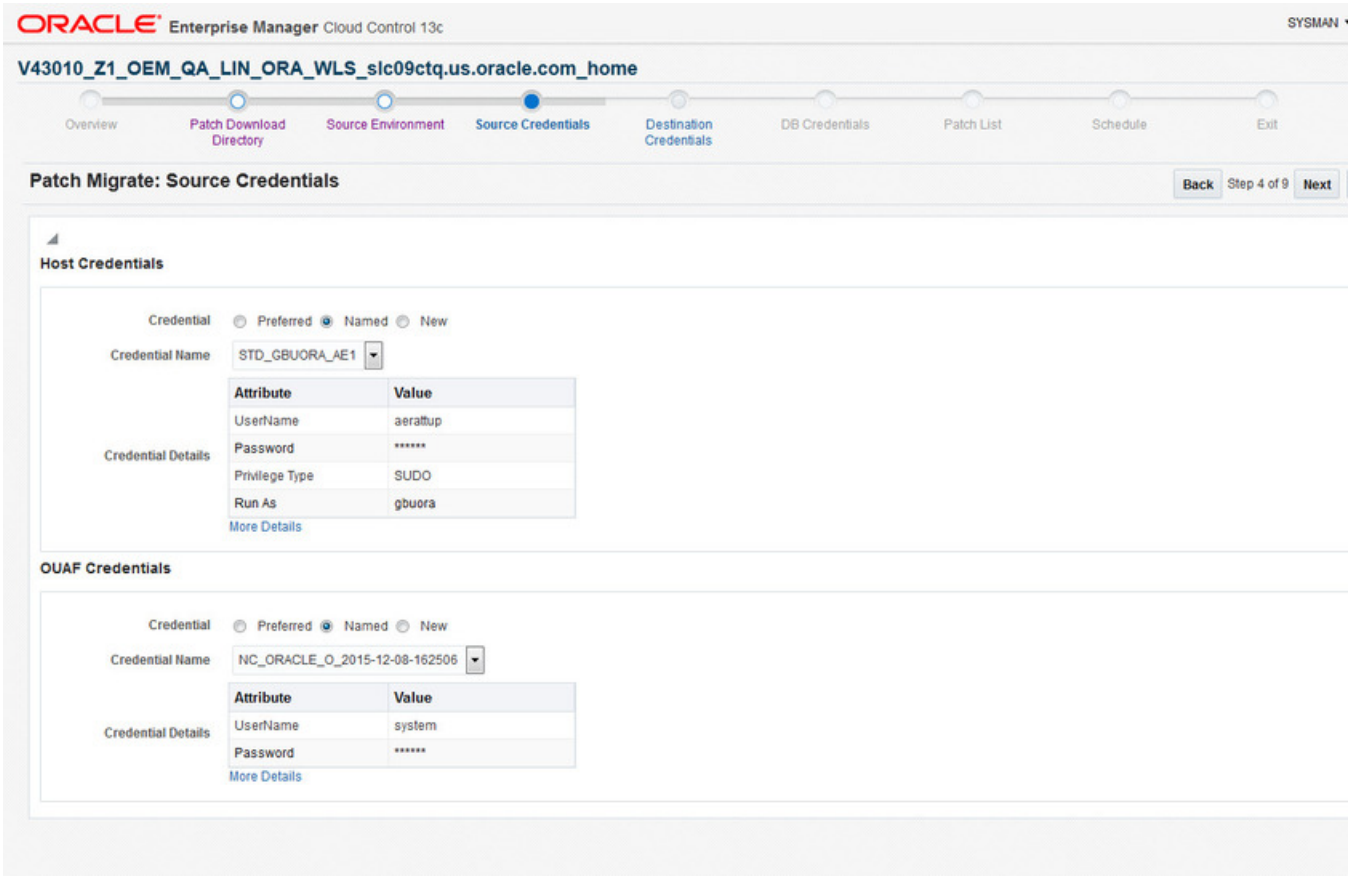


Figure 74: Specifying Source Credentials

5. On the **Destination Credentials** page, choose a set of saved credentials or enter the user name and password for the destination environment, then click **Next** to proceed.

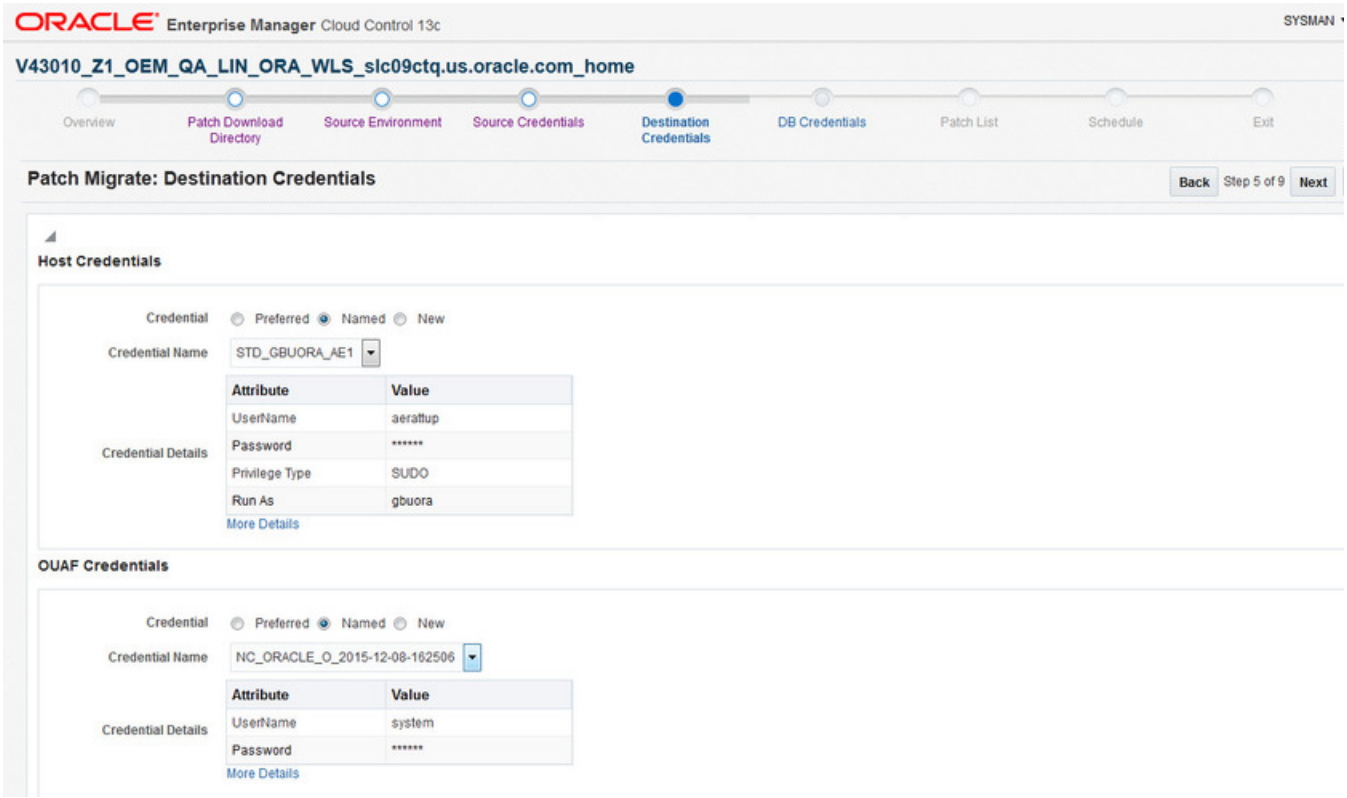


Figure 75: Specifying Destination Credentials

6. Enter the ouaf database credentials on the next page. The credentials should have been created previously as a named credential (see the Patching Prerequisite topic for details). After entering the credentials, click **Next** to proceed.

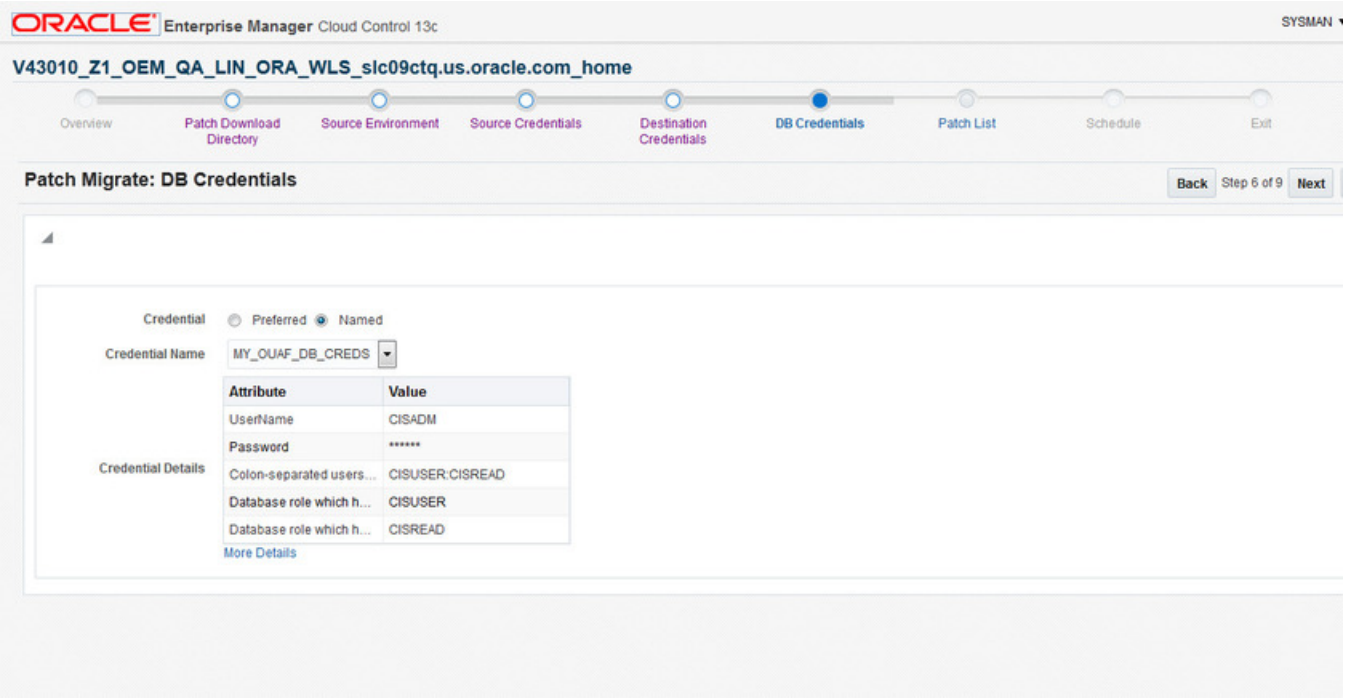


Figure 76: Specifying Database Credentials

7. The **Select Patches** page lists candidate patches. The list includes only patches that are valid for the target environment based on product, release and platform), exist on the download directory, and have not yet been installed on the destination target but are already installed in the source target.

   For a patch to be displayed in the list, it must meet all of the following criteria:

   - It is valid for the product, release and platform of the environment;
   - It must have been already been successfully imported, and, thus, exist on the download directory;
   - It must not yet have been installed on the destination environment; and,
   - It must already be installed on the source environment.

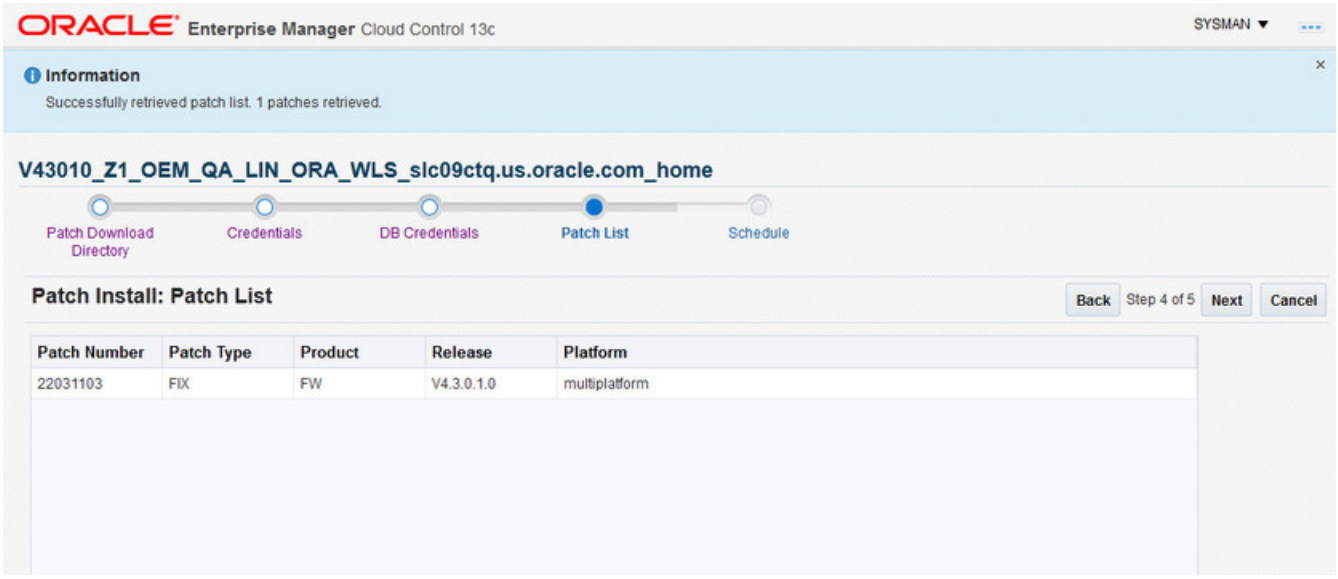


Figure 77: The Select Patches page

8. Select the patch or patches to be migrated. Use `Control+Click` or `Shift+Click` to select multiple patches. After making your choice(s), click **Next** to proceed.

