

# HP Database and Middleware Automation

For Linux, Solaris, AIX, and Windows®

Software Version: 10.10

## Database Release Management User Guide

Document Release Date: June 2013

Software Release Date: June 2013



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# Documentation Updates

The title page of this document contains the following identifying information:

- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

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Or click the **New users - please register** link on the HP Passport login page.

You will also receive updated or new editions if you subscribe to the appropriate product support service. Contact your HP sales representative for details.

## Document Changes

Chapter	Version	Changes
<a href="#">Title Page</a> <a href="#">Legal Notices</a>	10.01	Updated version number, software release date, document release date, and copyright date range.
<a href="#">Database Release Management Quick Start</a>	10.01	Updated from 10.00 to 10.01.
<a href="#">Title Page</a> <a href="#">Legal Notices</a>	10.10	Updated version number, software release date, document release date, and copyright date range.
<a href="#">About HP DMA Solution Packs</a>	10.10	Added overview topic: About HP DMA Solution Packs.
<a href="#">Supported Products and Platforms</a>	10.10	Added support for SQL Server 2012.

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- Manage support contracts
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<http://h20229.www2.hp.com/passport-registration.html>

To find more information about access levels, go to:

[http://h20230.www2.hp.com/new\\_access\\_levels.jsp](http://h20230.www2.hp.com/new_access_levels.jsp)

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## About HP DMA Solution Packs

HP Database and Middleware Automation (HP DMA) software automates administrative tasks like provisioning and configuration, compliance, patching, and release management for databases and application servers. When performed manually, these day-to-day operations are error-prone, time consuming, and difficult to scale.

HP DMA automates these daily, mundane, and repetitive administration tasks that take up 60-70% of a database or application server administrator's day. Automating these tasks enables greater efficiency and faster change delivery with higher quality and better predictability.

HP DMA provides role-based access to automation content. This enables you to better utilize resources at every level:

- End-users can deliver routine, yet complex, DBA and middleware tasks.
- Operators can execute expert level tasks across multiple servers including provisioning, patching, configuration, and compliance checking.
- Subject matter experts can define, enforce, and audit full stack automation across network, storage, server, database, & middleware.

An HP DMA workflow performs a specific automated task—such as provisioning database or application servers, patching database or application servers, or checking a database or application server for compliance with a specific standard. You specify environment-specific information that the workflow requires by configuring its parameters.

Related HP DMA workflows are grouped together in solution packs. When you purchase or upgrade HP DMA content, you are granted access to download specific solution packs.

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# Audience

This solution is designed for:

- Database administrators who are responsible for changing application schema or data in that schema, updating server configurations, or making security changes—for Oracle®, Microsoft® SQL Server, or Sybase Adaptive Server Enterprise (Sybase ASE) databases.
- Engineers who are implementing—or planning to implement—HP Database and Middleware Automation (HP DMA).

To use this solution effectively, you should be familiar with the pertinent database product and HP DMA (see the [Reference Information](#) on page 78).



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# Document Map

The following table shows you how to navigate this guide:

Topic	Description
<a href="#">The Database Release Management Solution</a>	General information about this solution, including what it contains and what it does.
<a href="#">Database Release Management Quick Start</a>	A step-by-step tutorial that shows you how to manage the release of Oracle SQL scripts. This can be used as a reference for the other workflows.
<a href="#">Workflow Details</a>	Information about each of the workflows included in this solution, including: prerequisites, how it works, how to run it, sample scenarios, and a list of input parameters.
<a href="#">Reference Information</a>	Links to pertinent product documentation and more information about HP DMA.
<a href="#">Tips and Best Practices</a>	Simple procedures that you can use to accomplish a variety of common HP DMA tasks.
<a href="#">Troubleshooting</a>	Tips for solving common problems.

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# Important Terms

Here are a few basic HP DMA terms that you will need to know:

- In HP DMA, a **workflow** executes a process —such as installing a software product or checking a database instance for compliance with a specific security benchmark.
- A workflow consists of a sequence of **steps**. Each step performs a very specific task. Steps can be shared among workflows.
- Steps can have input and output **parameters**, whose values will be unique to your environment.

If you provide correct values for the input parameters that each scenario requires, the workflow will be able to accomplish its objective. Output parameters from one step often serve as input parameters to another step.

- A **solution pack** contains a collection of related workflows and the steps, functions, and policies that implement each workflow.

More precisely, solution packs contain **workflow templates**. These are read-only versions of the workflows that cannot be deployed. To run a workflow included in a solution pack, you must first create a deployable copy of the workflow template and then customize that copy for your environment.

- A **deployment** associates a workflow with the targets (servers, instances, or databases) where the workflow will run. To run a workflow, you execute a specific deployment. A deployment is associated with one workflow; a workflow can have many deployments, each with its own targets and parameter settings.
- The umbrella term **automation items** is used to refer to those items to which role-based permissions can be assigned. Automation items include workflows, deployments, steps, and policies.

Organizations also have role-based permissions. Servers, instances, and databases inherit their role-based permissions from the organization in which the server resides.

- The **software repository** contains any files that a workflow might need to carry out its purpose (for example, software binaries or patch archives). If the files that a workflow requires are not in the software repository, they must be stored locally on each target server.

When you are using HP DMA with HP Server Automation (HP SA), the software repository is the HP SA Software Library.

- An **organization** is a logical grouping of servers. You can use organizations to separate development, staging, and production resources—or to separate logical business units. Because user security for running workflows is defined at the organization level, organizations should be composed with user security in mind.

Additional terms are defined in the [Glossary](#) on page 93.

# Chapter 1

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## The Database Release Management Solution

The HP Database and Middleware Automation (HP DMA) Database Release Management solution provides tools that you can use to manage your databases in an efficient, automated way. Any schema, data, server configuration, or security can be changed with these tools. Basically, any change that can be implemented using an SQL script is possible when you provide the appropriate inputs.

**Benefits of using this HP DMA solution rather than a manual release management process:**

- You can automatically and thoroughly analyze each SQL script before it is deployed and executed, alleviating the need to visually inspect your SQL script files.
- You can control which SQL statements are allowed and which are prohibited.
- You can keep your databases in a consistent state.
- You can update your databases across multiple targets in either a test or production environment.
- With Oracle databases, you can roll back all of the SQL script changes if an error occurs any time during the deployment.
- With Sybase ASE databases, you can simulate your SQL script deployment and execution—providing a query plan, an estimated execution time, and estimated logical/physical input and output counts—all without executing and committing changes to the database.

By consistently using the tools provided in this solution, you can manage your database updates more precisely—and save time in the process!

## What this Solution Includes

The HP DMA Database Release Management solution includes the following workflows:

Workflow Name	Description
<a href="#">Oracle SQL Release</a>	This workflow deploys and executes an SQL script (or scripts) against target Oracle databases.
<a href="#">DB Release for SQL Server</a>	This workflow will check a list of T-SQL script files for disallowed commands, check the syntax, then execute the files on the target Microsoft SQL Server databases if they pass all required tests.
<a href="#">Sybase Release Management</a>	<p>This workflow is designed to release T-SQL code for a Sybase Adaptive Server Enterprise (Sybase ASE) database. The workflow can be used to:</p> <ul style="list-style-type: none"><li>• Release DDL/DML/DCL T-SQL code.</li><li>• Update the database server level configuration.</li><li>• Update the database options.</li><li>• Restrict the user from executing prohibited commands or regular expressions in the code.</li></ul>

## Supported Products and Platforms

### Product Versions and Operating System Requirements

The HP DMA Database Release Management workflows are supported on the following products and platforms:

Product	Product Versions	Operating System Platform
Oracle Database	10gR2, 11gR1, and 11gR2	Red Hat Enterprise Linux, SUSE Linux, and Oracle Linux  Solaris  AIX
SQL Server	2005, 2008, 2008 R2, 2012	Windows
Sybase ASE	15.0.3, 15.5 (tested)  15.0, 15.0.1, 15.0.2 (not tested)	Red Hat Enterprise Linux and SUSE Linux  Solaris  AIX

For specific target operating system versions supported by each workflow, see the *HP Database and Middleware Automation Support Matrix* available on the HP Software Product Manuals web site:

<http://h20230.www2.hp.com/selfsolve/manuals>

### Product Hardware and Software Requirements

For database product hardware and software requirements, see the pertinent [Database Product Documentation](#).

### HP DMA Hardware Requirements

For HP DMA server hardware requirements, see the *HP DMA Installation Guide* and the *HP DMA Release Notes*.

### HP DMA Software Requirements

This solution requires HP DMA version 10.10 (or later).

## Chapter 2

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# Database Release Management Quick Start

This tutorial shows you how to run one of the workflows, Oracle SQL Release, in the Database Release Management Solution Pack. You can use this tutorial as an example for running the other database release management workflows.

The tutorial will guide you through the following steps:

1. [Import the Solution Pack](#) on the next page
2. [Create a Deployable Workflow](#) on page 18
3. [Create a Deployment](#) on page 19
4. [Run Your Workflow](#) on page 21
5. [View the Results](#) on page 22

**Note:** In this tutorial, default values will be used for most input parameters. Before executing these steps, make sure that these default values are suitable for your environment.

See [Parameters for Oracle SQL Release](#) on page 41 for descriptions of available input parameters, including default values.

The information presented in this tutorial assumes the following:

- HP DMA is installed and operational.
- At least one valid target is available.

**Note:** This tutorial is included in every HP DMA solution pack user guide. To skip directly to information about the Database Release Management workflows, see the [Workflow Details](#).

## Import the Solution Pack

The following instructions assume that you have purchased a license for the HP DMA solution pack that you want to import.

The HP DMA 10.10 solution packs are included on the HP DMA 10.10 installation media. They are located in the following folders:

- The `DMA_10.10_Server_and_Client` folder contains the Discovery solution pack.  
The Discovery solution pack is not automatically installed with HP DMA. You must import it if you want to use the discovery workflows.
- The `DMA_10.10_Database_Solution_Packs` folder contains all of the database solution packs (provisioning, advanced provisioning, patching, advanced patching, compliance, refresh, and release management).
- The `DMA_10.10_Middleware_Solution_Packs` folder contains all of the application server solution packs (provisioning, patching, configuration management, and release management).

**Note:** Always check to see if there are more recent versions of the HP DMA solution packs available online. Due to frequent releases, it is likely that the solution packs provided on the installation media have since been updated.

### To get the most recent version of a solution pack:

1. Go to the following web site: [HP Software Support Online](#)
2. Go to the Self-Solve tab, and sign in using your HP Passport credentials (see [Support](#) on page 4 for more information).
3. On the Advanced Search page, specify the following search criteria:

Product:	Database and Middleware Automation
Version:	All Versions
Operating System:	All Operating Systems
Document Type:	Patches
4. Click **Search**.
5. If there is a more recent version of the Database Release Management solution pack that you want to import, do the following:
  - a. Click the link for the solution pack that you want to import (for example: DB RelMgmt 10.x).
  - b. Click the **DOWNLOAD PATCH** link, and download the ZIP file that contains the patch.
  - c. From the patch ZIP file, extract the ZIP file that contains the solution pack (for example: DBReleaseManagement.zip).

**Note:** This ZIP file may be included in a larger ZIP file that contains multiple solution packs.

### To import the solution pack:

1. On the system where you downloaded the solution pack, open a web browser, and go to the following address:  
  
`https://<HP_DMAserver>:8443/dma/login`
2. Log in to the HP DMA server using an account with Administrator capability.
3. On the Solutions > Installed tab, click the **Browse** button in the lower right corner. The Choose File dialog opens.

**Note:** This button and the dialog that subsequently opens may have different names depending on the browser that you are using.

4. Locate and select the solution pack ZIP file that you extracted earlier, and click **Open**.
5. Click **Import solution pack**.

To view basic information about the solution pack, hover your mouse over its name in the left pane:

The screenshot displays the HP Database & Middleware Automation web interface. The top navigation bar includes links for Home, Automation, Reports, Environment, Solutions, and Setup. The 'Solutions' tab is active, and the 'Installed' sub-tab is selected. A green banner at the top of the main content area states 'Successfully imported HP DMA Database Release Management Solution Pack'. Below this, the 'Installed Solutions' section is divided into two panes. The left pane, titled 'SOLUTION PACKS', lists several solution packs, with 'HP DMA Database Release Management Solution Pack' (Version 10.01) highlighted. The right pane, titled 'DETAILS', provides information for the selected pack: Name (HP DMA Database Release Management Solution Pack), Version (10.01), Targets (5), Installed (06 Mar, 2013), and Description (Database Release Management for Oracle and SQL Server. Build 31995). At the bottom right of the interface, there are two buttons: 'Browse...' and 'Import solution pack'.



To view detailed information about the solution pack, click its name in the left pane. To view a list of the workflows that the solution pack contains, go to the Workflows tab.

The screenshot displays the HP Database & Middleware Automation console. The top navigation bar includes links for Home, Automation, Reports, Environment, Solutions, and Setup. Below this, the 'Installed' tab is active, showing the 'HP DMA Database Release Management Solution Pack' (Version 10.01). The 'Workflows' tab is selected, displaying a list of 12 workflow steps in a numbered sequence:

1. Prepare Oracle Call Wrapper
2. Oracle SQL Release Parameters
3. Check If Download File Exists
4. Check Oracle Database Links
5. Download Software
6. Failure
7. Check Oracle System Grants
8. Check Prohibited Statements In SQL Scripts
9. Run Oracle SQL\*Plus Script
10. Create and Execute Rollback Script
11. Cleanup Downloaded Files
12. Success

On the left side, a list of solution packs is shown, with 'Oracle SQL Release' selected. At the bottom, a red 'X DELETE' button is visible.

## Create a Deployable Workflow

The workflow templates provided by HP in your solution pack are read-only and cannot be deployed. When you are viewing a read-only item in the HP DMA web UI, you will see the lock icon in the lower right corner:

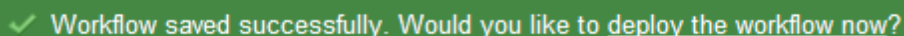


Read-only workflows are not deployable. You can create a deployable workflow by making a copy of a workflow template.<sup>1</sup>

### To create a deployable copy of the workflow template:

1. In the HP DMA web interface, go to Solutions > Installed.
2. In the left pane, click the Database Release Management Solution Pack.
3. Go to the Workflows tab.
4. From the list of workflows, select the Oracle SQL Release template.
5. Click the **Copy** button in the lower left corner.
6. On the Documentation tab, specify the following:
  - Name – Name that will appear in the list of available workflows
  - Tags – Keywords that you can use later to search for this workflow (optional)
  - Type – OS (this will be selected as a result of the copy)
  - Target level – Database (this will be selected as a result of the copy)
7. On the Roles tab, grant Read access to at least one user or group and Write access to at least one user or group.
8. Click **Save**.

