



# HP Database and Middleware Automation

Software Version: 10.30  
Linux, Solaris, and Windows®

## JBoss Provisioning

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

### Document Changes

Chapter	Version	Changes
<a href="#">Title Page</a> <a href="#">Legal Notices</a>	10.01	Updated version number, software release date, document release date, and copyright date range.
<a href="#">Sample Scenarios</a>	10.01	Updated the Web Service URL parameter example value to reference the correct default port (8443) for SSL communication.

## Document Changes, continued

Chapter	Version	Changes
<a href="#">Title Page</a> <a href="#">Legal Notices</a>	10.10	Updated version number, software release date, document release date, and copyright date range.
<a href="#">Title Page</a> <a href="#">Legal Notices</a>	10.20	Updated version number, software release date, document release date, and copyright date range.
<a href="#">JBoss Provisioning Quick Start</a> <a href="#">Workflow Details</a>	10.20	Removed Quick Start chapter. In the "How to Run this Workflow" topics, pointed to the <i>HP DMA Quick Start Tutorial</i> .
<a href="#">Title Page</a> <a href="#">Legal Notices</a> Entire guide	10.21	Updated version number, software release date, document release date, and copyright date range.  Updated document template.
<a href="#">Title Page</a> <a href="#">Legal Notices</a>	10.22	Updated version number, software release date, document release date, and copyright date range.
<a href="#">Provision Red Hat JBoss StandAlone</a>	10.22	HP DMA now uses the <code>trustAllCertificates</code> parameter in the <code>dma.xml</code> file rather than the Trust SSL Certificates workflow parameter.
<a href="#">JBoss - Provision Software</a>	10.22	Added new JBoss workflow.
<a href="#">Title Page</a> <a href="#">Legal Notices</a> Entire guide	10.30	Updated version number, software release date, document release date, and copyright date range.  Updated to new documentation template.

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# About HP DMA Solution Packs

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

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

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

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

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

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

# Audience

This solution is designed for IT architects and engineers who are responsible for planning, implementing, and maintaining application-serving environments using Red Hat JBoss Enterprise Application Platform (EAP) and/or Enterprise Web Platform (EWP) version 5.1.1.

To use this solution, you should be familiar with JBoss and its requirements (see links to the [JBoss Product Documentation](#) on page 39).

# Document Map

The following table shows you how to navigate this guide:

Topic	Description
<a href="#">The JBoss Provisioning Solution</a>	General information about this solution, including what it contains and what it does.
<a href="#">Workflow Details</a>	Information about the JBoss provisioning workflows included in this solution, including: prerequisites, how the workflows work, how to run them, sample scenarios, and a list of input parameters.
<a href="#">Reference Information</a>	Links to current JBoss product documentation and additional HP DMA documentation.
<a href="#">Tips and Best Practices</a>	Simple procedures that you can use to accomplish a variety of common HP DMA tasks.
<a href="#">Troubleshooting</a>	Tips for solving common problems.

# Important Terms

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

- In HP DMA, a **workflow** executes a process —such as installing a software product or checking a database instance for compliance with a specific security benchmark.
- A workflow consists of a sequence of **steps**. Each step performs a very specific task. Steps can be shared among workflows.
- Steps can have input and output **parameters**, whose values will be unique to your environment. If you provide correct values for the input parameters that each scenario requires, the workflow will be able to accomplish its objective. Output parameters from one step often serve as input parameters to another step.
- A **solution pack** contains a collection of related workflows and the steps, functions, and policies that implement each workflow. More precisely, solution packs contain **workflow templates**. These are read-only versions of the workflows that cannot be deployed. To run a workflow included in a solution pack, you must first create a deployable copy of the workflow template and then customize that copy for your environment.
- A **deployment** associates a workflow with the targets (servers, instances, or databases) where the workflow will run. To run a workflow, you execute a specific deployment. A deployment is associated with one workflow; a workflow can have many deployments, each with its own targets and parameter settings.
- The umbrella term **automation items** is used to refer to those items to which role-based permissions can be assigned. Automation items include workflows, deployments, steps, and policies. Organizations also have role-based permissions. Servers, instances, and databases inherit their role-based permissions from the organization in which the server resides.
- The **software repository** contains any files that a workflow might need to carry out its purpose (for example, software binaries or patch archives). If the files that a workflow requires are not in the software repository, they must be stored locally on each target server. When you are using HP DMA with HP Server Automation (HP SA), the software repository is the HP SA Software Library.
- An **organization** is a logical grouping of servers. You can use organizations to separate development, staging, and production resources—or to separate logical business units. Because user security for running workflows is defined at the organization level, organizations should be composed with user security in mind.

Additional terms are defined in the [Glossary](#) on page 53.

# Chapter 1: The JBoss Provisioning Solution

The HP Database and Middleware Automation Application Server Provisioning solution contains two JBoss workflows:

Workflow Name	Purpose
<a href="#">Provision Red Hat JBoss StandAlone</a>	This workflow installs a new instance of Red Hat JBoss Enterprise Application Platform (EAP) and/or Enterprise Web Platform (EWP) version 5.1.1 and creates a stand-alone application server. You can use the workflow to install up to four instances per server.
<a href="#">Provision Open Source JBoss 7 StandAlone Mode</a>	This workflow installs a new instance of the open source JBoss Application Server 7 and creates a stand-alone application server.
<a href="#">JBoss - Provision Software</a>	This workflow installs a new instance of a standalone JBoss Application Server supporting Enterprise Application Platform (EAP) and WildFly versions of JBoss.

Although minimal JBoss knowledge is required to run these workflows using the default settings, the workflows are highly customizable and can support complex environment-specific deployment scenarios.

The remaining topics in this chapter provide the following contextual information about these workflows:

- [Supported Products and Platforms](#) on the next page
- [Prerequisites for this Solution](#) on the next page

# Supported Products and Platforms

The JBoss provisioning workflows are supported on Red Hat Enterprise Linux, Solaris, and Windows platforms.

## Operating Systems

For a list of the specific target operating system versions supported, refer to the *HP Database and Middleware Automation Support Matrix*.

This document is part of the HP DMA documentation library, which is available on the HP Software Support web site:

<https://softwaresupport.hp.com/>

## Hardware Requirements

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

For JBoss hardware and software requirements, see the [JBoss Product Documentation](#) on page 39.

## HP Software Requirements

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

# Prerequisites for this Solution

The following prerequisites must be satisfied before you can run the JBoss provisioning workflows in this solution pack:

- This workflow requires unchallenged `sudo` access to a user (typically root) who can access all required files and directories.
- The workflow requires the Java Development Kit (JDK). See the workflow description for the required version.

**Note:** There are also specific prerequisites for each workflow.

## Chapter 2: Workflow Details

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

**Note:** Each of these steps is explained in greater detail in the "How to Run 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.
- 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.

# Provision Red Hat JBoss StandAlone

Use this workflow to perform one or both of the following actions:

- Install Red Hat JBoss Enterprise Application Platform (EAP) version 5.1.1 and the Java Software Development Kit (SDK) version 1.6. Start a single, default profile application server.
- Install Red Hat JBoss Enterprise Web Platform (EWP) version 5.1.1 and the Java SDK version 1.6. Start a single, default profile application server.