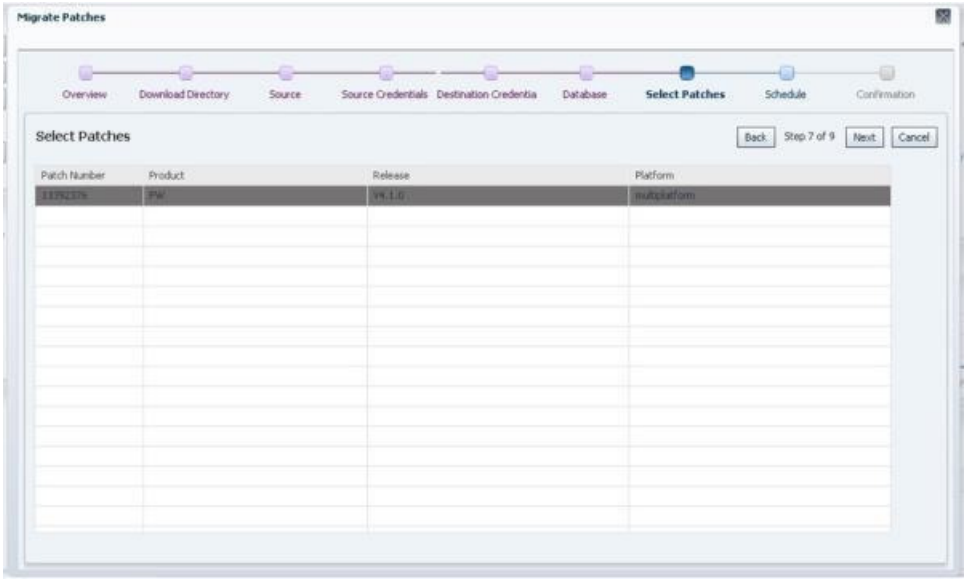


Figure 78: Selecting Patches

9. On the **Schedule** page, choose to either perform the migration operation **Now** or **Later**. If set for **Later**, click **Schedule** to complete the process and schedule the deployment procedure.

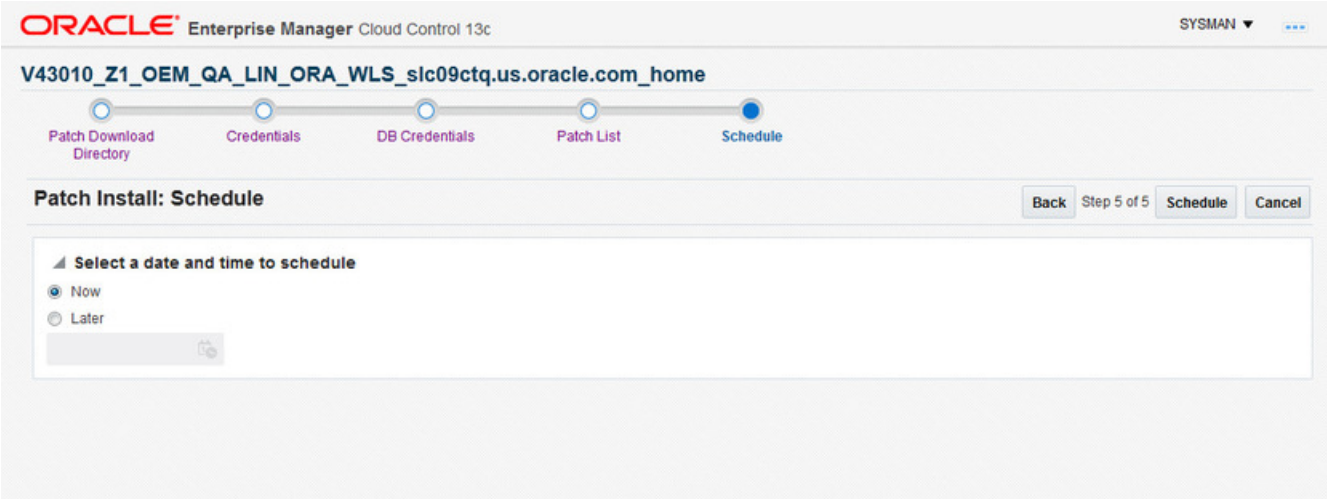


Figure 79: Scheduling the Migration

10. As with the patch import procedure, check the output by going to **Enterprise** > **Provisioning and Patching** > **Procedure Activity.** On the **Provisioning** page, search for the appropriate run and click on the link. To view the output, expand the **Procedure Steps** on the left to view the output.

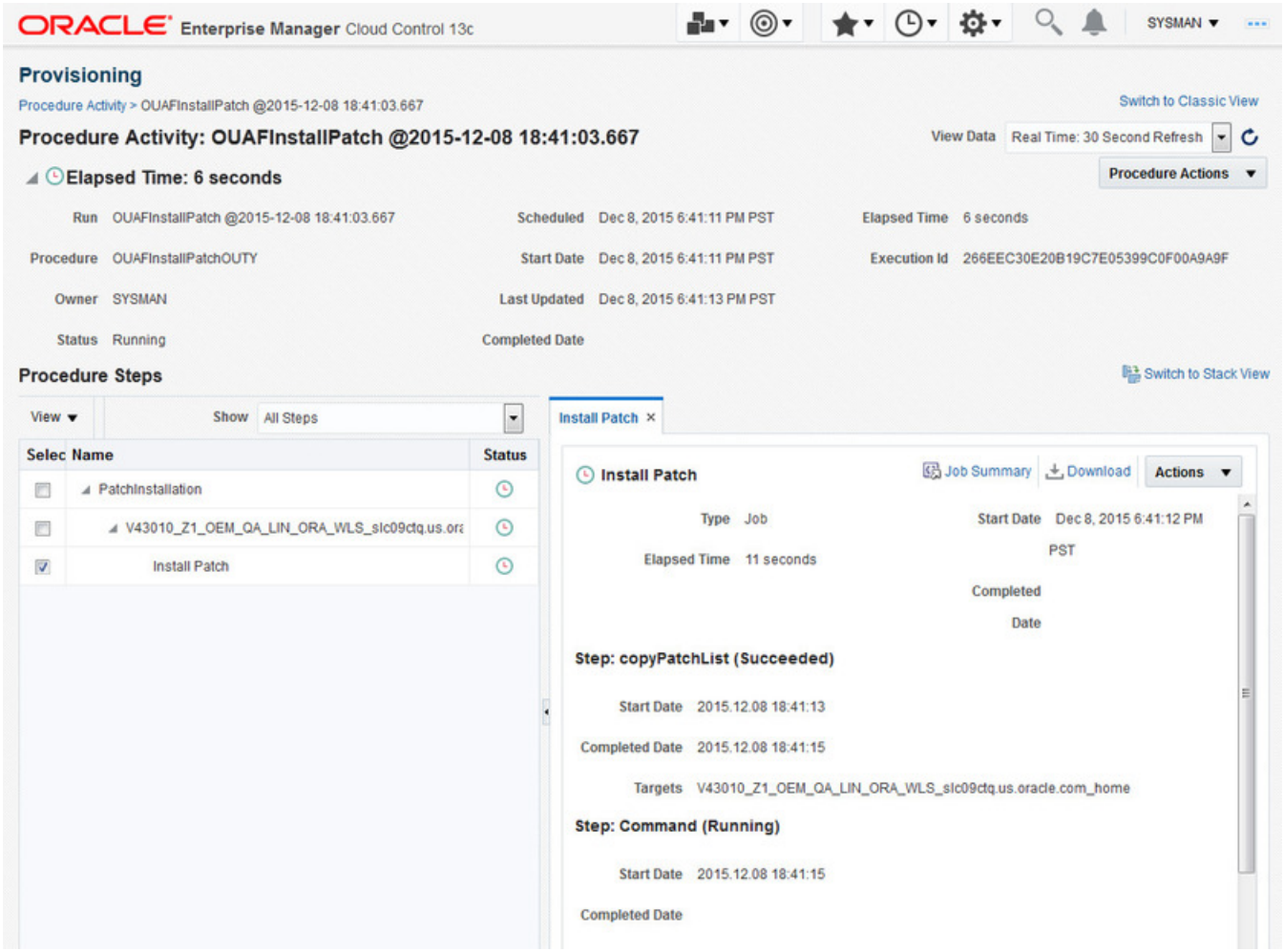


Figure 80: Patch Migration Procedure Activity

Viewing Configuration Files

The View Configuration Files feature lets you review configuration details remotely without logging into the server or the environment. This information lets you compare environments and diagnose customer setup issues.

To view configuration files:

1. From the appropriate Target Home Page (Web Application, Web Services, or Batch Server target home page), choose **Target** > **Control** > **View Config.**

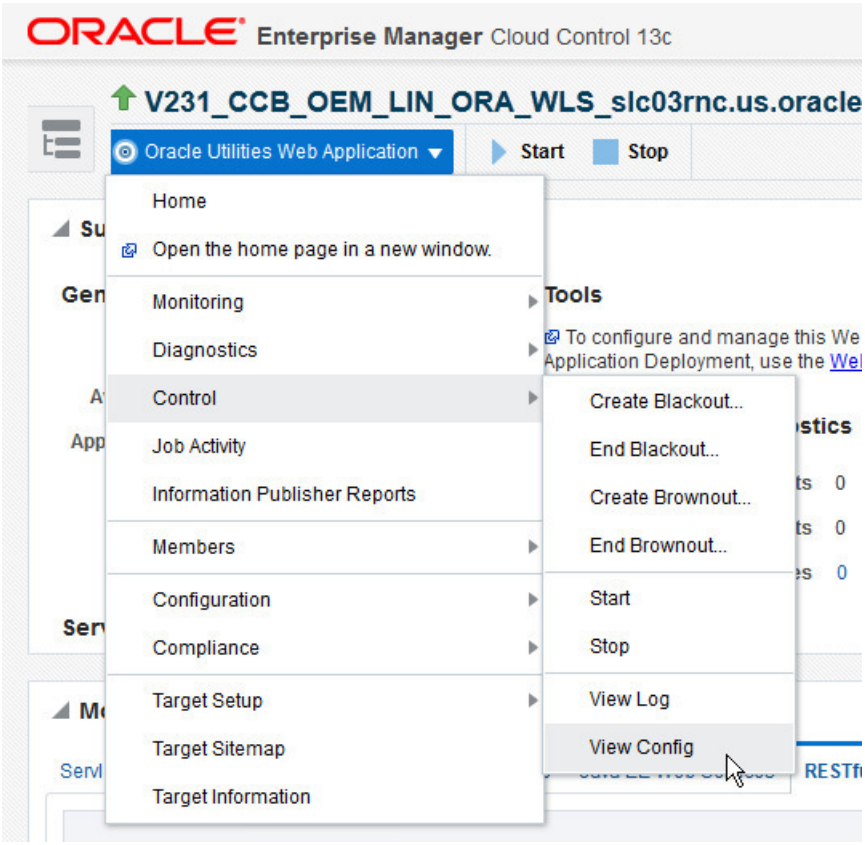


Figure 81: Viewing Configuration Files

2. On the **Credentials** page, choose a set of saved credentials or enter your user name and password, then click **Next** to proceed.

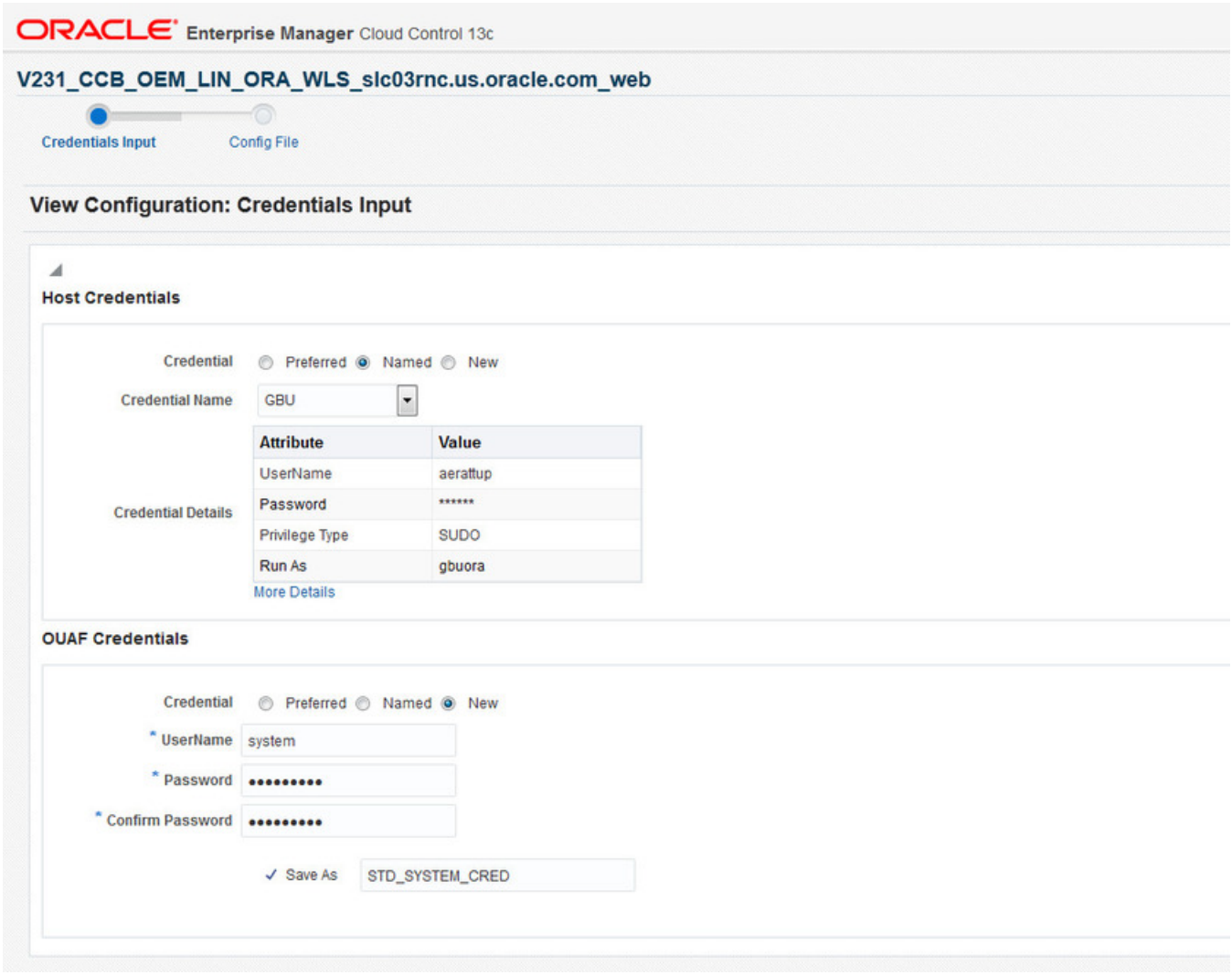


Figure 82: Specifying Credentials

3. The **Configuration Files** page offers a selection region to let you choose configuration files to view, as well as a display area for the selected file.

