# HP Database and Middleware Automation

For Linux, Solaris, AIX, and Windows® Software Version: 10.01

## WebSphere Configuration Management User Guide

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Software Release Date: April 2013



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## Contents

Contents	5
Audience	7
Document Map	8
Important Terms	9
The WebSphere Configuration Management Solution	
What this Solution Includes	11
Supported Products and Platforms	12
Prerequisites	13
WebSphere Configuration Management Quick Start	14
Import the Solution Pack	15
Create a Deployable Workflow	
Create a Deployment	19
Run Your Workflow	21
View the Results	
Workflow Details	24
Configure WebSphere Cluster and Cluster Members	
Prerequisites for this Workflow	
How this Workflow Works	
How to Run this Workflow	
Sample Scenario	
Parameters for Configure WebSphere Cluster and Cluster Members	
Create and Configure WebSphere Data Sources	
Prerequisites for this Workflow	
How this Workflow Works	
How to Run this Workflow	54
Sample Scenario	58
Parameters for Create and Configure WebSphere Data Sources	66

Create and Configure WebSphere Web Server Definitions	69
Prerequisites for this Workflow	
How this Workflow Works	71
How to Run this Workflow	75
Sample Scenario	78
Parameters for Create and Configure WebSphere Web Server Definitions	82
Reference Information	84
WebSphere Product Documentation	84
Database Product Documentation	84
Oracle Database Product Documentation	85
Microsoft SQL Server Documentation	
HP DMA Documentation	85
Tips and Best Practices	86
How a Solution Pack is Organized	87
How to Expose Additional Workflow Parameters	91
How to Use a Policy to Specify Parameter Values	92
Create a Policy	92
Extract a Policy	93
Reference the Policy in the Deployment	93
How to Import a File into the Software Repository	95
Troubleshooting	96
Target Type	96
User Permissions and Related Requirements	96
Discovery in HP DMA	97
Glossary	98

## Audience

This solution is designed for:

- IT architects and engineers who are responsible for planning, implementing, and maintaining application server environments using IBM WebSphere Application Server Network Deployment (WebSphere).
- Engineers who are implementing—or planning to implement—HP Database and Middleware Automation (HP DMA)

To use this solution, you should be familiar with WebSphere and its requirements (see links to the WebSphere Product Documentation on page 84).

## **Document Map**

The following table shows you how to navigate this guide:

Торіс	Description
The WebSphere Configuration Management Solution	General information about this solution, including what it contains and what it does.
WebSphere Configuration Management Quick Start	A step-by-step tutorial that shows you how to run the workflows.
Workflow Details	Information about the WebSphere 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 current WebSphere 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.
- 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.

 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 98.

## Chapter 1

## The WebSphere Configuration Management Solution

The WebSphere configuration management solution provides tools that you can use to manage the configuration of your WebSphere Application Server. It makes your provisioned WebSphere system useable.

These tools enable you to:

WebSphere Feature	Functionality			
WebSphere clusters and	Create WebSphere clusters			
cluster members	Add cluster members to the newly-created cluster			
	Create initial and maximum heap sizes for the newly- created cluster member			
	Create logging attributes based on time, size, and location for each cluster member			
WebSphere data sources	Create data sources for Oracle or SQL Server databases			
	<ul> <li>Customize the Java Database Connectivity (JDBC) provider</li> </ul>			
	Customize the Java 2 Connector (J2C) alias			
	Configure the Java Name Directory Interface (JNDI) name			
	Configure minimum and maximum pool connections			
WebSphere web server	Create an unmanaged node where web servers can run			
definitions	Define a web server under the unmanaged node			

By consistently using the tools provided in this solution, you can quickly, efficiently, and accurately configure your WebSphere Application Server environment. You maintain flexibility over the WebSphere environment by configuring environment-specific information through the input parameters.

## What this Solution Includes

The Application Server Configuration Management solution pack contains the following WebSphere configuration management workflows:

Workflow Name	Purpose
Configure WebSphere Cluster and Cluster Members	The purpose of this workflow is to create a new WebSphere Application Server cluster, create cluster members, and configure each cluster member.
Create and Configure WebSphere Data Sources	The purpose of this workflow is to create and configure a new WebSphere Application Server data source within the application server scope. This workflow creates the JDBC (Java Database Connectivity) provider, the J2C (Java 2 Connector) alias, and a data source associated with the JDBC provider.
Create and Configure WebSphere Web Server Definitions	The purpose of this workflow is to configure web server objects in a given WebSphere Application Server cell. These web server objects can be used later when deploying applications into a given application server or cluster. They also give limited ability to administer the web server instances.

## **Supported Products and Platforms**

The WebSphere configuration management workflows are supported on Red Hat Enterprise Linux, Solaris, and Windows platforms.

#### Product Platform

This solution pack is available for WebSphere 7 or WebSphere 8.

#### **Operating Systems**

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

#### http://h20230.www2.hp.com/selfsolve/manuals

#### Hardware Requirements

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

#### **HP Software Requirements**

This solution requires HP DMA version 10.01 (or later).

## Prerequisites

The following prerequisites must be satisfied before you can run the WebSphere configuration management workflows in this solution pack:

- You must have a working WebSphere Network Deployment cell version 7 or 8, with the Deployment Manager available for communication.
- You must run the Discover WebSphere workflow before you run the configuration management workflows. The Discover WebSphere workflow audits the server's physical environment for WebSphere cells, clusters, and application servers and stores the configuration information in the HP DMA environment.

Note: Be sure to review the additional prerequisites for each workflow.

## Chapter 2

## WebSphere Configuration Management Quick Start

This tutorial shows you how to run one of the workflows, Configure WebSphere Cluster and Cluster Members, in the Application Server Configuration Management Solution Pack. You can use this tutorial as an example for running the other configuration management workflows.

The tutorial will guide you through the following basic steps to import the Application Server Configuration Management Solution Pack and then to run the workflow:

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

You can follow the same steps to run the other configuration management workflows.

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.

**Note:** See the "Parameter" topic associated with each workflow for descriptions of all available input parameters for your workflow, including default values.

The information presented in this tutorial assumes the following:

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

**Note:** This tutorial is included in every HP DMA solution pack user guide. To skip directly to information about the Application Server Configuration Management workflows, see the Workflow Details.

## Import the Solution Pack

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

The HP DMA 10.01 solution packs are included on the HP DMA 10.01 installation media. They are located in the following folders:

- The DMA\_10.01\_Server\_and\_Client folder contains the Discovery solution pack.
- The DMA\_10.01\_Database\_Solution\_Packs folder contains all of the database solution packs (provisioning, advanced provisioning, patching, advanced patching, compliance, refresh, and release management).
- The DMA\_10.01\_Middleware\_Solution\_Packs folder contains all of the application server solution packs (provisioning, patching, configuration management, and release management).

**Note:** The Discovery solution pack is not automatically installed with HP DMA. You must import it if you want to use the discovery workflows.

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

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

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

Product:	Database and Middleware Automation
Version:	All Versions
Operating System:	All Operating Systems
Document Type:	Patches

#### 4. Click Search.

- 5. If there is a more recent version of the Application Server Configuration Management solution pack that you want to import, do the following:
  - a. Click the link for the solution pack that you want to import (for example: AS ConfMgt 10.0x).
  - b. Click the **DOWNLOAD PATCH** link, and download the ZIP file that contains the patch.
  - c. From the patch ZIP file, extract the ZIP file that contains the solution pack (for example: ASConfigManagement.zip).

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

#### To import the solution pack:

1. On the system where you downloaded the solution pack, open a web browser, and go to the following address:

https://<HP DMAserver>:8443/dma/login

- 2. Log in to the HP DMA server using an account with Administrator capability.
- 3. On the Solutions > Installed tab, click the **Browse** button in the lower right corner. The Choose File dialog opens.

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

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

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

Database & Middleware Automation		
Home Automation Reports Environment Soluti	ions Setup	
Installed History		
Installed Solutions		۹
SOLUTION PACKS	DETAILS	
	Name:	HP DMA Application Server Configuration Management Solution Pack
HP DMA Application Server Configuration Management Solution Pack Variation 40.01	Version:	10.01
HP DMA Application Server Patching Solution	Targets:	32
Pack Version 10.01	Installed:	06 Mar, 2013
HP DMA Application Server Provisioning Solution Pack Version 10.01	Description:	Configuration Management workflows for WebSphere Application Server 7 and 8. Includes clustering, data source and web server definition configuration workflows. Build 33756
HP DMA Discovery Solution Pack Version 10.01		
		Browse Import solution pack

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

🕼 Database & Middleware Auto	mation	
Home Automation Reports Env	ironment <b>Soluțions</b> Setup	
Installed History		
HP DMA Application Serve	r Configuration Management Solution Pack	
General Policies Work	flows Steps Reports	
Configure WebSphere Cluster and Cluster Members	Configure WebSphere Cluster Parameters	1
强 Create and Configure WebSphere	Get WSAdmin Call Wrapper	2
Data Sources	Failure	3
	<ul> <li>JVM Parameters for Configure WebSphere Cluster Members</li> </ul>	4
	Logging Parameters for Configure WebSphere Cluster Members	5
	Create WebSphere Cluster and Cluster Members	6
	WebSphere Start Cluster	7
	Run Discover WebSphere	8
	Success	9

## **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:

ß

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

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

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

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

✓ Workflow saved successfully. Would you like to deploy the workflow now?