You can use the workflow to install up to four JBoss instances per server.

The workflow performs checks to determine whether the JBoss and Java binaries exist on the target server. If they do not, the workflow downloads them from the software repository (see [How to Import a File into the Software Repository](#) on page 50 for more information).

The workflow also performs validation checks at the operating system level, including file system space checks and Java version level checks.

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

The process of deploying and running this workflow is the same for all scenarios, but the parameters required will differ depending on the specific scenario that you are implementing.

The workflow provides default values for most parameters. These default values are usually sufficient for a typical provisioning scenario. 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 Provision Red Hat JBoss StandAlone](#) on page 17 .

**Note:** For information about the steps in this workflow, see the [Steps in this Workflow](#).

## Prerequisites for this Workflow

The following prerequisites must be satisfied before you can run the [Provision Red Hat JBoss StandAlone](#) on the previous page workflow:

1. The workflow requires unchallenged `sudo` access to a user (typically root) who can access all required files and directories.
2. The workflow requires the Java Development Kit (JDK) version 1.6 update 24.
3. The workflow supports Red Hat JBoss 5.1.1 ZIP installs.
4. Adequate disk space must be available to install the JBoss and Java binaries.

For information about prerequisites for JBoss, refer to the [JBoss Product Documentation](#) on page 39.

## How this Workflow Works

This topic contains the following information about the [Provision Red Hat JBoss StandAlone](#) workflow:

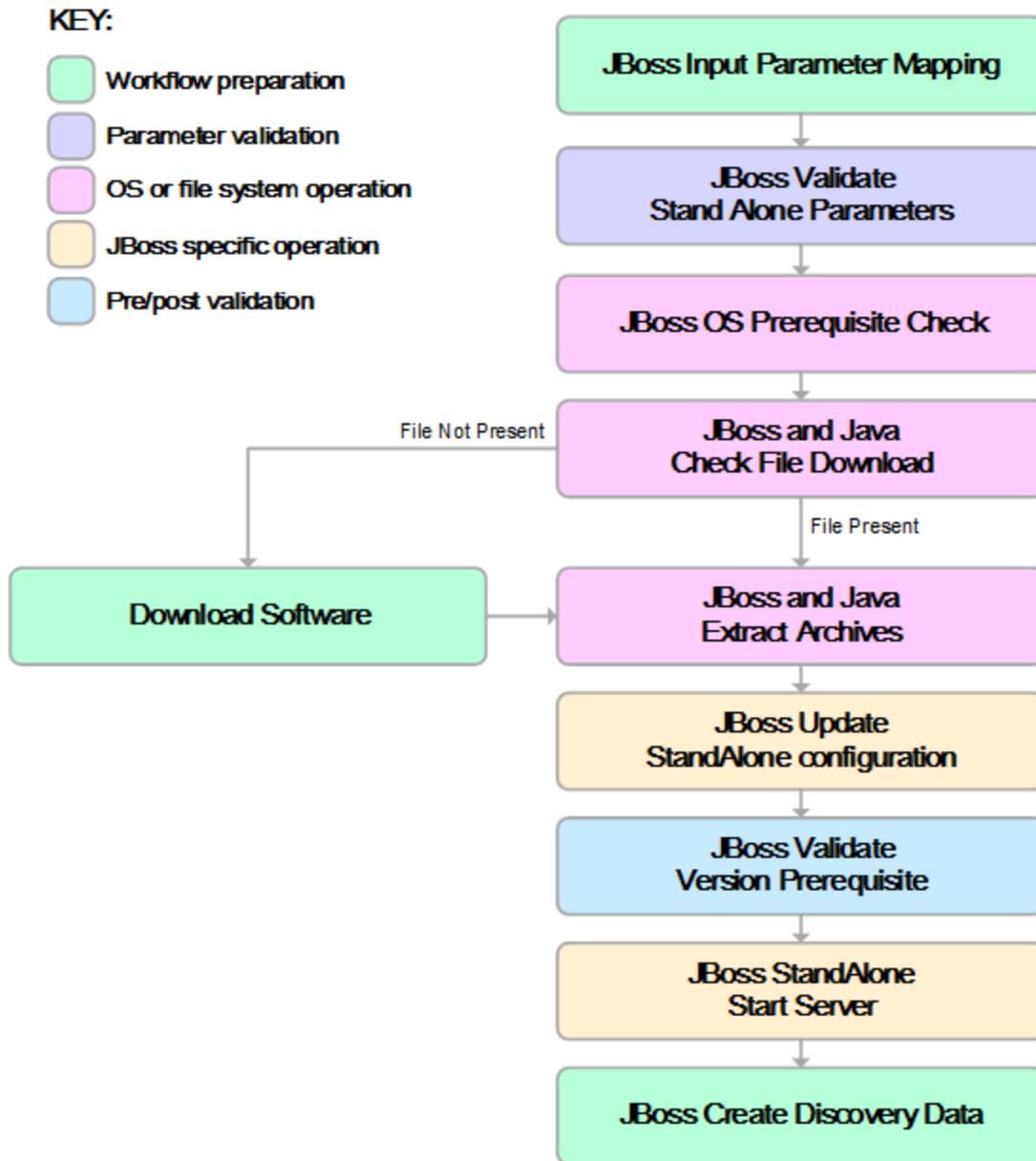
### **Validation Checks Performed**

The workflow checks the following things prior to extracting the binaries. If any of these checks fails, the workflow fails.

1. All required parameters have values. If any required parameter does not have a value—either a value that you specify or a default value—the workflow fails.
2. All required libraries are present (see [Prerequisites for this Workflow](#) on the previous page).
3. The operating system is a supported platform.
4. Sufficient disk space is available to extract the binary files from the compressed archive.
5. Sufficient disk space is available to install JBoss and Java.

### Steps Executed

The [Provision Red Hat JBoss StandAlone](#) workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



### Process Flow

This workflow performs the following tasks:

1. Creates the call wrapper and determines the target server platform type.
2. Validates the parameters needed to install JBoss and Java and create a stand-alone profile (see the [validation checks](#) performed).
3. Checks the following:
  - a. File system space requirements where JBoss and Java will be installed.
  - b. Temporary space requirements where the compressed software will be extracted before it is installed.
4. Determines whether the JBoss and Java binary archives are present on the target server. If either archive is not present, the workflow downloads it from the software repository.
5. Extracts the JBoss and Java binary archives to the specified directories.
6. Creates a default profile for a stand-alone application server.
7. Starts the new stand-alone JBoss application server.
8. Captures information learned during the provisioning process in HP DMA metadata fields.

## How to Run this Workflow

This topic explains how to customize and run the [Provision Red Hat JBoss StandAlone](#) workflow in your environment.

**Note:** Prior to running this workflow, review the [Prerequisites for this Workflow](#), and ensure that all requirements are satisfied.