Your new workflow now appears in the list of available workflows, and the following message is displayed:



Workflow saved successfully. Would you like to [deploy the workflow now?](#)

9. Click the **deploy the workflow now** link in the green message bar.

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<sup>1</sup>For more information about creating and working with workflows, see “Workflows” in the *HP DMA User Guide*. This document is available on the HP Software Product Manuals web site: <http://h20230.www2.hp.com/selfsolve/manuals>

## Create a Deployment

Before you can run your new workflow, you must create a deployment. A deployment associates a workflow with one or more specific targets (servers, instances, or databases).

### To create a deployment:

1. If you do not see the green message bar—for example, if you navigated to another page after you created your copy of the workflow template—follow these steps:
  - a. Go to the Automation > Deployments page.
  - b. In the lower right corner, click **New deployment**.
2. Specify the following:
  - Name – Name that will appear in the list of available deployments.
  - Workflow – From the drop-down list, select the deployable workflow (the copy) that you just created.
  - Schedule – Frequency or date when the workflow will run. Select None so that the workflow will run once when you explicitly tell it to run.
3. From the list of AVAILABLE targets on the left side of the Targets area, click the **ADD** link for the database where the workflow will run.

hp Database & Middleware Automation Server: dma1.mycompany.com User: admin Logout

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

### New deployment

Targets Parameters Roles

Name: My Deployment Oracle SQL Release

Workflow: My Copy of Oracle SQL Release [VIEW WORKFLOW](#)

Schedule: None

Targets

**Instance**

**AVAILABLE**

TESTDOMAIN [DMALAB.MYCOMPANY.COM]	<a href="#">ADD ALL</a>
AdminServer	<a href="#">ADD</a>
CLOUDDB [CLOUD.MYCOMPANY.COM]	<a href="#">ADD ALL</a>
CLOUDDB	<a href="#">ADD</a>
DB1 [ORCL1.MYCOMPANY.COM]	<a href="#">ADD ALL</a>
DB1 <b>Database</b>	<a href="#">ADD</a>
DB11203 [ORCL2.MYCOMPANY.COM]	<a href="#">ADD ALL</a>
DB11203	<a href="#">ADD</a>

**SELECTED**

DB1 [ORCL1.MYCOMPANY.COM]	<a href="#">REMOVE ALL</a>
DB1	<a href="#">REMOVE</a>

Save or CANCEL

- On the Parameters tab, specify values for the following input parameters:

hp Database & Middleware Automation Server: dma1.mycompany.com User: admin Logout

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

### New deployment

Targets Parameters Roles

Prepare Oracle Call Wrapper

Oracle Account:  Text  
(Required) The user who owns ORACLE\_HOME. Left blank for Windows.

Oracle SQL Release Parameters

Oracle Password:  Text  
(Required) Oracle database User password.

Oracle User:  Text  
(Required) Oracle database User to be used in executing the SQL scripts.

SQL Scripts:  Text  
(Required) SQL script file(s) that needs to be downloaded from software repository that will be deployed onto the target servers. Use comma to separate multiple SQL script files. SQL script file can handle arguments. Example: MySQLfile1.sql Variable1, MySQLfile2.sql Variable2 Variable3

Staging Directory:  Text  
(Optional) The target server's directory path on where the SQL script file(s) are to be downloaded.

Check Oracle Database Links

Run Flag:  Text  
(Required) "Y" indicates that this step is to be executed. "N" skips the step from being being executed.

**Note:** These are a subset of the required parameters for this workflow. Parameters that are not visible in the deployment will have default values. See [Parameters for Oracle SQL Release](#) on page 41 for descriptions of all available input parameters for this workflow, including default values.

- Click **Save**.

Your new deployment now appears in the list of available workflows, and the following message is displayed:

✓ Deployment saved successfully. Would you like to [run the workflow now?](#)

- Click the **run the workflow now** link in the green message bar.

## Run Your Workflow

Now you are ready to run your workflow against the target that you selected.

### To run the workflow:

1. If you do not see the green message bar—for example, if you navigated to another page after you created your deployment—follow these steps: show
  - a. Go to the Automation > Run area.
  - b. In the list of WORKFLOWS on the left side, select the workflow that you created.
  - c. In the list of DEPLOYMENTS on the right side, select the deployment that you just created.
2. Select the target selector check box for the database where you want to run the workflow.

The screenshot shows the HP Database & Middleware Automation console. The top navigation bar includes tabs for Home, Automation, Reports, Environment, Solutions, Setup, Workflows, Steps, Functions, Policies, Deployments, Run, Console, and History. The 'Run' tab is active. The main area is titled 'Run Workflow' and contains a list of workflows on the left and a list of deployments on the right. A workflow named 'My Copy of Oracle SQL Release' is selected, and its deployment 'My Deployment Oracle SQL Release' is also selected. Below this, a table lists targets with columns for Instance, Database, and Target selector. The target '[DB1] ORCL1.MYCOMPANY.COM' is selected, and the 'DB1 [DB1]' database is also selected. The 'Target selector' checkbox is checked. A 'Run workflow' button is at the bottom right.

3. Click the **Run workflow** button.
4. The following message is displayed:

✓ Workflow started successfully. For status, see the [console](#) or [history](#).

5. To view the progress of your deployment, click the **console** link in the green message bar.

## View the Results

While your workflow is running, you can watch its progress on the Automation > Console page.

To view the progress of the workflow as the deployment proceeds, click the workflow name in the upper box on the Console page.

hp

Database & Middleware Automation

Server: dma1.mycompany.com

User: admin

Logout

Home

Automation

Reports

Environment

Solutions

Setup

Workflows

Steps

Functions

Policies

Deployments

Run

Console

History

Console

Filter

	Workflow	Started	Run by	Server	Instance	Database
<div>RUNNING</div>	My Copy of Oracle SQL Release	14 Sep 12:20	admin	orcl1.mycompany.com	DB1	DB1

To view the outcome of a specific step, select that step in the left box in the Output area. Informational messages are displayed in the right box, and the values of any output parameters are listed.

Output	
<div><div>Prepare Oracle Call Wrapper Finished</div><div>Oracle SQL Release Parameters Finished</div><div>Check If Download File Exists Finished</div><div>Check Oracle Database Links Finished</div><div>Check Oracle System Grants Finished</div><div>Check Prohibited Statements In SQL Scripts Finished</div><div>Run Oracle SQL*Plus Script Finished</div><div>Create and Execute Rollback Script Running</div></div>	<pre>[INFO]: Running SQL scripts using SQL*Plus CreateTestUsers1.sql [INFO]: Running script /tmp/CreateTestUsers1.sql [WARNING]: Exit found in script, will not exit SQLPlus session from the script. All scripts run in a single session. [INFO]: Successfully executed Script /tmp/CreateTestUsers1.sql [INFO]: Successfully executed SQL scripts [INFO]: Closesqlplus session before exit [INFO]: Closesqlplus session after exit [INFO]: Closesqlplus session before exit [INFO]: Closesqlplus session after exit Execute Rollback = False File List = /tmp/tmp2DKJdk.sqlrev Downloaded Files = Status = Success Turn off Supplemental Logging = No jobid = 90cec2e0399411340139c604c88f687f</pre>

While the workflow is running, its status indicator on the Console says RUNNING. After the workflow finishes, its status indicator changes to SUCCESS, FAILURE, or FINISHED depending on the outcome of the workflow.

hp

Database & Middleware Automation

Server: dma1.mycompany.com

User: admin

Logout

Home

Automation

Reports

Environment

Solutions

Setup

Workflows

Steps

Functions

Policies

Deployments

Run

Console

History

Console

Filter

	Workflow	Started	Run by	Server	Instance	Database
SUCCESS	My Copy of Oracle SQL Release	14 Sep 12:20	admin	orcl1.mycompany.com	DB1	DB1

After the workflow has finished running, you can view a summary of your deployment on the History page. This page lists all the workflows that have run on this HP DMA server during the time period specified in the Filter box.

To view step-by-step results, select the row in the table that corresponds to your deployment.

The screenshot shows the HP Database & Middleware Automation interface. The top navigation bar includes links for Home, Automation, Reports, Environment, Solutions, and Setup. The main menu has tabs for Workflows, Steps, Functions, Policies, Deployments, Run, Console, and History. The History page displays a table of workflow runs. The selected workflow, 'My Copy of Oracle SQL Release', is shown in detail below the table. The detailed view includes tabs for Step Output, Step Errors, Step Header, Connector Output, and Connector Errors. The Step Output tab is active, showing a list of steps with their start/end times, exit codes, and descriptions.

Workflow	Started	Run by	Server	Instance	Database	Status
My Copy of Oracle SQL Release	14 Sep 12:20	admin	orcl1.mycompany.com	DB1	DB1	SUCCESS

Step	Start Time	End Time	Exit Code	Description
Prepare Oracle Call Wrapper	18:20:51	18:21:09	Exit: 0	
Oracle SQL Release Parameters	18:21:16	18:21:23	Exit: 0	SQL Scripts 'CreateTestUsers1.sql' Split ['CreateTestUsers1.sql'] SQL Scripts Out CreateTestUsers1.sql
Check If Download File Exists	18:21:41	18:21:58	Exit: 0	[INFO]: Local file exists /tmp/CreateTestUsers1.sql. Will not download from software repository
Check Oracle Database Links	18:22:04	18:22:12	Exit: 0	Check will be skipped
Check Oracle System Grants	18:22:22	18:22:30	Exit: 0	Check will be skipped
Check Prohibited Statements In SQL Scripts	18:22:36	18:22:44	Exit: 0	Check will be skipped

The tabs below the table show you information about each step in the workflow. This includes the start and end time for each step, the exit code, and the following information:

- Step Output – any informational messages that were produced
- Step Errors – any errors that were reported
- Step Header – values assigned to any output parameters
- Connector Output – any informational messages related to the connection to your server management tool
- Connector Errors – any errors that were reported by the connector to your server management tool—if any errors were reported a red asterisk (\*) appears on the tab

# Chapter 3

## Workflow Details

This solution pack contains the following workflows:

Workflow Name	Description
<a href="#">Oracle SQL Release</a>	This workflow deploys and executes an SQL script (or scripts) against target Oracle databases.
<a href="#">DB Release for SQL Server</a>	This workflow will check a list of T-SQL script files for disallowed commands, check the syntax, then execute the files on the target Microsoft SQL Server databases if they pass all required tests.
<a href="#">Sybase Release Management</a>	<p>This workflow is designed to release T-SQL code for a Sybase Adaptive Server Enterprise (Sybase ASE) database. The workflow can be used to:</p> <ul style="list-style-type: none"><li>• Release DDL/DML/DCL T-SQL code.</li><li>• Update the database server level configuration.</li><li>• Update the database options.</li><li>• Restrict the user from executing prohibited commands or regular expressions in the code.</li></ul>

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 database release management 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:

- HP DMA is installed and operational.
- At least one suitable target server is available (see [Supported Products and Platforms](#) on page 13).
- You are logged in to the HP DMA web interface.
- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

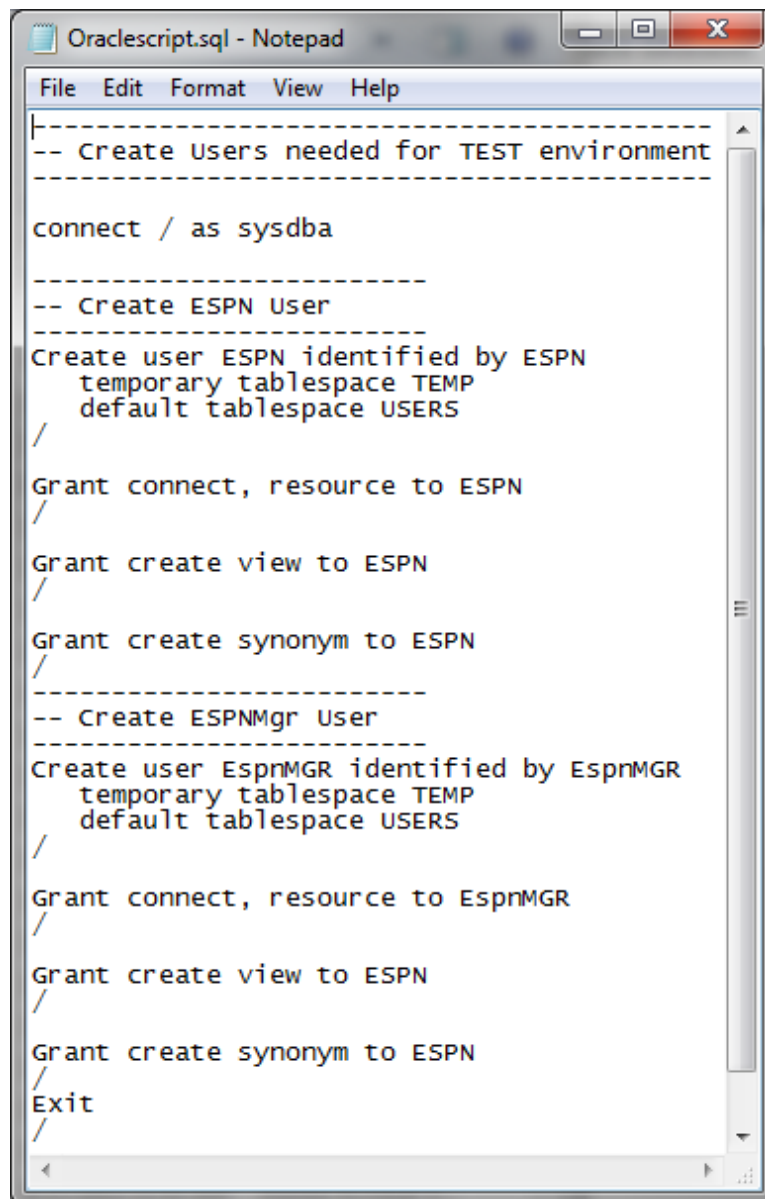
**Tip:** All parameters used by the workflows in this solution are provided in the "Parameters" topic associated with each workflow.

## Oracle SQL Release

This workflow deploys and executes an SQL script (or scripts) against target Oracle databases.

This workflow is designed for SQL script transactions to be deployed and executed against target Oracle databases. SQL scripts are stored and downloaded from the software repository.

