HP Database and Middleware Automation

Software Version: 10.30
Linux, Solaris, AIX, HP-UX, and Windows®

Database Release Management

Legal Notices

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Restricted Rights Legend

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notice

© Copyright 2010-2015 Hewlett-Packard Development Company, L.P.

Trademark Notices

Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corporation.

Oracle® and Java® are registered trademarks of Oracle and/or its affiliates.

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.

To check for recent updates or to verify that you are using the most recent edition of a document, go to: **https://softwaresupport.hp.com**

This site requires that you register for an HP Passport and sign in. To register for an HP Passport ID, go to: **https://hpp12.passport.hp.com/hppcf/createuser.do**

Or click the **Register** link at the top of the HP Software Support 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.

The following table indicates changes made to this document since the last major edition.

Document Changes

Chapter	Version	Changes
Title Page Legal Notices	10.01	Updated version number, software release date, document release date, and copyright date range.
Database Release Management Quick Start	10.01	Updated from 10.00 to 10.01.

Document Changes, continued

Chapter	Version	Changes
Title Page Legal Notices	10.10	Updated version number, software release date, document release date, and copyright date range.
About HP DMA Solution Packs	10.10	Added overview topic: About HP DMA Solution Packs.
Supported Products and Platforms	10.10	Added support for SQL Server 2012.
Title Page Legal Notices	10.20	Updated version number, software release date, document release date, and copyright date range.
Database Release Management Quick Start Workflow Details	10.20	Removed the Quick Start chapter. In the "How to Run this Workflow" sections, pointed to the *HP DMA Quick Start Tutorial*.
Supported Products and Platforms Oracle - SQL Release SQL Parser Documentation	10.20	Added support for Oracle 12c. Standardized workflow, step, and parameter names. Moved all parameter inputs to the Gather step. Added reference information for SQL parser.
Prerequisites for this Workflow	10.20	Added CREATE USER and DROP USER to the supported SQL commands. Clarified SQL commands that are not listed in table.
DB Release for SQL Server	10.20.100	Added capability to specify the Windows domain user at runtime for the SQL Server workflow.
Title Page Legal Notices Entire guide	10.21	Updated version number, software release date, document release date, and copyright date range. Updated documentation template.
DB Release for SQL Server	10.21	Updated SQL Server versions that are supported.
Title Page Legal Notices	10.22	Updated version number, software release date, document release date, and copyright date range.
Title Page Legal Notices Entire guide	10.30	Updated version number, software release date, document release date, and copyright date range. Updated to new documentation template.

Support

Visit the HP Software Support Online web site at: **https://softwaresupport.hp.com**

This web site provides contact information and details about the products, services, and support that HP Software offers.

HP Software online support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support web site to:

- Search for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches
- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To register for an HP Passport ID, go to:

https://hpp12.passport.hp.com/hppcf/createuser.do

To find more information about access levels, go to:

https://softwaresupport.hp.com/web/softwaresupport/access-levels

HP Software Solutions Now accesses the HPSW Solution and Integration Portal Web site. This site enables you to explore HP Product Solutions to meet your business needs, includes a full list of Integrations between HP Products, as well as a listing of ITIL Processes. The URL for this Web site is
http://h20230.www2.hp.com/sc/solutions/index.jsp

Contents

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, and 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.

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 70).

Document Map

The following table shows you how to navigate this guide:

Topic	Description
The Database Release Management Solution	General information about this solution, including what it contains and what it does.
Workflow Details	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.
Reference Information	Links to pertinent product documentation, SQL parser documentation, and more information about HP DMA.
Tips and Best Practices	Simple procedures that you can use to accomplish a variety of common HP DMA tasks.
Troubleshooting	Tips for solving common problems.

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 85.

Chapter 1: 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
Oracle - SQL Release	This workflow deploys and executes an SQL script (or scripts) against target Oracle databases.
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.
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.

Deprecated Workflow

The following workflow has been deprecated from the solution pack and removed from the product:

Workflow Name	Description
Oracle SQL Release	This workflow deploys and executes an SQL script (or scripts) against target Oracle databases. This workflow has been replaced by the Oracle - SQL Release workflow that has the following changes: • Supports Oracle 12c • Has new names for the workflow, steps, and parameters to standardize names throughout HP DMA • Inputs all parameters in the step Gather Parameters for Oracle SQL Release

Tip: Documentation for the deprecated workflow is available in the *HP DMA Database Release Management User Guide* for HP DMA version 10.10. This document is available on the HP Software Support web site: https://softwaresupport.hp.com/

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 *, 11gR2, and 12cR1 * = Out of Oracle standard support	Red Hat Enterprise Linux, SUSE Linux, and Oracle Linux Solaris AIX
SQL Server	2008, 2008 R2, 2012, 2014	Windows
Sybase ASE	15.0.3, 15.5, 15.7 (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 Support web site:

https://softwaresupport.hp.com/

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

The latest HP DMA solution packs require the latest HP DMA platform. To use the latest solution packs, update the HP DMA platform. HP DMA 10.30 solution packs are supported on HP DMA 10.30 (and later).

Chapter 2: Workflow Details

This solution pack contains the following workflows:

Workflow Name	Description
Oracle - SQL Release	This workflow deploys and executes an SQL script (or scripts) against target Oracle databases.
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.
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.