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

### To customize and run the Provision Red Hat JBoss StandAlone workflow:

1. Create a deployable copy of the workflow (see "Create a Deployable Workflow" in *HP DMA Quick Start Tutorial*).
2. Determine the values that you will specify for the following parameters. These are the parameters that are visible in the deployment by default.

Parameter Name	Default Value	Description
JBoss User	root	In a Unix environment, this is the user who will install and run JBoss. If a JBoss user is specified, this user must have access to write into the install directory. Currently, this parameter is not supported on Windows targets.
Admin Password	no default	The password for the Admin User account.  <b>Tip:</b> To avoid having to re-enter passwords whenever they change, you can create a policy to provide them to the workflow (see <a href="#">How to Use a Policy to Specify Parameter Values</a> on page 47).
Admin User	no default	The user who will manage the JBoss environment.
Install Dir	UNIX: /opt/jboss  Windows: C:\jboss	Fully qualified path of the location where the Java and JBoss binaries will be uncompressed. If the Java software package is not available in this location, it will be downloaded from the software repository and placed in this location.
JBoss Binary Archive	no default	Fully qualified path where the compressed JBoss software package should be found on the target server. If the JBoss software package is not available in this location, it will be downloaded from the SA software repository and placed in this location.

Parameter Name	Default Value	Description
Java Binary Archive	no default	Fully qualified path where the compressed Java software package should be found on the target server. If the Java software package is not available in this location, it will be downloaded from the SASoftware repository and placed in this location.
JBoss Type	no default	Type of JBoss will be installed. Valid options are EAP (Enterprise Application Platform) or EWP (Enterprise Web Platform).
Trust SSL Certificates	no default	Deprecated. HP DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HP DMA web service. HP DMA uses the following parameter in the dma.xml file:  <pre>&lt;Parameter name="com.hp.dma.conn.trustAllCertificates" values="VALUE" /&gt;</pre> Here, VALUE is true or false.
Web Service Password	no default	Password for the HP DMA Discovery web service API.
Web Service URL	no default	URL for the HP DMA Discovery web service API.
Web Service User	no default	User capable of modifying the managed environment through the HP DMA Discovery web service API.

See [Parameters for Provision Red Hat JBoss StandAlone](#) on page 17 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need (see [How to Expose Additional Workflow Parameters](#) on page 46). You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment (see "Create a Deployment" in *HP DMA Quick Start Tutorial* for instructions).
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment (see "Run Your Workflow" in *HP DMA Quick Start Tutorial* for instructions).

The workflow will complete and report "Success" on the Console if it has run successfully. If an invalid parameter value is specified, an error is logged, and the workflow terminates in the "Failure" state.

## Sample Scenarios

This topic shows you how to use various parameters to achieve the following provisioning scenarios in your environment using the [Provision Red Hat JBoss StandAlone](#) workflow:

### Scenario 1: Install Red Hat JBoss EAP

Specify values for the following parameters to install the Red Hat JBoss Enterprise Application Platform (EAP) and start a single, default profile application server.

Step Name	Parameter Name	Example Value
JBoss Input Parameter Mapping	JBoss User	jboss
JBoss Validate Stand Alone Parameters	Admin Password	adminpwd
	Admin User	admin
	Install Dir	/opt/jboss/jboss5eap2
	JBoss Binary Archive	/opt/jboss/jboss-eap-5.1.1.zip
	Java Binary Archive	/opt/jboss/jdk-6u29-linux-x64.bin
	JBoss Type	EAP
	Web Service Password	mypwd
	Web Service URL	https://mycomputername:8443/dma
	Web Service User	myusername

Be sure that the default values for all remaining parameters are appropriate for your environment (see [Parameters for Provision Red Hat JBoss StandAlone](#) on page 17).

### Scenario 2: Install Red Hat JBoss EWP

Specify values for the following parameters to install the Red Hat JBoss Enterprise Web Platform (EAP) and start a single, default profile application server.

Step Name	Parameter Name	Example Value
JBoss Input Parameter Mapping	JBoss User	jboss
JBoss Validate Stand Alone Parameters	Admin Password	adminpwd
	Admin User	admin
	Install Dir	c:\jboss\jboss5ewp
	JBoss Binary Archive	c:\jboss\jboss-ewp-5.1.1.zip
	Java Binary Archive	c:\jboss\jdk-6u29-win-x64.bin
	JBoss Type	EWP
	Web Service Password	mypwd
	Web Service URL	https://mycomputername:8443/dma
	Web Service User	myusername

Be sure that the default values for all remaining parameters are appropriate for your environment (see [Parameters for Provision Red Hat JBoss StandAlone](#) on the next page).

## Parameters for Provision Red Hat JBoss StandAlone

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

### Parameters Defined in this Step: JBoss Input Parameter Mapping

Parameter Name	Default Value	Required	Description
JBoss User	root	optional	In a Unix environment, this is the user who will install and run JBoss. If a JBoss user is specified, this user must have access to write into the install directory. Currently, this parameter is not supported on Windows targets.

### Additional Parameters Defined in this Step: JBoss Validate Stand Alone Parameters

Parameter Name	Default Value	Required	Description
Admin Password	no default	required	The password for the Admin User account.
Admin User	no default	required	The user who will manage the JBoss environment.
Call Wrapper	see description	required	Command that will execute this step (or subsequent steps) as a specific user.  For UNIX targets, the default is: <code>/opt/hp/dma/client/jython.sh</code> running as root  For Windows targets, the default is: <code>jython</code> running as Administrator
Install Dir	UNIX: <code>/opt/jboss</code>  Windows: <code>C:\jboss</code>	optional	Fully qualified path of the location where the Java and JBoss binaries will be uncompressed. If the Java software package is not available in this location, it will be downloaded from the software repository and placed in this location.
JBoss Binary Archive	no default	required	Fully qualified path where the compressed JBoss software package should be found on the target server. If the JBoss software package is not available in this location, it will be downloaded from the SA software repository and placed in this location.
JBoss Type	no default	required	Type of JBoss will be installed. Valid options are EAP (Enterprise Application Platform) or EWP (Enterprise Web Platform).

Additional Parameters Defined in this Step: JBoss Validate Stand Alone Parameters, continued

Parameter Name	Default Value	Required	Description
Java Binary Archive	no default	required	Fully qualified path where the compressed Java software package should be found on the target server. If the Java software package is not available in this location, it will be downloaded from the SASoftware repository and placed in this location.
Trust SSL Certificates	no default	deprecated	HP DMA no longer uses this workflow parameter to determine whether the workflow will trust any Secure Sockets Layer (SSL) certificate used to connect to the HP DMA web service. HP DMA uses the following parameter in the dma.xml file:  <pre>&lt;Parameter name="com.hp.dma.conn.trustAllCertificates" values="VALUE" /&gt;</pre> Here, VALUE is true or false.
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.
Web Service User	no default	required	User capable of modifying the managed environment through the HP DMA Discovery web service API.

# Provision Open Source JBoss 7 StandAlone Mode

Use this workflow to install the open source JBoss Application Server 7 Community version (JBoss AS 7) and start a single, default profile application server.

The workflow performs checks to determine whether the JBoss and Java binaries exist on the target server. If they do not, the workflow downloads them from the software repository.