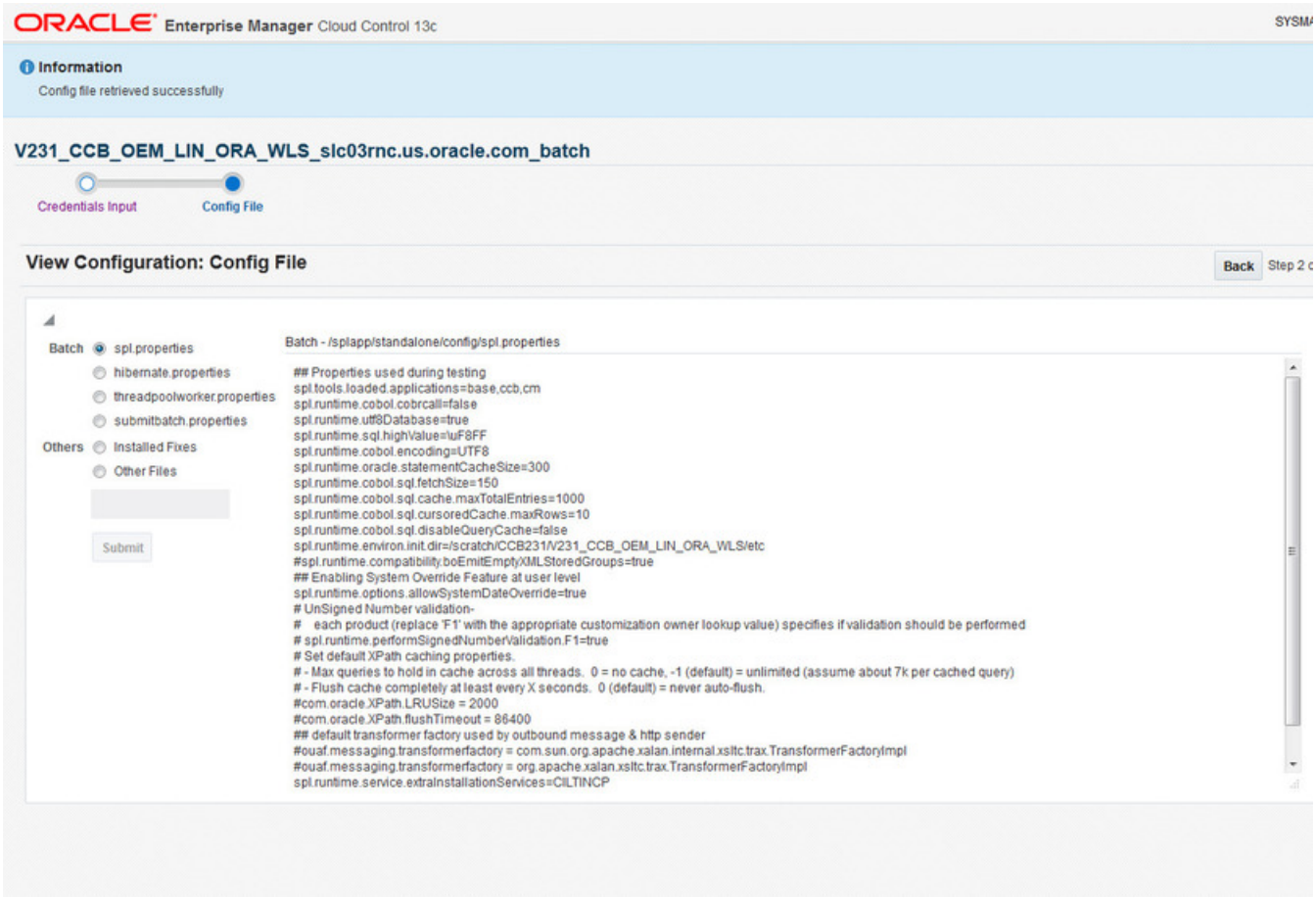


Figure 83: Configuration File Viewer

4. Choose a configuration file by either clicking an option button from the listed items or by selecting the **Other file** option and entering the path (relative to `SPLBASE`) of a valid configuration file. `etc/ENVIRON.INI`, will, for example, display `$SPLEBASE/etc/ENVIRON.INI`.

5. Click **Submit** to display the file in the scrollable text area.

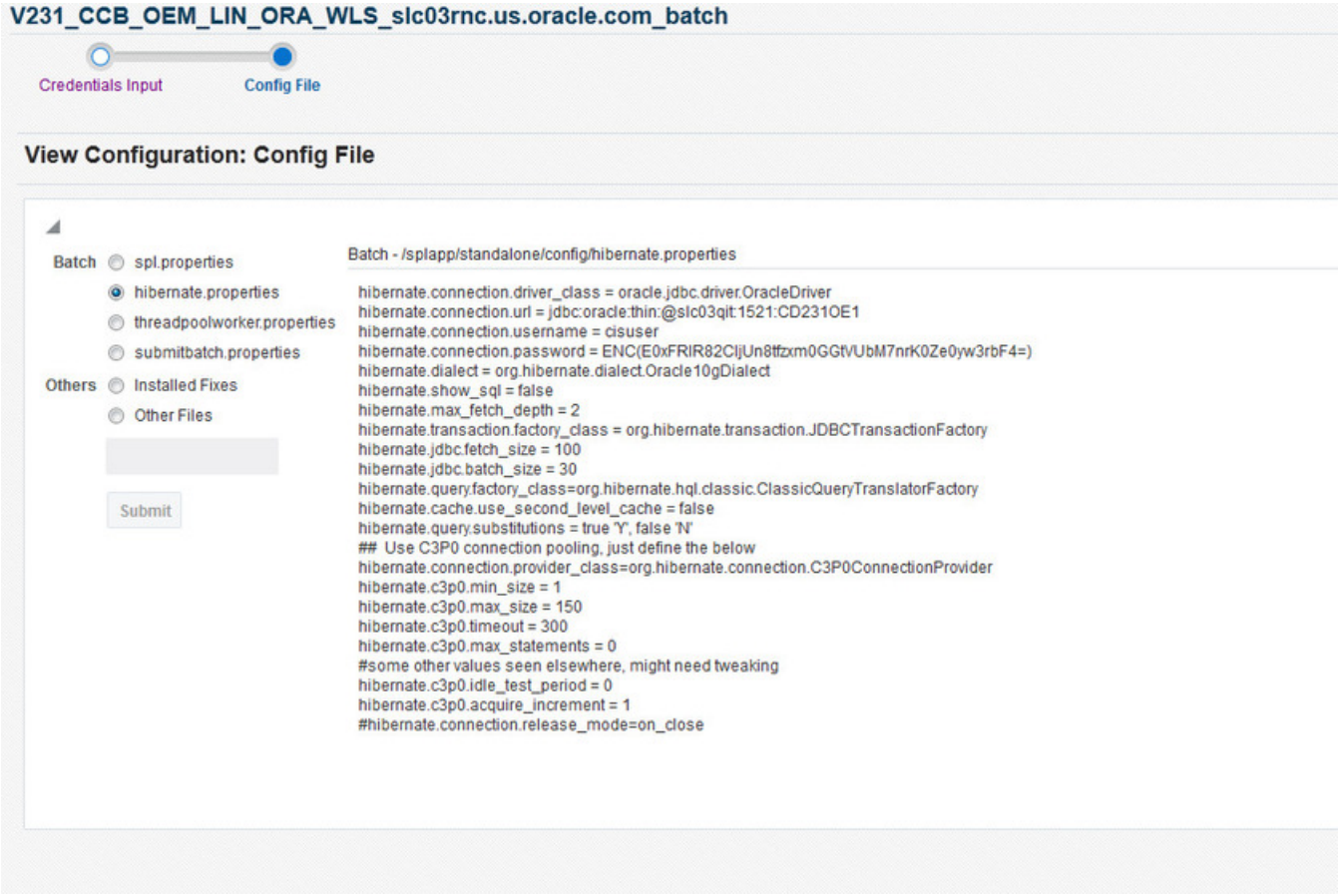


Figure 84: Viewing a Configuration File

6. After viewing the selected configuration file, you can select other configuration files to view, or click **Cancel** to return to the Target Home Page.

Viewing Logs

The View Logs feature allows you to view the contents of log files, including the latest thread pool worker log, that are generated at the application server level.

To view logs:

1. From the appropriate Target Home Page (Web Application, Web Services, or Batch Server target home page), choose **Target** > **Control** > **View Log.**

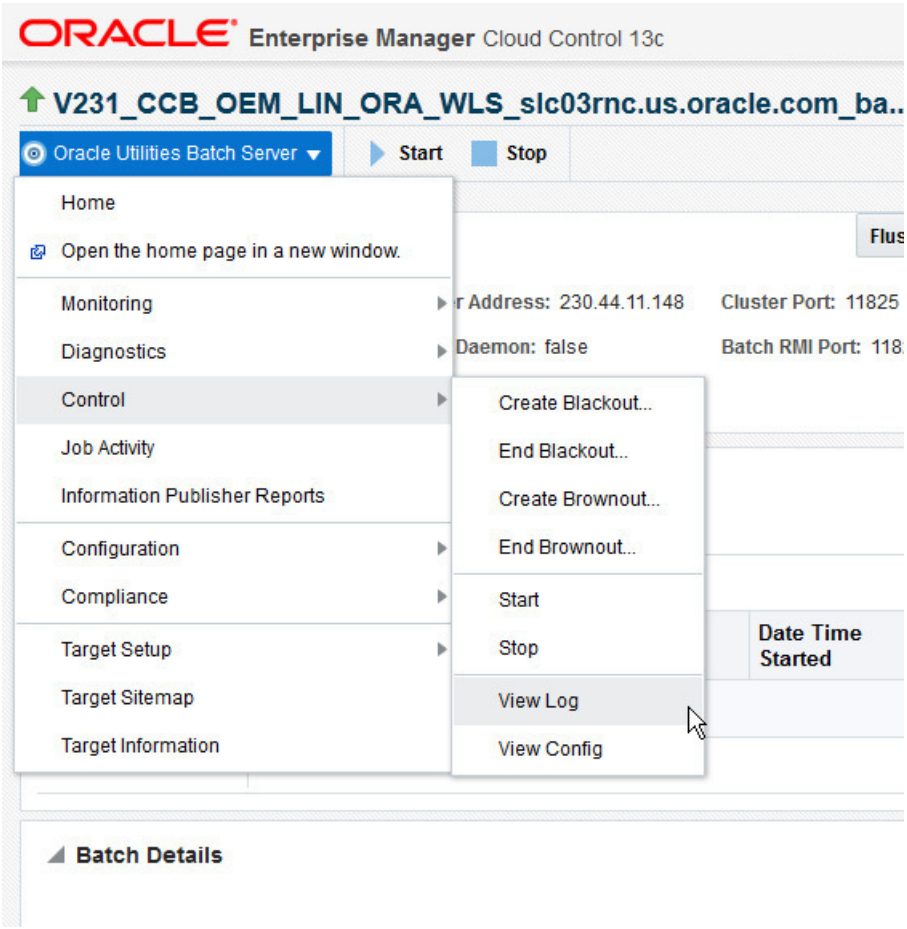


Figure 85: Viewing Configuration Logs

2. On the **Credentials** page, choose a set of saved server credentials or enter your user name and password, then click **Next** to proceed.

