

HP Database and Middleware Automation Solution Packs

For Red Hat Enterprise Linux

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Oracle WebLogic Patching User Guide

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Audience

This solution is designed for:

- IT architects and engineers who are responsible for planning, implementing, and maintaining application-serving environments using Oracle® WebLogic Server version 11g or 12c
- Engineers who are implementing—or planning to implement—HP Database and Middleware Automation (HP DMA)

To use this solution, you should be familiar with WebLogic 11g or 12c, its requirements, and its patching process (see links to the [WebLogic Product Documentation](#) on page 34).

Document Map

The following table shows you how to navigate this guide:

Topic	Description
The WebLogic Patching Solution	General information about this solution, including what it contains and what it does.
WebLogic Patching Quick Start	A step-by-step tutorial that shows you how to run the Patch WebLogic Domain workflow.
Workflow Details	Information about the WebLogic 11g and 12c patching workflow 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 current WebLogic 11g and 12c product documentation and additional HP DMA documentation.
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 consist of a sequence of **steps**. Each step performs a very specific task. Steps can be shared among workflows.
- 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 this solution pack, you must first create a deployable copy of that template and then customize that copy for your environment.

- 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.

- 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.

Additional terms are defined in the [Glossary](#) on page 47.

Tip: For more information about the basic structure of a solution pack, including HP DMA screen images, see [How this Solution is Organized](#) on page 37.

Chapter 1

The WebLogic Patching Solution

The WebLogic 11g and 12c patching solution provides tools that you can use to patch your WebLogic 11g or 12c domain in an efficient, automated way.

When performed manually, patching can be error-prone, time consuming, and difficult to scale. Automating patching tasks enables you to achieve greater efficiency and faster change delivery with higher quality and better predictability.

Benefits of using these HP DMA tools rather than patching your WebLogic application server environment manually:

- You can patch your application servers across multiple targets in either a development or production environment.
- You can apply multiple vendor-supplied patches.
- You can reduce server down time.
- You can reduce patching errors thanks to safeguards that HP DMA provides.

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

What this Solution Includes

The WebLogic patching solution includes the following workflows:

Workflow Name	Purpose
Patch WebLogic Domain	This workflow applies one or more patches to the specified WebLogic 11g or 12c domain.
Patch WebLogic 11g Domain	This workflow applies one or more patches specifically to a WebLogic 11g domain. Note: This workflow has been deprecated and will eventually be removed from the solution pack. Please use the Patch WebLogic Domain workflow—it has the same functionality.

Supported Products and Platforms

Operating Systems

The WebLogic 11g and 12c patching workflow is supported on the following operating system platforms:

Red Hat Enterprise Linux 5.x

For specific operating system versions supported by each workflow, see the *HP Database and Middleware Automation version 9.15 Support Matrix* available on the HP Software Product Manuals web site:

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

Product Hardware and Software Requirements

For WebLogic 11g and 12c hardware and software requirements, see the [WebLogic Product Documentation](#) on page 34.

HP DMA Hardware Requirements

For HP DMA hardware requirements, see the *HP Server Automation Quick Reference: SA Installation Requirements* or the *HP Server Automation Standard/Advanced Installation Guide*.

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

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

HP DMA Software Requirements

This solution requires HP Server Automation version 9.13 with DMA 9.13 Hotfix 2 (or later).

Chapter 2

WebLogic Patching Quick Start

This tutorial shows you how to patch WebLogic 11g or 12c using HP Database and Middleware Automation.

The tutorial will guide you through the following basic steps to import the HP DMA Application Server Patching Solution Pack and to run the [Patch WebLogic Domain](#) workflow:

1. [Import the Solution Pack](#) on next page
2. [Create a Deployable Workflow](#) on page 16
3. [Create a Deployment](#) on page 17
4. [Run Your Workflow](#) on page 18
5. [View the Results](#) on page 19

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

See [Parameters for Patch WebLogic Domain](#) on page 33 for descriptions of available input parameters, including default values.

The information presented in this tutorial assumes the following:

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

Note: This tutorial uses a very simple scenario to help you get started quickly. For detailed information about how the WebLogic patching workflow works and how you can customize it for your environment, see the [Workflow Details](#) on page 20.

Import the Solution Pack

Before you can use the workflows in the Application Server Patching solution, you must import that solution into HP DMA.

The following instructions assume that you have purchased the Application Server Patching solution pack.