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

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

## **Create a Deployment**

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

#### To create a deployment:

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

Database	& Middleware	Automation	1			
Home Autor	ation Reports	Environme	nt Solutions	Setup		
Workflows S	teps Functions	Policies	Deployments	Run	Console	e History
ConfigureV	/ebSphere( Parameters	Clusteran Roles	dClusterMe	embei	rs_Setu	etupClusterAndMembers
Nam	e: ConfigureWeb	SphereCluste	randClus			
Workflov	v: My Configure 1	WebSphere C	luster and Clus	ter Mem	bers 👻 <u>v</u>	VIEW WORKFLOW
Schedul	e: None		•			•
Targets	Serve	ər				
AVAILABLE						SELECTED
		<b>0</b> M				WASSRV5.MYCOMPANY.COM REMOVE ALL
WASSRV4.W		UM			ADD ALL	
Up base_doma		<b>-</b>				
WASSRV5.M	YCOMPANY.CI	JM			ADD ALL	
		nce			ADD	
WASSRV6.M	YCOMPANY.CU	JM			ADD ALL	
U base_doma	in				ADD	
WASSRV7.M	YCOMPANY.C	MC			ADD ALL	
DevCell					ADD	<u>400</u>
WASSRV8.M	YCOMPANY.C	MC			ADD ALL	
1 DP1					ADD	
QATestCell					ADD	
	RUN					Copy Save or CANCEL

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

🕼 Datab	oase & Mi	ddleware /	Automation	n							
Home A	Automation	Reports	Environme	ent Solutions	Setu	p					
Workflows	Steps	Functions	Policies	Deployments	Run	Console	History				
Configu	reWebS	SphereC	lusteran	dClusterM	embe	ers_Set	upCluste	erAndMem	bers		
Targat	to Do	ramatara	Delee								
Targe		ameters	Rules								
Configure	WebSphe	ere Cluster	Paramete	rs							
		Cluste	r Member N	lame: SuperMe	mber				Text	•	
				Required: The	base clu	ster member	name that will	be used for			
				each cluster m	nember/a	pplication set	rver. A suffix	vill automatically			
				be appended t	o this ba: a initial of	se name that	fives will be (	e node and			
				node, 001b for	r second	node, and si	o on. If a vertic	al cluster			
				member is cre	ated, the	suffixes will	be 002a for th	e first node,			
				002b for the s	econd no	ode, and so o	on. It cannot co	ntain any of the			
				following char	acters / \	*,:;=+?	<>&%'"[]>	#\$^{}.			
			Cluster N	lame: WAS8					Text	•	
				Required: This	is the na	me given to	the logical grou	ping of cluster			
				members. This	name ha	as to be uniq	ue to the cell. I	cannot contain			
				any of the folk	owing ch	aracters / \ *	,:;=+? <>	& % ' " [ ] > # \$			
				- 1 <i>1</i> -							
			Enable Sec	curity: true					Text	•	
				Required: India	ates wh	ether securit	ty will be enabl	ed. Valid values			
				are True or Fa	lse. If Tru	le then Webs	Sphere Admin	Password and			
				WebSphere A	dmin Use	er must have	values.				
		Number C	Cluster Mem	nbers: 1					Text	•	
				Required: The	number (	of cluster me	mbers/applicat	ion servers that			
				will be created	I on each	node.					
		Web S	ervice Pass	word:					Text	•	
				Required: Pass	sword fo	or the HP DMA	A Discovery w	eb service API.			

**Note:** These are a subset of the required parameters for this workflow. Parameters that are not visible in the deployment will have default values. See Parameters for Configure WebSphere Cluster and Cluster Members on page 44 for descriptions of all available input parameters for this workflow, including default values.

5. Click Save.

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



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

## **Run Your Workflow**

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

#### To run the workflow:

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

Home Automation Reports Environment Solut	tions Setup	
Workflows Steps Functions Policies Deployment	ents <u>Run</u> Console History	
Run Workflow	Filter	0
Add WebSphere 7 Node To Existing Cell	📥 🐻 ConfigureWebSphereClusterandClusterMembers_SetupClusterAndMembers	
<ul> <li>My Configure WebSphere Cluster and Cluster Memb</li> <li>Create StandAlone From Existing WebSphere 7 Ins</li> <li>Discovery</li> <li>Patch WebSphere 7 Network Deployment Cell</li> <li>Patch WebSphere 7 StandAlone Profile</li> <li>Provision IBM HTTP Server 7 and Pluq-in</li> </ul>	bers	4
My Configure WebSphere Cluster and Cluster M ConfigureWebSphereClusterandClusterMembers_	Members: SetupClusterAndMembers Configure WebSphere Cluster Parameters	
WASSBUS MYCOMPANY COM	Parameters	1

	Web Service URL: https://dma.mycompany.com:8443/dma	
	Web Service User: admin	
	WebSphere Admin Password: ***	
	WebSphere Admin Username: wasadmin	
	Get WSAdmin Call Wrapper	2
	No parameters.	
	Failure	3
	No parameters.	
SELECT ALL		
	Run wor	kflow

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

Workflow started successfully. For status, see the <u>console</u> or <u>history</u>.

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.

<li>Data</li>	Database & Middleware Automation											
Home	Automation	Reports	Environmen	nt Solutions	Setup							
Workflow	s Steps	Functions	Policies	Deployments	Run	Console	History					
Consol	e									Filter		0
Status	Workflo	w				Start	ed	Run by	Server	I	Instance	Database
RUNNING	My Configure WebSphere Cluster and Cluster Members				s 24 Ja	an 11:21	admin	srv.mycompany.com		DevCell		

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

Output

<ul> <li>Configure WebSphere Cluster Parameters</li> <li>Finished (2013-01-24 11:22:33)</li> </ul>	WASX7209I: Connected to process "dmgr" on node DevManager using SOAP connector; The type of proces is: DeploymentManager In main method	is *
Get WSAdmin Call Wrapper Finished (2013-01-24 11:22:47)	cluster name WAS8 cluster member name SuperMember pumber cluster members 1	
JVM Parameters for Configure WebSphere Cluster Members Finished (2013-01-24 11:22:56)	<pre>len of maplist 26 item QANode1 maplist[i] _01_a item QANode2 maplist[i] _01_b</pre>	
<ul> <li>Logging Parameters for Configure WebSphere Cluster Members Finished (2013-01-24 11:23:05)</li> </ul>	_01_a _01_b cell is DevCell cell is DevCell node is OANode1	
Create WebSphere Cluster and Cluster Members Running (2013-01-24 11:24:03)	<pre>format result type=Server,cell=DevCell,node=QANode1,processType=NodeAgent,* state of QANode1 STARTED cell is DevCell node is QANode2 format result type=Server,cell=DevCell,node=QANode2,processType=NodeAgent,* state of QANode2 STARTED</pre>	
	<pre>item QANode1 value _01_a item QANode2 value _01_b managed nodes = ['QANode1', 'QANode2'], all unmanaged = at top of create cluster, full cluster name WAS8Cluster </pre>	

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

🕼 Da	Database & Middleware Automation												
Home	Aut	tomation	Reports	Environm	ent Solutions	Setup	)						
Workflo	WS	Steps	Functions	Policies	Deployments	Run	Console	History					
Conse	ole										Filter		
Status		Workflo	w				Star	ted	Run by	Server		Instance	Database
SUCCE	SS	Discov	er WebSphe	re			24 J	an 11:25	admin	srv.mycompany.com			
SUCCE	SS	My Cor	nfigure Webs	Sphere Clu	ster and Cluster	Membe	ers 24 J	an 11:21	admin	srv.mycompany.com		DevCell	

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.

Ø Databas	se & Mida	lleware A	utomatior	า									
Home Aut	omation	Reports	Environme	ent Solutions	Setup								
Workflows	Steps F	unctions	Policies	Deployments	Run	Console	History						
History										Filter		Last 8 hours 💌	0
Status	Workflow									Started	Run by	Server	•
SUCCESS	Discover V Discover V	VebSphere VebSphere	•							24 Jan 11:25	admin	srv.mycompany.co	om
SUCCESS	My Config Configure	<mark>ure WebSp</mark> NebSphere	ohere Clust Clusterand	ter and Cluster ClusterMember	Members s_Setup(	s ClusterAndM	lembers			24 Jan 11:21	admin	srv.mycompany.co	om =
•	n	M.LO.L								04.1			+
Step Ou [INFO]: R [DEBUG]: [DEBUG]: [DEBUG]: [DEBUG]: [INFO]: A	tunning te Test resu Test resu tunning te Test resu Test resu test resu	Step Errors st: valic lt: True lt_msg: ' st: valic lt: True lt_msg: ' sters have	date_non_ date_non_ date_non_ e been va	<pre>&gt; Header C negative_int negative_int lidated succe</pre>	connecto ssfully	r Output	Conne	ctor Errors					•
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The tabs below the table show you information about each step in the workflow. This includes the start and end time for each step, the exit code, and the following information:

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

## **Workflow Details**

The Application Server Configuration Management solution pack contains the following WebSphere configuration management workflows. You can run these workflows ad-hoc for custom WebSphere installations or create reusable deployments to standardize WebSphere installations in your environment.

Workflow Name	Purpose
Configure WebSphere Cluster and Cluster Members	The purpose of this workflow is to create a new WebSphere Application Server cluster, create cluster members, and configure each cluster member.
Create and Configure WebSphere Data Sources	The purpose of this workflow is to create and configure a new WebSphere Application Server data source within the application server scope. This workflow creates the JDBC (Java Database Connectivity) provider, the J2C (Java 2 Connector) alias, and a data source associated with the JDBC provider.
Create and Configure WebSphere Web Server Definitions	The purpose of this workflow is to configure web server objects in a given WebSphere Application Server cell. These web server objects can be used later when deploying applications into a given application server or cluster. They also give limited ability to administer the web server instances.

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 configuration 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 Use this Workflow" topic associated with 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 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 the workflows in this solution are described in the "Parameters" topic associated with each workflow.

## **Configure WebSphere Cluster and Cluster Members**

The purpose of this workflow is to create a new WebSphere Application Server cluster, create cluster members, and configure each cluster member.

The cluster members can be both vertically and horizontally clustered depending on the number of cluster members specified and the number of nodes that are within a cell.

The cluster members are configured consistently based on a set of configurable parameters. If you do not specify parameters then the default WebSphere values are used.

The following chart shows the customizable parameters for WebSphere clusters and cluster members:

Cluster/cluster member attribute	Configurable parameter
Cluster definition	Cluster Name Cluster Member Name Number Cluster Members
Java Virtual Machine (JVM)	Initial Heap Size Maximum Heap Size
Logging	Logfile Location Rollover Type (SIZE, TIME, NONE, or BOTH) Base Hour Rollover Period Rollover Size Maximum Rollback Files

### Architecture Diagram

The following is an example of a WebSphere Application Server environment:



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

Торіс	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 Configure WebSphere Cluster and Cluster Members workflow.

#### Product Platform

This workflow is available for WebSphere 7 or WebSphere 8.

#### Dependencies

This workflow has the following dependencies:

- You must have a working WebSphere Network Deployment cell version 7 or 8, with the Deployment Manager available for communication.
- You must run the Discover WebSphere workflow before you run the configuration management workflows. The Discover WebSphere workflow audits the server's physical environment for WebSphere cells, clusters, and application servers and stores the configuration information in the HP DMA environment.

For more information about prerequisites for WebSphere, refer to the WebSphere Product Documentation on page 84.

### How this Workflow Works

The following information describes how the Configure WebSphere Cluster and Cluster Members workflow works:

#### Overview

This workflow does the following things in the order shown:

- 1. Before creating the cluster and cluster members, the workflow prepares and validates all parameters and creates the call wrapper that will be used to execute commands within a WebSphere environment.
- 2. Next the workflow uses the call wrapper to call wsadmin to create the cluster and cluster members and to configure the cluster members.
- 3. Then the workflow starts the cluster to verify that it starts correctly and calls the component workflow, Discover WebSphere, to look for WebSphere configurations—including clusters and cluster members attributes.

