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Oracle

The following topics are included:

| Workflow type | Workflow name |
|--------------------|---|
| Compliance | "Oracle - Compliance Audit v2" on the next page |
| Provisioning | "Oracle - Provision Data Guard v5" on page 222 |
| | "Oracle - Create Data Guard Broker Configuration" on page 234 |
| | "Oracle - Configure Data Guard Broker Properties" on page 242 |
| | "Oracle - Data Guard Broker Switchover" on page 251 |
| | "Oracle - Provision or Upgrade Grid Infrastructure" on page 291 |
| | "Oracle - Provision Database Software v2" on page 301 |
| | "Oracle - Provision Database v3" on page 310 |
| Patching | Oracle - Patch Home and Databases |
| | Oracle - Rollback Patch from Home and Databases |
| | "Apply Oracle Patchset" on page 46 |
| | "Clone Oracle Home" on page 66 |
| | "Migrate Oracle Home" on page 76 |
| | "Oracle - Patch Grid Infrastructure and Databases v6" on page 98 |
| | "Oracle - Rollback Patch from Grid Infrastructure and Database" on page 116 |
| | "Oracle - Migrate and Patch Grid Managed Database" on page 87 |
| Refreshing | "Oracle - Extract Database via RMAN" on page 129 |
| | "Oracle - Refresh Database via RMAN" on page 140 |
| | "Oracle - Extract and Refresh Database via RMAN" on page 152 |
| | "Oracle - Export Database via Data Pump" on page 167 |
| | "Oracle - Refresh Database via Data Pump" on page 185 |
| | "Oracle - Migrate Database TTS" on page 203 |
| Release Management | "Oracle - SQL Release v3" on page 321 |

Oracle - Compliance Audit v2

The Oracle - Compliance Audit v2 workflow enables you to audit an Oracle Database instance for compliance with one of the following security benchmarks:

- Center for Internet Security (CIS) security configuration benchmarks
- Payment Card Industry (PCI) data security standard
- Sarbanes-Oxley (SOX) requirements

The workflow performs CIS Level 1 and Level 2 auditing and can identify more than 175 compliance related problems.

The workflow performs the checks included in the CIS benchmark and then maps those CIS checks to the benchmark type that you specify in the Compliance Type parameter. The audit summary email will match the Compliance Type that you specify.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| Prerequisites for this Workflow | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a step descriptions |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| Parameters | List of input parameters for this workflow |

How this Workflow Works

This workflow performs the following actions:

1. Prepares to run the workflow by gathering information about the target Oracle Database instance and validating parameter values.
2. Audits the various configuration settings specified in the pertinent benchmark.
3. Composes and sends an email containing the results of the audit.

Note: The emails are sent through the mail server configured on the HPE DMA server. You can configure the mail server in the path below:

DMA setup > Configuration > Outgoing Mail > Server.

Validation Checks Performed show

This workflow validate the following conditions:

1. The Oracle Home derived in the Get Oracle Home step is a fully qualified path that exists on the target server.
2. The workflow can connect to the Oracle SID derived in the Get Oracle Home step.
3. Any Excluded Checks specified by the user refer to actual CIS checks.
4. Any email addresses specified are valid addresses.
5. The workflow can create the temporary file that will store the compliance check results.

Steps Executed show

The "[Oracle - Compliance Audit v2](#)" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used in Oracle Compliance Audit

| Workflow Step | Description |
|---|---|
| Gather Parameters for Oracle Compliance | <p>This step gathers three pieces of information that the workflow needs to perform the compliance audit:</p> <ul style="list-style-type: none"> • The type of compliance audit to perform (CIS, PCI, or SOX) • A list of compliance checks to exclude from the audit (if any) • The location of the Oracle inventory files. <p>All parameters are optional.</p> |

Steps Used in Oracle Compliance Audit, continued

| Workflow Step | Description |
|---|--|
| Gather Advanced Parameters for Oracle Compliance v2 | This step gathers the information that the workflow needs to create and deliver the compliance audit report via email. It also enables you to specify the name of the most recent Oracle patch that was applied to the pertinent Oracle Home (derived from the Oracle inventory file). |
| Validate Compliance Parameters v2 | <p>This step validates the input parameters specified in the previous steps. It validates the list of excluded checks to ensure that all specified checks in the list correspond to actual Center for Internet Security (CIS) benchmark items. It also validates the email information to ensure that all specified email addresses are valid.</p> <p>The step then creates the path to the temporary file that will store the results of the current audit as the workflow is running. This file is deleted after the audit report is sent.</p> |
| Prepare Server | This step prepares the Server Wrapper and Instance Wrapper, which enable subsequent steps to be executed by the OS administrator user or the owner of the database or middleware software. |
| Get Oracle Home | This step determines the value of ORACLE_HOME from the Oracle inventory file on UNIX targets or from the Registry on Windows targets. |
| Prepare Oracle Instance | This step gathers the information that the workflow will need to access the pertinent Oracle instance. |
| Get Listener Names | <p>This step gets the names of the Oracle listeners that are running.</p> <p>Results can be filtered based on one or more ORACLE_HOMEs, one or more ORACLE_SIDs, or both.</p> |
| Database Installation and Patching Requirements | This step audits the scorable recommendations in Section 1, Oracle Database Installation and Patching Requirements, of the CIS Security Benchmarks for Oracle. |
| Audit Oracle Parameter Settings v2 | This step audits the scorable recommendations in Section 2, Oracle Parameter Settings, of the CIS Security Benchmarks for Oracle. |
| Oracle Connection and Login Restrictions | This step audits the scorable recommendations in Section 3, Oracle Connection and Login Restrictions, of the CIS Security Benchmarks for Oracle. |
| Audit Oracle User Access and Authorization Restrictions | This step audits the scorable recommendations in Section 4, Audit Oracle User Access and Authorization Restrictions, of the CIS Security Benchmarks for Oracle. |
| Audit Logging Policies and Procedures | This step audits the scorable recommendations in Section 5, Audit Logging Policies and Procedures, of the CIS Security Benchmarks for Oracle. |

Steps Used in Oracle Compliance Audit, continued

| Workflow Step | Description |
|---------------------------------|---|
| Validate Post Compliance Checks | This step reads the temporary file that contains the results of the compliance audit and prints the audit results to the HPE DMA Console. If email addresses were specified, it also creates a report in HTML format that will be emailed to those addresses by a later step in the workflow. |
| Send Compliance Email v2 | If email addresses are provided, this step sends the previously generated compliance audit report to the specified email addresses. |
| Delete File | This step deletes the specified file on the target server. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Compliance Audit"](#) on page 21.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Compliance Audit v2"](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Compliance Audit" on page 21](#).

Note: Before following this procedure, review the [Prerequisites for this Workflow](#), and ensure that all requirements are satisfied.

To use the Run Oracle Compliance Audit workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Parameters Defined in this Step: Gather Parameters for Oracle Compliance

| Parameter Name | Default Value | Required | Description |
|----------------------------|-----------------|----------|--|
| Compliance Type | CIS | optional | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Excluded Compliance Checks | no default | optional | Comma-separated list of compliance checks to exclude from the audit. For example: 1.2, 2, 3.*, 5*, 6.1.2 Note: Make sure that the checks specified here correspond with the compliance audit type (CIS, PCI, or SOX) that you are running. |
| Inventory Files | see description | optional | Comma-separated list of fully qualified Oracle inventory files. If this parameter is not specified, it |

Parameters Defined in this Step: Gather Parameters for Oracle Compliance , continued

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| | | | defaults to one of the following values: Linux or AIX: /etc/oraInst.loc Solaris: /var/opt/oracle/oraInst.loc Windows: %ProgramFiles%\Oracle\Inventory |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Compliance

| Parameter Name | Default Value | Required | Description |
|-----------------------------------|---------------|----------|---|
| Email Addresses to Receive Report | no default | optional | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |

Note: This is the minimum set of parameters required to run this workflow. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Compliance Audit" on page 21](#) for detailed descriptions of all input parameters for this workflow, including default values.

- In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
- Save the changes to the workflow (click **Save** in the lower right corner).
- Create a new deployment.
- On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
- On the Targets tab, specify one or more targets for this deployment.
- Save the deployment (click **Save** in the lower right corner).
- Run the workflow using this deployment .

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Information about each compliance check is displayed in the step output on the Console (and the History page) for each of the auditing steps. A summary of the compliance audit is also displayed in the step output for the Validate Post-Compliance Checks step.

To view the reports:

A compliance audit summary in HTML format is emailed to all parties on the Email Addresses to Receive Report list.

After you run this workflow, you can generate two types of compliance reports on the Reports page:

- Database Compliance Report
- Database Compliance Detail Report

To access the Database Compliance reports:

1. Go to the Reports page.
2. At the bottom of the page, specify the following settings:

For the Database Compliance Report:

- a. Select the Database Compliance report.
- b. Select the organization where your target resides.
- c. Because this report lists the latest compliance audit reports for all targets in the specified organization, you do not specify a Server, Database, or Time span.

For the Database Compliance Detail Report:

- a. Select the Database Compliance Details report.
 - b. Select the organization where your target resides.
 - c. Specify the Server and Instance that you selected when you created your deployment.
3. Click **Run report**.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following compliance audit scenarios in your environment using the "Oracle - Compliance Audit v2" workflow.

Scenario 1: Perform a Partial CIS Compliance Audit and Email the Results show

In the scenario, the following checks are excluded from the audit:

- Section 8: Oracle Profile (User) Setup Settings
- Section 9: Oracle Profile (User) Access Settings

A summary report is sent to the three parties listed in the Email Addresses to Receive Report parameter.

| Parameter Name | Example Value | Description |
|----------------------------|---------------|--|
| Compliance Type | CIS | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Excluded Compliance Checks | 8.*,9.* | Comma-separated list of compliance checks to exclude from the audit. For example: 1.2, 2, 3.*, 5*, 6.1.2 |

| Parameter Name | Example Value | Description |
|----------------|---------------|---|
| | | <p>Note: Make sure that the checks specified here correspond with the compliance audit type (CIS, PCI, or SOX) that you are running.</p> |

Note: Some of these parameters are not exposed by default in the deployment.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see "[Parameters for Oracle - Compliance Audit](#)" on page 21).

Scenario 2: Perform a Full PCI Compliance Audit and Email the Results show

In the scenario, no checks are excluded from the audit. A summary report is sent to the three parties listed in the Email Addresses to Receive Report parameter.

| Parameter Name | Example Value | Description |
|-----------------------------------|--|---|
| Compliance Type | PCI | <p>Type of compliance report that will be generated by the workflow. Supported types are:</p> <p>CIS = Center for Internet Security (CIS) Security Configuration Benchmark</p> <p>PCI = Payment Card Industry (PCI) Data Security Standard</p> <p>SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements</p> |
| Email Addresses to Receive Report | DBAdminTeam@mycompany.com, DBAdminMgr@mycompany.com, CustomerSupportTeam@mycompany.com | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |

Note: Some of these parameters are not exposed by default in the deployment.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see "[Parameters for Oracle - Compliance Audit](#)" on page 21).

Scenario 3: Perform a Full SOX Compliance Audit and Email the Results show

In the scenario, no checks are excluded from the audit. A summary report is sent to the three parties listed in the Email Addresses to Receive Report parameter.

| Parameter Name | Example Value | Description |
|-----------------------------------|--|--|
| Compliance Type | SOX | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Email Addresses to Receive Report | DBAdminTeam@mycompany.com, DBAdminMgr@mycompany.com, CustomerSupportTeam@mycompany.com | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |

Note: Some of these parameters are not exposed by default in the deployment.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see "[Parameters for Oracle - Compliance Audit](#)" on page 21).

Scenario 4: Perform a Full CIS Compliance Audit and Display the Results on the HPE DMA Console show

In the scenario, all scorable checks are performed, and the compliance audit report is displayed only on the HPE DMA Console. In this case, a summary report is not emailed. This scenario would be appropriate for initial testing.

It is not necessary to specify any input parameters in this scenario unless the Oracle Databaseinventory file is located in a non-standard directory.

| Parameter Name | Example Value | Description |
|-----------------|---------------|--|
| Compliance Type | CIS | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |

Be sure that the default values for all remaining input parameters are appropriate for your environment (see ["Parameters for Oracle - Compliance Audit" on the next page](#)).

Parameters for Oracle - Compliance Audit

The following tables describe the required and optional input parameters for this workflow. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Parameters Defined in this Step: Gather Parameters for Oracle Compliance

| Parameter Name | Default Value | Required | Description |
|----------------------------|-----------------|----------|--|
| Compliance Type | CIS | optional | Type of compliance report that will be generated by the workflow. Supported types are: CIS = Center for Internet Security (CIS) Security Configuration Benchmark PCI = Payment Card Industry (PCI) Data Security Standard SOX = Sarbanes-Oxley (SOX) sections 302.2, 302.4b, 302.4c, and 302.5 requirements |
| Excluded Compliance Checks | no default | optional | Comma-separated list of compliance checks to exclude from the audit. For example: 1.2, 2, 3.*, 5*, 6.1.2 Note: Make sure that the checks specified here correspond with the compliance audit type (CIS, PCI, or SOX) that you are running. |
| Inventory Files | see description | optional | Comma-separated list of fully qualified Oracle inventory files. If this parameter is not specified, it defaults to one of the following values: |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Compliance

| Parameter Name | Default Value | Required | Description |
|-----------------------------------|---------------|----------|---|
| Email Addresses to Receive Report | no default | optional | Comma-separated list of email addresses for those individuals or groups who will receive a copy of the compliance audit report. |
| Latest Patch | no default | optional | Most recent Oracle patch installed on this Oracle Home. |

Patching Database

This solution pack contains the following workflows:

| Workflow Template | Description |
|---|---|
| Oracle - Patch Home and Databases | This workflow applies an Oracle Critical Patch Update or Security Patch Update (CPU/SPU), Patch Bundle, or Patch Set Update (PSU) to an Oracle Home and to the Oracle Database Instances associated with the Oracle Home. It also updates the OPatch version if the OPatch Archive file is specified. |
| Oracle - Rollback Patch from Home and Databases | This workflow rolls back a Critical Patch Update or Security Patch Update (CPU/SPU), Patch Bundle, or Patch Set Update (PSU) from an Oracle Home and from the Oracle Database Instances associated with the Oracle Home. |
| Apply Oracle Patchset | This workflow applies an Oracle Software Patch Set to an existing Oracle Home and Oracle Database. |
| Clone Oracle Home | This workflow makes a clone (copy) of an Oracle Home on the same server. |
| Migrate Oracle Home | This workflow moves an Oracle Instance from one Oracle Home to another Oracle Home. |

Each workflow included in this solution pack has a set of input parameters whose values will be unique to your environment. If you provide correct values for the parameters that each scenario requires, the workflow will be able to accomplish its objective.

There are two steps required to customize this solution:

1. Ensure that all required parameters are visible. You do this by using the workflow editor.

For simple patching scenarios, you can use the default values for most parameters. To use this solution's more advanced features, you will need to expose additional parameters.

2. Specify the values for those parameters. You do this when you create a deployment.

Tip: Detailed instructions are provided in the "How to Run this Workflow" topic for each workflow.

The information presented here assumes the following:

- HPE DMA is installed and operational.
- At least one suitable target server is available.
- You are logged in to the HPE DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

Tip: All parameters used by the workflows in this solution are provided in the "Parameters" topic associated with each workflow.

Oracle - Patch Home and Databases v3

This workflow applies an Oracle patch to an Oracle home and database. It also updates the OPatch version if the OPatch archive file is specified. This workflow only applies to single instance installations. It is not designed for Oracle Real Application Clusters (RAC).

This workflow applies the following patch types to Oracle home and database on different platforms as supported by Oracle.

- Critical Patch Update(CPU) / Security Patch Update (SPU)
- Patch Set Update (PSU)
- Interim Patch/One-off Patch
- Oracle JavaVM Component PSU (OJVM)
- Combo Patches (CPU+OJVM/ PSU+OJVM)
- Bundle Patch

This workflow stops all processes running from the ORACLE_HOME in order to patch. This includes the Listener, which may be servicing instances outside this ORACLE_HOME. If multiple patch types are provided as input, the patches will be applied in the following order:

1. CPU
2. PSU
3. OJVM
4. Interim

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 27 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 30 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Patch Home and Databases v3" on page 32 | List of input parameters for this workflow |

Tip: To patch HP Server Automation Grid standalone environments, see *Achieve Patch Related Compliance for Oracle Grid Standalone Environments Using HPE DMA*.

To patch more complex Oracle clustered environments, see *Achieve Patch Related Compliance for Oracle RAC Environments Using HPE DMA*.

These documents are available at: softwaresupport.hp.com

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run this workflow:

- The Oracle Home and database are ready to be updated.
- The HPE DMA server is online.
- You have obtained the following files:
 - The patch archive from Oracle
 - The current OPatch version from Oracle (optional)
- You have licenses for Oracle Database and HPE DMA.
- You have coordinated a scheduled outage for all application servers that use the databases.
- You have read access to all specified inventory pointers (Linux/UNIX).
- You have enough free space available, which varies depending on the Oracle patch.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Applies Oracle quarterly patches on Oracle standalone environments and standalone dataguard.

Steps Executed by the Workflow

The Oracle - Patch Home and Databases v3 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Patch Home and Databases v3

| Workflow Step | Description |
|---|--|
| Gather Parameters for Patch Home and Database | This step gathers parameters for the Oracle - Patch Home and Database workflow. |
| Gather Advanced Parameters for Patch Home and Database v2 | This steps gathers advanced parameters for the Oracle - Patch Home and Database workflow. |
| Parse Oracle Inventory | This step parses the Oracle inventory files that exists or forwards the inventory information does not exist. <div style="border-left: 2px solid black; padding-left: 10px; margin-left: 20px;">This step must be run as the DMA superuser.</div> |
| Validate Patch Home and Database v2 | This step validates the parameters specified in Oracle – Patch Home and Database v3 workflow. |
| Oracle - Upgrade OPatch Utility | This step takes backup of the existing OPatch utility and updates the OPatch utility to the version provided as input. |
| Download Software v2 | This step automates the transfer of files from the HPE SA Software Library to individual managed servers for use in downstream workflow steps. This step also verifies checksum of each file transferred. |
| Cleanup Downloaded Files v2 | This step remove all downloaded files and archives. |
| Oracle - Unzip Patch Archives for Patch Oracle Home and Databases | This step unzips (extracts) the patch archives to the given folder. |
| Oracle - Parse Patch Information | This step parses the patch archive and extracts the following information: <ul style="list-style-type: none"> • OPatch Version required to apply the patch • Additional Patch Numbers |

Steps Used by Oracle - Patch Home and Databases v3, continued

| Workflow Step | Description |
|--|---|
| | <ul style="list-style-type: none"> • Database version on which the patch is applicable • Ignorable Oracle errors • Patch Type : SPU(or CPU), PSU, Combo, One-off, OJVM, Bundle • Patch Name |
| Oracle - Post Patch Unzip Validation | This step validates whether patch that is being applied is already present on the given Oracle home. |
| Run slibclean | This step runs the slibclean command on required operating systems. |
| Verify Oracle Versions | This step validates if the database version is same as the database version of the patch being applied. It also validates, if the OPatch utility is higher than the OPatch utility version recommended by Oracle. |
| Data Guard Prechecks | This step cancels Managed Recovery Process on the standby database. |
| Oracle - Stop Processes Standalone Target | This step stops all Oracle instances in a list, stops all Oracle listeners in the list, and attempts to stop the Oracle agent. |
| Cleanup Downloaded Files v2 | This step removes all downloaded files and archives. |
| Oracle - Patch Standalone Target Homes | This step patches Oracle home directory using OPatch utility. |
| Oracle - Start Processes Standalone Target | This step starts all Oracle instances in a list, starts all Oracle listeners in the a list, and attempts to start Oracle agent. |
| Data Guard Postchecks | This step performs Managed Recovery Process (MRP) on the standby database. |
| Oracle - Patch Standalone Databases | This step applies patches for standalone databases. |
| Cleanup Downloaded Files v2 | This step removes all downloaded files and archives. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases.</p> <p>Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is the end-user's responsibility to delete content that is no longer in use.</p> |

Steps Used by Oracle - Patch Home and Databases v3, continued

| Workflow Step | Description |
|---------------|---|
| | In cluster situations where one node is active while other nodes are inactive, discovery will only find instances and databases on the active node. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Patch Home and Databases v3](#)" on page 32.

How to Run this Workflow

The following instructions show you how to customize and run the Oracle – Patch Home and Database v3 workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Patch Home and Databases v3" on page 32](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 26](#), and ensure that all requirements are satisfied.

To use the Run Oracle – Patch Home and Database v3 workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Patch Home and Databases v3" on page 32](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Patch Home and Databases v3

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Patch Home and Database

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Oracle Home | no default | required | Absolute path of the Oracle home directory that is to be patched. Example: /u01/app/oracle/product/12.1.0/dbhome_1 |
| Patch Archive | no default | required | Comma separated list of patch archives that needs to be applied on the Oracle home. Example: p22502456_112040_Linux-x86-64.zip, p14666816_112040_Linux-x86-64.zip |

Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Home and Database

| Parameter Name | Default Value | Required | Description |
|---------------------------------|---------------|----------|--|
| Cleanup Downloaded Files | True | required | Value to represent whether the patch archive and extracted patch archive needs to be deleted after completion of the workflow. Valid values are True or False. Default is True. |
| Existing OPatch Backup Location | no default | required | Location to take backup of the existing OPatch directory. The backup of OPatch directory is taken only when the Patch Archive input parameter is specified. If no input is provided, the Oracle home directory is used for backup location. Oracle user must have write access to the directory specified. |
| Ignorable Oracle Errors | no default | optional | A comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme document. Values are of the form ORA-nnnnn. |
| Ignore SIDs | no default | optional | Comma separated SIDs to be ignored when applying the database patch. |
| Inventory Files | no default | optional | A comma-separated list of fully-qualified Oracle inventory files. If this parameter is not specified, the workflow looks for the oralnst.loc file in /etc and /var/opt/oracle folder. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Home and Database, continued

| Parameter Name | Default Value | Required | Description |
|---------------------------|---------------|----------|--|
| OCM Response File | no default | optional | The path name of the Oracle Configuration Manager (OCM) response file. If not found on the target, this file is downloaded from the software directory on the HPE SA. If left blank, a default response file will be created. |
| OPatch Archive | no default | optional | OPatch Archive to be applied on oracle home. Example: p6880880_112000_Linux-x86-64.zip. |
| OPatch Version | no default | optional | Version of the OPatch to be used for patching. This parameter has to be specified when OPatch version lower than the one specified in readme document of the Patch archive is to be used for patching. |
| Patch Download Location | /tmp | optional | Location where the patch archive has to be downloaded. |
| Patch Extraction Location | no default | optional | Location where the Patch archive will be extracted. |
| Preparatory SQL Script | no default | optional | File name containing SQL statements that must be run before the database catalog update. This file is passed directly to SQLPlus and must be formatted as such. If not found on the target, this file is downloaded from HPE SA. |
| Recompile Invalid Objects | False | optional | Value to represent whether the utlrp.sql needs to be executed to recompile the invalid Java objects. Valid values are True or False. Default value is False. |

Oracle - Rollback Patch from Home and Databases

v2

This workflow rolls back a Critical Patch Update or Security Patch Update (CPU/SPU), Patch Bundle, or Patch Set Update (PSU) from an Oracle Home and from the Oracle Database instances associated with the Oracle Home.

Use this workflow if you encounter problems after applying a patch update. Only the last patch that was applied is rolled back.

For additional information about how the Oracle - Rollback Patch from Home and Databases workflow can be used with other patching workflows see [How to Use the Workflows Together](#) topic.

This workflow only applies to single Oracle Instance installations. It is not designed for Oracle Real Application Clusters (RAC).

If the Oracle patch has already been removed, this workflow will verify the patch removal and end with SUCCESS status.

Caution: This workflow stops all processes running from the ORACLE_HOME in order to patch. This includes the Oracle Listener, which may be servicing Oracle Instances outside this ORACLE_HOME.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenario" | Examples of typical parameter values for this workflow |
| Parameters | List of input parameters for this workflow |

Note: The documentation for this workflow contains steps that are referred to by their base names. The names in the HPE DMA user interface may have a version appended, for example, v2.

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Rollback Patch from Home and Databases v2"](#) workflow:

- The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA 10.30 solution packs are supported on HPE DMA 10.30 (and later).
- You have installed the HPE DMA Database Patching Solution Pack.
- You have read access to all specified inventory pointers (Linux/UNIX).

Caution: This workflow stops all processes running from the ORACLE_HOME in order to rollback the patch. This includes the Oracle Listener, which may be servicing Oracle Instances outside this ORACLE_HOME.

For more information about prerequisites for Oracle Database, refer to the [Oracle Product Documentation](#).

How this Workflow Works

The following information describes how the "Oracle - Rollback Patch from Home and Databases v2" workflow works:

Overview show

This workflow does the following things in the order shown:

- The initial steps of the workflow prepare it to roll back the last patch applied to the Oracle Home. The workflow processes user input parameters, constructs commands used in subsequent steps, and downloads any required files.
- The workflow rolls back the Critical Patch Update from the Oracle Database Home. The workflow stops all Oracle Instances, all Oracle Listeners in the list, and the Oracle Agent. The workflow removes any currently unused modules in kernel and library memory. Then the workflow runs the OPatch utility to roll back an Oracle supplied Patch and runs the Oracle provided `cpu_root.sh` script to complete the rollback.
- The final steps of the workflow allow the workflow to end cleanly. The workflow restarts all the Oracle Instances, all Oracle Listeners, and the Oracle Agent. Then it runs Discovery to update the metadata and cleans up the downloaded files.

Validation Checks Performed show

Much of the validation centers on the input parameters:

- The input parameters have the proper syntax (no special characters or spaces).
- Files exist or have valid specifications.
- The supplied patch update applies to the current Oracle Database version.

Steps Executed show

The Oracle - Rollback Patch from Home and Databases workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used in Oracle - Rollback Patch from Home and Databases v2

| Workflow Step | Description |
|--|---|
| Gather Parameters for Rollback Patch from Home and Databases v2 | This step gathers the required parameters for the Oracle - Rollback Patch from Home and Databases workflow. |
| Gather Advanced Parameters for Rollback Patch from Home and Databases v2 | This step gathers the optional advanced parameters for the Oracle - Rollback Patch from Home and Databases workflow. |
| Parse Oracle Inventory | <p>This step parses the specified Oracle inventory files (if they exist) and passes the inventory information to subsequent steps.</p> <ul style="list-style-type: none"> • If one or more Inventory Files are specified and they exist, the step parses these files and extracts their contents. • If no Inventory Files are specified, the step assigns the appropriate default and attempts to parse that file. • If one or more Inventory Files are specified and they do not exist, the step creates inventory information based on the specified Oracle Account and Oracle Home. |
| Validate Rollback Patch from Home and Databases v2 | This step validates the specified values of the input parameters for the "Oracle - Rollback Patch from Home and Databases v2" workflow. |
| Download Software | This step downloads a list of files to a specified location on the target server. |
| Unzip for Rollback Patch Home and Databases | This step unzips the patch archive at the given location. |
| Oracle - Parse Patch Information | <p>This step parses the patch archive and extract the following information:</p> <ul style="list-style-type: none"> • OPatch version required to apply the patch • Additional patch numbers • Database version on which the patch is applicable • Ignorable Oracle errors • Patch Type : SPU (or CPU), PSU, Combo, One-off, OJVM, Bundle |

Steps Used in Oracle - Rollback Patch from Home and Databases v2, continued

| Workflow Step | Description |
|---|--|
| | <ul style="list-style-type: none"> • Patch name |
| Cleanup Downloaded Files v2 | This step removes all downloaded files and archives. |
| Run slibclean | This step runs the <code>slibclean</code> command on required targets. The <code>slibclean</code> utility removes any currently unused modules in kernel and library memory. |
| Rollback Patch Home and Databases v2 | This step rolls back the patch from the Oracle home and databases. If any preparatory SQL script is provided as input, then the same will be executed on each instance prior to rollback of the database patch. If <code>recompile invalid object parameter</code> is specified as true, then the <code>utlrp.sql</code> script will be executed after the database patch is rolled back. |
| Verify Home and Databases Patch Rolledback v2 | This step validates if the patch has been rolled back. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases.</p> <p>Note: Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is the end-user's responsibility to delete content that is no longer in use.</p> <p>In cluster situations where one node is active while other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |
| Cleanup Downloaded Files v2 | This step removes all downloaded files and archives. |

For parameter descriptions and defaults, see ["Parameters for Oracle - Rollback Patch from Home and Databases" on page 44](#).

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Rollback Patch from Home and Databases v2"](#) workflow in your environment.

Tip: For detailed instructions to run HPE DMA workflows—using the Oracle - Compliance Audit workflow as an example—see HPE DMA Quick Start Tutorial.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Rollback Patch from Home and Databases"](#) on page 44.

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#) on page 35, and ensure that all requirements are satisfied.

To use the Oracle - Rollback Patch from Home and Databases workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters for Gather Parameters for Rollback Patch from Home and Databases

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Oracle Home | no default | required | Fully-qualified path name of the Oracle Home where the patch will be rolled back. |
| Oracle OS User | oracle | required | The OS user that owns the specified Oracle Home. |
| Patch Archive | no default | required | Name of the patch archive file. If the file does not exist on the target it will be downloaded from the software repository. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Home and Databases v2

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Cleanup | True | optional | Flag that determines whether any downloaded and extracted files will be cleaned up. Valid values are True and False. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Home and Databases v2, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------|---------------|----------|--|
| Download Location | /tmp | optional | The directory on the target server where files are copied from the software repository—used only if the required files are not found on the target but are found in the software repository. |
| Extract Location | /tmp | optional | Location where the archive files will be extracted. |
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch README. Values are of the form ORA-nnnnn. For example: ORA-04020,ORA-03113 |
| OCM Response File | no default | optional | Path name of the Oracle Configuration Manager (OCM) response file. If not found on the target, this file is downloaded from the software repository. If left blank, a default response file will be created. |
| Oracle SIDs | ALL | optional | Oracle Instances (SIDs) that will be rolled back. Valid values are ALL, INCLUDE: followed by a comma-separated list of SIDs to be rolled back with the Oracle Home, and EXCLUDE: followed by a comma-separated list of Oracle SIDs to exclude from the rollback process. |
| Preparatory SQL Script | no default | optional | File name containing SQL statements that must be run before the database catalog update. This file is passed directly to SQLPlus and must be formatted as such. If it is not found on the target server, this file is downloaded from the software repository. |
| Rollback Current CPU Only | False | optional | Flag to specify only the molecule patches that are new to this CPU to be rolled back. Default value is False. This parameter is applicable only for CPU patch and Oracle 11g versions. |
| Run Database View Recompile | N | optional | Flag to indicate if the Database View Recompile step will be run. |

Note: See "[Parameters for Oracle - Rollback Patch from Home and Databases](#)" on page 44 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment. You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.

Note: The targets need to be the same targets (servers) you used when you ran the Oracle - Patch Home and Database workflow.

8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: If you want to further verify that the patch was successfully removed from the Oracle Home:

1. Go to `$ORACLE_HOME/OPatch/opatch lsinventory -oh $ORACLE_HOME`
2. Check that the patch you rolled back is NOT on the list of patches.

Optional: If you want to further verify that the patch was successfully removed from the Oracle Database Instances associated with the Oracle Home:

1. Log in as an SQLPlus privileged user.
2. Set the ORACLE_HOME to your Oracle Home.
3. Run the command: **`$ORACLE_HOME/OPatch/opatch lsinventory`**
4. Verify that the patch number that you rolled back is NOT listed in the output.

Sample Scenario

It is very straightforward to run the "Oracle - Rollback Patch from Home and Databases v2" workflow. This topic shows you typical parameter values to use.

Input Parameters for Gather Parameters for Rollback Patch from Home and Databases v2

| Parameter Name | Example Value | Description |
|----------------|---|--|
| Oracle Home | /u01/app/ oracle/product/ 11.2.0/db1 | Fully-qualified path name of the Oracle Home where the patch will be rolled back. |
| Oracle OS User | oracle | The OS user that owns the specified Oracle Home. |
| Patch Archive | p16902043_ 112030_ Linux-x86- 64.zip | Name of the patch archive file. If the file does not exist on the target it will be downloaded from the software repository. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Home and Databases v2

| Parameter Name | Example Value | Description |
|-------------------------|-----------------------------|--|
| Cleanup | True | Flag that determines whether any downloaded and extracted files will be cleaned up. Valid values are True and False. |
| Download Location | /tmp | The directory on the target server where files are copied from the software repository—used only if the required files are not found on the target but are found in the software repository. |
| Extract Location | /tmp | Location where the archive files will be extracted. |
| Ignorable Oracle Errors | ORA- 04020,ORA- 03113 | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch README. Values are of the form ORA-nnnnn. |
| OCM Response File | no default | Path name of the Oracle Configuration Manager (OCM) response file. If not found on the target, this file is downloaded from the software repository. If left blank, a default response file will be created. |
| Oracle SIDs | ALL | Oracle Instances (SIDs) that will be rolled back. Valid values are ALL, INCLUDE: followed by a comma-separated list of SIDs to be rolled back with the Oracle Home, and EXCLUDE: followed by a comma- |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Home and Databases v2, continued

| Parameter Name | Example Value | Description |
|-----------------------------|---------------|--|
| | | separated list of Oracle SIDS to exclude from the rollback process. |
| Preparatory SQL Script | | File name containing SQL statements that must be run before the database catalog update. This file is passed directly to SQLPlus and must be formatted as such. If it is not found on the target server, this file is downloaded from the software repository. |
| Rollback Current CPU Only | False | Flag to specify only the molecule patches that are new to this CPU to be rolled back. Default value is False. This parameter is applicable only for CPU patch and Oracle 11g versions. |
| Run Database View Recompile | N | Flag to indicate if the Database View Recompile step will be run. |

Parameters for Oracle - Rollback Patch from Home and Databases

The following tables describe the required and optional input parameters for this workflow. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Input Parameters Defined in this Step: Gather Parameters for Rollback Patch from Home and Databases v2

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Oracle Home | no default | required | Fully-qualified path name of the Oracle Home where the patch will be rolled back. |
| Oracle OS User | oracle | required | The OS user that owns the specified Oracle Home. |
| Patch Archive | no default | required | Name of the patch archive file. If the file does not exist on the target it will be downloaded from the software repository. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Home and Databases v2

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|--|
| Cleanup | True | optional | Flag that determines whether any downloaded and extracted files will be cleaned up. Valid values are True and False. |
| Download Location | /tmp | optional | The directory on the target server where files are copied from the software repository—used only if the required files are not found on the target but are found in the software repository. |
| Extract Location | /tmp | optional | Location where the archive files will be extracted. |
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch README. Values are of the form ORA-nnnnn. For example: ORA-04020,ORA-03113 |
| OCM Response File | no default | optional | Path name of the Oracle Configuration Manager (OCM) response file. If not found on the target, this file is downloaded from the software repository. If left blank, a |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Home and Databases v2, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------|---------------|----------|--|
| | | | default response file will be created. |
| Oracle SIDs | ALL | optional | Oracle Instances (SIDs) that will be rolled back. Valid values are ALL, INCLUDE: followed by a comma-separated list of SIDs to be rolled back with the Oracle Home, and EXCLUDE: followed by a comma-separated list of Oracle SIDs to exclude from the rollback process. |
| Preparatory SQL Script | no default | optional | File name containing SQL statements that must be run before the database catalog update. This file is passed directly to SQLPlus and must be formatted as such. If it is not found on the target server, this file is downloaded from the software repository. |
| Rollback Current CPU Only | False | optional | Flag to specify only the molecule patches that are new to this CPU to be rolled back. Default value is False. This parameter is applicable only for CPU patch and Oracle 11g versions. |
| Run Database View Recompile | N | optional | Flag to indicate if the Database View Recompile step will be run. |

Apply Oracle Patchset

This workflow applies an Oracle Software Patch Set to an existing Oracle Home and Oracle Database.

Before you can run the Apply Oracle Patchset workflow you must provide the Oracle Software Patch Set in one of the following forms:

- A software archive (ZIP or `cpio.gz` file) that exists on the software repository or the target machine
- Unarchived files on a CD, DVD, NFS mount, or similar device

For additional information about how the Apply Oracle Patchset workflow can be used with other provisioning and patching workflows see [How to Use the Workflows Together](#) topic.

Note the following:

- The Database Upgrade Assistant (DBUA) utility is not available in Oracle Database version 9.2.0 (and earlier).
- The workflow does not upgrade the following items:
 - Oracle Label Security
 - Oracle Data Vault
 - Oracle ASM
- The workflow does not run the `changePerm.sh` command.
- The workflow does not configure Oracle Configuration Manager (OCM) for a cloned home.
- The workflow does not update Database time zone definitions.

Caution: This workflow stops all processes running from the `ORACLE_HOME` in order to patch. This includes the Oracle Listener, which may be servicing Oracle Instances outside this `ORACLE_HOME`.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenario" | Examples of typical parameter values for this workflow |
| Parameters | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Apply Oracle Patchset"](#) workflow:

- The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA 10.30 solution packs are supported on HPE DMA 10.30 (and later).
- You have installed the HPE DMA Database Patching Solution Pack.
- You need to have Oracle Database provisioned and operational. You can do this by running workflows found in the HPE DMA Database Provisioning Solution Pack:
 - Oracle – Provision Database Software
 - Oracle – Provision Database
- You have an Oracle support contract and have downloaded the appropriate patches to software repository or to the target machine.
- You have read access to all specified inventory pointers (Linux/UNIX).

For more information about prerequisites for Oracle Database, refer to the [Oracle Product Documentation](#).

How this Workflow Works

The following information describes how the "Apply Oracle Patchset" workflow works:

Overview show

This workflow does the following things in the order shown:

- The initial steps of the workflow prepare it to apply the Oracle Patch Set to the Oracle Home and Oracle Database. The workflow processes user input parameters, constructs commands used in subsequent steps, downloads any required files, uncompresses the archive files, and fetches the Oracle binaries and Instances.
- The workflow applies the Patch Set to the Oracle Home. The workflow updates the Oracle installer response file. Then it stops all processes using the Oracle Home. It runs platform-dependent steps. Then the workflow executes the Oracle Software Installer and completes the installation.
- The workflow configures the Oracle Database.
- The final steps of the workflow allow the workflow to end cleanly. The workflow stops and restarts all the Oracle processes. Then it cleans up the downloaded files.

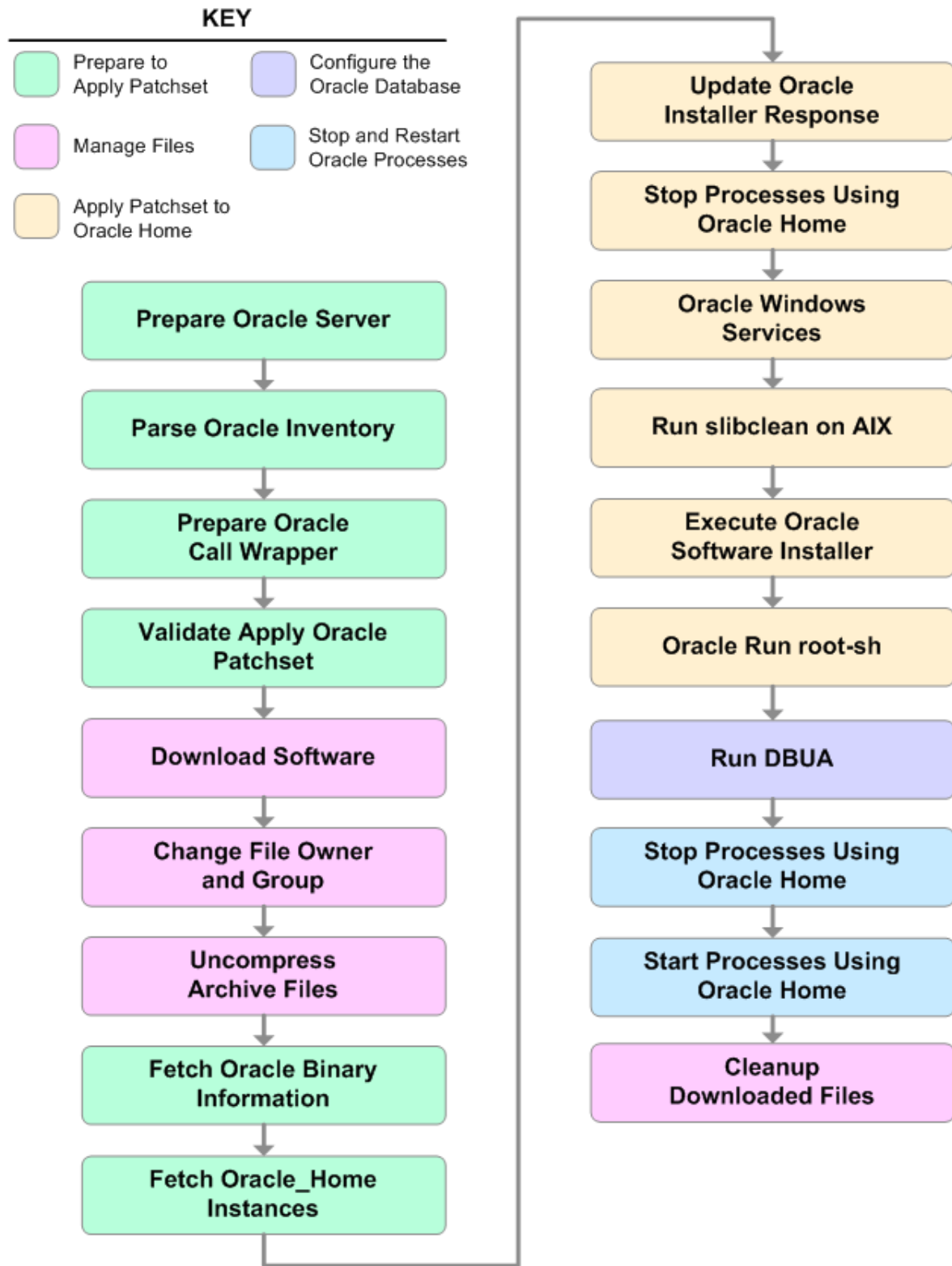
Validation Checks Performed show

Much of the validation centers on the input parameters:

- The input parameters have the proper syntax (no special characters or spaces).
- Files exist or have valid specifications.