To import the solution pack:

1. Get the latest Application Server Patching solution pack from HP Software Support. To do this, follow these steps:
 - a. Go to the following web site: <http://www.hp.com/go/hpssoftwaresupport>
 - b. Go to the Self-solve tab, and sign in using your HP Passport credentials (see [Support](#) on page 4 for more information).
 - c. On the Advanced Search page, specify the following search criteria:

Product:	Database and Middleware Automation Solution Packs
Version:	9.15
Operating System:	All Operating Systems
Document Type:	Patches
 - d. Click **Search**.
 - e. In the search results, locate and click the link for the Application Server Patching solution pack, for example: AS Patch 9.15.
 - f. Click the DOWNLOAD PATCH link, and download the ZIP file. For example:
DBMASP_00047
 - g. From that ZIP file, extract the file that contains the solution pack. For example:
ASPatching_v9_15_ALL.zip
2. On the system where you downloaded the solution pack, log in to HP DMA. To do this, follow these steps:
 - a. In a web browser, go to the following URL: `http://<DMAServer>/dma/login`
Here, `<DMAServer>` represents the host name (or IP address) of your HP DMA server.
 - b. Specify your HP DMA Login Name and Password, and click **Login**.
Be sure to log in to the HP DMA server using an account with administrative privileges.
3. On the Solutions > Installed page, click the **Browse** button in the lower right corner. The Choose File dialog opens.

Note: This button and the dialog that subsequently opens may have different names depending on the browser that you are using.
4. Locate and select the solution pack file that you extracted in step 1.g (for example: `ASPatching_v9_15_ALL.zip`) and click **Open**.
5. Click **Import solution pack**.

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

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

Create a Deployable Workflow

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

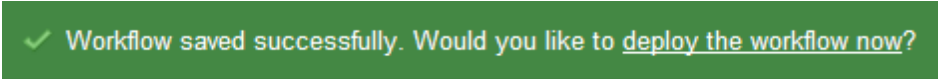


Read-only workflows are not deployable. You can create a deployable workflow by making a copy of a workflow template.¹

To create a deployable copy of the workflow template:

1. In the HP DMA web interface, go to Automation > Workflows.
2. From the list of workflows, select the workflow template that you want to use (for example, Patch WebLogic Domain).
3. Click the **Copy** button in the lower left corner.
4. On the Documentation tab, specify the following:
 - Name – Name that will appear in the list of available workflows
 - Tags – Keywords that you can use later to search for this workflow (optional)
 - Type – Either OS or the specific type of database (the correct type will be selected as a result of the copy)
 - Target level – Server, Instance, or Database (the correct target level will be selected as a result of the copy)
5. On the Roles tab, grant Read access to at least one user or group and Write access to at least one user or group.
6. Click **Save**.

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



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

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

¹For more information about creating and working with workflows, see “Workflows” in the *User Guide: Database and Middleware Automation*. This document is part of the HP Server Automation documentation library, which is available on the HP Software Product Manuals web site: <http://h20230.www2.hp.com/selfsolve/manuals>

Create a Deployment

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

To create a deployment:

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

Note: If you are running a bridged execution workflow, the targets that you select on the Deployment page will be included in the lists of available targets that you can choose from on the Run page.

For more information about bridged execution workflows, see the *User Guide: Database and Middleware Automation*. This document is part of the HP Server Automation documentation library, which is available on the HP Software Product Manuals web site: <http://h20230.www2.hp.com/selfsolve/manuals>

4. On the Parameters tab, specify values for the input parameters listed there.

These are a subset of the required parameters for this workflow. Parameters that are not visible in the deployment will have default values.

Note: See the [Reference Information](#) included in this guide for descriptions of all available input parameters for your workflow, including default values.

5. If you do not want to explicitly enter the values here, you can create a policy that stores the values and then reference that policy in your deployment (see [How to Use a Policy to Specify Parameter Values](#) on page 41).
6. Click **Save**.

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

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

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

Run Your Workflow

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

To run the workflow:

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

2. If you are running a single-target workflow, select the check box for each target where you want to run the workflow.

If you are running a bridged execution workflow, click the **SELECT** link to specify each target. The targets that are available to choose from here are the targets that you selected on the Deployment page.

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



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

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

View the Results

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

- To view the progress of the workflow as the deployment proceeds, click the workflow name in the upper box on the Console page.
- To view the outcome of a specific step, select that step in the left box in the Output area. Informational messages are displayed in the right box, and the values of any output parameters are listed.

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

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

To view step-by-step results, select the row in the table that corresponds to your deployment. The tabs below the table show you information about each step in the workflow. This includes the start and end time for each step, the exit code, and the following information:

- Output tab – any informational messages that were produced
- Errors tab – any errors that were reported
- Header tab – values assigned to any output parameters

Chapter 3

Workflow Details

The WebLogic patching solution pack includes the following workflows. You can run these workflows ad-hoc for custom WebLogic 11g and 12c patching or create reusable deployments to standardize WebLogic 11g and 12c patching in your environment.

Workflow Name	Purpose
Patch WebLogic Domain	This workflow applies one or more patches to the specified WebLogic 11g or 12c domain.
Patch WebLogic 11g Domain	This workflow applies one or more patches specifically to a WebLogic 11g domain. Note: This workflow has been deprecated and will eventually be removed from the solution pack. Please use the Patch WebLogic Domain workflow—it has the same functionality.