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 14).
- You are logged in to the HP DMA web interface.
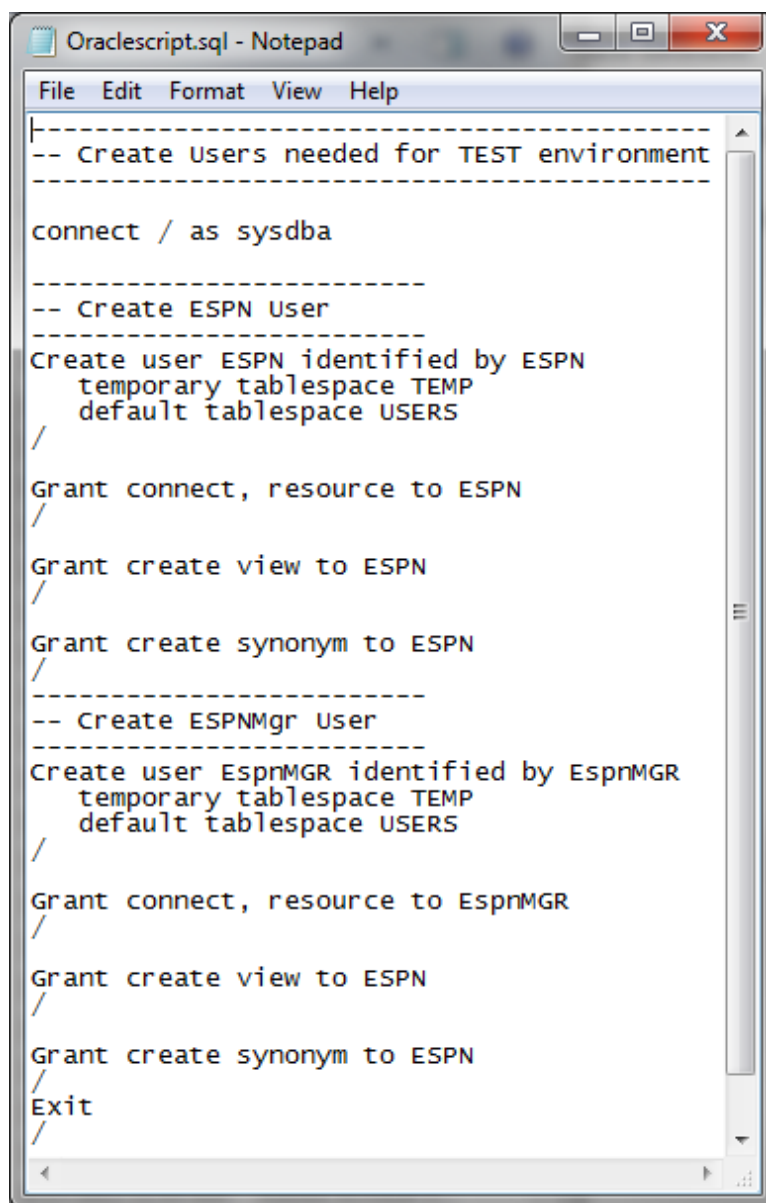- You have permission to create, edit, and deploy copies of the workflows included in this solution pack.

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:

```
Oraclescript.sql - Notepad

File   Edit   Format   View   Help

|---------------------------------------------
-- Create Users needed for TEST environment
---------------------------------------------

connect / as sysdba

-------------------------
-- Create ESPN User
-------------------------
Create user ESPN identified by ESPN
    temporary tablespace TEMP
    default tablespace USERS
/

Grant connect, resource to ESPN
/

Grant create view to ESPN
/

Grant create synonym to ESPN
/
-------------------------
-- Create ESPNMgr User
-------------------------
Create user EspnMGR identified by EspnMGR
    temporary tablespace TEMP
    default tablespace USERS
/

Grant connect, resource to EspnMGR
/

Grant create view to ESPN
/

Grant create synonym to ESPN
/
Exit
/
```

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

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

- The latest HP DMA solution packs require the latest HP DMA platform. To use the latest solution packs, update the HP DMA platform. HP DMA 10.30 solution packs are supported on HP DMA 10.30 (and 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 *, 11gR2, and 12cR1

* = Out of Oracle standard support

SQL Scripts

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

ALTER INDEX	DELETE	INSERT
CREATE INDEX	DROP INDEX	GRANT PRIVILEGE
CREATE SYNONYM	DROP SYNONYM	REVOKE PRIVILEGE
CREATE VIEW	DROP TABLE	UPDATE
CREATE TABLE	DROP VIEW	
CREATE USER	DROP USER	

Note: Any valid SQL command that is not included in the above table can still be contained in an SQL script, but the workflow's Rollback functionality will not be supported. You need to specify N for the Execute Rollback parameter when you deploy the workflow.

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

Oracle SQL Documentation

For more information about prerequisites for Oracle Database, refer to the Oracle Database Product Documentation on page 71.

How this Workflow Works

The following information describes how the Oracle - SQL Release workflow works.

Overview

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

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 the Check System Grants Exception List parameter—if any are found, the workflow will exit with a failure code.

- Check the SQL code for a regular expression specified in the Regular Expression parameter—if it is found, the workflow will exit with a failure code.

- Checks the SQL syntax for errors—if any are found and Check SQL Syntax Ignore Errors is not True, the workflow will exit with a failure code.

If no errors were found (or syntax errors are found and Check SQL Syntax Ignore Errors is True), the workflow creates an SQL*Plus session to run the SQL scripts. Any errors that are on the Acceptable ORA Error list are ignored.

If Execute Rollback is enabled and log archiving is turned on, a rollback SQL script file will be created. If an error occurs during the execution of the SQL scripts a rollback will automatically be performed—as if the SQL scripts had never been executed.

The workflow ends by cleaning up any temporary downloaded files.

Validation Checks Performed

This workflow validates the SQL scripts in the following ways:

1. If you set the Check Database Links Run Flag to Y, the workflow searches for the @ character to indicate a database link—ignoring any @ characters within single quotes.

2. If you set the Check System Grants Run Flag to Y, the workflow searches the SQL statements for the system grants that you specified in the Check System Grants Exception List parameter.
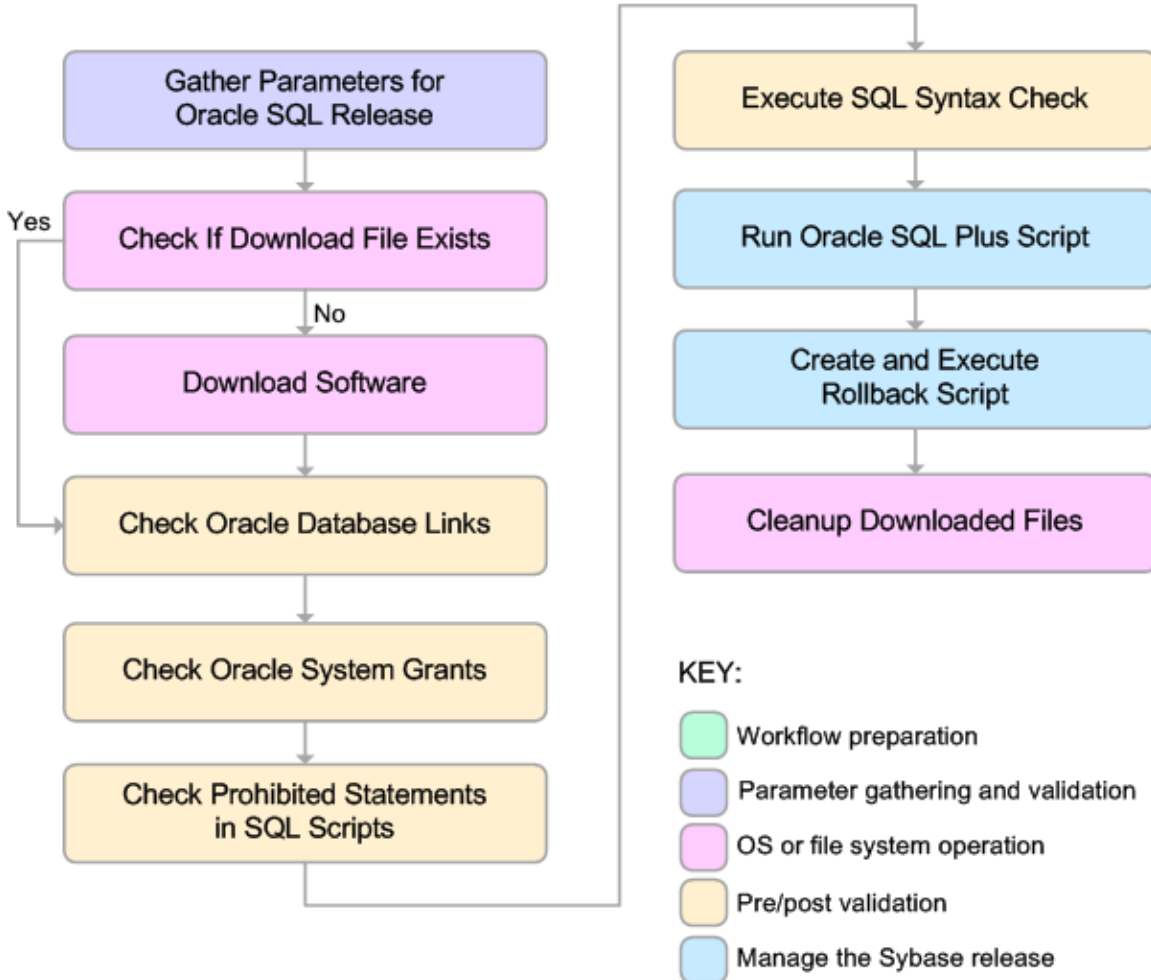
   For example:

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

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

4. The workflow checks the SQL syntax according to the data type specified in the Check SQL Syntax Database Type parameter. If you set the Check SQL Syntax Ignore Errors to True, any syntax errors will be ignored and the workflow will continue.

If any of the validation checks fail, the workflow will output the offending SQL line to `stdout`, return an error status, and the SQL scripts will not be executed.

Steps Executed

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.

KEY:

- Workflow preparation
- Parameter gathering and validation
- OS or file system operation
- Pre/post validation
- Manage the Sybase release

Steps Used in Oracle – SQL Release

Workflow Step	Description
Gather Parameters for Oracle SQL Release	This step accepts the basic input parameters for the workflow. The parameters will be used in subsequent steps. This step also constructs the commands needed to execute subsequent steps in the workflow as either the OS administrative user or the user who owns the pertinent ORACLE_HOME.
Check if Download File Exists	This step determines whether one or more specified files already exist on the target server.

Steps Used in Oracle – SQL Release, continued

Workflow Step	Description
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 Check System Grants Exception List parameter. If any are found the workflow will fail.
Check Prohibited Statements In SQL Scripts	This step applies a regular expression to each SQL statement in an SQL script. Any `regex` matches are output to `stdout`, an error status is returned, and the workflow will fail.
Execute SQL Syntax Check	This step executes an SQL syntax check of the SQL script files. It then reports pass or fail for each file and the number of syntax errors found. If Check SQL Syntax Ignore Errors is set to True, any syntax errors will be ignored and the workflow will continue.
Run Oracle SQL Plus Script	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. **Note:** This is designed to be run by the Oracle software owner (typically oracle). If Execute Rollback is enabled, log archiving must be turned on.
Create and Execute Rollback Script	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. **Note:** This step is designed to be run as the Oracle software owner (typically oracle). 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.
Cleanup Downloaded Files	This step removes all temporary downloaded files and archives.

Note: For input parameter descriptions and defaults, see

How to Run this Workflow

The following instructions show you how to customize and run the Oracle - SQL Release workflow in your environment.

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

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

> **Note:** Before following this procedure, review the Prerequisites for this Workflow on page 19, 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" in *HP DMA Quick Start Tutorial*).

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

Input Parameters for Gather Parameters for Oracle SQL Release

Parameter Name	Default Value	Required	Description
Acceptable ORA Error		optional	Comma-separated list of ORA errors that will be expected (and can be ignored) while running release scripts. For example: ORA-00942
Check Database Links Run Flag	Y	required	Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check).
Regular Expression Check Prohibited Statements Run Flag Check Prohibited Statements Run Flag		optional	The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table.

Input Parameters for Gather Parameters for Oracle SQL Release, continued

Parameter Name	Default Value	Required	Description
Check Prohibited Statements Run Flag	no default	required	Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check).
Check SQL Syntax Database Type	dbvoracle	optional	Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation on page 71 for valid options.
Check SQL Syntax Ignore Errors	False	optional	Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present).
Check System Grants Exception List	CREATE VIEW, CREATE SYNONYM, CREATE CLUSTER, CREATE TABLE	optional	Comma-separated list of system privileges that are not allowed in this deployment.
Check System Grants Run Flag	Y	required	Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check).
Execute Rollback	no default	required	Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error.
Oracle OS User	no default	required	The user who owns ORACLE_HOME.
Oracle Password	no default	required	Password for the Oracle Database user.

Input Parameters for Gather Parameters for Oracle SQL Release, continued

Parameter Name	Default Value	Required	Description
Oracle User	no default	required	Oracle Database user who will execute the SQL scripts.
Rollback File	no default	required if Execute Rollback is enabled	The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to: • Perform an automatic rollback in the event of an error • Execute a rollback at a later time • Serve as an audit file for future use
SQL Scripts	`script.sql`	required	Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: `MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql` **Note:** List the SQL script files in the order in which they need to be executed.
Staging Directory	`/tmp/`	optional	The directory on the target server where the SQL script file (or files) will be downloaded.

Tip: To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow (see How to Use a Policy to Specify Parameter Values on page 79).

Note: See Parameters for Oracle - SQL Release on page 32 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need (see How to Expose Additional Workflow Parameters on page 78). 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" in *HP DMA Quick Start Tutorial* 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" in *HP DMA Quick Start Tutorial* 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. SQL syntax errors will be ignored. The workflow will create an SQL*Plus session to deploy and execute the scripts. It will not save a rollback file. It will not perform an automatic rollback if an error is encountered when executing the SQL scripts.

Archive logging can be off since Execute Rollback is not enabled.

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release

Parameter Name	Example	Description
Check Database Links Run Flag	N	Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check).
Check Prohibited Statements Run Flag	N	Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check).
Check SQL Syntax Database Type	dbvoracle	Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation on page 71 for valid options.
Check SQL Syntax Ignore Errors	True	Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present).
Check System Grants Run Flag	N	Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check).
Execute Rollback	N	Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error.