The workflow also performs validation checks at the operating system level, including file system space checks and Java version level checks.

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

Topic	Information Included
<a href="#">Prerequisites for this Workflow</a>	List of prerequisites that must be satisfied before you can run this workflow
<a href="#">How this Workflow Works</a>	Information about what the workflow does, including validation checks performed, steps executed, and a high-level process flow
<a href="#">How to Run this Workflow</a>	Instructions for running this workflow in your environment
<a href="#">Sample Scenario</a>	Examples of typical parameter values for this workflow
<a href="#">Parameters for Provision Open Source JBoss 7 StandAlone Mode</a>	List of input parameters for this workflow

The process of deploying and running this workflow is the same for all scenarios, but the parameters required will differ depending on the specific scenario that you are implementing.

The workflow provides default values for most parameters. These default values are usually sufficient for a typical provisioning scenario. 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 Provision Open Source JBoss 7 StandAlone Mode](#) on page 26 .

**Note:** For information about the steps in this workflow, see the [Steps in this Workflow](#).

## Prerequisites for this Workflow

The following prerequisites must be satisfied before you can run the [Provision Open Source JBoss 7 StandAlone Mode](#) workflow:

1. The workflow requires unchallenged `sudo` access to a user (typically root) who can access all required files and directories.
2. The workflow requires the Java Development Kit (JDK) version 1.6 update 24.
3. Adequate disk space must be available to install the JBoss and Java binaries.

For information about prerequisites for JBoss AS 7, refer to the [JBoss Product Documentation](#) on page 39.

## How this Workflow Works

This topic contains the following information about the [Provision Open Source JBoss 7 StandAlone Mode](#) workflow:

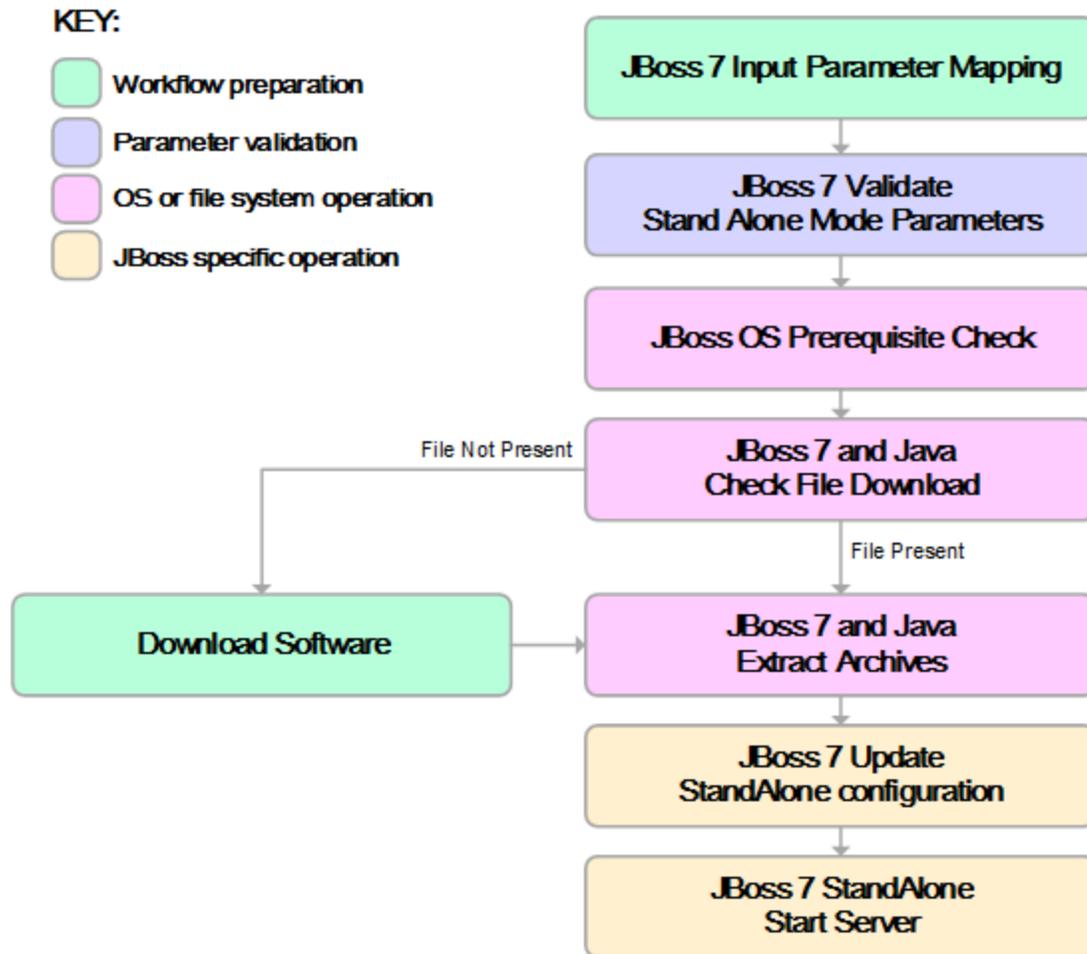
### Validation Checks Performed

The workflow checks the following things prior to extracting the binaries. If any of these checks fails, the workflow fails.

1. All required parameters have values. If any required parameter does not have a value—either a value that you specify or a default value—the workflow fails.
2. All required libraries are present (see [Prerequisites for this Workflow](#) on the previous page).
3. Sufficient disk space is available to extract the binary files from the compressed archive.
4. Sufficient disk space is available to install JBoss and Java.

### Steps Executed

The [Provision Open Source JBoss 7 StandAlone Mode](#) workflow includes the following steps. Each step must complete successfully before the next step can start. If a step fails, the workflow reports a failure, and all subsequent steps are skipped.



### Process Flow

This workflow performs the following tasks:

1. Creates the call wrapper and determines the target server platform type.
2. Validates the parameters needed to install JBoss and Java and create a stand-alone profile (see the [validation checks](#) performed).
3. Checks the following:
  - a. File system space requirements where JBoss and Java will be installed.
  - b. Temporary space requirements where the compressed software will be extracted before it is installed.
4. Determines whether the JBoss and Java binary archives are present on the target server. If either archive is not present, the workflow downloads it from the software repository.
5. Extracts the JBoss and Java binary archives to the specified directories.
6. Creates a default profile for a stand-alone application server.
7. Starts the new stand-alone JBoss application server.
8. Cleans up any files that were downloaded.

## How to Run this Workflow

This topic explains how to customize and run the [Provision Open Source JBoss 7 StandAlone Mode](#) workflow in your environment.

**Note:** Prior to running this workflow, review the [Prerequisites for this Workflow](#), and ensure that all requirements are satisfied.

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

### To customize and run the Provision Open Source JBoss StandAlone Mode workflow:

1. Create a deployable copy of the workflow (see "Create a Deployable Workflow" in *HP DMA Quick Start Tutorial*).
2. Determine the values that you will specify for the following parameter. These are the parameters that are visible in the deployment by default.

