HP Database and Middleware Automation

For the Linux operating system

Software Version: 10.10 or later

Integration Guide for HP Operations Orchestration 10.01

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

Document Changes

Chapter	Version	Changes
Title Page Legal Notices	10.10 or later	Updated dates, version numbers, and copyright dates.
Entire guide	10.21	Updated documentation template.
Troubleshooting	10.22	Explained how to resolve a connection error.

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Contents

Audience

This document is designed for experienced HP Operations Orchestration (HP OO) users who want to access HP Database and Middleware Automation (HP DMA) automation content by using HP OO flows.

To use the information presented in this guide effectively, you should have a basic understanding of HP DMA workflow execution and administration processes.

Document Map

The following table shows you how to navigate this guide:

Topic	Description
About the HP DMA Integration with HP OO	General information about the integration, including what it contains, what you can do with it, how to install it, and best practices for using it effectively.
HP DMA Flow Examples	Descriptions of the examples of HP OO flows that are included in the HP DMA content pack for HP OO. These examples are designed to show you how to create your own HP OO flows for accessing HP DMA content.
HP DMA Operations	Descriptions of the HP OO operations that are included in the HP DMA content pack for HP OO.
HP DMA Wizard for HP OO	Information about the HP DMA Operations Orchestration Configuration Wizard, a tool that enables you to automatically create HP OO flows that run HP DMA workflows.
Troubleshooting	Information to help you troubleshoot problems that may occur when you integrate HP DMA with HP OO or run the HP DMA Configuration Wizard for Operations Orchestration.

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 89.

Chapter 1: About the HP DMA Integration with HP OO

This chapter contains the following general information about this integration:

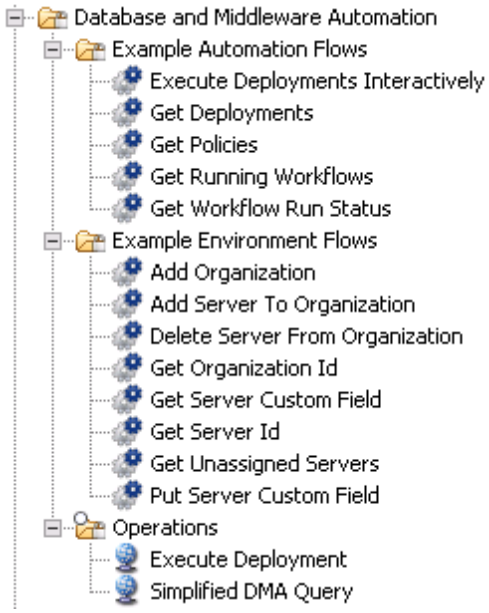
Overview

This document provides information about the HP Database and Middleware Automation (HP DMA) Content Pack for HP Operations Orchestration (HP OO), a collection of example flows and operations that you can use to manage and invoke HP DMA automation content from HP OO. This document also provides information about the HP DMA Wizard for HP OO.

This overview contains general information that pertains to all of the HP DMA REST APIs. It includes the following information:

What's Included in the HP DMA Content Pack

The HP DMA Content Pack contains the following example flows and operations:



Documentation Conventions

The notation <*something*> indicates a placeholder for a specific piece of information. For example, <*dmaServer*> is the host name or IP address of your HP DMA server.

Information that appears in a gray box represents the response body or request body for an HP DMA API request.

HP DMA API Return Codes

Every HP DMA API request returns a code that tells you whether the specified operation was successful:

Code	Meaning
200 SC_OK	The GET, PUT, or DELETE was successfully completed.
201 SC_ CREATED	The POST was successfully completed.
400 SC_BAD_ REQUEST	The GET, PUT, POST, or DELETE could not be completed due to a problem in the request
401 SC_ UNAUTHORIZED	The user making the request did not specify credentials (user name and password), or the credentials were invalid. NOTE: HP DMA uses HTTP Basic authentication.
403 SC_ FORBIDDEN	The PUT, POST, or DELETE could not be completed, because the user does not have write permission for that object, or because the object is locked.
404 SC_NOT_ FOUND	The target object for the GET, PUT, or DELETE does not exist, or the user does not have read permission for that object.
405 SC_NOT_ ALLOWED	The resource does not support the specified method.
409 SC_ CONFLICT	For a POST, the object cannot be created because an object with the same name already exists. For a DELETE, the object cannot be deleted because it is in use (for example: a step that is used by a workflow).

Permissions and Capabilities

The HP DMA capabilities and permissions associated with the specified dmaUser's role (or roles) determine which resources that user can read (GET) and write (PUT, POST, DELETE).

Some flows require the dmaUser to have Administrator capability.

Where to Find More Information

For more information, see the following documents:

Where can I find information about...	Topic
Details about the HP DMA REST APIs	*HP DMA API Reference Guide* (see below)

Where can I find information about...	Topic
HP DMA concepts and features	*HP DMA User Guide* *HP DMA Concepts Guide*
Installing HP DMA	*HP DMA Installation Guide*
Administering HP DMA	*HP DMA Administrator Guide*
HP DMA Solution Packs	Individual *HP DMA Solution Pack User Guides*
HP DMA best practices for using workflows	Individual *HP DMA Technical White Papers*
HP OO concepts and features	*HP OO Concepts Guide*
Creating HP OO flows and operations	*HP OO Studio Authoring Guide*
Using XPath to parse XML (for example: the XML returned by the HP DMA APIs)	There are many online sources of information about XPath. For example: http://www.w3schools.com/xpath/default.asp http://en.wikipedia.org/wiki/XPath
More detailed information about the example flows and operations described in this document	Examine each component step using the HP OO Studio Properties viewer.

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Updates to the *HP DMA API Reference Guide* are available on HP Live Network: http://hpln.hp.com/group/database-and-middleware-automation

Additional HP DMA and HP OO product documentation is available on the HP Software Support web site: https://softwaresupport.hp.com/

Supported Products and Platforms

This integration requires HP DMA version 10.10 or later.

Operating Systems

The HP DMA version 10.10 or later platform runs on Red Hat Enterprise Linux.

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

https://softwaresupport.hp.com/

For HP DMA hardware requirements, see the *HP Database and Middleware Automation Installation Guide*.

Software Requirements

This integration works with HP Operations Orchestration (HP OO) version 10.01 and requires the HP OO Base Content Pack version 1.0.121 or greater.

Note: You will need to use HP OO Studio to work with this integration. Installation instructions are, therefore, only provided for Windows installations. See "Testing and Deploying Flows" in the *HP OO Studio Authoring Guide* for information about publishing flows that you create to your staging or production HP OO environment.

Install the HP DMA Content Pack for HP OO

To view or use the example flows and operations included in the HP DMA content pack for HP OO, you must install this content pack in the pertinent HP OO repository.

Note: Before you install the HP DMA Content Pack, make sure that the HP OO base content pack is installed in HP OO Studio and the HP OO 10.01 patch is installed.

Note: On Windows 2008 and Windows 2008 R2 servers, you must have administrative privileges to install this content pack. To get administrative privileges, follow these steps:

1. On the Start menu select **All Programs**, and then **Accessories**.
2. Right-click **Command Prompt** and then select the **Run as administrator** option.

Download the HP DMA Content Pack

1. Go to the HP Live Network Database and Middleware Automation community:

   http://hpln.hp.com/group/database-and-middleware-automation

2. Click on the **DMA 10/OO 10 integration** link and then download and extract the `OO10-DMA10-integration_0.zip` file.

Import the HP DMA Content Pack into HP OO Studio

1. Open HP OO Studio.
2. Select **Import Content Pack**.
3. Navigate to where you extracted the `OO10-DMA10-integration_0.zip` file and locate the `DMA Integration-CP-1.0.1.jar` file.

Import the HP DMA Content Pack into HP OO Central

Tip: You may import the HP DMA Content Pack into HP OO Central at a later time.

Note: Before you install the HP DMA Content Pack, make sure that the HP OO base content pack has been imported into HP OO Central.

1. Log in to the HP OO Central, for example:

   `https://localhost:8443/oo`

2. Navigate to the Content Workspace.
3. Select **Deploy New Content**.
4. Select the plus sign (+) to open up a file browser.
5. Navigate to the HP DMA content file, click **Select**, and then click **Deploy**.

Save the HP DMA Configuration Wizard for HP OO

If you have not done so already, download the latest version of the HP DMA Configuration Wizard for Operations Orchestration from the HP Live Network site for HP DMA:

https://hpln.hp.com/group/database-and-middleware-automation

Save the `wswizard` executable file in the location of your choice.

Note: No installation is required for the HP DMA wizard. It is provided as a program executable and can be run from any location. The wizard is now ready to use.

Related Topics:

About the Wizard on page 85

Use the Wizard to Create OO Flows on page 86

Chapter 2: HP DMA Flow Examples

The HP DMA content pack for HP OO provides two groups of example flows that you can use to automate various database and middleware administration tasks in your managed server environment:

- Example Automation Flows on the next page
- Example Environment Flows on page 47

This document contains a brief description of each example flow. Additional detailed information is available on the Description tab in the for each flow in the Properties viewer in HP OO Studio.

See Also:

HP DMA Operations on page 78

HP DMA Wizard for HP OO on page 85

Example Automation Flows

The HP DMA content pack includes the following example automation flows:

Flow Name	Description
Example Flow: Execute Deployments Interactively	Enables you to execute a deployment to run an HP DMA workflow from HP OO.
Example Flow: Get Deployments	Returns a comma-separated list of all the deployments that have been created on the specified HP DMA server.
Example Flow: Get Policies	Returns a list of all the policies that have been created on the specified HP DMA server.
Example Flow: Get Running Workflows	Returns a comma-separated list of all the workflows that are currently running (or have completed in the last 60 seconds) on the specified HP DMA server.
Example Flow: Get Workflow Run Status	Returns information about a particular workflow execution on the specified HP DMA server.

See Also:

Example Environment Flows on page 47

HP DMA Operations on page 78

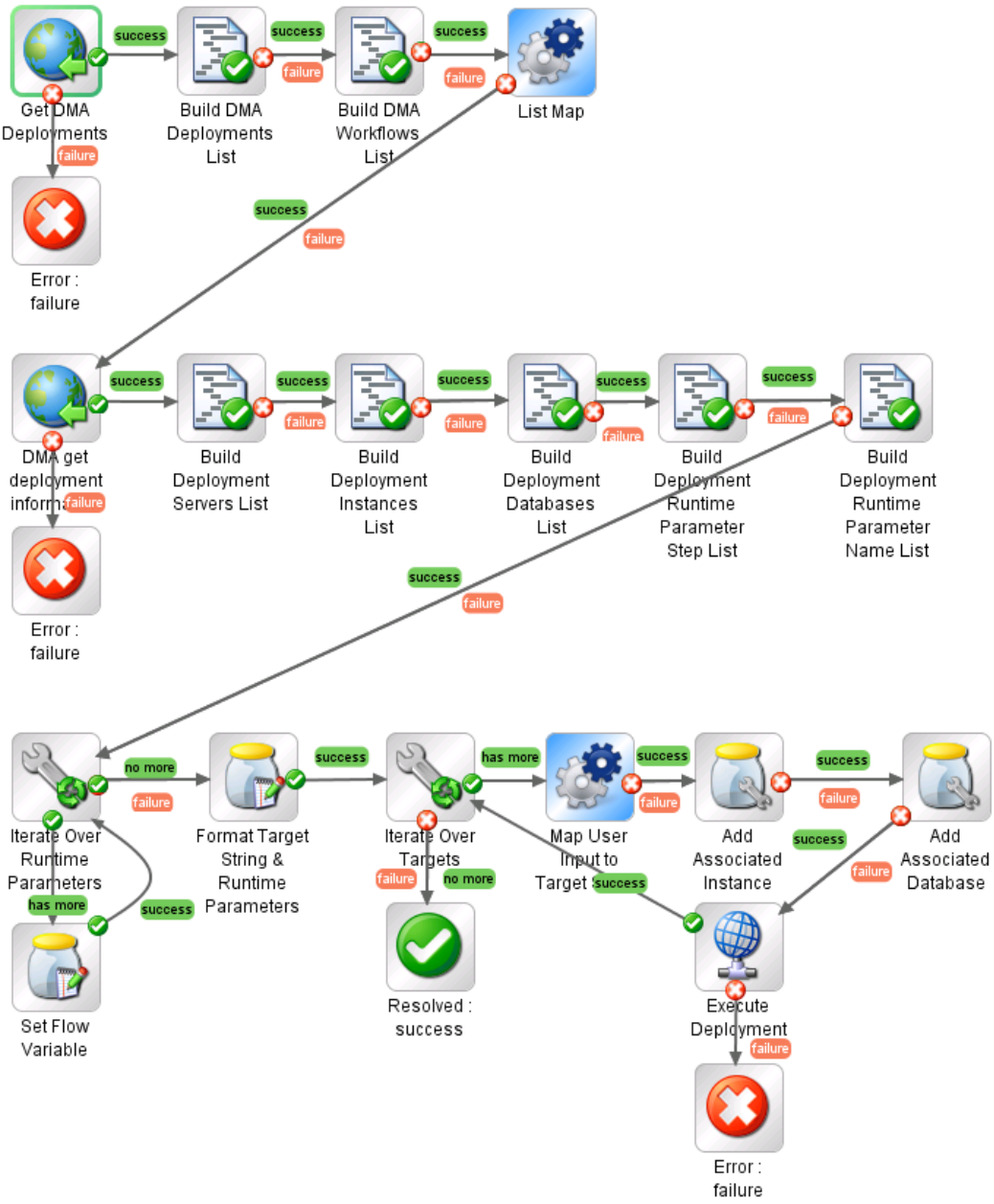
HP DMA Wizard for HP OO on page 85

Example Flow: Execute Deployments Interactively

The Execute Deployments Interactively example flow enables you to run an HP DMA workflow from HP OO. The flow does the following things:

- Creates a list of all deployments defined on the specified HP DMA server.
- Asks you to select a deployment from a drop-down list.
- Collects all the information that it needs to execute the deployment.
- Asks you to specify the targets and any parameter values that must be specified at run time.