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

Parameter Name	Example	Description
Oracle OS User	oracle	The user who owns ORACLE_HOME.
Oracle Password	tiger	Password for the Oracle Database user.
Oracle User	scott	Oracle Database user who will execute the SQL scripts.
SQL Scripts	see description	Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: `MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql` **Note:** List the SQL script files in the order in which they need to be executed.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see).

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
- SQL syntax errors

If no errors were found in the checks, the workflow creates an SQL*Plus session to deploy and execute the scripts. It will save a rollback file and perform an automatic rollback if an error is encountered when executing the SQL scripts.

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release

Parameter Name	Example	Description
Acceptable ORA Error	ORA-00942	Comma-separated list of ORA errors that will be expected (and can be ignored) while running release scripts. For example: ORA-00942
Check Database Links Run Flag	Y	Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check).
Check Prohibited Statements Regular Expression	drop\s+table	The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table.
Check Prohibited Statements Run Flag	Y	Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check).
Check SQL Syntax Database Type	dbvoracle	Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation on page 71 for valid options.
Check SQL Syntax Ignore Errors	False	Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present).

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

Parameter Name	Example	Description
Check System Grants Exception List	CREATE VIEW, CREATE SYNONYM, CREATE CLUSTER, CREATE TABLE	Comma-separated list of system privileges that are not allowed in this deployment.
Check System Grants Run Flag	Y	Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check).
Execute Rollback	Y	Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error.
Oracle OS User	oracle	The user who owns ORACLE_HOME.
Oracle Password	tiger	Password for the Oracle Database user.
Oracle User	scott	Oracle Database user who will execute the SQL scripts.
Rollback File	`/var/tmp/ rollback.sql`	The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to: • Perform an automatic rollback in the event of an error • Execute a rollback at a later time • Serve as an audit file for future use

Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

Parameter Name	Example	Description
SQL Scripts	see description	Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: `MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql` **Note:** List the SQL script files in the order in which they need to be executed.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see Parameters for Oracle - SQL Release 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 78). For some parameters, if you do not specify a value for a parameter, a default value is assigned.

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

Input Parameters Defined in this Step: Gather Parameters for Oracle SQL Release

Parameter Name	Default Value	Required	Description
Acceptable ORA Error		optional	Comma-separated list of ORA errors that will be expected (and can be ignored) while running release scripts. For example: ORA-00942
Check Database Links Run Flag	Y	required	Flag to indicate whether the workflow should run the database links check. Valid values are Y (run the check) or N (do not run the check).
Check Prohibited Statements Regular Expression		optional	The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table.
Check Prohibited Statements Run Flag	no default	required	Flag to indicate whether the workflow should run the prohibited statements check. Valid values are Y (run the check) or N (do not run the check).
Check SQL Syntax Database Type	dbvoracle	optional	Database type used to set the SQL parser. For example: dbvoracle, dbvsybase, dbvmssql, or dbvdb2. See SQL Parser Documentation on page 71 for valid options.
Check SQL Syntax Ignore Errors	False	optional	Flag to indicate whether the workflow should pass the SQL syntax check regardless of whether or not syntax errors are found. Valid values are True (the check will always pass) or False (the check will fail if syntax errors are present).

Input Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

Parameter Name	Default Value	Required	Description
Check System Grants Exception List	CREATE VIEW, CREATE SYNONYM, CREATE CLUSTER, CREATE TABLE	optional	Comma-separated list of system privileges that are not allowed in this deployment.
Check System Grants Run Flag	Y	required	Flag to indicate whether the workflow should run the system grants check. Valid values are Y (run the check) or N (do not run the check).
Execute Rollback	no default	required	Flag to indicate whether an automatic rollback will be performed whenever an error is detected during the execution of the SQL scripts. If Y is specified and an error occurs, the workflow exits and rolls back all committed SQL transactions that belong to the deployed SQL scripts. If N is specified, no rollback will be performed in the event of an error.
Oracle OS User	no default	required	The user who owns ORACLE_HOME.
Oracle Password	no default	required	Password for the Oracle Database user.
Oracle User	no default	required	Oracle Database user who will execute the SQL scripts.
Rollback File	no default	required if Execute Rollback is enabled	The file name and path of the rollback script file that records all SQL transactions performed by the SQL scripts. This file can be used to: • Perform an automatic rollback in the event of an error • Execute a rollback at a later time • Serve as an audit file for future use

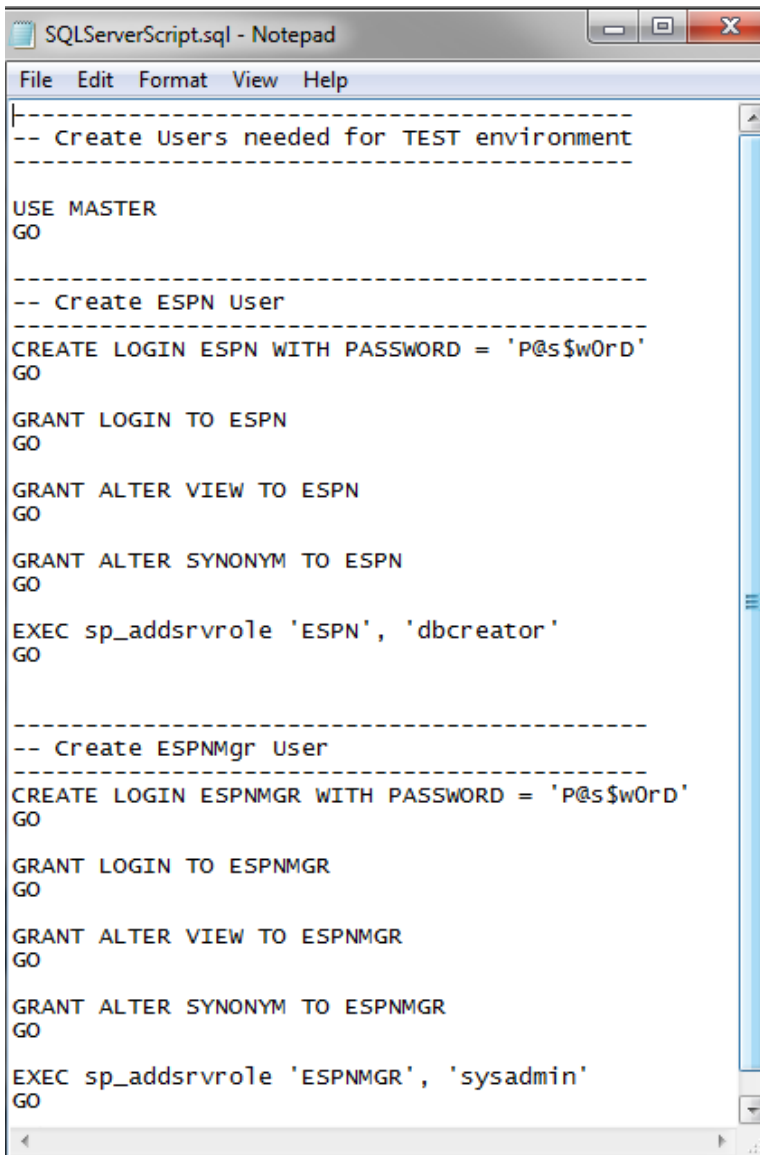Input Parameters Defined in this Step: Gather Parameters for Oracle SQL Release, continued

Parameter Name	Default Value	Required	Description
SQL Scripts	`script.sql`	required	Comma-separated list of SQL script files that will be deployed to the target servers. These files will be downloaded from the software repository if they do not already exist on the target server. SQL script files can have arguments. For example: `MySQLfile1.sql arg1, MySQLfile2.sql arg2 arg3, MySQLfile3.sql` **Note:** List the SQL script files in the order in which they need to be executed.
Staging Directory	`/tmp/`	optional	The directory on the target server where the SQL script file (or files) will be downloaded.