### Validation Checks Performed

The workflow then performs the following checks on the input parameters:

WebSphere Admin Username	Cannot contain the following characters / \ * , : ; = + ?   < > & % ' "[]#\$^{} Cannot begin with a dash (-), period (.), or space ()
WebSphere Admin Password	Cannot begin with a dash (-) Cannot contain a space ( )
Cluster Name Cluster Member Name	Must be specified Cannot contain the following characters / \ * , : ; = + ?   < > & % ' "[]#\$^{} or space Cannot begin with a period (.)
Enable Security	Must be true or false
If Enable Security is true	WebSphere Admin Username must be specified WebSphere Admin Password must be specified
Number Cluster Members	If specified, must be an integer
Web Service URL Web Service User Web Service Password Cluster Name Cluster Member Name	Must be specified
WebSphere Home WebSphere Dmgr Port WebSphere Dmgr Host	Must be found in the metadata
Initial Heap Size Maximum Heap Size	If one is specified the other must also be specified If specified, must be non-negative integers with an optional leading plus sign (+) If specified, Maximum Heap Size must be greater than Initial Heap Size
Rollover Type	Must be BOTH, SIZE, NONE, or TIME (case dependent)
If Rollover Type is either BOTH or SIZE	Rollover Size must be specified
Maximum Rollback Files Rollover Size	If specified, must be non-negative integers with an optional leading plus sign (+)
Base Hour Rollover Period	If specified, must be integers between 1 and 24
Logfile Location	Must be a valid fully-qualified directory path that exists or can be created.
Web Service Password Web Service URL Web Service User	Must define a valid WebSphere Home

### **Steps Executed**

The Configure WebSphere Cluster and Cluster Members workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Workflow Step	Description
Configure WebSphere Cluster Parameters	This step prepares and validates the parameters needed to create a cluster and cluster members for WebSphere Application Server. This step also prepares the parameters needed for the wsadmin call wrapper.
Get WSAdmin Call Wrapper	This step creates the necessary call wrapper to call wsadmin to execute certain operations within a given WebSphere environment.
JVM Parameters for Configure WebSphere Cluster Members	This step prepares and validates the parameters needed to configure Java Virtual Machine (JVM) parameters for each of the newly created WebSphere Application Server cluster members.
Logging Parameters for Configure WebSphere Cluster Members	This step prepares and validates the parameters needed to configure logging parameters for each of the newly created WebSphere Application Server cluster members.
Create WebSphere Cluster and Cluster Members	This step creates a new WebSphere Application Server cluster and cluster members. It also configures any of the cluster members with the optional configurations.
WebSphere Start Cluster	This step starts the newly created WebSphere Application Server cluster and cluster members and then checks the status of the cluster to make sure it started correctly.
Run Discover WebSphere	This step runs Discover WebSphere to examines the target server's physical environment to discover information about WebSphere cells, clusters, and application servers.
	<b>Note:</b> Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is your HP DMA administrator's responsibility to delete content that is no longer in use.

### Steps Used in the Configure WebSphere Cluster and Cluster Members Workflow

For parameter descriptions and defaults, see Parameters for Configure WebSphere Cluster and Cluster Members on page 44.

### How to Run this Workflow

The following instructions show you how to customize and run the Configure WebSphere Cluster and Cluster Members workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in Parameters for Configure WebSphere Cluster and Cluster Members on page 44.

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

#### To use the Configure WebSphere Cluster and Cluster Members workflow:

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

### Input Parameters for Configure WebSphere Cluster Parameters

Parameter Name	Default Value	Required	Description
Cluster Member Name	no default	required	The base cluster member name that will be used for each cluster member/application server. A suffix will automatically be appended to this base name that will indicate the node and cluster. For the initial cluster, the suffixes will be 001a for the first node, 001b for second node, and so on. If a vertical cluster member is created, the suffixes will be 002a for the first node, 002b for the second node, and so on. It cannot contain any of the following characters /\*,:;=+? <>& %'"[]#\$^{
Cluster Name	no default	required	This is the name given to the logical grouping of cluster members. This name has to be unique to the cell. It cannot contain any of the following characters / $\ ; = +?   <> \& \%'' [] # \$^{}.$
Enable Security	no default	required	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Number Cluster Members	no default	required	The number of cluster members/application servers that will be created on each node.

Parameter Name	Default Value	Required	Description
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.
Web Service URL	ce default		URL for the HP DMA Discovery web service API. For example: https://example.com:8443/dma
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	no default	optional	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	no default	optional	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters / $\ ; ; = + ?   <> \& \%'"[] # $ ^{}.

### Input Parameters for Configure WebSphere Cluster Parameters (continued)

**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 92).

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

See Parameters for Configure WebSphere Cluster and Cluster Members on page 44 for detailed descriptions of all input parameters for this workflow, including default values.

- 3. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
- 4. Save the changes to the workflow (click Save in the lower right corner).
- 5. Create a new deployment (see Create a Deployment on page 19 for instructions).
- 6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
- 7. On the Targets tab, specify one or more targets for this deployment.

- 8. Save the deployment (click **Save** in the lower right corner).
- 9. Run the workflow using this deployment (see Run Your Workflow on page 21 for instructions).

#### To verify the results:

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

### Sample Scenario

This topic shows you typical parameter values for different use cases for the Configure WebSphere Cluster and Cluster Members workflow. For a complete list of all parameters used in this workflow, including default values, see Parameters for Configure WebSphere Cluster and Cluster Members on page 44.

**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 92).

#### Scenario 1: To create two cluster members on each node using the default configurations

This use case will create a cluster testCluster with two nodes testApp001a and testApp001b. Security will be enabled. The WebSphere default values will be used for Initial Heap Size, Maximum Heap Size, and for logging.

Parameter Name	Example Value	Description
Cluster Member Name	testApp	The base cluster member name that will be used for each cluster member/application server. A suffix will automatically be appended to this base name that will indicate the node and cluster. For the initial cluster, the suffixes will be 001a for the first node, 001b for second node, and so on. If a vertical cluster member is created, the suffixes will be 002a for the first node, 002b for the second node, and so on. It cannot contain any of the following characters $/ \times $ , :; = +?   <> & % '"[]#\$^{}.
Cluster Name	testCluster	This is the name given to the logical grouping of cluster members. This name has to be unique to the cell. It cannot contain any of the following characters / \ * , : ; = + ?   <> & % ' " [] # \$ ^ {}.
Enable Security	True	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Number Cluster Members	2	The number of cluster members/application servers that will be created on each node.
Web Service Password	myWebSvcPwd	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: https://example.com:8443/dma

### Input Parameters for Configure WebSphere Cluster Parameters
Parameter Name	Example Value	Description
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	myPwd	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	wasadmin	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters $/ \ *, :; = +$ ? $  < > \& \%' "[] # $^{}.$

## Input Parameters for Configure WebSphere Cluster Parameters (continued)

## Scenario 2: To create two cluster members on each node, specifying initial and maximum heap sizes, and using the default logging configurations

This use case will create a cluster testCluster with two nodes testApp001a and testApp001b. Security will be enabled. The Initial Heap Size will be set to 512MB and the Maximum Heap Size to 1024MB. The WebSphere default values will be used for logging.

**Note:** Some of these parameters are not exposed by default in the deployment. See How to Expose Additional Workflow Parameters on page 91. You need to expose the following:

In the step JVM Parameters for Configure WebSphere Cluster Members:

- Initial Heap Size
- Maximum Heap Size

Parameter Name	Example Value	Description
Cluster Member Name	testApp	The base cluster member name that will be used for each cluster member/application server. A suffix will automatically be appended to this base name that will indicate the node and cluster. For the initial cluster, the suffixes will be 001a for the first node, 001b for second node, and so on. If a vertical cluster member is created, the suffixes will be 002a for the first node, 002b for the second node, and so on. It cannot contain any of the following characters $/ $ , $: ; = + ?   <> \& \%'"[] # $^{}.$
Cluster Name	testCluster	This is the name given to the logical grouping of cluster members. This name has to be unique to the cell. It cannot contain any of the following characters / \*, :; = +?   <> & % ' " [] # \$^{}.
Enable Security	True	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Number Cluster Members	2	The number of cluster members/application servers that will be created on each node.
Web Service Password	myWebSvcPwd	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: https://example.com:8443/dma

#### Input Parameters for Configure WebSphere Cluster Parameters

Parameter Name	Example Value	Description
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	myPwd	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	wasadmin	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters $/ \ *, :; = +$ ? $  <> \& \%'"[] # \$^{}.$

## Input Parameters for Configure WebSphere Cluster Parameters (continued)

### Input Parameters for JVM Parameters for Configure WebSphere Cluster Members

Parameter Name	Example Value	Description
Initial Heap Size	512	Initial heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.
Maximum Heap Size	1024	Maximum heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.

## Scenario 3: To create two cluster members on each node, specifying initial and maximum heap sizes, and using a time-based logging configuration

This use case will create a cluster testCluster with two nodes testApp001a and testApp001b. The Initial Heap Size will be set to 512MB and the Maximum Heap Size to 1024MB. Security will not be enabled. The WebSphere periodic rollover logging will start at hour 1 (midnight), will update every 24 hours, and 7 historic logs will be saved.

**Note:** Some of these parameters are not exposed by default in the deployment. See How to Expose Additional Workflow Parameters on page 91. You need to expose the following:

In the step JVM Parameters for Configure WebSphere Cluster Members:

- Initial Heap Size
- Maximum Heap Size

In the step Logging Parameters for Configure WebSphere Cluster Members:

- Base Hour
- Logfile Location
- Maximum Rollback Files
- Rollover Period
- Rollover Type

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Parameter Name	Example Value	Description
Cluster Member Name	testApp	The base cluster member name that will be used for each cluster member/application server. A suffix will automatically be appended to this base name that will indicate the node and cluster. For the initial cluster, the suffixes will be 001a for the first node, 001b for second node, and so on. If a vertical cluster member is created, the suffixes will be 002a for the first node, 002b for the second node, and so on. It cannot contain any of the following characters $/ \times $ , :; = +? $  < > \& \%' "[] # \$^{}$ .
Cluster Name	testCluster	This is the name given to the logical grouping of cluster members. This name has to be unique to the cell. It cannot contain any of the following characters /\*, :; = +?   <> & % ' " []#\$^{}.
Enable Security	False	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Number Cluster Members	2	The number of cluster members/application servers that will be created on each node.

### Input Parameters for Configure WebSphere Cluster Parameters

Parameter Name	Example Value	Description
Web Service Password	myWebSvcPwd	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: https://example.com:8443/dma
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

## Input Parameters for Configure WebSphere Cluster Parameters (continued)

## Input Parameters for JVM Parameters for Configure WebSphere Cluster Members

Parameter Name	Example Value	Description
Initial Heap Size	512	Initial heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.
Maximum Heap Size	1024	Maximum heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.

# Input Parameters for Logging Parameters for Configure WebSphere Cluster Members

Parameter Name	Example Value	Description
Base Hour	1	The hour of the day, from 1 to 24, when the periodic rollover starts. The rollover always starts at the specified hour of the day. Hour 1 is 00:00:00 (midnight) and hour 24 is 23:00:00. Once started, the rollover repeats every Rollover Period hours.
Logfile Location	see description	Fully qualified directory path where the SystemOut and SystemErr logs will be created. For example: /app/logs
Maximum Rollback Files	7	The number of historical logs to keep.
Rollover Period	24	The number of hours after which the log file rolls over. Valid values range from 1 to 24. Only used if Rollover Type is TIME or BOTH.
Rollover Type	TIME	Type of log rollover. Valid values are SIZE, TIME, NONE or BOTH. The default is SIZE.