- Executes the deployment to run the workflow against the specified targets.



The flow makes numerous calls to the HP DMA REST API to gather information and, ultimately, execute the deployment.

If it successfully completes all of these processes, it produces a Success response. If it fails to collect the information it needs or fails to run the workflow, it produces a Failure response.

To determine the result of the executed deployment, view the History page on your HP DMA server.

How to Use this Flow

Use this flow when you want to interactively select an HP DMA deployment and use that deployment to run a workflow on the HP DMA server.

Note: Deployment targets that include HP DMA Smart Groups are not currently supported by this flow.

This flow uses the Operation: Execute Deployment operation.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that returns a list of all workflows or all deployments.
- Invoke the HP DMA API to perform a GET operation that returns information about a specific workflow or deployment.
- Invoke the HP DMA API to perform a POST operation to run a workflow.
- Use XPath queries to retrieve information from the response bodies of the GET and POST operations.
- Create and present a list of choices to the user.
- Branch, iterate, and set flow variables based on the user's choices.

Flow Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to carry out the requested operation.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.

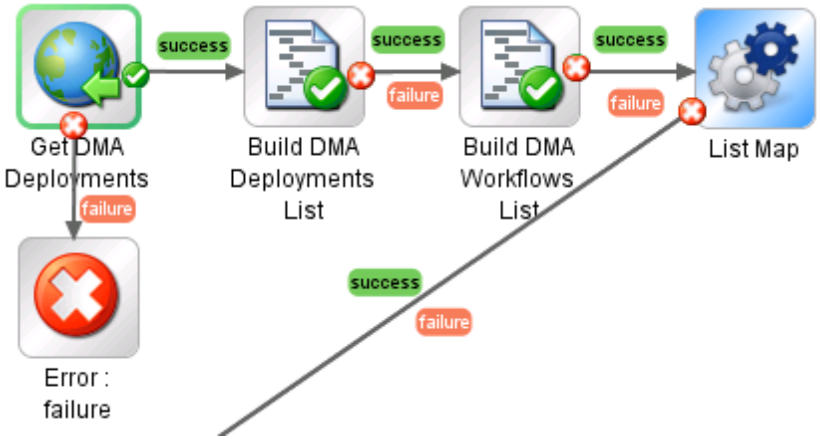
The flow prompts you for additional informations during Phase 1 and Phase 3.

How it Works

The flow has four major phases. Each is briefly described here. For additional detail, view the properties of each step in the flow by using the HP OO Studio Inspector.

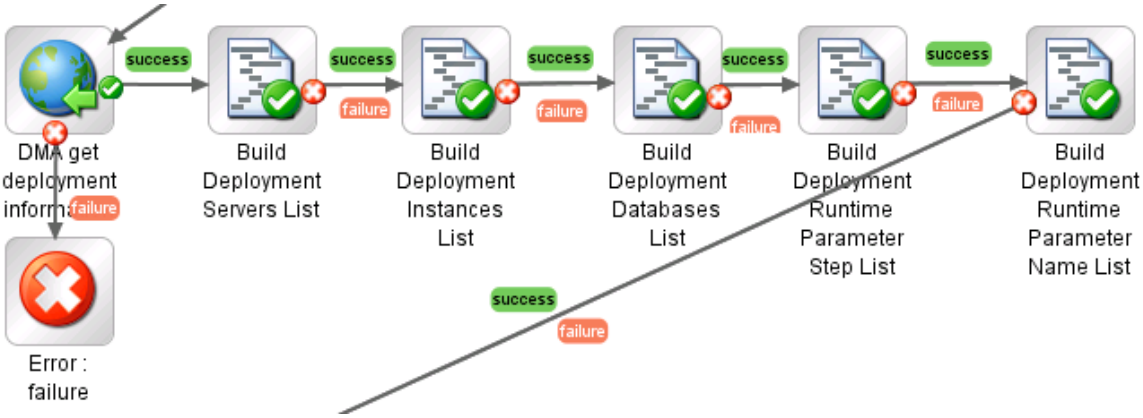
Phase 1: Select a deployment

Phase 1 prompts you for the flow inputs and then uses the HP DMA REST API to get a list of all the deployments and another list of all the workflows that exist on the HP DMA server. It then presents a drop-down list of deployments to choose from. You must select a deployment to proceed.



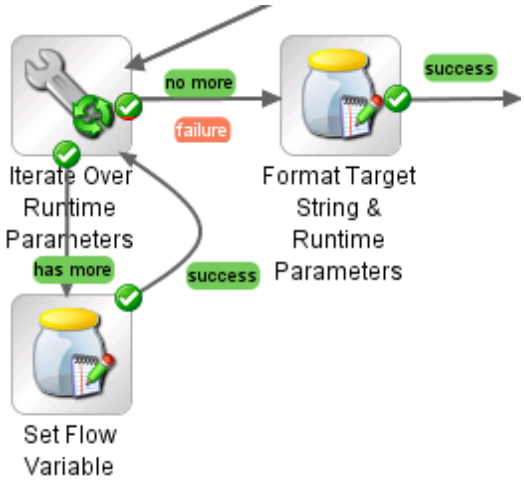
Phase 2: Get information required to execute the selected deployment

Phase 2 queries the HP DMA server to get all the information about the selected deployment. This includes the available targets (servers, instances, or databases) and any parameters that must be specified at run time. It then presents a drop-down list of targets to choose from. You must select one or more targets to proceed. To select multiple targets, use CTRL+click or SHIFT+click.



Phase 3: Execute the deployment to run the workflow

Phase 3 asks you to specify values for any Runtime parameters this deployment requires.



Phase 4: Execute the deployment

Phase 4 executes the deployment to run the workflow against all selected targets.

Permissions and Constraints

To successfully execute a deployment and run a workflow using this flow, the specified dmaUser must have the following permissions:

- READ permission on the workflow
- READ and EXECUTE permission on the deployment
- READ permission on the organizations where the targets reside

Users who have a role with Administrator capability can execute any deployment against any targets.

This flow does not support Smart Groups. Deployments that use Smart Groups to specify targets cannot be executed using this flow.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

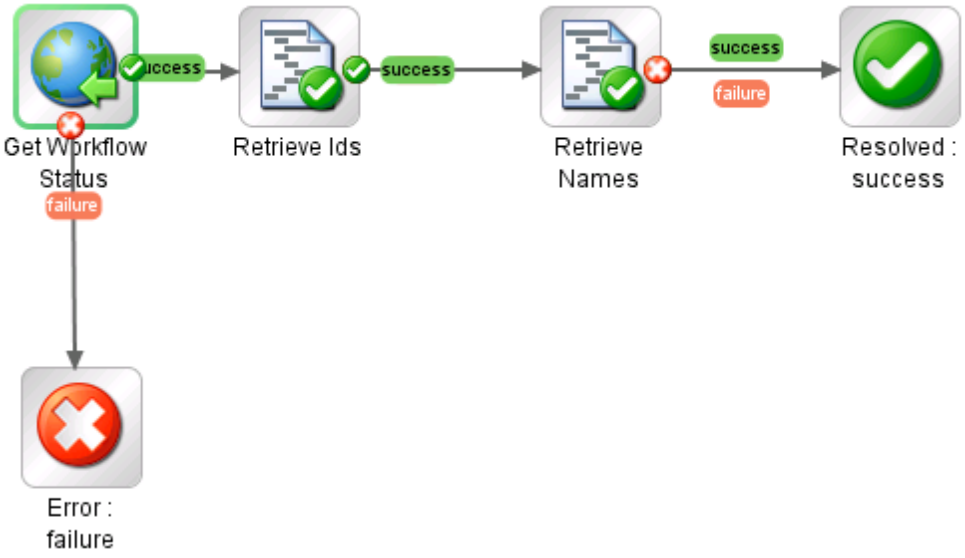
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Deployments

The Get Deployments example flow returns a comma-separated list of all the deployments that have been created on the specified HP DMA server. The flow returns the list of deployments in three different formats: deploymentNames, deploymentUUIDs, and deploymentUrls.



The flow produces a Success response as long as it successfully queries the HP DMA server using the HP DMA API. It produces a Failure response if it cannot query the HP DMA server for any reason.

How to Use this Flow

Use this flow when you want to obtain a list of all deployments defined on the HP DMA server.

You can use this flow as a step (subflow) in a larger flow that uses the Operation: Execute Deployment operation to run an HP DMA workflow using a specific deployment.

Note that this flow is used in the Example Flow: Execute Deployments Interactively example flow.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that returns the list of deployments currently defined on the specified HP DMA server.
- Use XPath queries to retrieve the URLs and names of the deployments from the response body of the GET operation.
- Use a scriptlet filter to extract the deployment UUIDs from the URLs.

Permissions and Constraints

Only those deployments for which the specified dmaUser has a role with READ permission will be included in the list. Users who have a role with Administrator capability can list all deployments.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to list the deployments.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
deploymentNames	Provision Oracle Software Linux 6.x 001, Provision WebSphere 8 and Depl Mgr 014, Run MS SQL Compliance Audit 005	List of deployments by name.
deploymentUUIDs	90cefae83eeccde1013eed02d3b1006d, 90cefae83ef26cbb013ef28074460002, 90cefae83ef1920b013ef1faf0f406c0	List of deployments by UUID.
deploymentUrls	https://dma1.mycompany.com:8443/dma/api/auto/deployment/90cefae83eeccde1013eed02d3b1006d, https://dma1.mycompany.com:8443/dma/api/auto/deployment/90cefae83ef26cbb013ef28074460002, https://dma1.mycompany.com:8443/dma/api/auto/deployment/90cefae83ef1920b013ef1faf0f406c0	List of deployments by URL.