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$wOrD'
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$wOrD'
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
Prerequisites for this Workflow	List of prerequisites that must be satisfied before you can run this workflow
How this Workflow Works	Information about what the workflow does, including validation checks performed, and steps executed
How to Run this Workflow	Instructions for running this workflow in your environment
Sample Scenarios	Examples of typical parameter values for this workflow
Parameters	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

- The latest HP DMA solution packs require the latest HP DMA platform. To use the latest solution packs, update the HP DMA platform. HP DMA 10.30 solution packs are supported on HP DMA 10.30 (and 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

2008, 2008 R2, 2012, 2014

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 71.

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.
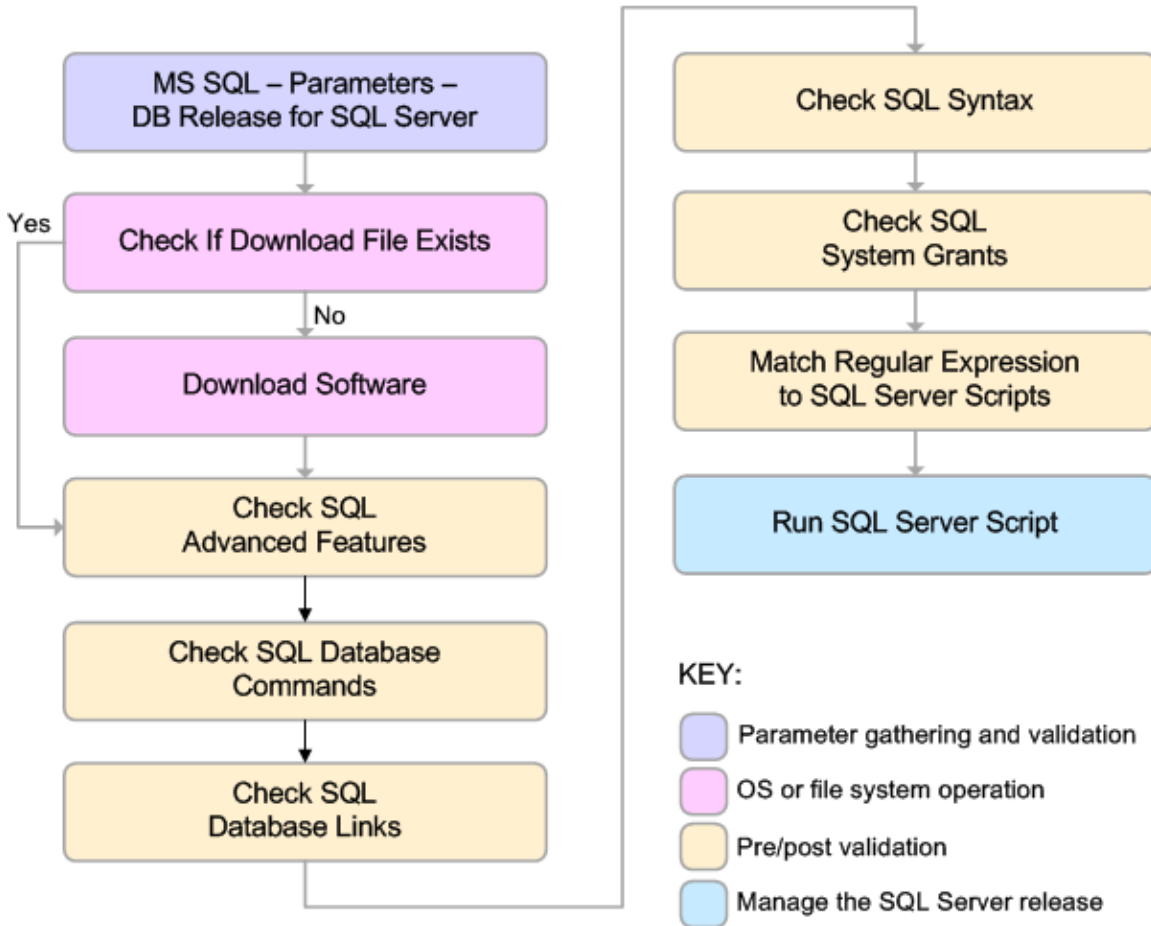
Steps Used in DB Release for SQL Server

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 go 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 regex matches are found, they are output to stdout and an error is returned.
Run SQL Server Script	This step executes SQL Scripts using osql or SQLCMD. 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 48.

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.

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

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in Parameters for DB Release for SQL Server on page 48.

> **Note:** Before following this procedure, review the Prerequisites for this Workflow on page 37, 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" in *HP DMA Quick Start Tutorial*).

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. **Note:** 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. **Note:** 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 ddladmin, 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 48 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 (see How to Expose Additional Workflow Parameters on page 78). You will specify values for those parameters when you create the deployment or at runtime.

4. Save the changes to the workflow (click **Save** in the lower right corner).

5. Create a new deployment (see "Create a Deployment" in *HP DMA Quick Start Tutorial* for instructions).

6. On the Parameters tab, specify values (or set the type to Runtime Value) for the required parameters listed in step 2 and any additional parameters that you have exposed.You do not need to specify values for those parameters whose default values are appropriate for your environment.

7. On the Targets tab, specify one or more targets for this deployment.

8. Save the deployment (click **Save** in the lower right corner).

9. Run the workflow using this deployment, specifying any runtime parameters (see "Run Your Workflow" in *HP DMA Quick Start Tutorial* 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

This topic shows you typical parameter values for different use cases for the DB Release for SQL Server workflow.

Scenario 1: 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. **Note:** 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 page 48).