## Scenario 4: To create two cluster members on each node, specifying initial and maximum heap sizes, and using a size-based logging configuration

This use case will create a cluster testCluster with two nodes testApp001a and testApp001b. Security will not be enabled. The Initial Heap Size will be set to 512MB and the Maximum Heap Size to 1024MB. The WebSphere periodic logging will rollover when the file size reaches 100MB and 7 historic logs will be saved.

**Note:** Some of these parameters are not exposed by default in the deployment. See How to Expose Additional Workflow Parameters on page 91. You need to expose the following:

In the step JVM Parameters for Configure WebSphere Cluster Members:

- Initial Heap Size
- Maximum Heap Size

In the step Logging Parameters for Configure WebSphere Cluster Members:

- Logfile Location
- Maximum Rollback Files
- Rollover Size
- Rollover Type

Parameter Name	Example Value	Description
Cluster Member Name	testApp	The base cluster member name that will be used for each cluster member/application server. A suffix will automatically be appended to this base name that will indicate the node and cluster. For the initial cluster, the suffixes will be 001a for the first node, 001b for second node, and so on. If a vertical cluster member is created, the suffixes will be 002a for the first node, 002b for the second node, and so on. It cannot contain any of the following characters /\*, :; = +?   <> & % '"[]#\$^{}.
Cluster Name	testCluster	This is the name given to the logical grouping of cluster members. This name has to be unique to the cell. It cannot contain any of the following characters /\*, :; = +?   <> & % ' " [] #\$^{}.
Enable Security	False	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Number Cluster Members	2	The number of cluster members/application servers that will be created on each node.

### Input Parameters for Configure WebSphere Cluster Parameters

Parameter Name	Example Value	Description
Web Service Password	myWebSvcPwd	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: https://example.com:8443/dma
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

## Input Parameters for Configure WebSphere Cluster Parameters (continued)

## Input Parameters for JVM Parameters for Configure WebSphere Cluster Members

Parameter Name	Example Value	Description
Initial Heap Size	512	Initial heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.
Maximum Heap Size	1024	Maximum heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.

## Input Parameters for Logging Parameters for Configure WebSphere Cluster Members

Parameter Name	Example Value	Description
Logfile Location	see description	Fully qualified directory path where the SystemOut and SystemErr logs will be created. For example: /app/logs
Maximum Rollback Files	7	The number of historical logs to keep.
Rollover Size	100	The maximum size of the log file in megabytes. When the file reaches this size, it rolls over. Only used if Rollover Type is SIZE or BOTH.
Rollover Type	SIZE	Type of log rollover. Valid values are SIZE, TIME, NONE or BOTH. The default is SIZE.

## Parameters for Configure WebSphere Cluster and Cluster Members

The following tables describe the required and optional input parameters for this workflow. Most of these parameters are not initially visible in a deployment (see How to Expose Additional Workflow Parameters on page 91). For most parameters, if you do not specify a value for a parameter, a default value is assigned

Parameter Name	Default Value	Required	Description
Cluster Member Name	no default	required	The base cluster member name that will be used for each cluster member/application server. A suffix will automatically be appended to this base name that will indicate the node and cluster. For the initial cluster, the suffixes will be 001a for the first node, 001b for second node, and so on. If a vertical cluster member is created, the suffixes will be 002a for the first node, 002b for the second node, and so on. It cannot contain any of the following characters / \*, :; = +?   <> & % '"[]#\$^{}.
Cluster Name	no default	required	This is the name given to the logical grouping of cluster members. This name has to be unique to the cell. It cannot contain any of the following characters /\*,:; = +?   <> & % ' " [] # \$ ^ {}.
Enable Security	no default	required	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Number Cluster Members	no default	required	The number of cluster members/application servers that will be created on each node.
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: https://example.com:8443/dma
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	no default	optional	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().

#### Parameters Defined in this Step: Configure WebSphere Cluster Parameters

### Parameters Defined in this Step: Configure WebSphere Cluster Parameters (continued)

Parameter Name	Default Value	Required	Description
WebSphere Admin Username	no default	optional	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters $/ \ :; = +?   < > \& \%'"[] # \$^{}.$

# Additional Parameters Defined in this Step: JVM Parameters for Configure WebSphere Cluster Members

Parameter Name	Default Value	Required	Description
Initial Heap Size	see description	optional	Initial heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.
Maximum Heap Size	see description	optional	Maximum heap size, in megabytes, that all cluster members will be set to on creation. The default is the WebSphere default value.

## Additional Parameters Defined in this Step: Logging Parameters for Configure WebSphere Cluster Members

Parameter Name	Default Value	Required	Description	
Base Hour	no default	optional	The hour of the day, from 1 to 24, when the periodic rollover starts. The rollover always starts at the specified hour of the day. Hour 1 is 00:00:00 (midnight) and hour 24 is 23:00:00. Once started, the rollover repeats every Rollover Period hours.	
Logfile Location	no default	optional	Fully qualified directory path where the SystemOut and SystemErr logs will be created. For example: /app/logs	
Maximum Rollback Files	no default	optional	The number of historical logs to keep.	
Rollover Period	no default	optional	The number of hours after which the log file rolls over. Valid values range from 1 to 24. Only used if Rollover Type is TIME or BOTH.	
Rollover Size	no default	optional	The maximum size of the log file in megabytes. When the file reaches this size, it rolls over. Only used if Rollover Type is SIZE or BOTH.	
Rollover Type	no default	optional	Type of log rollover. Valid values are SIZE, TIME, NONE or BOTH. The default is SIZE.	

## **Create and Configure WebSphere Data Sources**

The purpose of this workflow is to create and configure a new WebSphere Application Server data source within the application server scope. This workflow creates the JDBC (Java Database Connectivity) provider, the J2C (Java 2 Connector) alias, and a data source associated with the JDBC provider.

Data sources—backend connections to an existing database—allow pooling of connections to the database for fast access, reuse by application components, and abstraction of the database connection information by WebSphere.

#### Supported vendors

The supported database vendors are:

- Oracle Database Enterprise Edition
- Microsoft SQL Server

See WebSphere Product Documentation on page 1 to find IBM documentation for the supported database versions. See Database Product Documentation on page 84 to find additional information about the supported databases.

The following chart shows shows the customizable parameters for WebSphere data sources:

Data source attribute	Configurable parameter
JDBC provider	Database Type (Oracle or SQL Server) Implementation Type (Connection pool source or XA data source) Provider Name Driver Class Path
J2C alias	J2C Alias Name Database User Name Database Password Description
Oracle data source	Oracle URL Java Name Directory Interface (JNDI) Name Data Source Name J2C Alias Name Minimum Pool Connections Maximum Pool Connections
SQL Server data source	Database Name Port Number DB Server Name JNDI Name Data Source Name J2C Alias Name Minimum Pool Connections Maximum Pool Connections

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

Торіс	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 Create and Configure WebSphere Data Sources workflow.

#### **Product Platform**

This workflow is available for WebSphere 7 or WebSphere 8.

#### Dependencies

This workflow has the following dependencies:

- You must have a working WebSphere Network Deployment cell version 7 or 8, with the Deployment Manager available for communication.
- You must run the Discover WebSphere workflow before you run the configuration management workflows. The Discover WebSphere workflow audits the server's physical environment for WebSphere cells, clusters, and application servers and stores the configuration information in the HP DMA environment.
- You need either a working WebSphere Application Server (or servers) or cluster members associated with a cluster.
- You need a running Oracle or SQL Server backend database to connect the data source to.
- A compatible JDBC driver must be on the target machine (or machines). This is available from your database vendor.

For example, a compatible driver for Oracle is <code>ojdbc6.jar</code> and for SQL Server is <code>sqljdbc4.jar</code>.

For more information about prerequisites for WebSphere, refer to the WebSphere Product Documentation on page 84.

## How this Workflow Works

The following information describes how the Create and Configure WebSphere Data Sources workflow works:

#### Overview

This workflow does the following things in the order shown:

- 1. Before creating the WebSphere data source, the workflow prepares and validates all parameters and creates the call wrapper that will be used to execute commands within a WebSphere environment.
- 2. Next the workflow stops the WebSphere Application Servers, uses the AdminTask command to create the data source according to all the user-specified options, and then restarts the WebSphere Application Servers.
- 3. Finally, the workflow verifies that the connection to the data source was successful and then discovers the WebSphere configurations associated with the data source.

### Validation Checks Performed

The workflow then performs the following checks on the input parameters:

WebSphere Admin Username	Cannot contain the following characters / \ * , : ; = + ?   <> & % ' " [] # \$ ^ { } Cannot begin with a dash (-), period (.), or space ( )
WebSphere Admin Password	Cannot begin with a dash (-) Cannot contain a space ( )
Enable Security	Must be true or false
If Enable Security is true	WebSphere Admin Username must be specified WebSphere Admin Password must be specified
Database Type	Must be either Oracle or SQL Server (case independent)
Database Type Database Password Database User Name Data Source Name Driver Class Path J2C Alias Name JNDI Name Provider Name	Must be specified
Implementation Type	Must be XA data source or Connection pool data source (case dependent)
If Database Type is Oracle	Oracle URL must be specified Database Name must be null Port Number must be null DB Server Name must be null
If Database Type is SQL Server	Database Name must be specified Port Number must be specified and be numeric DB Server Name must be specified Oracle URL must be null
Maximum Pool Connections Minimum Pool Connections	If specified, must be an integer
Trust SSL Certificates Web Service Password Web Service User	Must define a valid WebSphere cluster or application server

The Create and Configure WebSphere Data Sources workflow also checks the environment for the following:

- There needs to be valid organization, server ID, and instance IDs.
- The middleware platform must be WebSphere.
- There must be associated databases.
- The WebSphere container types must be Cluster or APPLICATION\_SERVER.

### **Steps Executed**

The Create and Configure WebSphere Data Sources workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Workflow Step	Description		
WebSphere Input Parameter	This step performs the following actions to facilitate the execution of subsequent steps in the workflow:		
Mapping	1. Sets the Call Wrapper parameter to its default value. The Call Wrapper is the command that executes a step as a specific user.		
	<ol> <li>Allows certain parameters—that may or may not be required depending on what type of action you want to perform—to be hidden or exposed.</li> </ol>		
Validate Configure WebSphere Data Source Parameters	This step prepares and validates the parameters needed to configure a JDBC provider, J2C alias, and data source for a WebSphere Application Server.		
Get WSAdmin Call Wrapper	This step creates the necessary call wrapper to call wsadmin to execute certain operations within a given WebSphere environment.		
WebSphere Stop Application Servers	This step takes a list of WebSphere Application Servers, checks the state of each application server, and stops only the application servers that are in a started state.		
Create WebSphere Data Source	This step creates and configures the JDBC provider, J2C alias, and data source within a WebSphere Application Server scope.		
WebSphere Start Application Servers	This step takes a list of WebSphere Application Servers, checks the state of each application server, and starts only the application servers that were stopped by the WebSphere Stop Application Servers step.		
WebSphere Verify Data Source Connection	This step verifies the connection of a newly created data source within WebSphere.		
Discover WebSphere	This step audits the server's physical environment looking for WebSphere cells, clusters, and application servers.		
	<b>Note:</b> Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is your HP DMA administrator's responsibility to delete content that is no longer in use.		