How it Works

1. The Get Workflow Status step uses the HP DMA API to perform the following GET request:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/auto/deployment

   The GET request returns an XML feed that looks like this:

```
<feed>
    xmlns="http://www.w3.org/2005/Atom"
    xmlns:sop="http://www.hp.com/dma/api/sop"
    xmlns:env="http://www.hp.com/datapal/api/env">
    <id>https://dma1.mycompany.com:8443/dma/api/auto/deployment</id>
    <author>
        <name>HP DMA</name>
    </author>
    <updated>2013-05-30T10:12:47Z</updated>
    <title>Deployments</title>
    <link rel='self' type='application/atom+xml'
        href='https://dma1.mycompany.com:8443/dma/api/auto/deployment'/>
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/deployment/
            90cefae83eeccde1013eed02d3b1006d</id>
        <published>2013-05-30T10:12:47Z</published>
        <updated>2013-05-28T21:19:45Z</updated>
        <title>Provision Oracle Software Linux 6.x 001</title>
        <link rel='self' type='application/atom+xml'
           href='https://dma1.mycompany.com:8443/dma/api/auto/deployment/
           90cefae83eeccde1013eed02d3b1006d'/>
        <link rel='edit' type='application/atom+xml'
           href='https://dma1.mycompany.com:8443/dma/api/auto/deployment/
           90cefae83eeccde1013eed02d3b1006d'/>
        <link rel='alternate' type='text/html'
           href='https://dma1.mycompany.com:8443/dma/sop/deploy/view/
           90cefae83eeccde1013eed02d3b1006d'/>
        <link rel='parent' type='application/atom+xml'
           href='https://dma1.mycompany.com:8443/dma/api/auto/workflow/
           90cefae83eeccde1013eecfe5b610051'
           title='Provision Oracle Software'/>
        <sop:deployment name='Provision Oracle Software Linux 6.x 001'
            workflow='Provision Oracle Software'/>
    </entry>
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/deployment/
            90cefae83ef26cbb013ef28074460002</id>
        <published>2013-05-30T10:12:47Z</published>
        <updated>2013-05-29T22:55:04Z</updated>
        <title>Provision WebSphere 8 and Depl Mgr 014</title>
        <link rel='self' type='application/atom+xml'
           href='https://dma1.mycompany.com:8443/dma/api/auto/deployment/
           90cefae83ef26cbb013ef28074460002'/>
        <link rel='edit' type='application/atom+xml'
```

```
            href='https://dma1.mycompany.com:8443/dma/api/auto/deployment/
            90cefae83ef26cbb013ef28074460002'/>
        <link rel='alternate' type='text/html'
              href='https://dma1.mycompany.com:8443/dma/sop/deploy/view/
              90cefae83ef26cbb013ef28074460002'/>
        <link rel='parent' type='application/atom+xml'
            href='https://dma1.mycompany.com:8443/dma/api/auto/workflow/
            90cefae83ef1920b013ef1f7130006b9'
            title='Provision WebSphere 8 and Deployment Manager'/>
        <sop:deployment name='Provision WebSphere 8 and Depl Mgr 014'
            workflow='Provision WebSphere 8 and Deployment Manager' />
    </entry>
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/deployment/
            90cefae83ef1920b013ef1faf0f406c0</id>
        <published>2013-05-30T10:12:47Z</published>
        <updated>2013-05-29T20:29:14Z</updated>
        <title>Run MS SQL Compliance Audit 005</title>
        <link rel='self' type='application/atom+xml'
            href='https://dma1.mycompany.com:8443/dma/api/auto/deployment/
            90cefae83ef1920b013ef1faf0f406c0'/>
        <link rel='edit' type='application/atom+xml'
            href='https://dma1.mycompany.com:8443/dma/api/auto/deployment/
            90cefae83ef1920b013ef1faf0f406c0'/>
        <link rel='alternate' type='text/html'
            href='https://dma1.mycompany.com:8443/dma/sop/deploy/view/
            90cefae83ef1920b013ef1faf0f406c0'/>
        <link rel='parent' type='application/atom+xml'
            href='https://dma1.mycompany.com:8443/dma/api/auto/workflow/
            90cefae83ef1920b013ef1f7130006b9'
            title='Run MS SQL Compliance Audit'/>
        <sop:deployment name='Run MS SQL Compliance Audit 005'
            workflow='Run MS SQL Compliance Audit'/>
    </entry>
</feed>
```

If the GET request does not return valid XML, the flow terminates with a Failure response.

2. The Retrieve IDs step uses the following XPath query to extract the deploymentUrls (highlighted above) from the XML feed:

   ```
   /*[local-name()='feed']/*[local-name()='entry']/*[local-name()='id']
   ```

   It then uses the following scriptlet filter to extract the deploymentUUIDs from the deploymentUrls:

   ```
   scriptletResult = scriptletInput.match(/[a-z0-9]{32}/g,'')
   ```

3. The Retrieve Names step uses the following XPath query to extract the deploymentNames from the XML feed:

   ```
   /feed/entry/title/text()
   ```

4. If the flow has reached this point, it terminates with a Success response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

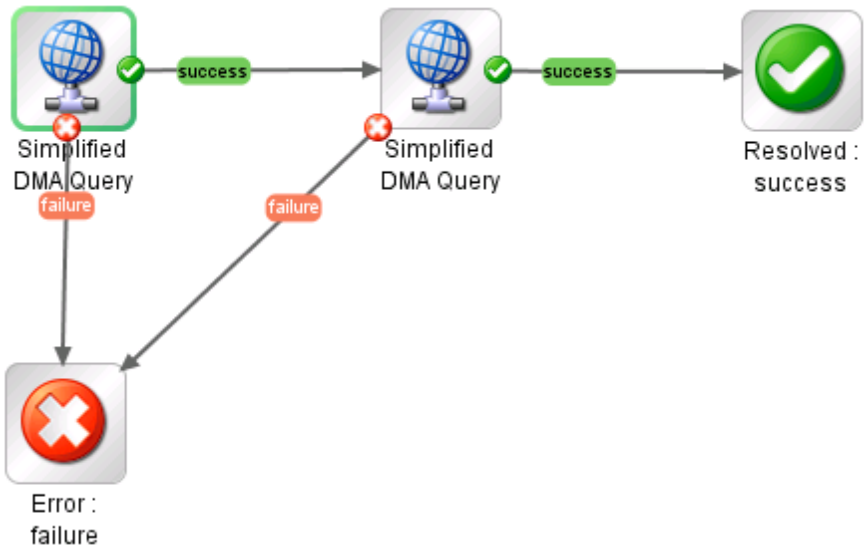
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Policies

The Get Policies example flow returns a list of all the policies that have been created on the specified HP DMA server. The flow returns the list of policies in three different formats: policyNames, policyUUIDs, and policyUrls.



The flow produces a Success response if it successfully retrieves and parses the list of policies. It produces a Failure response if it cannot retrieve or parse the list for any reason.

How to Use this Flow

Use this flow when you want to obtain a list of all policies defined on the HP DMA server.

You can use this flow as a step (subflow) in a larger flow that uses the Operation: Execute Deployment operation to run an HP DMA workflow.

Note that this flow contains two instances of the Operation: Simplified DMA Query operation.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that returns the list of policies currently defined on the specified HP DMA server.
- Use XPath queries to retrieve the URLs and names of the policies from the response body of the GET operation.
- Use a scriptlet filter to extract the policy UUIDs from the URLs.

Permissions and Constraints

Only those policies for which the specified dmaUser has a role with READ permission will be included in the list. Users who have a role with Administrator capability can list all policies.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to list the policies.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
policyNames	Discovery|MS SQL: Authentication|MS SQL: Patching	List of policies by name.
policyUUIDs	90cefae83eeccde1013eed09ede20375| 90cefae83eeccde1013eed0d1c31154e| 90cefae83eeccde1013eed0d1c091544	List of policies by UUID.
policyUrls	https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed09ede20375| https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed0d1c31154e| https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed0d1c091544	List of policies by URL.

How it Works

1. The first Operation: Simplified DMA Query step uses the HP DMA API to perform the following GET request:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/auto/policy

   The GET request returns an XML feed that looks like this:

```
<feed xmlns="http://www.w3.org/2005/Atom"
       xmlns:sop="http://www.hp.com/dma/api/sop">
   <id>https://dma1.mycompany.com:8443/dma/api/auto/policy</id>
   <author>
      <name>HP DMA</name>
   </author>
   <updated>2013-05-30T11:10:12Z</updated>
   <title>Policies</title>
   <link rel='self' type='application/atom+xml'
      href='https://dma1.mycompany.com:8443/dma/api/auto/policy'/>
   <entry>
      <id>https://dma1.mycompany.com:8443/dma/api/auto/policy/
          90cefae83eeccde1013eed09ede20375</id>
      <published>2013-05-30T11:10:12Z</published>
      <updated>2013-05-28T21:27:31Z</updated>
      <title>Discovery</title>
      <link rel='self' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/policy/
         90cefae83eeccde1013eed09ede20375'/>
      <link rel='edit' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/policy/
         90cefae83eeccde1013eed09ede20375'/>
      <link rel='alternate' type='text/html'
         href='https://dma1.mycompany.com:8443/dma/sop/policy/view/
         90cefae83eeccde1013eed09ede20375'/>
      <sop:policy name='Discovery' locked='true'/>
   </entry>
   <entry>
      <id>https://dma1.mycompany.com:8443/dma/api/auto/policy/
          90cefae83eeccde1013eed0d1c31154e</id>
      <published>2013-05-30T11:10:12Z</published>
      <updated>2013-05-28T21:30:59Z</updated>
      <title>MS SQL: Authentication</title>
      <link rel='self' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/policy/
         90cefae83eeccde1013eed0d1c31154e'/>
      <link rel='edit' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/policy/
         90cefae83eeccde1013eed0d1c31154e'/>
      <link rel='alternate' type='text/html'
         href='https://dma1.mycompany.com:8443/dma/sop/policy/view/
         90cefae83eeccde1013eed0d1c31154e'/>
      <sop:policy name='MS SQL: Authentication' locked='true'/>
```

```
   </entry>
   <entry>
      <id>https://dma1.mycompany.com:8443/dma/api/auto/policy/
          90cefae83eeccde1013eed0d1c091544</id>
      <published>2013-05-30T11:10:12Z</published>
      <updated>2013-05-28T21:30:59Z</updated>
      <title>MS SQL: Patching</title>
      <link rel='self' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/policy/
         90cefae83eeccde1013eed0d1c091544'/>
      <link rel='edit' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/policy/
         90cefae83eeccde1013eed0d1c091544'/>
      <link rel='alternate' type='text/html'
         href='https://dma1.mycompany.com:8443/dma/sop/policy/view/
         90cefae83eeccde1013eed0d1c091544'/>
      <sop:policy name='MS SQL: Patching' locked='true'/>
   </entry>
</feed>
```

The step uses the following XPath query to extract the policyUrls (highlighted above) from the XML feed:

```
/feed/entry/id/text()
```

It then uses the following scriptlet filter to extract the policyIds from the policyUrls:

```
scriptletResult = scriptletInput.match(/[a-z0-9]{32}/g,'')
```

If the GET request does not return valid XML, the flow terminates with a Failure response.

2. The second Operation: Simplified DMA Query step uses the HP DMA API to perform the same GET request, and then it uses this XPath query to extract the policyNames from the XML:

   ```
   //sop:policy/@name
   ```

   If this GET request does not return valid XML, the flow terminates with a Failure response.

3. If the two Operation: Simplified DMA Query steps successfully retrieve and extracts the list of policies in the three different formats, the flow terminates with a Success response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

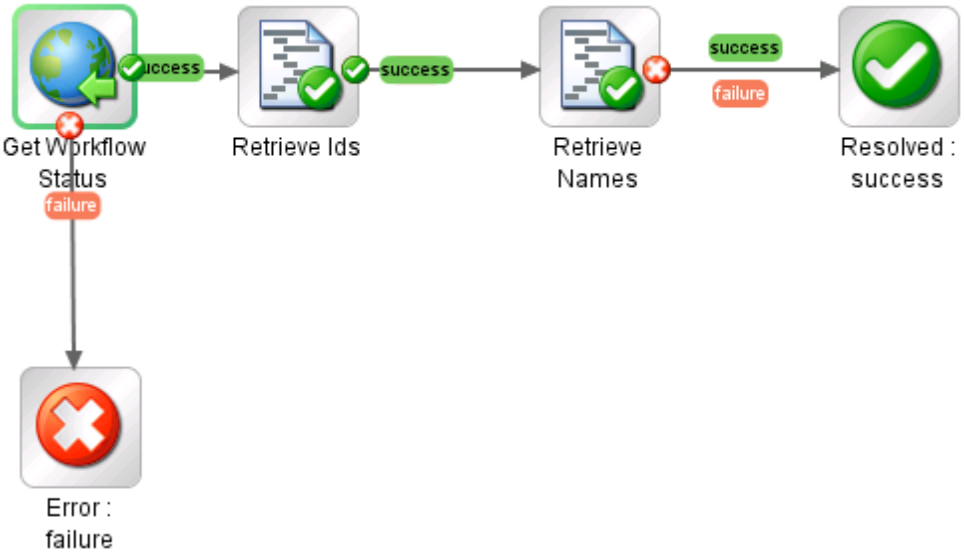
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Running Workflows

The Get Running Workflows example flow returns a comma-separated list of all the workflows that are currently running (or have completed in the last 60 seconds) on the specified HP DMA server. The flow returns the list of workflow executions in three different formats: workflowNames, workflowUUIDs, and workflowUrls.



The flow produces a Success response as long as it successfully queries the HP DMA server using the HP DMA API. It produces a Failure response if it cannot query the HP DMA server for any reason.

How to Use this Flow

Use this flow when you want to obtain a list of all workflows currently running on an HP DMA server.