Parameter Name	Default Value	Description
Install Dir	UNIX: /opt/jboss  Windows: c:\jboss	Fully qualified path where the JBoss and Java binaries will be uncompressed..
JBoss Binary Archive	no default	Fully qualified path where the compressed Java software package should be found on the target server. If the Java software package is not available in this location, it will be downloaded from the SAsoftware repository and placed in this location.
Java Binary Archive	no default	Fully qualified path where the compressed Java software package should be found on the target server. If the Java software package is not available in this location, it will be downloaded from the SAsoftware repository and placed in this location.
JBoss User	root	The user who will install and run JBoss. This user must have write permission on the install directory.

See [Parameters for Provision Open Source JBoss 7 StandAlone Mode](#) on page 26 for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need (see [How to Expose Additional Workflow Parameters](#) on page 46). You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment (see "Create a Deployment" in *HP DMA Quick Start Tutorial* for instructions).

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

The workflow will complete and report "Success" on the Console if it has run successfully. If an invalid parameter value is specified, an error is logged, and the workflow terminates in the "Failure" state.

## Sample Scenario

This topic shows you how to use various parameters to achieve the following provisioning scenario in your environment using the [Provision Open Source JBoss 7 StandAlone Mode](#) workflow:

### Install JBoss Application Server 7 Community version

Specify values for the following parameters to install JBoss AS 7 and start a single, default profile application server. This is the simplest scenario, and it uses only those parameters that are visible in the deployment by default (out of the box).

Step Name	Parameter Name	Example Value
JBoss 7: Validate Stand Alone Mode Parameters	Install Dir	/opt/jboss/jboss-as7
	JBoss Binary Archive	/opt/jboss/jboss-as-7.1.1.Final.zip
	Java Binary Archive	/opt/jboss/jdk-6u29-linux-x64.bin
	JBoss User	root

Be sure that the default values for all remaining parameters are appropriate for your environment (see [Parameters for Provision Open Source JBoss 7 StandAlone Mode](#) on the next page).

## Parameters for Provision Open Source JBoss 7 StandAlone Mode

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

Parameters Defined in this Step: JBoss 7: Validate Stand Alone Mode Parameters

Parameter Name	Default Value	Required	Description
Call Wrapper	see description	optional	Command that will execute this step (or subsequent steps) as a specific user.  For UNIX targets, the default is: <code>/opt/hp/dma/client/jython.sh</code> running as root  For Windows targets, the default is: <code>jython</code> running as Administrator
File List	no default	optional	Comma-separated list of fully qualified files ( JBoss Binary Archive, Java Binary Archive) that must either exist on the target server or be downloaded from the software repository.
HostName	no default	required	Fully qualified hostname or IP address of the server where JBoss will be installed.
Install Dir	UNIX: <code>/opt/jboss</code>  Windows: <code>c:\jboss</code>	optional	Fully qualified path where the JBoss and Java binaries will be uncompressed..
JBoss Binary Archive	no default	required	Fully qualified path where the compressed Java software package should be found on the target server. If the Java software package is not available in this location, it will be downloaded from the SASoftware repository and placed in this location.
JBoss Home	no default	optional	Fully qualified path from which JBoss will run.
JBoss User	root	optional	The user who will install and run JBoss. This user must have write permission on the install directory.

Parameters Defined in this Step: JBoss 7: Validate Stand Alone Mode Parameters, continued

<b>Parameter Name</b>	<b>Default Value</b>	<b>Required</b>	<b>Description</b>
Java Binary Archive	no default	required	Fully qualified path where the compressed Java software package should be found on the target server. If the Java software package is not available in this location, it will be downloaded from the SASoftware repository and placed in this location.
Java Home	no default	optional	Fully qualified path from which Java will run.

# JBoss - Provision Software

Use this workflow to install a new instance of a standalone JBoss Application Server supporting Enterprise Application Platform (EAP) and WildFly versions of JBoss.

The workflow performs checks to determine whether the JBoss and Java binaries exist on the target server. If they do not, the workflow downloads them from the software repository (see [How to Import a File into the Software Repository](#) on page 50 for more information).

The workflow also performs validation checks at the operating system level, including file system space checks and Java version level checks.

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

The process of deploying and running this workflow is the same for all scenarios, but the parameters required will differ depending on the specific scenario that you are implementing.

The workflow provides default values for most parameters. These default values are usually sufficient for a typical provisioning scenario. 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 JBoss - Provision Software](#).

**Note:** For information about the steps in this workflow, see the [Steps in this Workflow](#).

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

## Prerequisites for this Workflow

The following prerequisites must be satisfied before you can run the [JBoss - Provision Software](#) workflow:

1. The workflow requires unchallenged `sudo` access to a user (typically root) who can access all required files and directories.
2. The workflow requires the Java Development Kit (JDK) version 1.7 (or later).
3. Adequate disk space must be available to install the JBoss and Java binaries.

For information about prerequisites for JBoss, refer to the [JBoss Product Documentation](#) on page 39.

## How this Workflow Works

This topic contains the following information about the [JBoss - Provision Software](#) workflow:

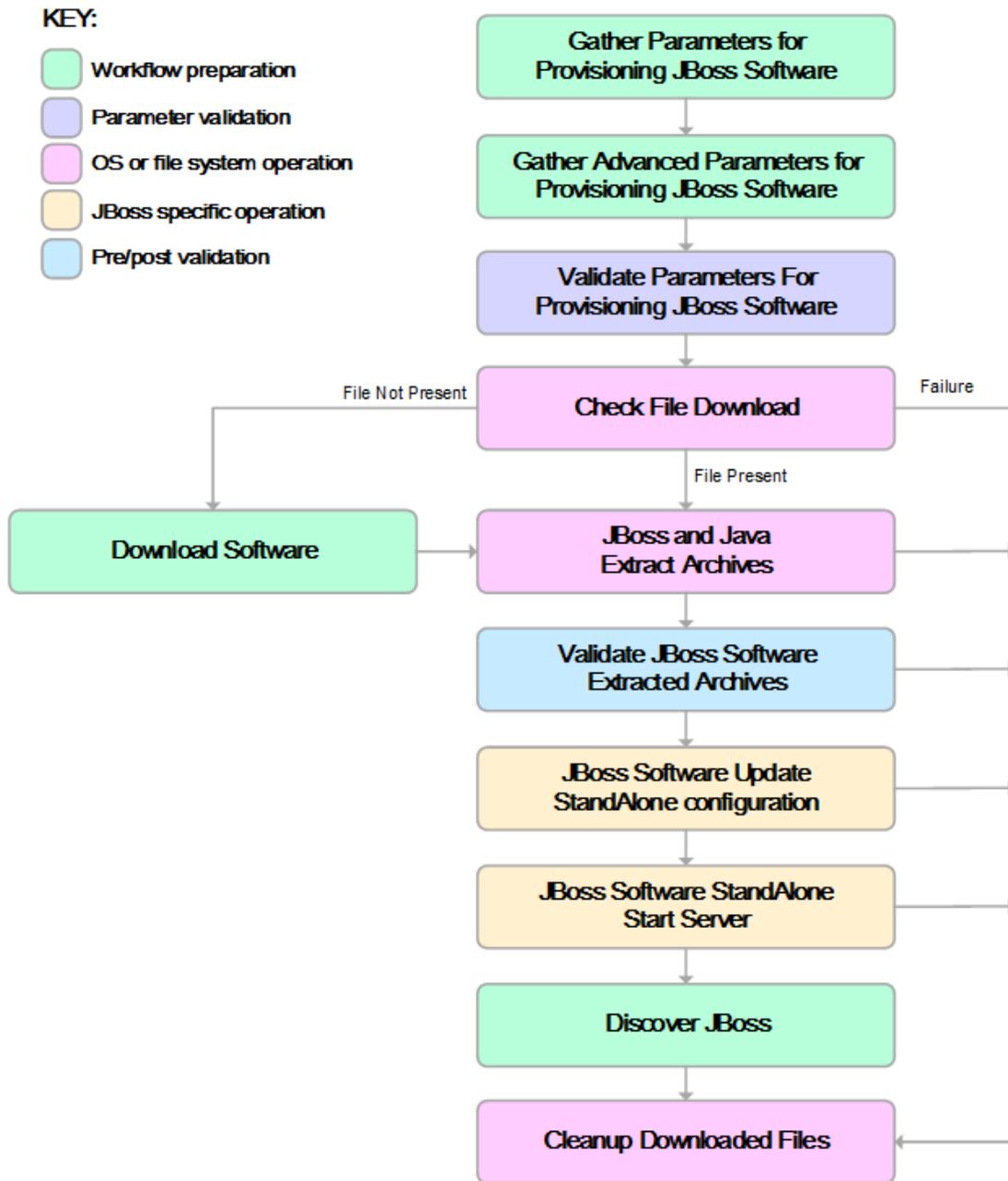
### Validation Checks Performed

The workflow checks the following things prior to extracting the binaries. If any of these checks fails, the workflow fails.

1. All required parameters have values. If any required parameter does not have a value—either a value that you specify or a default value—the workflow fails.
2. Directories and host names are valid. No illegal characters are included. The fully qualified paths specified for downloading JBoss and Java binaries exist and point to the same folder, for example: `/example/downloads/`.
3. The Java version is 1.7 or later and the revision is 5 or later.
4. The operating system is a supported platform.
5. Sufficient disk space is available to extract the binary files from the compressed archive.
6. Sufficient disk space is available to install JBoss and Java.

### Steps Executed

The [JBoss - Provision Software](#) 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 subsequent steps are skipped.



## Process Flow

This workflow performs the following tasks:

1. Creates the call wrapper and determines the target server platform type.
2. Inputs the required and optional parameters for the workflow.
3. Validates the parameters needed to install JBoss and Java in standalone mode (see the [validation checks](#) performed).
4. Determines whether the JBoss and Java binary archives are present on the target server. If either archive is not present, the workflow downloads it from the software repository.
5. Extracts the JBoss and Java binary archives to the specified directories.
6. Validates that the Java version is 1.7 or later.
7. Updates the `standalone.xml` configuration file—required to start the server in standalone mode.
8. Starts the new standalone JBoss application server.
9. Captures information learned during the provisioning process in HP DMA metadata fields.
10. Cleans up downloaded files that are no longer required, based on user-specified flags in the event of workflow success or failure.

## How to Run this Workflow

This topic explains how to customize and run the [JBoss - Provision Software](#) workflow in your environment.

**Note:** Prior to running this workflow, review the [Prerequisites for this Workflow](#), and ensure that all requirements are satisfied.

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

### To customize and run the JBoss - Provision Software workflow:

1. Create a deployable copy of the workflow (see "Create a Deployable Workflow" in *HP DMA Quick Start Tutorial*).
2. Determine the values that you will specify for the following parameters. These are the parameters that are visible in the deployment by default.

Parameter Name	Default Value	Description
Java Binary Archive	no default	Fully qualified path to where the compressed Java software package should be located on the target machine. The directory should exist on the target machine and must be the same directory specified in the JBoss Binary Archive parameter. If the Java software package is not available in this directory, then it will be downloaded from the software repository and placed in this directory. For example: /example/downloads/jdk-7u71-linux-x64.gz
JBoss Binary Archive	no default	Fully qualified path to where the compressed JBoss software package should be located on the target machine. The directory should exist on the target machine and must be the same directory that is provided in the Java Binary Archive Parameter. If the JBoss software package is not available in this directory, then it will be downloaded from the software repository and placed in this directory. For example: /example/downloads/wildfly-9.0.0.Alpha1.tar.gz
Web Service Password	no default	Password for the HP DMA Discovery web service API.
Web Service URL	no default	URL for the HP DMA Discovery web service API.
Web Service User	no default	User capable of modifying the managed environment through the HP DMA Discovery web service API.

See [Parameters for JBoss - Provision Software](#) for detailed descriptions of all input parameters for this workflow, including default values.

3. In the workflow editor, expose any additional parameters that you need (see [How to Expose Additional Workflow Parameters](#) on page 46). You will specify values for those parameters when you create the deployment.
4. Save the changes to the workflow (click **Save** in the lower right corner).
5. Create a new deployment (see "Create a Deployment" in *HP DMA Quick Start Tutorial* for instructions).
6. On the Parameters tab, specify values for the required parameters listed in step 2 and any additional parameters that you have exposed. You do not need to specify values for those parameters whose default values are appropriate for your environment.
7. On the Targets tab, specify one or more targets for this deployment.
8. Save the deployment (click **Save** in the lower right corner).
9. Run the workflow using this deployment (see "Run Your Workflow" in *HP DMA Quick Start Tutorial* for instructions).

The workflow will complete and report "Success" on the Console if it has run successfully. If an invalid parameter value is specified, an error is logged, and the workflow terminates in the "Failure" state.

## Sample Scenarios

This topic shows you how to use various parameters to achieve the following provisioning scenarios in your environment using the [JBoss - Provision Software](#) workflow:

### Scenario 1: Install JBoss Enterprise Application Platform 6 (EAP)

Specify values for the following parameters to install the EAP 6.3.0 version of JBoss. The downloaded JBoss and Java binaries will be removed upon successful or unsuccessful execution of the workflow.

Step Name	Parameter Name	Example Value
Gather Parameters for Provisioning JBoss Software	Java Binary Archive	/example/downloads/jdk-7u71-linux-x64.gz
	JBoss Binary Archive	/example/downloads/jboss-eap-6.3.0.zip
	Web Service Password	mypwd
	Web Service URL	https://mycomputername:8443/dma
	Web Service User	myusername
Gather Advanced Parameters for Provisioning JBoss Software	Clean on Failure	True
	Clean on Success	True
	Install Dir	/opt/jboss

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

### Scenario 2: Install JBoss WildFly

Specify values for the following parameters to install the WildFly 9.0.0 Alpha1 version of JBoss in the `/opt/wildfly` folder. The downloaded JBoss and Java binaries will not be removed upon successful or unsuccessful execution of the workflow. You need to expose the advanced parameters in your copy of the workflow in order to implement this scenario (see [How to Expose Additional Workflow Parameters](#) on page 46).