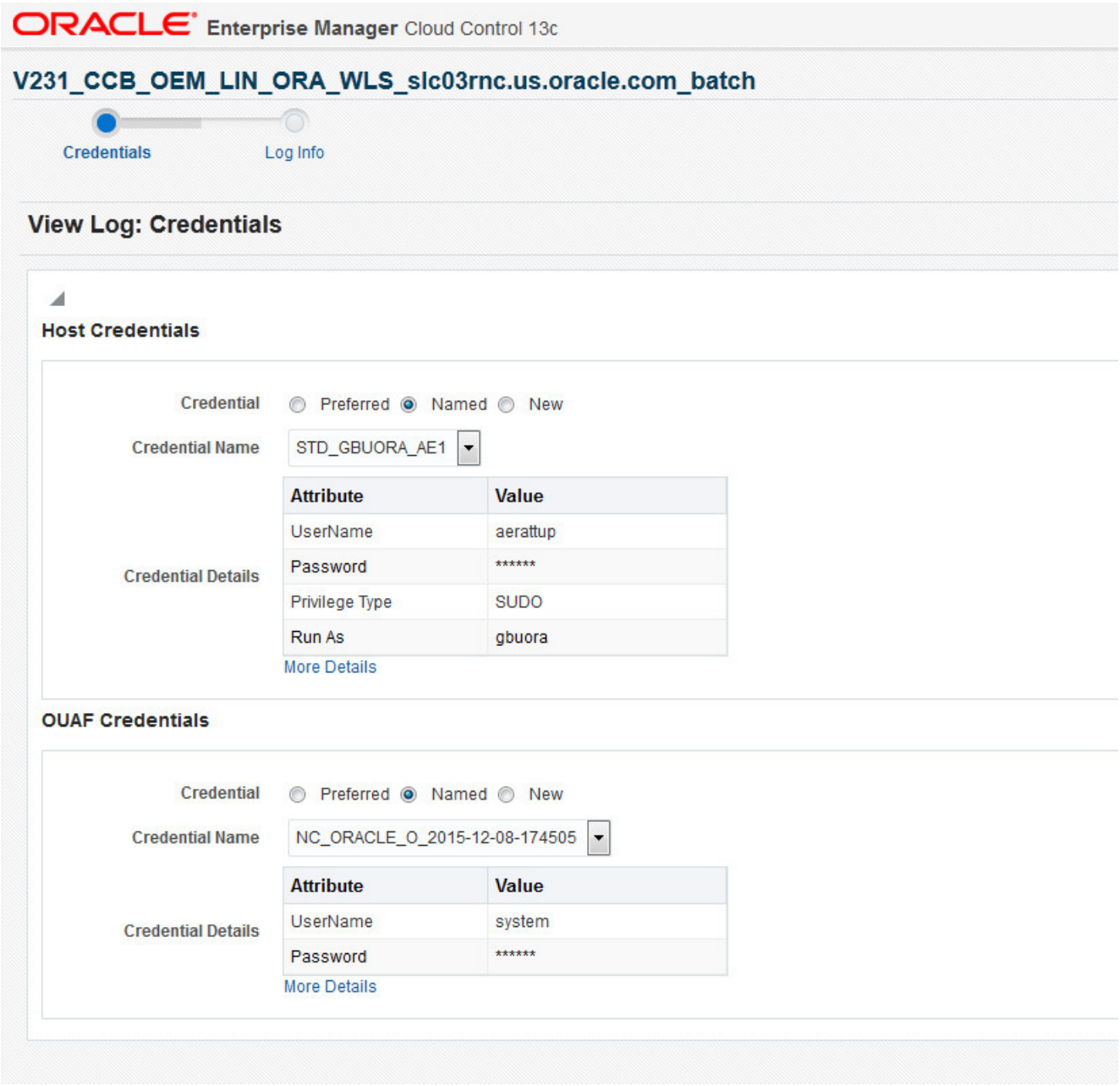


Figure 86: Specifying Credentials

3. The **Log Info** page offers a selection region to let you choose from among all available logs, as well as a display area for the selected log.

Figure 87: Log Info page

4. Enter the number of lines that you would like to view from the selected log. If no value is entered or the value exceeds the number of lines in the selected log, the complete log is displayed.

5. Click **Submit** to display the log in the scrollable text area.

6. After viewing the selected log, you can select other logs to view, or click **Cancel** to return to the Target Home Page.

Log Viewer Enhancements

This module allows you to view all log files relating to a specified target type. Log viewer enhancements allow display of details such as timestamp, message type, etc., lets you search for specific terms in the log file, and lets you download the file.

> **NOTE:** The default preferred host credentials for the target type must be set beforehand.

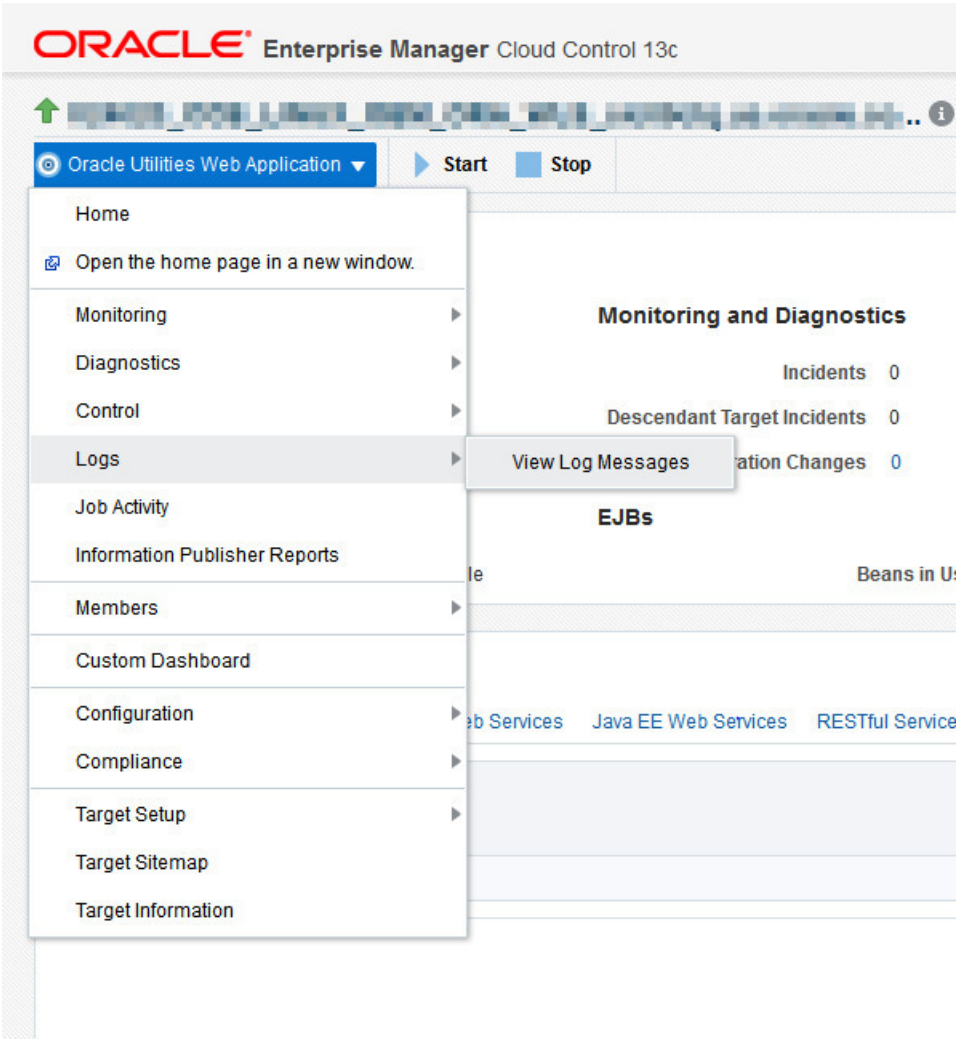


Figure 88: Log viewer menu

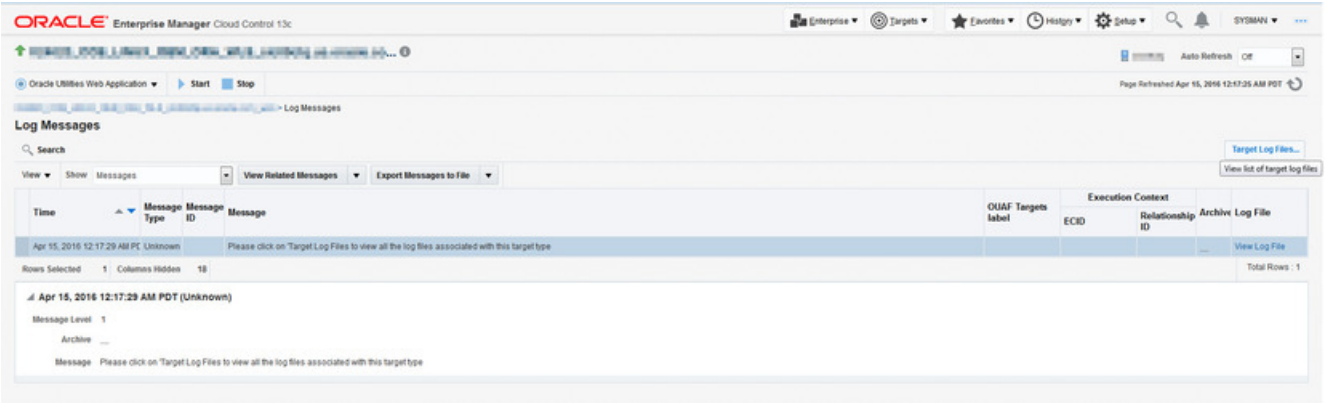


Figure 89: Log viewer landing page

This is a generic page. To view the target-specific log files, click **Target Log Files** on the side of the screen.

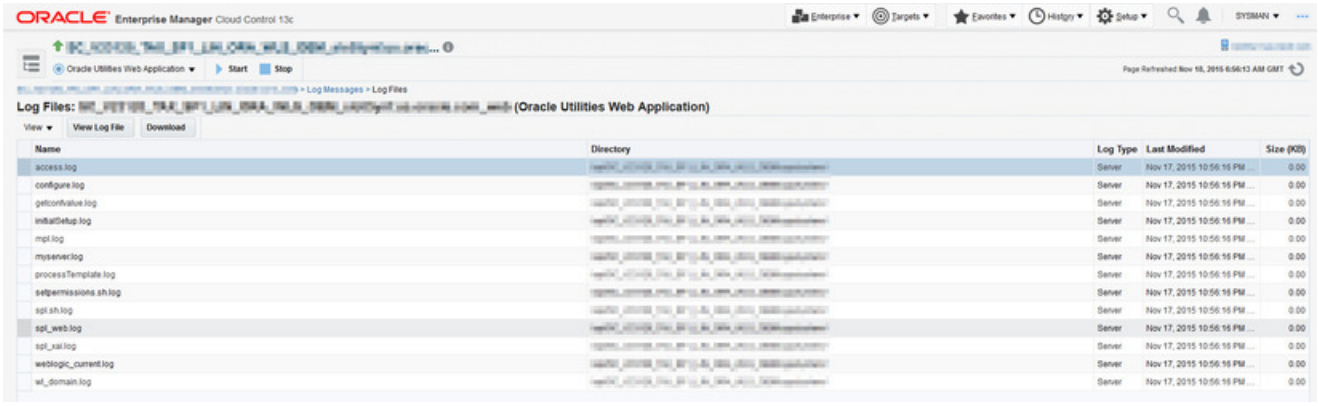


Figure 90: Target-specific log files

In the following image, the list of log files relating to the target type are displayed. You can also can view/download a selected log file from this screen.