## Steps Used in the Create and Configure WebSphere Data Sources Workflow

For parameter descriptions and defaults, see Parameters for Create and Configure WebSphere Data Sources on page 66.

## How to Run this Workflow

The following instructions show you how to customize and run the Create and Configure WebSphere Data Sources workflow in your environment.

The workflow provides default values for some parameters. These default values are usually sufficient for a "typical" installation. You can override the defaults by specifying parameter values in the deployment. You can also expose additional parameters in the workflow, if necessary, to accomplish more advanced scenarios. Any parameters not explicitly specified in the deployment will have the default values listed in Parameters for Create and Configure WebSphere Data Sources on page 66.

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

#### To use the Create and Configure WebSphere Data Sources workflow:

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

#### Input Parameters for Validate Configure WebSphere Data Source Parameters

Parameter Name	Default Value	Required	Description
Database Name	no default	optional	The name of the SQL Server database. Only used if Database Type if set to SQL Server.
Database Password	no default	required	Password for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Database Type	no default	required	The type of database that will be used by the JDBC (Java Database Connectivity) provider. Valid values are Oracle or SQL Server.
Database User Name	no default	required	User name for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Data Source Name	no default	required	The name given to the data source when it is created.
DB Server Name	no default	optional	The server name where the database lives. Only used if Database Type is set to SQL Server. For example: dma.mycompany.com

# Input Parameters for Validate Configure WebSphere Data Source Parameters (continued)

Parameter Name	Default Value	Required	Description
Driver Class Path	no default	required	A list of paths or JAR file names for the resource provider classes. For example: /app/oracle/jdbc/ojdbc6.jar for UNIX and C:\app\oracle\jdbc\ojdbc6.jar for Windows.
Enable Security	no default	required	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Implementation Type	no default	required	The implementation type for the JDBC (Java Database Connectivity) provider. Use Connection pool data source if your application runs in a single phase or a local transaction. Otherwise, use XA data source to run in a global transaction. Valid values are Connection pool data source or XA data source.
J2C Alias Name	no default	required	Java 2 Connector (J2C) alias name. This will later be used for authentication purposes to map to the data source.
JNDI Name	no default	required	Java Name Directory Interface (JNDI) name. This is a user specified string specific to the application component calls to the data source. For example: jdbc/myDatasource
Oracle URL	no default	optional	Oracle URL for the data source to connect to the database. Only used if Database Type is set to Oracle. For example:
			thin or jdbc:oracle:oci:@//localhost:1521 for thick.
Port Number	no default	optional	The port number that the SQL Server database is listening on. Only used if Database Type is set to SQL Server.
Provider Name	no default	required	The name of the JDBC (Java Database Connectivity) provider. For example: My Oracle 11g JDBC Provider.

ļ	nput Parameters for Validate Configure WebSphere Data Source Parameters
(	continued)

Parameter Name	Default Value	Required	Description
Trust SSL Certificates	True	optional	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	no default	optional	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	no default	optional	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters / \ *, :; = +?   < > & % ' " [] # \$ ^{}.

**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 92).

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

See Parameters for Create and Configure WebSphere Data Sources on page 66 for detailed descriptions of all input parameters for this workflow, including default values.

- 2. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
- 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 19 for instructions).
- 5. 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.
- 6. On the Targets tab, specify one or more targets for this deployment.
- 7. Save the deployment (click **Save** in the lower right corner).

8. Run the workflow using this deployment (see Run Your Workflow on page 21 for instructions).

### To verify the results:

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

Optional: If you want to further verify the results:

Use the WebSphere user interface to check that the data source is connected.

## Sample Scenario

This topic shows you typical parameter values for different use cases for the Create and Configure WebSphere Data Sources workflow. For a complete list of all parameters used in this workflow, including default values, see Parameters for Create and Configure WebSphere Data Sources on page 66.

The sample scenarios assume that Web Service URL has the value of DMA.url. This is the default value mapped from the HP DMA metadata.

**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 92).

#### Scenario 1: To create an Oracle data source using connection pool data source

This use case will create an Oracle data source using connection pool data source. This example does not enable security and does not trust SSL certificates.

Parameter Name	Example Value	Description
Database Password	DbPassWord	Password for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Database Type	Oracle	The type of database that will be used by the JDBC (Java Database Connectivity) provider. Valid values are Oracle or SQL Server.
Database User Name	system	User name for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Data Source Name	Oracle App Data Source	The name given to the data source when it is created.
Driver Class Path	see description	A list of paths or JAR file names for the resource provider classes. For example: /app/oracle/jdbc/ojdbc6.jar for UNIX and C:\app\oracle\jdbc\ojdbc6.jar for Windows.
Enable Security	False	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.

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Input Parameters for Validate Configure WebSphere Data Source Parameters	(con-
tinued)	

Parameter Name	Example Value	Description
Implementation Type	Connection pool data source	The implementation type for the JDBC (Java Database Connectivity) provider. Use Connection pool data source if your application runs in a single phase or a local transaction. Otherwise, use XA data source to run in a global transaction. Valid values are Connection pool data source or XA data source.
J2C Alias Name	OraAppAlias	Java 2 Connector (J2C) alias name. This will later be used for authentication purposes to map to the data source.
JNDI Name	jdbc/ oraAppDataSource	Java Name Directory Interface (JNDI) name. This is a user specified string specific to the application component calls to the data source. For example: jdbc/myDatasource
Oracle URL	see description	Oracle URL for the data source to connect to the database. Only used if Database Type is set to Oracle. For example:
		<pre>jdbc:oracle:thin:@//localhost:1521 for thin or jdbc:oracle:oci:@//localhost:1521 for thick.</pre>
Provider Name	Oracle App JDBC Provider	The name of the JDBC (Java Database Connectivity) provider. For example: My Oracle 11g JDBC Provider.
Trust SSL Certificates	False	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Web Service Password	myWebSvcPwd	Password for the HP DMA Discovery web service API.
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

#### Scenario 2: To create an SQL Server data source using connection pool data source

This use case will create an SQL Server data source using connection pool data source and will trust SSL certificates. This example does not enable security.

Parameter Name	Example Value	Description
Database Name	master	The name of the SQL Server database. Only used if Database Type if set to SQL Server.
Database Password	DbPassWord	Password for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Database Type	SQL Server	The type of database that will be used by the JDBC (Java Database Connectivity) provider. Valid values are Oracle or SQL Server.
Database User Name	sa	User name for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Data Source Name	SQL Server App Data Source	The name given to the data source when it is created.
DB Server Name	see description	The server name where the database lives. Only used if Database Type is set to SQL Server. For example: dma.mycompany.com
Driver Class Path	see description	A list of paths or JAR file names for the resource provider classes. For example: /app/sqlserver/jdbc/sqljdbc4.jar for UNIX and C:\app\sqlserver\jdbc\sqljdbc4.jar for Windows.
Enable Security	False	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Implementation Type	Connection pool data source	The implementation type for the JDBC (Java Database Connectivity) provider. Use Connection pool data source if your application runs in a single phase or a local transaction. Otherwise, use XA data source to run in a global transaction. Valid values are Connection pool data source or XA data source.
J2C Alias Name	MSSQLAppAlias	Java 2 Connector (J2C) alias name. This will later be used for authentication purposes to map to the data source.

#### Input Parameters for Validate Configure WebSphere Data Source Parameters

### Input Parameters for Validate Configure WebSphere Data Source Parameters (continued)

Parameter Name	Example Value	Description
JNDI Name	jdbc/ sqlAppDataSource	Java Name Directory Interface (JNDI) name. This is a user specified string specific to the application component calls to the data source. For example: jdbc/myDatasource
Port Number	53074	The port number that the SQL Server database is listening on. Only used if Database Type is set to SQL Server.
Provider Name	MS SQL Server App JDBC Provider	The name of the JDBC (Java Database Connectivity) provider. For example: My Oracle 11g JDBC Provider.
Trust SSL Certificates	True	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Web Service Password	myWebSvcPwd	Password for the HP DMA Discovery web service API.
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

#### Scenario 3: To create an Oracle data source using XA data source

This use case will create an Oracle data source using XA data source. To enable security you also need to specify WebSphere Admin Password and WebSphere Admin Username. This example does not trust SSL certificates.

Parameter Name	Example Value	Description
Database Password	DbPassWord	Password for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Database Type	Oracle	The type of database that will be used by the JDBC (Java Database Connectivity) provider. Valid values are Oracle or SQL Server.
Database User Name	system	User name for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Data Source Name	Oracle App XA Data Source	The name given to the data source when it is created.
Driver Class Path	see description	A list of paths or JAR file names for the resource provider classes. For example: /app/oracle/jdbc/ojdbc6.jar for UNIX and C:\app\oracle\jdbc\ojdbc6.jar for Windows.
Enable Security	True	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Implementation Type	XA data source	The implementation type for the JDBC (Java Database Connectivity) provider. Use Connection pool data source if your application runs in a single phase or a local transaction. Otherwise, use XA data source to run in a global transaction. Valid values are Connection pool data source or XA data source.
J2C Alias Name	OraAppAlias	Java 2 Connector (J2C) alias name. This will later be used for authentication purposes to map to the data source.
JNDI Name	jdbc/ oraAppXADataSource	Java Name Directory Interface (JNDI) name. This is a user specified string specific to the application component calls to the data source. For example: jdbc/myDatasource

### Input Parameters for Validate Configure WebSphere Data Source Parameters

Input Parameters for Validate Configure WebSphere Data Source Parameters (	con-
tinued)	

Parameter Name	Example Value	Description
Oracle URL	see description	Oracle URL for the data source to connect to the database. Only used if Database Type is set to Oracle. For example:
		<pre>jdbc:oracle:thin:@//localhost:1521 for thin or jdbc:oracle:oci:@//localhost:1521 for thick.</pre>
Provider Name	Oracle App XA JDBC Provider	The name of the JDBC (Java Database Connectivity) provider. For example: My Oracle 11g JDBC Provider.
Trust SSL Certificates	False	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Web Service Password	myWebSvcPwd	Password for the HP DMA Discovery web service API.
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	myPwd	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	wasadmin	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters /\*, :; = + ?   < > & % ' " [] # \$ ^ {}.

#### Scenario 4: To create an SQL Server data source using XA data source

This use case will create an SQL Server data source using XA data source and specifying the Maximum and Minimum Pool Connections. This example does not trust SSL certificates and does not enable security.