Steps Executed show

The Apply Oracle Patchset workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Workflow Steps show

Steps Used in Apply Oracle Patchset

| Workflow Step | Description |
|---------------------------------|---|
| Prepare Oracle Server | This step prepares the target server for access by the OS administrative user. |
| Parse Oracle Inventory | <p>This step parses the specified Oracle inventory files (if they exist) and passes the inventory information to subsequent steps.</p> <ul style="list-style-type: none"> • If one or more Inventory Files are specified and they exist, the step parses these files and extracts their contents. • If no Inventory Files are specified, the step assigns the appropriate default and attempts to parse that file. • If one or more Inventory Files are specified and they do not exist, the step creates inventory information based on the specified Oracle Account and Oracle Home. |
| Prepare Oracle Call Wrapper | <p>This step constructs the commands needed to execute subsequent steps in the workflow as either the OS administrative user or the user who owns the pertinent ORACLE_HOME.</p> <p>The step also creates utility parameters that will be used by subsequent steps.</p> |
| Validate Apply Oracle Patchset | This step validates the values specified for the input parameters used by the "Apply Oracle Patchset" workflow. It also sets the values of various output parameters that will be consumed by subsequent steps. |
| Download Software | This step downloads a list of files to a specified location on the target server. |
| Change File Owner and Group | This step changes the ownership and group of each file specified. A warning is issued for files that are not found. |
| Uncompress Archive Files | For each supplied file, this step extracts the contents of the archive file (or files). |
| Fetch Oracle Binary Information | <p>This step fetches the fully qualified pathnames of the following files from the staging location in an Oracle software archive (either a Patch Set or the install software):</p> <pre>runInstaller products.xml rootpre.sh *.rsp.</pre> |

Steps Used in Apply Oracle Patchset, continued

| Workflow Step | Description |
|-----------------------------------|---|
| Fetch Oracle_ Home Instances | This step fetches the list of Oracle Instances that share the specified ORACLE_HOME. |
| Update Oracle Installer Response | This step updates the provided installer response file or, if one is not provided, creates an installer response file based on a default response file provided by Oracle. This step is designed to be run by the owner of the ORACLE_HOME. |
| Stop Processes Using Oracle Home | This step stops all Oracle Instances included in the Oracle SIDs list—excluding any specified in the Ignore SIDs list. The step attempts to stop the Oracle Agent. |
| Oracle Windows Services | This step preserves the list of Windows Services. This is necessary because the same step can be used more than once in a workflow. |
| Run slibclean on AIX | This step runs the <code>slibclean</code> command, if appropriate, on AIX targets. |
| Execute Oracle Software Installer | This step installs the Oracle software as defined by the response file. It is designed to be run as the Oracle software owner (typically <code>oracle</code>). |
| Oracle Run root-sh | This step runs the Oracle provided <code>root.sh</code> script in silent mode. It must be run as <code>root</code> . |
| Run DBUA | This step runs the Oracle Database Upgrade Assistant (DBUA) with the specified response file. It must be run as the Oracle software owner (typically <code>oracle</code>). |
| Stop Processes Using Oracle Home | This step stops all Oracle Instances included in the Oracle SIDs list—excluding any specified in the Ignore SIDs list. The step attempts to stop the Oracle Agent. |
| Start Processes Using Oracle Home | This step starts all Oracle Instances and Oracle Listeners in the Oracle SIDs list. It also attempts to start the Oracle Agent. |

Steps Used in Apply Oracle Patchset, continued

| Workflow Step | Description |
|--------------------------|--|
| Cleanup Downloaded Files | This step removes all downloaded files and archives. |

For parameter descriptions and defaults, see ["Parameters for Apply Oracle Patchset" on page 62](#).

How to Run this Workflow

The following instructions show you how to customize and run the ["Apply Oracle Patchset"](#) workflow in your environment.

Tip: For detailed instructions to run HPE DMA workflows—using the Oracle - Compliance Audit workflow as an example—see [HPE DMA Quick Start Tutorial](#).

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Apply Oracle Patchset" on page 62](#)

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 48](#), and ensure that all requirements are satisfied.

To run this workflow, you need to set your parameters differently depending on the location and status of your Oracle Patch Set. Use the following table to choose the method that matches your situation.

For information about uploading files to the HPE DMA software repository, see [How to Import a File into the Software Repository on page 97](#).

To specify the Oracle Software Patch Set, choose one of the following methods:

Method 1: The Oracle ZIP file is in the software repository:

Note: The ZIP file must be downloaded from Oracle. Example: p6890831_111070_Linux-x86.zip.

1. In the Patchset Archive parameter, specify the name (or names) of the ZIP file (or files) that was downloaded from Oracle.
2. In the Download Location parameter, specify the directory where the ZIP file (or files) specified in the Patchset Archive parameter should be downloaded.
3. In the Software Archive Location parameter, specify the directory where the ZIP file (or files) specified in the Patchset Archive parameter should be extracted (unzipped).

All downloaded files are removed upon successful completion of the workflow.

Method 2: The Oracle ZIP file is stored on each target machine:

Note: The ZIP file must be downloaded from Oracle. Example: p6890831_111070_Linux-x86.zip.

1. In the Patchset Archive parameter, specify the fully qualified name (or names) of the ZIP file (or files) that was downloaded from Oracle.
2. You must specify a value for the Download Location parameter if the Install Response needs to be downloaded; otherwise, do not specify a value for Download Location.

All downloaded files are removed upon successful completion of the workflow.

To use the Apply Oracle Patchset workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters for Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |
| Oracle Home | no default | optional | Fully-qualified path name of the Oracle Home where the patch will be applied. |

Input Parameters for Validate Apply Oracle Patchset

| Parameter Name | Default Value | Required | Description |
|-------------------|-----------------|----------|--|
| Download Location | /var/tmp | optional | The directory on the target server where files are copied from the software repository—used only if the required files are not found on the target but are found in the software repository. |
| Oracle Base | /u01/app/oracle | required | The location of the base directory for an Optimal Flexible Architecture (OFA) installation. This is typically called the ORACLE_BASE. |
| Patchset Archive | see description | required | Comma-separated list of relative or fully-qualified path names of the Oracle Patch Set archive files. If a fully-qualified path name points to a file, that file is expected to be on the target. If a relative path name points to a file, that file will be downloaded from the software directory on the HPE DMA server. If a fully-qualified path name is a directory, the software is expected to be unzipped and ready to be applied. The default for UNIX targets is: /tmp/p5337014_10203_SOLARIS64.zip |
| Skip root-sh | N | optional | Skip running the rootpre.sh and root.sh scripts. Valid values are Y (yes) and N (no). Set to Y if an existing newer ORACLE_HOME is |

Input Parameters for Validate Apply Oracle Patchset, continued

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|--|
| | | | installed. |
| Software Archive | /var/tmp | optional | Directory location where the patch archives will be extracted. |

Input Parameters for Update Oracle Installer Response

| Parameter Name | Default Value | Required | Description |
|-----------------|---------------|----------|---|
| Install Edition | EE | optional | The product edition of the Oracle Database installation. Can be one of the following: SE (standard edition) or EE (enterprise edition). |

Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow (see [How to Use a Policy to Specify Parameter Values](#) on page 60).

Note: See ["Parameters for Apply Oracle Patchset" on page 62](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: If you want to further verify the results:

1. Log in to Oracle on the server where you deployed the Patch Set.
2. Check that the version that is running is the same as the deployed Patch Set, for example:

Oracle Database 11g 11.2.0.4.0

Sample Scenario

It is very straightforward to run the "Apply Oracle Patchset" workflow. This topic shows you typical parameter values to use.

Input Parameters for Parse Oracle Inventory

| Parameter Name | Example Value | Description |
|-----------------|--|--|
| Inventory Files | /etc/ oraInst.loc | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |
| Oracle Home | /u01/app/ oracle/product/ 11.2.0/db1 | Fully-qualified path name of the Oracle Home where the patch will be applied. |

Input Parameters for Validate Apply Oracle Patchset

| Parameter Name | Example Value | Description |
|-------------------|--|--|
| Download Location | /var/tmp | The directory on the target server where files are copied from the software repository—used only if the required files are not found on the target but are found in the software repository. |
| Oracle Base | /u01/app/ oracle | The location of the base directory for an Optimal Flexible Architecture (OFA) installation. This is typically called the ORACLE_BASE. |
| Patchset Archive | p5337014_ 10203_ SOLARIS64 .zip | Comma-separated list of relative or fully-qualified path names of the Oracle Patch Set archive files. If a fully-qualified path name points to a file, that file is expected to be on the target. If a relative path name points to a file, that file will be downloaded from the software directory on the HPE DMA server. If a fully-qualified path name is a directory, the software is expected to be unzipped and ready to be applied. The default for UNIX targets is: /tmp/p5337014_10203_SOLARIS64.zip |
| Skip root-sh | N | Skip running the rootpre.sh and root.sh scripts. Valid values are Y (yes) and N (no). Set to Y if an existing newer ORACLE_HOME is installed. |
| Software Archive | /tmp/ software | Directory location where the patch archives will be extracted. |

Input Parameters for Update Oracle Installer Response

| Parameter Name | Example Value | Description |
|-----------------------|----------------------|---|
| Install Edition | EE | The product edition of the Oracle Database installation. Can be one of the following: SE (standard edition) or EE (enterprise edition). |

Parameters for Apply Oracle Patchset

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment (see [How to Expose Additional Workflow Parameters](#) on page 93). For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Parameters Defined in this Step: Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: <code>/var/opt/oracle/oraInst.loc</code> Linux: <code>/etc/oraInst.loc</code> |
| Oracle Account | no default | optional | Oracle user who owns the ORACLE_HOME. Required if inventory does not exist. |
| Oracle Home | no default | optional | Fully-qualified path name of the Oracle Home where the patch will be applied. |
| Server Wrapper | see description | required | Command that will execute a step as the OS administrative user. The default for UNIX targets is: <code>sudo su - root /opt/hp/dma/client/jython.sh</code> Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |

Additional Parameters Defined in this Step: Validate Apply Oracle Patchset

| Parameter Name | Default Value | Required | Description |
|-------------------|-----------------------|----------|--|
| Download Location | <code>/var/tmp</code> | optional | The directory on the target server where files are copied from the software repository—used only if the required files are not found on the target but are found in the software repository. |
| Ignore SIDs | no default | optional | Comma-separated list of Oracle Instances (SIDs) that should not be patched. |
| Install | no default | optional | Location of the Oracle Universal Installer response |

Additional Parameters Defined in this Step: Validate Apply Oracle Patchset, continued

| Parameter Name | Default Value | Required | Description |
|--------------------|-----------------|----------|---|
| Response | | | file. |
| Instance Wrapper | no default | required | <p>Command that will be used to execute subsequent steps as the user who owns the ORACLE_HOME. For example:</p> <pre>su - oracle /opt/hp/dma/client/jython.sh</pre> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| Inventory Pointers | no default | optional | <p>Comma separated list of fully qualified inventory pathname directories.</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| Oracle Base | /u01/app/oracle | required | The location of the base directory for an Optimal Flexible Architecture (OFA) installation. This is typically called the ORACLE_BASE. |
| Oracle Home Info | no default | optional | <p>Dictionary list of all information discovered in the specified inventory file(s).</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| Patchset Archive | see description | required | <p>Comma-separated list of relative or fully-qualified path names of the Oracle Patch Set archive files.</p> <p>If a fully-qualified path name points to a file, that file is expected to be on the target. If a relative path name points to a file, that file will be downloaded from the software directory on the HPE DMA server. If a fully-qualified path name is a directory, the software is expected to be unzipped and ready to be applied.</p> <p>The default for UNIX targets is: /tmp/p5337014_10203_SOLARIS64.zip</p> |
| Skip root-sh | N | optional | Skip running the rootpre.sh and root.sh scripts. Valid values are Y (yes) and N (no). Set to Y if an existing newer ORACLE_HOME is installed. |
| Software | /var/tmp | optional | Directory location where the patch archives will be |

Additional Parameters Defined in this Step: Validate Apply Oracle Patchset, continued

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|-------------|
| Archive | | | extracted. |

Additional Parameters Defined in this Step: Update Oracle Installer Response

| Parameter Name | Default Value | Required | Description |
|-----------------------|-----------------|----------|---|
| CRS Nodes | no default | optional | List of all nodes where Oracle Clusterware is deployed. Caution: This parameter should only be specified for RAC and Cluster Ready systems. |
| DBA Group | no default | optional | The DBA group to use for superuser access to the subsequent Oracle Database. |
| Install Edition | EE | optional | The product edition of the Oracle Database installation. Can be one of the following: SE (standard edition) or EE (enterprise edition). |
| Operator Group | no default | optional | The operator group to use for operator access to the subsequent Oracle Database. |
| Oracle Group | no default | optional | The Oracle software installation group. Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |
| Oracle Home Name | no default | optional | The name of the ORACLE_HOME as recorded in the inventory. Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |
| Oracle Products File | see description | optional | The fully qualified path name of the products.xml file. Default is: /tmp/Disk1/stage/products.xml Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |
| Oracle Response Files | see description | optional | A comma-separated list of default response files. Default is: /tmp/Disk1/response/standard.rsp Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its |

Additional Parameters Defined in this Step: Update Oracle Installer Response, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|-----------------|----------|--|
| | | | mapping or its value. |
| Oracle runInstaller | see description | optional | <p>The fully qualified path name of the Oracle installer executable.</p> <p>Default is: /tmp/Disk1/runInstaller</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| RAC One Node Install | false | optional | <p>The <code>oracle.install.db.isRACOneInstall</code> option. If set to true, the installer will install Oracle RAC One Node software.</p> <p>Caution: This parameter should only be specified for RAC and Cluster Ready systems.</p> |
| Temporary File Location | no default | optional | <p>The location where all temporary output files will be placed. This directory will be removed at the completion of the workflow.</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |

Clone Oracle Home

This workflow makes a clone (copy) of an Oracle Home on the same server.

This workflow uses the tar facility to copy the Oracle Home. The new copy of the Oracle Home is then registered in the inventory using the Oracle Installer (`runInstaller`).

For additional information about how the Clone Oracle Home workflow can be used with other provisioning and patching workflows see [How to Use the Workflows Together](#) topic.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenario" | Examples of typical parameter values for this workflow |
| Parameters | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the "[Clone Oracle Home](#)" workflow:

- The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA10.50 solution packs are supported on HPE DMA10.50 (and later).
- You have installed the HPE DMA Database Patching Solution Pack .
- You need to have Oracle Database provisioned and operational. You can do this by running workflows found in the HPE DMA Database Provisioning Solution Pack:

Oracle – Provision Database Software

Oracle – Provision Database

- You have an Oracle support contract and have downloaded the appropriate patches to the software repository or to the target machine.
- You have read access to all specified inventory pointers (Linux/UNIX).

For more information about prerequisites for Oracle Database, refer to the [Oracle Product Documentation](#).

How this Workflow Works

The following information describes how the "Clone Oracle Home" workflow works:

Overview show

This workflow does the following things in the order shown:

- The initial steps of the workflow prepare it to clone the Oracle Home. The workflow processes user input parameters, and constructs commands used in subsequent steps.
- The workflow creates a clone (copy) of one or more specified Oracle Homes.

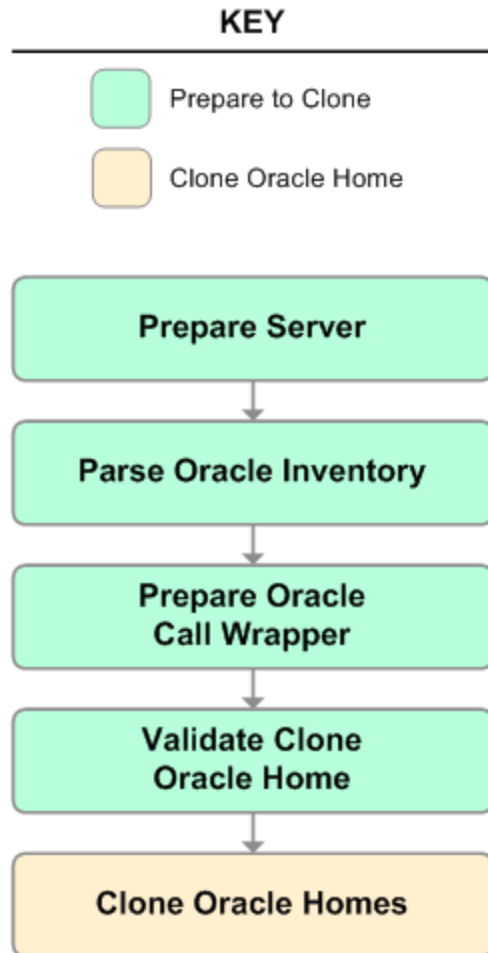
Validation Checks Performed show

Much of the validation centers on the input parameters:

- The input parameters have the proper syntax (no special characters or spaces).
- Files exist or have valid specifications.

Steps Executed show

The Clone Oracle Home workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Workflow Steps show

Steps Used in Clone Oracle Home

| Workflow Step | Description |
|-----------------------------|---|
| Prepare Server | This step prepares the Server Wrapper and Instance Wrapper, which enable subsequent steps to be executed by the OS administrator user or the owner of the database or middleware software. |
| Parse Oracle Inventory | <p>This step parses the specified Oracle inventory files (if they exist) and passes the inventory information to subsequent steps.</p> <ul style="list-style-type: none"> • If one or more Inventory Files are specified and they exist, the step parses these files and extracts their contents. • If no Inventory Files are specified, the step assigns the appropriate default and attempts to parse that file. • If one or more Inventory Files are specified and they do not exist, the step creates inventory information based on the specified Oracle Account and Oracle Home. |
| Prepare Oracle Call Wrapper | <p>This step constructs the commands needed to execute subsequent steps in the workflow as either the OS administrative user or the user who owns the pertinent ORACLE_HOME.</p> <p>The step also creates utility parameters that will be used by subsequent steps.</p> |
| Validate Clone Oracle Home | This step validates the values specified for the input parameters used by the "Clone Oracle Home" workflow. It also sets the values of various output parameters that will be consumed by subsequent steps. |
| Clone Oracle Homes | This step creates a copy of one or more specified Oracle homes. |

For parameter descriptions and defaults, see ["Parameters for Clone Oracle Home" on page 74](#).

How to Run this Workflow

The following instructions show you how to customize and run the ["Clone Oracle Home"](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Clone Oracle Home" on page 74](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 67](#) and ensure that all requirements are satisfied.

To use the Clone Oracle Home workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters for Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |

Input Parameters for Validate Clone Oracle Home

| Parameter Name | Default Value | Required | Description |
|------------------|-----------------|----------|---|
| New Oracle Homes | see description | optional | Comma-separated list of the Oracle homes (fully qualified paths) that will be cloned (copied) from the Oracle Homes list. There must be one New Oracle Home for each Clone Oracle Home. Default is: /u01/app/oracle/product/11.2.0.0/DB4 |
| Oracle Homes | see description | optional | Comma-separated list of Oracle Homes (fully qualified path names) that will be cloned. One or more is required. Default is: /u01/app/oracle/product/11.2.0.0/DB2 |

Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow.

Note: See "[Parameters for Clone Oracle Home](#)" on page 74 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: If you want to further verify the results:

1. Go to the location where the Oracle Home was cloned.
2. Check that your important folders and files were created.

Sample Scenario

It is very straightforward to run the "Clone Oracle Home" workflow. This topic shows you typical parameter values to use.

Input Parameters for Parse Oracle Inventory

| Parameter Name | Example Value | Description |
|-----------------|------------------|--|
| Inventory Files | /etc/oraInst.loc | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |

Input Parameters for Validate Clone Oracle Home

| Parameter Name | Example Value | Description |
|------------------|------------------------------------|---|
| New Oracle Homes | /opt/app/oracle/product/11.2.0/DB4 | Comma-separated list of the Oracle homes (fully qualified paths) that will be cloned (copied) from the Oracle Homes list. There must be one New Oracle Home for each Clone Oracle Home. Default is: /u01/app/oracle/product/11.2.0/DB4 |
| Oracle Homes | /opt/app/oracle/product/11.2.0/DB2 | Comma-separated list of Oracle Homes (fully qualified path names) that will be cloned. One or more is required. Default is: /u01/app/oracle/product/11.2.0/DB2 |

Parameters for Clone Oracle Home

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Parameters Defined in this Step: Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: <code>/var/opt/oracle/oraInst.loc</code> Linux: <code>/etc/oraInst.loc</code> |
| Oracle Account | no default | optional | Oracle user who owns the ORACLE_HOME. Required if inventory does not exist. |
| Oracle Home | no default | optional | Fully-qualified path name of the Oracle Home where the patch will be applied. |
| Server Wrapper | see description | required | Command that will execute a step as the OS administrative user. The default for UNIX targets is: <code>sudo su - root /opt/hp/dma/client/jython.sh</code> This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |

Additional Parameters Defined in this Step: Validate Clone Oracle Home

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|---|
| Instance Wrapper | no default | required | Command that will be used to execute subsequent steps as the user who owns the ORACLE_HOME. For example: <code>su - oracle /opt/hp/dma/client/jython.sh</code> Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |

Additional Parameters Defined in this Step: Validate Clone Oracle Home , continued

| Parameter Name | Default Value | Required | Description |
|-----------------------|-----------------|----------|---|
| New Oracle Home Names | Ora102A | optional | Comma-separated list of Oracle Home Names for the cloned Oracle homes. There must be one New Oracle Home Name for each New Oracle Home. |
| New Oracle Homes | see description | optional | Comma-separated list of the Oracle homes (fully qualified paths) that will be cloned (copied) from the Oracle Homes list. There must be one New Oracle Home for each Clone Oracle Home. Default is: /u01/app/oracle/product/11.2.0.0/DB4 |
| Oracle Homes | see description | optional | Comma-separated list of Oracle Homes (fully qualified path names) that will be cloned. One or more is required. Default is: /u01/app/oracle/product/11.2.0.0/DB2 |
| Oracle Inventory Info | no default | optional | Dictionary list of all information discovered in the supplied inventory file(s). |

Migrate Oracle Home

This workflow moves an Oracle Instance from one Oracle Home to another Oracle Home.

For additional information about how the Migrate Oracle Home workflow can be used with other patching workflows see [How to Use the Workflows Together](#) topic.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| Prerequisites for this Workflow | List of prerequisites that must be satisfied before you can run this workflow |
| How this Workflow Works | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| How to Run this Workflow | Instructions for running this workflow in your environment |
| Sample Scenario | Examples of typical parameter values for this workflow |
| Parameters | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the "[Migrate Oracle Home](#)" workflow:

- The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA10.50 solution packs are supported on HPE DMA10.50 (and later).
- You have installed the HPE DMA Database Patching Solution Pack .
- You need to have Oracle Database provisioned and operational. You can do this by running workflows found in the HPE DMA Database Provisioning Solution Pack:
 - Oracle – Provision Database Software
 - Oracle – Provision Database
- You have an Oracle support contract and have downloaded the appropriate patches to software repository or to the target machine.
- You have read access to all specified inventory pointers (Linux/UNIX).

For more information about prerequisites for Oracle Database, refer to the [Oracle Product Documentation](#).

How this Workflow Works

The following information describes how the "Migrate Oracle Home" workflow works:

Overview show

This workflow does the following things in the order shown:

- The initial steps of the workflow prepare it to move an Oracle Instance from one Oracle Home to another Oracle Home. The workflow prepares the server, determines the Oracle Home, parses the Oracle inventory, constructs commands used in subsequent steps, and processes user input parameters,
- The workflow migrates the Oracle Instance. The workflow shuts down the Oracle Instances, Oracle Listeners, and the Oracle Agent. It copies the Oracle configuration files and the Oracle network files. It resets the Oracle Home in the network files.
- The final steps of the workflow allow the workflow to end cleanly. The workflow restarts all the Oracle Instances, all Oracle Listeners, and the Oracle Agent. Then it shuts down these processes and restarts them to force a clean run environment. Then it associates the Oracle Instance with the Oracle Home in the `oratab` file.

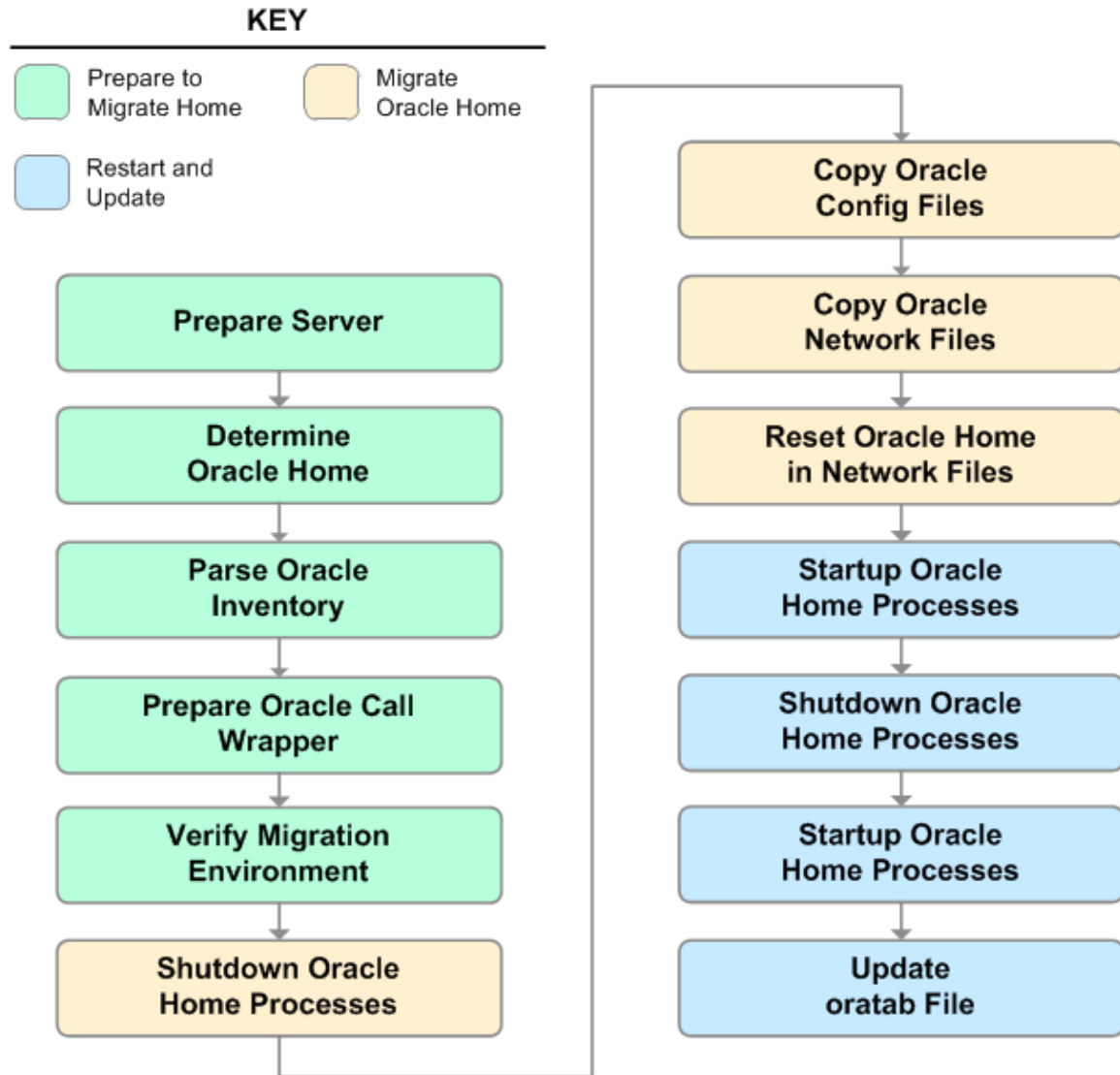
Validation Checks Performed show

Much of the validation centers on the input parameters:

- The directories specified in the Current Oracle Home, New Oracle Home, Oracle SIDS, and Listeners parameters exist on the target.
- There are entries in the `oratab` file for the specified Oracle SIDs.
- There are entries in the `listener.ora` file for the specified Oracle Listeners.

Steps Executed show

The Migrate Oracle Home workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Workflow Steps show

Steps Used in Migrate Oracle Home

| Workflow Step | Description |
|--------------------------------|---|
| Prepare Server | This step prepares the Server Wrapper and Instance Wrapper, which enable subsequent steps to be executed by the OS administrator user or the owner of the database or middleware software. |
| Determine Oracle Home | This step determines the value of ORACLE_HOME from the <code>/etc/oratab</code> or <code>/var/opt/oracle/oratab</code> file on UNIX targets. |
| Parse Oracle Inventory | <p>This step parses the specified Oracle inventory files (if they exist) and passes the inventory information to subsequent steps.</p> <ul style="list-style-type: none"> • If one or more Inventory Files are specified and they exist, the step parses these files and extracts their contents. • If no Inventory Files are specified, the step assigns the appropriate default and attempts to parse that file. • If one or more Inventory Files are specified and they do not exist, the step creates inventory information based on the specified Oracle Account and Oracle Home. |
| Prepare Oracle Call Wrapper | <p>This step constructs the commands needed to execute subsequent steps in the workflow as either the OS administrative user or the user who owns the pertinent ORACLE_HOME.</p> <p>The step also creates utility parameters that will be used by subsequent steps.</p> |
| Verify Migration Environment | <p>This step verifies the input parameters used throughout the Migrate Oracle Home workflow:</p> <ul style="list-style-type: none"> • The directories specified in the Current Oracle Home, New Oracle Home, Oracle SIDS, and Listeners parameters exist on the target. • There are entries in the <code>oratab</code> file for the specified Oracle SIDs. • There are entries in the <code>listener.ora</code> file for the specified Oracle Listeners. |
| Shutdown Oracle Home Processes | This step stops the Oracle Instances specified in the Oracle SIDs list—excluding those Oracle Instances in the Ignore SIDs list. It also stops all Oracle Listeners in the Listeners list and attempts to stop the Oracle Agent. |
| Copy Oracle Config Files | This step copies the Oracle configuration files from the current (source) Oracle home to the new (destination) Oracle home. |
| Copy Oracle Network Files | <p>This step copies the following files from the <code>\${Current Oracle Home}/network/admin</code> directory to the <code>\${New Oracle Home}/network/admin</code> directory:</p> <ul style="list-style-type: none"> • <code>tnsnames.ora</code> |

Steps Used in Migrate Oracle Home, continued

| Workflow Step | Description |
|------------------------------------|---|
| | <ul style="list-style-type: none"> • listener.ora • sqlnet.ora |
| Reset Oracle Home in Network Files | This step resets the ORACLE_HOME value in the \${New Oracle Home} /network/admin files to reflect the \${New Oracle Home} value. |
| Startup Oracle Home Processes | This step starts the Oracle Instances specified in the Oracle SIDs list—excluding those Oracle Instances in the Ignore SIDs list. It also starts all Oracle Listeners in the Listeners list and attempts to start the Oracle Agent. |
| Shutdown Oracle Home Processes | This step stops the Oracle Instances specified in the Oracle SIDs list—excluding those Oracle Instances in the Ignore SIDs list. It also stops all Oracle Listeners in the Listeners list and attempts to stop the Oracle Agent. |
| Startup Oracle Home Processes | This step starts the Oracle Instances specified in the Oracle SIDs list—excluding those Oracle Instances in the Ignore SIDs list. It also starts all Oracle Listeners in the Listeners list and attempts to start the Oracle Agent. |
| Update oratab File | This step updates the \${oratab directory}/oratab file that associates the ORACLE_SID and ORACLE_HOME values. It replaces entries with the \${Current Oracle Home} value with the \${New Oracle Home} value. |

For parameter descriptions and defaults, see ["Parameters for Migrate Oracle Home" on page 86](#).

How to Run this Workflow

The following instructions show you how to customize and run the "Migrate Oracle Home" workflow in your environment.

Tip: For detailed instructions to run HPE DMA workflows—using the Oracle - Compliance Audit workflow as an example—see *Quick Start Tutorial*.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in "Parameters for Migrate Oracle Home" on page 86.

Note: Before following this procedure, review the "Prerequisites for this Workflow" on page 77, and ensure that all requirements are satisfied.

To use the Migrate Oracle Home workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters for Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |

Input Parameters for Verify Migration Environment

| Parameter Name | Default Value | Required | Description |
|-----------------|---------------|----------|---|
| Listeners | no default | optional | Comma-separated list of the Oracle Listener names to be included in start-up and shut-down sequences. |
| New Oracle Home | no default | required | File system location of the new ORACLE_HOME (migration destination). |

Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow.

Note: See "[Parameters for Migrate Oracle Home](#)" on page 86 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need . You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: If you want to further verify the results:

Make sure that you can log in to the server where your Oracle Database was migrated.

Sample Scenario

The following use cases demonstrate different ways that the "Migrate Oracle Home" workflow can be run:

Scenario 1: To migrate Oracle Home without shutting down and starting up the Listeners

For this use case, you leave the Listeners parameter blank.

Input Parameters for Parse Oracle Inventory

| Parameter Name | Example Value | Description |
|-----------------|------------------|--|
| Inventory Files | /etc/oraInst.loc | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |

Input Parameters for Verify Migration Environment

| Parameter Name | Example Value | Description |
|-----------------|------------------------------------|---|
| Listeners | | Comma-separated list of the Oracle Listener names to be included in start-up and shut-down sequences. |
| New Oracle Home | /u01/app/oracle/product/11.2.0/db4 | File system location of the new ORACLE_HOME (migration destination). |

Scenario 2: To migrate Oracle Home with shutting down and starting up the Listeners

For this use case, you set the Listeners parameter to a comma-separated list of Oracle Listener names.

Input Parameters for Parse Oracle Inventory

| Parameter Name | Example Value | Description |
|-----------------|------------------|--|
| Inventory Files | /etc/oraInst.loc | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc |

Input Parameters for Verify Migration Environment

| Parameter Name | Example Value | Description |
|-----------------|------------------------------------|---|
| Listeners | LISTENER1, LISTENER2 | Comma-separated list of the Oracle Listener names to be included in start-up and shut-down sequences. |
| New Oracle Home | /u01/app/oracle/product/11.2.0/db4 | File system location of the new ORACLE_HOME (migration destination). |

Parameters for Migrate Oracle Home

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Parameters Defined in this Step: Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma-separated list of fully-qualified Oracle inventory files. If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris or HP-UX: <code>/var/opt/oracle/oraInst.loc</code> Linux: <code>/etc/oraInst.loc</code> |
| Oracle Account | no default | optional | Oracle user who owns the ORACLE_HOME. Required if inventory does not exist. |
| Oracle Home | no default | optional | Fully-qualified path name of the Oracle Home where the patch will be applied. Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |
| Server Wrapper | see description | required | Command that will execute a step as the OS administrative user. The default for UNIX targets is: <code>sudo su - root /opt/hp/dma/client/jython.sh</code> Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value. |

Additional Parameters Defined in this Step: Verify Migration Environment

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|---|
| Call Wrapper | no default | required | Command used to execute a step as the Oracle Instance owner. For example: <code>sudo -u oracle /opt/hp/dma/client/jython.sh</code> |

Additional Parameters Defined in this Step: Verify Migration Environment, continued

| Parameter Name | Default Value | Required | Description |
|---------------------|---------------|----------|--|
| | | | <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| Current Oracle Home | no default | required | <p>File system location of the existing ORACLE_HOME (migration source).</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| Listeners | no default | optional | Comma-separated list of the Oracle Listener names to be included in start-up and shut-down sequences. |
| New Oracle Home | no default | required | File system location of the new ORACLE_HOME (migration destination). |
| Oracle SIDs | no default | optional | <p>Comma-separated list of the Oracle Instances (ORACLE_SIDs) in this ORACLE_HOME where the step's action should be performed.</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |

Additional Parameters Defined in this Step: Shutdown Oracle Home Processes

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|---|
| Ignore SIDs | TST,DEV | optional | Comma-separated list of Oracle Instances (SIDs) that should not be patched. |

Oracle - Migrate and Patch Grid Managed Database

This workflow is designed to migrate and patch a database to a new home. The database is managed by Oracle Grid Infrastructure. The workflow will work for both Grid Standalone and Grid Cluster environments. The workflow is a database level workflow so you can migrate each database individually..

For additional information about how the Oracle - Migrate and Patch Grid Managed Database workflow can be used with other patching workflows see [How to Use the Workflows Together](#) topic.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 90 | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" on page 92 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Migrate and Patch Grid Managed Database" on page 95 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the Oracle - Migrate and Patch Grid Managed Database workflow:

- The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA10.50 solution packs are supported on HPE DMA10.50 (and later).
- You have installed the HPE DMA Database Patching Solution Pack .
- You need to have Oracle Database provisioned and operational. You can do this by running workflows found in the HPE DMA Database Provisioning Solution Pack:

Oracle – Provision Database Software

Oracle – Provision Database

- You have an Oracle support contract and have downloaded the appropriate patches to software repository or to the target machine.
- You have read access to all specified inventory pointers (Linux/UNIX).

For more information about prerequisites for Oracle Database, refer to the [Oracle Product Documentation](#).

How this Workflow Works

The following information describes how the Oracle - Migrate and Patch Grid Managed Database workflow works:

Overview show

This workflow does the following things in the order shown:

- The initial steps of the workflow prepare it to move an Oracle Instance from one Oracle Home to another Oracle Home. The workflow prepares the server, determines the Oracle Home, parses the Oracle inventory, constructs commands used in subsequent steps, and processes user input parameters,
- The workflow migrates the Oracle Instance. The workflow shuts down the Oracle Instances, Oracle Listeners, and the Oracle Agent. It copies the Oracle configuration files and the Oracle network files. It resets the Oracle Home in the network files.
- The final steps of the workflow allow the workflow to end cleanly. The workflow restarts all the Oracle Instances, all Oracle Listeners, and the Oracle Agent. Then it shuts down these processes and restarts them to force a clean run environment. Then it associates the Oracle Instance with the Oracle Home in the `oratab` file.

Validation Checks Performed show

Much of the validation centers on the input parameters:

- The directories specified in the Current Oracle Home, New Oracle Home, Oracle SIDS, and Listeners parameters exist on the target.
- There are entries in the `oratab` file for the specified Oracle SIDs.
- There are entries in the `listener.ora` file for the specified Oracle Listeners.

Steps Executed show

The Oracle - Migrate and Patch Grid Managed Database workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Workflow Steps show

Steps Used in Oracle - Migrate and Patch Grid Managed Database

| Workflow Step | Description |
|---|--|
| Gather Parameters for Migrate and Patch Grid Managed Database | This step gathers the required parameters for Migrate and Patch Grid Managed Database. |
| Migrate and Patch Database | This step migrates the Oracle instance to a new home and patches the database. |

For parameter descriptions and defaults, see Parameters for Oracle - Migrate and Patch Grid Managed Database.

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Migrate and Patch Grid Managed Database workflow in your environment.

Tip: For detailed instructions to run HPE DMA workflows—using the Oracle - Compliance Audit workflow as an example—see *Quick Start Tutorial*.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in Parameters for Oracle - Migrate and Patch Grid Managed Database.

Note: Before following this procedure, review the Prerequisites for this Workflow, and ensure that all requirements are satisfied.

To use the Oracle - Migrate and Patch Grid Managed Database workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters for Gather Parameters for Migrate and Patch Grid Managed Database

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme. Values are of the form ORA-nnnnn. Example: ORA-04020,ORA-03113 |
| New Oracle Home | no default | optional | File system location of the new ORACLE_HOME (migration destination). |
| Oracle OS User | oracle | required | The OS user that owns the specified Oracle Home. |

Input Parameters for Migrate and Patch Grid Managed Database

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Call | no | required | Command used to execute a step as the Oracle |

Input Parameters for Migrate and Patch Grid Managed Database, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|--|
| Wrapper | default | | Instance owner. For example: <pre>sudo -u oracle /opt/hp/dma/client/jython.sh</pre> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> |
| Database Name | no default | required | The name of the new database. |
| Grid Nodes | no default | optional | Comma separated list of nodes that are part of a Grid Infrastructure environment. By default, the nodes are discovered by olsnodes and then all nodes are rolled back. |
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme. Values are of the form ORA-nnnnn. Example: ORA-04020,ORA-03113 |
| Instance Name | no default | Required | The Oracle Database Instance Name. |
| New Oracle Home | no default | required | File system location of the new ORACLE_HOME (migration destination). |
| Oracle Home | no default | required | File system location of the current ORACLE_HOME. |
| Oracle OS User | oracle | required | The OS user that owns the specified Oracle Home. |
| Oracle Version | no default | optional | Version of the Oracle Installation |

Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow.

Note: See Parameters for Oracle - Migrate and Patch Grid Managed Database for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need . You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: If you want to further verify the results:

Make sure that you can log in to the server where your Oracle Database was migrated.

Parameters for Oracle - Migrate and Patch Grid Managed Database

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Parameters Defined in this Step: Gather Parameters for Migrate and Patch Grid Managed Database

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme. Values are of the form ORA-nnnnn. Example: ORA-04020,ORA-03113 |
| New Oracle Home | no default | optional | File system location of the new ORACLE_HOME (migration destination). |
| Oracle OS User | oracle | required | The OS user that owns the specified Oracle Home. |
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme. Values are of the form ORA-nnnnn. Example: ORA-04020,ORA-03113 |

Additional Parameters Defined in this Step: Migrate and Patch Grid Managed Database

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|---|
| Call Wrapper | no default | required | <p>Command used to execute a step as the Oracle Instance owner. For example:</p> <pre>sudo -u oracle /opt/hp/dma/client/jython.sh</pre> <p>Caution: This parameter is derived by the workflow. Under most circumstances, you should not change its mapping or its value.</p> <p>Caution: This parameter is derived by the</p> |

Additional Parameters Defined in this Step: Migrate and Patch Grid Managed Database, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| | | | workflow. Under most circumstances, you should not change its mapping or its value. |
| Database Name | no default | required | The name of the new database. |
| Grid Nodes | no default | optional | Comma separated list of nodes that are part of a Grid Infrastructure environment. By default, the nodes are discovered by olsnodes and then all nodes are rolled back. |
| Ignorable Oracle Errors | no default | optional | Comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme. Values are of the form ORA-nnnnn. Example: ORA-04020,ORA-03113 |
| Instance Name | no default | Required | The Oracle Database Instance Name. |
| New Oracle Home | no default | required | File system location of the new ORACLE_HOME (migration destination). |
| Oracle Home | no default | required | File system location of the current ORACLE_HOME. |
| Oracle OS User | oracle | required | The OS user that owns the specified Oracle Home. |
| Oracle Version | no default | optional | Version of the Oracle Installation |

The Advanced Database Patching Solution

The HPE Database and Middleware Automation (HPE DMA) Database Compliance solution provides tools that you can use to patch specialized Oracle Grid Infrastructure in an efficient and automated way.

The benefits of using this HPE DMA solution instead of patching your databases manually are:

- You can patch databases across multiple targets in either a development or production environment.

- You can use a variety of Oracle-supplied patches.
- You can easily roll back your system to a previous patch level.
- You can reduce database down time.
- You can reduce patching errors thanks to safeguards that HPE DMA provides.

By consistently using the tools provided in this solution, you can apply database patches more accurately and consistently—and save time in the process.

Oracle - Patch Grid Infrastructure and Databases v6

This workflow enables you to patch Oracle Grid Infrastructure on 11.2 and 12.1 environments. The workflow will work for both Grid Standalone and Grid Cluster environments. The workflow is designed to run against the ASM Instance (+ASM, +ASM1) selected as the target and will handle patching any database homes and databases automatically through self discovery.

In order to run on a clustered environment, you must specify a list of all nodes that are part of the Oracle Cluster in the Grid Nodes parameter. If there are specific Oracle Database Homes that you want included or excluded from the patching process, you can expose the Oracle Database Homes parameter in the Gather Advanced Parameters for Patch Grid Infrastructure and Databases step and specify the homes.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|---|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, and steps executed |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Patch Grid Infrastructure and Databases v6" on page 112 | List of input parameters for this workflow |

Note: The documentation for this workflow refers to the workflow and its steps by their base names. The names in the HPE DMA user interface may have a version appended, for example, v2.