You can use this flow as a step (subflow) in a larger flow that uses the Example Flow: Get Workflow Run Status flow to retrieve detailed information about a particular workflow execution..

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that returns the list of workflows currently running on the specified HP DMA server.
- Use XPath queries to retrieve the URLs and names of the workflow executions from the response body of the GET operation.
- Use a scriptlet filter to extract the workflow execution UUIDs from the URLs.

Permissions and Constraints

To view (GET) information about a workflow execution, the specified dmaUser must have a role with READ permission on the organization were the targets reside or EXECUTE permission on the pertinent deployment. Users who have a role with Administrator capability can list all workflow executions.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to list the workflows.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
workflowNames	Copy of Discovery,Copy of Provision Oracle Software,Copy of Create Sybase Database	List of running workflows by name.
workflowUUIDs	90cefae83ef26cbb013ef55a902e001f, 90cefae83ef26cbb013ef55a94d90048, 90cefae83ef26cbb013ef55a989b0070	List of running workflows by UUID.
workflowUrls	https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/90cefae83ef26cbb013ef55a902e001f|https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/90cefae83ef26cbb013ef55a94d90048|https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/90cefae83ef26cbb013ef55a989b0070	List of running workflows by URL.

How it Works

1. The Get Workflow Status step uses the HP DMA API to perform the following GET request:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/auto/running

   The GET request returns an XML feed that looks like this:

```
<feed>
    xmlns='http://www.w3.org/2005/Atom'
    xmlns:sop='http://www.hp.com/dma/api/sop'>
    <id>https://dma1.mycompany.com:8443/dma/api/auto/running</id>
    <author>
        <name>HP DMA</name>
    </author>
    <updated>2013-05-30T12:14:26Z</updated>
    <title>Active Workflows</title>
    <link rel='self' type='application/atom+xml'
       href='https://dma1.mycompany.com:8443/dma/api/auto/running' />
    <entry>
       <id>https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/
           90cefae83ef26cbb013ef55a902e001f</id>
       <published>2013-05-30T12:12:33Z</published>
       <updated>2013-05-30T12:12:33Z</updated>
       <title>Copy of Discovery</title>
       <link rel='alternate' type='application/atom+xml'
          href='https://dma1.mycompany.com:8443/dma/api/auto/running/
          workflow/90cefae83ef26cbb013ef55a902e001f' />
       <link rel='alternate' type='text/html'
          href='https://dma1.mycompany.com:8443/dma/sop/workflow/view/
          90cefae83eeccde1013eed0a873304c2' />
       <sop:target server='target1' />
       <sop:status state='Running'/>
       <sop:deployment name='Full Discovery Deployment'/>
    </entry>
    <entry>
       <id>https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/
           90cefae83ef26cbb013ef55a94d90048</id>
       <published>2013-05-30T12:12:34Z</published>
       <updated>2013-05-30T12:12:34Z</updated>
       <title>Copy of Provision Oracle Software</title>
       <link rel='alternate' type='application/atom+xml'
          href='https://dma1.mycompany.com:8443/dma/api/auto/running/
          workflow/90cefae83ef26cbb013ef55a94d90048' />
       <link rel='alternate' type='text/html'
          href='https://dma1.mycompany.com:8443/dma/sop/workflow/view/
          90cefae83eeccde1013eed0a873304c2' />
       <sop:target server='target2' />
       <sop:status state='Running'/>
       <sop:deployment name='Prov Oracle Software Linux 004'/>
    </entry>
    <entry>
```

```
      <id>https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/
          90cefae83ef26cbb013ef55a989b0070</id>
      <published>2013-05-30T12:12:35Z</published>
      <updated>2013-05-30T12:12:35Z</updated>
      <title>Copy of Create Sybase Database</title>
      <link rel='alternate' type='application/atom+xml'
         href='https://dma1.mycompany.com:8443/dma/api/auto/running/
         workflow/90cefae83ef26cbb013ef55a989b0070' />
      <link rel='alternate' type='text/html'
         href='https://dma1.mycompany.com:8443/dma/sop/workflow/view/
         90cefae83eeccde1013eed0a873304c2' />
      <sop:target server='target3' />
      <sop:status state='Failed'/>
      <sop:deployment name='Create Sybase DB 014'/>
   </entry>
</feed>
```

If the GET request does not return valid XML, the flow terminates with a Failure response.

2. The Retrieve IDs step uses the following XPath query to extract the workflowUrls (highlighted above) from the XML feed:

   ```
   /*[local-name()='feed']/*[local-name()='entry']/*[local-name()='id']
   ```

   It then uses the following scriptlet filter to extract the workflowUUIDs from the workflowUrls:

   ```
   scriptletResult = scriptletInput.match(/[a-z0-9]{32}/g,'')
   ```

3. The Retrieve Names step uses the following XPath query to extract the workflowNames from the XML feed:

   ```
   /*[local-name()='feed']/*[local-name()='entry']/*[local-name()='title']
   ```

4. If the flow has reached this point, it terminates with a Success response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Workflow Run Status

The Get Workflow Run Status example flow returns information about a particular workflow execution on the specified HP DMA server.

The flow produces a Success response as long as the HP DMA API returns information about the specified workflow execution. It produces a Failure response if the API does not return valid information.

The possible HP DMA workflow execution states are:

State	Description
RUNNING	The workflow is currently running on the specified target.
SUCCESS	The workflow has finished running, and the final step executed was the built-in Success step.
FAILED	The workflow has finished running, and the final step executed was the built-in Failure step. This usually indicates that an earlier step in the workflow failed to accomplish its objective.
FINISHED	The workflow ran to completion, but the final step executed was neither the built-in Success step nor the built-in Failure step.
SKIPPED	Pertains only to scheduled deployments. If a workflow is already running at the scheduled execution time, HP DMA will not attempt to start the workflow again. The scheduled deployment will be marked SKIPPED on the History page.
CANCELLED	An HP DMA user cancelled the workflow execution.
SKIPPED	This status pertains only to scheduled deployments. It indicates that the workflow was scheduled to run, but the execution was skipped. This would happen, for example, or if a previous execution of this workflow were still running on that target.

State	Description
ABORTED	HP DMA was unable to run the workflow. This usually means that the target server was not configured to run workflows, or a connectivity problem arose between either the HP DMA server or the SA server and one or more of the target servers.

How to Use this Flow

Use this flow when you want to know detailed information about a specific workflow execution and you have its UUID.

You can use the Example Flow: Get Running Workflows example flow to get the UUID for any current workflow execution that the specified dmaUser has permission to view.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for a specific workflow execution.
- Use XPath queries to retrieve information about the workflow execution from the response body of the GET operation.
- Use a scriptlet filter to compute the value of a result.

Permissions and Constraints

To view (GET) information about a workflow execution, the specified dmaUser must have a role with READ permission on the organization were the targets reside or EXECUTE permission on the pertinent deployment. Users who have a role with Administrator capability can list all workflow executions.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to carry out the requested operation.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
executionUUID	The universally unique identifier (UUID) of the workflow execution.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
lastStatusUpdate	2013-05-30T14:45:35Z	Time when the last step to execute was started.
currentRuntime	00:01:43	Elapsed time that the workflow has been running (in HH:MM:SS format). More precisely, the elapsed time between the startTime and the lastStatusUpdate.
currentStepName	Discovery Parameters	The name of the step that was initiated or running when the flow performed the GET request.
executionStatus	Running	The current status of the workflow execution: Initiated, Running, Finished, Success, Failure, Cancelled, Aborted, or Skipped See the *HP DMA User Guide* for definitions of these workflow execution states.
startTime	2013-05-30T14:44:31Z	Date and time that the workflow execution was initiated.

How it Works

1. The Get Workflow Status step uses the HP DMA API to perform a GET request using the specified organizationName and serverName:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/auto/running/<*executionUUID*>

   The GET request returns an XML feed that looks like the following example. Each `<entry>` element represents a step in the workflow that has been executed or is currently running. The `rc` attribute contains the return code for those steps that have finished. The `rc` attribute for the step that is currently running is empty.

```
<feed>
    xmlns='http://www.w3.org/2005/Atom'
    xmlns:sop='http://www.hp.com/dma/api/sop'>
    <id>https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/
        90cefae83ef26cbb013ef5e5b19e0de0</id>
    <author>
        <name>HP DMA</name>
    </author>
    <updated>2013-05-30T14:44:31Z</updated>
    <title>Copy of Discovery</title>
    <link rel='self' type='application/atom+xml'
       href='https://dma1.mycompany.com:8443/dma/api/auto/running/
       workflow/90cefae83ef26cbb013ef5e5b19e0de0' />
    <link rel='alternate' type='text/html'
       href='https://dma1.mycompany.com:8443/dma/sop/workflow/view/
       90cefae83eeccde1013eed0a873304c2' />
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e5b1c80de6</id>
        <published>2013-05-30T14:44:31Z</published>
        <updated>2013-05-30T14:44:56Z</updated>
        <title>Discovery Parameters</title>
        <link rel='alternate' type='application/atom+xml'
           href='https://dma1.mycompany.com:8443/dma/api/auto/running/
           workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
           90cefae83ef26cbb013ef5e5b1c80de6' />
        <link rel='alternate' type='text/html'
           href='https://dma1.mycompany.com:8443/dma/sop/step/view/
           90cefae83eeccde1013eed09eb430313' />
        <sop:status state='Finished' rc='0'/>
    </entry>
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e6133a0e0d</id>
        <published>2013-05-30T14:44:56Z</published>
        <updated>2013-05-30T14:45:15Z</updated>
        <title>Discover WebSphere</title>
        <link rel='alternate' type='application/atom+xml'
```

```
            href='https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e6133a0e0d' />
        <link rel='alternate' type='text/html'
            href='https://dma1.mycompany.com:8443/dma/sop/step/view/
            90cefae83eeccde1013eed09ec91033f' />
        <sop:status state='Finished' rc='1'/>
    </entry>
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e6604f0e78</id>
        <published>2013-05-30T14:45:15Z</published>
        <updated>2013-05-30T14:45:34Z</updated>
        <title>Discover Oracle Databases</title>
        <link rel='alternate' type='application/atom+xml'
            href='https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e6604f0e78' />
        <link rel='alternate' type='text/html'
            href='https://dma1.mycompany.com:8443/dma/sop/step/view/
            90cefae83eeccde1013eed09e0a50206' />
        <sop:status state='Finished' rc='1'/>
    </entry>
    <entry>
        <id>https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e6a9880ee4</id>
        <published>2013-05-30T14:45:34Z</published>
        <updated>2013-05-30T14:45:35Z</updated>
        <title>Discover SQL Databases</title>
        <link rel='alternate' type='application/atom+xml'
            href='https://dma1.mycompany.com:8443/dma/api/auto/running/
            workflow/90cefae83ef26cbb013ef5e5b19e0de0/step/
            90cefae83ef26cbb013ef5e6a9880ee4' />
        <link rel='alternate' type='text/html'
            href='https://dma1.mycompany.com:8443/dma/sop/step/view/
            90cefae83eeccde1013eed09e8e402d5' />
        <sop:status state='Running' rc=''/>
    </entry>
    <sop:target server='target5' />
    <sop:script-execution url='https://dma1.mycompany.com:8443/dma/api/
         auto/running/workflow/90cefae83ef26cbb013ef5e5b19e0de0/
         scriptExecution/90cefae83ef26cbb013ef5e5b3b90e08'/>
    <sop:status state='Running'/>
    <sop:deployment name='Full Discovery Deployment'/>
</feed>
```

If the GET request does not return valid XML, the flow terminates with a Failure response.