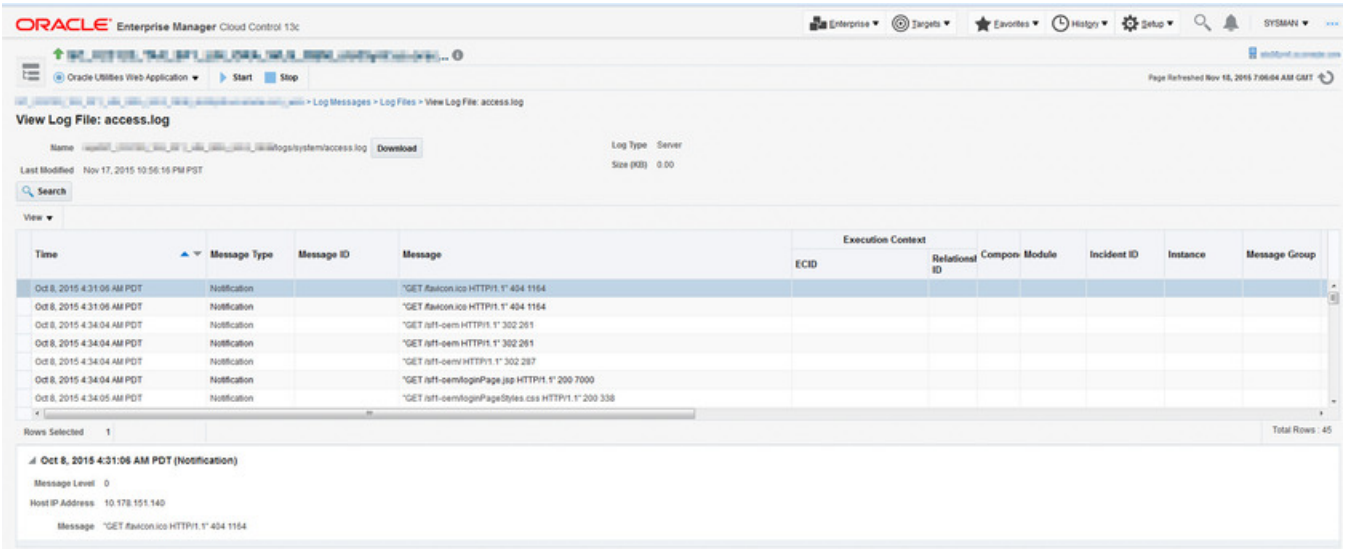


Figure 91: Display content of log file

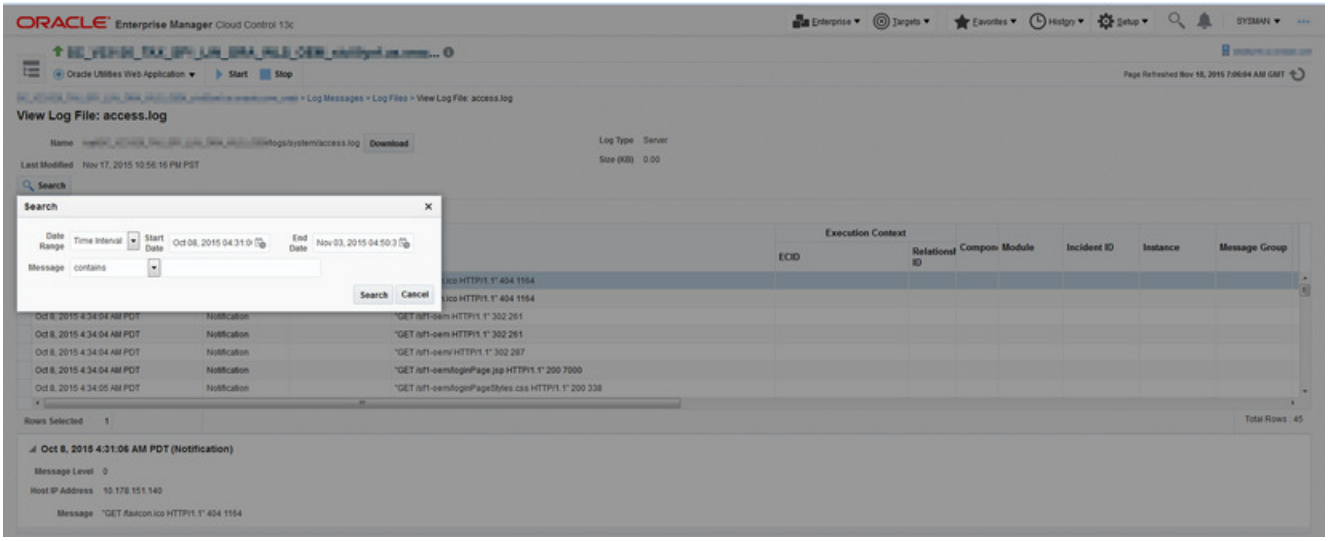


Figure 92: Searching for a term in a log file

Performance Portal: Custom Dashboard

This feature is available for all target types. By default, it displays the availability region and a metric palette along with a chart toolbar and a time toolbar. You can customize this dashboard according to your own use cases. Various charts can be viewed by selecting the charts in the metric palette, and the time range can be selected accordingly. Also, chart values can be compared with respect to a set baseline or with another chart.

NOTE: Users with read-only privileges cannot access the custom dashboard.

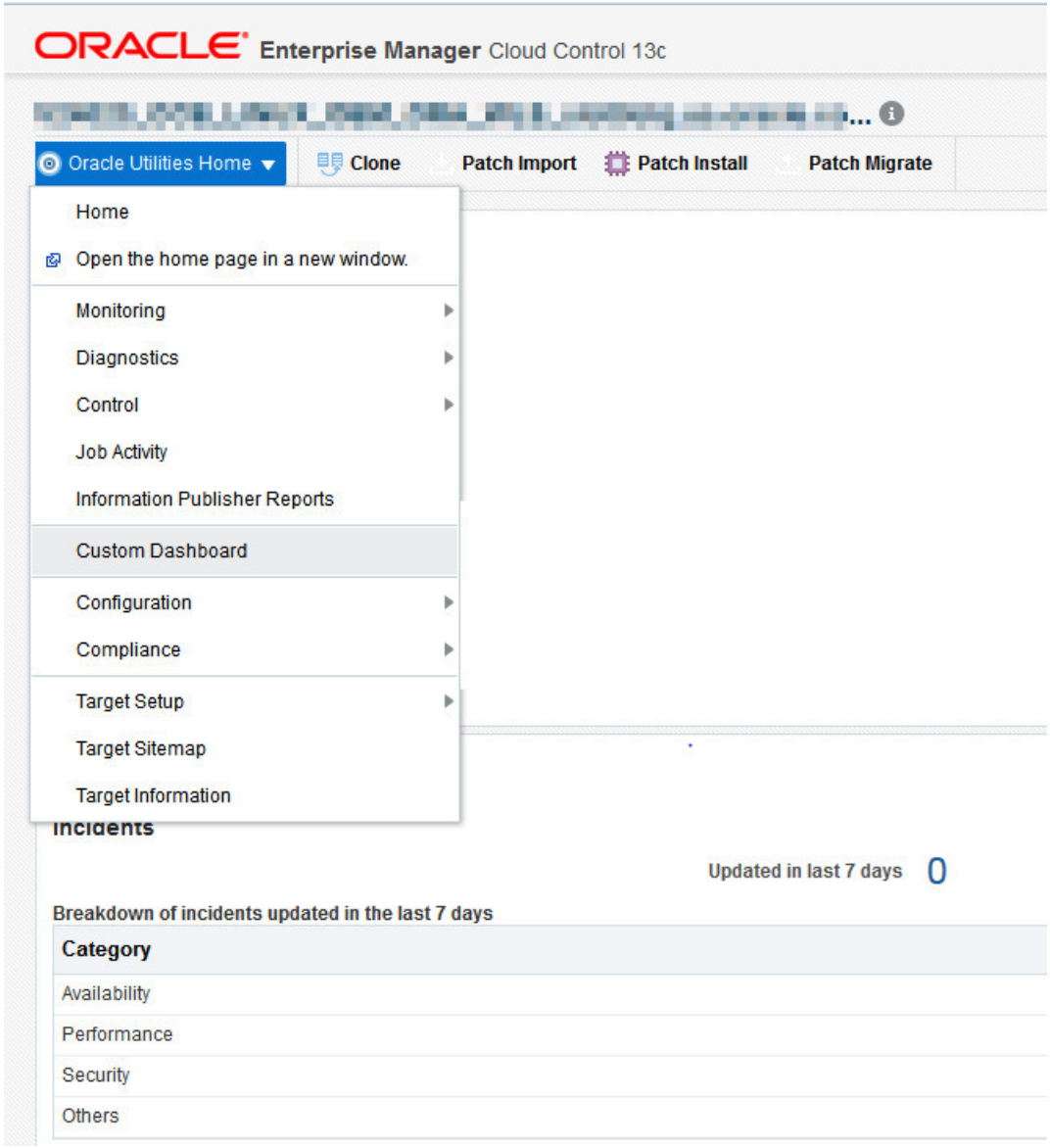


Figure 93: Custom dashboard menu option

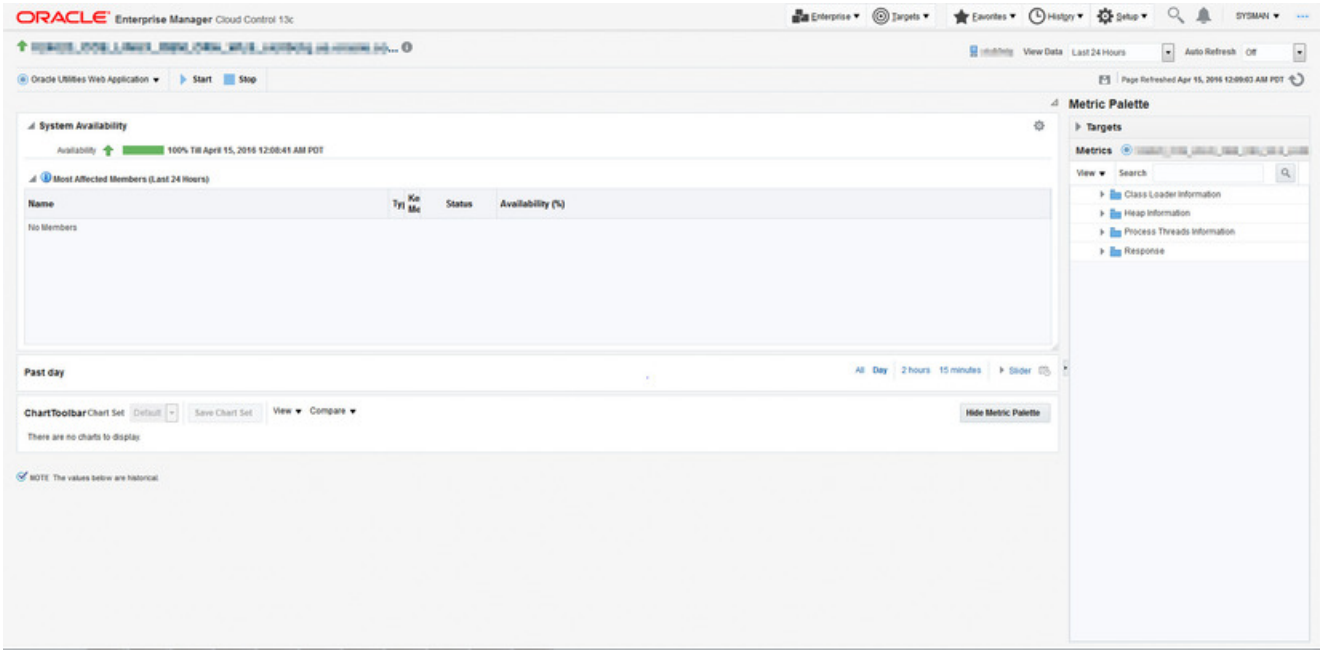


Figure 94: Default custom dashboard page

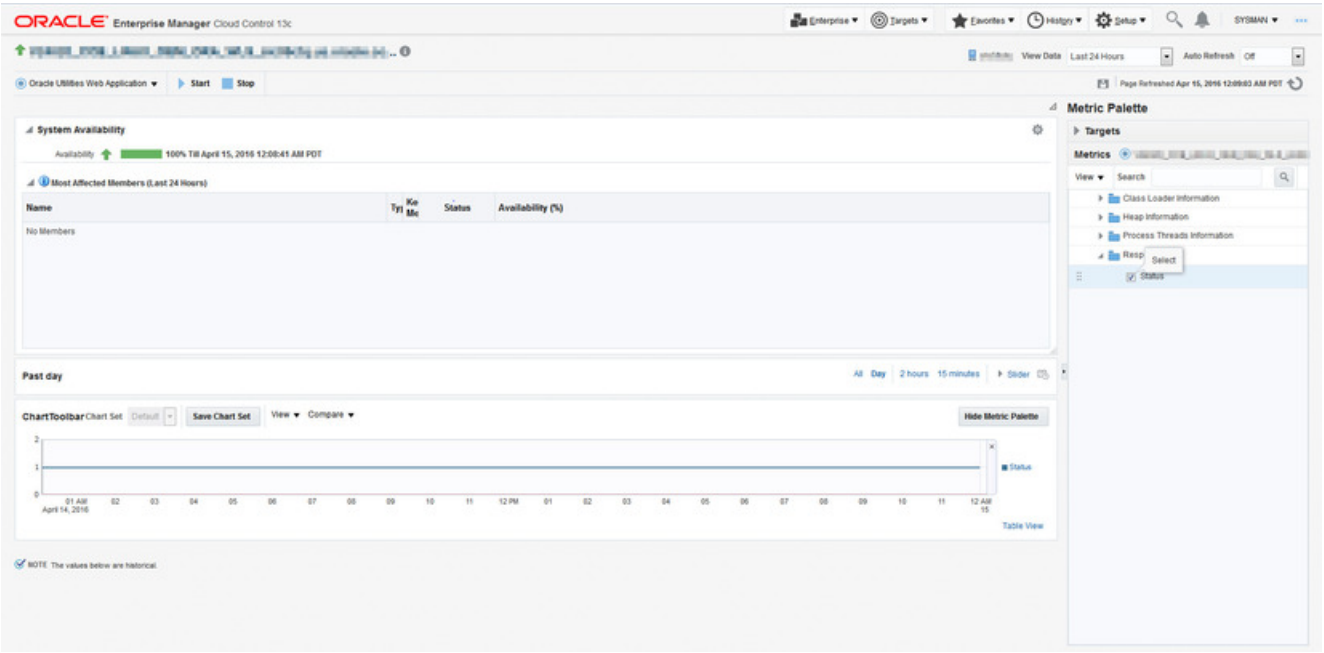


Figure 95: Charts selected and displayed on the UI

Additional Features and Functionality

Metrics Enhancement: Batch Level of Service

This feature supported from OUAF 4.2.0 Service Pack 3 with Bug 21358792.