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

There are two steps required to customize this solution:

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

For simple patching scenarios, you can use the default values for most parameters. To use this solution's more advanced features, you will need to expose additional parameters.
2. Specify the values for those parameters. You do this when you create a deployment.

Tip: Detailed instructions are provided in the "How to Run this Workflow" topic associated with the 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 12).
- 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 each workflow in this solution are described in the "Parameter" topic associated with the workflow.

Patch WebLogic Domain

This workflow applies one or more patches to the specified WebLogic 11g or 12c domain.

The workflow uses the Oracle Smart Update (`bsu`) utility to apply the patches.

Oracle releases WebLogic 11g and 12c patches approximately every five months. The patches can be applied to minor releases or major releases. You must identify which patches are necessary for your domain.

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

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

Prerequisites for this Workflow

Be sure that the following prerequisites are satisfied before you run the [Patch WebLogic Domain](#) workflow:

- This solution requires HP Server Automation version 9.13 with DMA 9.13 Hotfix 2 (or later).
- You have installed the HP DMA Application Server Patching Solution Pack (see [Import the Solution Pack](#) on page 14 for instructions).
- You have provisioned a WebLogic 11g and 12c domain. You can do this by running workflows found in the HP DMA Application Server Provisioning Solution Pack:
 - Provision Weblogic Software
 - Provision Weblogic Domain and Administration Server
 - Provision Weblogic Managed Servers
 - *Optional:* Provision Weblogic Cluster
 - *Optional:* Increase WebLogic Domain Span
- You have started the following WebLogic 11g and 12c components:
 - Managed Server
 - Administration Server
 - Managed Nodes
- You have an Oracle support contract that enables you to access the appropriate patch ZIP files.
- You have run the WebLogic Discovery workflow and made sure that all metadata is up to date.
- You have verified that the patches to be installed are appropriate for your version of WebLogic 11g or 12c.

For more information about prerequisites for WebLogic 11g and 12c patching, refer to the [WebLogic Product Documentation](#) on page 34.

How this Workflow Works

The following information describes how the [Patch WebLogic Domain](#) workflow works:

Overview

The Patch WebLogic Domain workflow first prepares to apply the patch. It creates the commands that will be used to execute subsequent steps, gathers and validates the necessary input parameters, and creates additional utility parameters.

The workflow then makes sure that all necessary files exist, have valid specifications, and are in the expected locations. It downloads any required files from the software repository and extracts the contents of the archive files. It collects the patch identifiers from the patch files.

The workflow then prepares the environment. It analyzes the WebLogic domain environment using the HP DMA REST API to read the metadata for each target. Just before applying the patches, the workflow shuts down or stops the following servers and processes: the Managed Server (or servers), the Node Manager, and the Administration Server.

Next, the workflow applies the patches. To do this, it utilizes the Oracle Smart Update (`bsu`) command line utility to apply each of the patches to the specified WebLogic domain. On the Console page, the workflow reports whether each patch succeeded or failed. It collects the patch identifiers of the patches that were successfully installed. Then it updates the WebLogic domain environment using the HP DMA REST API with the newly retrieved patch identifier metadata.

The workflow ends cleanly. It restarts the WebLogic 11g and 12c Administration Server and the Node Manager. It starts the WebLogic 11g and 12c Managed Server (or servers).