2. If the GET request successfully returns information about the specified workflow execution, the subsequent steps use the following XPath queries (or filters) to extract information from the XML response body returned by the GET:

Step Name	Result	XPath Query and Filter
Determine Start Time State	startTime	/*[local-name()='feed']/*[local-name()='updated']
Determine Running State	executionStatus	/*[local-name()='feed']/*[local-name()='status']/@state
Determine Last Status Update Time	lastStatusUpdate	/*[local-name()='feed']/*[local-name()='entry' and last()]/*[local-name()='updated'] RegEx filter: '[^\,]*$'

Step Name	Result	XPath Query and Filter

Determine Current Step	currentStepName
	
	currentRuntime
		/*[local-name()='feed']/*[local-name()='entry'][*[local-name()='status'][@*[local-name()='state'] = 'Running' or @*[local-name()='state'] = 'Initiated']]/*[local-name() ='title']
		
		Scriptlet used to compute currentRuntime:
		
		`var jsStartTime = ('' + startTime).replace(/-/g,"/").replace(/[TZ]/g," ");`
		`var jsLastUpdateTime = ('' + lastStatusUpdate).replace(/-/g,"/").replace(/[TZ]/g," ");`
		
		`var startDate = new Date(jsStartTime);`
		`var lastDate = new Date(jsLastUpdateTime);`
		
		`var milliseconds = lastDate.getTime() - startDate.getTime();`
		`var totalSeconds = milliseconds / 1000;`
		`var hours = parseInt( totalSeconds / 3600 ) % 24;`
		`var minutes = parseInt( totalSeconds / 60 ) % 60;`
		`var seconds = totalSeconds % 60;`
		
		`currentRuntime = (hours < 10 ? "0" + hours : hours) + ":" + (minutes < 10 ? "0" + minutes : minutes) + ":" + (seconds < 10 ? "0" + seconds : seconds);`
		
		`scriptletContext.putGlobal("currentRuntime", currentRuntime);`
		`scriptletResult = currentRuntime;`

3. If the flow reaches this point, it terminates with a Success response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

Example Environment Flows on the next page

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Environment Flows

The HP DMA content pack includes the following example environment flows:

Flow Name	Description
Example Flow: Add Organization	Creates a new organization in the HP DMA environment.
Example Flow: Add Server to Organization	Adds a server to a new or existing organization in the HP DMA environment.
Example Flow: Delete Server From Organization	Deletes the specified server from the specified organization in the HP DMA environment.
Example Flow: Get Organization Id	Returns the UUID of the specified organization in the HP DMA environment.
Example Flow: Get Server Custom Field	Returns the value of the specified server Custom Field.
Example Flow: Get Server Id	Returns the UUID of the specified server.
Example Flow: Get Unassigned Servers	Returns a list of servers that are available to add to HP DMA organizations.
Example Flow: Put Server Custom Field	Modifies the value of the specified server Custom Field.

See Also:

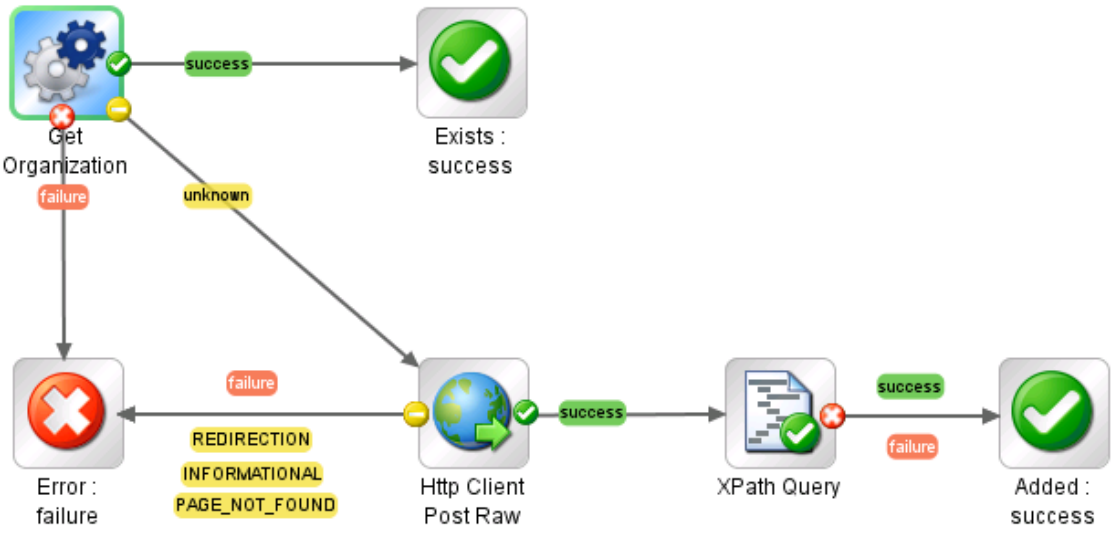
Example Automation Flows on page 17

HP DMA Operations on page 78

HP DMA Wizard for HP OO on page 85

Example Flow: Add Organization

The Add Organization example flow creates a new organization in the HP DMA environment. It first searches the HP DMA environment to determine whether the organization already exists. If the organization does not exist, it adds a new organization to the environment. The flow returns the UUID of the new or existing organization and the URL that you can use to access the organization using the HP DMA API.



The flow produces a Success response if it successfully adds the new organization or the organization already exists. The flow produces a Failure response if it is unable to either find or add the organization.

The flow also produces a Failure response if it is unable to contact the specified HP DMA server for any reason (for example: incorrect HP DMA server host name or IP address, incorrect user name or password, or a network connectivity problem).

How to Use this Flow

Use this flow when you want to create a new organization in your HP DMA environment.

You can use this flow in combination with the Example Flow: Add Server to Organization flow to populate your HP DMA environment.

After you add one or more servers to an organization, you can use the Example Automation Flows to run and monitor HP DMA workflows in your environment.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for an existing organization in the HP DMA environment by name and returns information about that organization, including its UUID.
- Invoke the HP DMA API to perform a POST operation that creates a new organization in the HP DMA environment.
- Use XPath queries to retrieve the UUID and URL of the organization from the response body of the GET or POST operation.

Permissions and Constraints

The following constraints determine what you can accomplish with this flow:

- The specified dmaUser must have a role with Administrator capability.
- Organization names must be unique.

When you create (POST) an organization using this flow, no roles have permission to READ, WRITE, or DEPLOY to the new organization. You can set the permissions by performing a PUT operation on the organization (or by using the HP DMA user interface).

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has privileges required to add a new organization or get information about an existing organization.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization that will be retrieved from or created in the HP DMA environment.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
organizationUUID	8f82f39d2e084d0b012e0a28bcfa0000	The universally unique identifier (UUID) of the organization. This is a 128-bit number (32 hexadecimal characters) that is unique within the HP DMA environment.
organizationUrl	https://dma1.mycompany.com:8443/dma/api/env/organization/8f82f39d2e084d0b012e0a28bcfa0000	URL of the organization. This URL can directly be used directly in subsequent HP DMA REST API calls (for example: a GET).

How it Works

1. The Get Organization Id step uses the HP DMA API to perform a GET request using the specified organizationName:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/organization?orgName=<*organizationName*>

   If the GET request fails for any reason, the flow terminates with a Failure reponse.

2. If an organization with that name exists in the HP DMA environment, the XPath Query step extracts the UUID of that organization from the XML response body returned by the GET:

   /*[local-name()='entry']/*[local-name()='id']

   The flow then terminates with a Success response.

3. If an organization with that name does not exist, the flow attempts to create it by performing a POST request:

   POST https://<*dmaServer*>:<*dmaPort*>/dma/api/env/organization

   Example of the request body (payload) for the POST:

```
<entry xmlns="http://www.w3.org/2005/Atom" xmlns:env="http://www.hp.com/d
atapal/api/env">
   <title>NewOrg</title>
   <env:organization name='NewOrg'>
      <env:permissions/>
```

```
   </env:organization>
</entry>
```

If the POST succeeds, the XPath Query step extracts the UUID of the new organization from the response body returned by the POST. The flow then terminates with a Success response.

If the POST fails, the flow terminates with a Failure response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

Example Environment Flows on page 47

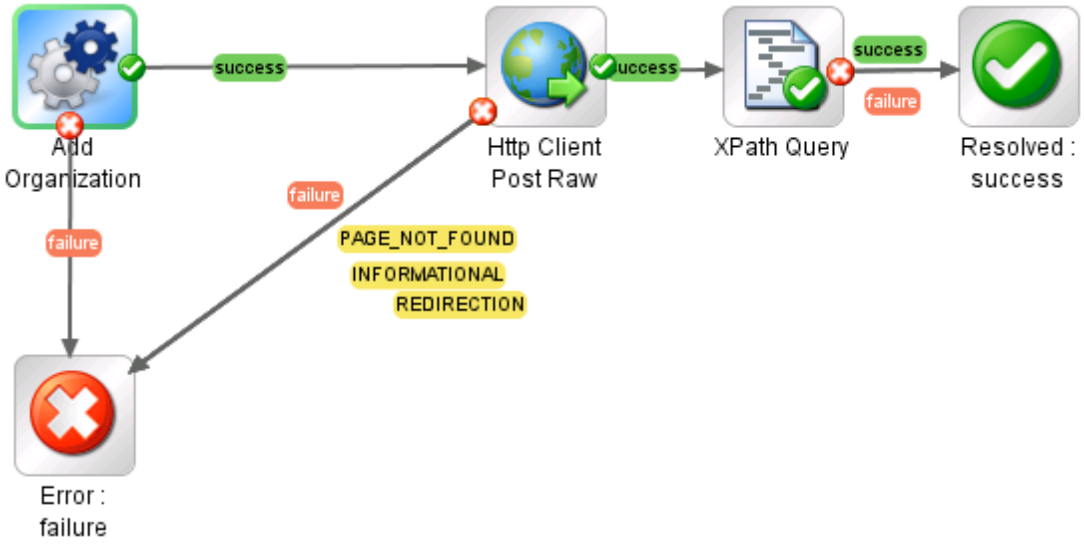
Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Add Server to Organization

The Add Server to Organization example flow adds a server to an organization in the HP DMA environment. It first searches the HP DMA environment to determine whether the specified organization already exists. If the organization does not exist, it adds a new organization to the environment. It then attempts to add the new server to the organization.

If it successfully adds the server, the flow returns the UUID of the new server and the URL that you can use to access the server using the HP DMA API.



The flow produces a Success response if it successfully adds the new server. The flow produces a Failure response under the following conditions:

- It is unable to either find or add the specified organization.
- It is unable to either add the specified server.
- The specified server is already included in an existing organization.
- The specified server is not included in the unassigned servers pool.
- The specified dmaUser does not have WRITE permission for the specified organization.

The flow also produces a Failure response if it is unable to contact the specified HP DMA server for any reason (for example: incorrect HP DMA server host name or IP address, incorrect user name or password, or a network connectivity problem).

How to Use this Flow

Use this flow when you want to add a server to an organization in your HP DMA environment.

To get a list of servers that can be added to organizations, use the Example Flow: Get Unassigned Servers flow.

To delete a server in an existing organization, use the Example Flow: Delete Server From Organization flow.

After you add one or more servers to an organization, you can use the Example Automation Flows to run and monitor HP DMA workflows in your environment.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for an existing organization in the HP DMA environment by name and returns information about that organization, including its UUID.
- Invoke the HP DMA API to perform a POST operation that creates a new organization in the HP DMA environment.
- Use XPath queries to retrieve the UUID and URL of the organization or server from the response body of the GET or POST operation.
- Invoke the HP DMA API to perform a POST operation that adds a server to an existing organization.

Permissions and Constraints

The following constraints determine what you can accomplish with this flow:

- The specified dmaUser must have a role with Administrator capability.
- Organization names must be unique.
- Server names must be unique.
- A server cannot be added to an organization if it is already assigned to another organization. Only unassigned servers can be added (see Example Flow: Get Unassigned Servers on page 69).
- A server must already exist in the server management platform before it can be added to an organization. With HP Server Automation (SA), for example, a server must be managed by SA and have the DMA Client Files policy (attached and remediated). Servers that meet these criteria appear in the list of unassigned servers.

When you add (POST) a server to an organization using this flow, no roles have permission to READ, WRITE, or DEPLOY to the new server. You can set the permissions by performing a PUT operation on the organization (or by using the HP DMA user interface).

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has privileges required to add a new organization or get information about an existing organization.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization that will be retrieved from or created in the HP DMA environment.
serverName	Name of the server that will be added to the organization.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
serverUUID	ff8080813eecf0a2013ef02fb1030005	The universally unique identifier (UUID) of the server. This is a 128-bit number (32 hexadecimal characters) that is unique within the HP DMA environment.
serverUrl	https://dma1.mycompany.com:8443/dma/api/env/server/ff8080813eecf0a2013ef02fb1030005	URL of the server. This URL can directly be used directly in subsequent HP DMA REST API calls (for example: a GET).

How it Works

1. The Get Organization Id step uses the HP DMA API to perform a GET request using the specified organizationName:

   GET
   https://<*dmaServer*>:<*dmaPort*>/dma/api/env/organization?orgName=<*organizationName*>

   If the GET request cannot be completed, the flow terminates with a Failure reponse.