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Patch Grid Infrastructure and Databases v6"](#) workflow:

1. You have installed the HPE DMA Advanced Database Patching solution pack.
2. You have read access to all specified inventory pointers (Linux/UNIX).
3. You have a valid Oracle support contract.
4. You have imported the pertinent Oracle CPU/SPU into the HPE DMA software repository.
5. If you do not specify the OPatch option, you must have the current OPatch already available on your system.
6. Your targets are running one of the supported operating systems (see the *HPE DMA Support Matrix*).

Other Dependencies

- Oracle Grid Home must be version 11.2.0.1 or later.
- The Oracle OPatch utility must be the latest version, or you must provide the newest OPatch archive using the appropriate workflow parameter.
- You must have enough free space available, which varies depending on the Oracle patch.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

The "Oracle - Patch Grid Infrastructure and Databases v6" workflow performs the following actions:

- The initial steps of the workflow prepare it to patch the Grid Home and all of the Database Homes and databases managed with Grid. The workflow performs the validation checks described in the "Validation Checks Performed show" section below.
- If an OPatch archive file has been provided, the workflow uses the correct OPatch version to patch the Oracle OPatch utility before applying the patch to the Grid Infrastructure Home and the target databases.
- The workflow performs various staging operations before applying the patch such as checking to see if Oracle Home is to be patched. If so, it will perform various validation checks. Otherwise, it will perform just those staging operations relevant to patching the Grid Infrastructure Home.
- The workflow applies the patch to the Grid Home and to all of the Database Homes and databases managed with the Grid.
- The final steps of the workflow allow the workflow to end cleanly. The workflow verifies that the patch has been applied. Then it cleans up the downloaded files and runs Discovery to update the metadata.

Validation Checks Performed show

This workflow validate the following conditions:

1. The input parameters have the proper syntax (no special characters or spaces).
2. Files exist or have valid specifications.
3. The current Oracle Database and OPatch versions match the required versions.
4. The supplied patch applies to Oracle Home.
5. Recompiled database views are accurate.
6. The download location has enough space.

After the patching operation is completed, the workflow verifies that the patch has been successfully applied to the Grid Infrastructure Home, Database Homes, and the target databases.

Steps Executed show

The "Oracle - Patch Grid Infrastructure and Databases v6" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used in Oracle - Patch Grid Infrastructure and Databases

| Workflow Step | Description |
|---|---|
| Gather Parameters for Patch Grid Infrastructure and Databases v2 | This step gathers the required parameters for Oracle - Patch Grid Infrastructure and Databases. |
| Gather Advanced Parameters for Patch Grid Infrastructure and Databases v5 | This step gathers the optional advanced parameters for Oracle - Patch Grid Infrastructure and Databases. |
| Prepare Oracle Instance | This step prepares instance level Oracle access. |
| Validate Patch Grid Infrastructure and Databases | This step validates the values specified for the input parameters used by Oracle - Patch Grid Infrastructure and Databases. It also sets the values of various output parameters that will be consumed by subsequent steps. |
| Download Software | This step downloads a list of files to a specified location on the target server. |
| Unzip for Patch Grid Infrastructure and Databases v5 | This step unzips on all nodes: <ul style="list-style-type: none"> • The OPatch on the Grid and the Database Homes • The Patch Archive |
| Patch Grid Infrastructure and Databases v5 | This step runs the preparatory SQL script and then patches the Grid infrastructure, the Database Homes, and all databases managed with the Grid. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Determine Oracle Patch Info | This step determines all patch information that the workflow requires to apply the pertinent patch. |
| Verify Grid and Databases Patched v4 | This step confirms that the patch has been properly applied to the Grid Infrastructure, Database Homes, and databases managed with the Grid. In a clustered environment, the workflow verifies across all nodes. |
| Run slibclean | This step runs the <code>slibclean</code> command on AIX targets. The <code>slibclean</code> utility removes any currently unused modules in kernel and library memory. |
| Cleanup Downloaded Files v2 | This step removes all downloaded files and archives. |
| Backup and | By default this step backs up all of the Grid and Database Homes and then |

Steps Used in Oracle - Patch Grid Infrastructure and Databases, continued

| Workflow Step | Description |
|---------------------------|--|
| Compress | compresses them into an archive. In addition, you can specify other directories and files that you want backed up—these parameters can be found in Gather Advanced Parameters for Patch Grid Infrastructure and Databases |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases.</p> <p>Note: Discovery is only additive. It will not remove instances or databases currently in your environment. It is the end user's responsibility to delete content this is no longer in use.</p> <p>In cluster situations where one node is active and other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Patch Grid Infrastructure and Databases v6](#)" on page 112.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Patch Grid Infrastructure and Databases v6"](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Patch Grid Infrastructure and Databases v6" on page 112](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 99](#), and ensure that all requirements are satisfied.

To use the Oracle - Patch Grid Infrastructure and Databases workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters Defined in this Step: Gather Parameters for Patch Grid Infrastructure and Databases v2

| Parameter Name | Default Value | Required | Description |
|-----------------|---------------|----------|---|
| Gold Grid Home | no default | required | A .tgz home that is already patched to be unzipped and then migrated to. This parameter is to be used in place of using a patch archive. |
| Gold RDBMS Home | no default | required | A .tgz home that is already patched to be unzipped and then migrated to either now or at a later date. This parameter is to be used instead of Patch Archive parameter. Multiple homes can be provided separating each home:version combination with a comma. For example: home1.tgz:12102,home2.tgz:11204 |
| Oracle OS User | no default | required | Oracle OS user. |
| Patch Archive | no default | required | Comma-separated list of patch file names (not fully-qualified). |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Grid Infrastructure and Databases v5

| Parameter Name | Default Value | Required | Description |
|------------------|----------------|----------|---|
| Backup File Name | dma_ backup | optional | Name of the backup file. |
| Patch Name | no default | optional | Name of the patch that is being applied. If you specify a value for this parameter, you MUST also expose and specify OPatch Version and Patch Number. |
| Patch Number | no default | optional | Patch number of the patch being applied. If you specify a value for this parameter, you MUST also expose and specify OPatch Version and Patch Name. |

Note: This is the minimum set of parameters required to run this workflow. You may specify values for the optional advanced parameters and you may need to expose additional parameters depending on your objectives.

See "[Parameters for Oracle - Patch Grid Infrastructure and Databases v6](#)" on page 112 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: To further verify that the Grid patch was successfully applied:

1. Log in to the target server.
2. Set the ORACLE_HOME to your Grid Home.
3. Run the command: `$ORACLE_HOME/OPatch/opatch lsinventory`
4. Verify that the patch number from the archive that you specified is listed in the output.

Optional: To further verify that the patch was successfully applied on the Database Homes:

1. Log in to the target server.
2. Set the ORACLE_HOME to your Database Home.
3. Run the command: `$ORACLE_HOME/OPatch/opatch lsinventory`
4. Verify that the patch number from the archive that you specified is listed in the output.

Optional: To further verify that the patch was successfully applied to the Oracle Database Instances associated with the Oracle Home:

1. Log in as an SQLPlus privileged user.
2. Set the environment variable, for example:
`. oraenv`
3. Give the name of the Oracle Database, for example:
`orca`
4. Search results for comments and actions, for example:
`select comments,action from sys.registry$history;`
5. Check that the desired patch was applied. For example, look for:
`CPUOct2013` or `PSUOct2013`

Sample Scenarios

This topic shows you how to use various parameters to achieve the following advanced patching scenarios in your environment using the ["Oracle - Patch Grid Infrastructure and Databases v6"](#) workflow.

Scenario 1: In-Place Patching

This option patches GI, any database homes, and databases that have been included based on parameter inputs for the "Oracle Database Homes" parameter. The parameters used for In-Place patching are as follows:

| Parameter Name | Value |
|-------------------------|-------|
| 2 Phase Patching | False |
| Clone Patching Database | False |
| Clone Patching Grid | False |
| Oracle Database Homes | ALL |
| RDBMS Homes Only | False |

Scenario 2: Clone Patching Single Phase

This option clones grid and database home(s) that are specified to be patched. Once cloned, the patches will be applied to the cloned home. After patching is complete for grid and database homes, switchover occurs to move grid services and database services to the newly patched homes. The parameters used for Clone Patching Single Phase are as follows:

| Parameter Name | Value |
|-------------------------|-------|
| 2 Phase Patching | False |
| Clone Patching Database | True |
| Clone Patching Grid | True |
| Oracle Database Homes | ALL |
| RDBMS Homes Only | False |

Scenario 3: Clone Patching Two Phase

This option clones grid and database home(s) that are specified to be patched. Once cloned, the patches will be applied to the cloned home. The workflow will then exit. The second phase is to re-run the workflow at which point the workflow will identify the first phase of the workflow has been executed and executes the switchover operations to move services to the new patched homes. The parameters used for Clone Patching Two Phase are as follows:

| Parameter Name | Value |
|-------------------------|-------|
| 2 Phase Patching | True |
| Clone Patching Database | True |
| Clone Patching Grid | True |
| Oracle Database Homes | ALL |
| RDBMS Homes Only | False |

Scenario 4: Patch RDBMS Home(s) Only

This option can be used to patch database homes of a different version at a later date separate from patching grid. This parameter can still be used with clone patching but will only effect the specified database home(s) part of the deployment. The parameters used for Clone Patching Two Phase are as follows:

| Parameter Name | Value |
|-------------------------|-------|
| 2 Phase Patching | False |
| Clone Patching Database | True |
| Clone Patching Grid | True |
| Oracle Database Homes | ALL |
| RDBMS Homes Only | False |

The following options are available for Oracle Database Homes parameter:

- ALL – This option patches every Oracle Database Home found on the selected target.
- NONE – This option only patches grid and leaves all database homes as is.
- INCLUDE:/u01/app/oracle/product/11.2.0/home_1,/u01/app/oracle/product/11.2.0/home_2 – This option lets you specify only specific home(s) that should be patched with grid.

- EXCLUDE:/u01/app/oracle/product/11.2.0/home_1,/u01/app/oracle/product/11.2.0/home_2 – This Option lets you specify only specific home(s) that should be excluded while patching grid.

Scenario 5: One Off Patching

One off patches can be applied using this workflow by specifying the one or many one off patches to be applied after the PSU. The parameter takes a comma separated list of one off patch archive provided by Oracle.

| Parameter Name | Value |
|-----------------|--|
| Oneoff Archives | p16836674_112040_Linux-x86-64.zip,p13571876_112046_Linux-x86-64.zip,p14059190_112040_Generic.zip |

If any of the one-off patches require post scripts to be run, you have to create a function library called "oraclepatchoneoff". Contents of the function should be formatted as follows:

```
one_off_patch_info = {

'13571876': {'Patch Name': '13571876', 'Database Version': '11.2.0.4.6', 'Oracle
Errors': ['ORA-29809', 'ORA-29931', 'ORA-29830', 'ORA-00942', 'ORA-00955', 'ORA-
01430', 'ORA-01432', 'ORA-01434', 'ORA-01435', 'ORA-01917', 'ORA-01920', 'ORA-
01921', 'ORA-01952', 'ORA-02303', 'ORA-02443', 'ORA-04043', 'ORA-29832', 'ORA-
29844', 'ORA-14452', 'ORA-06512', 'ORA-01927'], 'OPatch Version': '11.2.0.3.5',
'Additional Patches': '', 'SQL Script': ''},

'14059190': {'Patch Name': '14059190', 'Database Version': '11.2.0.4.0', 'Oracle
Errors': ['ORA-29809', 'ORA-29931', 'ORA-29830', 'ORA-00942', 'ORA-00955', 'ORA-
01430', 'ORA-01432', 'ORA-01434', 'ORA-01435', 'ORA-01917', 'ORA-01920', 'ORA-
01921', 'ORA-01952', 'ORA-02303', 'ORA-02443', 'ORA-04043', 'ORA-29832', 'ORA-
29844', 'ORA-14452', 'ORA-06512', 'ORA-01927'], 'OPatch Version': '11.2.0.3.5',
'Additional Patches': '', 'SQL Script': '<Patch Dir>/14059190/postinstall.sql'},

'16836674': {'Patch Name': '16836674', 'Database Version': '11.2.0.4.0', 'Oracle
Errors': ['ORA-29809', 'ORA-29931', 'ORA-29830', 'ORA-00942', 'ORA-00955', 'ORA-
01430', 'ORA-01432', 'ORA-01434', 'ORA-01435', 'ORA-01917', 'ORA-01920', 'ORA-
01921', 'ORA-01952', 'ORA-02303', 'ORA-02443', 'ORA-04043', 'ORA-29832', 'ORA-
29844', 'ORA-14452', 'ORA-06512', 'ORA-01927'], 'OPatch Version': '11.2.0.3.5',
'Additional Patches': '', 'SQL Script': ''},

}
```

Scenario 6: OJVM Patching

OJVM patches can be applied using this workflow by specifying the OJVM archive as input to 'Oneoff Archives' parameters. The OJVM patch will be applied after PSU.

| Parameter Name | Value |
|-----------------|-----------------------------------|
| Oneoff Archives | p22674697_112040_Linux-x86-64.zip |

For OJVM patches it is mandatory to create a function named "oraclepatchoneoff". The 'postinstall.sql' script needs to be provided as value for 'SQL Script' for the given OJVM patch number. Contents of the function should be formatted as follows:

```
one_off_patch_info = {
  '22674697': {'Patch Name': '22674697', 'Database Version': '11.2.0.4.0', 'Oracle
Errors': ['ORA-29809', 'ORA-29931', 'ORA-29830', 'ORA-00942', 'ORA-00955', 'ORA-
01430', 'ORA-01432', 'ORA-01434', 'ORA-01435', 'ORA-01917', 'ORA-01920', 'ORA-
01921', 'ORA-01952', 'ORA-02303', 'ORA-02443', 'ORA-04043', 'ORA-29832', 'ORA-
29844', 'ORA-14452', 'ORA-06512', 'ORA-01927'], 'OPatch Version': '11.2.0.3.5',
'Additional Patches': '', 'SQL Script': '<Patch Dir>/22674697/postinstall.sql'},
  '22139245': {'Patch Name': '22139245', 'Database Version': '11.2.0.4.0', 'Oracle
Errors': ['ORA-29809', 'ORA-29931', 'ORA-29830', 'ORA-00942', 'ORA-00955', 'ORA-
01430', 'ORA-01432', 'ORA-01434', 'ORA-01435', 'ORA-01917', 'ORA-01920', 'ORA-
01921', 'ORA-01952', 'ORA-02303', 'ORA-02443', 'ORA-04043', 'ORA-29832', 'ORA-
29844', 'ORA-14452', 'ORA-06512', 'ORA-01927'], 'OPatch Version': '11.2.0.3.5',
'Additional Patches': '', 'SQL Script': '<Patch Dir>/22139245/postinstall.sql'},
}
```

Be sure that the default values for all remaining input parameters are appropriate for your environment (see ["Parameters for Oracle - Patch Grid Infrastructure and Databases v6" on page 112](#)).

Scenario 2: Apply patch to a Grid Standalone environment show

In this scenario, the workflow patches a Grid Standalone environment. It applies the patch to both the Grid Standalone Home, the Oracle Database Homes, and all associated databases. You only need to leave Grid Nodes blank.

| Parameter Name | Description |
|------------------------|---|
| Patch Archive | Comma-separated list of patch file names (not fully-qualified). Example: p17272829_121010_Linux-x86-64.zip |
| Grid Nodes | Comma separated list of nodes that are part of a Grid Infrastructure environment. By default, the nodes are discovered by olsnodes and then all nodes are rolled back. Example: |
| OPatch Archive | The OPatch Archive file required for this patch (not fully-qualified). If this parameter value is not specified, the current OPatch version will be used. Example: p6880880_121010_Linux-x86-64.zip |
| Oracle Database Homes | Oracle Database Homes to patch along with the Oracle Grid. Valid values are ALL, NONE, INCLUDE: followed by a comma separated list of Oracle Homes to patch with the Oracle Grid, and EXCLUDE: followed by a comma separated list of Oracle Homes to exclude from the patching process. Example: ALL |
| Patch Information File | Supplementary patch information supplied by support. If this file is not found on the target, it is downloaded from the software repository on the HPE DMA server. Example: 201310_PatchInfo.xml |

Be sure that the default values for all remaining input parameters are appropriate for your environment (see ["Parameters for Oracle - Patch Grid Infrastructure and Databases v6"](#) on page 112).

Scenario 3: Only patch specific Oracle Database Homes show

In this scenario, the workflow patches Grid clustered environments. It applies the patch to the Grid Infrastructure, only the specified Oracle Database Homes, and all associated databases. You only need to set Oracle Database Homes to the desired Oracle Database Homes.

| Parameter Name | Description |
|------------------------|--|
| Patch Archive | Comma-separated list of patch file names (not fully-qualified). Example: p17272829_121010_Linux-x86-64.zip |
| Grid Nodes | Comma separated list of nodes that are part of a Grid Infrastructure environment. By default, the nodes are discovered by <code>olsnodes</code> and then all nodes are rolled back. Example: dma-rac1.usa.hp.com,dma-rac2.usa.hp.com |
| OPatch Archive | The OPatch Archive file required for this patch (not fully-qualified). If this parameter value is not specified, the current OPatch version will be used. Example: p6880880_121010_Linux-x86-64.zip |
| Oracle Database Homes | Oracle Database Homes to patch along with the Oracle Grid. Valid values are ALL, NONE, INCLUDE: followed by a comma separated list of Oracle Homes to patch with the Oracle Grid, and EXCLUDE: followed by a comma separated list of Oracle Homes to exclude from the patching process. Example: INCLUDE: /u01/app/oracle/product/12.1.0/dbhome_1 |
| Patch Information File | Supplementary patch information supplied by support. If this file is not found on the target, it is downloaded from the software repository on the HPE DMA server. Example: 201310_PatchInfo.xml |

Be sure that the default values for all remaining input parameters are appropriate for your environment (see "[Parameters for Oracle - Patch Grid Infrastructure and Databases v6](#)" on the next page).

Parameters for Oracle - Patch Grid Infrastructure and Databases v6

The following tables describe the required and optional input parameters for this workflow. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Patch Grid Infrastructure and Databases v2

| Parameter Name | Default Value | Required | Description |
|-----------------|---------------|----------|--|
| Gold Grid Home | no default | required | A .tgz home that is already patched to be unzipped and then migrated to. This parameter is to be used in place of using a patch archive. |
| Gold RDBMS Home | no default | required | A .tgz home that is already patched to be unzipped and then migrated to either now or at a later date. This parameter is to be used instead of Patch Archive parameter. Multiple homes can be provided separating each home:version combination with a comma. For example: home1.tgz:12102,home2.tgz:11204 |
| Oracle OS User | no default | required | Oracle OS user. |
| Patch Archive | no default | required | Comma-separated list of patch file names (not fully-qualified). |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Grid Infrastructure and Databases v5

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| 2 Phase Patching | false | optional | If the value is True the workflow will clone and patch the cloned home in the first run of the workflow. The second time you run the workflow it will perform the switchover operation to the newly patched home. |
| Additional Grid Patches | no default | optional | Comma separated list of any additional patched that need to be applied on top of the PSU. Example are ocw patches or any oneoff patches that need to be applied to the Grid Home. |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Grid Infrastructure and Databases v5, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|-----------------|----------|--|
| Backup File List | see description | optional | List of additional files and folders that you would like backed up. By default, the backup already includes Grid Home, Database Homes, and Inventory Location. |
| Backup File Name | dma_backup | optional | Name of the backup file. |
| Backup Location | no default | optional | Location where the backup file will be located. |
| Cleanup | True | optional | If true, the workflow will cleanup downloaded and extracted files upon completion. Valid values are True and False. |
| Clone Patching Database | no default | optional | True if patching process should use Oracle Clone Patching process for Oracle Database Homes and Databases. |
| Clone Patching Grid | no default | optional | True if patching process should use Oracle Clone Patching process for Oracle Database Homes and Databases. |
| DB Version | no default | optional | The current Oracle Database version. For example: 11.2.0.3 |
| Decommission Grid Home | true | optional | If Clone Patching Grid is set to True this parameter if set to true will decommission old Grid Home. If set to False the old Grid Home will remain after workflow has completed. |
| Decommission RDBMS Home | true | optional | If Clone Patching Database is set to True this parameter if set to True will decommission any old RDBMS Homes. If set to False the old RDBMS Homes will remain after workflow has completed. |
| Download Location | /tmp | optional | Location where all files where files will be downloaded or they already exist. |
| Extract Location | /tmp | optional | Directory location where the ZIP archives will be extracted. |
| Grid Nodes | no default | optional | Comma separated list of nodes that are part of a Grid Infrastructure environment. By default, the nodes are discovered by <code>olsnodes</code> and then all nodes are rolled back. |
| Ignorable Oracle Errors | no default | optional | A comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Grid Infrastructure and Databases v5, continued

| Parameter Name | Default Value | Required | Description |
|---------------------------------|---------------|----------|---|
| | | | addition to the list of Oracle errors specified in the patch readme file. Values are of the form ORA-nnnnn. For example: ORA-04020,ORA-03113 |
| Migrate Database | true | optional | When using a Gold RDBMS Home to patch, the databases for the homes will be migrated to the new home and patched. Default value is True. To migrate and patched databases rather than during the workflow specify False and run the Oracle - Migrate and Patch Grid Managed Database. |
| OCM Response File | no default | optional | Path name of the Oracle Configuration Manager (OCM) response file. If not found on the target, this file is downloaded from the software repository. If left blank, a default response file will be created. |
| Oneoff Archives | no default | optional | Comma separated list of One-off patch archive(s). |
| OPatch Archive | no default | optional | The OPatch Archive file required for this patch (not fully-qualified). If this parameter value is not specified, the current OPatch version will be used. |
| OPatch Version | no default | optional | The new OPatch version of the patch being applied. If you specify a value for this parameter, you MUST also specify values for Patch Number and Patch Name. |
| Oracle Database Homes | ALL | optional | Oracle Database Homes to patch along with the Oracle Grid. Valid values are ALL, NONE, INCLUDE: followed by a comma separated list of Oracle Homes to patch with the Oracle Grid, and EXCLUDE: followed by a comma separated list of Oracle Homes to exclude from the patching process. |
| Oracle Group | no default | optional | The group that owns the Grid Oracle Home. |
| Override Current OPatch Version | False | optional | If the value is True, the existing OPatch version will be overridden by the supplied OPatch archive version. |
| Patch Information File | no default | optional | Supplementary patch information supplied by support. If this file is not found on the target, it is downloaded from the software repository on the HPE DMA server. |
| Patch Name | no default | optional | Name of the patch that is being applied. |
| Patch Number | no default | optional | Patch number of the patch being applied. |
| Preparatory SQL | no default | optional | File name that contains SQL statements that must be |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Patch Grid Infrastructure and Databases v5, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------|---------------|----------|---|
| | | | run before the database catalog update. This file is passed directly to SQLPlus and must be formatted as such. If not found on the target, it is downloaded from the software repository. |
| RDBMS Homes Only | false | optional | If value is True than the patching workflow will only patch database homes found to be patched from the Oracle Database Homes parameter. The default value is False. |
| Required Disk Space | no default | optional | Amount of disk space required (checked for) before installing the patch. Size is in Gigabytes. |
| Run Database View Recompile | N | optional | If set to Y, the Database View Recompile step will be run. Valid values are Y and N. |
| Startup Instance | Y | optional | If set to Y, the workflow will attempt to start the database instance if it is offline. Valid values are Y and N. |
| Trust SSL Certificates | no default | optional | If this parameter is set to True, the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HP DMA web service. |
| Web Service Password | no default | optional | Password for the HPE DMA Discovery web service API. |
| Web Service URL | no default | optional | URL for the HPE DMA Discovery web service API. |
| Web Service User | no default | optional | User who is capable of modifying the managed environment by using the HPE DMA Discovery web service API. |

Oracle - Rollback Patch from Grid Infrastructure and Database

This workflow rolls back a patch from Oracle Grid Infrastructure on 11.2 and 12.1 environments. It works for both Grid Standalone and Grid Cluster environments. In addition to the Grid Home, it rolls back the patch from all of the Database Homes and databases managed with the Grid.

In order to run on a clustered environment, in the Grid Nodes parameter you specify a list all nodes that are part of the Oracle Cluster.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|---|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, and steps executed |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Rollback Patch from Grid Infrastructure and Database" on page 126 | List of input parameters for this workflow |

Note: The documentation for this workflow refers to the workflow and its steps by their base names. The names in the HPE DMA user interface may have a version appended, for example, v2.

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Rollback Patch from Grid Infrastructure and Database"](#) workflow:

1. You have installed the HPE DMA Advanced Database Patching solution pack.
2. You have Read access to all specified inventory pointers (Linux/UNIX).
3. Your targets are running one of the supported operating systems (see the *HPE DMA Support Matrix*).

Other Dependencies

- The workflow must have unchallenged ability to become the Oracle database user (typically oracle) on all nodes of the RAC. This is generally done using `sudo` or `ssh oracle@localhost`.
- The workflow must have unchallenged ability to become the Oracle CRS user (example oracrs) on all nodes of the RAC. This is generally done using `sudo` or `ssh oracle@localhost`.
- The workflow must have unchallenged ability to become the superuser user (typically root) on all nodes of the RAC. This is generally done using `sudo` or `ssh oracle@localhost`.
- The workflow and the CRS/ASM/Instance/Listener users (typically oracle) must have unchallenged ability to `ssh` to all the RAC nodes.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

The "Oracle - Rollback Patch from Grid Infrastructure and Database" workflow performs the following actions:

- The initial steps of the workflow prepare it to roll back the patch from the Grid Home, and all of the Database Homes and databases managed with Grid. The workflow performs the validation checks described in the "Validation Checks Performed show" section below.
- The workflow verifies the archive to roll back, the download location, and the Homes to roll back.
- The workflow rolls back the patch from the Grid Home and from all of the Database Homes and databases managed with the Grid.
- The final steps of the workflow allow the workflow to end cleanly. The workflow verifies that the patch has been rolled back. Then it runs Discovery to update the metadata and cleans up the downloaded files.

Validation Checks Performed show

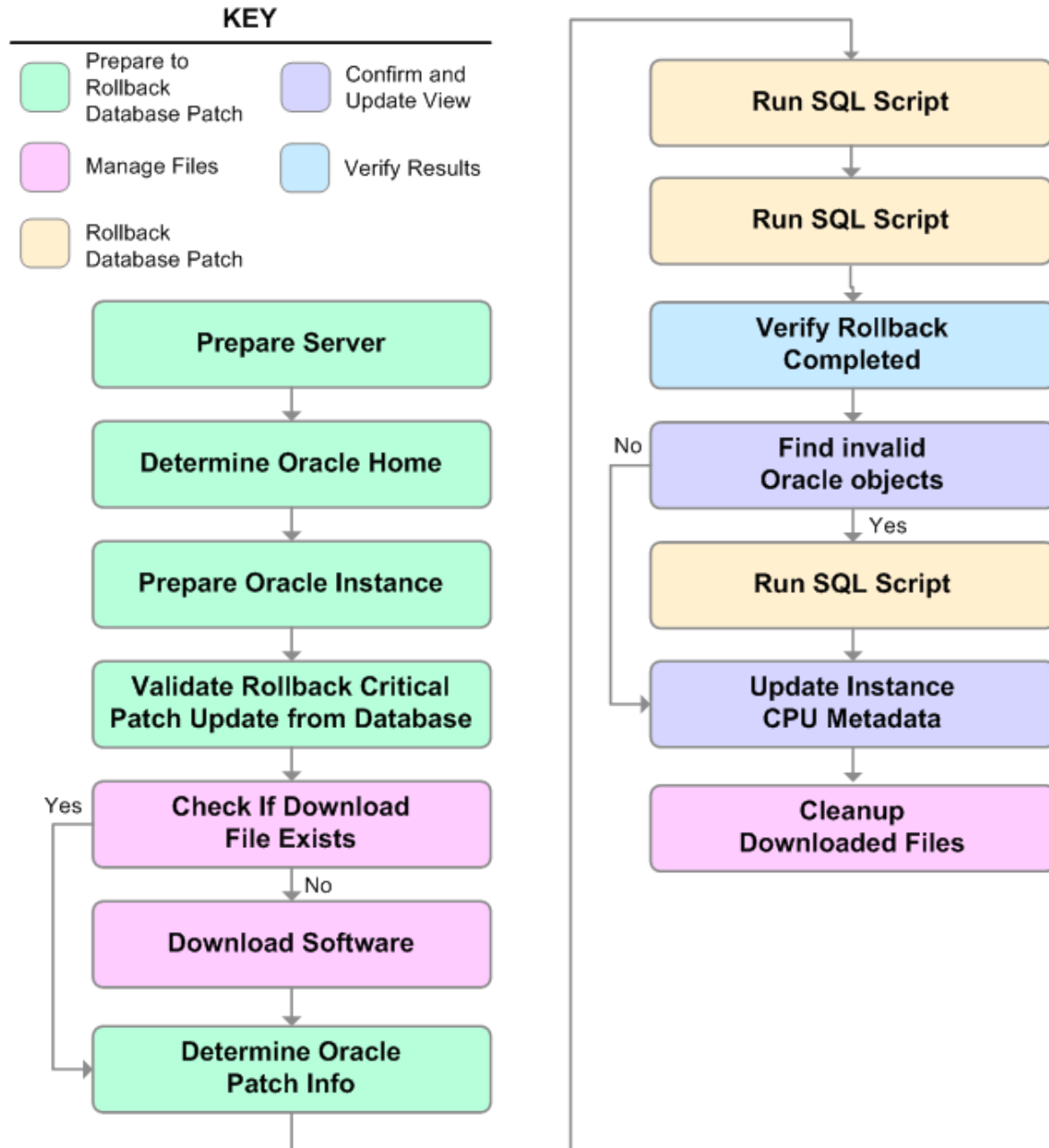
This workflow validates the following conditions:

1. The input parameters have the proper syntax (no special characters or spaces).
2. Files exist or have valid specifications.
3. The supplied patch applies to Oracle Home.
4. The download location has enough space.

After the patching operation is completed, the workflow verifies that the patch has been successfully rolled back from the Grid Infrastructure Home, Database Homes, and the target databases.

Steps Executed show

The "Oracle - Rollback Patch from Grid Infrastructure and Database" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Steps Used in Oracle - Rollback Patch from Grid Infrastructure and Databases

| Workflow Step | Description |
|--|--|
| Gather Parameters for Rollback Patch from Grid Infrastructure and Databases | This step gathers the required parameters for Oracle - Rollback Patch from Grid Infrastructure and Databases. |
| Gather Advanced Parameters for Rollback Patch from Grid Infrastructure and Databases | This step gathers the optional advanced parameters for Oracle - Rollback Patch from Grid Infrastructure and Databases. |
| Prepare Oracle Instance | This step prepares instance level Oracle access. |
| Validate Rollback Patch from Grid Infrastructure and Databases | This step validates the parameters for Oracle - Rollback Patch from Grid Infrastructure and Databases. |
| Download Software | This step downloads a list of files to a specified location on the target server. |
| Run slibclean | This step runs the <code>slibclean</code> command on AIX targets. The <code>slibclean</code> utility removes any currently unused modules in kernel and library memory. |
| Rollback Patch Grid Infrastructure and Databases | This step rolls back the patches from the Grid infrastructure, the Database Homes, and all databases managed with the Grid. |
| Verify Grid and Databases Patch Rollback | This step confirms that the patch has been properly rolled back from the Grid Infrastructure, Database Homes, and databases managed with the Grid. In a clustered environment, the workflow verifies across all nodes. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases.</p> <p>Note: Discovery is only additive. It will not remove instances or databases currently in your environment. It is the end user's responsibility to delete content this is no longer in use.</p> <p>In cluster situations where one node is active and other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |
| Cleanup Downloaded Files | This step removes files and archives that were downloaded to the target system during previous workflow steps. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Rollback Patch"](#)

from Grid Infrastructure and Database" on page 126.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Rollback Patch from Grid Infrastructure and Database"](#) workflow in your environment.

Tip: For detailed instructions to run HPE DMA workflows—using the Oracle - Compliance Audit workflow as an example—see HPE DMA Quick Start Tutorial.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Rollback Patch from Grid Infrastructure and Database"](#) on page 126.

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#) on page 117, and ensure that all requirements are satisfied.

To use the Oracle - Rollback Patch from Grid Infrastructure and Databases workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters Defined in this Step: Gather Parameters for Rollback Patch from Grid Infrastructure and Databases

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Patch Archive | no default | required | Patch archive file of the applied patch to roll back from the Oracle Grid and databases. |

Note: This is the minimum set of parameters required to run this workflow. You may specify values for the optional advanced parameters and you may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Rollback Patch from Grid Infrastructure and Database"](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.

6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: To further verify that the Grid patch was successfully rolled back:

1. Log in to the target server.
2. Set the ORACLE_HOME to your Grid Home.
3. Run the command: `$ORACLE_HOME/OPatch/opatch lsinventory`
4. Verify that the patch number that you rolled back is NOT listed in the output.

Optional: To further verify that the patch was successfully rolled back from the Database Homes:

1. Log in to the target server.
2. Set the ORACLE_HOME to your Database Home.
3. Run the command: `$ORACLE_HOME/OPatch/opatch lsinventory`
4. Verify that the patch number that you rolled back is NOT listed in the output.

Optional: To further verify that the patch was successfully rolled back from the Oracle Database Instances associated with the Oracle Home:

1. Log in as an SQLPlus privileged user.
2. Set the environment variable, for example:


```
. oraenv
```
3. Give the name of the Oracle Database, for example:


```
orca
```
4. Search results for comments and actions, for example:


```
select comments,action from sys.registry$history;
```
5. Verify that the patch number that you rolled back is NOT listed in the output, for example:


```
CPUOct2013 or PSUOct2013
```

Sample Scenarios

This topic shows you how to use various parameters to achieve the following advanced patching scenarios in your environment using the ["Oracle - Rollback Patch from Grid Infrastructure and Database"](#) workflow.

Note: Use the ASM instance in your environment as the deployment's target.

Scenario: Roll back patch in a Grid cluster or Grid Standalone environment show

In this scenario, the workflow rolls back the patch from the Grid Infrastructure (cluster or Standalone), the Database Homes, and all associated databases.

| Parameter Name | Description |
|----------------|--|
| Patch Archive | Patch archive file of the applied patch to roll back from the Oracle Grid and databases. Example: p17272829_121010_Linux-x86-64.zip |

Be sure that the default values for all remaining input parameters are appropriate for your environment (see ["Parameters for Oracle - Rollback Patch from Grid Infrastructure and Database"](#) on the next page).

Parameters for Oracle - Rollback Patch from Grid Infrastructure and Database

The following tables describe the required and optional input parameters for this workflow. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Input Parameters Defined in this Step: Gather Parameters for Rollback Patch from Grid Infrastructure and Databases

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Patch Archive | no default | required | Patch archive file of the applied patch to roll back from the Oracle Grid and databases. |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Grid Infrastructure and Databases

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| Cleanup | True | optional | If true, the workflow will cleanup downloaded and extracted files upon completion. Valid values are True and False. |
| Download Location | /tmp | optional | Location where all files where files will be downloaded or they already exist. |
| Extract Location | /tmp | optional | Directory location where the ZIP archives will be extracted. |
| Grid Nodes | no default | optional | Comma separated list of nodes that are part of a Grid Infrastructure environment. By default, the nodes are discovered by <code>olsnodes</code> and then all nodes are rolled back. |
| Ignorable Oracle Errors | no default | optional | A comma-separated list of Oracle errors to be ignored when applying the patch to the database. This is in addition to the list of Oracle errors specified in the patch readme file. Values are of the form <code>ORA-nnnnn</code> . For example: <code>ORA-04020,ORA-03113</code> |
| OCM Response File | no default | optional | Path name of the Oracle Configuration Manager (OCM) response file. If not found on |

Additional Input Parameters Defined in this Step: Gather Advanced Parameters for Rollback Patch from Grid Infrastructure and Databases, continued

| Parameter Name | Default Value | Required | Description |
|-----------------------------|---------------|------------|---|
| | | | the target, this file is downloaded from the software repository. If left blank, a default response file will be created. |
| Oracle Database Homes | ALL | optional | Oracle Database Homes to roll back along with the Oracle Grid. Valid values are ALL, NONE, INCLUDE: followed by a comma separated list of Oracle Homes to roll back with the Oracle Grid, and EXCLUDE: followed by a comma separated list of Oracle Homes to exclude from the rollback process. |
| Preparatory SQL | no default | optional | File name that contains SQL statements that must be run before the database catalog update. This file is passed directly to SQLPlus and must be formatted as such. If not found on the target, it is downloaded from the software repository. |
| Run Database View Recompile | False | deprecated | If set to true, the Database View Recompile step will be run. Valid values are True and False. |
| Trust SSL Certificates | no default | deprecated | HPE DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HPE DMA web service. HPE DMA uses the following parameter in the dma.xml file: <pre><Parameter name="com.hp.dma.conn.trustAllCertificates" values="VALUE" /></pre> Here, VALUE is true or false. |
| Web Service Password | no default | optional | Password for the HPE DMA Discovery web service API. |
| Web Service URL | no default | optional | URL for the HPE DMA Discovery web service API. |
| Web Service User | no default | optional | User who is capable of modifying the managed environment by using the HPE DMA Discovery web service API. |

Refreshing Database

Each workflow included in this solution pack has a set of **input parameters** whose values will be unique to your environment. If you provide correct values for the parameters that each scenario requires, the workflow will be able to accomplish its objective.

Tip: Input parameters are described in the "Parameters" topic for each workflow.

There are two steps required to customize this solution:

1. Ensure that all required parameters are visible. You do this by using the **workflow editor**.
To perform a simple database refresh, you can use the default values for most parameters. To use more advanced features of this solution, you will need to expose additional parameters.
2. Specify the values for those parameters. You do this when you create a **deployment**.

Note: Each of these steps is explained in greater detail in the "How to Use this Workflow" topic for each workflow.

The information presented here assumes the following:

- HPE DMA is installed and operational.
- At least one suitable target server is available.
- You are logged in to the HPE DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

Oracle - Extract Database via RMAN

This workflow performs a full database backup using Oracle Recovery Manager (RMAN) for the purpose of performing a database refresh. The RMAN backup set files can be stored in the local file system or on a network share.

RMAN stores an image of the database. It optimizes both speed and space consumption, and it performs block-level corruption detection during both the backup and restore phases of a database refresh.

Note: You cannot use this workflow to perform a cross-platform database refresh (for example: Linux to Solaris). You must use the Oracle Data Pump workflows included in this solution pack if you want to perform a cross-platform refresh.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Extract Database via RMAN" | List of input parameters for this workflow |

Note: To view the steps included in this workflow, see the [Steps for Oracle - Extract Database via RMAN](#).

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Extract Database via RMAN"](#) workflow:

1. The HPE DMA client must be installed on all target servers.
2. The Target Directory must exist prior to the execution of the workflow. This directory can be local, or it can be a Network File System (NFS) mount point.

Note: If you specify an NFS mount point, the pertinent NFS share must be available to the target server, and it must be mounted prior to running this workflow.

3. The specified Oracle Database user must have READ and WRITE permission for the specified Target Directory.
4. The Oracle Database software must be provisioned, and the database must exist in the target instance prior to workflow execution.

Note: For RMAN backup files, the destination database structure, database name, and Oracle SID must match that of the source.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

This topic contains the following information about the "[Oracle - Extract Database via RMAN](#)" workflow:

Overview show

This workflow performs a full database backup using Oracle Recovery Manager (RMAN) for the purpose of performing a database refresh. You can instruct the workflow to store the RMAN backup set files in the local file system or on a network share.

You can use this workflow as part of a database refresh process. Database refresh involves moving the contents of a database in one Oracle instance into a database in another Oracle instance. This is useful, for example, if you want to move a database from a traditional IT infrastructure to a private cloud. It is also useful if you want to duplicate production data in a test environment for application development or troubleshooting purposes.

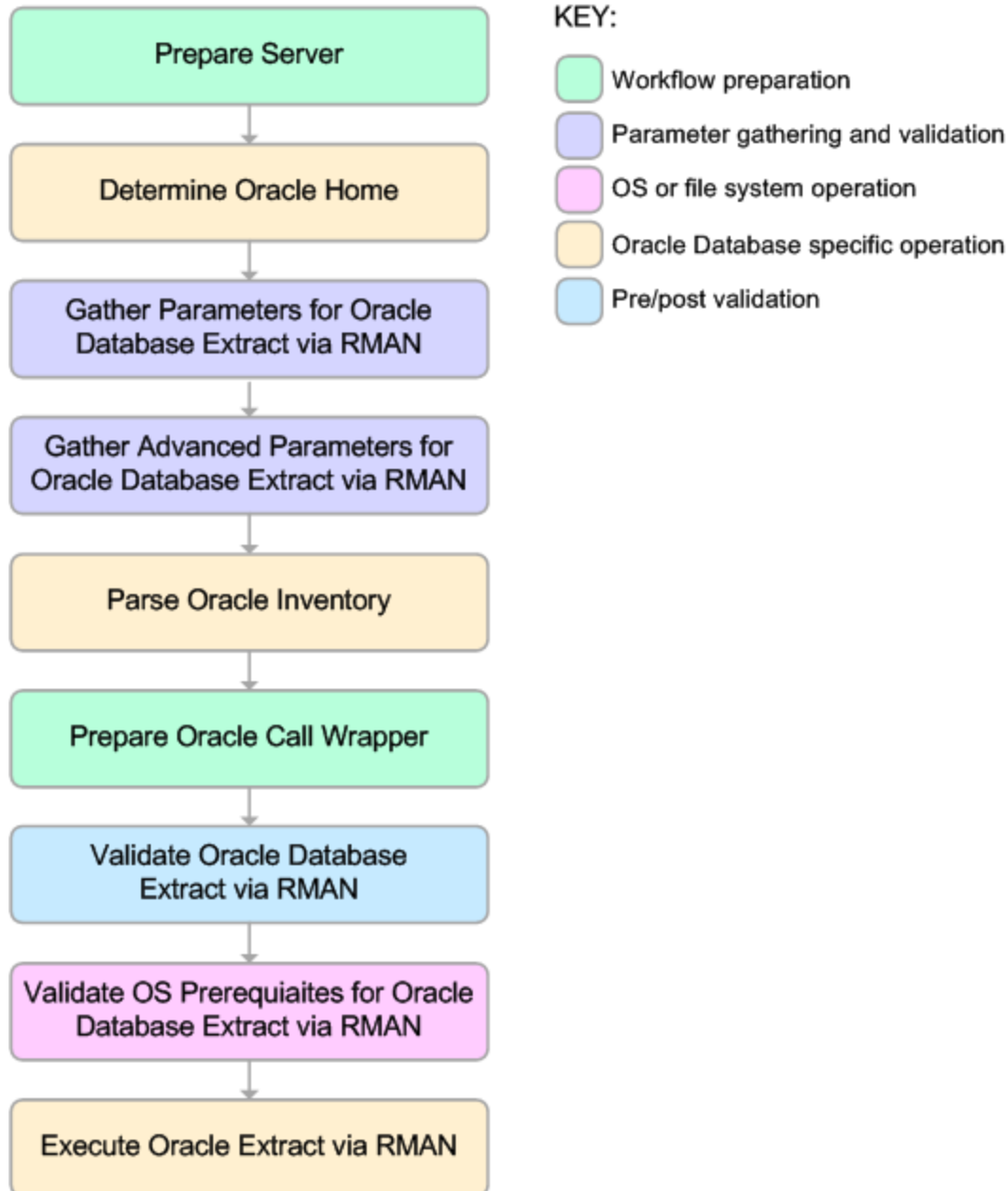
Validation Checks Performed show

The workflow validates the following conditions:

1. The Oracle Home derived in the Determine Oracle Home step is a fully qualified path that exists on the target server.
2. The specified Target Directory exists, either locally or on a network share, and is writable.
3. The following system utilities are available: `ar`, `make`, `ls`, `nm`, `unzip`, and `mkdir`.
4. The workflow can connect to the Oracle SID derived in the Determine Oracle Home step.
5. All specified Ignorable Oracle Errors can safely be ignored.
6. The specified Tag Name parameter is not an empty string.
7. The specified Max Piece Size is at least 40 KByte and less than 16 TByte.