Before running the Oracle SQL Release workflow you need to create the SQL script file (or files). For example:



```
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:

- 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 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 script.

**Note:** This workflow does not provide any pre-parsing of the SQL scripts.

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

Topic	Information Included
<a href="#">Prerequisites for this Workflow</a>	List of prerequisites that must be satisfied before you can run this workflow
<a href="#">How this Workflow Works</a>	Information about what the workflow does, including validation checks performed, and steps executed
<a href="#">How to Run this Workflow</a>	Instructions for running this workflow in your environment
<a href="#">Sample Scenarios</a>	Examples of typical parameter values for this workflow
<a href="#">Parameters</a>	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](#) workflow.

### Dependencies

- This solution requires HP DMA version 10.10 (or later).
- You have installed the Database Release Management 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, and 11gR2

### 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	

**Tip:** List the SQL script files in the SQL scripts parameter in the order in which they need to be executed.

### Oracle SQL Documentation

For more information about prerequisites for Oracle Database, refer to the [Oracle Database Product Documentation](#) on page 79.

## How this Workflow Works

The following information describes how the [Oracle SQL Release](#) workflow works.

### Overview

The workflow starts by constructing commands that will be used in subsequent steps and by gathering input parameters.

If the SQL scripts do not exist on the specified target location, they are downloaded from the HP 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 your Exception List parameter—if any are found, the workflow will exit with a failure code.
- Check the SQL code for a regular expression—if it is found, the workflow will exit with a failure code.

If no errors were found, 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

This workflow validates the SQL scripts in the following ways:

1. If you set the Run Flag to Check Oracle Database Links, the workflow searches for the @ character to indicate a database link—ignoring any @ characters within single quotes.
2. If you set the Run Flag to Check Oracle System Grants, the workflow searches the SQL statements for the system grants that you specified in the Exception List parameter.

For example:

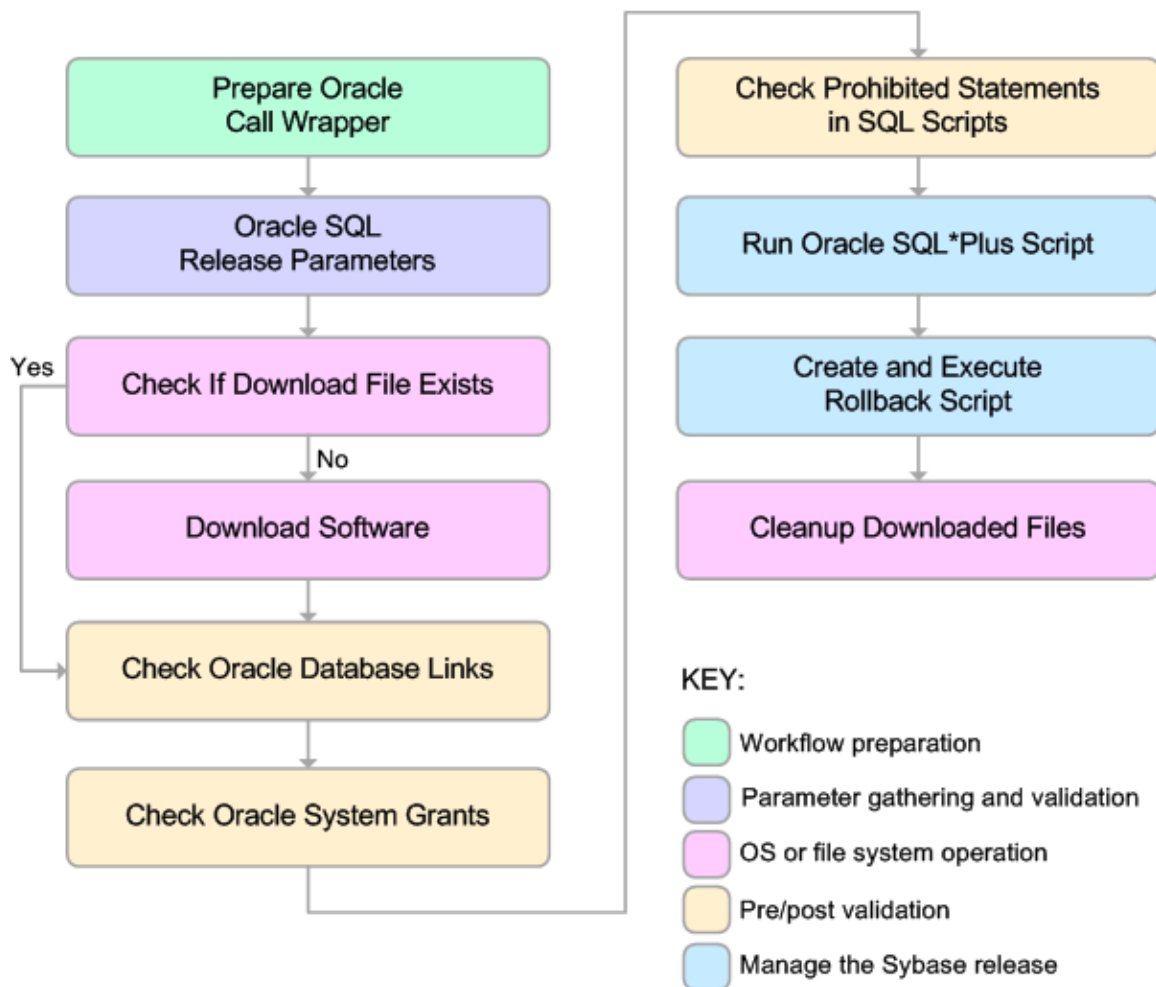
If you specify CREATE VIEW, the workflow makes sure there are no queries of the form GRANT CREATE VIEW TO myuser.

3. If you set the Run Flag to Check Prohibited Statements In SQL Scripts the workflow searches the SQL statements for the Regular Expression that you specify.

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**

The [Oracle SQL Release](#) 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**

Workflow Step	Description
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>
Oracle SQL Release Parameters	<p>This step accepts the basic input parameters for the workflow. The parameters will be used in subsequent steps.</p>

**Steps Used in Oracle SQL Release (continued)**

Workflow Step	Description
Check if Download File Exists	This step determines whether one or more specified files already exist on the target server.
Download Software	This step downloads a list of files to a specified location on the target server.
Check Oracle Database Links	This step checks the SQL scripts for the use of database links taking care to exclude hardcoded 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 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 <code>regex</code> matches are output to <code>stdout</code> , an error status is returned, and the workflow will fail.
Run Oracle SQL*Plus Script	<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><b>Note:</b> 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><b>Note:</b> 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>
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](#) on page 41.

## How to Run this Workflow

The following instructions show you how to customize and run the [Oracle SQL Release](#) 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 SQL Release](#) on page 41.

**Note:** Before following this procedure, review the [Prerequisites for this Workflow](#) on page 28, and ensure that all requirements are satisfied.

### To use the Oracle SQL Release workflow:

1. Create a deployable copy of the workflow (see [Create a Deployable Workflow](#) on page 18).
2. Determine the values that you will specify for the following parameters:

#### Input Parameters for Prepare Oracle Call Wrapper

Parameter Name	Default Value	Required	Description
Oracle Account	oracle	required	The OS user who owns the ORACLE_HOME. Leave this parameter blank for Windows.

#### Input Parameters for Oracle SQL Release Parameters

Parameter Name	Default Value	Required	Description
Oracle Password	no default	required	Password for the Oracle User.
Oracle User	no default	required	Oracle Database user who will execute the SQL scripts.
SQL scripts	script.sql	required	<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. For example:</p> <pre>MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql</pre> <p><b>Note:</b> List the SQL script files in the order in which they need to be executed.</p>
Staging Directory	/tmp/	optional	The directory on the target server where the SQL script file (or files) will be downloaded.



**Input Parameters for Check Oracle Database Links**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check Oracle System Grants**

Parameter Name	Default Value	Required	Description
Exception List	CREATE VIEW,CREATE SYNONYM,CREATE CLUSTER,CREATE TABLE	optional	Comma-separated list of system privileges that are not allowed in this deployment.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check Prohibited Statements In SQL scripts**

Parameter Name	Default Value	Required	Description
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.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Run Oracle SQL\*Plus Script**

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

**Input Parameters for Run Oracle SQL\*Plus Script (continued)**

Parameter Name	Default Value	Required	Description
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.

**Input Parameters for Create and Execute Rollback Script**

Parameter Name	Default Value	Required	Description
Rollback File	no default	required if Execute Rollback is enabled	<p>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:</p> <ul style="list-style-type: none"> <li>■ Perform an automatic rollback in the event of an error</li> <li>■ Execute a rollback at a later time</li> <li>■ Serve as an audit file for future use</li> </ul>

**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 87).

**Note:** See [Parameters for Oracle SQL Release](#) on page 41 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 (see [Create a Deployment](#) on page 19 for instructions).
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 (see [Run Your Workflow](#) on page 21 for instructions).

**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](#) workflow.

### Scenario 1: Deploy and execute the scripts

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. 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.

#### Input Parameters for Prepare Oracle Call Wrapper

Parameter Name	Example Value	Description
Oracle Account	oracle	The OS user who owns the ORACLE_HOME. Leave this parameter blank for Windows.

#### Input Parameters for Oracle SQL Release Parameters

Parameter Name	Example Value	Description
Oracle Password	tiger	Password for the Oracle User.
Oracle User	scott	Oracle Database user who will execute the SQL scripts.
SQL scripts	Oraclescript.sql	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. For example:  MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql  <b>Note:</b> List the SQL script files in the order in which they need to be executed.

#### Input Parameters for Check Oracle Database Links

Parameter Name	Example Value	Description
Run Flag	N	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check Oracle System Grants**

Parameter Name	Example Value	Description
Run Flag	N	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check Prohibited Statements In SQL scripts**

Parameter Name	Example Value	Description
Run Flag	N	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Run Oracle SQL\*Plus Script**

Parameter Name	Example Value	Description
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.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see [Parameters for Oracle SQL Release](#) on page 41).

**Scenario 2: Check the SQL script files, deploy and execute the scripts, then perform a rollback if an error is encountered**

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

If no errors were found in the checks, it 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.

**Input Parameters for Prepare Oracle Call Wrapper**

Parameter Name	Example Value	Description
Oracle Account	oracle	The OS user who owns the ORACLE_HOME. Leave this parameter blank for Windows.

**Input Parameters for Oracle SQL Release Parameters**

Parameter Name	Example Value	Description
Oracle Password	tiger	Password for the Oracle 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. For example:</p> <pre>MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql</pre> <p><b>Note:</b> List the SQL script files in the order in which they need to be executed.</p>

**Input Parameters for Check Oracle Database Links**

Parameter Name	Example Value	Description
Run Flag	Y	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check Oracle System Grants**

Parameter Name	Example Value	Description
Exception List	CREATE VIEW,CREATE SYNONYM,CREATE CLUSTER,CREATE TABLE	Comma-separated list of system privileges that are not allowed in this deployment.
Run Flag	Y	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check Prohibited Statements In SQL scripts**

Parameter Name	Example Value	Description
Regular Expression	drop\s+table	<p>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.</p> <p>For example: drop\s+table will match all statements that drop a table.</p>
Run Flag	Y	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Run Oracle SQL\*Plus Script**

Parameter Name	Example Value	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
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.

**Input Parameters for Create and Execute Rollback Script**

Parameter Name	Example Value	Description
Rollback File	/var/tmp/ rollback.sql	<p>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:</p> <ul style="list-style-type: none"> <li>• Perform an automatic rollback in the event of an error</li> <li>• Execute a rollback at a later time</li> <li>• Serve as an audit file for future use</li> </ul>

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



## Parameters for Oracle SQL Release

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 86). 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: Prepare Oracle Call Wrapper

Parameter Name	Default Value	Required	Description
Oracle Account	oracle	required	The OS user who owns the ORACLE_HOME. Leave this parameter blank for Windows.

### Additional Input Parameters Defined in this Step: Oracle SQL Release Parameters

Parameter Name	Default Value	Required	Description
Oracle Password	no default	required	Password for the Oracle User.
Oracle User	no default	required	Oracle Database user who will execute the SQL scripts.
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. For example:  MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql  <b>Note:</b> 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.

### Additional Input Parameters Defined in this Step: Check Oracle Database Links

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Check Oracle System Grants**

Parameter Name	Default Value	Required	Description
Exception List	CREATE VIEW,CREATE SYNONYM,CREATE CLUSTER,CREATE TABLE	optional	Comma-separated list of system privileges that are not allowed in this deployment.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Check Prohibited Statements In SQL scripts**

Parameter Name	Default Value	Required	Description
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.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Run Oracle SQL\*Plus Script**

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
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.

**Additional Input Parameters Defined in this Step: Create and Execute Rollback Script**

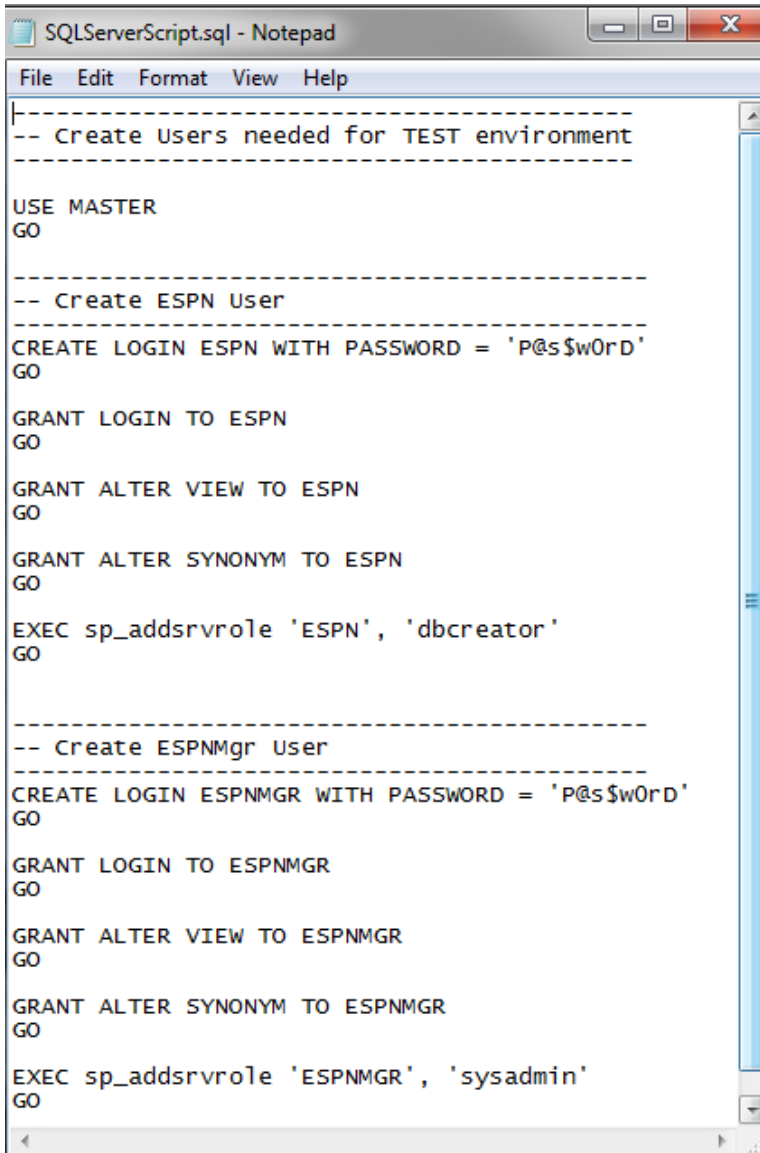
Parameter Name	Default Value	Required	Description
Rollback File	no default	required if Execute Rollback is enabled	<p>The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to:</p> <ul style="list-style-type: none"><li>• Perform an automatic rollback in the event of an error</li><li>• Execute a rollback at a later time</li><li>• Serve as an audit file for future use</li></ul>

## DB Release for SQL Server

This workflow will check a list of T-SQL script files for disallowed commands, check the syntax, then execute the files on the target Microsoft SQL Server databases if they pass all required tests.

This workflow is designed for SQL script transactions to be deployed and executed against target SQL Server databases. SQL scripts are stored and downloaded from the HP DMA software repository.

Before running the DB Release for SQL Server workflow you need to create the SQL script file (or files). For example:



```
SQLServerScript.sql - Notepad
File Edit Format View Help
-----
-- Create Users needed for TEST environment
-----

USE MASTER
GO

-----
-- Create ESPN User
-----

CREATE LOGIN ESPN WITH PASSWORD = 'P@s$w0rD'
GO

GRANT LOGIN TO ESPN
GO

GRANT ALTER VIEW TO ESPN
GO

GRANT ALTER SYNONYM TO ESPN
GO

EXEC sp_addsrvrole 'ESPN', 'dbcreator'
GO

-----
-- Create ESPNMgr User
-----

CREATE LOGIN ESPNMGR WITH PASSWORD = 'P@s$w0rD'
GO

GRANT LOGIN TO ESPNMGR
GO

GRANT ALTER VIEW TO ESPNMGR
GO

GRANT ALTER SYNONYM TO ESPNMGR
GO

EXEC sp_addsrvrole 'ESPNMGR', 'sysadmin'
GO
```

You can customize what the workflow checks in the SQL scripts:

- SQL advanced features
- SQL database commands
- SQL database links
- SQL syntax
- SQL system grants
- A regular expression

If all the tests pass, the SQL scripts may be deployed and executed against the target SQL Server databases.

**Note:** This workflow does not provide any rollback capability.

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

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

## Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the [DB Release for SQL Server](#) workflow.

### Dependencies

- This solution requires HP DMA version 10.10 (or later).
- You have installed the Database Release Management solution pack.
- An SQL Server instance and its databases should already be provisioned and added to the Environment section—this can be accomplished by using Discovery.
- The SQL script must be in the HP DMA software repository.
- You have installed the `osql` or `SQLCMD` utility and made it accessible via the user/password settings stored in the metadata. Check the Environment page for those settings. If there is no metadata, the connection will use Windows authentication.
- You need an SA (System Administrator) role to perform any server level or database level updates.

### Supported Versions of SQL Server

2005, 2008, 2008 R2, 2012

### SQL Scripts

You need to create the SQL script file (or files) that manage the release. The files may contain the normal SQL Server DML and DDL commands.

**Tip:** List the SQL script files in the SQL scripts parameter in the order in which they need to be executed.

### SQL Server Documentation

For more information about prerequisites for SQL Server, refer to the [Microsoft SQL Server Documentation](#) on page 79.

## How this Workflow Works

The following information describes how the [DB Release for SQL Server](#) workflow works.

### Overview

The workflow starts by gathering input parameters.

If the SQL scripts do not exist on the specified target location, they are downloaded from the software repository.

Based on the parameters you set when you create your deployment, the workflow will do the following:

- Check the SQL code for SQL advanced features—unless specified in the exception list. If any are found, the workflow will exit with a failure code.
- Check the SQL code for SQL database commands—unless specified in SQL commands to be excluded from the check. If any are found, the workflow will exit with a failure code.
- Check the SQL code for any SQL database links—if any are found, the workflow will exit with a failure code.
- Check the SQL code for syntax errors—if any are found, the workflow will exit with a failure code.
- Check the SQL code for any SQL system grants—unless specified in the exception list. If any are found, the workflow will exit with a failure code.
- Check the SQL code for a regular expression that you specify—if any matches are found, the workflow will exit with a failure code.

If there were no errors in the checks and the Run Flag is set, the workflow uses the `osql` or `SQLCMD` utility to execute the SQL script files.

**Validation Checks Performed**

This workflow validates the SQL scripts in the following ways:

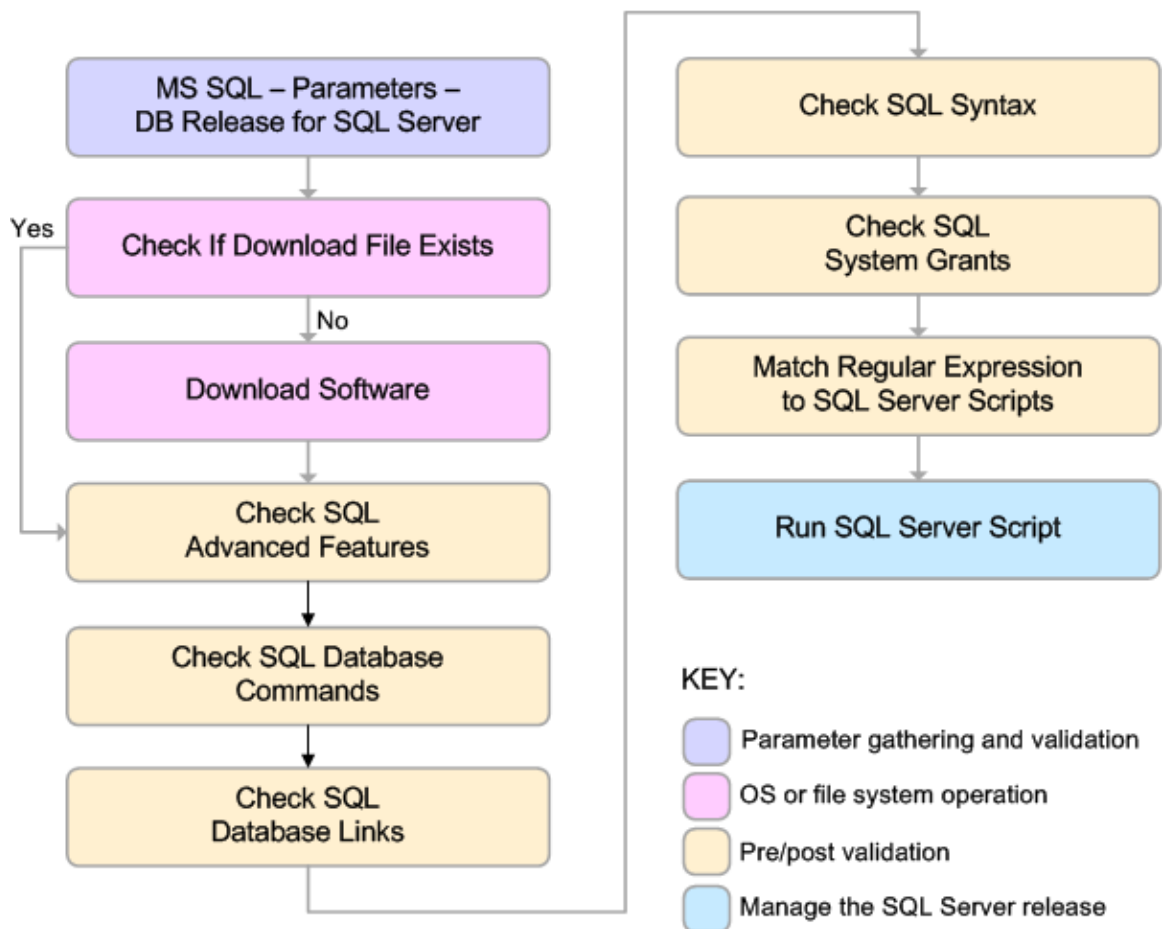
1. If you set the Run Flag to Check SQL Advanced Features, the workflow searches for any instance configuration options—unless included in your exclusion list. These are instance level settings that most users shouldn't be changing, for example, startup procs and xp\_cmdshell.
2. If you set the Run Flag to Check SQL Database Commands, the workflow searches the SQL statements for the commands that you specify in SQL Commands.
3. If you set the Run Flag to Check SQL Database Links, the workflow searches the SQL statements for OPENQUERY, OPENROWSET, and OPENDATASOURCE statements. It also checks for this pattern: [server].[instance].[owner].[database]
4. If you set the Run Flag to Check SQL Syntax, the workflow verifies that all the SQL statements have valid syntax.
5. If you set the Run Flag to Check SQL System Grants, the workflow searches the SQL statements for any system level (server role) grants—unless included in your exclusion list. For example: GRANT CONTROL SERVER TO SOMEUSER
6. If you set the Run Flag to Match Regular Expression to SQL Server Scripts and you specify a regular expression, the workflow searches the SQL statements for any regex matches.

If any of the validations 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**

The **DB Release for SQL Server** 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 DB Release for SQL Server**

Workflow Step	Description
MS SQL - Parameters - DB Release for SQL Server	This step accepts the basic input parameters for the workflow. The parameters will be used in subsequent steps.
Check if Download File Exists	This step determines whether one or more specified files already exist on the target server.
Download Software	This step downloads a list of files to a specified location on the target server.
Check SQL Advanced Features	This step checks the SQL scripts for any advanced feature non-default setting. An exception list can be specified to exclude specific advanced features from the check.

**Steps Used in DB Release for SQL Server (continued)**

Workflow Step	Description
Check SQL Database Commands	This step checks the SQL scripts to ensure that specific types of SQL database commands—as specified in the SQL Commands parameter—are not included.
Check SQL Database Links	This step checks an SQL Script for any database link usage.
Check SQL Syntax	This step verifies the syntax of an SQL Server Script. The step assumes that a <code>go</code> statement on its own line signifies the end of a code block.
Check SQL System Grants	This step checks an SQL Script for any system level (server role) grants. An exception list can be specified to exclude specific privileges from the check.
Match Regular Expression to SQL Server Scripts	This step applies a regular expression to each SQL statement in an SQL Script file. If any <code>regex</code> matches are found, they are output to <code>stdout</code> and an error is returned.
Run SQL Server Script	This step executes SQL Scripts using <code>osql</code> or <code>SQLCMD</code> . This step is only executed if all the previous checks passed.

**Note:** For input parameter descriptions and defaults, see [Parameters for DB Release for SQL Server](#) on page 56.

## How to Run this Workflow

The following instructions show you how to customize and run the [DB Release for SQL Server](#) 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 DB Release for SQL Server](#) on page 56.

**Note:** Before following this procedure, review the [Prerequisites for this Workflow](#) on page 46, and ensure that all requirements are satisfied.

**To use the DB Release for SQL Server workflow:**

1. Create a deployable copy of the workflow (see [Create a Deployable Workflow](#) on page 18).
2. Determine the values that you will specify for the following parameters:

### Input Parameters for MS SQL - Parameters - DB Release for SQL Server

Parameter Name	Default Value	Required	Description
Display SQL Length	2000	optional	The number of characters of a SQL batch that is displayed when an error occurs. Enter "0" to display the entire code.  <b>Note:</b> Displaying the entire code may cause performance issues for your browser.
File List	no default	required	Comma-separated list of the files that contain the SQL scripts that will be checked.  <b>Note:</b> List the SQL script files in the order in which they need to be executed.
Staging Directory	C:\Temp\	optional	The directory that contains the SQL scripts that will be checked.

**Input Parameters for Check SQL Advanced Features**

Parameter Name	Default Value	Required	Description
Exception List	see description	optional	Comma-separated list of advanced features that will be allowed. For example, if you specify CURSOR THRESHOLD, QUERY WAIT, those advanced features will be allowed—any other advanced features that occur in the code will cause the workflow to fail.  The default is to check all of the normal advanced features.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check SQL Database Commands**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).
SQL Commands	shutdown, sp_configure, create database, drop database, create login, create user, drop login, drop user, sp_grantdbaccess, sp_addlogin, sp_droplogin	optional	Comma-separated list of SQL commands that are not allowed.  The default shows an example of how to fill out the list. You may want to customize this list for your configuration.

**Input Parameters for Check SQL Database Links**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check SQL Syntax**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Check SQL System Grants**

Parameter Name	Default Value	Required	Description
Exception List	grant db_owner, grant ddldadmin, grant sysadmin, grant securityadmin, grant serveradmin, grant processadmin, grant diskadmin, grant dbcreator	optional	Comma-separated list of SQL system privileges that will be allowed. For example, if you specify , those system privileges will be allowed—any other system privileges that occur in the code will cause the workflow to fail.  The default shows an example of how to fill out the list. You may want to customize this list for your configuration.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Match Regular Expression to SQL Server Scripts**

Parameter Name	Default Value	Required	Description
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.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Input Parameters for Run SQL Server Script**

Parameter Name	Default Value	Required	Description
Database Name	master	optional	The name of the database to which the specified SQL scripts will be applied.
Run Flag	Y	optional	Flag to indicate whether the workflow should run the SQL Server script. Valid values are Y (run the check) or N (do not run the check).

**Note:** See [Parameters for DB Release for SQL Server](#) on page 56 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 (see [Create a Deployment](#) on page 19 for instructions).
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 (see [Run Your Workflow](#) on page 21 for instructions).

**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.

**To view the output:**

The workflow writes the execution output for SQL script execution in the HP DMA Steplog.

## Sample Scenarios

It is very straightforward to run the [DB Release for SQL Server](#) workflow. This topic shows you typical parameter values to use.

### Scenario: Check the SQL script files for disallowed commands, check the syntax, then deploy and execute the scripts

You only need to specify the File List and the Staging Directory since this scenario takes advantage of many parameter defaults. The workflow will check the SQL script files for:

- All of the normal advanced features
- All of the SQL database commands that are in the default SQL Commands parameter
- SQL database links
- SQL syntax
- All the SQL system grants—except those in the default Exception List parameter
- No regular expression—since none is specified by default

As long as no error is discovered in the checks, the SQL scripts will be deployed and executed on the target SQL Server databases.

Determine the values that you will specify for the following parameters:

#### Input Parameters for MS SQL - Parameters - DB Release for SQL Server

Parameter Name	Example Value	Description
File List	sqlserverscript.sql	Comma-separated list of the files that contain the SQL scripts that will be checked.  <b>Note:</b> List the SQL script files in the order in which they need to be executed.
Staging Directory	C:\Temp\	The directory that contains the SQL scripts that will be checked.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see [Parameters for DB Release for SQL Server](#) on the next page).

## Parameters for DB Release for SQL Server

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 86). 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: MS SQL - Parameters - DB Release for SQL Server

Parameter Name	Default Value	Required	Description
Display SQL Length	2000	optional	The number of characters of a SQL batch that is displayed when an error occurs. Enter "0" to display the entire code.  <b>Note:</b> Displaying the entire code may cause performance issues for your browser.
File List	no default	required	Comma-separated list of the files that contain the SQL scripts that will be checked.  <b>Note:</b> List the SQL script files in the order in which they need to be executed.
Staging Directory	C:\Temp\	optional	The directory that contains the SQL scripts that will be checked.

### Additional Input Parameters Defined in this Step: Check SQL Advanced Features

Parameter Name	Default Value	Required	Description
Exception List	see description	optional	Comma-separated list of advanced features that will be allowed. For example, if you specify CURSOR THRESHOLD, QUERY WAIT, those advanced features will be allowed—any other advanced features that occur in the code will cause the workflow to fail.  The default is to check all of the normal advanced features.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).



**Additional Input Parameters Defined in this Step: Check SQL Database Commands**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).
SQL Commands	shutdown, sp_configure, create database, drop database, create login, create user, drop login, drop user, sp_grantdbaccess, sp_addlogin, sp_droplogin	optional	Comma-separated list of SQL commands that are not allowed.  The default shows an example of how to fill out the list. You may want to customize this list for your configuration.

**Additional Input Parameters Defined in this Step: Check SQL Database Links**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Check SQL Syntax**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Check SQL System Grants**

Parameter Name	Default Value	Required	Description
Exception List	grant db_owner, grant ddldadmin, grant sysadmin, grant securityadmin, grant serveradmin, grant processadmin, grant diskadmin, grant dbcreator	optional	Comma-separated list of SQL system privileges that will be allowed. For example, if you specify , those system privileges will be allowed—any other system privileges that occur in the code will cause the workflow to fail.  The default shows an example of how to fill out the list. You may want to customize this list for your configuration.

**Additional Input Parameters Defined in this Step: Check SQL System Grants (continued)**

Parameter Name	Default Value	Required	Description
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Match Regular Expression to SQL Server Scripts**

Parameter Name	Default Value	Required	Description
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.
Run Flag	Y	optional	Flag to indicate whether the workflow should run this check. Valid values are Y (run the check) or N (do not run the check).

**Additional Input Parameters Defined in this Step: Run SQL Server Script**

Parameter Name	Default Value	Required	Description
Database Name	master	optional	The name of the database to which the specified SQL scripts will be applied.
Run Flag	Y	optional	Flag to indicate whether the workflow should run the SQL Server script. Valid values are Y (run the check) or N (do not run the check).

## Sybase Release Management

This workflow is designed to release T-SQL code for a Sybase Adaptive Server Enterprise (Sybase ASE) database. The workflow can be used to:

- Release DDL/DML/DCL T-SQL code.
- Update the database server level configuration.
- Update the database options.
- Restrict the user from executing prohibited commands or regular expressions in the code.

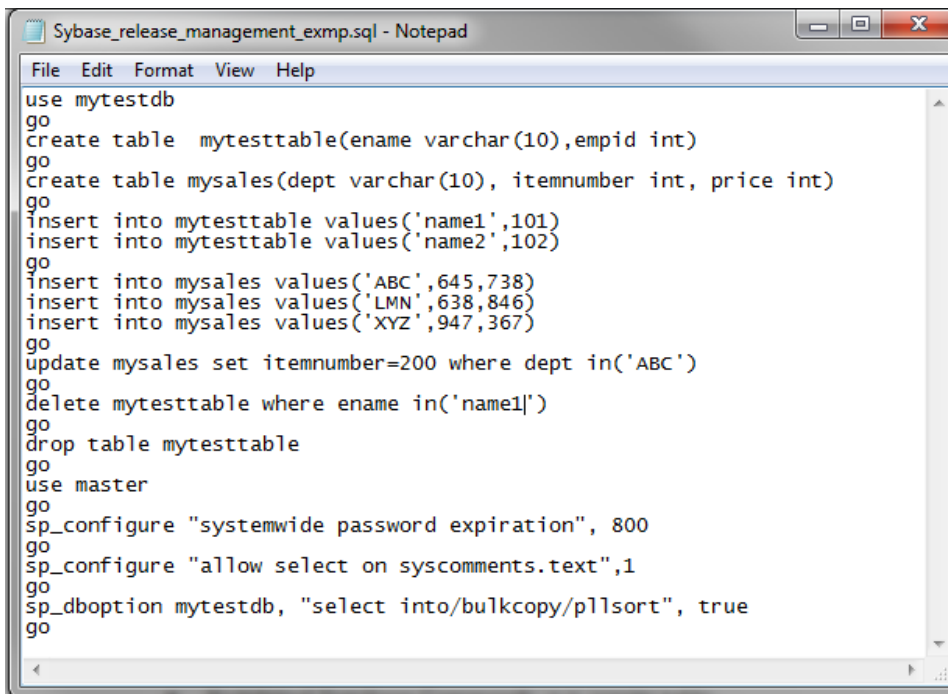
T-SQL scripts, Adaptive Server configuration parameters, and database options are deployed and executed against target Sybase ASE databases.

The workflow extensively checks the T-SQL scripts before executing and committing changes to the target database on the discovered ASE Server. It can match a regular expression and can prohibit restricted database commands (DDL/DML/DCL), server level configuration changes, and database level option settings. It also avoids executing any remote database commands such as creating proxy tables or proxy databases.

This workflow enables you to perform the following Sybase ASE database commands:

- DB DDL/DML/DCL—to run common Sybase ASE database queries
- `sp_dboption`—to control the database level configuration
- `sp_configure`—to control the server level configuration
- `regex`—to set exceptions to the regular expiration of permissions

Before running the Sybase Release Management workflow you need to create the SQL script file (or files), for example:



```
use mytestdb
go
create table mytesttable(ename varchar(10),empid int)
go
create table mysales(dept varchar(10), itemnumber int, price int)
go
insert into mytesttable values('name1',101)
insert into mytesttable values('name2',102)
go
insert into mysales values('ABC',645,738)
insert into mysales values('LMN',638,846)
insert into mysales values('XYZ',947,367)
go
update mysales set itemnumber=200 where dept in('ABC')
go
delete mytesttable where ename in('name1')
go
drop table mytesttable
go
use master
go
sp_configure "systemwide password expiration", 800
go
sp_configure "allow select on syscomments.text",1
go
sp_dboption mytestdb, "select into/bulkcopy/pllsort", true
go
```

You can use the input parameters to customize the following:

- Provide prohibited database commands (DDL/DML/DCL commands).
- Override the prohibited configuration updates (`sp_configure` commands) with a list of approved updates.
- Override the prohibited database options (`sp_dboption` commands) with a list of approved options.
- Provide prohibited regular expressions.
- Check the syntax of the SQL queries.
- Show the query plan—without actually executing the SQL scripts.
- Estimate the time required to execute the SQL scripts—without actually executing.
- Show the logical and physical input and output counts that will be required to execute each query—without actually executing.
- If all the tests pass, deploy and execute the SQL scripts against the target Sybase ASE databases.

**Note:** This workflow does not provide any rollback capability.

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

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

## Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the [Sybase Release Management](#) workflow.

### Dependencies

- This solution requires HP DMA version 10.10 (or later).
- You have installed the Database Release Management solution pack.
- You have installed the native isql (Interactive SQL parser to Adaptive Server) utility from OCS (Open Client Server) and made it accessible via the user/password settings stored in the metadata. Check the Environment page for those settings.
- The user specified in the Sybase User parameter has default database access to the target database when logged in to Sybase ASE.
- The target database instance and the databases within it have been discovered prior to running this workflow to gather the instance information from the metadata.
- You need an SSO (System Security Officer) or SA (System Administrator) role to perform any server level or database level updates.
- The SQL script must reside in the software repository or on the target.

### Supported Versions of Sybase ASE

15.0.3, 15.5 (tested)

15.0, 15.0.1, 15.0.2 (not tested)

### SQL Scripts

You need to create the SQL script file (or files) that manage the release. The files may contain the following Sybase ASE SQL commands:

- Supported DML, DDL, and DCL statements:

ALTER DATABASE	CREATE TABLE	REVOKE
ALTER ROLE	CREATE VIEW	SELECT
CHECKPOINT	DELETE	SELECT INTO
COMMIT	DISK INIT	SETUSER
CREATE CLUSTERED INDEX	DROP DATABASE	TRUNCATE
CREATE DATABASE	DROP INDEX	UPDATE
CREATE DEFAULTS	DROP SYNONYM	UPDATE ALL STATISTICS
CREATE NONCLUSTERED INDEX	DROP TABLE	UPDATE INDEX STATISTICS
CREATE ROLE	DROP VIEW	UPDATE STATISTICS
CREATE RULES	EXECUTE	UPDATE TABLE STATISTICS
CREATE SCHEMA	GRANT	
CREATE SYNONYM	INSERT	
	REORG REBUILD	

- All the Sybase system stored procedures, for example: `sp_helpdb`, `sp_helpindex`, `sp_help`
- All the global variable execution, for example: `select @@version`
- All the native Sybase system functions, for example: `select db_name()`
- All the Sybase supported dbcc commands, for example: `dbcc checkalloc`

**Tip:** List the SQL script files in the SQL scripts parameter in the order in which they need to be executed.

### Sybase Adaptive Server Enterprise Documentation

For more information about prerequisites for [Sybase Release Management](#), refer to the [Sybase Adaptive Server Enterprise Documentation](#) on page 79.

## How this Workflow Works

The following information describes how the [Sybase Release Management](#) workflow works.

### Overview

The workflow starts by constructing commands that will be used in subsequent steps and by gathering and validating input parameters.

If the T-SQL scripts, server level configurations, and database option settings do not exist on the specified target location, they are stored and downloaded from the HP DMA software repository.

Based on the parameters you set when you create your deployment, this workflow will do the following things:

- Scan the T-SQL code for prohibited database commands, prohibited configuration updates, prohibited database options, and regular expressions—if any are found, the workflow will exit with a failure code.
- Analyze the T-SQL code for remote server usage (database commands such as creating proxy tables or proxy databases)—if any are found, the workflow will exit with a failure code.
- Determine if there are syntax errors—if any problems are found, the query will not be executed, and the errors will be reported on the step log Error tab.
- Parse and verify that the server level configuration and database level options exist on the specified target database server and database respectively—if any are found, the workflow will exit with a failure code.
- Run the `isql` (Interactive SQL parser to Adaptive Server) utility to simulate the execution of the SQL script files—without running the actual T-SQL code. Based on your input parameters, show a query plan, show the statistics time, and/or show the statistics of logical/physical input and output. If you run this simulation, the workflow assumes that you want to review the reports so do not want to actually execute the SQL script files.
- Run the `isql` utility to deploy and execute the SQL script files against the target Sybase ASE databases—only if the run flag is set, no errors were found in the SQL scripts, and you did not request any of the simulation reports (Generate Query Plan, Generate Optimizer Statistics, or Generate Logical I/O Counts).

If the workflow proceeds successfully to the last step, it writes status messages to the Output tab of the step log. If it fails, it writes error messages to the Error tab.

**Validation Checks Performed**

This workflow validates the input parameters in the following ways:

1. Checks that there are values for the required input parameters: Sybase Home, Sybase User, Sybase Password, and SQL Scripts.
2. Checks whether the Sybase Release Management SQL scripts exist—if not, adds them to a list of files to be downloaded .
3. Checks that the database is online.
4. Checks that all flag parameters are y, yes, no, no, t, true, f, or false—case insensitive.

This workflow validates the SQL scripts in the following ways:

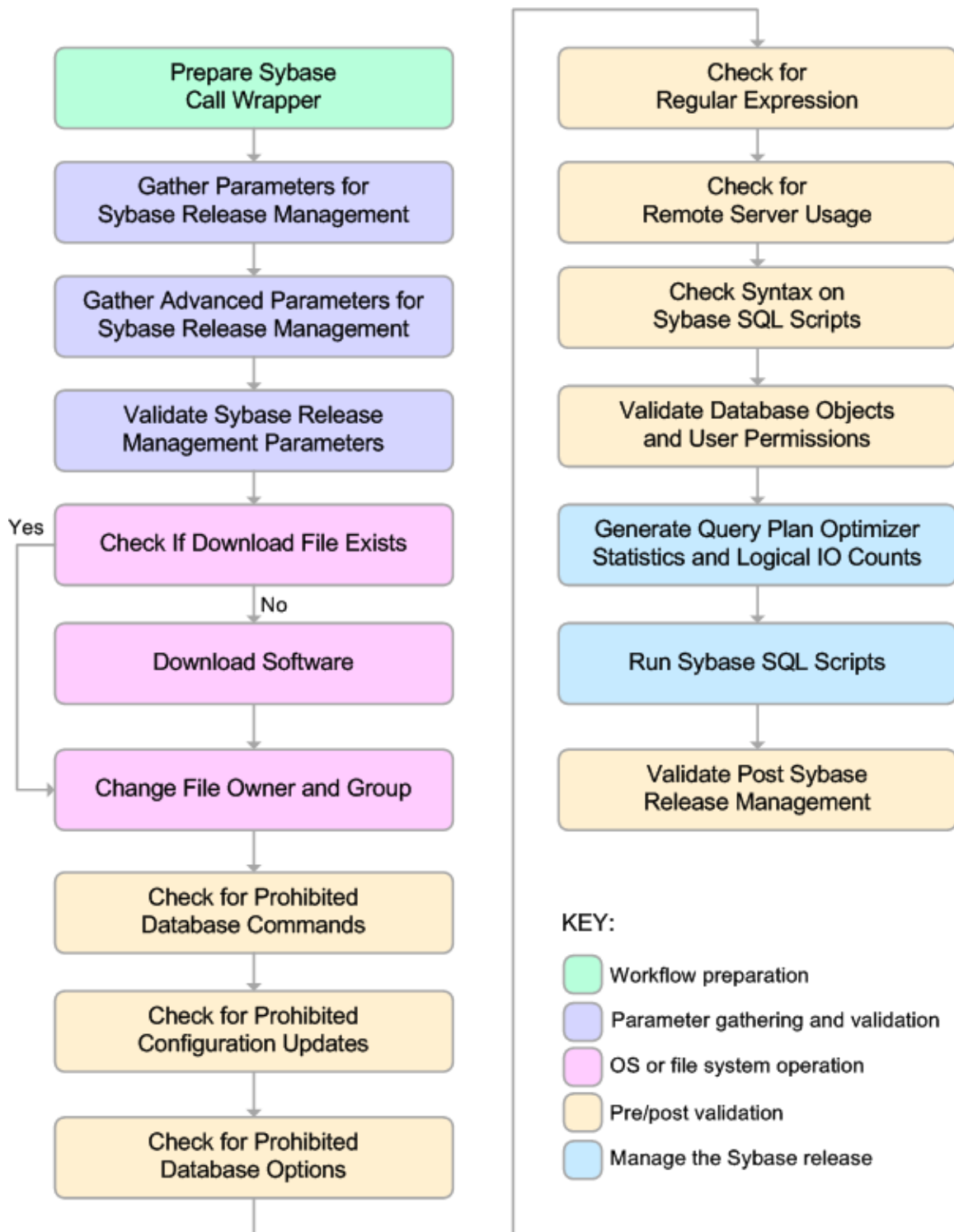
1. Checks whether the SQL statements contain any of the specified Prohibited Database Commands.
2. Checks whether the SQL statements contain any prohibited configuration updates defined in the `sysconfigures` system catalog—unless you specifically approve them in the Approved Configuration Updates parameter.
3. Checks whether the SQL statements contain any prohibited database options defined in the `spt_values` system catalog—unless you specifically approve them in the Approved Database Options parameter.
4. Checks whether the SQL statements match any of the specified prohibited Regular Expressions.
5. Checks whether the SQL statements contain the following remote server usage commands: `create proxy_table`, `sp_addserver`, or `sp_dropserver`.
6. If you set the Run Check Syntax flag, checks whether the SQL statements have valid syntax.
7. Checks that the database objects used in the script exist and are available and that the user has permission to modify the database objects.

If any of the validations 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**

The [Sybase Release Management](#) 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 Sybase Release Management:**

Workflow Step	Description
Prepare Sybase Call Wrapper	This step constructs the commands that will be used to execute subsequent workflow steps as either the OS administrative user or the owner of the Sybase ASE installation. The step also creates utility parameters that will be used by subsequent steps.
Gather Parameters For Sybase Release Management	This step accepts the basic input parameters for the <a href="#">Sybase Release Management</a> workflow. The parameters will be used in subsequent steps.
Gather Advanced Parameters for Sybase Release Management	This step accepts the advanced input parameters for the <a href="#">Sybase Release Management</a> workflow. The parameters will be used in subsequent steps.
Validate Sybase Release Management Parameters	This step validates the input parameters that manage the Sybase ASE release: the required input parameters have values, the SQL script files exist or will be downloaded, the Sybase ASE database is online, and the flag parameters have appropriate yes or no values.
Check if Download File Exists	This step determines whether one or more specified files already exist on the target server.
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.
Check for Prohibited Database Commands	This step checks the SQL scripts for any invalid database commands that you specify in the Prohibited Database Commands parameter.
Check for Prohibited Configuration Updates	This step checks the SQL scripts for any invalid <code>sp_configure</code> configuration updates. You can specify which configuration updates are valid with the Approved Configuration Updates parameter.

**Steps Used in Sybase Release Management: (continued)**

Workflow Step	Description
Check for Prohibited Database Options	This step checks the SQL scripts for any invalid <code>sp_dboption</code> database options. You can specify which database options are valid with the Approved Database Options parameter.
Check for Regular Expressions	This step checks the SQL scripts for any text that matches what you specify in the Regular Expressions parameter. This step is skipped if no Regular Expressions are specified.
Check for Remote Server Usage	This step checks the SQL scripts for the usage of remote servers. The keywords <code>create proxy_table</code> , <code>sp_addserver</code> , and <code>sp_dropserver</code> indicate that a remote server is used.
Check Syntax on Sybase SQL Scripts	If the Run Check Syntax flag is set, this step checks the SQL scripts for any syntax errors. The underlying code will not be executed.
Validate Database Objects and User Permissions	This step checks the SQL scripts to ensure that: <ul style="list-style-type: none"> <li>Database objects used in the script exist and are available.</li> <li>The user has permission to modify the database objects.</li> </ul>
Generate Query Plan Optimizer Statistics and Logical IO Counts	This step runs the <code>isql</code> (Interactive SQL parser to Adaptive Server) utility to simulate the execution of the SQL script files—without running the actual T-SQL code. If the following input flags are set: <ul style="list-style-type: none"> <li>Generate Query Plan—the step will show a query plan.</li> <li>Generate Optimizer Statistics—the step will show the statistics time.</li> <li>Generate Logical I/O Counts—the step will show the statistics of logical/physical input and output.</li> </ul>
Run Sybase SQL Scripts	This step runs the <code>isql</code> (Interactive SQL parser to Adaptive Server) utility to deploy and execute the SQL script files against the target Sybase ASE databases—only if the run flag is set, no errors were found in the SQL scripts, and the Generate Query Plan, Generate Optimizer Statistics, and Generate Logical I/O Counts flags are all set to N.
Validate Post Sybase Release Management	This step sends messages to steplog that the workflow was successful: <ul style="list-style-type: none"> <li>Input TSQL/config/dboptions files have been verified successfully and have not been run.</li> <li>All Sybase Release Management scripts ran successfully.</li> </ul>

**Note:** For input parameter descriptions and defaults, see [Parameters for Sybase Release Management](#) on page 75.

## How to Run this Workflow

The following instructions show you how to customize and run the [Sybase Release Management](#) 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 Sybase Release Management](#) on page 75.

**Note:** Before following this procedure, review the [Prerequisites for this Workflow](#) on page 61, and ensure that all requirements are satisfied.

**To use the Sybase Release Management workflow:**

1. Create a deployable copy of the workflow (see [Create a Deployable Workflow](#) on page 18).
2. Determine the values that you will specify for the following parameters:

### Input Parameters for Prepare Sybase Call Wrapper

Parameter Name	Default Value	Required	Description
Call Wrapper	see description	optional	Command that will execute this step (or subsequent steps) as a specific user.  For UNIX targets, the default is: <code>/opt/hp/dma/client/jython.sh</code> running as root  For Windows targets, the default is: <code>jython</code> running as Administrator
Sybase OS User Name	sybase	required	OS user who owns the Sybase ASE installation directory.

### Input Parameters for Gather Parameters For Sybase Release Management

Parameter Name	Default Value	Required	Description
SQL Scripts	no default	required	Comma-separated list of SQL script files that will be released to (executed on) the target Sybase ASE database. These files can contain various SQL queries, configuration parameters, and database options.  For example: <code>mysql.sql</code>  <b>Note:</b> List the SQL script files in the order in which they need to be executed.

### Input Parameters for Gather Advanced Parameters For Sybase Release Management

Parameter Name	Default Value	Required	Description
Approved Configuration Updates		optional	Comma-separated list of configuration updates ( <code>sp_configure</code> commands) that are allowed to be performed by the specified SQL Scripts. This overrides configuration updates that would normally be prohibited.  For example: <code>systemwide password expiration</code>
Approved Database Options		optional	Comma-separated list of database options ( <code>sp_dboption</code> commands) that are allowed to be configured by the specified SQL Scripts. This overrides database options that would normally be prohibited.  For example: <code>select into/bulkcopy/pllsort</code>
Generate Logical I/O Counts	N	optional	Set to Y to enable generation of logical/physical input or output counts required to execute each query in the specified SQL Scripts.