**Note:** Some of these parameters are not exposed by default in the deployment. See How to Expose Additional Workflow Parameters on page 91. You need to expose the following in the step Validate Configure WebSphere Data Source Parameters:

- Maximum Pool Connections
- Minimum Pool Connections

Ini	out	<b>Parameters</b>	for	Validate	Config	ure V	VebSp	here	Data	Source	Paramete	ers

Parameter Name	Example Value	Description
Database Name	master	The name of the SQL Server database. Only used if Database Type if set to SQL Server.
Database Password	DbPassWord	Password for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Database Type	SQL Server	The type of database that will be used by the JDBC (Java Database Connectivity) provider. Valid values are Oracle or SQL Server.
Database User Name	sa	User name for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Data Source Name	SQL Server App XA Data Source	The name given to the data source when it is created.
DB Server Name	see description	The server name where the database lives. Only used if Database Type is set to SQL Server. For example: dma.mycompany.com
Driver Class Path	see description	A list of paths or JAR file names for the resource provider classes. For example: /app/sqlserver/jdbc/sqljdbc4.jar for UNIX and C:\app\sqlserver\jdbc\sqljdbc4.jar for Windows.
Enable Security	False	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.

Input Parameters for Validate Configure WebSphere Data Source Parameters	(con-
tinued)	

Parameter Name	Example Value	Description
Implementation Type	XA data source	The implementation type for the JDBC (Java Database Connectivity) provider. Use Connection pool data source if your application runs in a single phase or a local transaction. Otherwise, use XA data source to run in a global transaction. Valid values are Connection pool data source or XA data source.
J2C Alias Name	MSSQLAppAlias	Java 2 Connector (J2C) alias name. This will later be used for authentication purposes to map to the data source.
JNDI Name	jdbc/ sqlAppXADataSource	Java Name Directory Interface (JNDI) name. This is a user specified string specific to the application component calls to the data source. For example: jdbc/myDatasource
Maximum Pool Connections	40	The maximum number of connections to be maintained in the data source connection pool. The default is the WebSphere default value.
Minimum Pool Connections	20	The minimum number of connections to be maintained in the data source connection pool. The default is the WebSphere default value.
Port Number	53074	The port number that the SQL Server database is listening on. Only used if Database Type is set to SQL Server.
Provider Name	MS SQL Server App XA JDBC Provider	The name of the JDBC (Java Database Connectivity) provider. For example: My Oracle 11g JDBC Provider.
Trust SSL Certificates	False	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Web Service Password	myWebSvcPwd	Password for the HP DMA Discovery web service API.
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

## Parameters for Create and Configure WebSphere Data Sources

The following tables describe the required and optional input parameters for this workflow. Most of these parameters are not initially visible in a deployment (see How to Expose Additional Workflow Parameters on page 91). For most parameters, if you do not specify a value for a parameter, a default value is assigned.

Parameter Name	Default Value	Required	Description
Database Name	no default	optional	The name of the SQL Server database. Only used if Database Type if set to SQL Server.
Database Password	no default	required	Password for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Database Type	no default	required	The type of database that will be used by the JDBC (Java Database Connectivity) provider. Valid values are Oracle or SQL Server.
Database User Name	no default	required	User name for the database. It will be used for authentication purposes when connecting to the database in order to create the J2C alias.
Data Source Name	no default	required	The name given to the data source when it is created.
DB Server Name	no default	optional	The server name where the database lives. Only used if Database Type is set to SQL Server. For example: dma.mycompany.com
Driver Class Path	no default	required	A list of paths or JAR file names for the resource provider classes. For example: /app/oracle/jdbc/ojdbc6.jar for UNIX and C:\app\oracle\jdbc\ojdbc6.jar for Windows.
Enable Security	no default	required	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Implementation Type	no default	required	The implementation type for the JDBC (Java Database Connectivity) provider. Use Connection pool data source if your application runs in a single phase or a local transaction. Otherwise, use XA data source to run in a global transaction. Valid values are Connection pool data source or XA data source.

# Parameters Defined in this Step: Validate Configure WebSphere Data Source Parameters

## Parameters Defined in this Step: Validate Configure WebSphere Data Source Parameters (continued)

Parameter Name	Default Value	Required	Description
J2C Alias Name	no default	required	Java 2 Connector (J2C) alias name. This will later be used for authentication purposes to map to the data source.
JNDI Name	no default	required	Java Name Directory Interface (JNDI) name. This is a user specified string specific to the application component calls to the data source. For example: jdbc/myDatasource
Maximum Pool Connections	see descriptioin	optional	The maximum number of connections to be maintained in the data source connection pool. The default is the WebSphere default value.
Minimum Pool Connections	see description	optional	The minimum number of connections to be maintained in the data source connection pool. The default is the WebSphere default value.
Oracle URL	no default	optional	Oracle URL for the data source to connect to the database. Only used if Database Type is set to Oracle. For example:
			<pre>jdbc:oracle:thin:@//localhost:1521 for thin or jdbc:oracle:oci:@//localhost:1521 for</pre>
			thick.
Port Number	no default	optional	The port number that the SQL Server database is listening on. Only used if Database Type is set to SQL Server.
Provider Name	no default	required	The name of the JDBC (Java Database Connectivity) provider. For example: My Oracle 11g JDBC Provider.
Trust SSL Certificates	True	optional	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.

Parameters Defined in this	Step: Validate Configure	WebSphere Data Source
Parameters (continued)		

Parameter Name	Default Value	Required	Description
Web Service URL	see description	required	URL for the HP DMA Discovery web service API. For example:
			https://example.com:8443/dma
			By default this is mapped to DMA.Url. You can also set this in a policy (see How to Use a Policy to Specify Parameter Values).
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	no default	optional	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	no default	optional	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters /\*, :; = +?  <> & % ' "[]#\$^{}.

## **Create and Configure WebSphere Web Server Definitions**

The purpose of this workflow is to configure web server objects in a given WebSphere Application Server cell. These web server objects can be used later when deploying applications into a given application server or cluster. They also give limited ability to administer the web server instances.

First, the workflow creates an unmanaged node that represents the system where the web servers are running. Second, the workflow creates the web server definition under the unmanaged node. This node will hold information about the web server instance that runs on either the same machine or a remote machine.

#### Context

After the web server has been created an application can be installed and mapped to these web server objects at deployment time. Then a plug-in component can be generated based on the application configuration and application server information. The workflow consolidates that information into a single xml file that will be read by the web server plug-in.

#### Supported vendor

The supported web server vendor is IBM HTTP Server.

See WebSphere Product Documentation on page 1 to find IBM documentation for IBM HTTP Server.

Торіс	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

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

## **Prerequisites for this Workflow**

Be sure that the following prerequisites are satisfied before you run the Create and Configure WebSphere Web Server Definitions workflow.

#### **Product Platform**

This workflow is available for WebSphere 7 or WebSphere 8.

#### Dependencies

This workflow has the following dependencies:

- You must have a working WebSphere Network Deployment cell version 7 or 8, with the Deployment Manager available for communication.
- You must run the Discover WebSphere workflow before you run the configuration management workflows. The Discover WebSphere workflow audits the server's physical environment for WebSphere cells, clusters, and application servers and stores the configuration information in the HP DMA environment.

For more information about prerequisites for WebSphere, refer to the WebSphere Product Documentation on page 84.

## How this Workflow Works

The following information describes how the Create and Configure WebSphere Web Server Definitions workflow works:

#### Overview

This workflow does the following things in the order shown:

- Before creating the WebSphere web server definitions, the workflow prepares and validates all parameters and creates the call wrapper that will be used to execute commands within a WebSphere environment.
- 2. Next the workflow uses the AdminTask command with all the user-specified options to create and configure the WebSphere unmanaged node and to create an IHS web server definition. Then the workflow synchronizes the node if it is enabled.
- 3. Finally, the workflow discovers the web server definitions associated with a WebSphere node.

### Validation Checks Performed

The workflow then performs the following checks on the input parameters:

Access Log File Error Log File HTTP Configuration File Plugin Install Root Web Server Install Root	Must be specified
Admin Protocol HTTP Web Protocol	If not specified, set to HTTP If specified, must be HTTP or HTTPS (case independent)
Unmanaged Node Host Name Unmanaged Node Name Web Server Name	Must be specified Cannot contain the following characters /\*,:;=+? <>&%'"[]# \$^{} or space Cannot begin with a period (.)
HTTP Admin Password	Cannot begin with a dash (-) Cannot contain a space ( )
HTTP Admin User	Cannot contain the following characters / \ * , : ; = + ?   <> & % ' " [ ] # \$ ^{} Cannot begin with a dash (-), period (.), or space ( )
HTTP Admin Port HTTP Web Port	Must be specified Must be an integer
Node Operating System	Must be aix, linux, solaris, or windows (case independent)
WebApp Mapping	If not specified, set to NONE If specified, must be ALL or NONE (case independent)
WebSphere Admin Username	Cannot contain the following characters / \ * , : ; = + ?   < > & % ' " [ ] # \$ ^ { } Cannot begin with a dash (-), period (.), or space ( )
WebSphere Admin Password	Cannot begin with a dash (-) Cannot contain a space ( )
Enable Security	Must be true or false
If Enable Security is true	WebSphere Admin Username must be specified WebSphere Admin Password must be specified
Trust SSL Certificates Web Service Password Web Service User	Must define a valid WebSphere Home
#### **Steps Executed**

The Create and Configure WebSphere Web Server Definitions workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure and all subsequent steps are skipped.



Workflow Step	Description	
WebSphere Input Parameter Mapping	This step performs the following actions to facilitate the execution of subsequent steps in the workflow:	
	<ol> <li>Sets the Call Wrapper parameter to its default value. The Call Wrapper is the command that executes a step as a specific user.</li> </ol>	
	<ol> <li>Allows certain parameters—that may or may not be required depending on what type of action you want to perform—to be hidden or exposed.</li> </ol>	
Validate Configure WebSphere Web Server Parameters	This step prepares and validates the parameters needed to create and configure an unmanaged node and create an IHS web server definition.	
Get WSAdmin Call Wrapper	This step creates the necessary call wrapper to call wsadmin to execute certain operations within a given WebSphere environment.	
Create WebSphere Web Server Definitions	This step creates and configures the WebSphere unmanaged node and IHS web server definition.	
Discover WebSphere	This step audits the server's physical environment looking for WebSphere cells, clusters, and application servers.	
	<b>Note:</b> Discovery is ONLY additive. It will not remove instances or databases currently in your environment. It is your HP DMA administrator's responsibility to delete content that is no longer in use.	

## Steps Used in the Create and Configure WebSphere Web Server Definitions Workflow

For parameter descriptions and defaults, see Parameters for Create and Configure WebSphere Web Server Definitions on page 82.

### How to Run this Workflow

The following instructions show you how to customize and run the Create and Configure WebSphere Web Server Definitions 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.