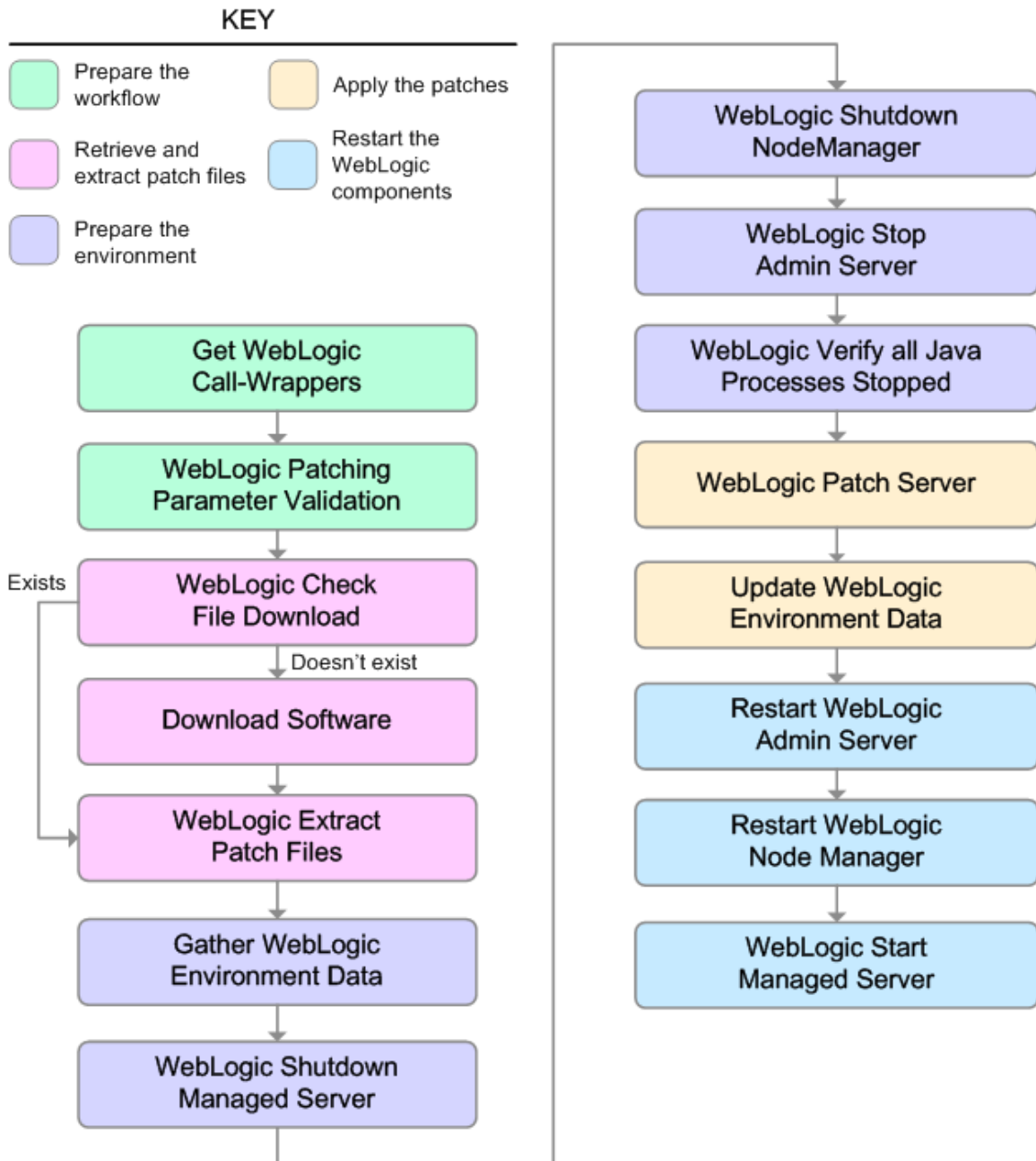
Validation Checks Performed

This workflow performs the following validation checks on the input parameters:

Parameter	Validation Checks
BEA Home WLS Install Home	The fully qualified paths to the directories must exist.
Patch File List	Checks whether the patch ZIP files exist. If they do not exist, they will be downloaded from the software repository. Multiple files must be separated by commas. Any white space is ignored.
Trust SSL Certificates	Must be True or False.
Web Service Password Web Service URL Web Service User WebLogic User Id WebLogic User Password	Must not be null.

Steps Executed

The Patch WebLogic Domain 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 Patch WebLogic Domain

Workflow Step	Description
Get WebLogic Call-Wrappers	This step creates the commands that will be used by the workflow to run subsequent steps. It also sets up some parameters that are used to specify an empty string, a True value, and a False value for input parameters of subsequent steps.
WebLogic Patching Parameter Validation	This step gathers and validates the parameters required to apply patches to a WebLogic 11g or 12c domain.
Weblogic Check File Download	This step checks for the existence of a file on the target server before downloading that file from the software repository. For each file in the list, this step does the following things: <ol style="list-style-type: none"> 1. Determines whether the file is in the expected location on the target machine. 2. If the file is not in the expected location, adds that file to a list of files that need to be downloaded.
Download Software	This step downloads a list of files to a specified location on the target server.
WebLogic Extract Patch Files	This step first checks to ensure that the archive file exists. Then, it extracts the archive to the specified directory. Then, it copies the JAR files and XML files to the following directory: <code>{bea_home}/utils/bsu/cache_dir/{patch_id}</code>
Gather WebLogic Environment Data	This step makes calls via the HP DMA REST API to obtain structural information about the WebLogic 11g or 12c domain.
WebLogic Shutdown Managed Server	This step connects to WebLogic 11g and 12c via the WebLogic Scripting Tool (WLST) and stops all application servers associated with the specified Administration Server.
WebLogic Shutdown NodeManager	This step stops the Node Manager on the target server.
WebLogic Stop Admin Server	This step stops the WebLogic 11g or 12c Administration Server on the specified host.