Generate Optimizer Statistics	N	optional	Set to Y to enable generation of Optimizer Statistics for each query in the specified SQL Scripts.
Generate Query Plan	N	optional	Set to Y to enable the generation of the Optimizer Query Plan required to execute each query in the specified SQL Scripts.
Prohibited Database Commands		optional	Comma-separated list of database commands ( <code>sp_dboption</code> commands) that will be ignored in the specified SQL Scripts.  For example: <code>dbo use only,select into/bulkcopy/pllsort</code>
Regular Expressions		optional	Comma-separated list of formatted regular expressions that will be searched for in the specified SQL Scripts. The expression can fall anywhere in the SQL command line.  For example: <code>drop table, truncate table</code>

**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 87).

**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 [How to Expose Additional Workflow Parameters](#) on page 86.

See [Parameters for Sybase Release Management](#) on page 75 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 (see [Create a Deployment](#) on page 19 for instructions).
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 (see [Run Your Workflow](#) on page 21 for instructions).

#### 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.

#### To view the output:

The workflow generates an output file for each SQL script file that is executed and stores it in the `/tmp` directory. Open the output files to see the execution results for the T-SQL, Adaptive Server configuration changes, and database option settings. The workflow also writes the execution output for SQL script execution in the HP DMA Steplog.

If you have chosen to view the optimizer query plan or to generate the statistics before the query execution, these files will also be created and stored in the `/tmp` directory.

## Sample Scenarios

This topic shows you typical parameter values for different use cases for the [Sybase Release Management](#) workflow.

### Scenario 1: Check the SQL script files for prohibited configuration updates, prohibited database options, and invalid syntax; then deploy and execute the SQL scripts

In this scenario, you only specify the SQL Scripts parameter since this scenario takes advantage of many parameter defaults. Running this scenario will check the SQL script files for:

- The normal prohibited configuration updates (`sp_configure` commands).
- The normal prohibited database options (`sp_dboption` commands).
- Any invalid syntax of the SQL queries.
- No database commands—since no prohibited database commands are specified by default.
- No regular expressions—since no regular expressions are specified by default.

It will not simulate executing the SQL scripts to generate a query plan, optimizer statistics, or logical/physical input and output counts. If all the tests pass, the SQL scripts are deployed and executed against the target Sybase ASE databases.

### Input Parameters for Gather Parameters For Sybase Release Management

Parameter Name	Example Value	Description
SQL Scripts	<code>mysql.sql</code>	<p>Comma-separated list of SQL script files that will be released to (executed on) the target Sybase ASE database. These files can contain various SQL queries, configuration parameters, and database options.</p> <p>For example: <code>mysql.sql</code></p> <div><b>Note:</b> List the SQL script files in the order in which they need to be executed.</div>

Be sure that the default values for all remaining input parameters are appropriate for your environment (see [Parameters for Sybase Release Management](#) on page 75).



**Scenario 2: Check the SQL script files for specified prohibited database commands, prohibited configuration updates, prohibited database options, prohibited regular expressions, and invalid syntax; simulate running the SQL scripts to generate statistics; then deploy and execute the SQL scripts**

In this scenario, you take advantage of the customized checks and reports that are available in Sybase Release Management. Running this scenario will check the SQL script files for:

- Prohibited database commands (`sp_dboption` commands) that you specify.
- Prohibited configuration updates (`sp_configure` commands) except for the updates that you specifically approve.
- Prohibited database options (`sp_dboption` commands) except for the options that you specifically approve.
- Prohibited regular expressions that you specify.
- Any invalid syntax of the SQL queries.

Then this scenario will simulate running the SQL scripts—without actually executing them—to give the following

- Show the query plan.
- Estimate the time required to execute the SQL scripts.
- Show the logical and physical input and output counts that will be required to execute each query.

If all the tests pass, the SQL scripts are deployed and executed against the target Sybase ASE databases.

#### Input Parameters for Gather Parameters For Sybase Release Management

Parameter Name	Example Value	Description
SQL Scripts	<code>mysql.sql</code>	<p>Comma-separated list of SQL script files that will be released to (executed on) the target Sybase ASE database. These files can contain various SQL queries, configuration parameters, and database options.</p> <p>For example: <code>mysql.sql</code></p> <div><b>Note:</b> List the SQL script files in the order in which they need to be executed.</div>

### Input Parameters for Gather Advanced Parameters For Sybase Release Management

Parameter Name	Example Value	Description
Approved Configuration Updates	see description	Comma-separated list of configuration updates ( <code>sp_configure</code> commands) that are allowed to be performed by the specified SQL Scripts. This overrides configuration updates that would normally be prohibited.  For example: <code>systemwide password expiration</code>
Approved Database Options	see description	Comma-separated list of database options ( <code>sp_dboption</code> commands) that are allowed to be configured by the specified SQL Scripts. This overrides database options that would normally be prohibited.  For example: <code>select into/bulkcopy/pllsort</code>
Generate Logical I/O Counts	Y	Set to Y to enable generation of logical/physical input or output counts required to execute each query in the specified SQL Scripts.
Generate Optimizer Statistics	Y	Set to Y to enable generation of Optimizer Statistics for each query in the specified SQL Scripts.
Generate Query Plan	Y	Set to Y to enable the generation of the Optimizer Query Plan required to execute each query in the specified SQL Scripts.
Prohibited Database Commands	see description	Comma-separated list of database commands ( <code>sp_dboption</code> commands) that will be ignored in the specified SQL Scripts.  For example: <code>dbo use only,select into/bulkcopy/pllsort</code>
Regular Expressions	see description	Comma-separated list of formatted regular expressions that will be searched for in the specified SQL Scripts. The expression can fall anywhere in the SQL command line.  For example: <code>drop table, truncate table</code>

Be sure that the default values for all remaining input parameters are appropriate for your environment (see [Parameters for Sybase Release Management](#) on the next page).

## Parameters for Sybase Release Management

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 86). 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: Prepare Sybase Call Wrapper

Parameter Name	Default Value	Required	Description
Call Wrapper	see description	optional	Command that will execute this step (or subsequent steps) as a specific user.  For UNIX targets, the default is: <code>/opt/hp/dma/client/jython.sh</code> running as root  For Windows targets, the default is: <code>jython</code> running as Administrator
Sybase OS User Name	sybase	required	OS user who owns the Sybase ASE installation directory.

### Parameters Defined in this Step: Gather Parameters For Sybase Release Management

Parameter Name	Default Value	Required	Description
SQL Scripts	no default	required	Comma-separated list of SQL script files that will be released to (executed on) the target Sybase ASE database. These files can contain various SQL queries, configuration parameters, and database options.  For example: <code>mysql.sql</code>  <b>Note:</b> List the SQL script files in the order in which they need to be executed.

**Parameters Defined in this Step: Gather Parameters For Sybase Release Management (continued)**

Parameter Name	Default Value	Required	Description
Sybase Home	see description	required	<p>Sybase ASE installation directory (absolute path). For example: <code>/opt/sybase/ase_1503</code></p> <p>If the Discovery workflow has previously been executed, this parameter value is automatically detected. You can specify a different installation directory if you prefer.</p> <p>The default is the metadata value for <code>Instance.sybase home</code>.</p>
Sybase Password	see description	required	<p>Adaptive Server (instance) login password for the Sybase User.</p> <p>If the Discovery workflow has previously been executed, this parameter value is automatically detected. You can specify a different password if you prefer.</p> <p>The default is the metadata value for <code>Instance.password</code>.</p>
Sybase User	see description	required	<p>Adaptive Server (instance) user who will execute the specified SQL Scripts on the target. For example: <code>admin</code></p> <p>If the Discovery workflow has previously been executed, this parameter value is automatically detected. You can specify a different Sybase ASE user if you prefer.</p> <p>The default is the metadata value for <code>Instance.user</code>.</p>

**Parameters Defined in this Step: Gather Advanced Parameters For Sybase Release Management**

Parameter Name	Default Value	Required	Description
Approved Configuration Updates		optional	<p>Comma-separated list of configuration updates (<code>sp_configure</code> commands) that are allowed to be performed by the specified SQL Scripts. This overrides configuration updates that would normally be prohibited.</p> <p>For example: <code>systemwide password expiration</code></p>
Approved Database Options		optional	<p>Comma-separated list of database options (<code>sp_dboption</code> commands) that are allowed to be configured by the specified SQL Scripts. This overrides database options that would normally be prohibited.</p> <p>For example: <code>select into/bulkcopy/pll sort</code></p>

**Parameters Defined in this Step: Gather Advanced Parameters For Sybase Release Management (continued)**

Parameter Name	Default Value	Required	Description
Download Location	/tmp	optional	Location where the SQL Scripts files will be downloaded from software repository if they are not found on the target server.
Generate Logical I/O Counts	N	optional	Set to Y to enable generation of logical/physical input or output counts required to execute each query in the specified SQL Scripts.
Generate Optimizer Statistics	N	optional	Set to Y to enable generation of Optimizer Statistics for each query in the specified SQL Scripts.
Generate Query Plan	N	optional	Set to Y to enable the generation of the Optimizer Query Plan required to execute each query in the specified SQL Scripts.
Prohibited Database Commands		optional	Comma-separated list of database commands (sp_dboption commands) that will be ignored in the specified SQL Scripts.  For example: <code>dbo use only,select into/bulkcopy/pllsort</code>
Regular Expressions		optional	Comma-separated list of formatted regular expressions that will be searched for in the specified SQL Scripts. The expression can fall anywhere in the SQL command line.  For example: <code>drop table, truncate table</code>
Run Check Syntax	Y	optional	Set to Y to enable syntax checking of the queries included in the specified SQL Scripts .
Run SQL Scripts Flag	Y	optional	Set to Y to perform the checks and run the specified SQL Scripts on the target. Set to N to only perform the checks.

# Chapter 4

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## Reference Information

This chapter contains the following information:

Topic	Description
<a href="#">Database Product Documentation</a>	Links to product documentation for the database products that these workflows support
<a href="#">HP DMA Documentation</a>	Links to additional HP DMA documentation

## Database Product Documentation

The following topics contain links to documentation for the database products supported by this solution:

**Note:** The links to the documents listed here were correct as of the publication of this guide.

### Oracle Database Product Documentation

The product documentation for Oracle Database Enterprise Edition version 11gis located here:

<http://www.oracle.com/pls/db112/homepage>

### Microsoft SQL Server Documentation

For information about SQL Server, including prerequisites, see the SQL Server documentation available at the following web site:

<http://msdn.microsoft.com/en-us/library/ms143506.aspx>

### Sybase Adaptive Server Enterprise Documentation

SAP provides an extensive documentation library for Sybase ASE at this location:

<http://infocenter.sybase.com/help/index.jsp>

For information about Adaptive Server specifications—including database requirements based on page size—see this document:

[Adaptive Server Specifications](#)

## HP DMA Documentation

For information about using the HP DMA web interface, see the *HP DMA User Guide* and the *HP DMA Administrator Guide*.

These documents are part of the HP DMA documentation library, which is available on the HP Software Product Manuals web site:

<http://h20230.www2.hp.com/selfsolve/manuals>



# Chapter 5

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## Tips and Best Practices

This portion of the document contains a collection of tips and best practices that will enable you to use HP DMA more effectively. It contains the following topics:

[How a Solution Pack is Organized](#) on the next page

[How to Expose Additional Workflow Parameters](#) on page 86

[How to Use a Policy to Specify Parameter Values](#) on page 87

[How to Import a File into the Software Repository](#) on page 90

## How a Solution Pack is Organized

**Note:** This topic uses the Run Oracle Compliance Audit workflow in the Database Compliance solution pack as an example. The information provided here, however, pertains to any solution pack.

In HP DMA, a **workflow** executes a process —such as installing a software product or checking a database instance for compliance with a specific security benchmark.

A **solution pack** contains one or more related **workflow templates**.

Each workflow template has a Documentation tab that provides detailed information about that workflow.