Steps Executed show

The "Oracle - Extract Database via RMAN" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



Process Flow show

This workflow performs the following tasks:

1. Determines the target server platform type, and identifies the server call wrapper.
2. Determines the Oracle Home path by reading the `oratab` file.
3. Gathers all required and optional parameters.
4. Determines the OS owner of the Oracle Home directory.
5. Prepares the instance call wrapper based on the specified Oracle User.
6. Validates all parameter values specified or derived.
7. Performs the RMAN backup.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Extract Database via RMAN"](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Extract Database via RMAN" on page 138](#)

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#), and ensure that all requirements are satisfied.

To use the Oracle - Extract Database via RMAN workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters: show

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|--|
| Oracle User | oracle | required | Oracle user that owns the ORACLE_HOME on the target Oracle database server. This user will perform the RMAN backup. |
| Target Directory | no default | required | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |

Note: This is the minimum set of parameters required to run this workflow. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Extract Database via RMAN" on page 138](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).

5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following database backup scenarios in your environment using the ["Oracle - Extract Database via RMAN"](#) workflow:

Scenario 1: Create a Backup Set on the Local File System

This is the simplest RMAN extract scenario. In this example, the backup set is stored on the local file system. The parameters shown here are visible by default.

| Parameter Name | Example Value | Description |
|------------------|---------------------------------------|--|
| Oracle User | oracle | Oracle user that owns the ORACLE_HOME on the target Oracle database server. This user will perform the RMAN backup. |
| Target Directory | /var/bckp/April2012/ rman_04032012 | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Extract Database via RMAN"](#)).

Scenario 2: Create a Backup Set on a Network Share

In this example, the backup set is stored on a network share. The parameters shown here are visible by default.

| Parameter Name | Example Value | Description |
|------------------|--|--|
| Oracle User | oracle | Oracle user that owns the ORACLE_HOME on the target Oracle database server. This user will perform the RMAN backup. |
| Target Directory | myfileservr.mycompany.com: /u01/nfs_share | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Extract Database via RMAN"](#)).

Scenario 3: Create a Backup Set Using Non-Default Parameters

In this example, the backup set is stored on the local file system. The first two parameters listed are visible by default; the remaining parameters must be exposed in the workflow so that they are available in the deployment.

| Parameter Name | Example Value | Description |
|-------------------------|--|---|
| Oracle User | oracle | Oracle user that owns the ORACLE_HOME on the target Oracle database server. This user will perform the RMAN backup. |
| Target Directory | /var/bckp/April2012/ rman_04032012 | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |
| Ignorable Oracle Errors | ORA-39083, ORA-00959, ORA-01917, ORA-01918, ORA-01435 | Comma delimited list of Oracle errors to ignore while executing the RMAN backup. The workflow always ignores ORA-39083, ORA-00959, ORA-01917, ORA-01918, ORA-01435, ORA-00942, ORA-31693, and ORA-20000. The workflow generates a warning but does not fail if it encounters LRM-00101, ORA-39000, ORA-31640, ORA-27037, ORA-31641, or ORA-27038. |
| Max Piece Size | 2G | Maximum size (in MB) of an RMAN backup set piece (physical file). |
| Tag Name | FULL DATABASE BACKUP, FULLDB-BACKUP, ARCHIVED LOGS BACKUP, DMA REFRESH | A text string assigned to this backup. |
| Temporary File Location | /var/temp/ rman_temp_files | Location to store temporary files while the workflow is running. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Extract Database via RMAN"](#)).

Parameters for Oracle - Extract Database via RMAN

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters whose values are derived in one step and consumed by another step are not shown here.

Parameters Defined in this Step: Gather Parameters for Oracle Database Extract via RMAN

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|--|
| Oracle User | oracle | required | Oracle user that owns the ORACLE_HOME on the target Oracle database server. This user will perform the RMAN backup. |
| Target Directory | no default | required | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Extract via RMAN

| Parameter Name | Default Value | Required | Description |
|-------------------------|---|----------|--|
| Ignorable Oracle Errors | ORA-31684,ORA-39111,ORA-39151,ORA-31685,ORA-00001,RMAN-00571,RMAN-00569,RMAN-03002,RMAN-06054 | optional | Comma delimited list of Oracle errors to ignore while executing the RMAN backup. The workflow always ignores ORA-39083, ORA-00959,ORA-01917,ORA-01918,ORA-01435,ORA-00942,ORA-31693, and ORA-20000. The workflow generates a warning but does not fail if it encounters LRM-00101, ORA-39000, ORA-31640, ORA-27037, ORA-31641, or ORA-27038. |
| Max Piece Size | 1048576 | optional | Maximum size (in MB) of an RMAN backup set piece (physical file). |
| Tag Name | DMA Refresh | optional | A text string assigned to this backup. |
| Temporary File Location | no default | optional | Location to store temporary files while the workflow is running. |

Additional Parameter Defined in this Step: Parse Oracle Inventory

| Parameter Name | Default Value | Required | Description |
|-----------------|-----------------|----------|---|
| Inventory Files | see description | optional | <p>Comma separated list of Oracle inventory file names (with absolute paths). If not specified, set to the appropriate default value for the target server operating system. Defaults are:</p> <p>Solaris: /var/opt/oracle/oraInst.loc</p> <p>Linux: /etc/oraInst.loc</p> <p>Windows: %ProgramFiles%\Oracle\Inventory</p> |

Oracle - Refresh Database via RMAN

This workflow restores an Oracle database from a previously created RMAN backup set. The backup set files can be located in the local file system or on a network share.

Note: You cannot use this workflow to perform a cross-platform database refresh (for example: Linux to Solaris). You must use the Oracle Data Pump workflows included in this solution pack if you want to perform a cross-platform refresh.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Refresh Database via RMAN" | List of input parameters for this workflow |

Note: To view the steps included in this workflow, see the [Steps for Oracle - Refresh Database via RMAN](#).

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Refresh Database via RMAN"](#) workflow:

1. The HPE DMA client must be installed on all target servers.
2. The Target Directory must exist prior to the execution of the workflow. This directory can be local, or it can be a Network File System (NFS) mount point.

Note: If you specify an NFS mount point, the pertinent NFS share must be available to the target server, and it must be mounted prior to running this workflow.

3. The specified Oracle Database user must have READ and WRITE permission for the specified Target Directory.
4. The Oracle Database software must be provisioned, and the database must exist in the target instance prior to workflow execution.

Note: For RMAN backup files, the destination database structure, database name, and Oracle SID must match that of the source.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

This topic contains the following information about the "[Oracle - Refresh Database via RMAN](#)" workflow:

Overview

This workflow performs a full RMAN database restore from a previously created RMAN backup set. A backup set contains an image that incorporates data from the following sources:

- Data files
- Archived redo log files
- Control files
- Server parameter files

The backup set can be located in the local file system or on a network share.

You can use this workflow as part of a database refresh process. Database refresh involves moving the contents of a database in one Oracle instance into a database in another Oracle instance. This is useful, for example, if you want to move a database from a traditional IT infrastructure to a private cloud. It is also useful if you want to duplicate production data in a test environment for application development or troubleshooting purposes.

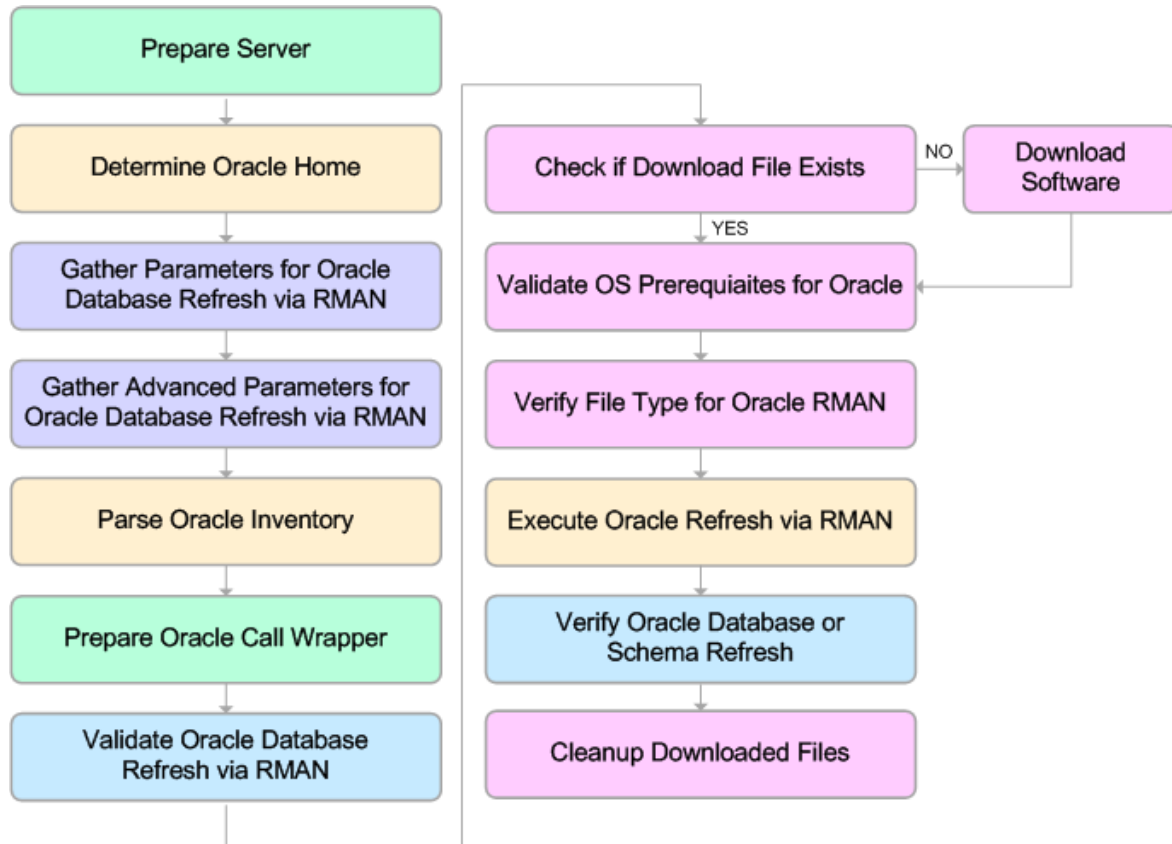
Validation Checks Performed show

The workflow validates the following conditions:

1. The database to be restored is shut down.
2. The specified Target Directory exists, either locally or on a network share, and is writable.
3. The following system utilities are available: `ar`, `make`, `ls`, `nm`, `unzip`, and `mkdir`.
4. The specified Oracle Home exists and is, in fact, an Oracle home.
5. The workflow can connect to the specified Oracle SID in the specified Oracle Home.
6. The specified RMAN Archive Logs, RMAN Control File, and RMAN Data Files exist and have the proper format.
7. All specified Ignorable Oracle Errors can safely be ignored.
8. If a Verification SQL Script is specified, both that file and the Verification Result file exist.
9. The OS platform and Oracle Database version are supported by HPE DMA.
10. Sufficient disk space is available to perform the database restore.

Steps Executed show

The "Oracle - Refresh Database via RMAN" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



KEY:

- Workflow preparation
- Parameter gathering and validation
- OS or file system operation
- Oracle Database specific operation
- Pre/post validation

Process Flow show

This workflow performs the following tasks:

1. Determines the target server platform type, and identifies the server call wrapper.
2. Gathers all required and optional parameters.
3. Determines the OS owner of the Oracle Home directory.
4. Prepares the instance call wrapper based on the specified Oracle Account.
5. Validates all parameter values specified or derived.
6. Determines whether the RMAN backup set files already exist on the target server. If the files do not yet exist, the workflow downloads them from the software repository.
7. Determines whether sufficient disk space is available to restore the database from the backup set.
8. Verifies that the specified backup set files constitute a valid RMAN backup set.
9. Performs the RMAN restore.
10. Verifies that the database was successfully restored by ensuring that the following conditions are true:
 - The database is accessible.
 - Temporary tablespace has been created.
 - No tablespaces are in backup mode.
11. Runs the Verification SQL Script (if specified), and compares the result to the specified Verification Result file.
12. Removes any files downloaded to facilitate this restore.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following database backup scenarios in your environment using the "Oracle - Refresh Database via RMAN" workflow:

Scenario 1: Restore from a Backup Set on the Local File System

This is the simplest RMAN refresh scenario. In this example, the backup set is downloaded to the local file system. The parameters shown here are visible by default.

In this scenario, the Refresh Oracle Database via RMAN workflow uses extracted files from an RMAN backup. These are files that were generated by using the Extract Oracle Database via RMAN workflow or by using the RMAN backup utility. The Database ID parameter represents the Database Identification of the source Oracle database.

The workflow has additional input parameters that can be exposed and specified as needed. For example, you may want to use an encrypted RMAN backup file or increase the number of channels to speed up the refresh process.

| Parameter Name | Example Value | Description |
|-------------------|---|---|
| Oracle Account | oracle | The ORACLE_HOME to use if more than one home is found in the inventory file (or files). |
| RMAN Archive Logs | /var/tmp/rman_dump/ my_archive.log.bak | Archived redo log files that were generated from the source database. These redo logs are applied as part of the RMAN restore. Separate multiple files with commas. Include the full path where each file is located. For example: /home/oracle/DbRefresh/RMAN/ archive_log_DB2_04n11fnh.bak |
| RMAN Control File | /var/tmp/rman_dump/ my_controlfile.ora | Control File generated from the source database. |
| RMAN Data Files | /var/tmp/rman_dump/ my_datafile.bkp | RMAN backup data files created from the source database where the RMAN backup was performed. Separate multiple files with commas. |
| Target Directory | /var/tmp/rman_dump | Directory on the target database server where the RMAN backup files will be downloaded. This directory must exist prior to workflow execution. The Oracle Account user must have READ and WRITE access to this directory. |
| Database ID | 1935744575 | Database ID of the source database used to create the RMAN backup files. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see Parameters for Oracle - Refresh Database via RMAN).

Scenario 2: Restore from a Backup Set on a Network Share

In this example, the backup set is downloaded to a network share. Restoring from a backup set stored on a network share alleviates the need to transfer files onto the target database servers.

The parameters shown here are visible by default. The workflow has additional parameters that can be modified to best fit any particular refresh scenario. For example, you can specify encryption parameters, ignore errors generated by the Oracle RMAN utility that do not affect the database refresh, or turn on and tune additional channels to speed up the refresh process.

| Parameter Name | Example Value | Description |
|-------------------|--|---|
| Oracle Account | oracle | The ORACLE_HOME to use if more than one home is found in the inventory file (or files). |
| RMAN Archive Logs | /var/tmp/rman_dump/ my_archivelog.bak | Archived redo log files that were generated from the source database. These redo logs are applied as part of the RMAN restore. Separate multiple files with commas. Include the full path where each file is located. For example: /home/oracle/DbRefresh/RMAN/ archive_log_DB2_04n11fnh.bak |
| RMAN Control File | /var/tmp/rman_dump/ my_controlfile.ora | Control File generated from the source database. |
| RMAN Data Files | /var/tmp/rman_dump/ my_datafile.bkp | RMAN backup data files created from the source database where the RMAN backup was performed. Separate multiple files with commas. |
| Target Directory | myfileservr.mycompany.com: /uo1/nfs_share | Directory on the target database server where the RMAN backup files will be downloaded. This directory must exist prior to workflow execution. The Oracle Account user must have READ and WRITE access to this directory. |
| Database ID | 1935744575 | Database ID of the source database used to create the RMAN backup files. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see Parameters for Oracle - Refresh Database via RMAN).

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Refresh Database via RMAN"](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Refresh Database via RMAN" on page 149](#)

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#), and ensure that all requirements are satisfied.

To use the Oracle - Refresh Database via RMAN workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

| Parameter Name | Default Value | Required | Description |
|-------------------|---------------|----------|---|
| Oracle Account | oracle | optional | Oracle user that owns the ORACLE_HOME on the target Oracle database server where the RMAN backup will be restored. This user will perform the RMAN restore. Required if inventory does not exist. Leave blank for windows. |
| RMAN Archive Logs | no default | required | Archived redo log files that were generated from the source database. These redo logs are applied as part of the RMAN restore. Separate multiple files with commas. Include the full path where each file is located. For example: <code>/home/oracle/DbRefresh/RMAN/archivelog_DB2_04n11fnh.bak</code> |
| RMAN Control File | no default | required | Control File generated from the source database. |
| RMAN Data Files | no default | required | RMAN backup data files created from the source database where the RMAN backup was performed. Separate multiple files with commas. |

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|---|
| Target Directory | no default | required | Directory on the target database server where the RMAN backup files will be downloaded. This directory must exist prior to workflow execution. The Oracle Account user must have READ and WRITE access to this directory. |
| Database ID | no default | required | Database ID of the source database used to create the RMAN backup files. |

Note: This is the minimum set of parameters required to run this workflow. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Refresh Database via RMAN" on the next page](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Parameters for Oracle - Refresh Database via RMAN

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters whose values are derived in one step and consumed by another step are not shown here.

Parameters Defined in this Step: Gather Parameters for Oracle Database Refresh via RMAN

| Parameter Name | Default Value | Required | Description |
|-------------------|-----------------|----------|--|
| Inventory Files | see description | optional | Comma separated list of Oracle inventory file names (with absolute paths). If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc Windows: %ProgramFiles%\Oracle\Inventory |
| Oracle Account | oracle | optional | Oracle user that owns the ORACLE_HOME on the target Oracle database server where the RMAN backup will be restored. This user will perform the RMAN restore. Required if inventory does not exist. Leave blank for windows. |
| Oracle Home | no default | optional | The ORACLE_HOME to use if more than one home is found in the inventory file (or files). |
| Oracle SID | no default | required | The Oracle System ID (SID) of the target database. |
| RMAN Archive Logs | no default | required | Archived redo log files that were generated from the source database. These redo logs are applied as part of the RMAN restore. Separate multiple files with commas. Include the full path where each file is located. For example: /home/oracle/DbRefresh/RMAN/ archive_log_DB2_04n11fnh.bak |
| RMAN Control File | no default | required | Control File generated from the source database. |
| RMAN Data Files | no default | required | RMAN backup data files created from the source database where the RMAN backup was performed. Separate multiple files with commas. |

Parameters Defined in this Step: Gather Parameters for Oracle Database Refresh via RMAN, continued

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|---|
| Target Directory | no default | required | Directory on the target database server where the RMAN backup files will be downloaded. This directory must exist prior to workflow execution. The Oracle Account user must have READ and WRITE access to this directory. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via RMAN

| Parameter Name | Default Value | Required | Description |
|-------------------------|--|----------|--|
| Ignorable Oracle Errors | ORA-31684,ORA-39111,ORA-39151,ORA-31685,ORA-00001,RMAN-06497,RMAN-00571,RMAN-00569,RMAN-03002,RMAN-06054 | optional | <p>Comma delimited list of Oracle errors to ignore while executing the RMAN restore.</p> <p>The workflow always ignores ORA-39083, ORA-00959,ORA-01917,ORA-01918,ORA-01435,ORA-00942,ORA-31693, and ORA-20000.</p> <p>The workflow generates a warning but does not fail if it encounters LRM-00101, ORA-39000, ORA-31640, ORA-27037, ORA-31641, or ORA-27038.</p> |
| Verification Result | no default | optional | <p>Name (with absolute path) of a text file containing the expected results of the SQL queries included in the Verification SQL Script.</p> <p>This parameter is required if you provide a Verification SQL Script. Be sure to run the Verification SQL Script on the SOURCE database before running this workflow, and copy the results into this file.</p> <p>You must provide this file in a location where the workflow can access it.</p> |
| Verification SQL Script | no default | optional | <p>Name (with absolute path) of a text file containing a SQL script that verifies the following:</p> <ul style="list-style-type: none"> • The import operation was successful. • No data is missing. |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via RMAN, continued

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| | | | You must provide this file in a location where the workflow can access it. The expected results of the queries included in this script must be provided in the Verification Result file. |

Additional Parameters Defined in this Step: Verify File Type for Oracle RMAN

| Parameter Name | Default Value | Required | Description |
|----------------|---|----------|--|
| RMAN Tags | FULL DATABASE BACKUP,FULLDB-BACKUP,ARCHIVED LOGS BACKUP,DMA REFRESH | optional | <p>Tags to search for in the specified RMAN backup files. Separate multiple tags with commas.</p> <p>You can assign a tag when you perform an RMAN backup on the source database (see "Oracle - Extract Database via RMAN" on page 129).</p> |

Additional Parameters Defined in this Step: Execute Oracle Refresh via RMAN

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Database ID | no default | required | Database ID of the source database used to create the RMAN backup files. |

Oracle - Extract and Refresh Database via RMAN

This workflow performs a database refresh using Oracle Recovery Manager (RMAN) to first perform a full database backup on the SOURCE database and then perform a full database restore on the DESTINATION database.

RMAN stores an image of the database. It optimizes both speed and space consumption, and it performs block-level corruption detection during both the backup and restore phases of a database refresh.

Note: You cannot use this workflow to perform a cross-platform database refresh (for example: Linux to Solaris). You must use the Oracle Data Pump workflows included in this solution pack if you want to perform a cross-platform refresh.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Extract and Refresh Database via RMAN" | List of input parameters for this workflow |

Note: To view the steps included in this workflow, see the [Steps for Oracle - Extract and Refresh Database via RMAN](#).

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Extract and Refresh Database via RMAN"](#) workflow:

1. The HPE DMA client must be installed on all target servers.
2. The Target Directory must exist prior to the execution of the workflow. This directory can be local, or it can be a Network File System (NFS) mount point.

Note: If you specify an NFS mount point, the pertinent NFS share must be available to the target server, and it must be mounted prior to running this workflow.

3. The specified Oracle Database user must have READ and WRITE permission for the specified Target Directory.
4. The Oracle Database software must be provisioned, and the database must exist in the target instance prior to workflow execution.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

This topic contains the following information about the "[Oracle - Extract and Refresh Database via RMAN](#)" workflow:

Overview show

This workflow performs a database refresh using Oracle Recovery Manager (RMAN) to first perform a full database backup on the SOURCE database and then perform a full database restore on the DESTINATION database.

RMAN stores an image of the database. It optimizes both speed and space consumption, and it performs block-level corruption detection during both the backup and restore phases of a database refresh.

Note: You cannot use this workflow to perform a cross-platform database refresh (for example: Linux to Solaris). You must use the Oracle Data Pump workflows included in this solution pack if you want to perform a cross-platform refresh.

Validation Checks Performed show

The workflow first validates the following conditions for the SOURCE database:

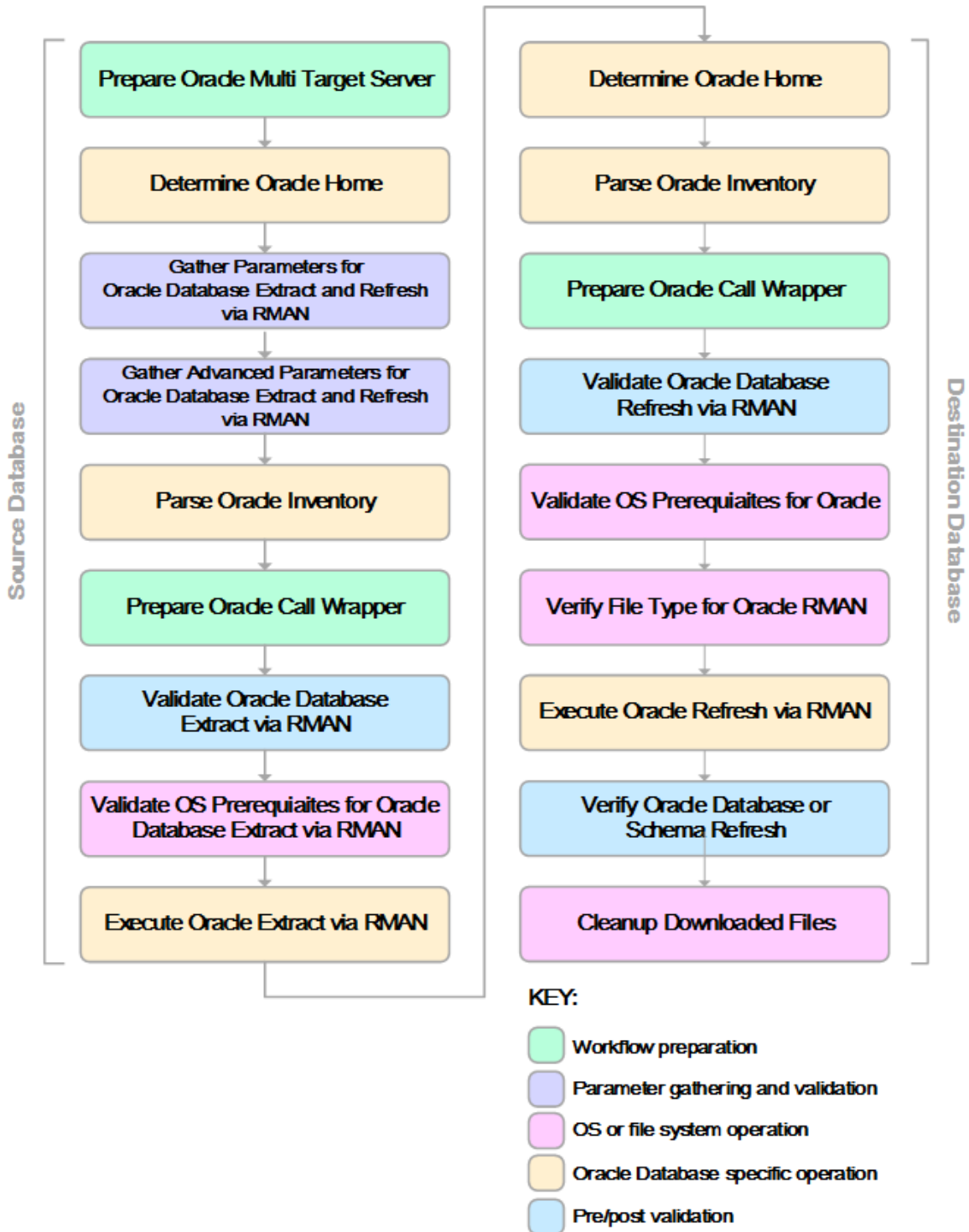
1. The Oracle Home derived in the Determine Oracle Home step is a fully qualified path that exists on the target server.
2. The specified Target Directory exists, either locally or on a network share, and is writable.
3. The following system utilities are available: `ar`, `make`, `ls`, `nm`, `unzip`, and `mkdir`.
4. The workflow can connect to the Oracle SID derived in the Determine Oracle Home step.
5. All specified Ignorable Oracle Errors can safely be ignored.
6. The specified Tag Name parameter is not an empty string.
7. The specified Max Piece Size is at least 40 KByte and less than 16 TByte.

The workflow validates the following conditions for the DESTINATION database:

1. The database to be restored is shut down.
2. The specified Target Directory exists, either locally or on a network share, and is writable.
3. The following system utilities are available: `ar`, `make`, `ls`, `nm`, `unzip`, and `mkdir`.
4. The specified Oracle Home exists and is, in fact, an Oracle home.
5. The workflow can connect to the specified Oracle SID in the specified Oracle Home.
6. The specified RMAN Archive Logs, RMAN Control File, and RMAN Data Files exist and have the proper format.
7. All specified Ignorable Oracle Errors can safely be ignored.
8. If a Verification SQL Script is specified, both that file and the Verification Result file exist.
9. The OS platform and Oracle Database version are supported by HPE DMA.
10. Sufficient disk space is available to perform the database restore.

Steps Executed show

The "Oracle - Extract and Refresh Database via RMAN" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



Process Flow show

This workflow first performs the following tasks on the SOURCE database:

1. Determines the target server platform type, and identifies the server call wrapper.
2. Determines the Oracle Home path by reading the `oratab` file.
3. Gathers all required and optional parameters.
4. Determines the OS owner of the Oracle Home directory.
5. Prepares the instance call wrapper based on the specified Oracle User.
6. Validates all parameter values specified or derived.
7. Performs the RMAN backup.

The workflow then performs the following tasks on the DESTINATION database:

1. Determines the OS owner of the Oracle Home directory.
2. Prepares the instance call wrapper based on the specified Oracle Account.
3. Validates all parameter values specified or derived.
4. Determines whether the RMAN backup set files already exist on the target server. If the files do not yet exist, the workflow downloads them from the software repository.
5. Determines whether sufficient disk space is available to restore the database from the backup set.
6. Verifies that the specified backup set files constitute a valid RMAN backup set.
7. Performs the RMAN restore.
8. Verifies that the database was successfully restored by ensuring that the following conditions are true:
 - The database is accessible.
 - Temporary tablespace has been created.
 - No tablespaces are in backup mode.
9. Runs the Verification SQL Script (if specified), and compares the result to the specified Verification Result file.
10. Removes any files downloaded to facilitate this restore.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Extract and Refresh Database via RMAN"](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Extract and Refresh Database via RMAN" on page 164](#)

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#), and ensure that all requirements are satisfied.

To use the Oracle - Extract and Refresh Database via RMAN workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters: show

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| ALL - Target Directory | no default | required | Directory where the RMAN backup files will be placed on the SOURCE database server and subsequently downloaded on DESTINATION database server. This directory must be the same on both the SOURCE and DESTINATION servers. The directory must exist on both servers before the workflow runs, and it must be accessible to the Oracle Account user. |
| EXPORT - Oracle User | no default | required | Oracle user that owns the ORACLE_HOME on the SOURCE Oracle database server. This user will perform the RMAN backup. |
| IMPORT - Oracle Account | no default | optional | Oracle user that owns the ORACLE_HOME on the DESTINATION database server. This user will perform the RMAN restore. |

Note: This is the minimum set of parameters required to run this workflow. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Extract and Refresh Database via RMAN" on page 164](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for

these parameters when you create the deployment.

4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
 - a. On the Targets tab, select all the target servers—both source and destination—that will participate in this database refresh. The targets that you select here will be available in the Target Parameters drop-down menus on the Run page (see [step 7](#)).
 - b. On the Parameters tab, specify values for the required parameters listed in [step 2](#) and any additional parameters that you exposed in [step 3](#). You do not need to specify values for those parameters whose default values are appropriate for your environment.
6. Save the deployment (click **Save** in the lower right corner).
7. Run the workflow using this deployment.

On the Run page, select the following targets from the respective drop-down menus:

| Parameter Name | Default | Description |
|----------------|------------|---|
| Source | no default | Instance that contains the database whose contents will be extracted. |
| Destination | no default | Instance where the database will be restored. |

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following database backup scenarios in your environment using the ["Oracle - Extract and Refresh Database via RMAN"](#) workflow:

Scenario 1: Store the Backup Set on the Local File System

This is the simplest RMAN extract and refresh scenario. In this example, the backup set is stored on the local file system of the SOURCE database server. The backup set files are then downloaded to the same location in the local file system of the DESTINATION database server. The parameters shown here are visible by default.

| Parameter Name | Example Value | Description |
|-------------------------|--|---|
| ALL - Target Directory | <code>/var/bckp/April2012/rman_04032012</code> | Directory where the RMAN backup files will be placed on the SOURCE database server and subsequently downloaded on DESTINATION database server. This directory must be the same on both the SOURCE and DESTINATION servers. The directory must exist on both servers before the workflow runs, and it must be accessible to the Oracle Account user. |
| EXPORT - Oracle User | <code>oracle</code> | Oracle user that owns the ORACLE_HOME on the SOURCE Oracle database server. This user will perform the RMAN backup. |
| IMPORT - Oracle Account | <code>oracle</code> | Oracle user that owns the ORACLE_HOME on the DESTINATION database server. This user will perform the RMAN restore. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Extract and Refresh Database via RMAN"](#)).

Scenario 2: Store the Backup Set on a Network Share

In this example, the backup set is stored on a network share that both the SOURCE and DESTINATION database servers can access. The parameters shown here are visible by default.

| Parameter Name | Example Value | Description |
|-------------------------|--|---|
| ALL - Target Directory | myfileservr.mycompany.com: /uo1/nfs_share | Directory where the RMAN backup files will be placed on the SOURCE database server and subsequently downloaded on DESTINATION database server. This directory must be the same on both the SOURCE and DESTINATION servers. The directory must exist on both servers before the workflow runs, and it must be accessible to the Oracle Account user. |
| EXPORT - Oracle User | oracle | Oracle user that owns the ORACLE_HOME on the SOURCE Oracle database server. This user will perform the RMAN backup. |
| IMPORT - Oracle Account | oracle | Oracle user that owns the ORACLE_HOME on the DESTINATION database server. This user will perform the RMAN restore. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Extract and Refresh Database via RMAN"](#)).

Scenario 3: Create a Backup Set Using Non-Default Parameters

In this example, the backup set is stored on the local file systems. The first two parameters listed are visible by default; the remaining parameters must be exposed in the workflow so that they are available in the deployment.

| Parameter Name | Example Value | Description |
|----------------------------------|--|---|
| ALL - Target Directory | myfileservr.mycompany.com: /uo1/nfs_share | Directory where the RMAN backup files will be placed on the SOURCE database server and subsequently downloaded on DESTINATION database server. This directory must be the same on both the SOURCE and DESTINATION servers. The directory must exist on both servers before the workflow runs, and it must be accessible to the Oracle Account user. |
| EXPORT - Oracle User | oracle | Oracle user that owns the ORACLE_HOME on the SOURCE Oracle database server. This user will perform the RMAN backup. |
| IMPORT - Oracle Account | oracle | Oracle user that owns the ORACLE_HOME on the DESTINATION database server. This user will perform the RMAN restore. |
| ALL - Ignorable Oracle Errors | ORA-39083, ORA-00959, ORA-01917, ORA-01918, ORA-01435 | Comma delimited list of Oracle errors to ignore while executing the RMAN extract and restore operations. The workflow always ignores ORA-39083, ORA-00959, ORA-01917, ORA-01918, ORA-01435, ORA-00942, ORA-31693, and ORA-20000. The workflow generates a warning but does not fail if it encounters LRM-00101, ORA-39000, ORA-31640, ORA-27037, ORA-31641, or ORA-27038. |
| EXPORT - Max Piece Size | 524288 | Maximum size (in MB) of an RMAN backup set piece (physical file). |
| EXPORT - Tag Name | FULL DATABASE BACKUP, FULLDB-BACKUP, ARCHIVED LOGS BACKUP, DMA REFRESH | A text string assigned to this backup. |
| EXPORT - Temporary File Location | /var/temp/ rman_temp_files | Location to store temporary files while the workflow is running. |

| Parameter Name | Example Value | Description |
|----------------------------------|---|---|
| IMPORT - Verification Result | <code>/var/temp/dbrefresh_ver_result.xml</code> | <p>Name (with absolute path) of a text file containing the expected results of the SQL queries included in the Verification SQL Script.</p> <p>This parameter is required if you provide a Verification SQL Script. Be sure to run the Verification SQL Script on the SOURCE database before running this workflow, and copy the results into this file.</p> <p>You must provide this file in a location where the workflow can access it.</p> |
| IMPORT - Verification SQL Script | <code>/var/temp/dbrefresh_ver.sql</code> | <p>Name (with absolute path) of a text file containing a SQL script that verifies the following:</p> <ul style="list-style-type: none"> • The import operation on the DESTINATION database server was successful. • No data is missing. <p>You must provide this file in a location where the workflow can access it. The expected results of the queries included in this script must be provided in the Verification Result file.</p> |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Extract and Refresh Database via RMAN"](#)).

Parameters for Oracle - Extract and Refresh Database via RMAN

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters whose values are derived in one step and consumed by another step are not shown here.

Parameters Defined in this Step: Gather Parameters for Oracle Database Extract and Refresh via RMAN

| Parameter Name | Default Value | Required | Description |
|---------------------------|-----------------|----------|---|
| ALL - Target Directory | no default | required | Directory where the RMAN backup files will be placed on the SOURCE database server and subsequently downloaded on DESTINATION database server. This directory must be the same on both the SOURCE and DESTINATION servers. The directory must exist on both servers before the workflow runs, and it must be accessible to the Oracle Account user. |
| EXPORT - Inventory Files | see description | optional | Comma separated list of Oracle inventory file names (with absolute paths) on the SOURCE database server. Defaults are: Solaris: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc Windows: %ProgramFiles%\Oracle\Inventory |
| EXPORT - Oracle User | no default | required | Oracle user that owns the ORACLE_HOME on the SOURCE Oracle database server. This user will perform the RMAN backup. |
| EXPORT - Target Directory | no default | optional | Directory accessible to the SOURCE database server where the RMAN backup files will be saved. This directory must exist before the workflow runs. The Oracle Account user must have READ and WRITE permissions for this directory. This directory must be also be accessible to the DESTINATION database server. |
| IMPORT - Inventory Files | no default | optional | Comma separated list of Oracle inventory file names (with absolute paths) on the DESTINATION database server. |
| IMPORT - Oracle Account | no default | optional | Oracle user that owns the ORACLE_HOME on the DESTINATION database server. This user will perform the RMAN restore. |

Parameters Defined in this Step: Gather Parameters for Oracle Database Extract and Refresh via RMAN , continued

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| Server Wrapper | jython | required | <p>Command that will be used to construct the call wrapper. The workflow uses the call wrapper to execute subsequent steps as either the OS administrative user or the Oracle user who owns the pertinent ORACLE_HOME. For example:</p> <pre>sudo su - root /opt/hp/dma/client/bin/jython.sh sudo su - sysdba /opt/hp/dma/client/bin/jython.sh</pre> |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Extract and Refresh via RMAN

| Parameter Name | Default Value | Required | Description |
|----------------------------------|--|----------|---|
| ALL - Ignorable Oracle Errors | ORA-31684,ORA-39111,ORA-39151,ORA-31685,ORA-00001,RMAN-06497,RMAN-00571,RMAN-00569,RMAN-03002,RMAN-06054 | optional | <p>Comma delimited list of Oracle errors to ignore while executing the RMAN extract and restore operations.</p> <p>The workflow always ignores ORA-39083, ORA-00959,ORA-01917,ORA-01918,ORA-01435,ORA-00942,ORA-31693, and ORA-20000.</p> <p>The workflow generates a warning but does not fail if it encounters LRM-00101, ORA-39000, ORA-31640, ORA-27037, ORA-31641, or ORA-27038.</p> |
| EXPORT - Max Piece Size | 1048576 | optional | Maximum size (in MB) of an RMAN backup set piece (physical file). |
| EXPORT - Tag Name | DMA Refresh | optional | A text string assigned to this backup. |
| EXPORT - Temporary File Location | no default | optional | Location to store temporary files while the workflow is running. |
| IMPORT - Verification Result | no default | optional | <p>Name (with absolute path) of a text file containing the expected results of the SQL queries included in the Verification SQL Script.</p> <p>This parameter is required if you provide a Verification SQL Script. Be sure to run</p> |

Additional Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Extract and Refresh via RMAN, continued

| Parameter Name | Default Value | Required | Description |
|----------------------------------|---------------|----------|---|
| | | | <p>the Verification SQL Script on the SOURCE database before running this workflow, and copy the results into this file.</p> <p>You must provide this file in a location where the workflow can access it.</p> |
| IMPORT - Verification SQL Script | no default | optional | <p>Name (with absolute path) of a text file containing a SQL script that verifies the following:</p> <ul style="list-style-type: none"> • The import operation on the DESTINATION database server was successful. • No data is missing. <p>You must provide this file in a location where the workflow can access it. The expected results of the queries included in this script must be provided in the Verification Result file.</p> |

Oracle - Export Database via Data Pump

This workflow performs a full database export using the Oracle Data Pump utility for the purpose of performing a database refresh. The Data Pump Export files can be stored in the local file system or on a network share. You can use this workflow to implement a cross-platform database refresh (for example: Linux to Solaris).

Data Pump uses SQL commands to import and export specific data objects. It is slower than the Oracle Recovery Manager (RMAN) but offers more flexibility.

The workflow automatically detects which ORACLE_HOME and ORACLE_SID to use when performing the Data Pump export. You can specify the encryption mode, compression level, and file size to use for the export—be sure to use the same settings for the subsequent import.

You have the option of providing a Data Pump parameter file or entering the parameters on the Deployment page. In either case, the parameter values are validated prior to the Data Pump export. If you do not provide a parameter file, the workflow creates one based on the parameter values that you specify on the Deployment page. If you do not specify a value for a particular parameter, the default value is used (see ["Parameters for Oracle - Export Database via Data Pump" on page 180](#)).

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Export Database via Data Pump" | List of input parameters for this workflow |

Note: The documentation for this workflow refers to the workflow and its steps by their base names. The names in the HPE DMA user interface may have a version appended, for example, v2.

Note: To view the steps included in this workflow, see the [Steps for Oracle - Export Database via Data Pump](#).

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Export Database via Data Pump"](#) workflow:

1. The HPE DMA client must be installed on all target servers.
2. The Target Directory must exist prior to the execution of the workflow. This directory can be local, or it can be a Network File System (NFS) mount point.

Note: If you specify an NFS mount point, the pertinent NFS share must be available to the target server, and it must be mounted prior to running this workflow.

3. The specified Oracle Database user must have READ and WRITE permission for the specified Target Directory.
4. The Oracle Database software must be provisioned, and the database must exist in the target instance prior to workflow execution.

Note: For Data Pump workflows, you must specify the same Content and Encryption Password settings for the export and any subsequent import operations.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

This topic contains the following information about the ["Oracle - Export Database via Data Pump"](#) workflow:

Overview show

This workflow performs a full database export using the Oracle Data Pump utility for the purpose of performing a database refresh. The Data Pump Export files can be stored in the local file system or on a network share. You can use this workflow to implement a cross-platform database refresh (for example: Linux to Solaris).

Data Pump uses SQL commands to import and export specific data objects. It is slower than the Oracle Recovery Manager (RMAN) but offers more flexibility.

The workflow automatically detects which ORACLE_HOME and ORACLE_SID to use when performing the Data Pump export. You can specify the encryption mode, compression level, and file size to use for the export—be sure to use the same settings for the subsequent import.

You have the option of providing a Data Pump parameter file or entering the parameters on the Deployment page. In either case, the parameter values are validated prior to the Data Pump export. If you do not provide a parameter file, the workflow creates one based on the parameter values that you specify on the Deployment page. If you do not specify a value for a particular parameter, the default value is used (see ["Parameters for Oracle - Export Database via Data Pump" on page 180](#)).