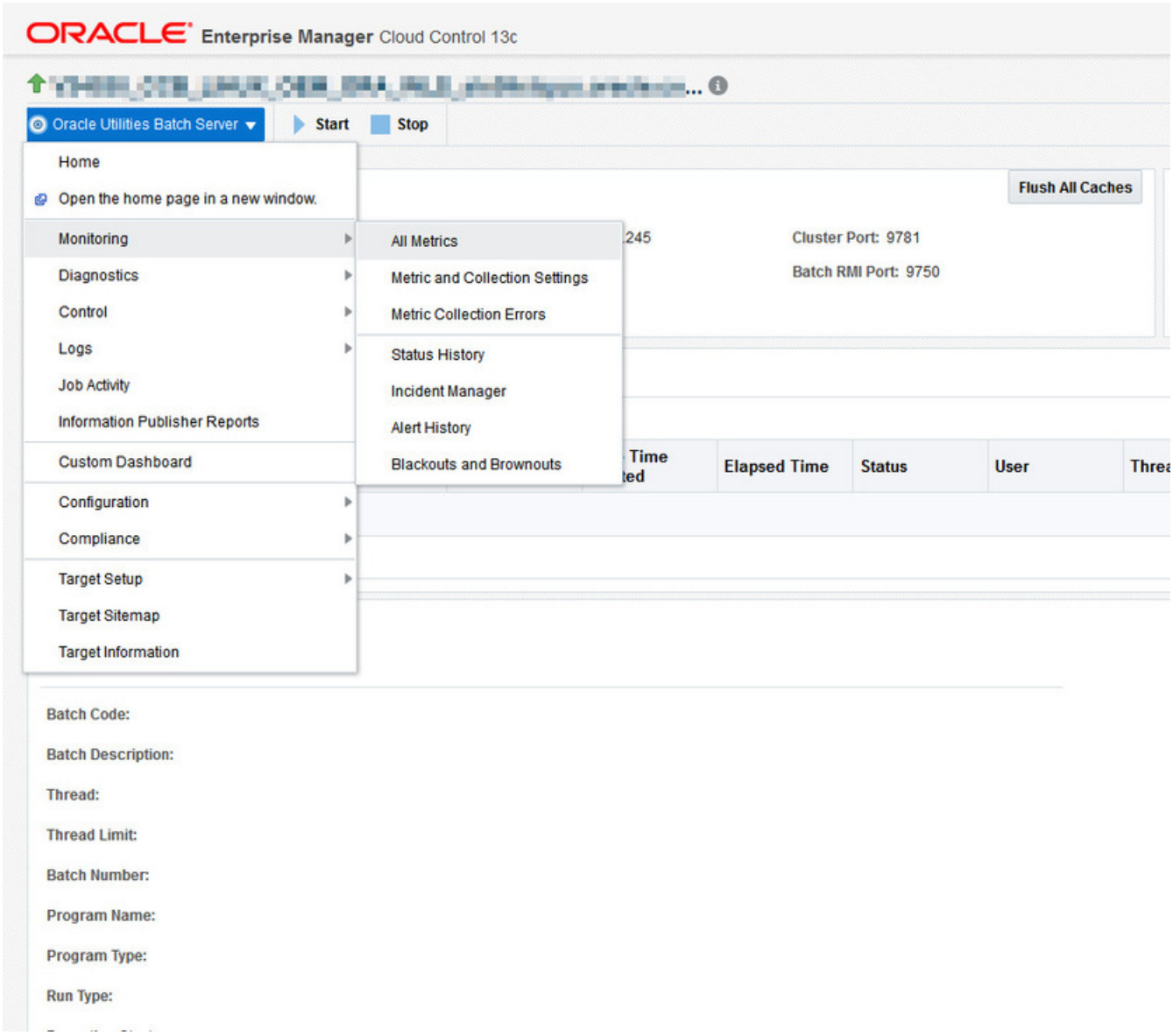


Figure 96: Menu to navigate to the metric

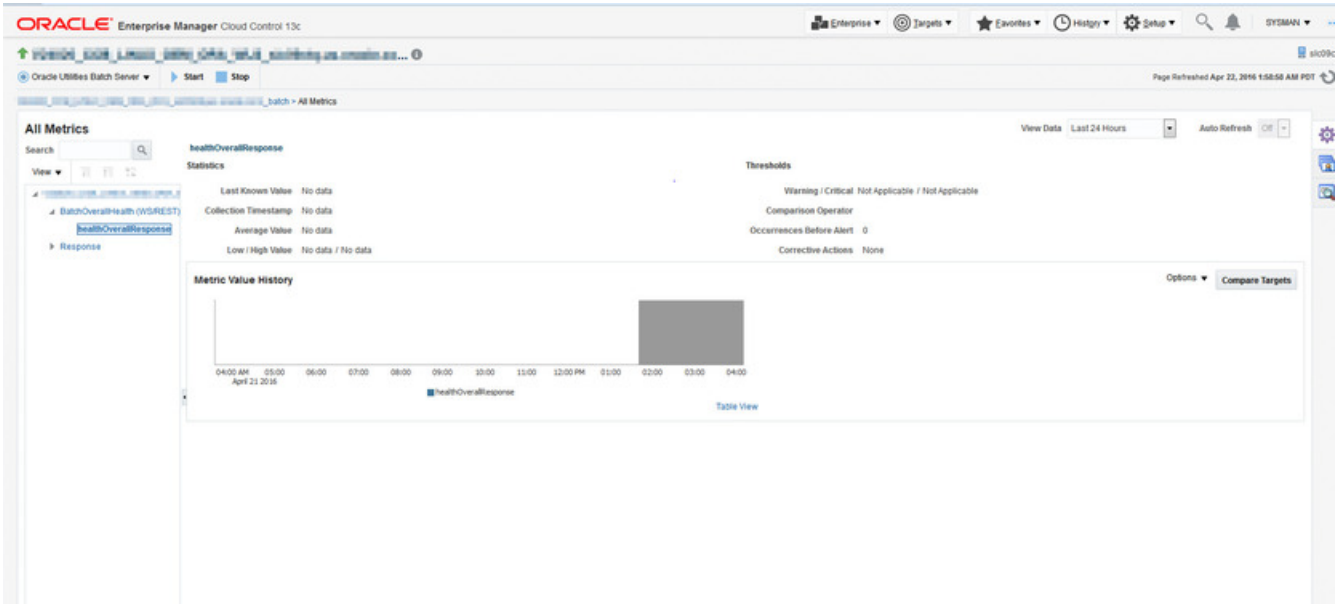


Figure 97: BatchOverAllHealth metric

Features Available for Users with Specific Roles

A. User: Operator Privileges

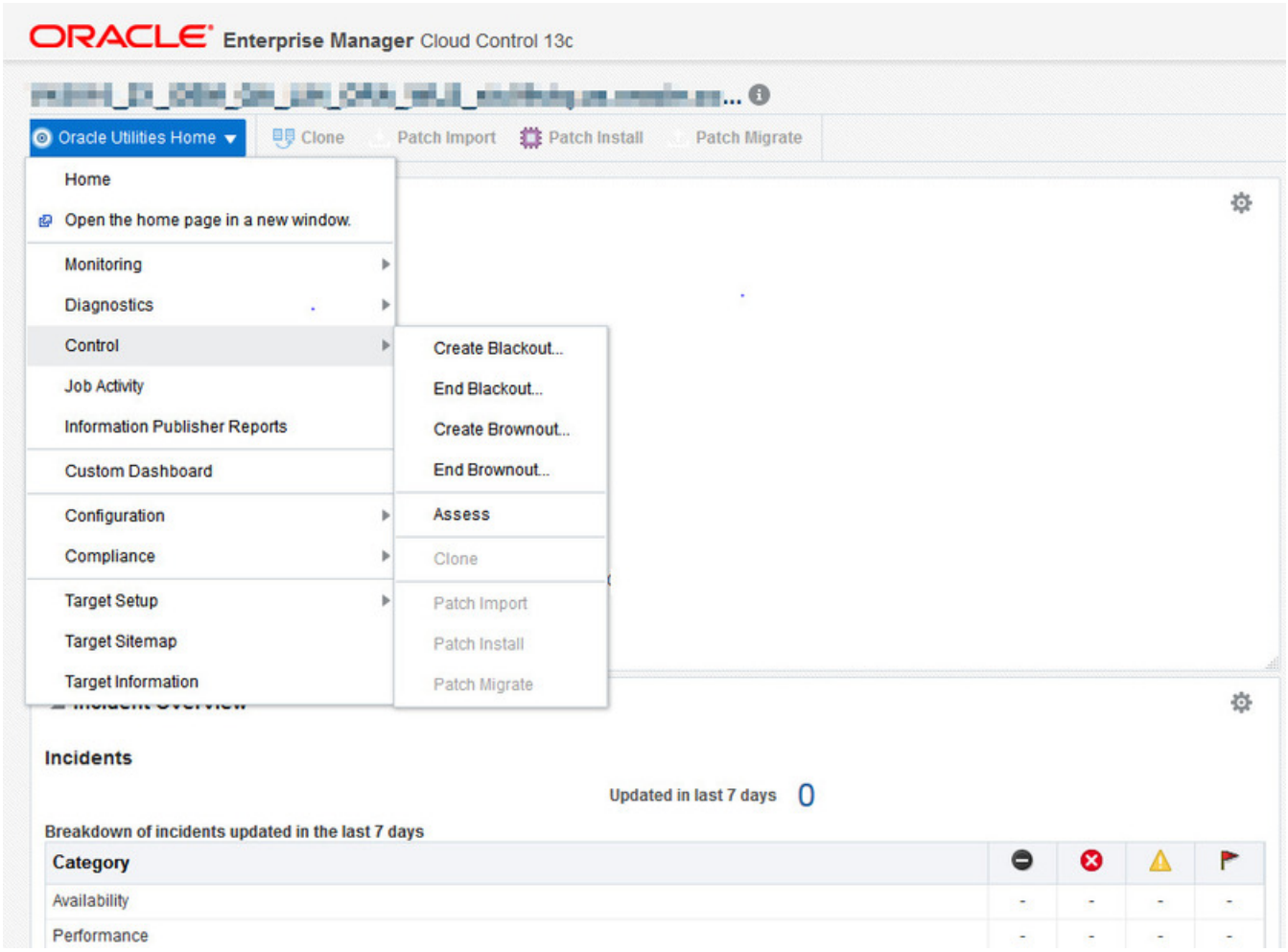


Figure 98: Environment Home page functions

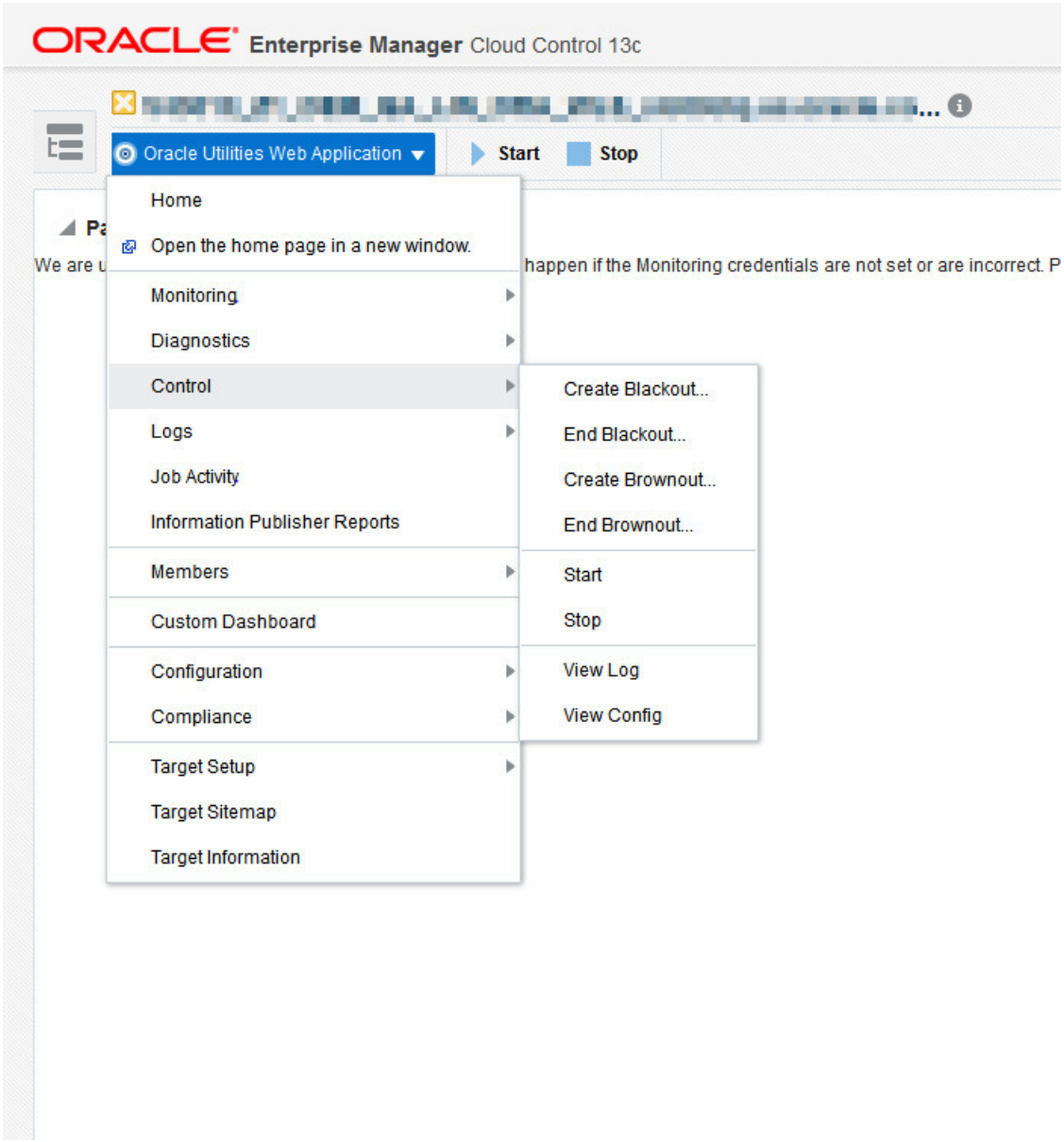


Figure 99: Web Page functions

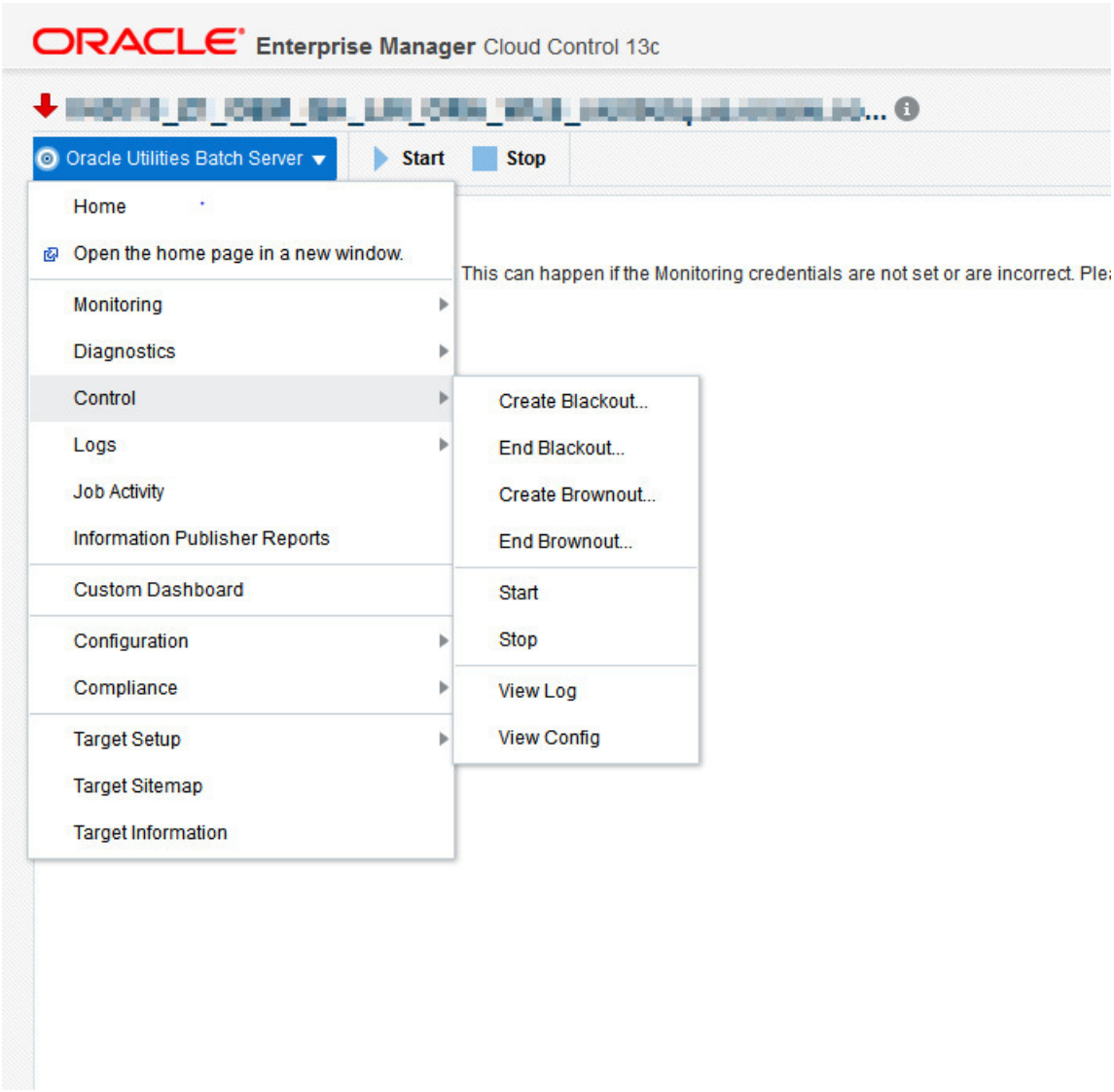


Figure 100: Batch Page functions

B. User: Read-Only Privileges

Prerequisite: For a read-only plugin user role to work properly (to enable the user to access modules with previously-saved credentials), the following actions must be applied:

- Add 'Execute Command Anywhere' for 'Privileges applicable to all targets'
- Add 'Named Credential' for 'EM Resource Privileges'
- Add 'Configure Target' Privilege for Target Privileges Applicable to Specific Targets