The screenshot displays the HP Database & Middleware Automation console. The top navigation bar includes 'Home', 'Automation', 'Reports', 'Environment', 'Solutions', and 'Setup'. Below this, a secondary bar shows 'Workflows', 'Steps', 'Functions', 'Policies', 'Deployments', 'Run', 'Console', and 'History'. The main content area is titled 'My Copy of Run Oracle Compliance Audit' and features four tabs: 'Documentation' (selected), 'Workflow', 'Deployments', and 'Roles'. Under the 'Documentation' tab, there are fields for 'Name' (My Copy of Run Oracle Compliance Audit), 'Tags', 'Type' (Oracle), and 'Target level' (Instance). Below these is a 'Documentation' section with three expandable areas: 'Purpose', 'Description', and 'Parameters'. The 'Purpose' section states the audit's goal is to check compliance with CIS benchmarks and PCI/SOX requirements. The 'Description' section details the audit process using CIS Level 1 and 2, and mentions reporting to email addresses. The 'Parameters' section is currently collapsed. At the bottom of the console, there is a toolbar with buttons for 'DELETE', 'EXPORT', 'EXTRACT POLICY', and 'DEPLOY', along with 'Copy', 'Save', and 'CANCEL' options. A 'HELP PDF EDIT' link is also present.

hp Database & Middleware Automation

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

### My Copy of Run Oracle Compliance Audit

Documentation Workflow Deployments Roles

Name: My Copy of Run Oracle Compliance Audit

Tags:

Type: Oracle

Target level: Instance

Documentation:

**Purpose**

Audit an Oracle Database instance for compliance with the following Center for Internet Security (CIS) benchmarks and, optionally, compare the audit results to the related PCI and SOX requirements:

- CIS Security Configuration Benchmark for Oracle Database Server 11g, version 1.1.0, December 2011
- CIS Security Benchmark for Oracle 9i/10g, version 2.01, April 2005
- Payment Card Industry (PCI) Data Security Standard Version 2.0, October 2010
- Sarbanes-Oxley (SOX) Sarbanes-Oxley Act of 2002 Section 302

**Description**

This workflow will audit an Oracle Database instance using CIS Level 1 and Level 2 auditing. It will then compare the results to the pertinent PCI and SOX requirements, where applicable. This audit, which runs in conjunction with the HP DMA reporting tool, can identify more than 175 compliance related problems with an Oracle database. You can view information about the audit on the Console while the audit is running. After the audit has finished, the workflow sends a summary report to each specified email address. You can also view a compliance report on the Reports page.

**Parameters**

HELP PDF EDIT

DELETE EXPORT EXTRACT POLICY DEPLOY Copy Save or CANCEL

A workflow consists of a sequence of [steps](#). Each step performs a very specific task. Each step includes a documentation panel that briefly describes its function.

The screenshot displays the HP Database & Middleware Automation web interface. At the top is a navigation bar with the HP logo and the title 'Database & Middleware Automation'. Below this is a menu bar with tabs: Home, Automation (selected), Reports, Environment, Solutions, and Setup. Under the 'Automation' tab, there are sub-tabs: Workflows, Steps (selected), Functions, Policies, Deployments, Run, Console, and History.

The main content area is titled 'Get Oracle Home'. Below the title is a sub-menu with tabs: General (selected), Action, Parameters, History, Workflows, Solutions, and Roles.

The 'General' tab is active, showing the 'Properties' section on the left and the 'Documentation' section on the right.

**Properties:**

- Name: Get Oracle Home
- Tags:
- Type: Oracle
- Category: Script
- Targetable: ☐

**Documentation:**

Description:

Get the value of ORACLE\_HOME from the appropriate source:

- The /etc/oratab or /var/opt/oracle/oratab file on UNIX
- The registry on Windows

Dependencies: None

Input Parameters: None

Output Parameters:

- Oracle Home = The fully qualified name of the ORACLE\_HOME
- Oracle SID = The Oracle server (instance) ID

Return Code:

0 = Step was successful

At the bottom of the interface, there is a 'Copy' button on the left and a lock icon with the text 'THIS STEP IS READ ONLY' on the right.

Steps can have input and output [parameters](#). Output parameters from one step often serve as input parameters to another step. Steps can be shared among workflows.

Parameter descriptions are displayed on the Parameters tab for each step in the workflow.

The screenshot shows the HP Database & Middleware Automation interface. The top navigation bar includes 'Home', 'Automation', 'Reports', 'Environment', 'Solutions', and 'Setup'. Below this, a secondary bar shows 'Workflows', 'Steps', 'Functions', 'Policies', 'Deployments', 'Run', 'Console', and 'History'. The main content area is titled 'Parse Oracle Inventory' and has tabs for 'General', 'Action', 'Parameters', 'History', 'Workflows', 'Solutions', and 'Roles'. The 'Parameters' tab is active, showing two sections: 'Input parameters' and 'Output parameters'.

**Input parameters**

Name	Value	Description
Inventory Files	<input type="text"/>	*Optional: Comma separated list of fully qualified Or
Oracle Account	<input type="text"/>	*Optional: Oracle user that will own the ORACLE_H
Oracle Home	<input type="text"/>	*Optional: The ORACLE_HOME to use if more than
Server Wrapper	/opt/hp/dma/client/bin/jython.sh	*Required: String to execute routine as server super

**Output parameters**

Name	Description
CRS Account	The OS owner of the ORA_CRS_HOME
CRS Active Version	Active CRS Version
CRS Group	The Oracle group used for the ORA_CRS_HOME installation
CRS Home	The last ORA_CRS_HOME location in the inventory file
CRS Home Name	The name of the ORA_CRS_HOME as recorded in the inventory
CRS Nodes	List of all nodes the Oracle Clusterware is deployed to
Cluster Nodes	List of all nodes the Oracle Home is deployed to

Parameter descriptions are also displayed on the Workflow tab for each workflow.

The screenshot shows a workflow step titled 'Get Listener Names / Oracle SIDs'. A red arrow points to the description of the 'ORACLE\_SIDs' parameter. The description states: 'Optional: Comma delimited list of ORACLE\_SIDs, at least one of which a resulting listener must service. If blank, listeners are not limited to those servicing any specific ORACLE\_SID.' Below the description, a red arrow points to the text 'To see the parameter description here'.

**Workflow Table**

Step ID	Step Name	Duration	Count
7	Prepare Oracle Instance	0	3, 8
8	Get Listener Names	0	3, 9
9	Audit Unix or Linux OS Specific Settings	0	3, 10
10	Audit Installation and Patch	0	11, 12

Below the table, the 'Listener Homes' and 'Oracle SIDs' are listed. The 'Oracle SIDs' field is highlighted with a red arrow and the text 'Click here'.

Listener Homes: Prepare Oracle Instance.Oracle Home  
Oracle SIDs: Get Oracle Home.Oracle SID

Parameter descriptions are also displayed on the Parameters tab in the [deployment](#) (organized by step).

The screenshot shows the HP Database & Middleware Automation interface. The top navigation bar includes 'Home', 'Automation', 'Reports', 'Environment', 'Solutions', and 'Setup'. Below this, a secondary bar shows 'Workflows', 'Steps', 'Functions', 'Policies', 'Deployments', 'Run', 'Console', and 'History'. The main title is 'Run Oracle Compliance CIS'. Below the title are three tabs: 'Targets', 'Parameters', and 'Roles'. The 'Parameters' tab is active, showing a section titled 'Gather Parameters for Oracle Compliance'. This section contains three input fields, each with a 'Text' dropdown menu: 'Compliance Type' (set to 'CIS'), 'Excluded Compliance Checks' (empty), and 'Inventory Files' (set to '/etc/orainst.loc'). Each field has a descriptive text block below it. The 'Compliance Type' block states: 'Compliance type that will be audited by the workflow. Compliance types supported: CIS, PCI, SOX. Will be defaulted to CIS.' The 'Excluded Compliance Checks' block states: 'Optional: Checks to exclude from of Compliance Checks'. The 'Inventory Files' block states: 'Optional: Comma separated list of fully qualified Oracle inventory files. If not specified, default to /etc/orainst.loc, /var/opt/oracle/orainst.loc, or %ProgramFiles%\Oracle\Inventory.' Below this is a section titled 'Gather Advanced Parameters for Oracle Compliance' with an 'Email Addresses to Receive Report' field set to 'CISComplianceAuditor@mycompany.com' and a 'Text' dropdown menu. A descriptive text block below it states: '\*Optional. Provided an email address or multiple email addresses separated by commas without spaces that you would like to receive an email of the results of the compliance tests run against the target specified.' At the bottom of the form are buttons for 'DELETE', 'RUN', 'Restore defaults', 'Copy', 'Save', and 'CANCEL'.

HP Database & Middleware Automation

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

### Run Oracle Compliance CIS

Targets Parameters Roles

#### Gather Parameters for Oracle Compliance

Compliance Type:  Text

Compliance type that will be audited by the workflow. Compliance types supported: CIS, PCI, SOX. Will be defaulted to CIS.

Excluded Compliance Checks:  Text

Optional: Checks to exclude from of Compliance Checks

Inventory Files:  Text

Optional: Comma separated list of fully qualified Oracle inventory files. If not specified, default to /etc/orainst.loc, /var/opt/oracle/orainst.loc, or %ProgramFiles%\Oracle\Inventory.

#### Gather Advanced Parameters for Oracle Compliance

Email Addresses to Receive Report:  Text

\*Optional. Provided an email address or multiple email addresses separated by commas without spaces that you would like to receive an email of the results of the compliance tests run against the target specified.

DELETE RUN Restore defaults Copy Save or CANCEL

**Note:** The workflow templates included in this solution pack are read-only and cannot be deployed. To use a workflow template, you must first create a copy of the template and then customize that copy for your environment.

## How to Expose Additional Workflow Parameters

Each workflow in this solution pack has a set of input parameters. Some are required and some are optional. To run a workflow in your environment, you must specify values for a subset of these parameters when you create a deployment.

By default, only a few of the input parameters for each workflow are visible on the Deployment page, and the rest are hidden. In order to specify a value for a parameter that is currently hidden, you must first expose that parameter by changing its mapping in the workflow editor.

### To expose a hidden workflow parameter:

1. In the HP DMA web interface, go to Automation > Workflows.
2. From the list of workflows, select a deployable workflow.
3. Go to the Workflow tab.
4. In the list of steps below the workflow diagram, click the ► (blue arrow) to the immediate left of the pertinent step name. This expands the list of input parameters for this step.
5. For the parameter that you want to expose, select - User Selected - from the drop-down list.  
For example:

Step	Name	Required Result	Next
▼ 1	<a href="#">Gather Parameters for Oracle Compliance</a>		2
	Compliance Type:	- User selected -	ⓘ
	Excluded Compliance Checks:	- User selected -	ⓘ
	Inventory Files:	- User selected -	ⓘ

6. Repeat steps 4 and 5 for all the parameters that you would like to specify in the deployment.
7. Click **Save** in the lower right corner.

## How to Use a Policy to Specify Parameter Values

It is sometimes advantageous to provide parameter values by using a policy rather than explicitly specifying the values in a deployment. This approach has the following advantages:

- The policy can be used in any deployment.
- It is faster and less error-prone than specifying parameter values manually.
- For parameter values that change frequently—for example, passwords that must be changed regularly—you only need to update them in one place.

To establish a policy, you can either [Create a Policy](#) or [Extract a Policy](#) from a workflow.

After you establish the policy, you must [Reference the Policy in the Deployment](#).

For more information, see the *HP DMA User Guide*. This document is available on the HP Software Product Manuals web site: <http://h20230.www2.hp.com/selfsolve/manuals>

### Create a Policy

The first step in this approach is to create a policy that provides parameter values. There are two ways to do this: (1) create a new policy, and define all attributes manually (as shown here) or (2) extract a policy from a workflow (see [Extract a Policy](#) on the next page).

#### To create a policy that provides parameter values:

1. In the HP DMA web UI, go to Automation > Policies.
2. Click **New Policy**.
3. In the **Name** box, specify the name of the policy
4. For each parameter value that you want to provide using this policy, perform the following actions on the Attributes tab:
  - a. From the drop-down list, select the type of attribute:
    - A Text attribute contains simple text that users can view while deploying and running workflows.
    - A List attribute contains a comma-separated list of values (or a large amount of text not suitable for a Text attribute).
    - A Password attribute contains simple text, but the characters are masked so that users cannot see the text.
  - b. In the text box to the left of the Add button, specify the name of the attribute.  
For your convenience, this name should be similar to the parameter name used in the pertinent workflow (or workflows).
  - c. Click **Add**.
  - d. In the new text box to the right of the attribute's name, enter a value for this attribute.  
To remove an attribute, click the **Remove** button.
5. On the Roles tab, grant Read and Write permission to any additional users and groups who will

be using this policy. By default, any groups to which you belong have Read and Write permission.

6. Click the **Save** button (lower right corner).

## Extract a Policy

An alternative to creating your own policy one attribute at a time is to extract the policy. This automatically creates a reusable policy that provides values for all input parameters associated with a workflow. This is a convenient way to create a policy.

### To extract a policy:

1. Go to Automation > Workflows.
2. Select the Workflow that you want to work with.
3. Click the Extract Policy link at the bottom of the screen.
4. Specify values for each attribute listed.
5. *Optional:* Remove any attributes that you do not want to use.
6. *Optional:* Add any new attributes that you want to use.
7. *Optional:* On the Roles tab, select the Read box for any users or user groups that you want to be able to use this policy to provide parameter values in a Deployment. Select the Write box for any users or groups that you want to be able to modify this Policy (add or remove attributes).