Steps Used in Patch WebLogic Domain (continued)

Workflow Step	Description
WebLogic Verify All Java Processes Stopped	This step validates that all Java processes on the target server that are associated with the WebLogic 11g or 12c server have been stopped.
WebLogic Patch Server	This step utilizes the Oracle Smart Update (<code>bsu</code>) command line utility to apply the patches to the specified WebLogic 11g or 12c domain.
Update WebLogic Environment Data	This step makes calls via the HP DMA REST API to update the structural information about the WebLogic 11g or 12c domain with the applied patches.
Restart WebLogic Admin Server	This step starts the WebLogic 11g or 12c Administration Server on the specified host.
Restart WebLogic Node Manager	This step starts the WebLogic 11g or 12c Node Manager on the target server.
WebLogic Start Managed Server	This step connects to WebLogic 11g or 12c via the WebLogic Scripting Tool (WLST) and starts all application servers associated with the specified Administration Server.

For parameter descriptions and defaults, see [Parameters for Patch WebLogic Domain](#) on page 33.

How to Run this Workflow

The following instructions show you how to customize and run the [Patch WebLogic Domain](#) workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. Any parameters not explicitly specified in the deployment will have the default values listed in [Parameters for Patch WebLogic Domain](#) on page 33.

Note: Before following this procedure, review the [Prerequisites for this Workflow](#) on page 23, and ensure that all requirements are satisfied.

To use the Patch WebLogic Domain workflow:

1. Create a deployable copy of the workflow (see [Create a Deployable Workflow](#) on page 16).
2. Determine the values that you will specify for the following parameters:

Input Parameters for Get WebLogic Call-Wrappers

Parameter Name	Default Value	Required	Description
BEA Home	no default	required	Fully qualified path to the product installation directory where the WebLogic 11g or 12c server is installed. For example: <code>/opt/oracle/WebLogic</code>
WLS Install Home	no default	required	Fully qualified path to the home directory that contains the WebLogic 11g or 12c installation . For example: <code>/opt/oracle/WebLogic/wlserver_10.3</code>

Input Parameters for WebLogic Patching Parameter Validation

Parameter Name	Default Value	Required	Description
Patch File List	no default	required	Comma-separated list of patches to install. For example: <code>/opt/wlpatch/p14154043_1035_Generic.zip,</code> <code>/opt/wlpatch/p13921016_1035_Generic.zip,</code> <code>/opt/wlpatch/p12818227_1035_Generic.zip</code>
Trust SSL Certificates	True	optional	If True, this step will trust any SSL certificate used to connect to the HP DMA web service.

Input Parameters for WebLogic Patching Parameter Validation (continued)

Parameter Name	Default Value	Required	Description
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.
Web Service URL	no default	required	URL for the HP DMA Discovery web service API. For example: <code>http://<DMAServer>/dma</code>
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebLogic User Id	weblogic	required	The user ID of the WebLogic administrator who will connect via the WebLogic Scripting Tool (WLST) and issue commands.
WebLogic User Password	no default	required	The password for the WebLogic user who will connect via the WebLogic Scripting Tool (WLST) and issue commands.

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 41).

Note: See [Parameters for Patch WebLogic Domain](#) on page 33 for detailed descriptions of all input parameters for this workflow, including default values.

3. Save the changes to the workflow (click **Save** in the lower right corner).
4. Create a new deployment (see [Create a Deployment](#) on page 17 for instructions).
5. On the Parameters tab, specify values for the required parameters listed in step 2. You do not need to specify values for those parameters whose default values are appropriate for your environment.
6. On the Targets tab, specify one or more targets for this deployment.

Note: Specify all the targets associated with your WebLogic 11g or 12c domain. The first target specified must be the Administration Server.

7. Save the deployment (click **Save** in the lower right corner).
8. Run the workflow using this deployment (see [Run Your Workflow](#) on page 18 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.

See the Console page output for error messages that indicate whether problems occurred during the application of the patches. Specifically, look at the WebLogic Patch Server step to see the results of applying each individual patch.

Sample Scenario

It is very straightforward to run the Patch WebLogic Domain workflow. This topic shows you typical parameter values to use.

Input Parameters for Get WebLogic Call-Wrappers

Parameter Name	Example Value	Description
BEA Home	see description	Fully qualified path to the product installation directory where the WebLogic 11g or 12c server is installed. For example: <code>/opt/oracle/WebLogic</code>
WLS Install Home	see description	Fully qualified path to the home directory that contains the WebLogic 11g or 12c installation . For example: <code>/opt/oracle/WebLogic/wlserver_10.3</code>

Input Parameters for WebLogic Patching Parameter Validation

Parameter Name	Example Value	Description
Patch File List	see description	Comma-separated list of patches to install. For example: <code>/opt/wlpatch/p14154043_1035_Generic.zip, /opt/wlpatch/p13921016_1035_Generic.zip, /opt/wlpatch/p12818227_1035_Generic.zip</code>
Trust SSL Certificates	True	If True, this step will trust any SSL certificate used to connect to the HP DMA web service.
Web Service Password	sapassword	Password for the HP DMA Discovery web service API.
Web Service URL	see description	URL for the HP DMA Discovery web service API. For example: <code>http://<DMAServer>/dma</code>
Web Service User	SAadmin	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebLogic User Id	weblogic	The user ID of the WebLogic administrator who will connect via the WebLogic Scripting Tool (WLST) and issue commands.
WebLogic User Password	wlpassword	The password for the WebLogic user who will connect via the WebLogic Scripting Tool (WLST) and issue commands.