You can use this workflow as part of a database refresh process. Database refresh involves moving the contents of a database in one Oracle instance into a database in another Oracle instance. This is useful, for example, if you want to move a database from a traditional IT infrastructure to a private cloud. It is also useful if you want to duplicate production data in a test environment for application development or troubleshooting purposes.

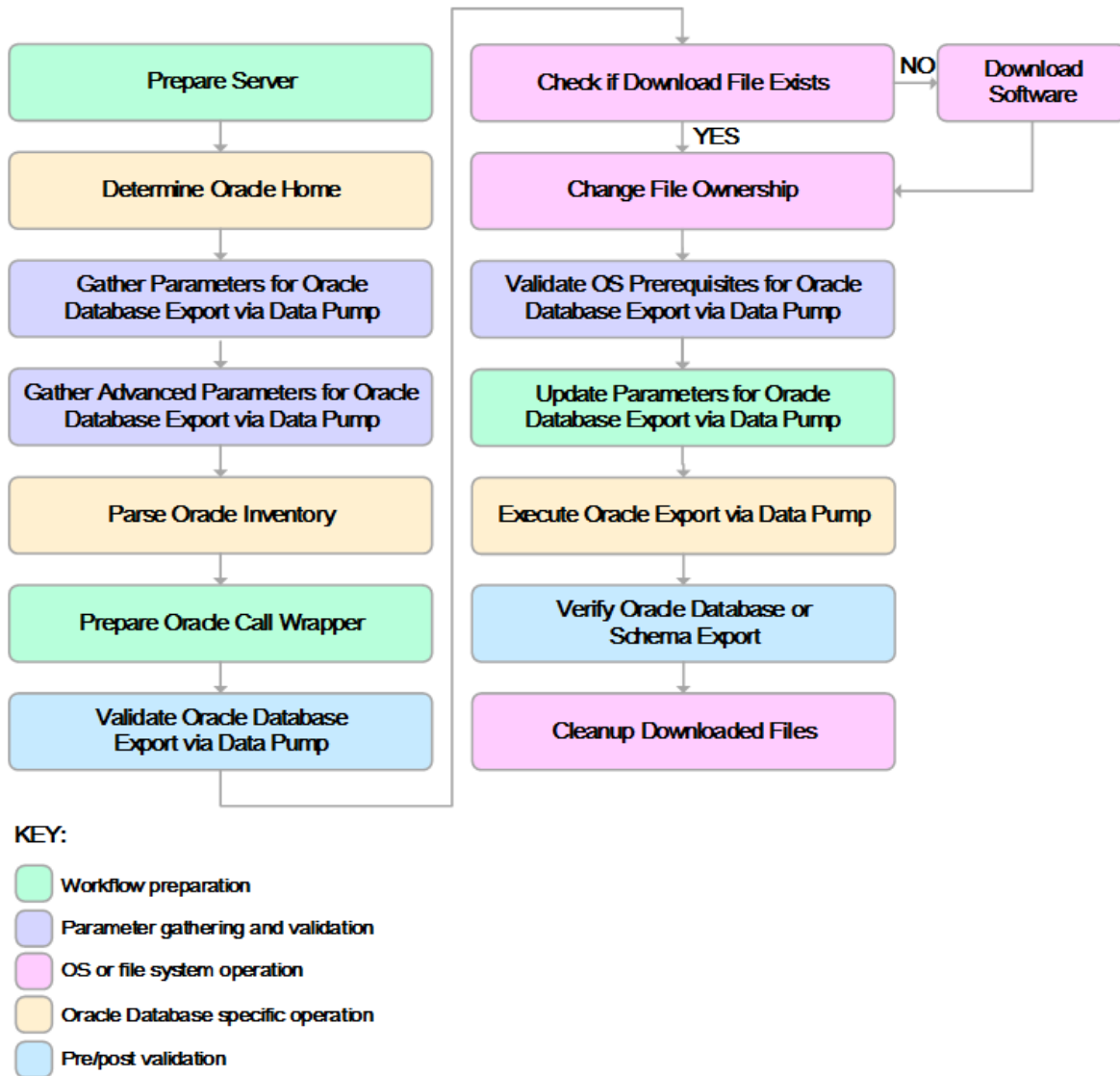
Validation Checks Performed show

The workflow validates the following conditions:

1. The Oracle DB User user can connect to and query the database specified in the Oracle SID.
2. Oracle Database version 10.2 (or later) is installed at the specified (or automatically detected) Oracle Home.
3. For Oracle Database version 11.2 (or later), the Oracle DB User has DATAPUMP_EXP_FULL_DATABASE permission. For earlier supported versions, the Oracle DB User has EXP_FULL_DATABASE permission.
4. The operating system on the target server is a supported HPE DMA platform.
5. A temporary directory required for file storage can be created on the target server.
6. Values specified for parameters are appropriate for the parameters.
7. The specified Ignorable Oracle Errors are, in fact, valid error codes.
8. The specified Data Pump Export File is a valid path and file name.
9. If a Data Pump Parameter file is specified, the file exists in the specified location.
10. If a Data Pump Parameter file is not specified, at least one schema is specified.
11. The specified Target Directory exists, either locally or on a network share, or it can be created.
12. The directory names included in the Do Not Remove list (if any) are valid.
13. The objects in Exclude are mutually exclusive of the objects in Include.
14. Flashback SCN and Flashback Time parameters are not used together. If Flashback Time is specified, it is in the proper time format.

Steps Executed show

The "Oracle - Export Database via Data Pump" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



Process Flow show

This workflow performs the following tasks:

1. Determines the target server platform type, and identifies the server call wrapper.
2. Determines the Oracle Home path and Oracle SID by reading the oratab file.
3. Gathers all required and optional parameters.
4. Determines the OS owner of the Oracle Home directory.
5. Prepares the instance call wrapper based on the specified Oracle User.
6. Validates all parameter values specified or derived.
7. Downloads the Data Pump Parameter File (if specified) from the software repository.
8. Creates a Data Pump parameter file (or updates the existing parameter file) using values specified on the Deployment page. If you do not specify a value for a particular parameter, the default value is used.
9. Performs the Data Pump Export operation. Optionally prints the export log file contents to console and history pages.
10. Verifies that the database is back online after the export:
 - No corrupted blocks exist.
 - No files are in backup mode.
 - Temporary table space is available.
11. Verifies that the Data Pump Export File exists in the Target Directory.
12. Removes any temporary files and directories used to perform the export.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Export Database via Data Pump"](#) workflow in your environment.

The workflow provides default values for most parameters. These default values are usually sufficient for a "typical" export. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Export Database via Data Pump" on page 180](#)

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#), and ensure that all requirements are satisfied.

To use the Oracle - Export Database via Data Pump workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

| Parameter Name | Default Value | Required | Description |
|--------------------------|---------------|----------|--|
| Data Pump Parameter File | no default | optional | Name of the Data Pump Export parameter file that you provide. If you do not specify the absolute path to the Parameter File, the workflow will look for the file in the Target Directory. If you do not specify a Parameter File, default Data Pump Export settings will be used for parameters not specified in the deployment. |
| Oracle Account | no default | optional | Oracle user that owns the ORACLE_HOME on the target Oracle database server. Required if an inventory file does not exist. Leave blank for Windows. |
| Target Directory | no default | required | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |

Note: This is the minimum set of parameters required to run this workflow. You may specify values for the optional parameters in the gather advanced parameters set. You also may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Export Database via Data Pump" on page 180](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following database backup scenarios in your environment using the "Oracle - Export Database via Data Pump" workflow:

Scenario 1: Perform an Export Using Default Settings and Store Export File Locally

This is the simplest Data Pump export scenario. In this example, the export file is stored on the local file system. The parameters shown here are visible by default.

In this scenario, the Data Pump Parameter File is not specified. The workflow will create its own parameter file using default values. The Oracle Account parameter is also not specified; it will be obtained from the Oracle inventory file (typically `oratab`).

The Target Directory will hold the Data Pump Export file (or files), which can subsequently be used to perform a database refresh on another target.

| Parameter Name | Example Value | Description |
|------------------|---|---|
| Target Directory | <code>/var/DPEXport/Full/May2012</code> | Directory where the Data Pump dump and Parameter files will be staged on the target database server. This directory must be known to the Oracle instance. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see Parameters for Oracle - Export Database via Data Pump).

Scenario 2: Perform an Export Using Default Settings and Store Export File on a Network Share

This scenario is identical to Scenario 1, except that the Data Pump Export file will be stored on a network share. This eliminates the need to move files from one server to another. Data Pump Export files that are placed in a shared network directory can readily be used as an input to the Refresh Oracle Database via Data Pump workflow.

| Parameter Name | Example Value | Description |
|------------------|--|---|
| Target Directory | <code>myfileservr.mycompany.com: /uo1/nfs_share</code> | Directory where the Data Pump dump and Parameter files will be staged on the target database server. This directory must be known to the Oracle instance. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see Parameters for Oracle - Export Database via Data Pump).

Scenario 3: Perform an Export Using Non-Default Parameters

The Export Oracle Database via Data Pump workflow provides many parameters that can be modified to suit your needs. For example, the Data Pump Export file generated by the workflow can be compressed, encrypted, or divided into standard-sized pieces. You can also tell the workflow to ignore specific Oracle errors that might arise during the export but would have no bearing on its outcome.

In this example, the Data Pump Export file is stored on the local file system. The first three parameters listed are visible by default; the remaining parameters must be exposed in the workflow so that they are available in the deployment.

| Parameter Name | Example Value | Description |
|--------------------------|--|--|
| Data Pump Parameter File | <code>/var/DPEExport/Parms/myDPparameters.par</code> | Name of the Data Pump Export parameter file that is updated (or created) by this step. If you do not specify a Parameter File, default Data Pump Export settings will be used for parameters not specified in the deployment. |
| Oracle Account | oracle | Oracle user that owns the ORACLE_HOME on the target Oracle database server where the Data Pump export will be performed. Required if inventory does not exist. Leave blank for windows. |
| Target Directory | <code>/var/DPEExport/Output/Fu11/May2012</code> | Directory where the Data Pump dump and Parameter files will be staged on the target database server. This directory must be known to the Oracle instance. |
| Compression | DATA_ONLY | Items that will be compressed in the Data Pump Export dump file set. Valid settings are ALL, NONE, DATA_ONLY, METADATA_ONLY. <ul style="list-style-type: none"> DATA_ONLY: Compress only the table row data (must also specify DATA_ONLY or ALL for the Content parameter). METADATA_ONLY: Compress only the database object definitions (must also specify METADATA_ONLY or ALL for the Content parameter). ALL: Compress both the table row data and the database object definitions in the dump file set (must also specify ALL for the Content parameter). NONE: Nothing is compressed in the dump file set. <p>You must specify the same Compression setting for the export and any subsequent import operations.</p> |

| Parameter Name | Example Value | Description |
|-----------------|---------------|---|
| | | <p>DATA_ONLY and ALL compression settings are only supported in Oracle Database Enterprise Edition. You must enable the Oracle Advanced Compression option to use these settings.</p> |
| Content | DATA_ONLY | <p>What to include in the Data Pump Export dump file set. Valid settings are ALL, DATA_ONLY, or METADATA_ONLY.</p> <ul style="list-style-type: none"> • DATA_ONLY: Include only table row data. Do not include database object definitions. • METADATA_ONLY: Include only database object definitions. Do not include table row data. If you specify METADATA_ONLY, any index or table statistics later imported from the dump file set will be locked after the import. • ALL: Include both table row data and database object definitions in the dump file set. <p>You must specify the same Content setting for the export and any subsequent import operations.</p> |
| Encryption Mode | PASSWORD | <p>This setting determines how the dump file set will be encrypted and how it can later be decrypted during a subsequent Data Pump Import operation. Valid values are PASSWORD, TRANSPARENT, and DUAL.</p> <ul style="list-style-type: none"> • PASSWORD: Data Pump Export uses the Encryption Password to encrypt the dump file set. You must specify the same Encryption Password to perform a subsequent import. • TRANSPARENT: The Oracle encryption wallet is used to encrypt the dump file set using the Secure Sockets Layer (SSL) protocol. The encryption wallet must also be used to decrypt the dump file set during a subsequent import. You cannot specify an Encryption Password if you specify TRANSPARENT mode. • DUAL: During a subsequent import operation, the dump file set can either be decrypted transparently using the Oracle encryption wallet, or it can be decrypted by using the same Encryption Password that was used for the export. |

| Parameter Name | Example Value | Description |
|---------------------|---|--|
| | | <p>DUAL and TRANSPARENT mode are only supported in Oracle Database Enterprise Edition.</p> <p>Note: To use DUAL or TRANSPARENT mode, you must enable Oracle Advanced Security.</p> <p>If Encryption Mode is specified, Encryption Password must also be specified.</p> <p>If no value is specified, the default workflow behavior is that there will be no encryption.</p> |
| Encryption Password | <p>myencpwd</p> <p>Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow.</p> | <p>Key used to ensure that any encrypted column data, metadata, or table data is re-encrypted before it is written to the dump file set. If you do not specify an Encryption Password—or specify TRANSPARENT for the Encryption Mode—data will be written to the dump files in clear text form.</p> <p>Note the following:</p> <ul style="list-style-type: none"> • If you specify an Encryption Password for the export, and the Encryption Mode is PASSWORD, you must specify the same Encryption Password for any subsequent import operations. • The Encryption Password is required when Encryption Mode is PASSWORD or DUAL. • The Encryption Password is not valid when Encryption Mode is TRANSPARENT. • If you specify an Encryption Password but do not specify the Encryption Mode, the mode defaults to PASSWORD. <p>This parameter is only supported in Oracle Database Enterprise Edition.</p> |
| File Size | 16GB | <p>Maximum size (in MByte) of each dump file in the dump file set. If any file in the dump file set reaches this size, that file is closed, and Data Pump attempts to create a new file.</p> <p>Specify an integer and one of the following units: B (bytes), KB (kilobytes), MB (megabytes), GB (gigabytes), or TB (terabytes). The default unit is bytes.</p> <p>The minimum valid file size is 4 kilobytes; the maximum</p> |

| Parameter Name | Example Value | Description |
|-------------------------|--|--|
| | | valid file size is 16 terabytes. The actual size of a dump file may be slightly smaller depending on the size of the internal blocks used. |
| Ignorable Oracle Errors | ORA-39083, ORA-00959, ORA-01917, ORA-01918, ORA-01435 | Comma delimited list of Oracle errors to ignore while executing the Data Pump Export. |
| Oracle DB User | siteadmin | Database user account (if other than sysdba) that will be used to perform the Data Pump Export. Note: For Oracle Database 11g R2 (and later), this user must have the DATAPUMP_EXP_FULL_DATABASE role, or the workflow will fail. For earlier versions, the user must have the EXP_FULL_DATABASE role. |
| Oracle DB User Password | siteadminpwd Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow. | Password for the Oracle DB User. This is required when this user is not sysdba. |
| Temporary File Location | /var/temp/ DP_temp_files | The location where all temporary output files will be placed. This directory will be removed at the completion of the workflow. |

Be sure that the default values for all remaining parameters are appropriate for your environment (see Parameters for Oracle - Export Database via Data Pump).

Parameters for Oracle - Export Database via Data Pump

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters whose values are derived in one step and consumed by another step are not shown here.

Parameters Defined in this Step: Gather Parameters for Oracle Database Export via Data Pump

| Parameter Name | Default Value | Required | Description |
|----------------------------|-----------------|----------|--|
| Data Pump Export File Name | see description | optional | Name (absolute path) of the Data Pump Export dump file (or files) that will be created from an existing Oracle database. The default is: Target Directory\Oracle SID.dmp |
| Data Pump Parameter File | no default | optional | Name of the Data Pump Export parameter file that you provide. If you do not specify the absolute path to the Parameter File, the workflow will look for the file in the Target Directory. If you do not specify a Parameter File, default Data Pump Export settings will be used for parameters not specified in the deployment. |
| Inventory Files | see description | optional | Comma separated list of Oracle inventory file names (with absolute paths). If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc Windows: %ProgramFiles%\Oracle\Inventory |
| Oracle Account | no default | optional | Oracle user that owns the ORACLE_HOME on the target Oracle database server. Required if an inventory file does not exist. Leave blank for Windows. |
| Oracle Home | no default | optional | The ORACLE_HOME to use if more than one home is found in the inventory file (or files). |
| Oracle SID | no default | required | The Oracle System ID (SID) of the target database. |
| Server Wrapper | jython | required | Command that will be used to construct the call wrapper. The workflow uses the call wrapper to execute subsequent steps as either the OS administrative user or the Oracle user who owns the pertinent ORACLE_HOME. For example: sudo su - root /opt/hp/dma/client/bin/jython.sh |

Parameters Defined in this Step: Gather Parameters for Oracle Database Export via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|--|
| | | | <code>sudo su - sysdba /opt/hp/dma/client/bin/jython.sh</code> |
| Target Directory | no default | required | Directory where the Data Pump Export dump file set and the Parameter file will be staged on the target database server. This directory must be known to the Oracle instance. |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Export via Data Pump

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|---|
| Compression | ALL | optional | <p>Items that will be compressed in the Data Pump Export dump file set. Valid settings are ALL, NONE, DATA_ONLY, METADATA_ONLY.</p> <ul style="list-style-type: none"> DATA_ONLY: Compress only the table row data (must also specify DATA_ONLY or ALL for the Content parameter). METADATA_ONLY: Compress only the database object definitions (must also specify METADATA_ONLY or ALL for the Content parameter). ALL: Compress both the table row data and the database object definitions in the dump file set (must also specify ALL for the Content parameter). NONE: Nothing is compressed in the dump file set. <p>You must specify the same Compression setting for the export and any subsequent import operations.</p> <p>DATA_ONLY and ALL compression settings are only supported in Oracle Database Enterprise Edition. You must enable the Oracle Advanced Compression option to use these settings.</p> |
| Content | ALL | optional | <p>What to include in the Data Pump Export dump file set. Valid settings are ALL, DATA_ONLY, or METADATA_ONLY.</p> <ul style="list-style-type: none"> DATA_ONLY: Include only table row data. Do not include database object definitions. METADATA_ONLY: Include only database object definitions. Do not include table row data. If you specify METADATA_ONLY, any index or table statistics later imported from the dump file set will be locked after the |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Export via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|---------------------|-----------------|----------|---|
| | | | <p>import.</p> <ul style="list-style-type: none"> ALL: Include both table row data and database object definitions in the dump file set. <p>You must specify the same Content setting for the export and any subsequent import operations.</p> |
| Encryption Mode | see description | optional | <p>This setting determines how the dump file set will be encrypted and how it can later be decrypted during a subsequent Data Pump Import operation. Valid values are PASSWORD, TRANSPARENT, and DUAL.</p> <ul style="list-style-type: none"> PASSWORD: Data Pump Export uses the Encryption Password to encrypt the dump file set. You must specify the same Encryption Password to perform a subsequent import. TRANSPARENT: The Oracle encryption wallet is used to encrypt the dump file set using the Secure Sockets Layer (SSL) protocol. The encryption wallet must also be used to decrypt the dump file set during a subsequent import. You cannot specify an Encryption Password if you specify TRANSPARENT mode. DUAL: During a subsequent import operation, the dump file set can either be decrypted transparently using the Oracle encryption wallet, or it can be decrypted by using the same Encryption Password that was used for the export. <p>DUAL and TRANSPARENT mode are only supported in Oracle Database Enterprise Edition.</p> <p>Note: To use DUAL or TRANSPARENT mode, you must enable Oracle Advanced Security.</p> <p>If Encryption Mode is specified, Encryption Password must also be specified.</p> <p>If no value is specified, the default workflow behavior is that there will be no encryption.</p> |
| Encryption Password | no default | optional | Encryption password. Only required when Encryption Mode is set. |
| Exclude | no default | optional | Filter for the metadata—objects and object types—that you |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Export via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| | | | want to EXCLUDE from the export. For example: SCHEMA:="HR" |
| File Size | 200MB | optional | Maximum size (in MByte) of each dump file in the dump file set. If any file in the dump file set reaches this size, that file is closed, and Data Pump attempts to create a new file. Specify an integer and one of the following units: B (bytes), KB (kilobytes), MB (megabytes), GB (gigabytes), or TB (terabytes). The default unit is bytes. The minimum valid file size is 4 kilobytes; the maximum valid file size is 16 terabytes. The actual size of a dump file may be slightly smaller depending on the size of the internal blocks used. |
| Flashback SCN | no default | optional | SCN (System Change Number) used to reset the session snapshot. |
| Flashback Time | no default | optional | Time used to find the closest corresponding SCN (System Change Number) value. Format: DD-MM-YYYY HH24:MI:SS |
| Full | Y | optional | This parameter is set to Y to perform a full Data Pump Export (data and metadata) or N to only export schemas (metadata). |
| Ignorable Oracle Errors | no default | optional | Comma delimited list of Oracle errors to ignore while executing the Data Pump Export. |
| Include | no default | optional | Filter for the metadata—objects and object types for the current export mode—that you want to INCLUDE in the export. The specified objects and all their dependent objects are exported. Grants on these objects are also exported. For example: SCHEMA:="HR" |
| Job Name | no default | optional | Name of export job to be created. |
| Metrics | Y | optional | If you specify Y, the number of objects exported and the elapsed time required for the export operation to complete are recorded in the Data Pump log file. Valid values are Y or N. |
| Oracle DB User | sysdba | optional | Database user account (if other than sysdba) that will be used to perform the Data Pump Export. |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Export via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|--|
| | | | <p>Note: For Oracle Database 11g R2 (and later), this user must have the DATAPUMP_EXP_FULL_DATABASE role, or the workflow will fail. For earlier versions, the user must have the EXP_FULL_DATABASE role.</p> |
| Oracle DB User Password | / as sysdba | optional | Password for the Oracle DB User. This is required when this user is not sysdba. |
| Parallel | 1 | optional | Number of active workers for current export job. If no value is specified, the default workflow behavior is 1. |
| Reuse | N | optional | If set to Y, the workflow overwrites the destination dump file (if it exists). Default behavior is N. |
| Schema | no default | optional | Comma separated list of schemas to export. Required if Data Pump Parameter File is not specified. |
| Show Log File | False | optional | If set to True, the workflow prints the export log file contents to console and history pages. Default value is False. |
| Statistics | no default | optional | A parameter comparable to STATISTICS is not needed. Statistics are always saved for tables. |

Oracle - Refresh Database via Data Pump

This workflow imports a full Oracle database from a previously created Data Pump Export file (or files). The files can be located in the local file system or on a network share. You can use this workflow to implement a cross-platform database refresh (for example: Linux to Solaris).

Data Pump uses SQL commands to import and export specific data objects. It is slower than the Oracle Recovery Manager (RMAN) but offers more flexibility.

The workflow automatically detects which ORACLE_HOME and ORACLE_SID to use when performing the Data Pump import. You must specify the same encryption mode and password, compression level, and file size that was used for the export.

You have the option of providing a Data Pump parameter file or entering the parameters on the Deployment page. In either case, the parameter values are validated prior to the Data Pump import. If you do not provide a parameter file, the workflow creates one based on the parameter values that you specify on the Deployment page. If you do not specify a value for a particular parameter, the default value is used (see ["Parameters for Oracle - Refresh Database via Data Pump" on page 197](#)).

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Refresh Database via Data Pump" | List of input parameters for this workflow |

Note: The documentation for this workflow refers to the workflow and its steps by their base names. The names in the HPE DMA user interface may have a version appended, for example, v2.

Note: To view the steps included in this workflow, see the [Steps for Oracle - Refresh Database via Data Pump](#).

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - Refresh Database via Data Pump"](#) workflow:

1. The HPE DMA client must be installed on all target servers.
2. The Target Directory must exist prior to the execution of the workflow. This directory can be local, or it can be a Network File System (NFS) mount point.

Note: If you specify an NFS mount point, the pertinent NFS share must be available to the target server, and it must be mounted prior to running this workflow.

3. The specified Oracle Database user must have READ and WRITE permission for the specified Target Directory.
4. The Oracle Database software must be provisioned, and the database must exist in the target instance prior to workflow execution.

Note: For Data Pump workflows, you must specify the same Content and Encryption Password settings for the export and any subsequent import operations.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

This topic contains the following information about the ["Oracle - Refresh Database via Data Pump"](#) workflow:

Overview show

This workflow imports a full Oracle database from a previously created Data Pump Export file (or files). The files can be located in the local file system or on a network share. You can use this workflow to implement a cross-platform database refresh (for example: Linux to Solaris).

Data Pump uses SQL commands to import and export specific data objects. It is slower than the Oracle Recovery Manager (RMAN) but offers more flexibility.

The workflow automatically detects which ORACLE_HOME and ORACLE_SID to use when performing the Data Pump import. You must specify the same encryption mode and password, compression level, and file size that was used for the export.

You have the option of providing a Data Pump parameter file or entering the parameters on the Deployment page. In either case, the parameter values are validated prior to the Data Pump import. If you do not provide a parameter file, the workflow creates one based on the parameter values that you specify on the Deployment page. If you do not specify a value for a particular parameter, the default value is used (see ["Parameters for Oracle - Refresh Database via Data Pump" on page 197](#)).

You can use this workflow as part of a database refresh process. Database refresh involves moving the contents of a database in one Oracle instance into a database in another Oracle instance. This is useful, for example, if you want to move a database from a traditional IT infrastructure to a private cloud. It is also useful if you want to duplicate production data in a test environment for application development or troubleshooting purposes.

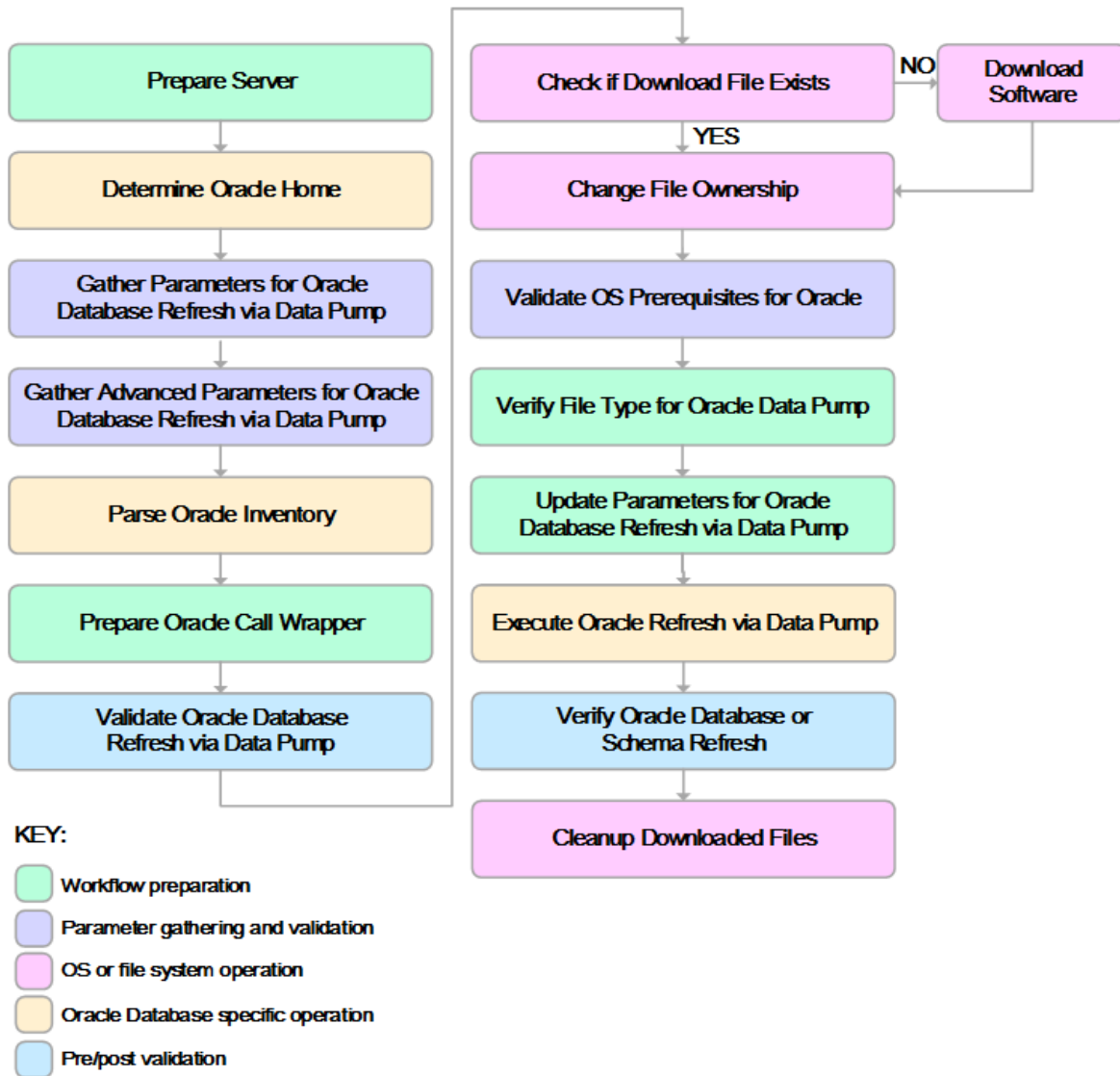
Validation Checks Performed show

The workflow validates the following conditions:

1. The specified Oracle DB User can connect to and query the database specified in the Oracle SID.
2. Oracle Database version 10.2 (or later) is installed at the specified (or automatically detected) Oracle Home.
3. The Oracle DB User has permission to perform a full database export using the Data Pump utility. The Oracle Database user must have EXP_FULL_DATABASE permission.
4. A temporary directory required for file storage can be created on the target server.
5. The specified Ignorable Oracle Errors are, in fact, valid error codes.
6. The specified Data Pump Export File is a valid path and file name.
7. If a Data Pump Parameter file is specified, the file exists in the specified location.
8. The specified Target Directory exists, either locally or on a network share, and is writable.
9. The directory names included in the Do Not Remove list (if any) are valid.
10. The operating system on the target server is a supported HPE DMA platform.
11. The specified Data Pump Export File was, indeed, created by Data Pump.

Steps Executed show

The "Oracle - Refresh Database via Data Pump" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



Process Flow show

This workflow performs the following tasks:

1. Determines the target server platform type, and identifies the server call wrapper.
2. Determines the Oracle Home path and Oracle SID by reading the oratab file.
3. Gathers all required and optional parameters.
4. Determines the OS owner of the Oracle Home directory.
5. Prepares the instance call wrapper based on the specified Oracle User.
6. Validates all parameter values specified or derived.
7. Downloads the Data Pump Parameter File, SQL Verification Script, and SQL Verification Results (if specified) from the software repository.
8. Creates a Data Pump parameter file (or updates the existing parameter file) using values specified on the Deployment page. If you do not specify a value for a particular parameter, the default value is used.
9. Performs the Data Pump Import operation.
10. Checks the Import Log File to ensure that it does not contain any unexpected errors.
11. Verifies that the database is online after the import:
 - No corrupted blocks exist.
 - No files are in backup mode.
 - Temporary table space is available.
12. Runs the SQL Verification Script (if provided), and compares the results to the SQL Verification Results (must be provided if the script is provided).
13. Removes any temporary files and directories used to perform the import.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Refresh Database via Data Pump"](#) workflow in your environment.

The workflow provides default values for most parameters. These default values are usually sufficient for a "typical" export. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Refresh Database via Data Pump" on page 197](#)

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#), and ensure that all requirements are satisfied.

To use the Oracle - Refresh Database via Data Pump workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

| Parameter Name | Default Value | Required | Description |
|--------------------------|---------------|----------|--|
| Data Pump Export Files | no default | required | Comma-separated list of Data Pump Export dump files included in the dump file set that will be used for this Data Pump Import. If only one file is specified, no comma is required. |
| Data Pump Parameter File | no default | optional | Name of the Data Pump Export parameter file that you provide. If you do not specify the absolute path to the Parameter File, the workflow will look for the file in the Target Directory. If you do not specify a Parameter File, default Data Pump Export settings will be used for parameters not specified in the deployment. |
| Oracle Account | no default | optional | Oracle user that owns the ORACLE_HOME on the target Oracle database server. Required if an inventory file does not exist. Leave blank for Windows. |
| Target Directory | no default | required | Directory where the RMAN backup files will be placed. This directory must exist prior to workflow execution. The specified Oracle User must have READ and WRITE permissions for this directory. This directory must be accessible to the target database server. |

Note: This is the minimum set of parameters required to run this workflow. You may specify values for the optional parameters in the gather advanced parameters set. You also may need

to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Refresh Database via Data Pump" on page 197](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following database backup scenarios in your environment using the "[Oracle - Refresh Database via Data Pump](#)" workflow:

Scenario 1: Perform a Schema Import Using Default Settings and a Network Share Target Directory

This is the simplest Data Pump import scenario. In this example, the export file has been stored on a network share. The parameters shown here are visible by default.

In this scenario, the Data Pump Parameter File is not specified. The workflow will create its own parameter file using default values.

| Parameter Name | Example Value | Description |
|------------------------|--|--|
| Data Pump Export Files | april302012export.dmp | Comma-separated list of Data Pump Export dump files included in the dump file set that will be used for this Data Pump Import. If only one file is specified, no comma is required. |
| Oracle Account | sysdba | Oracle user that owns the ORACLE_HOME on the target Oracle database server where the Data Pump import will be performed. Required if inventory does not exist. Leave blank for windows. |
| Target Directory | myfileservr.mycompany.com:/u01/nfs_share | Directory where the Data Pump dump and Parameter files will be staged on the target database server. This directory must be known to the Oracle instance. |
| Schema | hr,sh,oe | Comma separated list of schemas to be imported. |

Be sure that the default values for all remaining parameters are appropriate for your environment.

Scenario 2: Perform a Schema Import Using a Parameter File that is Stored in the Software Repository

In this scenario, a Data Pump parameter file is used to specify all the Data Pump Import options—including the schemas that will be imported. In this case, the Data Pump Export file is located on a network share.

| Parameter Name | Example Value | Description |
|--------------------------|--|--|
| Data Pump Export Files | apri1302012export.dmp | Comma-separated list of Data Pump Export dump files included in the dump file set that will be used for this Data Pump Import. If only one file is specified, no comma is required. |
| Data Pump Parameter File | myDPparameters.par | Name of the Data Pump Import parameter file that you provide. If you do not specify the absolute path to the Parameter File, the workflow will look for the file in the Target Directory. If you do not specify a Parameter File, default Data Pump Import settings will be used for parameters not specified in the deployment. |
| Oracle Account | sysdba | Oracle user that owns the ORACLE_HOME on the target Oracle database server where the Data Pump import will be performed. Required if inventory does not exist. Leave blank for windows. |
| Target Directory | myfileservers.mycompany.com: /u01/nfs_share | Directory where the Data Pump dump and Parameter files will be staged on the target database server. This directory must be known to the Oracle instance. |

Be sure that the default values for all remaining parameters are appropriate for your environment.

Scenario 3: Perform a Schema Import Using Non-Default Parameters

The "Oracle - Refresh Database via Data Pump" workflow provides many parameters that can be modified to suit your needs. You can instruct Data Pump how to proceed if it finds existing data in the database. You can also tell the workflow to ignore specific Oracle errors that might arise during the import but would have no bearing on its outcome.

In this example, the Data Pump Export file is stored on a network share. The first three parameters listed are visible by default; the remaining parameters must be exposed in the workflow so that they are available in the deployment.

| Parameter Name | Example Value | Description |
|------------------------|--|---|
| Data Pump Export Files | april302012export.dmp | Comma-separated list of Data Pump Export dump files included in the dump file set that will be used for this Data Pump Import. If only one file is specified, no comma is required. |
| Oracle Account | sysdba | Oracle user that owns the ORACLE_HOME on the target Oracle database server where the Data Pump import will be performed. Required if inventory does not exist. Leave blank for windows. |
| Target Directory | myfileservers.mycompany.com: /uo1/nfs_share | Directory where the Data Pump dump and Parameter files will be staged on the target database server. This directory must be known to the Oracle instance. |
| Cleanup Database | True | If set to True, the workflow will clean up the database and will attempt to drop all non-default schemas. Default behavior is False. |
| Content | DATA_ONLY | What is included in the Data Pump Export dump file set. Valid settings are ALL, DATA_ONLY, or METADATA_ONLY. <ul style="list-style-type: none"> • DATA_ONLY: Only table row data is included. Database object definitions are not included. • METADATA_ONLY: Only database object definitions are included. Table row data is not included. If you specify METADATA_ONLY, any index or table statistics later imported from the dump file set will be locked after the import. • ALL: Both table row data and database object definitions are included in the dump file set. |

| Parameter Name | Example Value | Description |
|-------------------------|---------------------------------|--|
| | | You must specify the same Content setting for the export and any subsequent import operations. |
| Encryption Password | myencpwd | Encryption password. Only required when Encryption Mode was used during the export. |
| Ignorable Oracle Errors | ORA-39111, ORA-39151, ORA-31685 | Comma delimited list of Oracle errors to ignore while executing the Data Pump Import. |
| Oracle DB User | siteadmin | Database user account (if other than sysdba) that will be used to perform the Data Pump Import. Note: For Oracle Database 11g R2 (and later), this user must have the DATAPUMP_IMP_FULL_DATABASE role, or the workflow will fail. For earlier versions, the user must have the IMP_FULL_DATABASE role. |
| Oracle DB User Password | siteadminpwd | Required only if the DB User Password is not '/' as sysdba'. |
| Table Exist Action | REPLACE | This parameter tells the Data Pump Import utility what to do if a table that it is attempting to import already exists in the database. Valid values are: <ul style="list-style-type: none"> • SKIP leaves the table unchanged (no rows are imported from the dump file). • APPEND adds the rows from the dump file and leaves the existing rows unchanged. • TRUNCATE deletes the existing rows from the table and adds the rows from the dump file. • REPLACE removes the existing table and recreates it from the dump file. Note: SKIP and REPLACE are not valid options if Content is DATA_ONLY. |
| Temporary File Location | /var/temp/ DP_temp_files | Location to store temporary files while the workflow is running. |

Be sure that the default values for all remaining parameters are appropriate for your environment.

Parameters for Oracle - Refresh Database via Data Pump

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters whose values are derived in one step and consumed by another step are not shown here.

Parameters Defined in this Step: Gather Parameters for Oracle Database Refresh via Data Pump

| Parameter Name | Default Value | Required | Description |
|--------------------------|-----------------|----------|--|
| Data Pump Export Files | no default | required | Comma-separated list of Data Pump Export dump files included in the dump file set that will be used for this Data Pump Import. If only one file is specified, no comma is required. |
| Data Pump Parameter File | no default | optional | Name of the Data Pump Import parameter file that you provide. You can also provide parameter that are not listed in the Gather Parameters for Oracle Database Refresh via Data Pump step or Gather Advanced Parameters for Oracle Database Refresh via Data Pump step. If you do not specify the absolute path to the Parameter File, the workflow will look for the file in the Target Directory. If you do not specify a Parameter File, default Data Pump Import settings will be used for parameters not specified in the deployment. The parameter values specified in the Data Pump Parameter File overwrites the default values. |
| Inventory Files | see description | optional | Comma separated list of Oracle inventory file names (with absolute paths). If not specified, set to the appropriate default value for the target server operating system. Defaults are: Solaris: /var/opt/oracle/oraInst.loc Linux: /etc/oraInst.loc Windows: %ProgramFiles%\Oracle\Inventory |
| Oracle Account | no default | optional | Oracle user that owns the ORACLE_HOME on the target Oracle database server. Required if an inventory file does not exist. Leave blank for Windows. |
| Oracle Home | no default | optional | The ORACLE_HOME to use if more than one home is found in the inventory file (or files). |
| Oracle SID | no default | required | The Oracle System ID (SID) of the target database. |

Parameters Defined in this Step: Gather Parameters for Oracle Database Refresh via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|------------------|---------------|----------|--|
| Server Wrapper | jython | required | Command that will be used to construct the call wrapper. The workflow uses the call wrapper to execute subsequent steps as either the OS administrative user or the Oracle user who owns the pertinent ORACLE_HOME. For example: <pre>sudo su - root /opt/hp/dma/client/bin/jython.sh sudo su - sysdba /opt/hp/dma/client/bin/jython.sh</pre> |
| Target Directory | no default | required | Directory where the Data Pump Export dump file set and the Parameter file will be staged on the target database server. This directory must be known to the Oracle instance. |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via Data Pump

| Parameter Name | Default Value | Required | Description |
|-----------------------|---------------|----------|---|
| Cleanup Database | False | optional | If set to True, the workflow will clean up the database and will attempt to drop all non-default schemas. Default behavior is False. |
| Cleanup Users Exclude | no default | optional | Comma separated list of database users that should be excluded from the cleanup process. |
| Content | ALL | optional | What is included in the Data Pump dump file set that will be imported. Valid settings are ALL, DATA_ONLY, or METADATA_ONLY. <ul style="list-style-type: none"> DATA_ONLY: Include only table row data. Do not include database object definitions. METADATA_ONLY: Include only database object definitions. Do not include table row data. If you specify METADATA_ONLY, any index or table statistics later imported from the dump file set will be locked after the import. ALL: Include both table row data and database object definitions in the dump file set. <p>You must specify the same Content setting for the export and any subsequent import operations.</p> |
| Data Options | no default | optional | Options for how to handle certain types of data during exports and imports. The only valid option for this |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|---|----------|--|
| | | | parameter is SKIP_CONSTRAINT_ERRORS. |
| Encryption Password | no default | optional | Encryption password. Only required when Encryption Mode was used during the export. |
| Exclude | no default | optional | Filter for the metadata—objects and object types—that you want to EXCLUDE from the import. For example: SCHEMA:="'HR'" |
| Ignorable Oracle Errors | ORA-31684, ORA-39111, ORA-39151, ORA-31685, ORA-00001 | optional | Comma delimited list of Oracle errors to ignore while executing the Data Pump Import. |
| Include | no default | optional | Filter for the metadata—objects and object types for the current import mode—that you want to INCLUDE in the import. For example: SCHEMA:="'HR'" |
| Job Name | no default | optional | Name of the import job to be created. |
| Oracle DB User | sysdba | optional | Database user account (if other than sysdba) that will be used to perform the Data Pump Import. Note: For Oracle Database 11g R2 (and later), this user must have the DATAPUMP_IMP_FULL_DATABASE role, or the workflow will fail. For earlier versions, the user must have the IMP_FULL_DATABASE role. |
| Oracle DB User Password | / as sysdba | optional | Password for the Oracle DB User. This is required when this user is not sysdba. |
| Parallel | 1 | optional | Number of active workers for current import job. If no value is specified, the default workflow behavior is 1. |
| Partition Options | no default | optional | This parameter specifies how table partitions will be created by providing a value for PARTITION_OPTIONS in |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|--------------------|---------------|----------|--|
| | | | <p>the Data Pump Import operation. Valid values are:</p> <ul style="list-style-type: none"> • NONE creates tables as they existed on the system from which the export operation was performed. • DEPARTITION promotes each partition or subpartition to a new individual table. • MERGE combines all partitions and subpartitions into one table. |
| Remap Data | no default | optional | <p>This parameter allows you to remap data by providing a value for REMAP_TABLE in the Data Pump Import operation.</p> <p>For example: TABLE_NAME1.COLUMN1:TABLE_NAME2.COLUMN2</p> |
| Remap Datafile | no default | optional | <p>Comma separated list of key value pairs separated by a colon. Changes the name of the source datafile to the target datafile name in all SQL statements where the source datafile is referenced: CREATE TABLESPACE, CREATE LIBRARY, and CREATE DIRECTORY.</p> <p>Example Format: ('u01/app/oracle/oradata/orca/scott1.dbf': 'u01/app/oracle/oradata/orcb/scott1.dbf', 'u01/app/oracle/oradata/orca/scott2.dbf': 'u01/app/oracle/oradata/orcb/scott2.dbf')</p> |
| Remap Tablespace | no default | optional | <p>This parameter allows you to remap all objects selected for import with persistent data in the source tablespace to be created in the target tablespace by providing a value for REMAP_TABLESPACE in the Data Pump Import operation.</p> <p>For example: TABLE_SPACE1:TABLE_SPACE2</p> |
| Schema | no default | optional | Comma separated list of schemas to be imported. |
| Show Log File | False | optional | If set to True, the workflow prints the import log file contents to console and history pages. Default value is False. |
| Table Exist Action | SKIP | optional | <p>This parameter tells the Data Pump Import utility what to do if a table that it is attempting to import already exists in the database. Valid values are:</p> <ul style="list-style-type: none"> • SKIP leaves the table unchanged (no rows are imported |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|-------------------------|---------------|----------|---|
| | | | <p>from the dump file).</p> <ul style="list-style-type: none"> • APPEND adds the rows from the dump file and leaves the existing rows unchanged. • TRUNCATE deletes the existing rows from the table and adds the rows from the dump file. • REPLACE removes the existing table and recreates it from the dump file. <p>Note: SKIP and REPLACE are not valid options if Content is DATA_ONLY.</p> |
| Tables | no default | optional | Comma separated list of tables to be imported. |
| Tablespaces | no default | optional | Comma separated list of tablespaces to be imported. |
| Update System Tables | False | optional | <p>Determines whether the system tables are updated during the Data Pump Import. If TRUE, all system tables will be included in the import. If FALSE, the SYS and SYSMGR tables are excluded from the import. This is useful, because importing these tables often generates numerous errors, each of which must otherwise be added to the Ignorable Oracle Errors list.</p> <p>You can explicitly specify a list of tables to be excluded from the import by using the Schema parameter in the Update Parameters for Oracle Database Refresh via Data Pump step.</p> |
| Verification Result | no default | optional | <p>Name (with absolute path) of a text file containing the expected results of the SQL queries included in the Verification SQL Script.</p> <p>This parameter is required if you provide a Verification SQL Script. Be sure to run the Verification SQL Script on the SOURCE database before running this workflow, and copy the results into this file.</p> <p>You must provide this file in a location where the workflow can access it.</p> |
| Verification SQL Script | no default | optional | <p>Name (with absolute path) of a text file containing a SQL script that verifies the integrity of the database.</p> <p>You must provide this file in a location where the workflow can access it. The expected results of the queries included</p> |

Parameters Defined in this Step: Gather Advanced Parameters for Oracle Database Refresh via Data Pump, continued

| Parameter Name | Default Value | Required | Description |
|----------------|---------------|----------|--|
| | | | in this script must be provided in the Verification Result file. |
| XML Password | xdb | optional | XML password. If the XDB schema is present and cleanup is set to True then the XML database will be re-created. Oracle requires the XML database password to be provided in the event that the XML database is re-created. |

Oracle - Migrate Database TTS

This workflow migrates a database from a known source database to a known destination database by using a shared staging directory that is available to both the source and the destination. The staging directory can be a Network File System (NFS) mount. You can use this workflow to implement a cross-platform migration (for example: Linux to Solaris).