Scenario 2: Check the SQL script files for disallowed commands, check the syntax, configure Windows domain user using runtime parameters, but do not deploy and execute the scripts

This scenario takes advantage of many parameter defaults and also demonstrates some optional parameters. The workflow will check the SQL script files for:

- 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
- The regular expression drop\s+table
- A database to which the SQL scripts will be applied

> **Note:** You may want to run this workflow against a MS SQL instance that can only be accessed by a Windows user with a temporary password. By using a runtime parameter for the password, you can ensure that the password used is always the latest.
>
> To specify the Windows domain user at the time you execute a deployment with runtime parameters, perform the following additional steps:
>
> 1. When you make a copy of the workflow, expand the appropriate step, and then set the Windows domain user parameters—Instance Account and Instance Password—to **- User selected -**.
> 2. When you create a deployment from the copy of the workflow, set the parameter types to **Runtime Value**.
> 3. When you execute the deployment, specify the Windows domain user account and password.

This workflow run will only report the results of the checks. The SQL scripts will NOT 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. > **Note:** List the SQL script files in the order in which they need to be executed.
Instance Account	Domain\DomainUserAcct > **Note:** Enter at runtime.	The Windows account that will perform the release management.

Input Parameters for MS SQL – Parameters – DB Release for SQL Server, continued

Parameter Name	Example Value	Description
Instance Password	DomainUserPswd **Note:** Enter at runtime.	The password for the Windows account that will perform the release management.
Staging Directory	`C:\Temp\`	The directory that contains the SQL scripts that will be checked.

Input Parameters for Match Regular Expression to SQL Server Scripts

Parameter Name	Example Value	Description
Regular Expression	drop\s+table	The regular expression to be searched for in all of the SQL scripts to be deployed. If the specified regular expression is found, the workflow exits with a failure. For example: drop\s+table will match all statements that drop a table.
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 SQL Server Script

Parameter Name	Example Value	Description
Database Name	mydb	The name of the database to which the specified SQL scripts will be applied.
Run Flag	N	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: Some of these parameters are not exposed by default in the deployment. See How to Expose Additional Workflow Parameters on page 78.

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 78). For some parameters, if you do not specify a value for a parameter, a default value is assigned.

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

Input Parameters Defined in this Step: 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. **Note:** 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. **Note:** List the SQL script files in the order in which they need to be executed.
Instance Account	no default	optional	The Windows account that will perform the release management.
Instance Password	no default	optional	The password for the Windows account that will perform the release management.
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 ddladmin, 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.
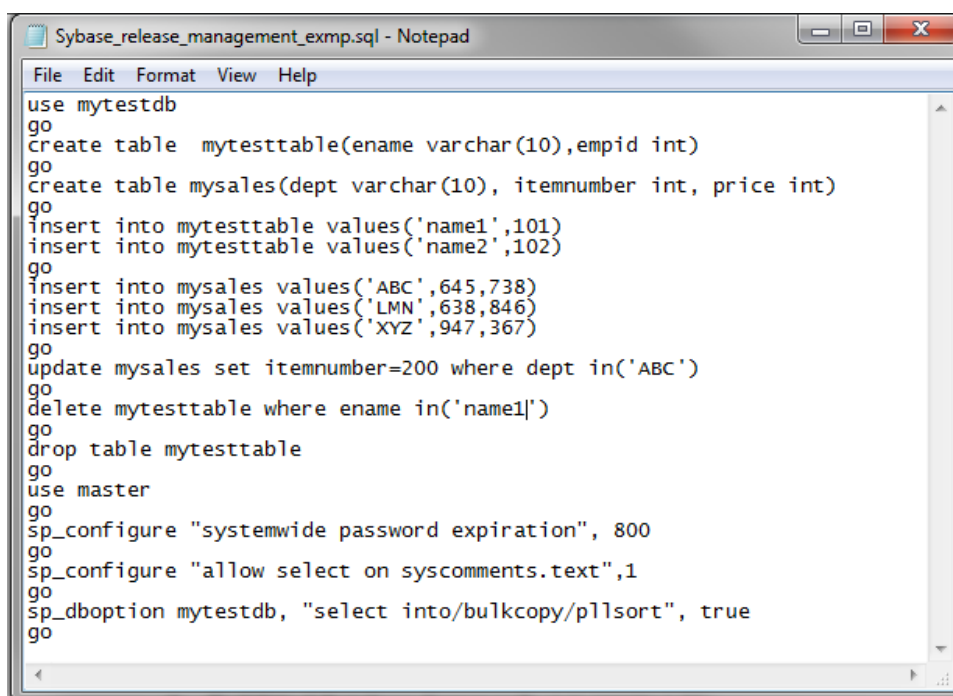
T-SQL scripts, Adaptive Server configuration parameters, and database options are deployed and executed against target Sybase ASE databases.