Parameters for Patch WebLogic Domain

The following tables describe the required and optional input parameters for this workflow.

Parameters Defined in this Step: Get WebLogic Call-Wrappers

Parameter Name	Default Value	Required	Description
BEA Home	no default	required	Fully qualified path to the product installation directory where the WebLogic 11g or 12c server is installed. For example: <code>/opt/oracle/WebLogic</code>
WLS Install Home	no default	required	Fully qualified path to the home directory that contains the WebLogic 11g or 12c installation . For example: <code>/opt/oracle/WebLogic/wlserver_10.3</code>

Additional Parameters Defined in this Step: WebLogic Patching Parameter Validation

Parameter Name	Default Value	Required	Description
Patch File List	no default	required	Comma-separated list of patches to install. For example: <code>/opt/wlpatch/p14154043_1035_Generic.zip,</code> <code>/opt/wlpatch/p13921016_1035_Generic.zip,</code> <code>/opt/wlpatch/p12818227_1035_Generic.zip</code>
Trust SSL Certificates	True	optional	If True, this step will trust any SSL certificate used to connect to the HP DMA web service.
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.
Web Service URL	no default	required	URL for the HP DMA Discovery web service API. For example: <code>http://<DMAServer>/dma</code>
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebLogic User Id	weblogic	required	The user ID of the WebLogic administrator who will connect via the WebLogic Scripting Tool (WLST) and issue commands.
WebLogic User Password	no default	required	The password for the WebLogic user who will connect via the WebLogic Scripting Tool (WLST) and issue commands.

Chapter 4

Reference Information

This chapter contains the following information:

Topic	Description
WebLogic Product Documentation	This topic contains links to general information about WebLogic 11g and 12c:
HP DMA Documentation	Links to additional HP DMA documentation

WebLogic Product Documentation

The product documentation for Oracle WebLogic versions 11g and 12c is located here:

<http://www.oracle.com/us/products/middleware/application-server/index.htm>

http://docs.oracle.com/cd/E23943_01/wls.htm

For the current platform matrix for WebLogic 11g and 12c, see:

<http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html>

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

HP DMA Documentation

For information about using the HP DMA web interface, see the *User Guide: Database and Middleware Automation* version 9.13 (or later).

This document is part of the HP Server Automation documentation library, which is available on the HP Software Product Manuals web site:

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

Chapter 5

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 this Solution is Organized](#) on next page

[How to Expose Additional Workflow Parameters](#) on page 40

[How to Use a Policy to Specify Parameter Values](#) on page 41

[How to Import a File into the Software Repository](#) on page 44

How this Solution is Organized

In HP DMA, a workflow executes a process —such as patching a WebLogic domain.

This solution contains the following WebLogic patching workflow templates:

Workflow Name	Purpose
Patch WebLogic Domain	This workflow applies one or more patches to the specified WebLogic 11g or 12c domain.
Patch WebLogic 11g Domain	This workflow applies one or more patches specifically to a WebLogic 11g domain. Note: This workflow has been deprecated and will eventually be removed from the solution pack. Please use the Patch WebLogic Domain workflow—it has the same functionality.

What's Inside

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

The screenshot shows the HP Database & Middleware Automation web interface. The top navigation bar includes 'Home', 'Automation', 'Reports', 'Environment', 'Solutions', and 'Setup'. The user is logged in as 'admin' on the server 'dma1.mycompany.com'. The main content area is titled 'Patch WebLogic Domain' and has tabs for 'Documentation', 'Workflow', 'Deployments', and 'Roles'. The 'Documentation' tab is active, displaying the following information:

- Name:** Patch WebLogic Domain
- Tags:**
- Type:** OS
- Target level:** Server

The 'Documentation' section contains the following details:

- Purpose:** This workflow applies one or more patches to a given WebLogic 11g or 12c Domain.
- Platforms:** This workflow applies one or more patches to a given WebLogic 11g or 12c Domain on Red Hat Enterprise Linux or Solaris operating platform. For a list of the specific OS versions supported, refer to the *HP Database and Middleware Automation Support Matrix* (see [Additional Documentation](#) below).
- Results verification:** The Console will indicate whether the workflow completed without errors. The workflow results will indicate whether some or all of the patches were applied successfully. Be sure to also perform the following steps:
 - Look at the console output for errors messages that indicate if one or all of the patches was had problems being applied. Specifically look at the WebLogic Patch Server for errors related to applying a specific patch.
- Dependencies:**
 - Make sure that WebLogic Discovery has been run and that metadata is up to date before running the WebLogic patching workflow.
 - Make sure that the patches you are trying to apply are intended to be installed on the correct version of WebLogic 11g.