Step Name	Parameter Name	Example Value
Gather Parameters for Provisioning JBoss Software	Java Binary Archive	<code>/example/downloads/jdk-7u71-linux-x64.gz</code>
	JBoss Binary Archive	<code>/example/downloads/wildfly-9.0.0.Alpha1.tar.gz</code>
	Web Service Password	<code>mypwd</code>
	Web Service URL	<code>https://mycomputername:8443/dma</code>
	Web Service User	<code>myusername</code>
Gather Advanced Parameters for Provisioning JBoss Software	Clean on Failure	<code>False</code>
	Clean on Success	<code>False</code>
	Install Dir	<code>/opt/wildfly</code>

## Parameters for JBoss - Provision Software

The following tables describe the required and optional input parameters for this workflow. Several of these parameters are not initially visible in a deployment (see [How to Expose Additional Workflow Parameters](#) on page 46). For many parameters, if you do not specify a value for a parameter, a default value is assigned

### Parameters Defined in this Step: Gather Parameters for Provisioning JBoss Software

Parameter Name	Default Value	Required	Description
Java Binary Archive	no default	required	Fully qualified path to where the compressed Java software package should be located on the target machine. The directory should exist on the target machine and must be the same directory specified in the JBoss Binary Archive parameter. If the Java software package is not available in this directory, then it will be downloaded from the software repository and placed in this directory.  For example: /example/downloads/jdk-7u71-linux-x64.gz
JBoss Binary Archive	no default	required	Fully qualified path to where the compressed JBoss software package should be located on the target machine. The directory should exist on the target machine and must be the same directory that is provided in the Java Binary Archive Parameter. If the JBoss software package is not available in this directory, then it will be downloaded from the software repository and placed in this directory.  For example: /example/downloads/wildfly-9.0.0.Alpha1.tar.gz
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.
Web Service User	no default	required	User capable of modifying the managed environment through the HP DMA Discovery web service API.

Parameters Defined in this Step: Gather Advanced Parameters for Provisioning JBoss Software

Parameter Name	Default Value	Required	Description
Clean on Failure	True	optional	Flag that determines whether to clean up on workflow failure. If set to 'True', the workflow will clean up the downloaded files. Valid values are 'True' and 'False'. The default value is 'True'.
Clean on Success	True	optional	Flag that determines whether to clean up on workflow success. If set to 'True', the workflow will clean up the downloaded files. Valid values are 'True' and 'False'. The default value is 'True'.
Install Dir	UNIX: /opt/jboss  Windows: C:\jboss	optional	Fully qualified path of location to the uncompressed Java and JBoss binaries.

# Chapter 3: Reference Information

This page shows you where to find additional information about the JBoss products discussed in this guide and about HP DMA.

## JBoss Product Documentation

The following JBoss product documentation is available online:

### **Red Hat JBoss Enterprise Application Platform (EAP) and/or Enterprise Web Platform (EWP) version 5.1.1**

- Product Documentation Home: <http://docs.redhat.com/docs/en-US/index.html>
- Hardware and Software Requirements: [https://access.redhat.com/documentation/en-US/JBoss\\_Enterprise\\_Application\\_Platform/5/html/Installation\\_Guide/index.html](https://access.redhat.com/documentation/en-US/JBoss_Enterprise_Application_Platform/5/html/Installation_Guide/index.html)

### **JBoss Application Server 7 Community version**

- Product Documentation Home: <https://docs.jboss.org/author/display/AS71/Documentation>
- Hardware and Software Requirements: <https://docs.jboss.org/author/display/AS71/Getting+Started+Guide>

### **JBoss Enterprise Application Platform (EAP) version**

- Product Documentation Home: <http://www.jboss.org/products/eap/overview/>
- Hardware and Software Requirements: <http://www.jboss.org/products/eap/get-started/>

### **JBoss WildFly version**

- Product Documentation Home: <http://www.wildfly.org/>
- Hardware and Software Requirements: <https://docs.jboss.org/author/display/WFLY8/Admin+Guide>

## HP DMA Documentation

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

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

<https://softwaresupport.hp.com/>

# Chapter 4: Tips and Best Practices

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

- [How this Solution is Organized](#) on the next page
- [How to Expose Additional Workflow Parameters](#) on page 46
- [How to Use a Policy to Specify Parameter Values](#) on page 47
- [How to Import a File into the Software Repository](#) on page 50

## How this Solution is Organized

In HP DMA, a workflow executes a process—such as installing a software product or creating a database.

A solution pack contains one or more related workflow templates. This solution pack contains the following workflow templates:

### **Provision Red Hat JBoss StandAlone**

Use this workflow to perform one or both of the following actions:

- Install Red Hat JBoss Enterprise Application Platform (EAP) version 5.1.1 and the Java Software Development Kit (SDK) version 1.6. Start a single, default profile application server.
- Install Red Hat JBoss Enterprise Web Platform (EWP) version 5.1.1 and the Java SDK version 1.6. Start a single, default profile application server.

You can use the workflow to install up to four JBoss instances per server.

The workflow performs checks to determine whether the JBoss and Java binaries exist on the target server. If they do not, the workflow downloads them from the software repository (see [How to Import a File into the Software Repository](#) on page 50 for more information).

The workflow also performs validation checks at the operating system level, including file system space checks and Java version level checks.

### **Provision Open Source JBoss 7 StandAlone Mode**

Use this workflow to install the open source JBoss Application Server 7 Community version (JBoss AS 7) and start a single, default profile application server.

The workflow performs checks to determine whether the JBoss and Java binaries exist on the target server. If they do not, the workflow downloads them from the software repository.

The workflow also performs validation checks at the operating system level, including file system space checks and Java version level checks.

### **JBoss - Provision Software**

Use this workflow to install a new instance of a standalone JBoss Application Server supporting Enterprise Application Platform (EAP) and WildFly versions of JBoss.

The workflow performs checks to determine whether the JBoss and Java binaries exist on the target server. If they do not, the workflow downloads them from the software repository (see [How to Import a File into the Software Repository](#) on page 50 for more information).

The workflow also performs validation checks at the operating system level, including file system space checks and Java version level checks.

## What's Inside

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

The screenshot shows the HP Database & Middleware Automation web interface. At the top, there is a navigation bar with the following items: Home, Automation, Reports, Environment, Solutions, Setup, Workflows, Steps, Functions, Policies, Deployments, Run, Console, and History. The main heading is "Provision Red Hat JBoss StandAlone". Below this heading are four tabs: Documentation (selected), Workflow, Deployments, and Roles. The "Documentation" tab is active, displaying the following information:

- Name: Provision Red Hat JBoss StandAlone
- Tags:
- Type: OS
- Target level: Server

Below this information is a section titled "Documentation:" which contains a scrollable area with the following content:

**Purpose**  
This workflow installs a new instance of Red Hat JBoss Enterprise Application Platform and Enterprise Web Platform 5.1.1 and starts up a standalone default profile.