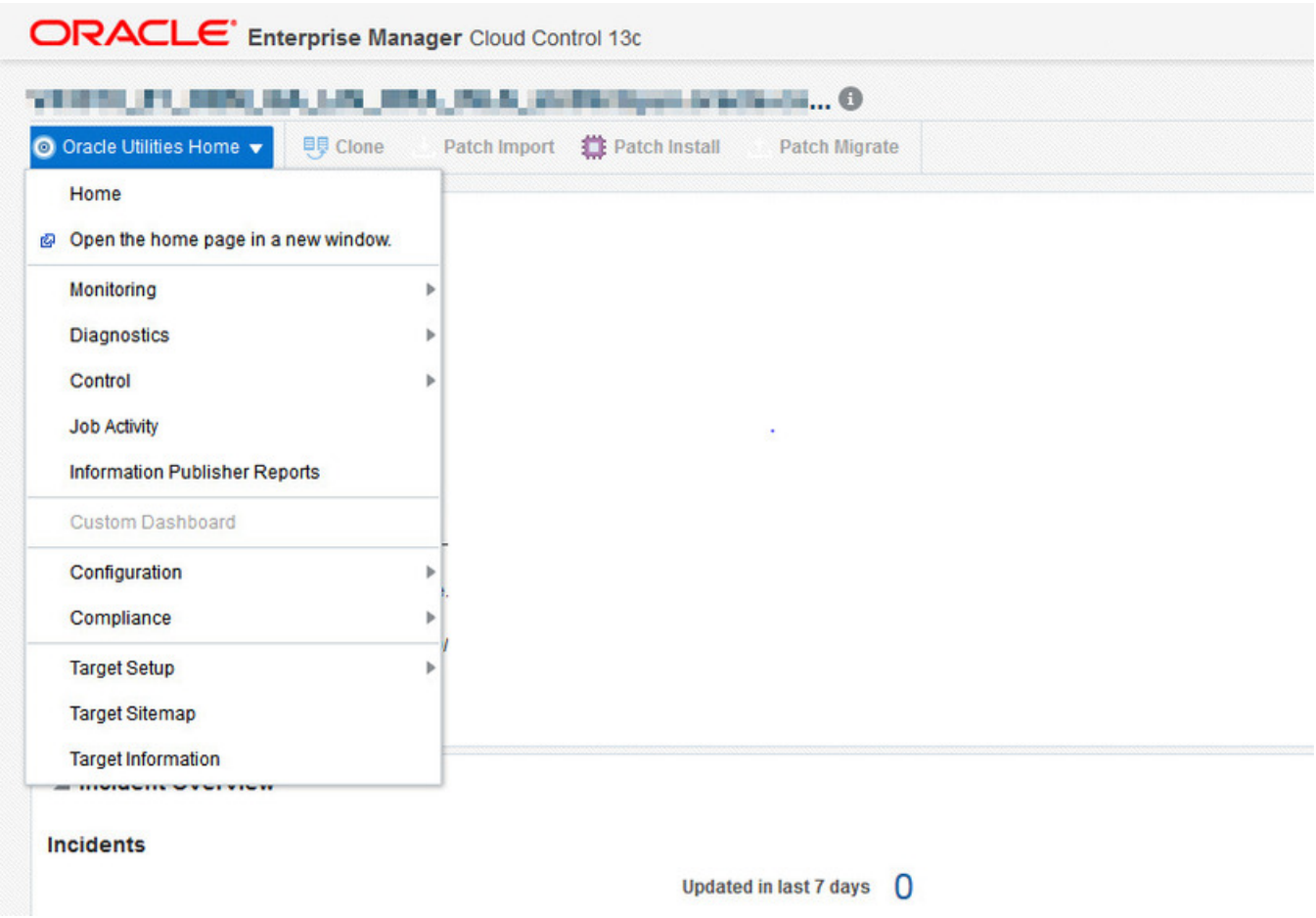


Figure 101: Environment Home page functions

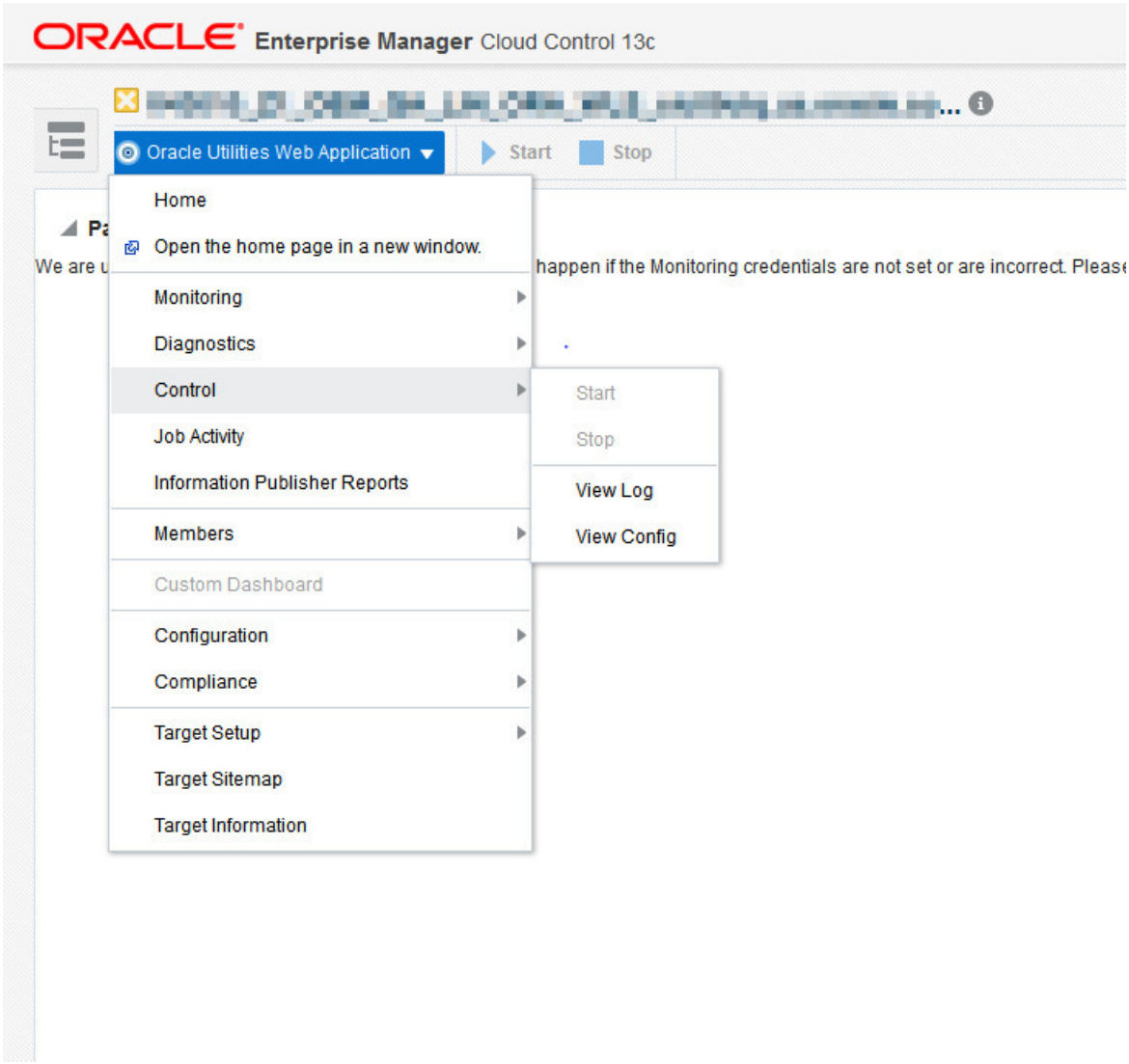


Figure 102: Web Page functions

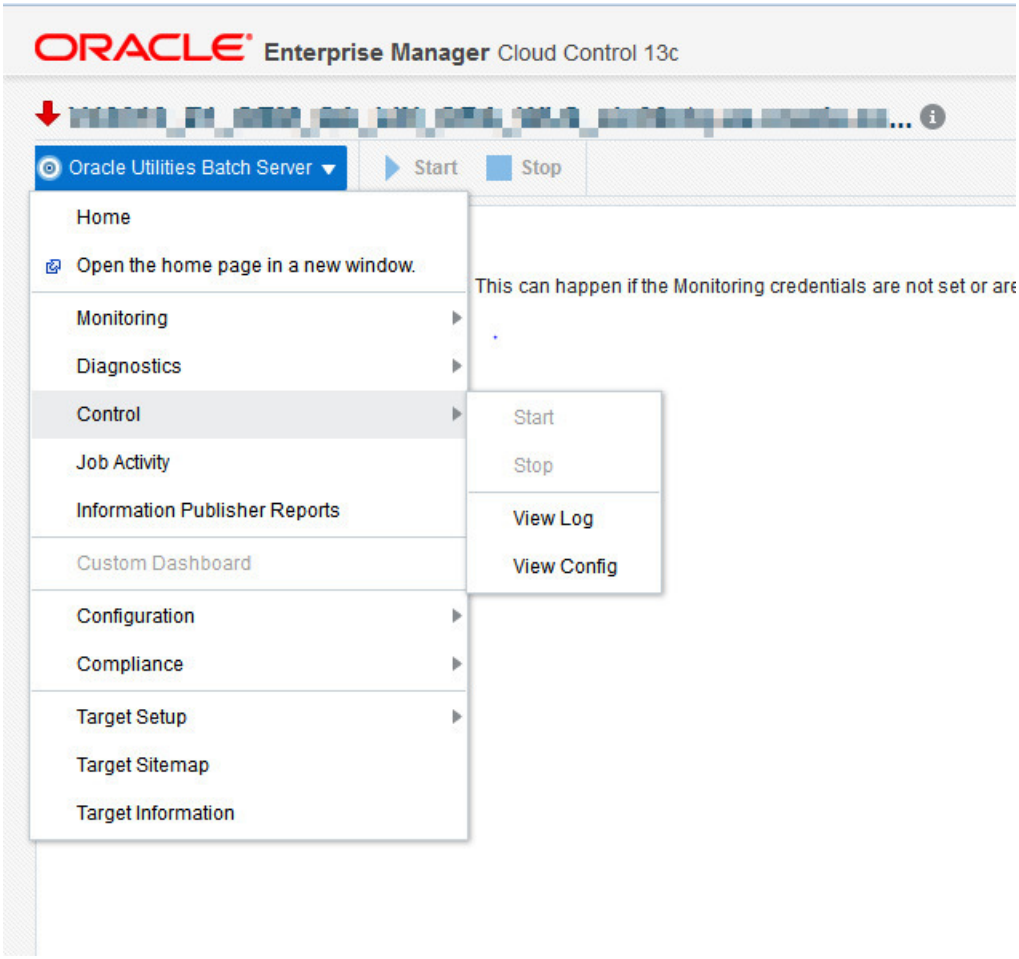


Figure 103: Batch Page functions

C. User: Administrator Privileges (has access to all functionality)

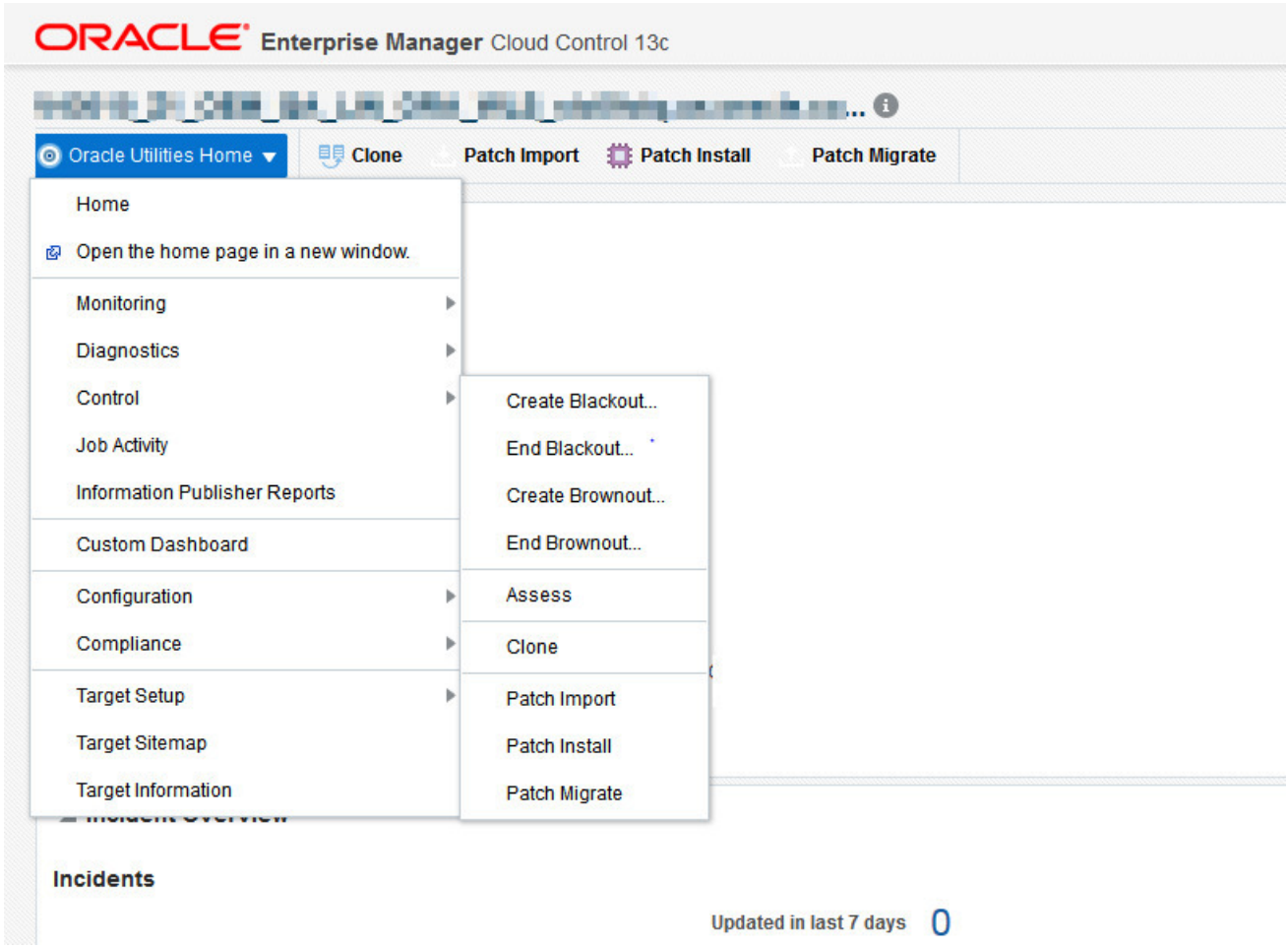


Figure 104: Environment Home page functions

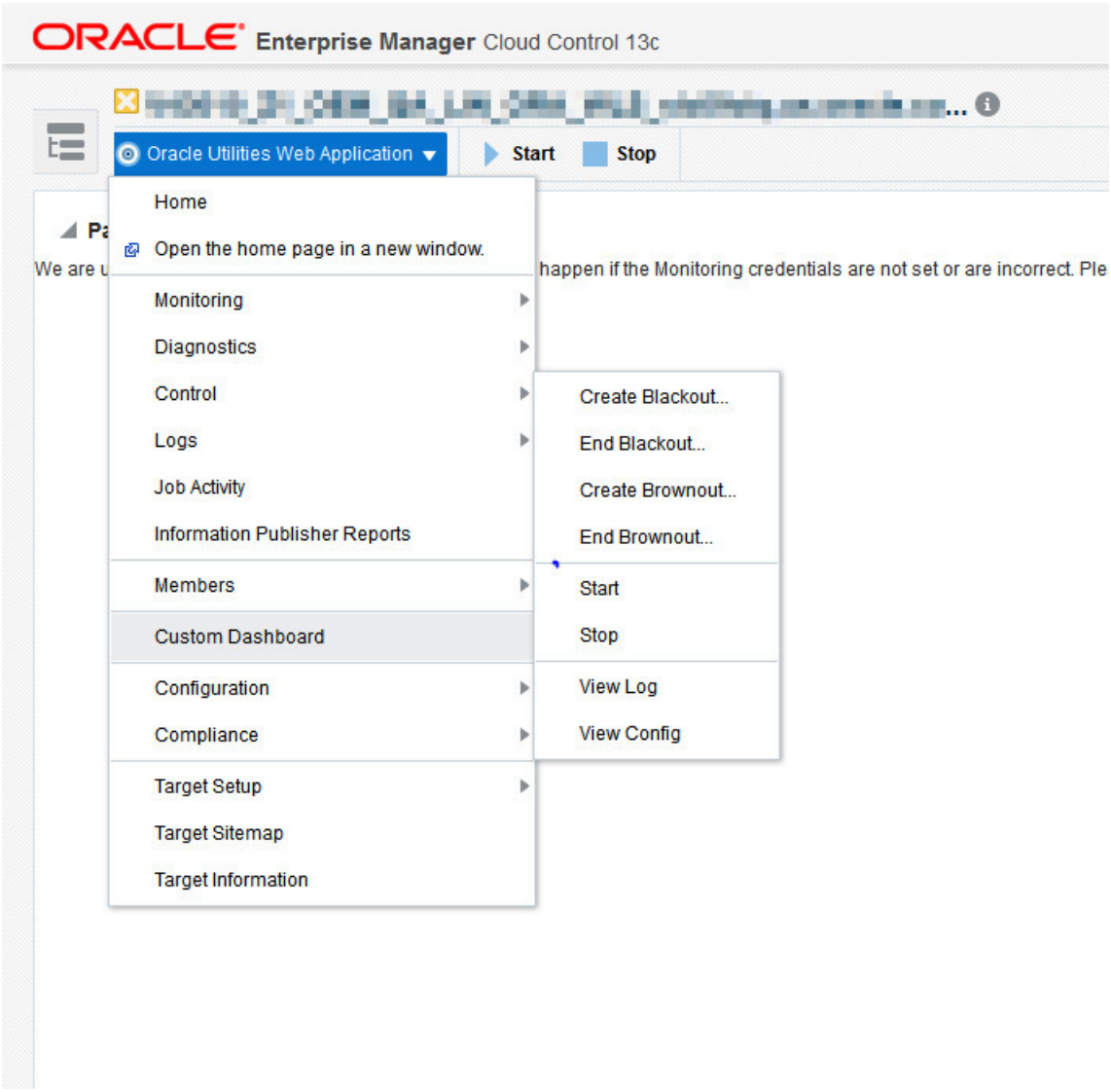


Figure 105: Web Page functions

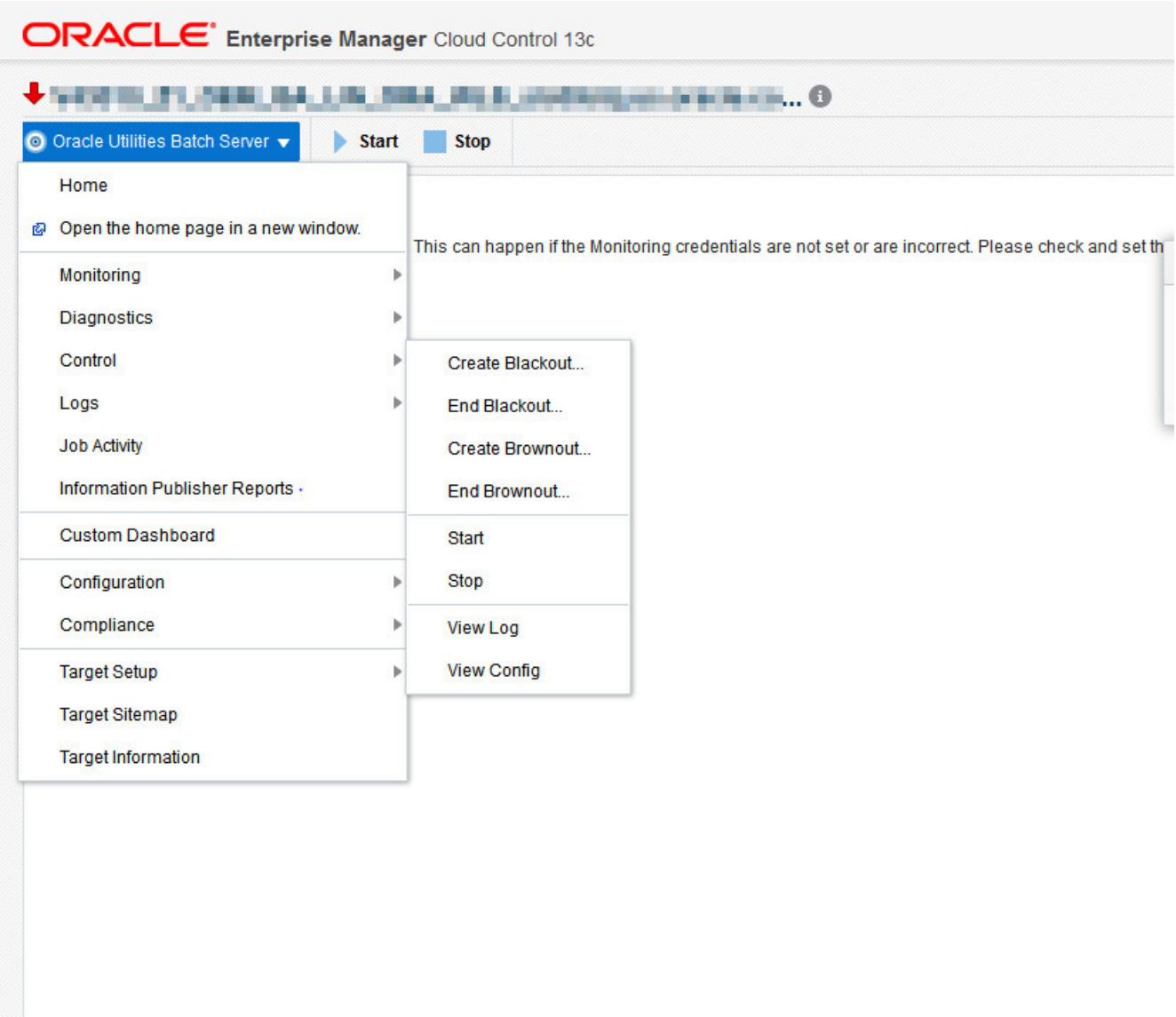


Figure 106: Batch Page functions

Tips and Troubleshooting

- Discovery and metric configuration collection log information can be found in the agent perl trace file (`.../agent_inst/sysman/log/emagent_perl.trc`).
- Environment-specific log files can be found in `$SPLEBASE/logs/system`, and are named `ouaf_oem*.log`.

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Enterprise Manager for Oracle Utilities

Administrative Guide

Release 13.4.1.0.0

Part number F27806-01

February 2020

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