If the operating systems on the two targets warrant, the workflow also converts the endian format during the migration. (Endianness is either big-endian or little-endian and does not depend directly on Oracle software because it is a platform (hardware+OS) property that is used by Oracle software.) If endian conversion is necessary, the workflow uses Transportable Tablespace (TTS) cross-platform migration with both Data Pump and RMAN; you choose whether to convert on the source side or the destination side. If endian conversion is not necessary, then the workflow uses Data Pump in a standard TTS method.

If the destination has a higher Oracle version, the workflow also upgrades the Oracle version.

This workflow is especially useful in the following cases:

- For refreshing very large databases
- When you plan to move your database from older hardware to newer hardware

You specify the parameters on the Deployment page. The parameter values are validated prior to the migration. If you do not specify a value for a particular parameter, the default value is used (see ["Parameters for Oracle - Migrate Database TTS"](#)).

Note: This workflow is a **bridged execution** workflow. You specify PRIMARY TARGET and DESTINATION at run-time.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - Migrate Database TTS" | List of input parameters for this workflow |

Note: To view the workflow steps, see [Steps for Oracle - Migrate Database TTS](#).

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the "Oracle - Migrate Database TTS" workflow:

1. The Primary Target (source) and Destination must both be available as targets within HPE DMA. In other words, you must run the Discovery workflow beforehand to "discover" them as targets.
2. A single, temporary target directory (staging directory) must exist and be available to both the Primary Target and the Destination prior to the execution of the workflow. This directory can be local, or it can be a Network File System (NFS) mount point. The directory is the Source Target Directory on the Primary Target and is the Destination Target Directory on the Destination.

Note: If you specify an NFS mount point, the pertinent NFS share must be available to the target servers and mounted prior to running this workflow. These are example NFS mount commands for Linux and Solaris:

| | | |
|---------|--|--|
| Linux | <pre>mount -t nfs -o rw,rsize=32768, wsize=32768,tcp,hard,nointr, nfsvers=3,bg,actimeo=0,timeo=600, suid,async <ServerName>: /u01/nfs_share /u01/nfs_share</pre> | <p><ServerName> is the server name where the NFS mount point is created</p> <p>/u01/nfs_share is an example of the NFS mount shared directory</p> |
| Solaris | <pre>share -F nfs -o rw,anon=0 -d "<InstallServerDirectory>" /var/tmp/nfs_share</pre> | <p><InstallServerDirectory> is the directory name where the NFS mount point is created</p> <p>/var/tmp/nfs_share is an example of the NFS mount shared directory</p> |

3. The Oracle user account that owns the Oracle binaries must have read and write privileges on both Source Target Directory and Destination Target Directory.
4. The Oracle Database software must be provisioned, and the database must exist in the Primary Target prior to workflow execution.
5. The HPE DMA client must be installed on all target servers.
6. The Oracle version on the destination must be the same or higher than the Oracle version on the source.
7. The same character set must be used on both the Primary Target and the Destination.
8. The Tablespaces must be self-contained. You must move both the Tablespace and the users at the same time.

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

This topic contains the following information about the ["Oracle - Migrate Database TTS"](#) workflow:

Overview show

This workflow performs a database migration and/or upgrade from a known source database to a destination database. The destination database must already be provisioned and discovered using Oracle's Transportable Tablespace (TTS) method.

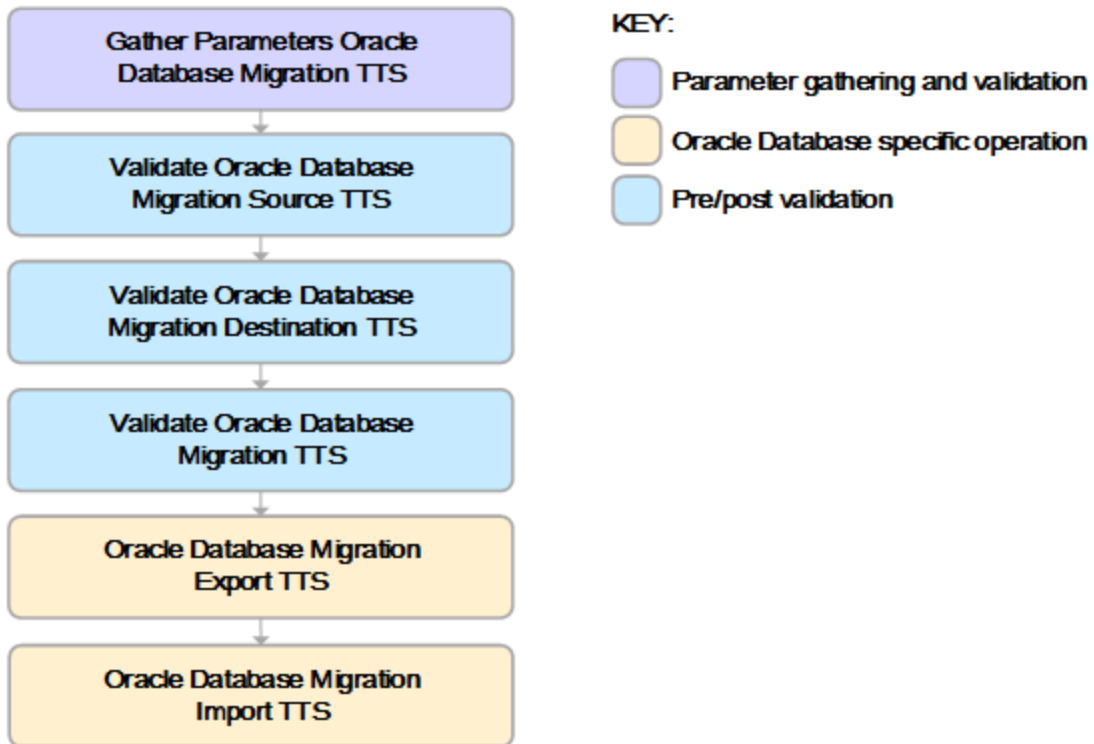
The workflow determines the operating systems where the databases reside. If endian conversion is necessary, then the workflow uses TTS cross-platform migration (both Data Pump and RMAN). If endian conversion is not necessary, then Data Pump is used in a standard Transportable Tablespace refresh method.

You enter the parameters on the Deployment page. The parameter values are validated prior to the migration. If you do not specify a value for a particular parameter, the default value is used (see ["Parameters for Oracle - Migrate Database TTS"](#)).

Note: This workflow is a **bridged execution** workflow. You specify the SOURCE and DESTINATION targets at run-time.

Steps Executed show

The "Oracle - Migrate Database TTS" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



Process Flow show

This workflow performs the following tasks on the SOURCE target server (Primary Target):

1. Gathers all required and optional parameters.
2. Validates the following:
 - The values of the parameters entered on the deployment page and assigns default values if not specified.
 - The Conversion Host is source or destination.
 - The Oracle Account owns Oracle Home.
 - The Oracle Home exists.
 - The target directory exists and is writable.
 - Oracle Errors have the correct format.
 - The database is ready for TTS migration.
 - The archive log mode.
 - Oracle Enterprise Edition.
3. Prepares the target directory and changes the permissions, if necessary.
4. Determines OS type and endian values.

The workflow then performs the following tasks on the DESTINATION target server:

5. Validates the following:
 - Oracle Account owns Oracle Home.
 - The Oracle Home exists.
 - The target directory exists and is writable.
 - The database is ready for TTS migration.
 - Oracle Enterprise Edition.
6. Prepares the target directory and changes the permissions, if necessary.
7. Determines OS type and endian values.

The workflow then performs the following tasks on the SOURCE target server (Primary Target):

8. Determines the migration option based on the OSes and endians.
9. Validates the following:
 - The Oracle version on the destination is the same (or higher) than the source.
 - Disk Parallelism is a number.
 - The charactersets are compatible.

10. If Pre-Check Only is True, the workflow ends.
11. Creates the target directory.
12. Performs a Data Pump export of the migration metadata.
13. Assigns full user grants for export database.
14. If conversion is necessary and is to be done on SOURCE, then runs an RMAN endian conversion, or else simply copies the data files.

The workflow then performs the following tasks on the DESTINATION target server:

15. Creates the target directory.
16. Assigns full user grants on the import database.
17. If conversion is necessary and is to be done on DESTINATION, then runs an RMAN endian conversion in place, or else simply copies the data files.
18. Performs a Data Pump import of the migration metadata.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - Migrate Database TTS"](#) workflow in your environment.

The workflow provides default values for most parameters. These default values are usually sufficient for a "typical" export. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Migrate Database TTS"](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow"](#), and ensure that all requirements are satisfied, particularly that the staging directory is available and mounted.

To use the Oracle - Migrate Database TTS workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

| Parameter Name | Default Value | Required | Description |
|------------------------------|---------------|----------|---|
| Conversion Host | Destination | optional | If endian conversions are necessary, the host where the conversions take place. Valid values: Source or Destination. |
| Destination | no default | required | Name of the destination database (migrated to). |
| Destination Target Directory | no default | required | Staging directory path known to the DESTINATION Database Server and shared with the SOURCE Database Server. For example, the path to the NFS mount point as known by the DESTINATION Database Server. |
| Source Target Directory | no default | required | Staging directory path known to the SOURCE Database Server and shared with the DESTINATION Database Server. For example, the path to NFS mount point as known by SOURCE Database Server. For Solaris NFS, these mount options are recommended: <code>mount -o rw,bg,intr,hard,timeo=600, wsize=32768,rsize=32768</code> |

Note: This is the minimum set of parameters required to run this workflow. You may need to

expose additional parameters depending on your objectives.

See "[Parameters for Oracle - Migrate Database TTS](#)" for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for these parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
 - a. On the Targets tab, select all the target servers—both source and destination—that will participate in this database migration. The targets that you select here will be available in the Target Parameters drop-down menus on the Run page (see [step 7](#)).
 - b. On the Parameters tab, specify values for the required parameters listed in [step 2](#) and any additional parameters that you exposed in [step 3](#). You do not need to specify values for those parameters whose default values are appropriate for your environment.
6. Save the deployment (click **Save** in the lower right corner).
7. Run the workflow using this deployment.

On the Run page, select the following targets from the respective drop-down menus:

| Parameter Name | Default | Description |
|----------------|------------|--|
| Primary Target | no default | Instance that contains the database that will be exported. |
| Destination | no default | Instance where the database will be imported. |

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Sample Scenarios

This topic shows you how to use various parameters to achieve the following database backup scenarios in your environment using the ["Oracle - Migrate Database TTS"](#) workflow:

Scenario 1: Perform a Database Migration between two Solaris systems

This is the simplest Data Pump database migration scenario. In this example, the export file is stored on a network share to minimize data transfer overhead. The parameters shown here are visible by default.

In this scenario, the Data Pump Parameter File is not specified for either the export or the import. The workflow will create its own parameter files using default values. The Oracle Account parameter is also not specified; it will be obtained from the Oracle inventory file (typically `oratab`) on the SOURCE and DESTINATION target servers, respectively.

| Parameter Name | Example Value | Description |
|------------------------------|---------------------------------------|---|
| Conversion Host | | If endian conversions are necessary, the host where the conversions take place. Valid values: Source or Destination. |
| Destination | | Name of the destination database (migrated to). |
| Destination Target Directory | <code>/var/tmp/nfs_destination</code> | Staging directory path known to the DESTINATION Database Server and shared with the SOURCE Database Server. For example, the path to the NFS mount point as known by the DESTINATION Database Server. |
| Source Target Directory | <code>/var/tmp/nfs_source</code> | Staging directory path known to the SOURCE Database Server and shared with the DESTINATION Database Server. For example, the path to NFS mount point as known by SOURCE Database Server. For Solaris NFS, these mount options are recommended: <code>mount -o rw,bg,intr,hard,timeo=600, wsize=32768,rsize=32768</code> |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Migrate Database TTS"](#)).

Scenario 2: Perform a Database Migration pre-check between two Solaris systems

This is almost the same as the previous Data Pump database migration scenario except this time you will only do a pre-check without performing the actual migration. This will validate that the source and destination databases are compatible and are ready for a migration. You need to expose the Pre-Check Only parameter in the workflow so that it is available in the deployment.

| Parameter Name | Example Value | Description |
|------------------------------|---------------------------------------|---|
| Conversion Host | | If endian conversions are necessary, the host where the conversions take place. Valid values: Source or Destination. |
| Destination | | Name of the destination database (migrated to). |
| Destination Target Directory | <code>/var/tmp/nfs_destination</code> | Staging directory path known to the DESTINATION Database Server and shared with the SOURCE Database Server. For example, the path to the NFS mount point as known by the DESTINATION Database Server. |
| Pre-Check Only | True | If set to True, then only the pre-check steps will run. |
| Source Target Directory | <code>/var/tmp/nfs_source</code> | Staging directory path known to the SOURCE Database Server and shared with the DESTINATION Database Server. For example, the path to NFS mount point as known by SOURCE Database Server. For Solaris NFS, these mount options are recommended: <code>mount -o rw,bg,intr,hard,timeo=600, wsize=32768,rsize=32768</code> |

Be sure that the default values for all remaining parameters are appropriate for your environment (see ["Parameters for Oracle - Migrate Database TTS"](#)).

Parameters for Oracle - Migrate Database TTS

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters Defined in this Step: Gather Parameters Oracle Database Migration TTS

| Parameter Name | Default Value | Required | Description |
|------------------------------|---|----------|---|
| Conversion Host | Destination | optional | If endian conversions are necessary, the host where the conversions take place. Valid values: Source or Destination. |
| Destination | no default | required | Name of the destination database (migrated to). |
| Destination Target Directory | no default | required | Staging directory path known to the DESTINATION Database Server and shared with the SOURCE Database Server. For example, the path to the NFS mount point as known by the DESTINATION Database Server. |
| Disk Parallelism | 1 | optional | RMAN Disk Parallelism to be set when disabling and re-enabling RMAN compression. Specifies how many channels (up to 254) RMAN should allocate for jobs on the specified device type. |
| Ignorable Oracle Errors | ORA-31684,ORA-39111,ORA-39151,ORA-31685,ORA-00001 | optional | Comma-separated list of Oracle Errors to ignore if found during the migration process. |
| Oracle Account | no default | required | Operation system account that owns the Oracle Home installation. |
| Pre-Check Only | False | optional | If set to True, then only the pre-check steps will run. |
| Source Target Directory | no default | required | Staging directory path known to the SOURCE Database Server and shared with the DESTINATION Database Server. For example, the path to NFS mount point as known by SOURCE Database Server. For Solaris NFS, these mount options are recommended: <code>mount -o rw,bg,intr,hard,timeo=600,wsiz=32768,rsize=32768</code> |

Oracle - Drop Database

The Oracle Drop Database enables you to remove the target database from the Oracle instance and from the DMA environment.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 218 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 219 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Drop Database" on page 221 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the Oracle Drop Database workflow:

- This solution requires HPE DMA version 10.30 (or later).
The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA10.50 solution packs are supported on HPE DMA10.50 (and later).
- You have installed the Database Compliance solution pack.

The workflow must be able to:

- Get the Oracle instance up and running.
- Log in to the Oracle instance using Oracle login credentials.
- Drop the database upon connecting to the Oracle instance.

The information presented here assumes the following:

- HPE DMA is installed and operational.
- At least one suitable target server is available.
- You are logged in to the HPE DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Drops an Oracle database and removes it from the DMA environment.

Steps Executed by the Workflow

The "[Oracle - Drop Database](#)" on page 216 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle

| Workflow Step | Description |
|--|---|
| Gather Parameters for Drop Oracle Database | This step gathers parameters prior to executing the rest of the workflow. |
| Drop Oracle Database | This step drops the Oracle database from the target machine. |
| Remove Instance from Environment | This step removes the Oracle database from the DMA environment. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Drop Database](#)" on page 221.

How to Run this Workflow

The following instructions show you how to customize and run the Oracle Drop Database workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Drop Database" on page 221](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 217](#), and ensure that all requirements are satisfied.

To use the Run Oracle Drop Database workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Drop Database" on page 221](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Drop Database

There are no mandatory parameters required to run this workflow. All parameters are optional. Some of these parameters are not initially visible in a deployment. For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Oracle - Provision Data Guard v5

This workflow enables you to provision the Standby database for an already provisioned standby host and ORACLE_HOME and then to set up Data Guard.

This workflow is designed to run in an Oracle 11.2 (or later) database environment in RAC or Non-RAC setups. It is currently supported on Oracle-supported Linux and AIX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 225 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| "How to Run this Workflow" on page 228 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision Data Guard v5" on page 230 | List of input parameters for this workflow |

Tip: To patch HP Server Automation Grid standalone environments, see *Achieve Patch Related Compliance for Oracle Grid Standalone Environments Using HPE DMA*.

To patch more complex Oracle clustered environments, see *Achieve Patch Related Compliance for Oracle RAC Environments Using HPE DMA*.

These documents are available at: <https://softwaresupport.hpe.com/>.

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- HPE DMA version 10.50 (or later) with the Advanced Database Provisioning Solution Pack installed
- Servers running one of the following operating systems:
 - Linux (any version that is supported by Oracle and HPE DMA)
 - AIX
 - Solaris
- Oracle 11.2.0.x or 12.1.0.x with the following Oracle configuration:

The Oracle Grid Infrastructure is installed on both the primary cluster servers and the standby cluster servers.

The Oracle database software is installed on all cluster servers.

Your primary database and your primary cluster already exist.

Tip: The following HPE DMA workflows can help you achieve this configuration:

HPE DMAOracle - Provision or Upgrade Grid Infrastructure

HPE DMAOracle - Provision Database Software

HPE DMAOracle - Provision Database

- The primary node of the primary cluster is able to `ssh` as root to ALL nodes in the standby cluster.
- Licenses for Oracle Database and HPE DMA.
- This workflow requires Oracle Database Enterprise Edition version 11.2 (or later). It assumes that the primary database is already provisioned and running and the standby host is available with an RDBMS ORACLE_HOME provisioned. These can be met with workflows Provision Oracle Home and Provision an Oracle Database.
- This workflow also requires root and oracle user ID equivalence across all primary and standby database servers represented in the Data Guard setup. This workflow will regenerate the RSA keys for the Oracle user, setup passwordless SSH login, and add the details of all nodes on all the nodes in `/etc/hosts` file.
- Root and oracle userid equivalence must exist between the nodes in the Primary RAC and the

nodes in the Standby RAC. The use of this workflow is only supported in an Oracle 11.2 environment.

Tip: If you are configuring data guard in an Oracle Grid standalone environment, the prerequisites are appropriately simplified. For detailed instructions to provision this environment, see *Standardize Oracle Grid Standalone Provisioning Using HPE DMA*, available at <https://softwaresupport.hpe.com/>

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Enables you to provision the Standby database for an already provisioned standby host and ORACLE_HOME and then to set up Data Guard.

Steps Executed by the Workflow

The Oracle - Provision Data Guard v5 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision Data Guard v5

| Workflow Step | Description |
|--|--|
| Gather Parameters for Provision Oracle Data Guard v3 | This step gathers all required input parameters needed for the Provision Oracle Data Guard workflow. |
| Gather Advanced Parameters for Provision Oracle Data Guard | This step gathers all optional (advanced) parameters needed for the Data Guard Provisioning workflow. |
| Set Oracle Provision Data Guard Prerequisites v2 | This step updates the /etc/hosts file on the primary and standby servers by adding the details of all the nodes on all the nodes and will establish password-less ssh communication between all the primary and standby servers for the Oracle user. |
| Prepare Oracle Instance | This step prepares instance level Oracle access. Dependencies: IMPORTANT: Be sure to run this step as a user with read access to all specified inventory pointers (Linux/UNIX) or inventory files (Windows). |
| Validate Provision Oracle Data Guard | This step validates all parameters for the Provision Oracle Data Guard workflow. |
| Gather Primary DB Attributes v3 | This step gathers all required input parameters needed for the Provision Oracle Data Guard workflow. |
| Enable ArchiveLog Mode AndOr Force Logging v2 | This step will enable archive logging and forced logging on the target database in order to configure Data Guard. |
| Set Data Guard Primary DB Initialization Parameters v2 | This step will configure the initialization parameters for the target database to support Data Guard. |
| Setup Standby | This step creates the standby redo logs on the primary database needed for |

Steps Used by Oracle - Provision Data Guard v5, continued

| Workflow Step | Description |
|---|--|
| Redo Logs on Primary Database | Data Guard to successfully synchronize databases. |
| Setup Network Configuration on Primary and Standby Servers v4 | This step sets up your tnsnames.ora and listener.ora files required for Data Guard to communicate to and from primary and standby databases. |
| Update oratab on Standby Server v2 | This step adds oratab entries for the standby database to be created on the standby nodes. |
| Create Required Directories on Standby Servers v4 | This step creates directories that will be required once the standby database is replicated to the standby nodes. |
| Setup Password File for Data Guard v2 | This step creates the password file on the primary and standby databases using the same password as required by Data Guard. |
| Create temporary initialization file on Standby server | This step creates the temporary initialization parameter file for the standby database. |
| Startup Listener on Standby Servers | This step starts the standby listeners if not already online. |
| Startup Instance Nomount on First Standby Server v2 | This step starts the standby database in nomount mode to allow RMAN at a later point to run duplicate database commands. |
| Run RMAN Duplicate with Standby Init Parameters v4 | This step uses RMAN to duplicate a primary database to a standby database location that has already been prepared. |
| Check Standby Database Status | This step verifies that a standby database reports that its database role is set to STANDBY. |
| Relocate SPFILE for Standby Database | This step will move the spfile for the standby database to proper location. |
| Multiplex Control Files on Standby v2 | This step will multiplex the control files if the user has specified multiple control file locations. |
| Cluster Enable Standby Database v2 | This step will cluster enable your standby database so it can belong to a RAC environment. |

Steps Used by Oracle - Provision Data Guard v5, continued

| Workflow Step | Description |
|--|---|
| Register Standby Database with CRS v2 | This step configures the standby database with CRS(Grid) home so CRS can manage the RAC database. |
| Verify Standby Database is up-to-date with Primary | This step will log in to both the primary and standby databases and obtain the log file sequence and compare to ensure the standby database is current with the primary database. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Provision Data Guard v5" on page 230](#).

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision Data Guard v5 workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision Data Guard v5" on page 230](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 223](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision Data Guard v5 workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision Data Guard v5" on page 230](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision Data Guard v5

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Data Guard v3

| Parameter Name | Example Value | Required | Description |
|--------------------------|---|----------|--|
| Database Protection Mode | Maximum Availability | required | <p>Data Guard database protection mode. Valid values are:</p> <p>Maximum Performance Transactions commit after the redo data required to recover those transactions is written to the online redo log</p> <p>Maximum Availability Transactions commit after the redo data is written to the online redo log and the standby redo log on at least one synchronized standby database</p> <p>Maximum Protection Similar to Maximum Availability, except that the primary database shuts down if it cannot write its redo stream to at least one synchronized standby database</p> |
| Oracle OS User | oracle | required | Oracle OS username used to derive primary node database properties. |
| Oracle sys Password | ●●● | required | SYS Password for the primary and secondary databases. |
| Primary Node Hostnames | dma-rac1.mycompany.com, dma-rac2.mycompany.com | required | <p>Comma-separated list of primary database server host names or IP addresses.</p> <p>If more than one IP address/hostname is entered, it indicates that the primary database is on RAC.</p> |
| Standby DB Prefix Name | DR | required | Prefix that is appended to the DB_NAME to become the DB_UNIQUE_NAME for the standby databases. |
| Standby Node Hostnames | dma-rac3.mycompany.com, dma- | required | <p>Comma-separated list of up to 30 standby database server host names or IP addresses.</p> <p>If more than one IP address/hostname is</p> |

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Data Guard v3, continued

| Parameter Name | Example Value | Required | Description |
|----------------|--------------------|----------|--|
| | rac4.mycompany.com | | entered, it indicates that the standby database is on RAC. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Data Guard

| Parameter Name | Example Value | Required | Description |
|---|---------------|----------|--|
| Archive Lag Target | 600 | optional | Specifies the maximum time (in seconds) by which the standby database can lag behind the primary database. Valid values are 0 (zero) or 60-7200 seconds. If you specify Archive Lag Target, you must also specify Standby DB Unique Name. |
| Change Remote Login PasswordFile on Primary | ? | optional | Set to Yes if HPE DMA is permitted to change the value of the Remote_Login_Passwordfile init.ora parameter to EXCLUSIVE (if it is not already set to EXCLUSIVE on the primary database). The default is Yes. |
| Data Guard Standby Type | Physical | optional | The type of standby databases that you are configuring. Valid values are Physical, Logical, or Snapshot (only Physical is currently implemented). The default is Physical. |
| DB File Name Convert | ? | optional | Used only if the primary and standby database datafiles will reside in different locations on the respective servers. Specify an even number of strings: "string1", "string2", "string3", "string4", ... where string 1 is a sequence of characters in the primary database datafile name, string 2 is a sequence of characters in the first standby database datafile name, string 3 is a sequence of characters in the second primary database datafile name, string 4 is a sequence of characters in the second standby database datafile name, and so on. Each string must be delimited with single or double quotes. For example: "newyork", "chicago", "newyork", "atlanta". |
| Listener File Location | ? | optional | Fully-qualified filename for the listener file. This is only needed for non-standard installs. Do not specify if using the default file \$ORACLE_HOME/network/admin/listener.ora or the listener runs from a non-ASM home while ASM is in use. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Data Guard, continued

| Parameter Name | Example Value | Required | Description |
|---|---------------|----------|--|
| Location for Controlfiles on Standby Server | ? | optional | Comma-separated list of fully-qualified controlfile filenames to create multiple copies of the controlfile on the standby database. By default, only one controlfile is generated on the standby database. The paths must already exist on the target servers. |
| Log Archive Dest 1 | ? | optional | The target destination for the archived logfiles on the primary database (if it is not already set in the primary database). The default is none. |
| Log File Name Convert | ? | optional | Used only if the primary and standby redo log files will reside in different locations on the respective servers. Specify an even number of strings: "string1", "string2", "string3", "string4", ... where string 1 is a sequence of characters in the primary database redo log file name, string 2 is a sequence of characters in the first standby database redo log file name, string 3 is a sequence of characters in the second primary database redo log file name, string 4 is a sequence of characters in the second standby database redo log file name, and so on. Each string must be delimited with single or double quotes. For example: "newyork", "chicago", "newyork", "atlanta". |
| Number of RMAN Auxiliary Channels | ? | optional | Number of RMAN (Recovery Manger) auxiliary channels to be used during the RMAN duplicate database process. |
| Number of RMAN Primary Channels | ? | optional | Number of RMAN (Recovery Manger) primary channels to be used during the RMAN duplicate database process. The default is 2. |
| Oratab File Location | ? | optional | Fully-qualified path to the oratab file. The default is /etc/oratab |
| Password File password | ? | optional | The password to set in the password file orapw. The default is the Oracle sys Password. |
| Primary DB Listener Port Number | ? | optional | Port number for the primary database listener. The default is the Oracle default. |
| Standby DB Listener Port | ? | optional | Port number for the standby database listener. The default is the Oracle default. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Data Guard, continued

| Parameter Name | Example Value | Required | Description |
|---------------------------------------|---------------|----------|---|
| Number | | | |
| Tnsnames File Location | ? | optional | Fully-qualified filename for the TNS (Transparent Network Substrate) file. This is only needed for non-standard installs. Do not specify if using the default file \$ORACLE_HOME/network/admin/tnsnames.ora |
| Update oratab file on Standby Servers | ? | optional | Set to Yes to update the oratab file on standby servers. The default is Yes. |

Oracle - Create Data Guard Broker Configuration

This workflow enables you to deploy a Data Guard Broker configuration on Oracle 11.2 (or later) databases with Data Guard successfully installed and set up.

This workflow is designed to run in an Oracle 11.2 (or later) database environment where Oracle Data Guard has been provisioned. It is currently supported on Oracle-supported Linux and AIX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 237 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 238 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Create Data Guard Broker Configuration" on page 240 | List of input parameters for this workflow |

Tip: To patch HP Server Automation Grid standalone environments, see *Achieve Patch Related Compliance for Oracle Grid Standalone Environments Using HPE DMA*.

To patch more complex Oracle clustered environments, see *Achieve Patch Related Compliance for Oracle RAC Environments Using HPE DMA*.

These documents are available at: <https://softwaresupport.hpe.com/>.

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- HPE DMA version 10.50 (or later) with the Advanced Database Provisioning Solution Pack installed
- Servers running one of the following operating systems:
 - Linux (any version that is supported by Oracle and HPE DMA)
 - AIX
 - Solaris
- Oracle 11.2.0.x or 12.1.0.x with the following Oracle configuration:

The Oracle Grid Infrastructure is installed on both the primary cluster servers and the standby cluster servers.

The Oracle database software is installed on all cluster servers.

Your primary database and your primary cluster already exist.

Tip: The following HPE DMA workflows can help you achieve this configuration:

HPE DMAOracle - Provision or Upgrade Grid Infrastructure

HPE DMAOracle - Provision Database Software

HPE DMAOracle - Provision Database

- The primary node of the primary cluster is able to `ssh` as root to ALL nodes in the standby cluster.
- Licenses for Oracle Database and HPE DMA.
- This workflow requires Oracle Database Enterprise Edition version 11.2 (or later). It assumes that the primary database is already provisioned and running and the standby host is available with an RDBMS ORACLE_HOME provisioned. These can be met with workflows Provision Oracle Home and Provision an Oracle Database.
- This workflow also requires root and oracle user ID equivalence across all primary and standby database servers represented in the Data Guard setup. This workflow will regenerate the RSA keys for the Oracle user, setup passwordless SSH login, and add the details of all nodes on all the nodes in `/etc/hosts` file.

Tip: If you are configuring data guard in an Oracle Grid standalone environment, the prerequisites

are appropriately simplified. For detailed instructions to provision this environment, see *Standardize Oracle Grid Standalone Provisioning Using HPE DMA*, available at <https://softwaresupport.hpe.com/>

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Enables you to deploy a Data Guard Broker configuration on Oracle 11.2 (or later) databases with Data Guard successfully installed and set up.

Steps Executed by the Workflow

The Oracle - Create Data Guard Broker Configuration workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Create Data Guard Broker Configuration

| Workflow Step | Description |
|--|---|
| Gather Parameters for Create Data Guard Broker Configuration | This step gathers all required input parameters needed for this workflow. |
| Validate Create Data Guard Broker Configuration | This step validates the input parameters required to create data guard blocker configuration. |
| Build Data Guard Broker Configuration v2 | <p>This step creates a Data Guard Broker configuration by performing the following actions:</p> <ol style="list-style-type: none"> 1. Makes sure that the Data Guard Broker is installed on the primary database server and has not yet been configured. 2. Gets the DB_UNIQUE_NAME for the primary and each standby database. 3. Creates the Broker configuration. 4. Checks the status of the Broker configuration. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Create Data Guard Broker Configuration](#)" on page 240.

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Create Data Guard Broker Configuration workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Create Data Guard Broker Configuration" on page 240](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 235](#), and ensure that all requirements are satisfied.

To use the Oracle - Create Data Guard Broker Configuration workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Create Data Guard Broker Configuration" on page 240](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Create Data Guard Broker Configuration

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Create Data Guard Broker Configuration

| Parameter Name | Example Value | Required | Description |
|-------------------------------|--|----------|---|
| Connect Identifier | | required | The connect identifier used to connect to the primary database. It is defined in the <code>tnsnames.ora</code> file. Make sure that the <code>tnsnames.ora</code> file on every database and instance that is part of the configuration contains an entry for this connect identifier. |
| Data Guard Broker Config Name | broker12c | required | The name that will be assigned to the Broker configuration that you are creating. |
| Data Guard Standby Type | Physical | required | The type of standby databases that you are configuring. Valid values are Physical, Logical, or Snapshot (only Physical is currently implemented). |
| Oracle sys Password | ●●● | required | SYS Password for the primary and secondary databases. |
| Oracle user name | | required | Owner of the Oracle database software. |
| Primary Node Hostnames | dma-rac1.mycompany.com, dma-rac2.mycompany.com <i>Use the same value(s) as the Primary Node Hostnames parameter for the Oracle - Provision Data Guard v3 deployment.</i> | required | Comma-separated list of primary database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the primary database is on RAC. |

Input Parameters Defined in this Step: Gather Parameters for Create Data Guard Broker Configuration, continued

| Parameter Name | Example Value | Required | Description |
|----------------------------|--|----------|---|
| Standby Connect Identifier | DRorca <i>Use the value of the Standby DB Prefix Name parameter for the Oracle - Provision Data Guard v3 deployment <u>plus</u> the target's primary database name.</i> | required | Comma-separated list of the connect strings used to connect to the standby databases. These are defined in the <code>tnsnames.ora</code> file. Make sure that the <code>tnsnames.ora</code> file on every database and instance that is part of the configuration contains an entry for these connect identifiers. |
| Standby Node Hostnames | dma-rac3.mycompany.com, dma-rac4.mycompany.com <i>Use the same value(s) as the Standby Node Hostnames parameter for the Oracle - Provision Data Guard v3 deployment.</i> | | Comma-separated list of up to 30 standby database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the standby database is on RAC. |

Oracle - Configure Data Guard Broker Properties

This workflow enables you to configure the Data Guard Broker Properties for existing Oracle 11.2 (or later) databases in a Data Guard configuration.

This workflow is designed to run in an Oracle 11.2 (or later) database environment where Oracle Data Guard has been provisioned. It is currently supported on Oracle-supported Linux and AIX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 245 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 246 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Configure Data Guard Broker Properties" on page 248 | List of input parameters for this workflow |

Tip: To patch HP Server Automation Grid standalone environments, see *Achieve Patch Related Compliance for Oracle Grid Standalone Environments Using HPE DMA*.

To patch more complex Oracle clustered environments, see *Achieve Patch Related Compliance for Oracle RAC Environments Using HPE DMA*.

These documents are available at: <https://softwaresupport.hpe.com/>.

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- HPE DMA version 10.50 (or later) with the Advanced Database Provisioning Solution Pack installed
- Servers running one of the following operating systems:
 - Linux (any version that is supported by Oracle and HPE DMA)
 - AIX
 - Solaris
- Oracle 11.2.0.x or 12.1.0.x with the following Oracle configuration:

The Oracle Grid Infrastructure is installed on both the primary cluster servers and the standby cluster servers.

The Oracle database software is installed on all cluster servers.

Your primary database and your primary cluster already exist.

Tip: The following HPE DMA workflows can help you achieve this configuration:

HPE DMAOracle - Provision or Upgrade Grid Infrastructure

HPE DMAOracle - Provision Database Software

HPE DMAOracle - Provision Database

- The primary node of the primary cluster is able to `ssh` as root to ALL nodes in the standby cluster.
- Licenses for Oracle Database and HPE DMA.
- This workflow requires Oracle Database Enterprise Edition version 11.2 (or later). It assumes that the primary database is already provisioned and running and the standby host is available with an RDBMS ORACLE_HOME provisioned. These can be met with workflows Provision Oracle Home and Provision an Oracle Database.
- This workflow also requires root and oracle user ID equivalence across all primary and standby database servers represented in the Data Guard setup. This workflow will regenerate the RSA keys for the Oracle user, setup passwordless SSH login, and add the details of all nodes on all the nodes in `/etc/hosts` file.

Tip: If you are configuring data guard in an Oracle Grid standalone environment, the prerequisites

are appropriately simplified. For detailed instructions to provision this environment, see *Standardize Oracle Grid Standalone Provisioning Using HPE DMA*, available at <https://softwaresupport.hpe.com/>

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Enables you to configure the Data Guard Broker Properties for existing Oracle 11.2 (or later) databases in a Data Guard configuration.

Steps Executed by the Workflow

The Oracle - Configure Data Guard Broker Properties workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Configure Data Guard Broker Properties

| Workflow Step | Description |
|--|--|
| Gather Parameters for Configure Data Guard Broker Properties | This step gathers all required input parameters needed for this workflow. |
| Validate Configure Data Guard Broker Properties | This step validates the input parameters required to configure data guard blocker properties. |
| Configure Data Guard Broker Properties | <p>This step enables you to modify the state and properties of a Data Guard Broker configuration or a specific database within it. You can use this step to perform any of the following:</p> <ul style="list-style-type: none"> • Change the LogXptMode parameter, which controls the redo data transport service (SYNC or ASYNC). • Start or stop the Redo Apply service on the specified standby database servers (APPLY-ON or APPLY-OFF). • Start or stop transmitting the redo data from the primary database server (TRANSPORT-ON or TRANSPORT-OFF). • Enable or disable Broker management of this configuration (ENABLE or DISABLE). • Disable Broker management of specific standby database. • Change the ArchiveLagTarget parameter, which determines how far the standby database lag the primary database (zero or 60-7200 seconds). |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Configure Data Guard Broker Properties" on page 248](#).

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Configure Data Guard Broker Properties workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Configure Data Guard Broker Properties" on page 248](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 243](#), and ensure that all requirements are satisfied.

To use the Oracle - Configure Data Guard Broker Properties:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Configure Data Guard Broker Properties" on page 248](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Configure Data Guard Broker Properties

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Configure Data Guard Broker Properties

| Parameter Name | Example Value | Required | Description |
|---------------------|---------------|----------|--|
| Archive Lag Target | 600 | optional | Specifies the maximum time (in seconds) by which the standby database can lag behind the primary database. Valid values are 0 (zero) or 60-7200 seconds. If you specify Archive Lag Target, you must also specify Standby DB Unique Name. |
| Broker Config State | ENABLE | optional | Enables or disables Broker management of the primary and all standby databases in the specified Broker configuration. Valid values are ENABLE or DISABLE. |
| Disable Standby DB | | optional | Comma-separated list of up to 30 standby databases for which Broker management will be disabled. For Oracle - Configure Data Guard Broker Properties - not yet implemented. |
| LogXptMode | SYNC | optional | Sets the redo transport service on the specified standby databases. Valid Values are SYNC or ASYNC. SYNC ensures the highest level of data protection for the primary database, but it also incurs the highest performance |

Input Parameters Defined in this Step: Gather Parameters for Configure Data Guard Broker Properties, continued

| Parameter Name | Example Value | Required | Description |
|------------------------|---|----------|--|
| | | | <p>impact. You must use SYNC for maximum protection and maximum availability modes.</p> <p>ASync offers a moderate grade of data protection for the primary database and incurs a lower performance impact than SYNC.</p> |
| Oracle sys Password | ●●● | required | SYS Password for the primary and secondary databases. |
| Oracle user name | Oracle | required | Owner of the Oracle database software. |
| Primary Node Hostnames | dma-rac1.mycompany.com, dma-rac2.mycompany.com <i>Use the same value(s) as the Primary Node Hostnames parameter for the Oracle - Provision Data Guard v3 and Oracle - Create Data Guard Broker Configuration deployments.</i> | required | <p>Comma-separated list of primary database server host names or IP addresses.</p> <p>If more than one IP address/hostname is entered, it indicates that the primary database is on RAC.</p> |
| RedoTransmit | TRANSPORT-ON | optional | Start or stop the redo transport services from the primary database to all standby databases. Valid values TRANSPORT-ON or TRANSPORT-OFF. |
| Standby DB State | APPLY-ON | optional | <p>Start or stop the Redo Apply services on the specified physical standby database. Valid values are APPLY-ON or APPLY-OFF.</p> <p>If you specify the Standby DB State, you must also specify the Standby DB Unique Name.</p> |
| Standby DB Unique Name | | optional | Unique name of the standby database whose property is being changed (see Standby DB State, Archive Lag Target). |

Input Parameters Defined in this Step: Gather Parameters for Configure Data Guard Broker Properties, continued

| Parameter Name | Example Value | Required | Description |
|------------------------|---|----------|--|
| Standby Node Hostnames | dma-rac3.mycompany.com, dma-rac4.mycompany.com <i>Use the same value(s) as the Standby Node Hostnames parameter for the Oracle - Provision Data Guard v3 and Oracle - Create Data Guard Broker Configuration deployments.</i> | required | Comma-separated list of up to 30 standby database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the standby database is on RAC. |

Oracle - Data Guard Broker Switchover

This workflow enables you to perform a Data Guard Broker switchover which will flip the roles of standby and primary databases on an existing Oracle 11.2 (or later) Data Guard configuration.