2. If an organization with that name exists in the HP DMA environment, the XPath Query step extracts the UUID of that organization from the XML response body returned by the GET:

   /*[local-name()='entry']/*[local-name()='id']

3. If an organization with that name does not exist, the flow attempts to create it by performing a POST request:

   POST https://<*dmaServer*>:<*dmaPort*>/dma/api/env/organization

   Example of the request body (payload) for the POST:

   ```
   <entry xmlns="http://www.w3.org/2005/Atom" xmlns:env="http://www.hp.com/d
   atapal/api/env">
      <title>NewOrg</title>
      <env:organization name='NewOrg'>
         <env:permissions/>
      </env:organization>
   </entry>
   ```

   If the POST succeeds, the XPath Query step extracts the UUID of the new organization from the response body returned by the POST.

   If the POST fails, the flow terminates with a Failure response.

4. The flow then attempts to add the specified server to the organization by performing a POST request:

   POST https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server

   Example of the request body (payload) for the POST:

   ```
   <entry xmlns='https://www.w3.org/2005/Atom' xmlns:env='https://www.hp.com
   /datapal/api/env'>
       <link rel='parent' type='application/atom+xml' href='https://DMA1.myc
   ```

```
ompany.com:8443/dma/api/env/organization/8f82f39d2e084d0b012e0a28bcfa000
0' />
    <env:server name='target3.mycompany.com'>
    </env:server>
</entry>
```

If the POST succeeds, the XPath Query step extracts the UUID of the server from the response body returned by the POST.

If the POST fails, the flow terminates with a Failure response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

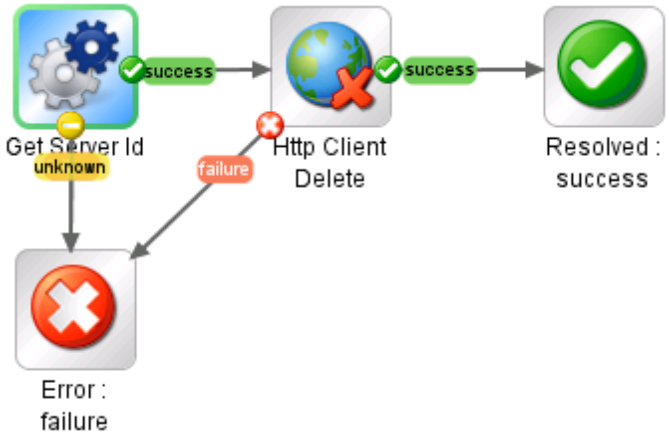
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Delete Server From Organization

The Delete Server From Organization example flow deletes the specified server from the specified organization in the HP DMA environment. This server then becomes part of the unassigned servers pool and can be added to any organization.



The flow produces a Success response if it successfully deletes the server from the organization. It produces a Failure response under the following conditions:

- It is unable to either find the specified server.
- The specified dmaUser does not have a role with both READ and WRITE permission for the specified organization.
- The specified server contains one or more instances.
- The specified server is currently a target for one or more deployments.

The flow also produces a Failure response if it is unable to contact the specified HP DMA server for any reason (for example: incorrect HP DMA server host name or IP address, incorrect user name or password, or a network connectivity problem).

How to Use this Flow

Use this flow when you want to delete a server from an organization and return it to the unassigned servers pool.

Note that the Example Flow: Get Server Id example flow is used as a step (subflow) in this flow.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for a specific server in the HP DMA environment by name and returns the server's UUID.
- Use XPath queries to retrieve the UUID of the server from the response body of the GET.
- Invoke the HP DMA API to perform a DELETE operation that deletes the server from the specified organization.

Permissions and Constraints

The following constraints determine what you can accomplish with this flow:

- The specified dmaUser must have a role with both READ and WRITE permission for the specified organization.
- You cannot delete a server that contains one or more instances.
- You cannot delete a server that is specified as a target for any deployment.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has privileges required to get information about and make changes to the specified organization.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization in which the specified server resides.
serverName	Name of the server that will be deleted from the specified organization.

Results

This flow does not produce results other than the Success or Failure response.

How it Works

1. The Get Server ID step (subflow) retrieves the UUID of the specified server:

   a. The Http Client Detailed Return step uses the HP DMA API to perform a GET request using the specified organizationName and serverName:

      GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server?orgName=<*organizationName*>&serverName=<*serverName*>

      If the GET request cannot be completed, the flow terminates with a Failure reponse.

   b. If the GET request successfully returns information about the specified server, the Find Server ID step extracts the UUID of that server from the XML response body returned by the GET:

      /*[local-name()='feed']/*[local-name()='id']

2. The Http Client Delete step uses the HP DMA API to perform a DELETE request using the the UUID of the specified server.

   If the DELETE request completes successfully (return code is 200), the flow terminates with a Success reponse.

   If the DELETE request cannot be completed, the flow terminates with a Failure reponse.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

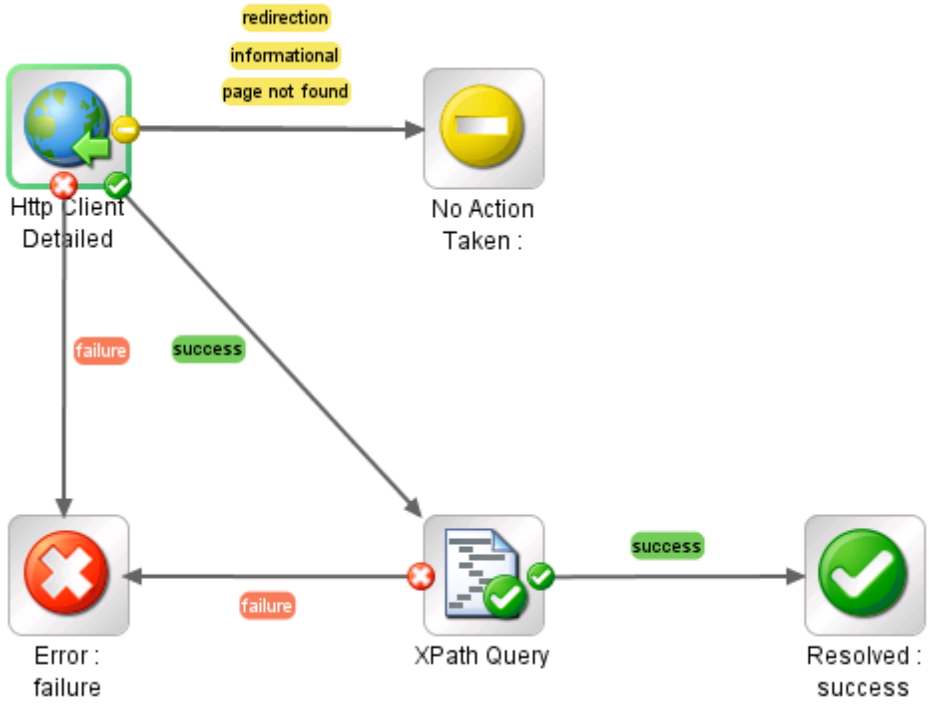
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Organization Id

The Get Organization Id example flow returns the UUID of the specified organization in the HP DMA environment. This is useful if you want to specify this organization's UUID in subsequent steps that access the HP DMA API.



The flow produces a Success response if it successfully retrieves the organization's UUID.

The flow produces a No Action Taken response under the following conditions:

- It cannot find the specified organization.
- The specified dmaUser does not have READ permission for the specified organization.

The flow produces a Failure response if it cannot retrieve the UUID for any other reason.

How to Use this Flow

Use this flow when you know the name of an organization but you do not know its UUID.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for a specific organization in the HP DMA environment by name and returns the organization's UUID.
- Use XPath queries to retrieve the UUID of the organization from the response body of the GET operation.

Permissions and Constraints

The specified dmaUser must have a role with READ permission for the specified organization.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has privileges required to get information about an existing organization.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization whose UUID will be returned.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
organizationUUID	ff8080813eecf0a2013ef02fb1030005	The universally unique identifier (UUID) of the organization. This is a 128-bit number (32 hexadecimal characters) that is unique within the HP DMA environment.

How it Works

1. The Http Client Detailed Return step uses the HP DMA API to perform a GET request using the specified organizationName:

   GET https://<*dmaorganization*>:<*dmaPort*>/dma/api/env/organization?orgName=<*organizationName*>&organizationName=<*organizationName*>

   If the GET request does not return valid XML, the flow terminates with a Failure response.

   If the GET request returns valid XML but does not successfully retrieve information about the organization, the flow terminates with a No Action Taken response.

2. If the GET request successfully returns information about the specified organization, the XPath Query step extracts the UUID of that organization from the XML response body returned by the GET:

   /*[local-name()='feed']/*[local-name()='id']

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

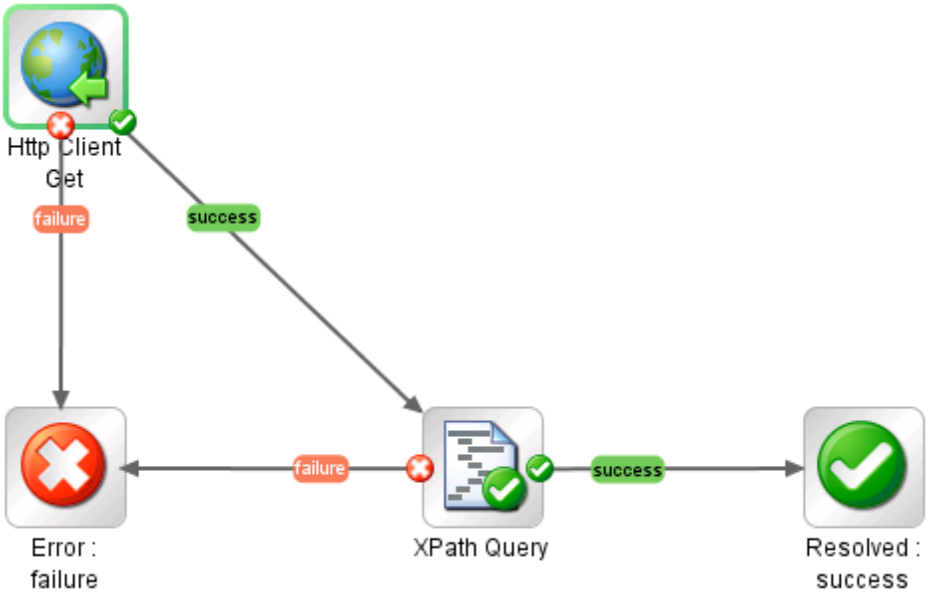
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Server Custom Field

The Get Server Custom Field example flow returns the value of the specified server Custom Field.



The flow produces a Success response if it successfully retrieves the value of the Custom Field. It produces a Failure response if it cannot retrieve the Custom Field value for any reason.

How to Use this Flow

Use this flow when you want to know the value of a specific Custom Field for a specific server. You must know the name of the server, the name of the organization in which it resides, and the name of the Custom Field.

You can use the Example Flow: Put Server Custom Field flow to change the value of the Custom Field.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for a specific target server in the HP DMA environment by specifying the name of the server and the name of the organization in which it resides.
- Use an XPath query to retrieve the Custom Field value from the response body of the GET operation.

Permissions and Constraints

The specified dmaUser must have a role with READ permission for the specified organization.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to get information about the specified organization.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization in which the specified server resides.
serverName	Name of the server whose Custom Field value will be returned.
customFieldName	Name of the Custom Field whose value will be returned.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
fieldValue	Chicago	The value of the specified server Custom Field.

How it Works

1. The Http Client Get step uses the HP DMA API to perform a GET request using the specified organizationName and serverName:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server?orgName=<*organizationName*>&serverName=<*serverName*>

If the GET request does not find the server, the flow terminates with a Failure response.