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

#### To use the Create and Configure WebSphere Web Server Definitions workflow:

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

#### Input Parameters for Validate Configure WebSphere Web Server Parameters

Parameter Name	Default Value	Required	Description
Access Log File	no default	required	Fully qualified path for the IBM HTTP Server access log file. For example: /opt/IBM/HTTPServer/logs/access.log
Admin Protocol	HTTP	optional	Administrative protocol title. Valid values are HTTP or HTTPS. The default is HTTP.
Enable Security	no default	required	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Error Log File	no default	required	Fully qualified path for the IBM HTTP Server error log file. For example: /opt/IBM/HTTPServer/logs/error.log
HTTP Admin Password	no default	optional	Password for the HTTP Admin User.
HTTP Admin Port	8008	required	Port of the IBM HTTP Server administrative server.
HTTP Admin User	no default	optional	User name of the IBM HTTP administrative user.
HTTP Configuration File	no default	required	Fully qualified path for the IBM HTTP Server configuration file. For example: /opt/IBM/HTTPServer/conf/httpd.conf

## Input Parameters for Validate Configure WebSphere Web Server Parameters (continued)

Parameter Name	Default Value	Required	Description
HTTP Web Port	80	required	Port number of the IBM HTTP web server.
HTTP Web Protocol	HTTP	required	The protocol used by the IBM HTTP Server administrative server running with an unmanaged or remote web server. Valid values are HTTP or HTTPS. The default is HTTP.
Node Operating System	no default	required	The operating system in use on the system associated with the node specified in Unmanaged Node Name. Valid values are: aix, linux, solaris, windows.
Plugin Install Root	no default	required	The installation root directory where the plug-in for the web server is installed. For example: /opt/IBM/HTTPServer/Plugin
Service Name	no default	optional	The Windows service name for the IBM HTTP Server. Only required if the Node Operating System is Windows.
Trust SSL Certificates	True	optional	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Unmanaged Node Host Name	no default	required	Host name of the system associated with the node specified in Unmanaged Node Name.
Unmanaged Node Name	no default	required	The node name in the configuration repository.
WebApp Mapping	NONE	optional	Level of installed web applications mapped to the web server. Valid values are ALL or NONE. The default is NONE.
Web Server Install Root	no default	required	Fully qualified directory path for the web server. For example: /opt/IBM/HTTPServer
Web Server Name	no default	required	Name of the IBM HTTP web server.
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

Input Parameters for Validate Config	gure WebSphere Web	<b>Server Parameters</b>
(continued)		

Parameter Name	Default Value	Required	Description
WebSphere Admin Password	no default	optional	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	no default	optional	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters $/ \*, :; = + ?   <> \& \%'"[] #$ $\$

**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 92).

**Note:** See Parameters for Create and Configure WebSphere Web Server Definitions on page 82 for detailed descriptions of all input parameters for this workflow, including default values.

- 2. In the workflow editor, expose any additional parameters that you need. You will specify values for those parameters when you create the deployment.
- 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 19 for instructions).
- 5. 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.
- 6. On the Targets tab, specify one or more targets for this deployment.
- 7. Save the deployment (click Save in the lower right corner).
- 8. Run the workflow using this deployment (see Run Your Workflow on page 21 for instructions).

#### To verify the results:

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

Optional: If you want to further verify the results:

Use the WebSphere administrative console interface to check that the web server is configured.

### Sample Scenario

This topic shows you typical parameter values for different use cases for the Create and Configure WebSphere Web Server Definitions workflow. For a complete list of all parameters used in this workflow, including default values, see Parameters for Create and Configure WebSphere Web Server Definitions on page 82.

**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 92).

## Scenario 1: To create and configure a WebSphere unmanaged node and web server definitions using unsecured protocol

This use case will create and configure a WebSphere unmanaged node and web server definitions using unsecured protocol. This example also does the following:

- Does not enable security
- Trusts SSL certificates
- · Has the Linux operating system on the node
- Does not map any web applications to the web server

Parameter Name	Example Value	Description
Access Log File	see description	Fully qualified path for the IBM HTTP Server access log file. For example: /opt/IBM/HTTPServer/logs/access.log
Admin Protocol	HTTP	Administrative protocol title. Valid values are HTTP or HTTPS. The default is HTTP.
Enable Security	False	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Error Log File	see description	Fully qualified path for the IBM HTTP Server error log file. For example: /opt/IBM/HTTPServer/logs/error.log
HTTP Admin Password	HttpPassWoRd	Password for the HTTP Admin User.
HTTP Admin Port	8008	Port of the IBM HTTP Server administrative server.
HTTP Admin User	httpadmin	User name of the IBM HTTP administrative user.

#### Input Parameters for Validate Configure WebSphere Web Server Parameters

Input Parameters for Validate Configure WebSphere Web Server Parameters (d	con-
tinued)	

Parameter Name	Example Value	Description
HTTP Configuration File	see description	Fully qualified path for the IBM HTTP Server configuration file. For example: /opt/IBM/HTTPServer/conf/httpd.conf
HTTP Web Port	80	Port number of the IBM HTTP web server.
HTTP Web Protocol	HTTP	The protocol used by the IBM HTTP Server administrative server running with an unmanaged or remote web server. Valid values are HTTP or HTTPS. The default is HTTP.
Node Operating System	linux	The operating system in use on the system associated with the node specified in Unmanaged Node Name. Valid values are: aix, linux, solaris, windows.
Plugin Install Root	see description	The installation root directory where the plug-in for the web server is installed. For example: /opt/IBM/HTTPServer/Plugin
Trust SSL Certificates	True	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Unmanaged Node Host Name	see description	Host name of the system associated with the node specified in Unmanaged Node Name. For example: example.mycompany.com
Unmanaged Node Name	webServerNode	The node name in the configuration repository.
WebApp Mapping	NONE	Level of installed web applications mapped to the web server. Valid values are ALL or NONE. The default is NONE.
Web Server Install Root	see description	Fully qualified directory path for the web server. For example: /opt/IBM/HTTPServer
Web Server Name	WebServer1	Name of the IBM HTTP web server.
Web Service Password	myWebSvcPwd	Password for the HP DMA Discovery web service API.
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.

## Scenario 2: To create and configure a WebSphere unmanaged node and web server definitions using secured protocol

This use case will create and configure a WebSphere unmanaged node and web server definitions using unsecured protocol. This example also does the following:

- Enables security—WebSphere Admin Password and WebSphere Admin Username also need to be provided
- Does not trust SSL certificates
- Has the AIX operating system on the node
- Maps all web applications to the web server

#### Input Parameters for Validate Configure WebSphere Web Server Parameters

Parameter Name	Example Value	Description
Access Log File	see description	Fully qualified path for the IBM HTTP Server access log file. For example: /opt/IBM/HTTPServer/logs/access.log
Admin Protocol	HTTPS	Administrative protocol title. Valid values are HTTP or HTTPS. The default is HTTP.
Enable Security	True	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Error Log File	see description	Fully qualified path for the IBM HTTP Server error log file. For example: /opt/IBM/HTTPServer/logs/error.log
HTTP Admin Password	HttpPassWoRd	Password for the HTTP Admin User.
HTTP Admin Port	8443	Port of the IBM HTTP Server administrative server.
HTTP Admin User	httpadmin	User name of the IBM HTTP administrative user.
HTTP Configuration File	see description	Fully qualified path for the IBM HTTP Server configuration file. For example: /opt/IBM/HTTPServer/conf/httpd.conf
HTTP Web Port	443	Port number of the IBM HTTP web server.
HTTP Web Protocol	HTTPS	The protocol used by the IBM HTTP Server administrative server running with an unmanaged or remote web server. Valid values are HTTP or HTTPS. The default is HTTP.

Input Parameters for Validate Configure WebSphere Web Server Parameters (co	n-
tinued)	

Parameter Name	Example Value	Description
Node Operating System	aix	The operating system in use on the system associated with the node specified in Unmanaged Node Name. Valid values are: aix, linux, solaris, windows.
Plugin Install Root	see description	The installation root directory where the plug-in for the web server is installed. For example: /opt/IBM/HTTPServer/Plugin
Trust SSL Certificates	False	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.
Unmanaged Node Host Name	see description	Host name of the system associated with the node specified in Unmanaged Node Name.
Unmanaged Node Name	webServerNode	The node name in the configuration repository.
WebApp Mapping	ALL	Level of installed web applications mapped to the web server. Valid values are ALL or NONE. The default is NONE.
Web Server Install Root	see description	Fully qualified directory path for the web server. For example: /opt/IBM/HTTPServer
Web Server Name	WebServer1	Name of the IBM HTTP web server.
Web Service Password	myWebSvcPwd	Password for the HP DMA Discovery web service API.
Web Service User	JohnDoe	User capable of modifying the managed environment by using the HP DMA Discovery web service API.
WebSphere Admin Password	myPwd	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().
WebSphere Admin Username	wasadmin	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters $/ \times , : ; = + ?   < > \& \%' " [] # \$^{}$ .

# Parameters for Create and Configure WebSphere Web Server Definitions

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

## Parameters Defined in this Step: Validate Configure WebSphere Web Server Parameters

Parameter Name	Default Value	Required	Description
Access Log File	no default	required	Fully qualified path for the IBM HTTP Server access log file. For example: /opt/IBM/HTTPServer/logs/access.log
Admin Protocol	HTTP	optional	Administrative protocol title. Valid values are HTTP or HTTPS. The default is HTTP.
Enable Security	no default	required	Indicates whether security will be enabled. Valid values are True or False. If True then WebSphere Admin Password and WebSphere Admin User must have values.
Error Log File	no default	required	Fully qualified path for the IBM HTTP Server error log file. For example: /opt/IBM/HTTPServer/logs/error.log
HTTP Admin Password	no default	optional	Password for the HTTP Admin User.
HTTP Admin Port	8008	required	Port of the IBM HTTP Server administrative server.
HTTP Admin User	no default	optional	User name of the IBM HTTP administrative user.
HTTP Configuration File	no default	required	Fully qualified path for the IBM HTTP Server configuration file. For example: /opt/IBM/HTTPServer/conf/httpd.conf
HTTP Web Port	80	required	Port number of the IBM HTTP web server.
HTTP Web Protocol	HTTP	required	The protocol used by the IBM HTTP Server administrative server running with an unmanaged or remote web server. Valid values are HTTP or HTTPS. The default is HTTP.
Node Operating System	no default	required	The operating system in use on the system associated with the node specified in Unmanaged Node Name. Valid values are: aix, linux, solaris, windows.