This workflow is designed to run in an Oracle 11.2 (or later) database environment where Oracle Data Guard has been provisioned and Data Guard Configuration has been set up. It is currently supported on Oracle-supported Linux and AIX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 254 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 255 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Data Guard Broker Switchover" on page 257 | List of input parameters for this workflow |

Tip: To patch HP Server Automation Grid standalone environments, see *Achieve Patch Related Compliance for Oracle Grid Standalone Environments Using HPE DMA*.

To patch more complex Oracle clustered environments, see *Achieve Patch Related Compliance for Oracle RAC Environments Using HPE DMA*.

These documents are available at: <https://softwaresupport.hpe.com/>.

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- HPE DMA version 10.50 (or later) with the Advanced Database Provisioning Solution Pack installed
- Servers running one of the following operating systems:
 - Linux (any version that is supported by Oracle and HPE DMA)
 - AIX
 - Solaris
- Oracle 11.2.0.x or 12.1.0.x with the following Oracle configuration:

The Oracle Grid Infrastructure is installed on both the primary cluster servers and the standby cluster servers.

The Oracle database software is installed on all cluster servers.

Your primary database and your primary cluster already exist.

Tip: The following HPE DMA workflows can help you achieve this configuration:

HPE DMAOracle - Provision or Upgrade Grid Infrastructure

HPE DMAOracle - Provision Database Software

HPE DMAOracle - Provision Database

- The primary node of the primary cluster is able to `ssh` as root to ALL nodes in the standby cluster.
- Licenses for Oracle Database and HPE DMA.
- This workflow requires Oracle Database Enterprise Edition version 11.2 (or later). It assumes that the primary database is already provisioned and running and the standby host is available with an RDBMS ORACLE_HOME provisioned. These can be met with workflows Provision Oracle Home and Provision an Oracle Database.
- This workflow also requires root and oracle user ID equivalence across all primary and standby database servers represented in the Data Guard setup. This workflow will regenerate the RSA keys for the Oracle user, setup passwordless SSH login, and add the details of all nodes on all the nodes in `/etc/hosts` file.

Tip: If you are configuring data guard in an Oracle Grid standalone environment, the prerequisites

are appropriately simplified. For detailed instructions to provision this environment, see *Standardize Oracle Grid Standalone Provisioning Using HPE DMA*, available at <https://softwaresupport.hpe.com/>

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Enables you to perform a Data Guard Broker switchover which will flip the roles of standby and primary databases on an existing Oracle 11.2 (or later) Data Guard configuration.

This section instructs you to run this workflow two times.

1. First time describes how to test switchover by switching the database from primary to standby.
2. Second time describes how to revert the switchover by switching the database back from standby to primary.

Steps Executed by the Workflow

The Oracle - Data Guard Broker Switchover workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Data Guard Broker Switchover

| Workflow Step | Description |
|--|--|
| Gather Parameters for Data Guard Broker Switchover | This step gathers all required input parameters needed for this workflow. |
| Validate Data Guard Broker Switchover | This step validates the input parameters required for data guard broker switchover. |
| Perform Data Guard Switchover v2 | This step performs a data guard switchover operation in an existing data guard broker configuration. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Data Guard Broker Switchover](#)" on page 257

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Data Guard Broker Switchover workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Data Guard Broker Switchover" on page 257](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 252](#), and ensure that all requirements are satisfied.

To use the Oracle - Configure Data Guard Broker Properties:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Data Guard Broker Switchover" on page 257](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Data Guard Broker

Switchover

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameters for switching the database from primary to standby

Input Parameters Defined in this Step: Gather Parameters for Data Guard Broker Switchover

| Parameter Name | Example Value | Required | Description |
|------------------------|---|----------|--|
| Oracle Account | oracle | required | The user who owns ORACLE_HOME. |
| Oracle sys Password | ●●● | required | SYS Password for the primary and secondary databases. |
| Primary Node Hostnames | dma-rac1.mycompany.com, dma-rac2.mycompany.com <i>Use the same value(s) as the Primary Node Hostnames parameter for the Oracle - Provision Data Guard v3, Oracle - Create Data Guard Broker Configuration, and Oracle - Configure Data Guard Broker Properties deployments.</i> | required | Comma-separated list of primary database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the primary database is on RAC. |
| Standby Node Hostnames | dma-rac3.mycompany.com, dma-rac4.mycompany.com <i>Use the same value(s) as the Standby Node Hostnames parameter for the Oracle - Provision Data Guard v3, Oracle - Create Data Guard Broker Configuration, and Oracle - Configure Data Guard Broker Properties deployments.</i> | required | Comma-separated list of up to 30 standby database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the standby database is on RAC. |

Input Parameters Defined in this Step: Gather Parameters for Data Guard Broker Switchover, continued

| Parameter Name | Example Value | Required | Description |
|---------------------------|---|----------|--|
| Switchover DB Unique Name | DRorca <i>Use same value as the Standby Connect Identifier for the Oracle - Create Data Guard Broker Configuration deployment.</i> | required | Required if the Switchover or Failover task is specified: Unique name of the standby database that will become the primary database in a switchover or failover operation. |

Parameters for switching the database back from standby to primary

Input Parameters Defined in this Step: Gather Parameters for Data Guard Broker Switchover

| Parameter Name | Example Value | Required | Description |
|------------------------|---|----------|---|
| Oracle Account | oracle | required | The user who owns ORACLE_HOME. |
| Oracle sys Password | ●●● | required | SYS Password for the primary and secondary databases. |
| Primary Node Hostnames | dma-rac3.mycompany.com, dma-rac4.mycompany.com <i>To switch back to the standby database, use the same value(s) as the Standby Node Hostnames parameter for the Oracle - Provision Data Guard v3, Oracle - Create Data Guard Broker Configuration, and Oracle - Configure Data Guard Broker Properties deployments.</i> | required | Comma-separated list of primary database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the primary database is on RAC. |
| Standby Node Hostnames | dma-rac1.mycompany.com, dma-rac2.mycompany.com <i>To switch back to the primary database, use the same value(s) as the Primary Node Hostnames</i> | required | Comma-separated list of up to 30 standby database server host names or IP addresses. If more than one IP address/hostname is entered, it indicates that the standby |

Input Parameters Defined in this Step: Gather Parameters for Data Guard Broker Switchover, continued

| Parameter Name | Example Value | Required | Description |
|---------------------------|--|----------|--|
| | <i>parameter for the Oracle - Provision Data Guard v3, Oracle - Create Data Guard Broker Configuration, and Oracle - Configure Data Guard Broker Properties deployments.</i> | | database is on RAC. |
| Switchover DB Unique Name | orca <i>Use the primary target's database name.</i> | required | Required if the Switchover or Failover task is specified: Unique name of the standby database that will become the primary database in a switchover or failover operation. |

Provisioning Grid Infrastructure

This section describes how to use Database and Middleware Automation (HPE DMA) to create a repeatable, standardized “gold image” for provisioning an Oracle Grid Infrastructure for a standalone server (also known as an Oracle Restart), the Oracle Database software, and then an Oracle database. The following provisioning workflows are available:

- ["Oracle - Provision or Upgrade Grid Infrastructure" on page 291](#)
- ["Oracle - Provision Database Software v2" on page 301](#)
- ["Oracle - Provision Database v3" on page 310](#)

What Oracle Grid standalone does

The Oracle Grid standalone server software allows an Oracle database to use Automatic Storage Management (ASM) local or remote storage. It enables the user to use these features of Oracle 11gR2 Oracle Restart:

- Start automatically with the server
- Manage the configuration and restart the database

Oracle - Provision or Upgrade Grid Infrastructure

This workflow installs Oracle Grid Infrastructure for a Standalone Server or for a Clustered environment. Once provisioned, the installed Grid Infrastructure provides the following:

- Oracle Cluster services (SCAN, VIPs, etc.)
- Oracle Restart services
- The Oracle Listener
- ASM storage to databases provisioned on the server

This workflow is designed to run for Oracle 11.2.0.x and 12.1.0.x. It is currently supported on Oracle-supported Linux, Solaris, and AIX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on page 292 | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 293 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 295 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision or Upgrade Grid Infrastructure" on page 297 | List of input parameters for this workflow |

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- A server running one of the following operating systems:

Linux (any version that is supported by Oracle and HPE DMA)

AIX

Solaris

This server must meet the Oracle requirements for installing 12c (see [Oracle Database Online Documentation 12c Release 1 \(12.1\)](#) for more information).

- A raw disk (or disks) available to be mounted and used by Oracle ASM. The device cannot be formatted, but it may be partitioned.

- Storage:

A staging directory with 8 gigabytes available to unzip the Oracle Grid Infrastructure and Oracle Database binaries.

For ASM disks, a minimum of 5 gigabytes combined for logical storage (more may be required for your environment).

A minimum of 30 gigabytes on the partition to install Oracle Grid Infrastructure and Oracle Database Homes (more may be required for your environment).

- Licenses for Oracle Database and HPE DMA.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Installs Oracle Grid Infrastructure for a Standalone Server or for a Clustered environment.

Steps Executed by the Workflow

The Oracle - Provision or Upgrade Grid Infrastructure workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision or Upgrade Grid Infrastructure

| Workflow Step | Description |
|--|---|
| Gather Parameters for Provision Grid Infrastructure | This step gathers and validates the parameters for the Provision Oracle Grid Infrastructure workflow. |
| Gather Advanced Parameters for Provision Grid Infrastructure | This step gathers and validates the advanced parameters for the Provision Grid Infrastructure workflow. |
| Parse Oracle Inventory | This step parses the Oracle inventory files that exists, or else it forwards the inventory information. <ul style="list-style-type: none"> • If the inventory pointer files are specified and exist, parse these files extracting the contents. • If an inventory file is specified and does not exist, ensure a valid specification. • If no inventory file is specified, assign the appropriate default. |
| Validate Provision Oracle Grid Infrastructure Parameters v2 | This step gathers and validates the parameters for the Provision Oracle Grid Infrastructure for Standalone Server workflow. |
| Decompress Archive Files v2 | This step unzips the "zip" archives or gunzip/unarchive cpio.gz files. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |
| Verify Oracle Install Software | This step verifies the Oracle Software by locating the installer (runInstaller), the product inventory (products.xml), the default response files, and the rootpre.sh script. |
| Clean Failed Oracle Grid | This step removes files and archives that were downloaded to the target |

Steps Used by Oracle - Provision or Upgrade Grid Infrastructure, continued

| Workflow Step | Description |
|---|--|
| Infrastructure Install | system during previous workflow steps. |
| Execute Oracle Root Pre Script | This step runs the rootpre.sh script in silent mode - if it exists. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Run Oracle Grid Infrastructure Pre-Installation Check | This step runs the runcluvfy.sh script found in the CRS installer directory. |
| Verify Oracle Grid Infrastructure Response File v2 | This step creates or verifies a response file to silently install Grid Infrastructure for Standalone Server. If the response file is not specified, a generic response file is created. |
| Install Oracle Grid Infrastructure | This step runs the Grid installer in silent mode using the supplied response file. |
| Run Oracle Grid Root Post Install Commands v2 | This step runs a series of commands as the root user as specified by the Grid silent install output. |
| Run Oracle Grid Post Install Commands v2 | This step runs a series of commands as the root user as specified by the Grid silent install output. |
| Verify Grid Infrastructure Installation Complete | This step will verify the grid services are online and running if response file was not given CRS_SWONLY parameter. Also will login to ASM and verify the disk group was created and online ready for database. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases.</p> <p>Note: Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is the end-user's responsibility to delete content that is no longer in use.</p> <p>In cluster situations where one node is active while other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Provision or Upgrade Grid Infrastructure](#)" on page 297.

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision or Upgrade Grid Infrastructure workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision or Upgrade Grid Infrastructure" on page 297](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 292](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision or Upgrade Grid Infrastructure workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision or Upgrade Grid Infrastructure" on page 297](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision or Upgrade Grid Infrastructure

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Grid Infrastructure

| Parameter Name | Example Value | Required | Description |
|--------------------|--|----------|--|
| ASM Diskgroup List | ASMDATA(/dev/raw/raw1) | optional | A comma-separated list of the diskgroups that you are creating, with each diskgroup containing a comma-separated list of its associated disks. |
| ASM Groups | oinstall:dba:oinstall | required | The operating system groups that manage ASM. The syntax is: ASMGroup:ASMDBA:ASMOper |
| ASM Password | ●●● | required | The password for provisioning an Oracle database using ASM storage. The default is Manager1. |
| CRS Base | /u01/app/grid | required | The location of the Oracle Base directory. This is where the admin directory is located. |
| CRS Home | /u01/app/oracle/product/12.1.0/grid1 | required | The location where the CRS software will be installed. The default is: /u01/app/oracle/product/12.1.0/grid1 |
| Oracle Software | linuxamd64_12c_grid_1of2.zip, linuxamd64_12c_grid_2of2.zip | required | A comma-separated list of the Oracle Database software (CRS) archive files (.zip or .cpio.gz). ¹ |

¹If the files are not found on the target servers, they will be downloaded from the software repository.

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Grid Infrastructure

| Parameter Name | Example Value | Required | Description |
|--------------------------|---------------|----------|---|
| ASM au_size | ? | optional | The allocation unit size of the ASM disk group. Valid values are: 1, 2, 4, 8, 16, 32, or 64 (MB). The default is 1. |
| ASM Disk String | ? | optional | Value ASM will use to discover the possible ASM Disks |
| ASM Redundancy | ? | optional | The redundancy level of the ASM disk group. Can be one of the following values: EXTERNAL for configuring at least 1 ASM disk, NORMAL for configuring at least 3 ASM disks, and HIGH for at least 5 ASM disks. Will be defaulted to EXTERNAL |
| Cleanup On Failure | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow failure. Valid values are True and False. The default is True, which will clean up on failure. |
| Cleanup On Success | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow success. Valid values are True and False. The default is True, which will clean up on success. |
| CLUSTER - Grid Node List | | optional | A comma-separated list of the Grid Infrastructure nodes. Must be in the format: node1-public:node1-private:node1-virtual, node2-public:node2-private:node2-virtual |
| CLUSTER - Scan Info | | optional | The Oracle single Client Access name and port that you will use to reference this cluster without specifying a specific node. |
| CRS Group | oinstall | required | The system group to be used by the CRS installation. Must be the primary group of the CRS Account User. Typically "oinstall". |
| CRS Home Name | OraCRS11gR2 | required | The unique Oracle name for this CRS software install. Must contain only letters, numbers, and underscores (_). |
| CRS Name | GRID01 | required | The unique Oracle name for this CRS cluster. Must contain only letters, numbers, and dashes (-). The default is RAC01 |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Grid Infrastructure, continued

| Parameter Name | Example Value | Required | Description |
|-----------------------------|--------------------------------|----------|--|
| CRS Response File | ? | required | An OUI (Oracle Universal Installer) response file for this CRS installation to be downloaded from the software repository. If not specified, a default will be created by the workflow for the installation based on a default template. It will be deleted upon completion. |
| CRS User | oracle | required | The user who will own the CRS software. Typically oracle. |
| Download Location | /tmp | required | The location where the CRS archive has been (or will be) downloaded. |
| Extract Location | /tmp | required | The directory location where the CRS archive has been (or will be) extracted. |
| Ignore System Prerequisites | ? | optional | Set to Y to include the <code>-ignoreSysPrereqs</code> parameter when running the install. Valid values are Y, N, and blank. Blank defaults to N. |
| Inventory File | /etc/orainst.loc | required | The location of the system's current Oracle inventory file. If it does not exist, it will be created. |
| Listener | LISTENER:1521 | optional | Name and port information of the listener. The syntax is Name:Port. The default is LISTENER:1521. |
| Network Admin Files | ? | optional | Comma-delimited list of files to be downloaded and placed in the <code>CRS_HOME/network/admin</code> directory after the Oracle Software is installed. |
| OCR Devices | +DATA | required | Required: The devices CRS uses to store cluster and database configuration information. The device must have the CRS group, be owned by root, and be at least 256Mb. Must be in the same location as Voting Devices. |
| runInstaller Parameters | <code>-ignoreSysPrereqs</code> | optional | The parameters to pass to the Oracle <code>runInstaller</code> command. For example: <code>-force</code> or <code>-ignoreSysPrereqs</code> |
| Trust SSL Certificates | | | Deprecated: HPE DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HPE DMA web server. HPE DMA now uses the |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Grid Infrastructure, continued

| Parameter Name | Example Value | Required | Description |
|----------------------|---------------|----------|---|
| | | | com.hp.dma.conn.trustAllCertificates parameter in the dma.xml file. |
| Upgrade to Oracle 12 | False | optional | Set to True if you are upgrading an existing Oracle 11g Grid Infrastructure to Oracle 12 Grid Infrastructure. The default is False. |
| Voting Devices | +DATA | required | The devices CRS uses to verify cluster node membership and status. The device must have the CRS owner and group and be at least 256Mb. Must be in the same location as OCR Devices. |
| Web Service Password | ●●● | optional | Password for the HPE DMA Discovery web service API. |
| Web Service URL | DMA.Url | optional | URL for the discovery web service API. |
| Web Service User | | optional | User who is capable of modifying the managed environment by using the HPE DMA Discovery web service API. |

Oracle - Provision Database Software v2

This workflow installs Oracle Database software on a server in the location specified by the Oracle Home parameter. The workflow can be customized to provision an Oracle Standalone, Grid Standalone, or CRS RAC environment.

This workflow installs Oracle Database software on a server using the runInstaller utility supplied by Oracle.

To use this workflow, you must provide the Oracle Database software in one of the following forms:

- A software archive (ZIP or cpio.gz file) that exists on the software repository or on the target machine
- Unarchived files on a CD, DVD, NFS mount, or similar device

If the inventory pointer is not found, it is created.

If you do not provide a response file, a default response file is created from the response files included in the software archive. This default response file will install Oracle Database Standard Edition.

This workflow currently supports Oracle version 10.2.0.x, 11.1.0.x, 11.2.0.x, 12.1.0.x. It is supported on Oracle-supported Linux, Solaris, AIX, and HP-UX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on page 302 | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 303 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 305 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision Database Software v2" on page 307 | List of input parameters for this workflow |

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- A server running one of the following operating systems:

Linux (any version that is supported by Oracle and HPE DMA)

AIX

Solaris

This server must meet the Oracle requirements for installing 12c (see [Oracle Database Online Documentation 12c Release 1 \(12.1\)](#) for more information).

- A raw disk (or disks) available to be mounted and used by Oracle ASM. The device cannot be formatted, but it may be partitioned.

- Storage:

A staging directory with 8 gigabytes available to unzip the Oracle Grid Infrastructure and Oracle Database binaries.

For ASM disks, a minimum of 5 gigabytes combined for logical storage (more may be required for your environment).

A minimum of 30 gigabytes on the partition to install Oracle Grid Infrastructure and Oracle Database Homes (more may be required for your environment).

- Licenses for Oracle Database and HPE DMA.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Installs Oracle Database software on a server in the location specified by the Oracle Home parameter. The workflow can be customized to provision an Oracle Standalone, Grid Standalone, or CRS RAC environment.

Steps Executed by the Workflow

The Oracle - Provision Database Software v2 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision Database Software v2

| Workflow Step | Description |
|---|--|
| Gather Parameters for Provision Oracle Software | This step validates all parameters needed for the Provision Oracle Software workflow. |
| Gather Advanced Parameters for Provision Oracle Software v2 | This step gathers and validates all advanced parameters needed for the Provision Oracle Software workflow. |
| Prepare Oracle Server | This step prepares the server wrapper for other steps to use. |
| Verify Oracle Install Location | This step verifies oralnst.loc file and location and creates if needed. |
| Parse Oracle Inventory | <p>This step parses the Oracle inventory files that exists, or else it forwards the inventory information.</p> <ul style="list-style-type: none"> • If the inventory pointer files are specified and exist, parse these files extracting the contents. • If an inventory file is specified and does not exist, ensure a valid specification. • If no inventory file is specified, assign the appropriate default. |
| Validate Provision Oracle Software v2 | This step validates all parameters needed for the Provision Oracle Software workflow. |
| Change File Owner and Group | This step changes the ownership and group of each supplied files. A warning is issued for files that are not found. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |

Steps Used by Oracle - Provision Database Software v2, continued

| Workflow Step | Description |
|---|---|
| Setup Standby Redo Logs on Primary Database | This step creates the standby redo logs on the primary database needed for Data Guard to successfully synchronize databases. |
| Uncompress Archive Files | This step unzips the "zip" archives or gunzip/unarchive cpio.gz files. |
| Clean Failed Oracle Software Install | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Verify Oracle Install Software | This step verifies the Oracle Software by locating the installer (runInstaller), the product inventory (products.xml), the default response files, and the rootpre.sh script. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Create Oracle Home Directories | This step creates the Oracle Home and Oracle Base directories and ensures that they are owned by the Oracle user and are in the specified Oracle group. |
| Execute Oracle Root Pre Script | This step runs the rootpre.sh script in silent mode - if it exists. |
| Create Oracle Inventory Pointer | This step creates the oracle inventory pointer file (oralnst.loc) if it does not already exist. |
| Update Oracle Installer Response | This step updates the provided installer response file or, if one is not provided, creates an installer response file based on a default response file provided by Oracle. |
| Execute Oracle Software Installer v2 | This step installs the Oracle software as defined by the response file. |
| Execute Oracle Install Root Script | This step runs the root.sh script in silent mode if needed. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Verify Provision Oracle Software v2 | This step verifies the installation of Oracle database software. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Provision Database Software v2" on page 307](#).

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision Database Software v2 workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision Database Software v2" on page 307](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 302](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision Database Software v2 workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision Database Software v2" on page 307](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision Database Software v2

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Software

| Parameter Name | Example Value | Required | Description |
|-----------------|---|----------|--|
| Oracle Account | Maximum Availability | optional | Required only if inventory does not exist. The Oracle user that will own the Oracle Home. |
| Oracle Base | /u01/app/oracle | required | The fully-qualified path to the Oracle base directory where the admin directories will be located. |
| Oracle Home | /u01/app/oracle/product/11.2.0/dbhome_1 | required | Fully-qualified path name where the Oracle Home will be created. If the specified directory does not exist, it will be created. |
| Oracle Software | p10404530_112030_Linux-x86-64_1of7.zip,p10404530_112030_Linux-x86-64_2of7.zip | required | Comma-separated list of relative or fully-qualified path names of the Oracle Database software archive files. If a fully-qualified path name points to a file, that file is expected to be on the target. If a relative path name points to a file, that file will be downloaded from the software repository. If a fully-qualified path name is a directory, the software is expected to be unzipped and ready to be applied. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Software v2

| Parameter Name | Example Value | Required | Description |
|--------------------|---------------|----------|---|
| Cleanup On Failure | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow failure. Valid values are True and False. The default is True, which will clean up on failure. |
| Cleanup On Success | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow success. Valid values are True and False. The default is True, which will clean up on success. |
| Cluster Nodes | | optional | Optional (required when provisioning a RAC database): Comma-separated list of nodes to install software on. Leave blank for non-clustered environments. |
| DBA Group | ? | optional | The DBA group to use for superuser access to the subsequent Oracle Database (typically dba). If not specified, derived from the Oracle OS user. |
| Download Location | /tmp | optional | The directory where input files already exist or to which files will be downloaded from the software repository. |
| Enable DNFS | ? | optional | When set to 'True' then the workflow will enable the Direct NFS option as part of the Software Installation. |
| Extract Location | /tmp | optional | The directory location where the Oracle database software archives will be extracted. It will be cleaned up at end of workflow execution. If not specified, a default will be created. |
| Install Edition | ? | optional | The install edition of the Oracle installation. Valid values are SE or EE. The default is EE. |
| Install Response | ? | optional | Location of the Oracle Universal Installer (OUI) response file. |
| Inventory Files | ? | optional | Comma-separated list of fully-qualified Oracle inventory files. If this parameter is not specified, the workflow looks for the oralnst.loc file in /etc and /var/opt/oracle. |
| Network Admin | ? | optional | Comma-delimited list of files to be downloaded and placed in the CRS_HOME/network/admin |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Software v2, continued

| Parameter Name | Example Value | Required | Description |
|-------------------------|-------------------|----------|--|
| Files | | | directory after the Oracle Software is installed. |
| Operator Group | ? | optional | The operator group to use for operator access to the subsequent Oracle Database (typically oper). If this parameter is not specified, it is derived from the Oracle OS user. |
| Oracle Home Name | ? | optional | The Oracle Home name. If not specified, it is randomly generated. |
| RAC One Node Install | ? | optional | Set to true to install Oracle RAC One Node software using the oracle.install.db.isRACOneInstall option. The default is false. |
| runInstaller Parameters | -ignoreSysPrereqs | optional | The parameters to pass to the Oracle runInstaller command. For example: -force or -ignoreSysPrereqs ¹ |

¹This parameter is hidden by default and must be exposed when you make a copy of the workflow.

Oracle - Provision Database v3

This workflow installs Oracle Database software on a server in the location specified by the Oracle Home parameter. The workflow can be customized to provision an Oracle Standalone, Grid Standalone, or CRS RAC environment.

This workflow installs Oracle Database software on a server using the runInstaller utility supplied by Oracle.

To use this workflow, you must provide the Oracle Database software in one of the following forms:

- A software archive (ZIP or cpio.gz file) that exists on the software repository or on the target machine
- Unarchived files on a CD, DVD, NFS mount, or similar device

If the inventory pointer is not found, it is created.

If you do not provide a response file, a default response file is created from the response files included in the software archive. This default response file will install Oracle Database Standard Edition.

This workflow currently supports Oracle version 10.2.0.x, 11.1.0.x, 11.2.0.x, 12.1.0.x. It is supported on Oracle-supported Linux, Solaris, AIX, and HP-UX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" on page 311 | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 312 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 315 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision Database v3" on page 317 | List of input parameters for this workflow |

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- A server running one of the following operating systems:

Linux (any version that is supported by Oracle and HPE DMA)

AIX

Solaris

This server must meet the Oracle requirements for installing 12c (see [Oracle Database Online Documentation 12c Release 1 \(12.1\)](#) for more information).

- A raw disk (or disks) available to be mounted and used by Oracle ASM. The device cannot be formatted, but it may be partitioned.

- Storage:

A staging directory with 8 gigabytes available to unzip the Oracle Grid Infrastructure and Oracle Database binaries.

For ASM disks, a minimum of 5 gigabytes combined for logical storage (more may be required for your environment).

A minimum of 30 gigabytes on the partition to install Oracle Grid Infrastructure and Oracle Database Homes (more may be required for your environment).

- Licenses for Oracle Database and HPE DMA.
- The ORACLE_HOME has already been installed and is ready for the DBCA to run.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Provisions an Oracle database on an Oracle Standalone, Grid Standalone, or CRS RAC environment.

Steps Executed by the Workflow

The Oracle - Provision Database v3 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision Database v3

| Workflow Step | Description |
|---|--|
| Gather Parameters for Provision Oracle Database v2 | This step gathers and validates the parameters for the Provision an Oracle Database workflow. |
| Gather Advanced Parameters for Provision Oracle Database v4 | This step gathers and validates the optional advanced parameters for the Provision an Oracle Database workflow. |
| Prepare Oracle Call Wrapper | This step prepares the call wrappers needed to become the owner of the Oracle Database software and root. It sets the default values for call wrapper and Oracle OS owner variables used in subsequent workflow steps. |
| Prepare Oracle Instance | This step prepares the call wrappers needed to become the owner of the Oracle Database software and root. It sets the default values for call wrapper and Oracle OS owner variables used in subsequent workflow steps. |
| Validate Provision an Oracle Database v4 | This step validates the parameters for the Provision an Oracle Database workflow. |
| Check If Download File Exists | This step is designed to facilitate the complicated methodologies that various companies use to distribute their software bundles for installation. |
| Verify DBCA Response v2 | This step creates or verifies a DBCA response file. If the response file does not exist, a generic response file is created. |
| Open File Permission | This step opens the file permission to ensure read/write for all. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |
| Verify Listener v2 | This step verifies the following: <ul style="list-style-type: none"> The listener is already created |

Steps Used by Oracle - Provision Database v3, continued

| Workflow Step | Description |
|---|---|
| | <ul style="list-style-type: none"> The Oracle version is 11.2.0.1 or above. <p>If CRS is already set up (the listener is already created), subsequent steps that run netca will not be executed.</p> |
| Run DBCA | This step runs Oracle's Database Configuration Assistant (DBCA) with the supplied response file. |
| Verify NetCA Response v2 | This step creates or verifies a NetCA response file. If the response file does not exist, it is created. |
| Parse DBCA Log | This step parses a DBCA log file to ensure a database was correctly created. |
| Clean Failed Oracle Database Install | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Run NetCA v2 | This step runs Oracle's Net Configuration Assistant (NetCA) with the supplied response file. |
| Add oratab entry | <p>This step adds a new entry in the /etc/oratab files on each node of a RAC cluster or on the local machine.</p> <p>If Oracle version is higher than 11.2 and CRS Home exists, the whole Add Oratab entry functionality is skipped as Oracle will automatically add the necessary entry to ORATAB file.</p> |
| Post Database Configuration for Provision Oracle Database | This step performs the Post Database Configuration for the pre-provisioned Oracle Database. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases</p> <p>Note: Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is the end-user's responsibility to delete content that is no longer in use.</p> <p>In cluster situations where one node is active while other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |
| Run Latest cpu or psu Script | This step runs the catcpu or catpsu script depending on the latest CPU or PSU installed. |
| Jan08CPU Database Views | This step recompiles database views on a RAC database as required by the CPU patching process if any patches are applied to the specified ORACLE_ |

Steps Used by Oracle - Provision Database v3, continued

| Workflow Step | Description |
|------------------------------------|--|
| | HOME. |
| Start or Stop RAC Database | This step starts or stops a RAC database. |
| Confirm Views Recompiled | This step confirms that the CPUJan2008 view recompile patch has been properly applied. |
| RAC Recompile Database Views | This step recompiles database views on a RAC database as required by the CPU patching process. |
| Recompile Invalid Database Objects | This step recompiles invalid database objects using <code>\${ORACLE_HOME}/rdbms/admin/utlrp.sql</code> . |
| Start or Stop RAC Database | This step starts or stops a RAC database. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Provision Database v3" on page 317](#).

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision Database v3 workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision Database v3" on page 317](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 311](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision Database Software v2 workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision Database v3" on page 317](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision Database v3

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Database v2

| Parameter Name | Example Value | Required | Description |
|------------------------|---|----------|--|
| Database Name | orca | required | The name of the database to provision. |
| Datafile Location | +ASMDATA <i>Use a plus sign (+) followed by the same value as the ASM Diskgroup List parameter for the Oracle - Provision or Upgrade Grid Infrastructure deployment.</i> | required | The database file locations. |
| Oracle Account | oracle <i>Use the same value specified for the Oracle Account parameter for the Oracle - Provision Database Software deployment.</i> | optional | Required only if inventory does not exist. The Oracle user that will own the Oracle Home. |
| Oracle Base | /u01/app/oracle/product/12.1.0/dbhome_1 <i>Use the same value specified for the Oracle Base parameter for the Oracle - Provision Database Software deployment.</i> | required | The fully-qualified path to the Oracle base directory where the admin directories are located. |
| Oracle Home | /u01/app/oracle <i>Use the same value specified for the Oracle Base parameter for the Oracle - Provision Database Software deployment.</i> | optional | The Oracle Home to use if more than one Oracle Home exists in the inventory files. |
| Trust SSL Certificates | | | Deprecated: HPE DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HPE DMA web server. HPE DMA now uses the <code>com.hp.dma.conn.</code> |

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Database v2, continued

| Parameter Name | Example Value | Required | Description |
|----------------------|---------------|----------|--|
| | | | trustAllCertificates parameter in the dma.xml file. |
| Web Service Password | ●●● | required | Password for the HPE DMA Discovery web service API. |
| Web Service URL | DMA.Url | optional | URL for the discovery web service API. |
| Web Service User | | optional | User who is capable of modifying the managed environment by using the HPE DMA Discovery web service API. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Database v4

| Parameter Name | Example Value | Required | Description |
|--------------------|--|----------|---|
| ASM Password | <i>Use the same value specified for the ASM Password parameter for the Oracle - Provision or Upgrade Grid Infrastructure deployment.</i> | optional | Optional (required when provisioning an Oracle database using ASM storage): The password used to manage ASM. ¹ |
| Cleanup On Failure | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow failure. Valid values are True and False. The default is True, which will clean up on failure. |
| Cleanup On Success | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow success. Valid values are True and False. The default is True, which will clean up on success. |

¹This parameter is hidden by default and must be exposed when you make a copy of the workflow.

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Database v4, continued

| Parameter Name | Example Value | Required | Description |
|-----------------------------|---------------|----------|--|
| Cluster Nodes | | optional | Optional (required when provisioning a RAC database): Comma-separated list of nodes where this database will run. Leave blank for non-clustered environments. True |
| Container Database | False | optional | Set to 'True' if provisioning a container database in Oracle 12c, set to 'False' otherwise. Default is 'False'. |
| DBCA Character Set | ? | optional | ? |
| DBCA National Character Set | ? | optional | ? |
| DBCA Password ALL | ? | optional | If set, this password will be used in the DBCA response file for the oracle.install.db.config.starterdb.password.ALL setting and the remaining DBCA Password inputs will be ignored. |
| DBCA Password DBSNMP | ? | optional | ? |
| DBCA Password SYS | ? | optional | ? |
| DBCA Password SYSMAN | ? | optional | ? |
| DBCA Password SYSTEM | ? | optional | ? |
| DBCA Response File | ? | optional | Location of a DBCA response file in the software repository to download. If not specified, a default will be used. |
| DBCA Template File | | optional | Location of a DBCA template file in the software repository to download. If not specified, a default will be used. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Database v4, continued

| Parameter Name | Example Value | Required | Description |
|---------------------------|---------------|----------|--|
| Database Name | orca | optional | Required: The name of the database to provision. Required to set the default value for RAC One Node Service Name. |
| Inventory Files | ? | optional | Comma-separated list of fully-qualified Oracle inventory files. If this parameter is not specified, the workflow looks for the oraInst.loc file in /etc and /var/opt/oracle. |
| Listener Configuration | ? | optional | Colon-separated name and port of the Oracle listener for this database. If left blank, the Oracle default of LISTENER:1521 will be used. |
| Local Listener | False | optional | Set to True to ignore any GRID installation listener and any attempt to create a local listener (in the Verify Listener step). If the environment does not include GRID, then the local listener will be created regardless of this setting. Default value is False. |
| NetCA Response File | ? | optional | Location of a NetCA response file in the software repository to download. If not specified, a default will be used. |
| Policy Managed | ? | optional | Set to true if Database is policy managed and set to false if Database is admin managed. The default is false. |
| RAC One Node | ? | optional | Set to true to provision an Oracle RAC One Node database. The default is false. |
| RAC One Node Service Name | ? | optional | The name of the service to connect to the RAC One Node Database. |
| Variables File | ? | optional | Location of a DBCA variables file in the software repository to download. If not specified, a default will be used. |

Provisioning RAC

This section describes how to use Database and Middleware Automation (HPE DMA) to create a repeatable, standardized “gold image” for provisioning an Oracle Grid Cluster Ready Services (CRS), Automatic Storage Management (ASM), and Real Application Clusters (RAC) database. The following provisioning workflows are available:

- ["Oracle - Provision or Upgrade Grid Infrastructure" on the next page](#)
- ["Oracle - Provision Database Software v2" on page 301](#)
- ["Oracle - Provision Database v3" on page 310](#)

What Oracle Grid infrastructure for cluster does

The Oracle Grid infrastructure for cluster allows an Oracle database to participate as a RAC database and use common ASM storage across nodes. It enables the user to use these features:

- Start automatically with the server
- Manage the configurations of the database
- Run Oracle Restart
- Use ASM
- Manage nodes in an Oracle cluster
- Manage virtual IP addresses and SCAN virtual IP addresses

Oracle - Provision or Upgrade Grid Infrastructure

This workflow installs Oracle Grid Infrastructure for a Standalone Server or for a Clustered environment. Once provisioned, the installed Grid Infrastructure provides the following:

- Oracle Cluster services (SCAN, VIPs, etc.)
- Oracle Restart services
- The Oracle Listener
- ASM storage to databases provisioned on the server

This workflow is designed to run for Oracle 11.2.0.x and 12.1.0.x. It is currently supported on Oracle-supported Linux, Solaris, and AIX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 293 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 295 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision or Upgrade Grid Infrastructure" on page 297 | List of input parameters for this workflow |

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- A server running one of the following operating systems:

Linux (any version that is supported by Oracle and HPE DMA)

AIX

Solaris

This server must meet the Oracle requirements for installing 12c (see [Oracle Database Online Documentation 12c Release 1 \(12.1\)](#) for more information).

- A raw disk (or disks) available to be mounted and used by Oracle ASM. The device cannot be formatted, but it may be partitioned.

- Storage:

A staging directory with 8 gigabytes available to unzip the Oracle Grid Infrastructure and Oracle Database binaries.

For ASM disks, a minimum of 5 gigabytes combined for logical storage (more may be required for your environment).

A minimum of 30 gigabytes on the partition to install Oracle Grid Infrastructure and Oracle Database Homes (more may be required for your environment).

- Licenses for Oracle Database and HPE DMA.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Installs Oracle Grid Infrastructure for a Standalone Server or for a Clustered environment.

Steps Executed by the Workflow

The Oracle - Provision or Upgrade Grid Infrastructure workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision or Upgrade Grid Infrastructure

| Workflow Step | Description |
|--|--|
| Gather Parameters for Provision Grid Infrastructure | This step gathers and validates the parameters for the Provision Oracle Grid Infrastructure workflow. |
| Gather Advanced Parameters for Provision Grid Infrastructure | This step gathers and validates the advanced parameters for the Provision Grid Infrastructure workflow. |
| Parse Oracle Inventory | <p>This step parses the Oracle inventory files that exists, or else it forwards the inventory information.</p> <ul style="list-style-type: none"> • If the inventory pointer files are specified and exist, parse these files extracting the contents. • If an inventory file is specified and does not exist, ensure a valid specification. • If no inventory file is specified, assign the appropriate default. |
| Validate Provision Oracle Grid Infrastructure Parameters v2 | This step gathers and validates the parameters for the Provision Oracle Grid Infrastructure for Standalone Server workflow. |
| Decompress Archive Files v2 | This step unzips the "zip" archives or gunzip/unarchive cpio.gz files. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |
| Verify Oracle Install Software | This step verifies the Oracle Software by locating the installer (runInstaller), the product inventory (products.xml), the default response files, and the rootpre.sh script. |
| Clean Failed Oracle Grid | This step removes files and archives that were downloaded to the target |

Steps Used by Oracle - Provision or Upgrade Grid Infrastructure, continued

| Workflow Step | Description |
|---|--|
| Infrastructure Install | system during previous workflow steps. |
| Execute Oracle Root Pre Script | This step runs the rootpre.sh script in silent mode - if it exists. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Run Oracle Grid Infrastructure Pre-Installation Check | This step runs the runcluvfy.sh script found in the CRS installer directory. |
| Verify Oracle Grid Infrastructure Response File v2 | This step creates or verifies a response file to silently install Grid Infrastructure for Standalone Server. If the response file is not specified, a generic response file is created. |
| Install Oracle Grid Infrastructure | This step runs the Grid installer in silent mode using the supplied response file. |
| Run Oracle Grid Root Post Install Commands v2 | This step runs a series of commands as the root user as specified by the Grid silent install output. |
| Run Oracle Grid Post Install Commands v2 | This step runs a series of commands as the root user as specified by the Grid silent install output. |
| Verify Grid Infrastructure Installation Complete | This step will verify the grid services are online and running if response file was not given CRS_SWONLY parameter. Also will login to ASM and verify the disk group was created and online ready for database. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases.</p> <p>Note: Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is the end-user's responsibility to delete content that is no longer in use.</p> <p>In cluster situations where one node is active while other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - Provision or Upgrade Grid Infrastructure](#)" on page 297.

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision or Upgrade Grid Infrastructure workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision or Upgrade Grid Infrastructure" on page 297](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 292](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision or Upgrade Grid Infrastructure workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision or Upgrade Grid Infrastructure" on page 297](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision or Upgrade Grid Infrastructure

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Grid Infrastructure

| Parameter Name | Example Value | Required | Description |
|--------------------|--|----------|--|
| ASM Diskgroup List | ASMDATA(/dev/raw/raw1) | optional | A comma-separated list of the diskgroups that you are creating, with each diskgroup containing a comma-separated list of its associated disks. |
| ASM Groups | oinstall:dba:oinstall | required | The operating system groups that manage ASM. The syntax is: ASMGroup:ASMDBA:ASMOper |
| ASM Password | ●●● | required | The password for provisioning an Oracle database using ASM storage. The default is Manager1. |
| CRS Base | /u01/app/grid | required | The location of the Oracle Base directory. This is where the admin directory is located. |
| CRS Home | /u01/app/oracle/product/12.1.0/grid1 | required | The location where the CRS software will be installed. The default is: /u01/app/oracle/product/12.1.0/grid1 |
| Oracle Software | linuxamd64_12c_grid_1of2.zip, linuxamd64_12c_grid_2of2.zip | required | A comma-separated list of the Oracle Database software (CRS) archive files (.zip or .cpio.gz). ¹ |

¹If the files are not found on the target servers, they will be downloaded from the software repository.