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:

```
Sybase_release_management_exmp.sql - Notepad

File  Edit  Format  View  Help
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
Prerequisites for this Workflow	List of prerequisites that must be satisfied before you can run this workflow
How this Workflow Works	Information about what the workflow does, including validation checks performed, and steps executed
How to Run this Workflow	Instructions for running this workflow in your environment
Sample Scenarios	Examples of typical parameter values for this workflow
Parameters	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

- The latest HP DMA solution packs require the latest HP DMA platform. To use the latest solution packs, update the HP DMA platform. HP DMA 10.30 solution packs are supported on HP DMA 10.30 (and 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, 15.7 (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 71.

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.

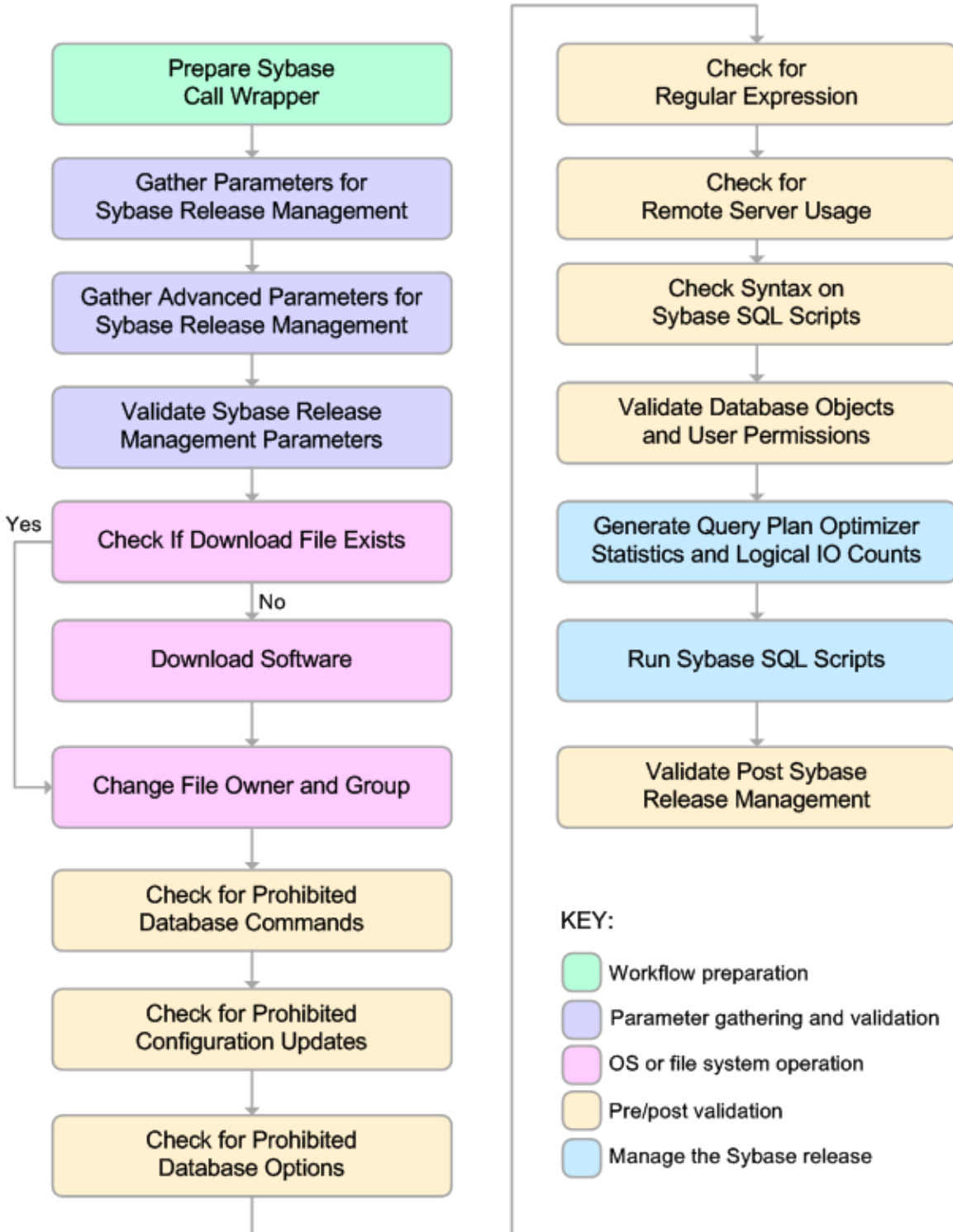4. Checks that all flag parameters are y, yes, no, no, t, true, f, or false—case insensitive.

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.

Prepare Sybase
Call Wrapper

Gather Parameters for
Sybase Release Management

Gather Advanced Parameters for
Sybase Release Management

Validate Sybase Release
Management Parameters

Check If Download File Exists

Yes

No

Download Software

Change File Owner and Group

Check for Prohibited
Database Commands

Check for Prohibited
Configuration Updates

Check for Prohibited
Database Options

Check for
Regular Expression

Check for
Remote Server Usage

Check Syntax on
Sybase SQL Scripts

Validate Database Objects
and User Permissions

Generate Query Plan Optimizer
Statistics and Logical IO Counts

Run Sybase SQL Scripts

Validate Post Sybase
Release Management

KEY:

Workflow preparation

Parameter gathering and validation

OS or file system operation

Pre/post validation

Manage the Sybase release

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 Sybase Release Management 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 Sybase Release Management 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 `sp_configure` 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 `sp_dboption` 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 `create proxy_table`, `sp_addserver`, and `sp_dropserver` 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: • Database objects used in the script exist and are available. • The user has permission to modify the database objects.
Generate Query Plan Optimizer Statistics and Logical IO Counts	This step runs 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. If the following input flags are set: • Generate Query Plan—the step will show a query plan. • Generate Optimizer Statistics—the step will show the statistics time. • Generate Logical I/O Counts—the step will show the statistics of logical/physical input and output.
Run Sybase SQL Scripts	This step runs the isql (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: • Input TSQL/config/dboptions files have been verified successfully and have not been run. • All Sybase Release Management scripts ran successfully.

Note: For input parameter descriptions and defaults, see

How to Run this Workflow

The following instructions show you how to customize and run the Sybase Release Management workflow in your environment.

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

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in Parameters for Sybase Release Management on page 67.

> **Note:** Before following this procedure, review the Prerequisites for this Workflow on page 53, 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" in *HP DMA Quick Start Tutorial*).

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: `/opt/hp/dma/client/jython.sh` running as root For Windows targets, the default is: `jython` 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: mysql.sql **Note:** 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 (`sp_configure` commands) that are allowed to be performed by the specified SQL Scripts. This overrides configuration updates that would normally be prohibited. For example: `systemwide password expiration`
Approved Database Options		optional	Comma-separated list of database options (`sp_dboption` commands) that are allowed to be configured by the specified SQL Scripts. This overrides database options that would normally be prohibited. For example: `select into/bulkcopy/pllsort`
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.

Input Parameters for Gather Advanced Parameters For Sybase Release Management, continued

Parameter Name	Default Value	Required	Description
Prohibited Database Commands		optional	Comma-separated list of database commands (`sp_dboption` commands) that will be ignored in the specified SQL Scripts. For example: `dbo use only,select into/bulkcopy/pllsort`
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 : `drop table, truncate table`

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 79).

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 78.

See Parameters for Sybase Release Management on page 67 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 (see How to Expose Additional Workflow Parameters on page 78). 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" in *HP DMA Quick Start Tutorial* 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" in *HP DMA Quick Start Tutorial* 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	`mysql.sql`	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: mysql.sql **Note:** List the SQL script files in the order in which they need to be executed.

Be sure that the default values for all remaining input parameters are appropriate for your environment (see Parameters for Sybase Release Management on page 67).

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	`mysql.sql`	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: mysql.sql **Note:** 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	Example Value	Description
Approved Configuration Updates	see description	Comma-separated list of configuration updates (`sp_configure` commands) that are allowed to be performed by the specified SQL Scripts. This overrides configuration updates that would normally be prohibited. For example: `systemwide password expiration`

Input Parameters for Gather Advanced Parameters For Sybase Release Management, continued