At the bottom of the page, there are links for 'Copy', 'EXPORT', and 'EXTRACT POLICY', along with a 'HELP PDF' link. The footer contains the copyright information: © 2006–2012 Hewlett-Packard Development Company, L.P. Web Server: 9.13.2 Repository: 9.10.0

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

The screenshot shows the Oracle Database & Middleware Automation interface. The main title is "WebLogic Patching Parameter Validation". Below the title are tabs for "General", "Action", "Parameters", "History", "Workflows", "Solutions", and "Roles". The "General" tab is selected, showing "Properties" on the left and "Documentation" on the right. The "Properties" section includes: Name: WebLogic Patching Parameter Validation, Tags: WebLogic, Type: OS, Category: Script, and Targetable: . The "Documentation" section includes: Description: Prepares the parameters needed to apply patches to a WebLogic Domain, Return Code: 0 = Step ran successfully, 1 = Step failed.

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 Workflow tab for each workflow:

The screenshot shows the Oracle Database & Middleware Automation interface. The main title is "WebLogic Patching Parameter Validation / BEA Home". Below the title are tabs for "General", "Action", "Parameters", "History", "Workflows", "Solutions", and "Roles". The "Workflows" tab is selected, showing a list of workflows. The first workflow is "WebLogic Patching Parameter Validation" with a status of "0" and a "Click here" link. Below the workflow list, the parameters for the selected workflow are displayed: BEA Home: Get WebLogic Call-Wrappers.BEA Home, Patch File List: Not selected, Trust SSL Certificates: Not selected, Web Service Password: Not selected, Web Service URL: Not selected, and Web Service User: Not selected. A red arrow points to the "Click here" link.

To see the parameter descriptions here

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

The screenshot shows the Oracle Database & Middleware Automation interface. The main title is "WebLogic Patching Parameter Validation". Below the title are tabs for "General", "Action", "Parameters", "History", "Workflows", "Solutions", and "Roles". The "Parameters" tab is selected, showing "Input parameters" in a table format. The table has columns for Name, Value, and Description. The parameters are: BEA Home, Patch File List, Trust SSL Certificates (True), Web Service Password, Web Service URL, Web Service User, WebLogic User Id (weblogic), and WebLogic User Password. Each parameter has a description explaining its required or optional nature and purpose.

Name	Value	Description
BEA Home		Required: Fully qualified path to the product installat
Patch File List		Required: Comma separated list of patches to instal
Trust SSL Certificates	True	Optional: If "True", this step will trust any SSL used
Web Service Password		Required: Password for the discovery web service API
Web Service URL		Required: URL for the discovery web service API.
Web Service User		Required: User capable of modifying the managed en
WebLogic User Id	weblogic	Required: The ID of the WebLogic administrator to c
WebLogic User Password		Required: The password of the WebLogic User Acc

Parameter descriptions are also displayed on the Parameters tab in the deployment (organized by step):

hp Database & Middleware Automation

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

Deploy Patch WebLogic Domain

Targets Parameters Roles

Get WebLogic Call-Wrappers

BEA Home: Text

Required: Fully qualified path to the product installation directory in which to install WebLogic Server. For instance /opt/oracle/WebLogic.

WLS Install Home: Text

Required: Fully qualified path to the Middleware Home directory that will contain this installation. For instance /opt/oracle/WebLogic/wlserver_10.3

WebLogic Patching Parameter Validation

Patch File List: Text

Required: Comma separated list of patches to install. Example /opt/wlpatch/p14154043_1035_Generic.zip

Trust SSL Certificates: Text

Optional: If "True", this step will trust any SSL used to connect to the DMA Web Service.

Web Service Password: Text

Required: Password for the discovery web service API.

Web Service URL: Text

Required: URL for the discovery web service API.

Web Service User: Text

Required: User capable of modifying the managed environment through the discovery web service API.

WebLogic User Id: Text

Required: The ID of the WebLogic administrator to connect via WLST and issue commands.

WebLogic User Password: Text

Required: The password of the WebLogic User Account to connect via WLST and issue commands.

or

© 2006–2012 Hewlett-Packard Development Company, L.P.
Web Server: 9.13.2 Repository: 9.10.0

All parameters used by the workflow in this solution pack are fully described in [Parameters for Patch WebLogic Domain](#) on page 33.

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 (see [Create a Deployable Workflow](#) on page 16).

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 *User Guide: Database and Middleware Automation*. This guide is included in the HP Server Automation documentation library.