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Grid Infrastructure

| Parameter Name | Example Value | Required | Description |
|--------------------------|---------------|----------|---|
| ASM au_size | ? | optional | The allocation unit size of the ASM disk group. Valid values are: 1, 2, 4, 8, 16, 32, or 64 (MB). The default is 1. |
| ASM Disk String | ? | optional | Value ASM will use to discover the possible ASM Disks |
| ASM Redundancy | ? | optional | The redundancy level of the ASM disk group. Can be one of the following values: EXTERNAL for configuring at least 1 ASM disk, NORMAL for configuring at least 3 ASM disks, and HIGH for at least 5 ASM disks. Will be defaulted to EXTERNAL |
| Cleanup On Failure | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow failure. Valid values are True and False. The default is True, which will clean up on failure. |
| Cleanup On Success | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow success. Valid values are True and False. The default is True, which will clean up on success. |
| CLUSTER - Grid Node List | | optional | A comma-separated list of the Grid Infrastructure nodes. Must be in the format: node1-public:node1-private:node1-virtual, node2-public:node2-private:node2-virtual |
| CLUSTER - Scan Info | | optional | The Oracle single Client Access name and port that you will use to reference this cluster without specifying a specific node. |
| CRS Group | oinstall | required | The system group to be used by the CRS installation. Must be the primary group of the CRS Account User. Typically "oinstall". |
| CRS Home Name | OraCRS11gR2 | required | The unique Oracle name for this CRS software install. Must contain only letters, numbers, and underscores (_). |
| CRS Name | GRID01 | required | The unique Oracle name for this CRS cluster. Must contain only letters, numbers, and dashes (-). The default is RAC01 |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Grid Infrastructure, continued

| Parameter Name | Example Value | Required | Description |
|-----------------------------|--------------------------------|----------|--|
| CRS Response File | ? | required | An OUI (Oracle Universal Installer) response file for this CRS installation to be downloaded from the software repository. If not specified, a default will be created by the workflow for the installation based on a default template. It will be deleted upon completion. |
| CRS User | oracle | required | The user who will own the CRS software. Typically oracle. |
| Download Location | /tmp | required | The location where the CRS archive has been (or will be) downloaded. |
| Extract Location | /tmp | required | The directory location where the CRS archive has been (or will be) extracted. |
| Ignore System Prerequisites | ? | optional | Set to Y to include the <code>-ignoreSysPrereqs</code> parameter when running the install. Valid values are Y, N, and blank. Blank defaults to N. |
| Inventory File | /etc/oralnst.loc | required | The location of the system's current Oracle inventory file. If it does not exist, it will be created. |
| Listener | LISTENER:1521 | optional | Name and port information of the listener. The syntax is Name:Port. The default is LISTENER:1521. |
| Network Admin Files | ? | optional | Comma-delimited list of files to be downloaded and placed in the <code>CRS_HOME/network/admin</code> directory after the Oracle Software is installed. |
| OCR Devices | +DATA | required | Required: The devices CRS uses to store cluster and database configuration information. The device must have the CRS group, be owned by root, and be at least 256Mb. Must be in the same location as Voting Devices. |
| runInstaller Parameters | <code>-ignoreSysPrereqs</code> | optional | The parameters to pass to the Oracle <code>runInstaller</code> command. For example: <code>-force</code> or <code>-ignoreSysPrereqs</code> |
| Trust SSL Certificates | | | Deprecated: HPE DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HPE DMA web server. HPE DMA now uses the |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Grid Infrastructure, continued

| Parameter Name | Example Value | Required | Description |
|----------------------|---------------|----------|---|
| | | | com.hp.dma.conn.trustAllCertificates parameter in the dma.xml file. |
| Upgrade to Oracle 12 | False | optional | Set to True if you are upgrading an existing Oracle 11g Grid Infrastructure to Oracle 12 Grid Infrastructure. The default is False. |
| Voting Devices | +DATA | required | The devices CRS uses to verify cluster node membership and status. The device must have the CRS owner and group and be at least 256Mb. Must be in the same location as OCR Devices. |
| Web Service Password | ●●● | optional | Password for the HPE DMA Discovery web service API. |
| Web Service URL | DMA.Url | optional | URL for the discovery web service API. |
| Web Service User | | optional | User who is capable of modifying the managed environment by using the HPE DMA Discovery web service API. |

Oracle - Provision Database Software v2

This workflow installs Oracle Database software on a server in the location specified by the Oracle Home parameter. The workflow can be customized to provision an Oracle Standalone, Grid Standalone, or CRS RAC environment.

This workflow installs Oracle Database software on a server using the runInstaller utility supplied by Oracle.

To use this workflow, you must provide the Oracle Database software in one of the following forms:

- A software archive (ZIP or cpio.gz file) that exists on the software repository or on the target machine
- Unarchived files on a CD, DVD, NFS mount, or similar device

If the inventory pointer is not found, it is created.

If you do not provide a response file, a default response file is created from the response files included in the software archive. This default response file will install Oracle Database Standard Edition.

This workflow currently supports Oracle version 10.2.0.x, 11.1.0.x, 11.2.0.x, 12.1.0.x. It is supported on Oracle-supported Linux, Solaris, AIX, and HP-UX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|--|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 303 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 305 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision Database Software v2" on page 307 | List of input parameters for this workflow |

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- A server running one of the following operating systems:

Linux (any version that is supported by Oracle and HPE DMA)

AIX

Solaris

This server must meet the Oracle requirements for installing 12c (see [Oracle Database Online Documentation 12c Release 1 \(12.1\)](#) for more information).

- A raw disk (or disks) available to be mounted and used by Oracle ASM. The device cannot be formatted, but it may be partitioned.

- Storage:

A staging directory with 8 gigabytes available to unzip the Oracle Grid Infrastructure and Oracle Database binaries.

For ASM disks, a minimum of 5 gigabytes combined for logical storage (more may be required for your environment).

A minimum of 30 gigabytes on the partition to install Oracle Grid Infrastructure and Oracle Database Homes (more may be required for your environment).

- Licenses for Oracle Database and HPE DMA.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Installs Oracle Database software on a server in the location specified by the Oracle Home parameter. The workflow can be customized to provision an Oracle Standalone, Grid Standalone, or CRS RAC environment.

Steps Executed by the Workflow

The Oracle - Provision Database Software v2 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision Database Software v2

| Workflow Step | Description |
|---|--|
| Gather Parameters for Provision Oracle Software | This step validates all parameters needed for the Provision Oracle Software workflow. |
| Gather Advanced Parameters for Provision Oracle Software v2 | This step gathers and validates all advanced parameters needed for the Provision Oracle Software workflow. |
| Prepare Oracle Server | This step prepares the server wrapper for other steps to use. |
| Verify Oracle Install Location | This step verifies oralnst.loc file and location and creates if needed. |
| Parse Oracle Inventory | <p>This step parses the Oracle inventory files that exists, or else it forwards the inventory information.</p> <ul style="list-style-type: none"> • If the inventory pointer files are specified and exist, parse these files extracting the contents. • If an inventory file is specified and does not exist, ensure a valid specification. • If no inventory file is specified, assign the appropriate default. |
| Validate Provision Oracle Software v2 | This step validates all parameters needed for the Provision Oracle Software workflow. |
| Change File Owner and Group | This step changes the ownership and group of each supplied files. A warning is issued for files that are not found. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |

Steps Used by Oracle - Provision Database Software v2, continued

| Workflow Step | Description |
|---|---|
| Setup Standby Redo Logs on Primary Database | This step creates the standby redo logs on the primary database needed for Data Guard to successfully synchronize databases. |
| Uncompress Archive Files | This step unzips the "zip" archives or gunzip/unarchive cpio.gz files. |
| Clean Failed Oracle Software Install | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Verify Oracle Install Software | This step verifies the Oracle Software by locating the installer (runInstaller), the product inventory (products.xml), the default response files, and the rootpre.sh script. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Create Oracle Home Directories | This step creates the Oracle Home and Oracle Base directories and ensures that they are owned by the Oracle user and are in the specified Oracle group. |
| Execute Oracle Root Pre Script | This step runs the rootpre.sh script in silent mode - if it exists. |
| Create Oracle Inventory Pointer | This step creates the oracle inventory pointer file (oralnst.loc) if it does not already exist. |
| Update Oracle Installer Response | This step updates the provided installer response file or, if one is not provided, creates an installer response file based on a default response file provided by Oracle. |
| Execute Oracle Software Installer v2 | This step installs the Oracle software as defined by the response file. |
| Execute Oracle Install Root Script | This step runs the root.sh script in silent mode if needed. |
| Cleanup Downloaded Files v2 | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Verify Provision Oracle Software v2 | This step verifies the installation of Oracle database software. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Provision Database Software v2" on page 307](#).

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision Database Software v2 workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision Database Software v2" on page 307](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 302](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision Database Software v2 workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision Database Software v2" on page 307](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision Database Software v2

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Software

| Parameter Name | Example Value | Required | Description |
|-----------------|---|----------|--|
| Oracle Account | Maximum Availability | optional | Required only if inventory does not exist. The Oracle user that will own the Oracle Home. |
| Oracle Base | /u01/app/oracle | required | The fully-qualified path to the Oracle base directory where the admin directories will be located. |
| Oracle Home | /u01/app/oracle/product/11.2.0/dbhome_1 | required | Fully-qualified path name where the Oracle Home will be created. If the specified directory does not exist, it will be created. |
| Oracle Software | p10404530_112030_Linux-x86-64_1of7.zip,p10404530_112030_Linux-x86-64_2of7.zip | required | Comma-separated list of relative or fully-qualified path names of the Oracle Database software archive files. If a fully-qualified path name points to a file, that file is expected to be on the target. If a relative path name points to a file, that file will be downloaded from the software repository. If a fully-qualified path name is a directory, the software is expected to be unzipped and ready to be applied. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Software v2

| Parameter Name | Example Value | Required | Description |
|--------------------|---------------|----------|---|
| Cleanup On Failure | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow failure. Valid values are True and False. The default is True, which will clean up on failure. |
| Cleanup On Success | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow success. Valid values are True and False. The default is True, which will clean up on success. |
| Cluster Nodes | | optional | Optional (required when provisioning a RAC database): Comma-separated list of nodes to install software on. Leave blank for non-clustered environments. |
| DBA Group | ? | optional | The DBA group to use for superuser access to the subsequent Oracle Database (typically dba). If not specified, derived from the Oracle OS user. |
| Download Location | /tmp | optional | The directory where input files already exist or to which files will be downloaded from the software repository. |
| Enable DNFS | ? | optional | When set to 'True' then the workflow will enable the Direct NFS option as part of the Software Installation. |
| Extract Location | /tmp | optional | The directory location where the Oracle database software archives will be extracted. It will be cleaned up at end of workflow execution. If not specified, a default will be created. |
| Install Edition | ? | optional | The install edition of the Oracle installation. Valid values are SE or EE. The default is EE. |
| Install Response | ? | optional | Location of the Oracle Universal Installer (OUI) response file. |
| Inventory Files | ? | optional | Comma-separated list of fully-qualified Oracle inventory files. If this parameter is not specified, the workflow looks for the oralnst.loc file in /etc and /var/opt/oracle. |
| Network Admin | ? | optional | Comma-delimited list of files to be downloaded and placed in the CRS_HOME/network/admin |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Software v2, continued

| Parameter Name | Example Value | Required | Description |
|-------------------------|--------------------------------|----------|--|
| Files | | | directory after the Oracle Software is installed. |
| Operator Group | ? | optional | The operator group to use for operator access to the subsequent Oracle Database (typically oper). If this parameter is not specified, it is derived from the Oracle OS user. |
| Oracle Home Name | ? | optional | The Oracle Home name. If not specified, it is randomly generated. |
| RAC One Node Install | ? | optional | Set to true to install Oracle RAC One Node software using the <code>oracle.install.db.isRACOneInstall</code> option. The default is false. |
| runInstaller Parameters | <code>-ignoreSysPrereqs</code> | optional | The parameters to pass to the Oracle <code>runInstaller</code> command. For example: <code>-force</code> or <code>-ignoreSysPrereqs</code> ¹ |

¹This parameter is hidden by default and must be exposed when you make a copy of the workflow.

Oracle - Provision Database v3

This workflow installs Oracle Database software on a server in the location specified by the Oracle Home parameter. The workflow can be customized to provision an Oracle Standalone, Grid Standalone, or CRS RAC environment.

This workflow installs Oracle Database software on a server using the runInstaller utility supplied by Oracle.

To use this workflow, you must provide the Oracle Database software in one of the following forms:

- A software archive (ZIP or cpio.gz file) that exists on the software repository or on the target machine
- Unarchived files on a CD, DVD, NFS mount, or similar device

If the inventory pointer is not found, it is created.

If you do not provide a response file, a default response file is created from the response files included in the software archive. This default response file will install Oracle Database Standard Edition.

This workflow currently supports Oracle version 10.2.0.x, 11.1.0.x, 11.2.0.x, 12.1.0.x. It is supported on Oracle-supported Linux, Solaris, AIX, and HP-UX platforms.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|--|
| "Prerequisites for this Workflow" on the next page | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" on page 312 | Information about what the workflow does, including validation checks performed, steps executed, and step descriptions |
| " How to Run this Workflow" on page 315 | Instructions for running this workflow in your environment |
| "Parameters for Oracle - Provision Database v3" on page 317 | List of input parameters for this workflow |

Prerequisites for this Workflow

Before performing the procedures in this section, your environment must meet the following minimum requirements:

- A server running one of the following operating systems:

Linux (any version that is supported by Oracle and HPE DMA)

AIX

Solaris

This server must meet the Oracle requirements for installing 12c (see [Oracle Database Online Documentation 12c Release 1 \(12.1\)](#) for more information).

- A raw disk (or disks) available to be mounted and used by Oracle ASM. The device cannot be formatted, but it may be partitioned.

- Storage:

A staging directory with 8 gigabytes available to unzip the Oracle Grid Infrastructure and Oracle Database binaries.

For ASM disks, a minimum of 5 gigabytes combined for logical storage (more may be required for your environment).

A minimum of 30 gigabytes on the partition to install Oracle Grid Infrastructure and Oracle Database Homes (more may be required for your environment).

- Licenses for Oracle Database and HPE DMA.
- The ORACLE_HOME has already been installed and is ready for the DBCA to run.

For more information about prerequisites for Oracle database, refer to the [Oracle Server Documentation](#).

How this Workflow Works

This workflow performs the following actions:

Provisions an Oracle database on an Oracle Standalone, Grid Standalone, or CRS RAC environment.

Steps Executed by the Workflow

The Oracle - Provision Database v3 workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used by Oracle - Provision Database v3

| Workflow Step | Description |
|---|--|
| Gather Parameters for Provision Oracle Database v2 | This step gathers and validates the parameters for the Provision an Oracle Database workflow. |
| Gather Advanced Parameters for Provision Oracle Database v4 | This step gathers and validates the optional advanced parameters for the Provision an Oracle Database workflow. |
| Prepare Oracle Call Wrapper | This step prepares the call wrappers needed to become the owner of the Oracle Database software and root. It sets the default values for call wrapper and Oracle OS owner variables used in subsequent workflow steps. |
| Prepare Oracle Instance | This step prepares the call wrappers needed to become the owner of the Oracle Database software and root. It sets the default values for call wrapper and Oracle OS owner variables used in subsequent workflow steps. |
| Validate Provision an Oracle Database v4 | This step validates the parameters for the Provision an Oracle Database workflow. |
| Check If Download File Exists | This step is designed to facilitate the complicated methodologies that various companies use to distribute their software bundles for installation. |
| Verify DBCA Response v2 | This step creates or verifies a DBCA response file. If the response file does not exist, a generic response file is created. |
| Open File Permission | This step opens the file permission to ensure read/write for all. |
| Download Software | This step automates the transfer of files from the HP SA Software Library to individual managed servers for use in downstream workflow steps. Verifies checksum of each file transferred. |
| Verify Listener v2 | This step verifies the following: <ul style="list-style-type: none"> The listener is already created |

Steps Used by Oracle - Provision Database v3, continued

| Workflow Step | Description |
|---|---|
| | <ul style="list-style-type: none"> The Oracle version is 11.2.0.1 or above. <p>If CRS is already set up (the listener is already created), subsequent steps that run netca will not be executed.</p> |
| Run DBCA | This step runs Oracle's Database Configuration Assistant (DBCA) with the supplied response file. |
| Verify NetCA Response v2 | This step creates or verifies a NetCA response file. If the response file does not exist, it is created. |
| Parse DBCA Log | This step parses a DBCA log file to ensure a database was correctly created. |
| Clean Failed Oracle Database Install | This step removes files and archives that were downloaded to the target system during previous workflow steps. |
| Run NetCA v2 | This step runs Oracle's Net Configuration Assistant (NetCA) with the supplied response file. |
| Add oratab entry | <p>This step adds a new entry in the /etc/oratab files on each node of a RAC cluster or on the local machine.</p> <p>If Oracle version is higher than 11.2 and CRS Home exists, the whole Add Oratab entry functionality is skipped as Oracle will automatically add the necessary entry to ORATAB file.</p> |
| Post Database Configuration for Provision Oracle Database | This step performs the Post Database Configuration for the pre-provisioned Oracle Database. |
| Discover Oracle Databases | <p>This step audits the server's physical environment looking for Oracle instances and databases</p> <p>Note: Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is the end-user's responsibility to delete content that is no longer in use.</p> <p>In cluster situations where one node is active while other nodes are inactive, Discovery will only find instances and databases on the active node. Nothing will be added to inactive nodes.</p> |
| Run Latest cpu or psu Script | This step runs the catcpu or catpsu script depending on the latest CPU or PSU installed. |
| Jan08CPU Database Views | This step recompiles database views on a RAC database as required by the CPU patching process if any patches are applied to the specified ORACLE_ |

Steps Used by Oracle - Provision Database v3, continued

| Workflow Step | Description |
|------------------------------------|--|
| | HOME. |
| Start or Stop RAC Database | This step starts or stops a RAC database. |
| Confirm Views Recompiled | This step confirms that the CPUJan2008 view recompile patch has been properly applied. |
| RAC Recompile Database Views | This step recompiles database views on a RAC database as required by the CPU patching process. |
| Recompile Invalid Database Objects | This step recompiles invalid database objects using <code>\${ORACLE_HOME}/rdbms/admin/utlrp.sql</code> . |
| Start or Stop RAC Database | This step starts or stops a RAC database. |

Note: For input parameter descriptions and defaults, see ["Parameters for Oracle - Provision Database v3" on page 317](#).

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - Provision Database v3 workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - Provision Database v3" on page 317](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 311](#), and ensure that all requirements are satisfied.

To use the Oracle - Provision Database Software v2 workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the parameters.

Note: There are no mandatory parameters required to run this workflow. All parameters are optional. You may need to expose additional parameters depending on your objectives.

See ["Parameters for Oracle - Provision Database v3" on page 317](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment or at runtime.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment.
6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment, specifying any runtime parameters.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state. The database will be removed from the DMA environment section upon SUCCESS as well.

Parameters for Oracle - Provision Database v3

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Database v2

| Parameter Name | Example Value | Required | Description |
|------------------------|---|----------|--|
| Database Name | orca | required | The name of the database to provision. |
| Datafile Location | +ASMDATA <i>Use a plus sign (+) followed by the same value as the ASM Diskgroup List parameter for the Oracle - Provision or Upgrade Grid Infrastructure deployment.</i> | required | The database file locations. |
| Oracle Account | oracle <i>Use the same value specified for the Oracle Account parameter for the Oracle - Provision Database Software deployment.</i> | optional | Required only if inventory does not exist. The Oracle user that will own the Oracle Home. |
| Oracle Base | /u01/app/oracle/product/12.1.0/dbhome_1 <i>Use the same value specified for the Oracle Base parameter for the Oracle - Provision Database Software deployment.</i> | required | The fully-qualified path to the Oracle base directory where the admin directories are located. |
| Oracle Home | /u01/app/oracle <i>Use the same value specified for the Oracle Base parameter for the Oracle - Provision Database Software deployment.</i> | optional | The Oracle Home to use if more than one Oracle Home exists in the inventory files. |
| Trust SSL Certificates | | | Deprecated: HPE DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HPE DMA web server. HPE DMA now uses the <code>com.hp.dma.conn.</code> |

Input Parameters Defined in this Step: Gather Parameters for Provision Oracle Database v2, continued

| Parameter Name | Example Value | Required | Description |
|----------------------|---------------|----------|--|
| | | | trustAllCertificates parameter in the dma.xml file. |
| Web Service Password | ●●● | required | Password for the HPE DMA Discovery web service API. |
| Web Service URL | DMA.Url | optional | URL for the discovery web service API. |
| Web Service User | | optional | User who is capable of modifying the managed environment by using the HPE DMA Discovery web service API. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Database v4

| Parameter Name | Example Value | Required | Description |
|--------------------|--|----------|---|
| ASM Password | <i>Use the same value specified for the ASM Password parameter for the Oracle - Provision or Upgrade Grid Infrastructure deployment.</i> | optional | Optional (required when provisioning an Oracle database using ASM storage): The password used to manage ASM. ¹ |
| Cleanup On Failure | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow failure. Valid values are True and False. The default is True, which will clean up on failure. |
| Cleanup On Success | True | optional | Indicates whether to remove downloaded and extracted files—to clean up the installation directory—in the event of workflow success. Valid values are True and False. The default is True, which will clean up on success. |

¹This parameter is hidden by default and must be exposed when you make a copy of the workflow.

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Database v4, continued

| Parameter Name | Example Value | Required | Description |
|-----------------------------|---------------|----------|--|
| Cluster Nodes | | optional | Optional (required when provisioning a RAC database): Comma-separated list of nodes where this database will run. Leave blank for non-clustered environments. True |
| Container Database | False | optional | Set to 'True' if provisioning a container database in Oracle 12c, set to 'False' otherwise. Default is 'False'. |
| DBCA Character Set | ? | optional | ? |
| DBCA National Character Set | ? | optional | ? |
| DBCA Password ALL | ? | optional | If set, this password will be used in the DBCA response file for the oracle.install.db.config.starterdb.password.ALL setting and the remaining DBCA Password inputs will be ignored. |
| DBCA Password DBSNMP | ? | optional | ? |
| DBCA Password SYS | ? | optional | ? |
| DBCA Password SYSMAN | ? | optional | ? |
| DBCA Password SYSTEM | ? | optional | ? |
| DBCA Response File | ? | optional | Location of a DBCA response file in the software repository to download. If not specified, a default will be used. |
| DBCA Template File | | optional | Location of a DBCA template file in the software repository to download. If not specified, a default will be used. |

Input Parameters Defined in this Step: Gather Advanced Parameters for Provision Oracle Database v4, continued

| Parameter Name | Example Value | Required | Description |
|---------------------------|---------------|----------|--|
| Database Name | orca | optional | Required: The name of the database to provision. Required to set the default value for RAC One Node Service Name. |
| Inventory Files | ? | optional | Comma-separated list of fully-qualified Oracle inventory files. If this parameter is not specified, the workflow looks for the oraInst.loc file in /etc and /var/opt/oracle. |
| Listener Configuration | ? | optional | Colon-separated name and port of the Oracle listener for this database. If left blank, the Oracle default of LISTENER:1521 will be used. |
| Local Listener | False | optional | Set to True to ignore any GRID installation listener and any attempt to create a local listener (in the Verify Listener step). If the environment does not include GRID, then the local listener will be created regardless of this setting. Default value is False. |
| NetCA Response File | ? | optional | Location of a NetCA response file in the software repository to download. If not specified, a default will be used. |
| Policy Managed | ? | optional | Set to true if Database is policy managed and set to false if Database is admin managed. The default is false. |
| RAC One Node | ? | optional | Set to true to provision an Oracle RAC One Node database. The default is false. |
| RAC One Node Service Name | ? | optional | The name of the service to connect to the RAC One Node Database. |
| Variables File | ? | optional | Location of a DBCA variables file in the software repository to download. If not specified, a default will be used. |

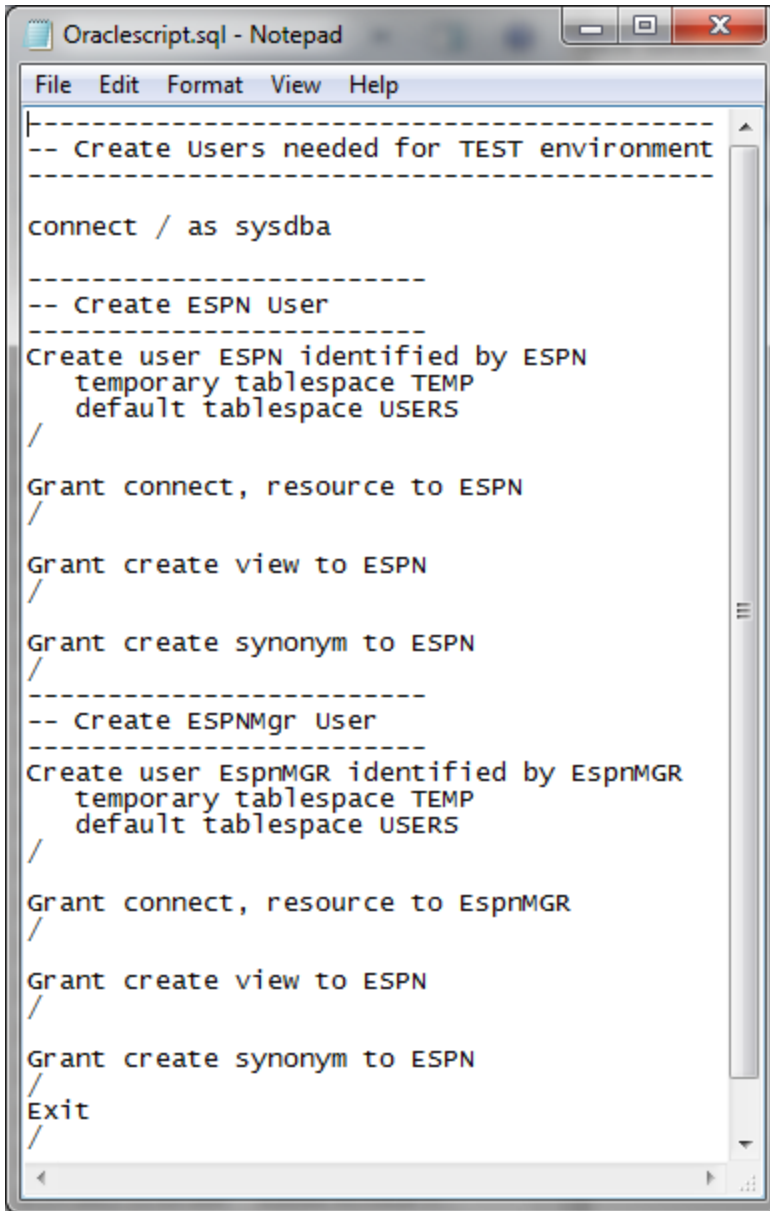
Oracle - SQL Release v3

This workflow deploys and executes an SQL script (or scripts) against target Oracle databases.

This workflow is designed for SQL script and embedded SQL script transactions to be deployed and executed against target Oracle databases. SQL scripts and embedded SQL scripts are stored and downloaded from the software repository .

If the SQL scripts are embedded within an SQL script, this workflow has the ability to download the embedded scripts from SA core. This workflow can download only one level of embedded SQL scripts.

Before running the Oracle - SQL Release workflow you need to create the SQL script file (or files). For example:



```
Oraclescript.sql - Notepad
File Edit Format View Help
-----
-- Create Users needed for TEST environment
-----

connect / as sysdba

-----
-- Create ESPN User
-----
Create user ESPN identified by ESPN
  temporary tablespace TEMP
  default tablespace USERS
/

Grant connect, resource to ESPN
/

Grant create view to ESPN
/

Grant create synonym to ESPN
/
-----
-- Create ESPNMGR User
-----
Create user EspnMGR identified by EspnMGR
  temporary tablespace TEMP
  default tablespace USERS
/

Grant connect, resource to EspnMGR
/

Grant create view to ESPN
/

Grant create synonym to ESPN
/
Exit
/
```

You can customize what the workflow checks in the SQL scripts and embedded SQL scripts:

- Oracle database links
- Oracle system grants based on your list of exceptions
- Prohibited SQL statements based on a regular expression

If all the tests pass, the SQL scripts and embedded SQL scripts will be deployed and executed against the target Oracle databases.

When you create a deployment there is an option to automatically execute a rollback when an error occurs while running the SQL scripts. This rolls back not only the SQL transaction that generated the error but also the previously committed transactions defined within the deployed SQL script.

There is also an option to specify a rollback file that can be executed at a later time. The rollback SQL file serves as an audit file for future use—it records all SQL transactions performed by the SQL scripts and embedded SQL scripts.

Note: This workflow does not provide any pre-parsing of the SQL scripts or embedded SQL scripts.

To use this workflow in your environment, see the following information:

| Topic | Information Included |
|---|---|
| "Prerequisites for this Workflow" | List of prerequisites that must be satisfied before you can run this workflow |
| "How this Workflow Works" | Information about what the workflow does, including validation checks performed, and steps executed |
| "How to Run this Workflow" | Instructions for running this workflow in your environment |
| "Sample Scenarios" | Examples of typical parameter values for this workflow |
| "Parameters for Oracle - SQL Release v2" on page 339 v3 | List of input parameters for this workflow |

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the ["Oracle - SQL Release v3"](#) workflow.

Dependencies

- The latest HPE DMA solution packs require the latest HPE DMA platform. To use the latest solution packs, update the HPE DMA platform. HPE DMA10.50 solution packs are supported on HPE DMA10.50 (and later).
- You have installed the Database Compliance solution pack.
- The SQL script must reside on the target server or in the software repository.
- The Oracle instance port must be populated correctly.
- Target servers must be in archive log mode if you desire to execute rollback.
- The target instance has been discovered prior to running this workflow to gather the instance information from the metadata.

Supported Versions of Oracle Database

10gR2 *, 11gR1 *, 11gR2, and 12cR1

* = Out of Oracle standard support

SQL Scripts

You need to create the SQL script file (or files) that manage the release. The files may contain the following Oracle DML and DDL commands:

| | | |
|----------------|--------------|------------------|
| ALTER INDEX | DELETE | INSERT |
| CREATE INDEX | DROP INDEX | GRANT PRIVILEGE |
| CREATE SYNONYM | DROP SYNONYM | REVOKE PRIVILEGE |
| CREATE VIEW | DROP TABLE | UPDATE |
| CREATE TABLE | DROP VIEW | |
| CREATE USER | DROP USER | |

Note: Any valid SQL command that is not included in the above table can still be contained in an SQL script, but the workflow's Rollback functionality will not be supported. You need to specify N for the Execute Rollback parameter when you deploy the workflow.

Tip: List the SQL script files in the SQL scripts parameter in the order in which they need to be executed.

OracleSQL Documentation

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#).

How this Workflow Works

The following information describes how the "Oracle - SQL Release v3" workflow works.

Overview show

The workflow starts by gathering input parameters and constructing commands that will be used in subsequent steps .

If the SQL scripts and embedded SQL scripts does not exist on the specified target location, they are downloaded from the HPE DMA software repository.

Based on the parameters you set when you create your deployment, the workflow will do the following:

- Check the SQL code for Oracle database links—if any are found, the workflow will exit with a failure code.
- Check the SQL code for Oracle system grants specified in the Check System Grants Exception List parameter—if any are found, the workflow will exit with a failure code.
- Check the SQL code for a regular expression specified in the Regular Expression parameter—if it is found, the workflow will exit with a failure code.
- Checks the SQL syntax for errors—if any are found and Check SQL Syntax Ignore Errors is not True, the workflow will exit with a failure code.

If no errors were found (or syntax errors are found and Check SQL Syntax Ignore Errors is True), the workflow creates an SQL*Plus session to run the SQL scripts. Any errors that are on the Acceptable ORA Error list are ignored.

If Execute Rollback is enabled and log archiving is turned on, a rollback SQL script file will be created. If an error occurs during the execution of the SQL scripts a rollback will automatically be performed—as if the SQL scripts had never been executed.

The workflow ends by cleaning up any temporary downloaded files.

Validation Checks Performed show

This workflow validates the SQL scripts in the following ways:

1. If you set the Check Database Links Run Flag to Y, the workflow searches for the @ character to indicate a database link—ignoring any @ characters within single quotes.
2. If you set the Check System Grants Run Flag to Y, the workflow searches the SQL statements for the system grants that you specified in the Check System Grants Exception List parameter.

For example:

If you specify CREATE VIEW, the workflow makes sure there are no queries of the form GRANT CREATE VIEW TO myuser.

3. If you set the Check Prohibited Statements Run Flag to Y, the workflow searches the SQL statements for the Regular Expression that you specify.
4. The workflow checks the SQL syntax according to the data type specified in the Check SQL Syntax Database Type parameter. If you set the Check SQL Syntax Ignore Errors to True, any syntax errors will be ignored and the workflow will continue.

If any of the validation checks fail, the workflow will output the offending SQL line to stdout, return an error status, and the SQL scripts will not be executed.

Steps Executed show

The "Oracle - SQL Release v3" workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.

Steps Used in Oracle - SQL Release v3

| Workflow Step | Description |
|---|--|
| Gather Parameters for Oracle SQL Release v3 | This step accepts the basic input parameters for the workflow. The parameters will be used in subsequent steps. This step also constructs the commands needed to execute subsequent steps in the workflow as either the OS administrative user or the user who owns the pertinent ORACLE_HOME. |
| Validate Oracle SQL Release v3 | This step validates the input parameters for Oracle SQL Release v3. |
| Check if Download File Exists | This step determines whether one or more specified files already exist on the target server. |
| Check For Nested | This step checks for embedded SQL scripts. |

Steps Used in Oracle - SQL Release v3, continued

| Workflow Step | Description |
|---|---|
| SQL files in Oracle SQL file | |
| Download Software | This step downloads a list of files to a specified location on the target server. |
| Set File Owner and Group Permissions For Oracle SQL files | This step changes the ownership and group of each supplied files. A warning is displayed if any files that are not found in the specified location. |
| Check Oracle Database Links | This step checks the SQL scripts for the use of database links taking care to exclude hard-coded strings. If any are found the workflow will fail. |
| Check Oracle System Grants | This step checks an SQL script for any system level grants and for specific privileges specified in the Check System Grants Exception List parameter. If any are found the workflow will fail. |
| Check Prohibited Statements In SQL Scripts | This step applies a regular expression to each SQL statement in an SQL script. Any regex matches are output to <code>stdout</code> , an error status is returned, and the workflow will fail. |
| Execute SQL Syntax Check | This step executes an SQL syntax check of the SQL script files. It then reports pass or fail for each file and the number of syntax errors found. If Check SQL Syntax Ignore Errors is set to True, any syntax errors will be ignored and the workflow will continue. |
| Run Oracle SQL Plus Script v3 | <p>This step executes an SQL*Plus Script. It checks the output for any errors. Any errors that are on the Acceptable ORA Error list are ignored.</p> <p>Note: This is designed to be run by the Oracle software owner (typically oracle).</p> <p>If Execute Rollback is enabled, log archiving must be turned on.</p> |
| Create and Execute Rollback Script | <p>This step creates the rollback SQL script for all actions executed in the SQL release process. If Execute Rollback is enabled and an error occurs during the release process, the step will also execute the rollback SQL script.</p> <p>Note: This step is designed to be run as the Oracle software owner (typically oracle).</p> <p>This step is designed to only work with the Run Oracle SQL*Plus Script step and cannot be used standalone since it depends on the log archiving.</p> |

Steps Used in Oracle - SQL Release v3, continued

| Workflow Step | Description |
|--------------------------|--|
| Cleanup Downloaded Files | This step removes all temporary downloaded files and archives. |

Note: For input parameter descriptions and defaults, see "[Parameters for Oracle - SQL Release v2](#)" on page 339.

How to Run this Workflow

The following instructions show you how to customize and run the ["Oracle - SQL Release v3"](#) workflow in your environment.

Tip: For detailed instructions to run HPE DMA workflows—using the Oracle - Compliance Audit workflow as an example—see [HPE DMA Quick Start Tutorial](#).

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in ["Parameters for Oracle - SQL Release v2" on page 339](#).

Note: Before following this procedure, review the ["Prerequisites for this Workflow" on page 324](#), and ensure that all requirements are satisfied.

To use the Oracle - SQL Release workflow:

1. Create a deployable copy of the workflow.
2. Determine the values that you will specify for the following parameters:

Input Parameters for Gather Parameters for Oracle SQL Release

| Parameter Name | Default Value | Required | Description |
|--|---------------|----------|--|
| Acceptable ORA Error | | optional | Comma-separated list of ORA errors that will be expected (and can be ignored) while running release scripts. For example: ORA-00942 |
| Check Database Links Run Flag | Y | required | Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check). |
| Regular Expression Check Prohibited Statements Run Flag Check Prohibited | | optional | The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table. |

Input Parameters for Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Default Value | Required | Description |
|--------------------------------------|--|----------|---|
| Statements Run Flag | | | |
| Check Prohibited Statements Run Flag | no default | required | Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check). |
| Check SQL Syntax Database Type | dbvoracle | optional | Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation for valid options. |
| Check SQL Syntax Ignore Errors | False | optional | Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present). |
| Check System Grants Exception List | CREATE VIEW, CREATE SYNONYM, CREATE CLUSTER, CREATE TABLE | optional | Comma-separated list of system privileges that are not allowed in this deployment. |
| Check System Grants Run Flag | Y | required | Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check). |
| Execute Rollback | no default | required | Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error. |
| Oracle OS User | no default | required | The user who owns ORACLE_HOME. |

Input Parameters for Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Default Value | Required | Description |
|-------------------|---------------|---|---|
| Oracle Password | no default | required | Password for the Oracle Database user. |
| Oracle User | no default | required | Oracle Database user who will execute the SQL scripts. |
| Rollback File | no default | required if Execute Rollback is enabled | The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to: <ul style="list-style-type: none"> Perform an automatic rollback in the event of an error Execute a rollback at a later time Serve as an audit file for future use |
| SQL Scripts | script.sql | required | Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql Note: List the SQL script files in the order in which they need to be executed. |
| Staging Directory | /tmp/ | optional | The directory on the target server where the SQL script file (or files) will be downloaded. |

Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow.

Note: See "[Parameters for Oracle - SQL Release v2](#)" on page 339 for detailed descriptions of all input parameters for this workflow, including default values.

- In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
- Save the changes to the workflow (click **Save** in the lower right corner).
- Create a new deployment.

6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment.

To verify the results:

The workflow will complete and report SUCCESS on the Console if it has run successfully. If an error occurs during workflow execution, the error is logged, and the workflow terminates in the FAILURE state.

Optional: If you want to further verify the results:

Log in to your database to make sure that whatever you created or modified was actually done.

Sample Scenarios

This topic shows you typical parameter values for different use cases for the "[Oracle - SQL Release v3](#)" workflow.

Scenario 1: Deploy and execute the scripts show

This is a very simple example that you might use in a development environment. None of the optional checks of the SQL scripts are performed. SQL syntax errors will be ignored. The workflow will create an SQL*Plus session to deploy and execute the scripts. It will not save a rollback file. It will not perform an automatic rollback if an error is encountered when executing the SQL scripts.

Archive logging can be off since Execute Rollback is not enabled.

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release

| Parameter Name | Example | Description |
|--------------------------------------|-----------|---|
| Check Database Links Run Flag | N | Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check). |
| Check Prohibited Statements Run Flag | N | Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check). |
| Check SQL Syntax Database Type | dbvoracle | Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation for valid options. |
| Check SQL Syntax Ignore Errors | True | Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present). |
| Check System Grants Run Flag | N | Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check). |
| Execute Rollback | N | Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error. |

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Example | Description |
|-------------------|-----------------|--|
| Oracle OS User | oracle | The user who owns ORACLE_HOME. |
| Oracle Password | tiger | Password for the Oracle Database user. |
| Oracle User | scott | Oracle Database user who will execute the SQL scripts. |
| SQL Scripts | see description | <p>Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example:</p> <pre>MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql</pre> <p>Note: List the SQL script files in the order in which they need to be executed.</p> |
| SQL Script Output | True | The output of SQL script execution will be displayed on DMA console. |

Scenario 2: Check the SQL script files, deploy and execute the scripts, then perform a rollback if an error is encountered show

This is a more complex example that you might use in a production environment where you desire more safeguards.

Archive logging must be enabled for this use case.

The workflow will check the SQL script files for:

- Oracle database links
- The Oracle system grants that are specified in the Exception List parameter
- The regular expression that is specified in the Regular Expression parameter
- SQL syntax errors

If no errors were found in the checks, the workflow creates an SQL*Plus session to deploy and execute the scripts. It will save a rollback file and perform an automatic rollback if an error is encountered when executing the SQL scripts.

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release

| Parameter Name | Example | Description |
|--|--------------|--|
| Acceptable ORA Error | ORA-00942 | Comma-separated list of ORA errors that will be expected (and can be ignored) while running release scripts. For example: ORA-00942 |
| Check Database Links Run Flag | Y | Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check). |
| Check Prohibited Statements Regular Expression | drop\s+table | The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table. |
| Check Prohibited Statements Run Flag | Y | Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check). |
| Check SQL Syntax Database Type | dbvoracle | Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation for valid options. |

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Example | Description |
|------------------------------------|--|---|
| Check SQL Syntax Ignore Errors | False | Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present). |
| Check System Grants Exception List | CREATE VIEW, CREATE SYNONYM, CREATE CLUSTER, CREATE TABLE | Comma-separated list of system privileges that are not allowed in this deployment. |
| Check System Grants Run Flag | Y | Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check). |
| Execute Rollback | Y | Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error. |
| Oracle OS User | oracle | The user who owns ORACLE_HOME. |
| Oracle Password | tiger | Password for the Oracle Database user. |
| Oracle User | scott | Oracle Database user who will execute the SQL scripts. |
| Rollback File | /var/tmp/ rollback.sql | The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to: <ul style="list-style-type: none"> • Perform an automatic rollback in the event of an error • Execute a rollback at a later time • Serve as an audit file for future use |
| SQL Scripts | see description | Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: |

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Example | Description |
|----------------|---------|--|
| | | MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql Note: List the SQL script files in the order in which they need to be executed. |

Be sure that the default values for all remaining input parameters are appropriate for your environment (see ["Parameters for Oracle - SQL Release v2" on the next page](#)).

Parameters for Oracle - SQL Release v2

The following tables describe the required and optional input parameters for this workflow. Some of these parameters may not be initially visible in a deployment. For some parameters, if you do not specify a value for a parameter, a default value is assigned.

Note: Only those parameters that are configurable in a standard deployment are listed here. Input parameters that must be mapped to output parameters of previous steps are not listed.

Input Parameters Defined in this Step: Gather Parameters for Oracle SQL Release

| Parameter Name | Default Value | Required | Description |
|--|---------------------------------|----------|--|
| Acceptable ORA Error | | optional | Comma-separated list of ORA errors that will be expected (and can be ignored) while running release scripts. For example: ORA-00942 |
| Check Database Links Run Flag | Y | required | Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check). |
| Check Prohibited Statements Regular Expression | | optional | The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table. |
| Check Prohibited Statements Run Flag | no default | required | Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check). |
| Check SQL Syntax Database Type | dbvoracle | optional | Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation for valid options. |
| Check SQL Syntax Ignore Errors | False | optional | Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present). |
| Check System Grants Exception | CREATE VIEW, CREATE SYNONYM, | optional | Comma-separated list of system privileges that are not allowed in this deployment. |

Input Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Default Value | Required | Description |
|------------------------------|------------------------------|---|---|
| List | CREATE CLUSTER, CREATE TABLE | | |
| Check System Grants Run Flag | Y | required | Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check). |
| Execute Rollback | no default | required | Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error. |
| Oracle OS User | no default | required | The user who owns ORACLE_HOME. |
| Oracle Password | no default | required | Password for the Oracle Database user. |
| Oracle User | no default | required | Oracle Database user who will execute the SQL scripts. |
| Rollback File | no default | required if Execute Rollback is enabled | The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to: <ul style="list-style-type: none"> • Perform an automatic rollback in the event of an error • Execute a rollback at a later time • Serve as an audit file for future use |
| SQL Script Output | False | optional | If True, enables to view the output of SQL script execution on DMA console. |
| SQL Scripts | script.sql | required | Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql |

Input Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

| Parameter Name | Default Value | Required | Description |
|-------------------|---------------|----------|---|
| | | | Note: List the SQL script files in the order in which they need to be executed. |
| Staging Directory | /tmp/ | optional | The directory on the target server where the SQL script file (or files) will be downloaded. |

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