Parameter Name	Example Value	Description
Approved Database Options	see description	Comma-separated list of database options (`sp_dboption` commands) that are allowed to be configured by the specified SQL Scripts. This overrides database options that would normally be prohibited. For example: `select into/bulkcopy/pllsort`
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 (`sp_dboption` commands) that will be ignored in the specified SQL Scripts. For example: `dbo use only,select into/bulkcopy/pllsort`
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 : `drop table, truncate table`

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 78). For some parameters, if you do not specify a value for a parameter, a default value is assigned.

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

Parameters Defined in this Step: 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: `/opt/hp/dma/client/jython.sh` running as root For Windows targets, the default is: `jython` 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: mysql.sql **Note:** List the SQL script files in the order in which they need to be executed.
Sybase Home	see description	required	Sybase ASE installation directory (absolute path). For example: `/opt/sybase/ase_1503` If the Discovery workflow has previously been executed, this parameter value is automatically detected. You can specify a different installation directory if you prefer. The default is the metadata value for `Instance.sybase home`.

Parameters Defined in this Step: Gather Parameters For Sybase Release Management, continued

Parameter Name	Default Value	Required	Description
Sybase Password	see description	required	Adaptive Server (instance) login password for the Sybase User. If the Discovery workflow has previously been executed, this parameter value is automatically detected. You can specify a different password if you prefer. The default is the metadata value for `Instance.password`.
Sybase User	see description	required	Adaptive Server (instance) user who will execute the specified SQL Scripts on the target. For example: admin 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. The default is the metadata value for `Instance.user`.

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

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

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

Parameter Name	Default Value	Required	Description
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: `dbo use only,select into/bulkcopy/pllsort`
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 : `drop table, truncate table`
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 3: Reference Information

This chapter contains the following information:

Topic	Description
Database Product Documentation	Links to product documentation for the database products that these workflows support
SQL Parser Documentation	Links to information for data types used for SQL parsers.
HP DMA Documentation	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 10gR2 *, 11gR1 *, 11gR2, and 12cR1* = Out of Oracle standard support is located here:

http://www.oracle.com/pls/db102/homepage

http://www.oracle.com/pls/db11/homepage

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

http://www.oracle.com/pls/db121/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

SQL Parser Documentation

Additional information for valid database types for the SQL parser is located here:

http://sqlparser.com/kb/javadoc/index.html?gudusoft/gsqlparser/EDbVendor.html

HP DMA Documentation

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

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

https://softwaresupport.hp.com/

Chapter 4: 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 78
- How to Use a Policy to Specify Parameter Values on page 79
- How to Import a File into the Software Repository on page 82

How a Solution Pack is Organized

Note: This topic uses the 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.

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.

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.
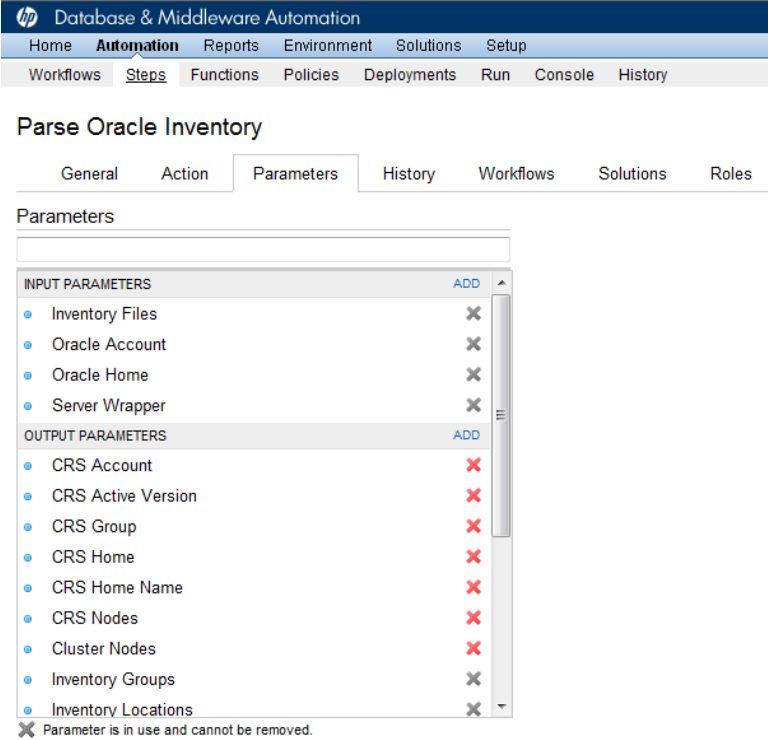
Parameter descriptions are also displayed on the Workflow tab for each workflow.
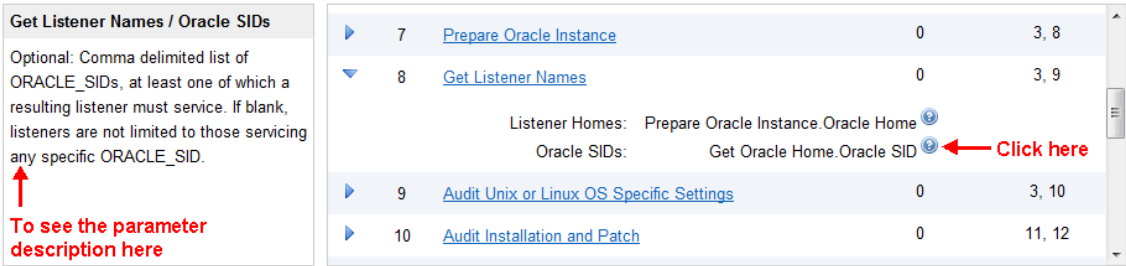
Parameter descriptions are also displayed on the Parameters tab in the **deployment** (organized by step).

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.
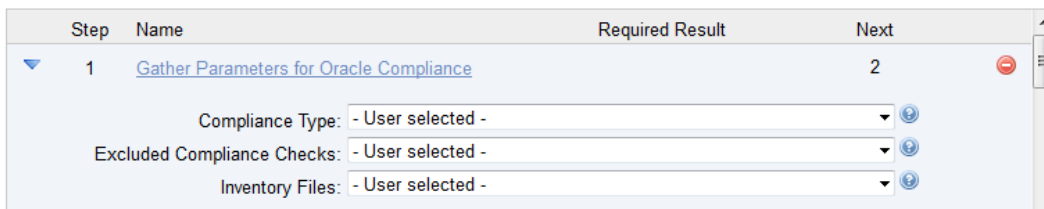
How to Expose Additional Workflow Parameters

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	Gather Parameters for Oracle Compliance		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 Support web site: https://softwaresupport.hp.com/

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:

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

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 Business Service Automation → HP Server Automation Client

    If the HP SA Client is not installed locally, follow the instructions under "Installing the SA Client Launcher" in the *User Guide: Server Automation*, available on the HP Software Support web site: https://softwaresupport.hp.com/

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 5: 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 the HP Server Automation 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 Support web site: https://softwaresupport.hp.com/

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 Support web site: https://softwaresupport.hp.com/

Glossary

A

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

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

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 HP Server Automation. 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

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

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

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

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

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

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

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 HP Server Automation. Before you can associate a role with an automation item or organization, however, you must register that role in HP DMA.

S

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

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

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.