**Platforms**  
This workflow installs the Red Hat JBoss 5.1.1 Base core product binaries on the following operating system platforms:

- Red Hat Enterprise Linux 5.x and 6.1
- Solaris 10 SPARC 64
- Microsoft Windows 2008 R2

For a list of the specific OS versions supported, refer to the *HP Database and Middleware Automation Support Matrix* (see [Additional Documentation](#) below).

**Parameters**

Parameter	Default	Required	Description
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At the bottom right of the scrollable area are links for [HELP](#) and [PDF](#). At the very bottom of the page, there is a footer bar with icons for Copy, EXPORT, and EXTRACT POLICY, along with the text "HP DMA APPLICATION SERVER PROVISIONING SOLUTION PACK".

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

hp Database & Middleware Automation

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

### JBoss Update StandAlone configuration

General Action Parameters History Workflows Solutions Roles

Properties Documentation

Name: JBoss Update StandAlone configuration  
 Tags: Provision, standalone  
 Type: OS  
 Category: Script  
 Targetable:

Description:  
 Prepares the run.conf and security related properties files in order to start the application server securely in standalone mode.

Dependencies:  
 Return Code:  
 0 = Step ran successfully  
 1 = Step failed.

Copy 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 also displayed on the Workflow tab for each workflow:

On the Workflow tab for each workflow.

JBoss Input Parameter Mapping / JBoss User

Optional: In a Unix environment this will set the user to install and run JBoss. The default is root. Currently, Windows is not supported. If a JBoss user is passed in this user must have access to write into the install dir.

Step	Name	Required Result	Next
1	JBoss Input Parameter Mapping		2
2	JBoss Validate Stand Alone Parameters	0	3, 4
3	JBoss OS Prerequisite Check	0	4, 5
4	Failure		

JBoss User: - User selected -

Click here

To see parameter description here

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

The screenshot shows the HP Database & Middleware Automation interface. At the top, there is a navigation bar with the following tabs: Home, Automation, Reports, Environment, Solutions, Setup, Workflows, Steps, Functions, Policies, Deployments, Run, Console, and History. Below this, the main content area is titled 'JBoss Validate Stand Alone Parameters'. Underneath the title, there are several tabs: General, Action, Parameters, History, Workflows, Solutions, and Roles. The 'Parameters' tab is currently selected. The main content area is titled 'Parameters' and contains a scrollable list of parameters. The list is divided into two sections: 'INPUT PARAMETERS' and 'OUTPUT PARAMETERS'. The 'INPUT PARAMETERS' section contains the following items: Admin Password, Admin User, Call Wrapper, HostName, Install Dir, JBoss Binary Archive, JBoss Type, JBoss User, Java Binary Archive, Trust SSL Certificates, Web Service Password, Web Service URL, and Web Service User. The 'OUTPUT PARAMETERS' section is currently empty. At the bottom of the parameters list, there is a 'Copy' button and a lock icon with the text 'THIS STEP IS READ ONLY'.

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

hp Database & Middleware Automation

Home Automation Reports Environment Solutions Setup

Workflows Steps Functions Policies Deployments Run Console History

### Example Deployment

Targets Parameters Roles

#### JBoss Input Parameter Mapping

JBoss User:  Text

Optional: In a Unix environment this will set the user to install and run JBoss. The default is root. Currently, Windows is not supported. If a JBoss user is passed in this user must have access to write into the install dir.

#### JBoss Validate Stand Alone Parameters

Admin Password:  Text

Required: Admin User password

Admin User:  Text

Required: User that will manage the JBoss environment

Install Dir:  Text

Optional: Fully qualified path of location to uncompress binaries Both Java and JBoss. Default is /opt/jboss on Unix and c:\jboss on Windows

Java Binary Archive:  Text

Required: Fully qualified path to where the compressed Java software package should be on the target machine. If the Java software package is not available in this location it will be downloaded from the software repository and placed in this location.

JBoss Binary Archive:  Text

Required: Fully qualified path to where the compressed JBoss software package should be on the target machine. If the JBoss software package is not available in this location it will be downloaded from the software repository and placed in this location.

JBoss Type:  Text

Required: Identify what type or flavor of JBoss that is going to be installed. Valid options are EAP or EWP.

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

# 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 Support web site: <https://softwaresupport.hp.com/>

## Create a Policy

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

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

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

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

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

## Extract a Policy

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

### To extract a policy:

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

## Reference the Policy in the Deployment

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

### To reference policy attributes in a deployment:

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

Admin Password:  Policy Attribute ▾

- Discovery.Web Service Password
- DTE - Policy.Password
- MyParameterValues.MyAdminPassword** 
- MyParameterValues.MyAdminUser
- MyParameterValues.MyDBUser
- MyParameterValues.MyDBUserPassword
- oracle software.oracle software

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

Admin Password:  Policy Attribute ▾

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

# How to Import a File into the Software Repository

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

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

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

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

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

# Chapter 5: Troubleshooting

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

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

## Target Type

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

## User Permissions and Related Requirements

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

Roles are assigned by the HP Server Automation administrator. They are then registered in HP DMA by your HP DMA administrator.

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

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

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

For more information, see the *HP DMA Administrator Guide*. This document is available on the HP Software Support web site: <https://softwaresupport.hp.com/>

## Discovery in HP DMA

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

You must explicitly initiate the process of discovery—it is not automatic. See the *HP DMA User Guide* for instructions. This document is available on the HP Software Support web site:

<https://softwaresupport.hp.com/>

# Glossary

## A

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### **automation items**

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

## B

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### **bridged execution**

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

## C

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### **capability**

Capabilities are collections of related privileges. There are three capabilities defined in HP DMA. Login Access capability enables a user to log in to the web interface. This capability does not guarantee that this user can view any organizations or automation items—permissions are required to access those items. Workflow Creator

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

### **connector**

HP DMA includes a Connector component that enables it to communicate with HP Server Automation. You must configure the Connector before you can run a workflow against a target.

### **cross-platform**

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

### **custom field**

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

## D

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### **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

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### **function**

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

## I

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### **input parameters**

A workflow has a set of required parameters for which you must specify a value. The required parameters are a subset of all the parameters associated with that workflow. The remaining parameters are considered optional. You can specify a value for an optional parameter by first exposing it using the workflow editor and then specifying the value when you create a deployment.

## M

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### **mapping**

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

## O

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### **organization**

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

## P

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### **parameters**

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

### **policy**

Policies are reusable sets of attributes that can be used as parameter values in deployments. Deployments can reference policy attributes to change the automation behavior. Policies provide values for input parameters. They can contain fixed values or reference Custom Fields. Policies enable HP DMA to manage groups of hundreds or thousands of servers at a time without the need to configure each individual server.

## R

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### **raw devices**

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

address space to the operating system kernel buffers.

### **role**

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

## **S**

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### **smart group**

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

### **software repository**

The software repository is where the workflow will look for any required files that are not found on the target server. If you are using HP DMA with HP Server Automation (SA), this repository is the SA Software Library.

### **solution pack**

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

### **steps**

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

## **T**

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### **target instance**

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

## **W**

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### **workflow**

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

### **workflow editor**

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

### **workflow templates**

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