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 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 *User Guide: Database and Middleware Automation* for details. This guide is included in the HP Server Automation documentation library (SA version 9.13 and later).
2. On the Parameters tab, perform the following steps for each parameter whose value you want to provide by referencing a policy attribute:
 - a. In the drop-down menu for that parameter, select **Policy Attribute**.
 - b. In the text box for that parameter, type any character. A drop-down list of policy attributes appears. For example:

Admin Pwd: Policy Attribute ▼

- MS SQL: Provisioning.Virtual Server Name
- MyParameterValues.MyAdminPassword
- MyParameterValues.MyAdminUser
- MyParameterValues.MyDBUser
- MyParameterValues.MyDBUserPassword
- Oracle Compliance.Oracle Mandatory Checks
- Oracle Compliance.Oracle Recommended Checks
- Oracle Provisioning.Additional Groups
- Oracle Provisioning.Backup Directory
- Oracle Provisioning.Base
- Oracle Provisioning.Binaries Host
- Oracle Provisioning.Bit Mode

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

Admin Pwd: Policy Attribute ▼

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

How to Import a File into the Software Repository

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

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

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

To import a file into the HP SA Software Library:

1. Launch the HP SA Client from the Windows Start Menu.

By default, the HP SA Client is located in Start → All Programs → HP Software → HP Server Automation Client

If the HP SA Client is not installed locally, follow the instructions under “Download and Install the HP SA Client Launcher” in the *HP Server Automation Single-Host Installation Guide*.
2. In the navigation pane in the HP SA Client, select Library → By Folder.
3. Select (or create) the folder where you want to store the file.
4. From the Actions menu, select **Import Software**.
5. In the Import Software dialog, click the **Browse** button to the right of the File(s) box.
6. In the Open dialog:
 - a. Select the file (or files) to import.
 - b. Specify the character encoding to be used from the Encoding drop-down list. The default encoding is English ASCII.
 - c. Click **Open**. The Import Software dialog reappears.
7. From the Type drop-down list, select **Unknown**.
8. If the folder where you want to store the files does not appear in the Folder box, follow these steps:
 - a. Click the **Browse** button to the right of the Folder box.
 - b. In the Select Folder window, select the import destination location, and click **Select**. The Import Software dialog reappears.
9. From the Platform drop-down list, select all the operating systems listed.
10. Click **Import**.

If one of the files that you are importing already exists in the folder that you specified, you will be prompted regarding how to handle the duplicate file. Press F1 to view online help that explains the options.
11. Click **Close** after the import is completed.

Chapter 6

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 Server Automation](#) below

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 (Read or Write) permissions for organizations, workflows, steps, policies, and deployments. Deployments have an extra permission: Execute. Users are assigned to roles, and they gain access to these items according to the permissions defined for their roles.

Roles are assigned by your HP Server Automation (SA) administrator using the SA console. See the HP Server Automation *Administration Guide* and the *User Guide: Database and Middleware Automation* for more information. Both guides are included in the HP Server Automation documentation library

Make sure that the users in your environment are assigned roles that grant them the permissions they need to accomplish their tasks. For example:

- To view a workflow, your role must have Read permission for that workflow.
- To view a deployment, your role must have Read permission for that deployment.
- To edit a workflow, your role must have Write permission for that workflow.
- To run a deployment, your role must have Execute permission for that deployment.

Permissions determine what features and functions are available and active in the HP DMA UI. For a detailed breakdown, see the *User Guide: Database and Middleware Automation*.

Discovery in HP Server Automation

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

In HP Server Automation, you must explicitly initiate the process of discovery—it is not automatic. Refer to the *User Guide: Database and Middleware Automation* for instructions. This guide is included in the SA documentation library.

Glossary

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 Server Automation version 9.11 (and later).

C

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.

D

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.

destination

In a database refresh scenario, the contents of a database dump file are loaded into the DESTINATION database.

DESTINATION

In a database refresh scenario, the contents of a database dump file are loaded into the DESTINATION database.

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 its 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

Oracle Data Pump

Oracle Data Pump is a utility that enables you to move data or metadata from one database to another. You can use Data Pump to move a complete database or a subset of a database.

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.

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.

Recovery Manager (RMAN)

Oracle Recovery Manager (RMAN) is a backup and recovery tool included in Oracle Database Enterprise Edition (and related products). RMAN enables you to efficiently backup and restore data files, control files, server parameter files, and archived redo log files. It provides block-

level corruption detection during both the backup and restore phases. It is optimized for performance and space consumption.

S

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.

source

In a database refresh scenario, the contents of the SOURCE database are extracted and stored in a file (or multiple files).

SOURCE

In a database refresh scenario, the contents of the SOURCE database are extracted and stored in a file (or multiple files).

source database

In the context of MS SQL database refresh, the "source database" is the database from which the backup file is created.

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.

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.