## Parameters Defined in this Step: Validate Configure WebSphere Web Server Parameters (continued)

Parameter Name	Default Value	Required	Description	
Plugin Install Root	no default	required	The installation root directory where the plug-in for the well server is installed. For example: /opt/IBM/HTTPServer/Plugin	
Service Name	no default	optional	The Windows service name for the IBM HTTP Server. Only required if the Node Operating System is Windows.	
Trust SSL Certificates	True	optional	Indicates whether to trust any SSL certificate used to connect to the HP DMA web service. Valid values are True or False.	
Unmanaged Node Host Name	no default	required	Host name of the system associated with the node specified in Unmanaged Node Name.	
Unmanaged Node Name	no default	required	The node name in the configuration repository.	
WebApp Mapping	NONE	optional	Level of installed web applications mapped to the web server. Valid values are ALL or NONE. The default is NONE.	
Web Server Install Root	no default	required	Fully qualified directory path for the web server. For example: /opt/IBM/HTTPServer	
Web Server Name	no default	required	Name of the IBM HTTP web server.	
Web Service Password	no default	required	Password for the HP DMA Discovery web service API.	
Web Service User	no default	required	User capable of modifying the managed environment by using the HP DMA Discovery web service API.	
WebSphere Admin Password	no default	optional	The password for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot not begin with a dash (-) or contain a space ().	
WebSphere Admin Username	no default	optional	The user account for a user in a group that can change the state of a given application server. Only required if global security is enabled. It cannot begin with a dash (-), a period (.), or a space (). It cannot contain any of the following characters $/ \ ; ; = + ?   <> \& \% ' " [] # $^{}.$	

## Chapter 4

## **Reference Information**

This chapter contains the following information:

Торіс	Description
WebSphere Product Documentation	Links to product documentation for IBM WebSphere Application Server Network Deployment (WebSphere), the hardware and software requirements, as well as supported platforms
Database Product Documentation	Links to product documentation for the database products that these workflows support
HP DMA Documentation	Links to additional HP DMA documentation

### **WebSphere Product Documentation**

For the current list of hardware and software requirements, as well as supported platforms for IBM HTTP Server, see:

http://www-01.ibm.com/support/docview.wss?uid=swg27006921

For WebSphere 7 product documentation, see:

http://publib.boulder.ibm.com/infocenter/wasinfo/v7r0/index.jsp

For WebSphere 8 product documentation, see:

http://publib.boulder.ibm.com/infocenter/wasinfo/v8r0/index.jsp

For IBM Red Book resources for WebSphere, see:

http://publib-b.boulder.ibm.com/Redbooks.nsf/portals/WebSphere

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

### **Database Product Documentation**

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

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

### **Oracle Database Product Documentation**

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

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

### Microsoft SQL Server Documentation

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

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

## **HP DMA Documentation**

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

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

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

## Chapter 5

## **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 next page

How to Expose Additional Workflow Parameters on page 91

How to Use a Policy to Specify Parameter Values on page 92

How to Import a File into the Software Repository on page 95

## How a Solution Pack is Organized

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

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

A solution pack contains one or more related workflow templates.

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

🅼 Databa	se & Middleware Automation	
Home Au	omation Reports Environment Solutions Setup	
Workflows	Steps Functions Policies Deployments Run Console History	
My Copy	of Run Oracle Compliance Audit ntation Workflow Deployments Roles	
Name:	My Copy of Run Oracle Compliance Audit	
Tags:		
Type:	Oracle •	
Target level:	Instance 🔹	
Documentatio	n.	
	Purpose Audit an Oracle Database instance for compliance with the following Center for Internet Security (CIS) benchmarks and, optionally, compa results to the related PCI and SOX requirements: CIS Security Configuration Benchmark for Oracle Database Server 11g, version 1.1.0, December 2011 CIS Security Benchmark for Oracle 9i/10g, version 2.01, April 2005 Payment Card Industry (PCI) Data Security Standard Version 2.0, October 2010 Sarbanes-Oxley (SOX) Sarbanes-Oxley Act of 2002 Section 302 Description This workflow will audit an Oracle Database instance using CIS Level 1 and Level 2 auditing. It will then compare the results to the pertine	re the audit
	requirements, where applicable. This audit, which runs in conjunction with the HP DMA reporting tool, can identify more than 175 compliar problems with an Oracle database. You can view information about the audit on the Console while the audit is running. After the audit has workflow sends a summary report to each specified email address. You can also view a compliance report on the Reports page. Parameters	ice related finished, the
		HELP PDF EDIT
🗶 DELETE		

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.

🕼 Database & Mide	dleware A	utomation						
Home Automation	Reports	Environmen	t Solutions	Setup				
Workflows Steps F	Functions	Policies [	Deployments	Run	Console	History		
Get Oracle Home	e on Pai	rameters	History	Workfl	ows	Solutions	Roles	
Properties				Do	cumentat	ion		
Name Tage Type Category Targetable	e: Get Orac s: e: Oracle y: Script e:	le Home		Des Get Dep Inpi Out -	scription: t the value The /etc// The regis pendencies ut Parame tput Param tput Param c Oracle Ho c Oracle Si urn Code: 0 = Step w	of ORACLE oratab or /va try on Windo s: None ters: None neters: ome = The fu D = The Ora	E_HOME from the appropriate source: n/opt/oracle/oratab file on UNIX ows ully qualified name of the ORACLE_HOME acle server (instance) ID	E

Сору

THIS STEP IS READ ONLY

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.

Home       Automation       Reports       Environment       Solutions       Setup         Workflows       Steps       Functions       Policies       Deployments       Run       Console       History         Parse Oracle Inventory	
Workflows       Steps       Functions       Policies       Deployments       Run       Console       History         Parse Oracle Inventory	
Parse Oracle Inventory         General       Action       Parameters       History       Workflows       Solutions       Roles         Input parameters       Name       Value       Description         Inventory Files       *Optional: Comma separated list of fully qualified Oritorial	
General     Action     Parameters     History     Workflows     Solutions     Roles       Input parameters     Name     Value     Description       Inventory Files     *Optional: Comma separated list of fully qualified Or;	
Input parameters       Name     Value     Description       Inventory Files     *Optional: Comma separated list of fully qualified Or;	
Name         Value         Description           Inventory Files         *Optional: Comma separated list of fully qualified Or;	
Inventory Files *Optional: Comma separated list of fully qualified Or;	.
Oracle Account *Optional: Oracle user that will own the ORACLE_H	
Oracle Home *Optional: The ORACLE_HOME to use if more than	
Server Wrapper /opt/hp/dma/client/bin/jython.sh *Required: String to execute routine as server super	
	:
Name Description	
CRS Account The OS owner of the ORA_CRS_HOME	
CRS Active Version Active CRS Version	
CRS Group The Oracle group used for the ORA_CRS_HOME installation	
CRS Home The last ORA_CRS_HOME location in the inventory file	
CRS Home Name The name of the ORA_CRS_HOME as recorded in the inventory	
CRS Nodes List of all nodes the Oracle Clusterware is deployed to	
Cluster Nodes List of all nodes the Oracle Home is deployed to	

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

Get Listener Names / Oracle SIDs	▶	7	Prepare Oracle Instance	0	3, 8
Optional: Comma delimited list of ORACLE_SIDs, at least one of which a	•	8	Get Listener Names	0	3, 9
resulting listener must service. If blank, listeners are not limited to those servicing any specific ORACLE_SID.			Listener Homes: Prepare Oracle Instance.Oracl Oracle SIDs: Get Oracle Home.Ora	le Home 🙆 acle SID 🥹 ┥ —	- Click here
T		9	Audit Unix or Linux OS Specific Settings	0	3, 10
To see the parameter description here		10	Audit Installation and Patch	0	11, 12

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

Database & Middleware Automation						
Home Automation Reports Environment Solutions Setup						
Workflows Steps Functions Policies Deployments Run Console History						
Run Oracle Compliance CIS						
Targets Parameters Roles						
Gather Parameters for Oracle Compliance						
Compliance Type: CIS Compliance type that will be audited by the workflow. Compliance types supported: CIS, PCI, SOX. Will be defaulted to CIS.	Text					
Excluded Compliance Checks: Optional: Checks to exclude from of Compliance Checks	Text					
Inventory Files: //etc/oralnst.loc	Text					
Optional: Comma separated list of fully qualified Oracle inventory files. If not specified, default to /etc/orainst.loc, /var/opt/oracle/orainst.loc, or %ProgramFiles%\Oracle\Inventory. Gather Advanced Parameters for Oracle Compliance						
Email Addresses to Bassive Basset: CISComplianceAuditor@mycompany.com	Taxt					
*Optional. Provided an email address or multiple email addresses separated by commas without spaces that you would like to receive an email of the results of the compliance tests run against the target specified.						
X DELETE V RUN	Restore defaults Copy Save or CANCEL					
<b>Note:</b> The workflow templates included in this solution pack are read-only and cannot be						

**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:



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

### How to Use a Policy to Specify Parameter Values

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

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

To establish a policy, you can either Create a Policy or Extract a Policy from a workflow.

After you establish the policy, you must Reference the Policy in the Deployment.

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

### **Create a Policy**

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

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

- 1. In the HP DMA web UI, go to Automation > Policies.
- 2. Click New Policy.
- 3. In the Name box, specify the name of the policy
- 4. For each parameter value that you want to provide using this policy, perform the following actions on the Attributes tab:
  - a. From the drop-down list, select the type of attribute:
    - A Text attribute contains simple text that users can view while deploying and running workflows.
    - A List attribute contains a comma-separated list of values (or a large amount of text not suitable for a Text attribute).
    - A Password attribute contains simple text, but the characters are masked so that users cannot see the text.
  - b. In the text box to the left of the Add button, specify the name of the attribute.

For your convenience, this name should be similar to the parameter name used in the pertinent workflow (or workflows).

- c. Click Add.
- d. In the new text box to the right of the attribute's name, enter a value for this attribute.

To remove an attribute, click the **Remove** button.

5. On the Roles tab, grant Read and Write permission to any additional users and groups who will

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

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

### **Extract a Policy**

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

#### To extract a policy:

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

### **Reference the Policy in the Deployment**

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

#### To reference policy attributes in a deployment:

1. Create or access the deployment.

See "Deployments" in the HP DMA User Guide for details.

- 2. On the Parameters tab, perform the following steps for each parameter whose value you want to provide by referencing a policy attribute:
  - a. In the drop-down menu for that parameter, select **Policy Attribute**.
  - b. In the text box for that parameter, type any character. A drop-down list of policy attributes appears. For example:

Admin Pwd:	а		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	Ŧ	

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

Admin Pwd: MyParameterValues.MyAdminPassword

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  $\rightarrow$  All Programs  $\rightarrow$  HP Software  $\rightarrow$  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  $\rightarrow$  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 DMA on next page

## **Target Type**

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

## **User Permissions and Related Requirements**

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

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

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

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

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

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

## **Discovery in HP DMA**

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

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

## Glossary

#### Α

#### automation items

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

#### В

#### 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).

#### С

#### capability

Capabilities are collections of related privileges. There are three capabilities defined in HP DMA. Login Access capability enables a user to log in to the web interface. This capability does not guarantee that this user can view any organizations or automation items permissions are required to access those items. Workflow Creator capability enables a user to create new workflows and make copies of other workflows. Administrator capability enables a user to perform any action and view all organizations. If you have Administrator capability, you do not need Workflow Creator capability. The Administrator can assign any of these capabilities to one or more roles registered roles.

#### connector

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

#### cross-platform

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

#### custom field

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

#### D

#### 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.

#### 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.

#### Μ

#### 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.

#### 0

#### 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.

#### Ρ

#### 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 your server management tool. Before you can associate a role with an automation item or organization, however, you must register that role in HP DMA.

#### S

#### 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.

#### Т

#### 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.

#### 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.