8. Click **Save**.

## Reference the Policy in the Deployment

After you create a policy, you can reference its attributes in a deployment.

### To reference policy attributes in a deployment:

1. Create or access the deployment.  
See “Deployments” in the *HP DMA User Guide* for details.
2. On the Parameters tab, perform the following steps for each parameter whose value you want to provide by referencing a policy attribute:
  - a. In the drop-down menu for that parameter, select **Policy Attribute**.
  - b. In the text box for that parameter, type any character. A drop-down list of policy attributes appears. For example:



Admin Password:  Policy Attribute ▼

Discovery.Web Service Password

DTE - Policy.Password

**MyParameterValues.MyAdminPassword**

MyParameterValues.MyAdminUser

MyParameterValues.MyDBUser

MyParameterValues.MyDBUserPassword

oracle software.oracle software

- c. From the drop-down list, select the attribute that you want to reference. For example:

Admin Password:  Policy Attribute ▼

3. Click **Save** to save your changes to the deployment.

## How to Import a File into the Software Repository

Many HP DMA workflows are capable of downloading files from the software repository on the HP DMA server to the target server (or servers) where the workflow is running. The following procedure shows you how to import a file into the software repository so that it can be downloaded and deployed by a workflow.

HP DMA uses the HP Server Automation (HP SA) Software Library as its software repository.

**Tip:** Be sure to use unique file names for all files that you import into the software repository.

### To import a file into the HP SA Software Library:

1. Launch the HP SA Client from the Windows Start Menu.  
  
By default, the HP SA Client is located in Start → All Programs → HP Software → HP Server Automation Client  
  
If the HP SA Client is not installed locally, follow the instructions under “Download and Install the HP SA Client Launcher” in the *HP Server Automation Single-Host Installation Guide*.
2. In the navigation pane in the HP SA Client, select Library → By Folder.
3. Select (or create) the folder where you want to store the file.
4. From the Actions menu, select **Import Software**.
5. In the Import Software dialog, click the **Browse** button to the right of the File(s) box.
6. In the Open dialog:
  - a. Select the file (or files) to import.
  - b. Specify the character encoding to be used from the Encoding drop-down list. The default encoding is English ASCII.
  - c. Click **Open**. The Import Software dialog reappears.
7. From the Type drop-down list, select **Unknown**.
8. If the folder where you want to store the files does not appear in the Folder box, follow these steps:
  - a. Click the **Browse** button to the right of the Folder box.
  - b. In the Select Folder window, select the import destination location, and click **Select**. The Import Software dialog reappears.
9. From the Platform drop-down list, select all the operating systems listed.
10. Click **Import**.  
  
If one of the files that you are importing already exists in the folder that you specified, you will be prompted regarding how to handle the duplicate file. Press F1 to view online help that explains the options.
11. Click **Close** after the import is completed.

# Chapter 6

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## Troubleshooting

These topics can help you address problems that might occur when you install and run the workflows in this solution pack:

- [Target Type](#) below
- [User Permissions and Related Requirements](#) below
- [Discovery in HP DMA](#) on the next page

### Target Type

In your deployment, make sure that you have specified the correct type of target. The workflow type and the target type must match. A workflow designed to run against an instance target, for example, cannot run against a server target.

### User Permissions and Related Requirements

Roles define access permissions for organizations, workflows, steps, policies, and deployments. Users are assigned to roles, and they gain access to these automation items according to the permissions and capabilities defined for their roles.

Roles are assigned by your server management tool administrator. They are then registered in HP DMA by your HP DMA administrator.

Your HP DMA administrator will ensure that the users in your environment are assigned roles that grant them the permissions and capabilities they need to accomplish their tasks. For example:

- To create a workflow, your role must have Workflow Creator capability.
- To view a workflow, your role must have Read permission for that workflow.
- To edit a workflow, your role must have Write permission for that workflow.
- To view a deployment, your role must have Read permission for that deployment.
- To modify a deployment, your role must have Write permission for that deployment.
- To run a deployment, your role must have Execute permission for that deployment and Deploy permission for the organization where it will run.

Capabilities determine what features and functions are available and active in the HP DMA UI for each user role.

For more information, see the *HP DMA Administrator Guide*. This document is available on the HP Software Product Manuals web site: <http://h20230.www2.hp.com/selfsolve/manuals>

## Discovery in HP DMA

HP DMA uses a process called “discovery” to find information about the servers, networks, and database instances on target machines in your managed environment.

You must explicitly initiate the process of discovery—it is not automatic. See the *HP DMA User Guide* for instructions. This document is available on the HP Software Product Manuals web site: <http://h20230.www2.hp.com/selfsolve/manuals>

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# Glossary

## A

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### **automation items**

The umbrella term automation items is used to refer to those items to which role-based permissions can be assigned. Automation items include workflows, deployments, steps, and policies.

## B

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### **bridged execution**

A bridged execution workflow includes some steps that run on certain targets and other steps that run on different targets. An example of a bridged execution workflow is Extract and Refresh Oracle Database via RMAN (in the Database Refresh solution pack). This workflow extracts the contents of a database on one target (the Source) and creates a new database with the same contents on another target (the Destination). This workflow is useful when you want to clone a database - for example, to move it from a traditional IT infrastructure location into a private cloud. Bridged execution workflows are supported on HP DMA version 9.11 (and later).

## C

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### **capability**

Capabilities are collections of related privileges. There are three capabilities defined in HP DMA. Login Access capability enables a user to log in to the web interface. This capability does not guarantee that this user can view any

organizations or automation items—permissions are required to access those items. Workflow Creator capability enables a user to create new workflows and make copies of other workflows. Administrator capability enables a user to perform any action and view all organizations. If you have Administrator capability, you do not need Workflow Creator capability. The Administrator can assign any of these capabilities to one or more roles registered roles.

### **connector**

HP DMA includes a Connector component that enables it to communicate with your server management tool. You must configure the Connector before you can run an workflow against a target.

### **cross-platform**

Cross-platform database refresh involves converting the data from one type of byte ordering to another. This is necessary, for example, if you want to load a database dump file on a little-endian Linux target that was created on a big-endian Solaris server.

### **custom field**

Custom Fields are used to customize workflows or show information about the environment. Custom Fields can be used in workflow steps to automatically supply information that is specific to an organization, server, instance, or database.

### D

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#### DCL

Data Control Language.

#### DDL

Data Definition Language.

#### deployment

Deployments associate a workflow with a target environment in which a workflow runs. You can customize a deployment by specifying values for any workflow parameters that are designated - User Selected - in the workflow. You must save a deployment before you can run the workflow. You can re-use a saved deployment as many times as you like.

#### DML

Data Manipulation Language.

### F

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#### function

Functions are reusable pieces of code that can be included in automation steps. Any common routine or operation that multiple steps perform is a good candidate for a function. Functions can be tagged with keywords indicating the language in which they are written and the operating system with which they work. Functions are "injected" into the step code just prior to step execution.

### I

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#### input parameters

A workflow has a set of required parameters for which you must specify a value. The required parameters are a subset of all the parameters associated with that workflow. The remaining parameters are considered optional. You can specify a value for an optional

parameter by first exposing it using the workflow editor and then specifying the value when you create a deployment.

### M

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#### mapping

An input parameter is said to be "mapped" when it's value is linked to an output parameter from a previous step in the workflow or to a metadata field. Mapped parameters are not visible on the Deployment page. You can "unmap" a parameter by specifying - User Selected - in the workflow editor. This parameter will then become visible on the Deployment page.

### O

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#### organization

An organization is a logical grouping of servers. You can use organizations to separate development, staging, and production resources - or to separate logical business units.

### P

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#### parameters

Parameters are pieces of information - such as a file system path or a user name - that a step requires to carry out its action. Values for parameters that are designated User Selected in the workflow can be specified in the deployment. Parameters that are marked Enter at Runtime in the deployment must be specified on the target system when the workflow runs.

#### policy

Policies are reusable sets of attributes that can be used as parameter values in deployments. Deployments can reference policy attributes to change the automation behavior. Policies provide

values for input parameters. They can contain fixed values or reference Custom Fields. Policies enable HP DMA to manage groups of hundreds or thousands of servers at a time without the need to configure each individual server.

## R

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### raw devices

In Sybase ASE version 15, you can create and mount database devices on raw bound devices. This enables Sybase ASE to use direct memory access from your address space to the physical sectors on the disk. This can improve performance by reducing memory copy operations from the user address space to the operating system kernel buffers.

### role

Each HP DMA user has one or more roles. Roles are used to grant users permission to log in to and to access specific automation items and organizations. Roles are defined in your server management tool. Before you can associate a role with an automation item or organization, however, you must register that role in HP DMA.

## S

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### smart group

Smart Groups are dynamic groups of servers, instances, or databases defined by some criteria. They are used to specify targets for deployments. As information about an environment object changes, its membership in the groups is re-evaluated.

### software repository

The software repository is where the workflow will look for any required files that are not found on the target server. If you are using HP DMA with HP Server

Automation (SA), this repository is the SA Software Library.

### solution pack

A solution pack contains one or more related workflow templates. These templates are read-only and cannot be deployed. To run one of the workflows included in a solution pack, you must first create a deployable copy of that template and then customize that copy for your environment. Solution packs are organized by function - for example: database patching or application server provisioning.

### steps

Steps contains the actual code used to perform a unit of work detailed in a workflow.

## T

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### target instance

In the context of MS SQL database refresh, the term "target instance" refers to the SQL Server instance where the database that will be restored resides.

### T-SQL

T-SQL stands for "Transact Structure Query Language" which includes all ANSI or Non-ANSI standard of DDL (Data Definition Language), DML (Data Manipulation Language), and DCL (Data Control Language).

## W

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### workflow

A workflow automates the process followed for an operational procedure. Workflows contain steps, which are linked together to form business logic for a common task. Workflows connect existing tasks in order to perform a new

business process by building on existing best practices and processes.

### **workflow editor**

The workflow editor is the tool that you use to assemble steps into workflows. You can map each input parameter to output parameters of previous steps or built-in metadata (such as the server name, instance name, or database name). You can also specify User Selected to expose a parameter in the deployment; this enables the person who creates the deployment to specify a value for that parameter.

### **workflow templates**

A workflow template is a read-only workflow that cannot be deployed. To run one of the workflows included in a solution pack, you must first create a deployable copy of the workflow template and then customize that copy for your environment.