2. If the GET request successfully returns information about the specified server, the XPath Query step extracts the Custom Field value from the XML response body returned by the GET:

   //*[local-name()="custom-field" and @name="${customFieldName}"]/@value

3. If the flow finds the server and successfully extracts the value of the Custom Field, the flow terminates with a Success response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

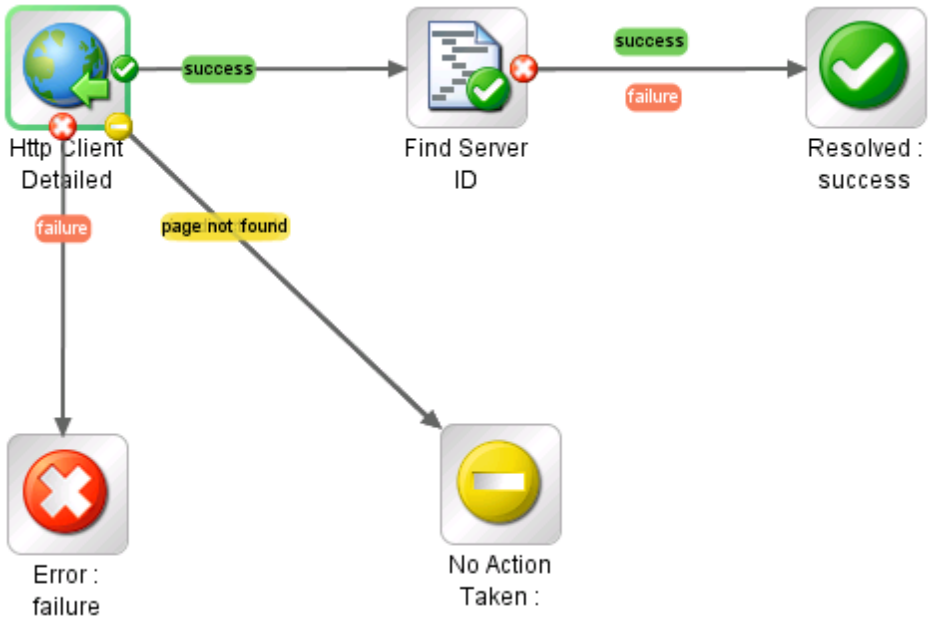
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Server Id

The Get Server Id example flow returns the UUID of the specified server. This is useful if you want to specify this server's UUID in subsequent steps that access the HP DMA API.



The flow produces a Success response if it successfully retrieves the server's UUID.

The flow produces a No Action Taken response under the following conditions:

- It cannot find the specified organization or server.
- The specified dmaUser does not have READ permission for the specified organization.

The flow produces a Failure response if it cannot retrieve the UUID for any other reason.

How to Use this Flow

Use this flow when you know the name of a target server and the organization in which it resides, but you do not know the server's UUID.

The Example Flow: Put Server Custom Field and Example Flow: Delete Server From Organization flows show you how to use this flow as a step in another flow.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that searches for a specific server in the HP DMA environment by name and returns the server's UUID.
- Use XPath queries to retrieve the UUID of the server from the response body of the GET operation.

Permissions and Constraints

The specified dmaUser must have a role with READ permission for the specified organization.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has privileges required to get information about an existing organization.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization in which the specified server resides.
serverName	Name of the server whose UUID will be returned.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
serverUUID	ff8080813eecf0a2013ef02fb1030005	The universally unique identifier (UUID) of the server. This is a 128-bit number (32 hexadecimal characters) that is unique within the HP DMA environment.

How it Works

1. The Http Client Detailed Return step uses the HP DMA API to perform a GET request using the specified organizationName and serverName:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server?orgName=<*organizationName*>&serverName=<*serverName*>

   If the GET request does not return valid XML, the flow terminates with a Failure response.

   If the GET request returns valid XML but does not successfully retrieve information about the server, the flow terminates with a No Action Taken response.

2. If the GET request successfully returns information about the specified server, the Find Server ID step extracts the UUID of that server from the XML response body returned by the GET:

   /*[local-name()='feed']/*[local-name()='id']

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

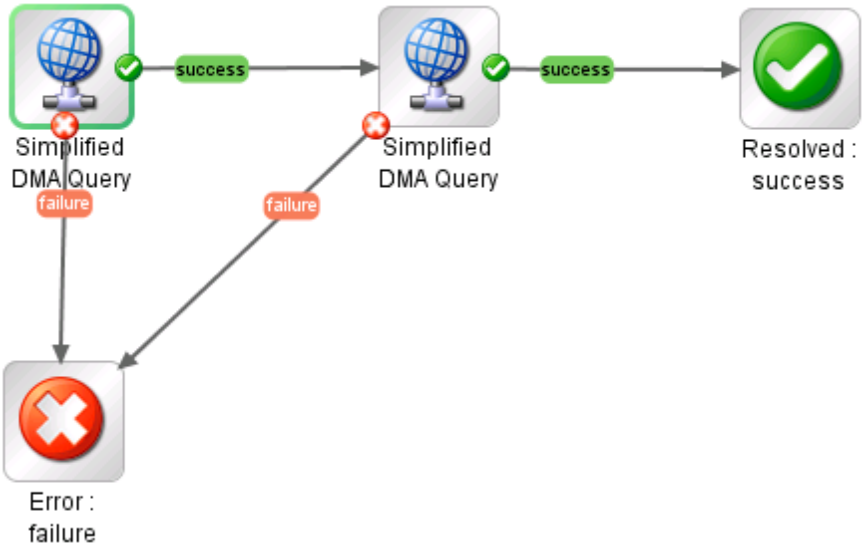
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Get Unassigned Servers

The Get Unassigned Servers example flow returns a list of servers that are available to add to HP DMA organizations. The flow returns the list of servers in three different formats: serverNames, serverIds, and serverUrls. Only the serverNames are relevant in the HP DMA context, however.



The flow produces a Success response if it successfully retrieves and parses the list of servers. It produces a Failure response if it cannot retrieve or parse the list for any reason.

How to Use this Flow

Use this flow when you want to find out which managed servers are available to add to HP DMA organizations.

You can use the Example Flow: Add Server to Organization flow to add a single server to an organization. You can also write a flow that iteratively adds available servers to one or more organizations.

Note that this flow contains two instances of the Operation: Simplified DMA Query operation.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform a GET operation that returns the list of managed servers that can be added to HP DMA organizations.
- Use XPath queries to retrieve the URLs and names of the servers from the response body of the GET operation.
- Use a scriptlet filter to extract the server IDs from the URLs.

Permissions and Constraints

The specified dmaUser must have a role with Administrator capability.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has a role with Administrator capability.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.

Results

This flow produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
serverNames	target1|target2|target3	List of unassigned servers by name.

Name	Example	Description
serverIds	70001|10001|30001	List of unassigned servers by SA server ID. Note that these are not UUIDs. They are internal IDs used by SA.
serverUrls	https://dma1.mycompany.com:8443/dma/api/env/unassignedserver/70001|https://dma1.mycompany.com:8443/dma/api/env/unassignedserver/10001|https://dma1.mycompany.com:8443/dma/api/env/unassignedserver/30001	List of unassigned servers by URL.

How it Works

1. The first Operation: Simplified DMA Query step uses the HP DMA API to perform the following GET request:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/unassignedserver

   The GET request returns an XML feed that looks like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<feed xmlns="http://www.w3.org/2005/Atom">
<id>https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver</id> <author>
<name>HP DMA</name> </author>
<updated>2013-02-26T12:49:35Z</updated>
<title>Unassigned Servers</title>
<link rel='self' type='application/atom+xml'
href='https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver'/>
<entry>
   <id>
 https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver/70001
   </id>
   <published>2013-02-26T12:49:35Z</published>
   <updated>2013-02-26T12:49:35Z</updated>
   <title>target1</title>
   <link link='self' type='application/atom+xml'
     href='https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver/70001'/>
</entry>
<entry>
   <id>
 https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver/10001
   </id>
   <published>2013-02-26T12:49:35Z</published>
   <updated>2013-02-26T12:49:35Z</updated>
   <title>target2</title>
   <link link='self' type='application/atom+xml'
     href='https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver/10001'/>
</entry>
<entry>
   <id>
 https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver/30001
   </id>
   <published>2013-02-26T12:49:35Z</published>
   <updated>2013-02-26T12:49:35Z</updated>
   <title>target3</title>
   <link link='self' type='application/atom+xml'
     href='https://DMA1.mycompany.com:8443/dma/api/env/unassignedserver/30001'/>
</entry>
</feed>
```

   The step uses the following XPath query to extract the serverUrls (highlighted above) from the XML feed:

```
/feed/entry/id/text()
```

It then uses the following scriptlet filter to extract the serverIds from the serverUrls:

```
var matchArray = scriptletInput.match(/\/unassignedserver\/[0-9]{5,}/g);
var partialString = matchArray.toString(); var returnString = scriptletResult
= partialString.replace(/\/unassignedserver\//g,'');
scriptletResult = returnString.replace(/,/g,delimiter);
```

If the GET request does not return valid XML, the flow terminates with a Failure response.

2. The second Operation: Simplified DMA Query step uses the HP DMA API to perform the same GET request, and then it uses this XPath query to extract the serverNames from the XML:

   ```
   /feed/entry/title/text()
   ```

   If this GET request does not return valid XML, the flow terminates with a Failure response.

3. If the two Operation: Simplified DMA Query steps successfully retrieve and extracts the list of unassigned servers in the three different formats, the flow terminates with a Success response.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

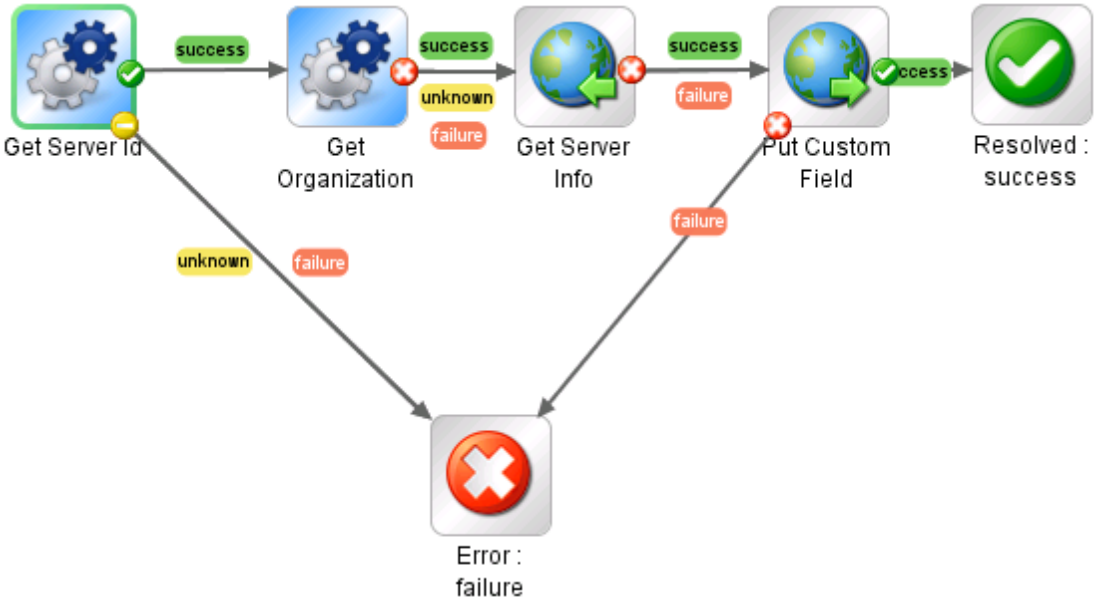
Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Example Flow: Put Server Custom Field

The Put Server Custom Field example flow modifies the value of the specified server Custom Field.



The flow produces a Success response if it successfully modifies the value of the Custom Field. It produces a Failure response if it cannot modify the Custom Field value for any reason.

How to Use this Flow

Use this flow when you want to change the value of a specific Custom Field for a specific server. You must know the name of the server, the name of the organization in which it resides, and the name of the Custom Field.

This flow uses the Example Flow: Get Server Id and Example Flow: Get Organization Id flows as steps (subflows).

You can use the Example Flow: Get Server Custom Field flow to learn the current value of a Custom Field.

What You Can Learn

The implementation of this example flow shows you how to do the following things:

- Invoke the HP DMA API to perform GET operations that search for the following things in the HP DMA environment:

  – UUID of the specified server (must also specify the organization name)

– UUID of the organization in which the server resides

– Detailed information about the server, including the names of its Custom Fields

- Use an XML Get Element filter to extract the definitions of the Custom Fields from the server details returned by the GET request.
- Invoke the HP DMA API to perform a PUT operation on the specified server Custom Field.

Permissions and Constraints

The specified dmaUser must have a role with both READ and WRITE permissions for the specified organization.

Inputs

This flow requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to get information about the specified organization and modify the Custom Field.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
organizationName	Name of the organization in which the specified server resides.
serverName	Name of the server whose Custom Field value will be modified.
customFieldName	Name of the Custom Field whose value will be modified.
customFieldValue	Value to which the Custom Field will be set.

Results

This flow does not produces results other than the Success and Failure responses.

How it Works

1. The Example Flow: Get Server Id step uses the HP DMA API to perform a GET request using the specified organizationName and serverName:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server?orgName=<*organizationName*>&serverName=<*serverName*>

   It then uses an XPath query to extract the server's UUID from the response body of the GET.

   If the GET request does not find the server and extract the UUID, the flow terminates with a Failure response.

2. The Example Flow: Get Organization Id step performs a GET request using the specified organizationName:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/organization?orgName=<*organizationName*>

   It then uses an XPath query to extract the organization's UUID from the response body of the GET.

3. The Get Server Info step performs a GET using the previously retrieved server UUID to get detailed information about the server, including a list of its Custom Fields:

   GET https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server<*serverUUID*>

   It then uses the following XML Get Element filter to extract the list of Custom Fields from the response body of the GET:

   //*[local-name()='custom-field']

   It stores this list in the queryServerResult step result. This flow (as shipped) does not use this result as an input to a subsequent step, however. This information is provided strictly for your understanding.

4. The Put Custom Field step modifies the value of the the pertinent `<env:custom-field>` element in the response body from the GET in step 3 to create the request body (payload) for the following PUT request:

   PUT https://<*dmaServer*>:<*dmaPort*>/dma/api/env/server<*serverUUID*>

5. If the flow successfully modifies the value of the Custom Field, the flow terminates with a Success response. If it fails for any reason, it terminates with a Failure reponse.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Chapter 3: HP DMA Operations

The HP DMA content pack for HP OO provides two operations:

Operation	Description
Operation: Execute Deployment on the next page	Executes a specific deployment to run a specific workflow.
Operation: Simplified DMA Query on page 82	Obtains information from the specified HP DMA server by executing a GET request via the HP DMA REST API.

These operations are provided primarily as learning tools that you can use as you create your own operations and flows.

This document contains a brief description of each operation. Additional detailed information is available on the Description tab in the for each operation in the Properties viewer in HP OO Studio.

See Also:

HP DMA Flow Examples on page 16

HP DMA Wizard for HP OO on page 85

Operation: Execute Deployment

The Execute Deployment operation executes a specific deployment to run a specific workflow. This operation is used by the Example Flow: Execute Deployments Interactively flow.

The operation produces a Success response if it successfully runs the workflow.It produces a Failure response if it fails to do so for any reason.

Tip: To quickly and convenient create a flow that runs a workflow using a specific deployment, use the HP DMA Wizard for HP OO.

Permissions and Constraints

To run a workflow using the HP DMA API, the specified dmaUser must have a role with READ permission for the organization where the target resides and EXECUTE permission for the deployment. Users who have a role with Administrator capability can execute any deployment.

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Inputs

This operation accepts the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to execute a deployment to run a workflow against a target.
dmaPassword	The password for the specified dmaUser.
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
workflowName	Name of the workflow to run.

Name	Description
deploymentName	Name of the deployment that will be used to run the workflow.
deploymentParameters	Values for all Runtime deployment parameters required by the specified deployment. Parameters must be separated by \n. <step name>.<parameter name>=<value>\n<step name>.<parameter name>=<value>\n <step name>.<parameter name>=<value>\n For example: Ping Server.Hostname=target1.mycompany.com\nPingServer.Ping Count=4
targetServer	Name of the target server where the workflow will run.
targetInstance	Name of the target instance where the workflow will run.
targetDatabase	Name of the target database where the workflow will run.
nonBlocking	If TRUE, the operation will resolve immediate after it initiates the workflow. If FALSE, the operation will wait for the workflow execution to finish before resolving.

Additional optional parameters that enable you to specify proxy server information or a timeout for the operation are available. See the Inputs tab for this operation in HP OO Studio.

Results

This operation produces the following results. You can assign these results to outputs for use in subsequent steps.

Name	Example	Description
exception	com.hp.dma.oo.ras.ActionException: Invalid User and/or Password	Any exception thrown by the operation.
returnCode	0	Return code for the operation (0 = Success, -1 = Failure).
returnResult	Step "Ping Computer" completed with return code 0	Return code of the each step executed.
sessionId	iconclude5164169279501586959	HP OO session ID.

Name	Example	Description
workflowRunStatus	Success	The current status of the workflow execution: Initiated, Running, Finished, Success, Failure, Cancelled, Aborted, or Skipped See the *HP DMA User Guide* for definitions of these workflow execution states.
workflowRunUrl	https://dma1.mycompany.com:8443/dma/api/auto/running/workflow/90cefae83ef26cbb013ef7ab57411491	The URL for the workflow execution created by this operation.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

Example Environment Flows on page 47

Example Automation Flows on page 17

HP DMA Operations on page 78

Operation: Simplified DMA Query

The Simplified DMA Query operation obtains information from the specified HP DMA server by executing a GET request via the HP DMA REST API. It returns a list of results based on an XPath query.

You control the type of information returned by the operation by specifying the xpathQuery and apiPath variables.

The operation produces a Success response if it successfully performs the GET and extracts the correct information from the XML response body. It produces a Failure response if it cannot complete the GET or extract the information for any reason.

Implementation Details

The HP DMA API returns information as Atom feeds that utilize a default namespace. Default namespaces are not supported by HP OO 9.x XPath utility operations. As a result, working with the HP DMA API through HP OO XPath utility functions frequently requires utilizing the XPath function `local-name()` in XPath queries. The Simplified DMA Query Operation enables you to use simply path queries instead of utilizing the `local-name()` function. This is intended to make retrieving information from HP DMA more intuitive.

Permissions and Constraints

Each HP DMA API call requires different permissions and imposes its own constraints.

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Inputs

This operation requires the following inputs:

Name	Description
dmaServer	Host name or IP address of the HP DMA server.
dmaPort	The port used to communicate with the HP DMA server (default is 8443).
dmaProtocol	The protocol used to perform the HP DMA API calls (default is https).
dmaUser	The HP DMA user who has the privileges required to make the specified HP DMA API call.
dmaPassword	The password for the specified dmaUser.

Name	Description
trustAllCerts	Enables weak security over SSL. Any SSL certificate will be trusted regardless of whether it was issued by a trusted certification authority (CA). Do not set this to TRUE in a production environment.
delimiter	The character that will be used to separate items when a result contains a list of of items (default is |).
xpathQuery	The XPath query that will be used to extract information from the XML response body from the GET operation (for example: /feed/entry/id/text() or /dma/api/auto/policy).
apiPath	The path that specifies which HP DMA API call to use (for example:/dma/api/auto/policy or /dma/api/env/unassignedserver).

Additional optional parameters that enable you to specify proxy server information or a timeout for the operation are available. See the Inputs tab for this operation in HP OO Studio.

Results

This operation produces the following results. You can assign these results to outputs for use in subsequent steps. The examples shown here were generated using the following inputs:

xpathQuery = /feed/entry/id/text()

apiPath = /dma/api/auto/policy

Name	Example	Description
exception	com.hp.dma.oo.ras.ActionException: Invalid User and/or Password	Any exception thrown by the operation.
queryStatus	Success	Terminal state of the operation.
returnCode	0	Return code for the operation (0 = Success, -1 = Failure).
returnResult	https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed09ede20375| https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed0d1c31154e| https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed0d1c091544| https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed0d1bd9152b| https://dma1.mycompany.com:8443/dma/api/auto/policy/90cefae83eeccde1013eed0d1bb41515	List of items extracted from the GET response body XML. The contents of this list depend on the value of the xpathQuery and apiPath inputs and any filters applied to the output.
sessionId	iconclude5164169279501586931	HP OO session ID.

API Information

For information about the HP DMA API, see the interactive *API Reference Guide* available on your HP DMA server at this URL:

https://<*DMA Server host name*>:8443/dma/api

This guide provides complete documentation for all supported API calls and responses.

Related Topics

Example Environment Flows on page 47

Example Automation Flows on page 17

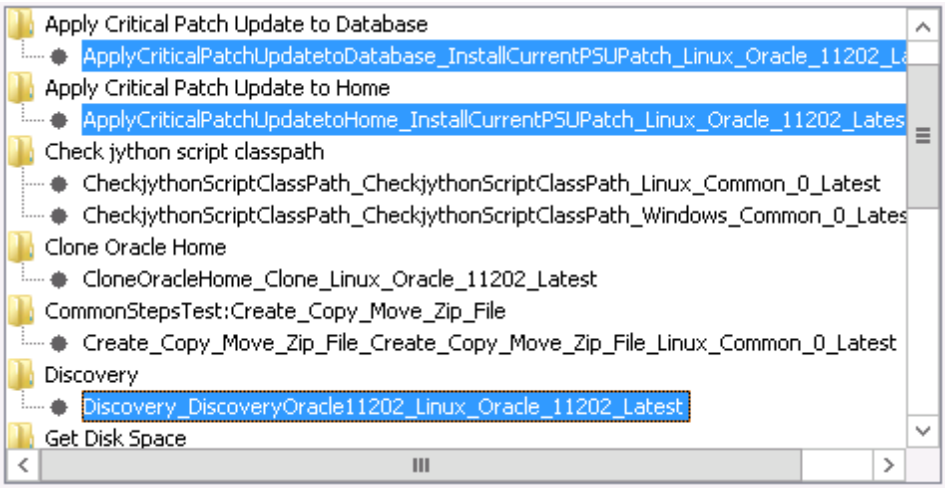
HP DMA Operations on page 78

Chapter 4: HP DMA Wizard for HP OO

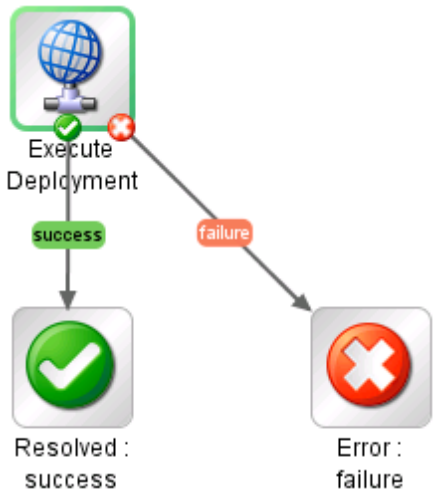
The HP DMA Configuration Wizard for Operations Orchestration creates HP OO flows that execute HP DMA deployments.

About the Wizard

When you run the wizard, you can specify any number of deployments. The wizard uses the HP DMA REST API to create a list of deployments available on the specified HP DMA server:



The wizard then creates an HP OO flow like this for each deployment that you select from the list:



Runtime parameters in the HP DMA deployment become inputs to the HP OO flow. By default, the user who runs the flow is prompted for the values of these inputs.

You can use these flows stand-alone, or you can include them in other flows.

The flow uses the Operation: Execute Deployment operation included in the HP DMA Content Pack for HP OO.

Use the Wizard to Create OO Flows

The HP DMA Configuration Wizard for Operations Orchestration creates an HP OO flow that executes an HP DMA deployment. It enables you to select one or more deployments from a list and creates one HP OO flow for each deployment that you select.

Note: Make sure that you have the wizard available. See Save the HP DMA Configuration Wizard for HP OO on page 15 for more information.

Before running the wizard, make sure that the repository where you will create the HP DMA flows is a local repository and is not open in HP OO Studio.

To run the HP DMA Configuration Wizard for Operations Orchestration:

1. Run the wizard executable from the location where you stored it in Save the HP DMA Configuration Wizard for HP OO on page 15.
2. On the wizard Welcome page, click **Next**.
3. On the wizard Specify Repository page, specify the location where the HP OO project will be created. This directory must already exist. For example:

   ```
   C:\DMAWizardProject
   ```

   Click **Next**.
4. On the wizard Connect to HP DMA page, specify the following information for your HP DMA server:

Setting	Description
HP DMA Host	Host name or IP address of the HP DMA server.
HP DMA Port	Port used to communicate with HP DMA (default is 8443).
Trust all SSL certificates	Select this box if you do not want HP OO to require the HP DMA server to present a trusted certificate (from a certificate authority). **Caution:** Use this setting ONLY for development or testing purposes. Do NOT use this setting this in a production environment.
User Name	The HP DMA user who will execute the deployment.
Password	The password for the specified HP DMA user.

   Click **Next**.

5. On the Select Deployments page, select one or more deployments from the list. Use CTRL+click to select more than one.

   Note: Currently there is an HP OO flow name limit of 128 characters. If the combination of your HP DMA deployment name and workflow name is greater than 128 characters, HP OO Studio will fail when you import the HP OO project that was created by HP DMA. Either select a different deployment or rename your workflow and/or deployment to be less than a combined 128 characters.

   Click **Next**.

6. On the Summary page, review the deployments that will be included in your HP OO flow.

   Click **Finish**.

Load the Project Created by the HP DMA Wizard into HP OO

1. Open HP OO Studio.
2. In the upper-left pane, select **Import Project**.
3. Navigate to the folder that you specified in the HP DMA Wizard for the project, for example:

   ```
   C:\DMAWizardProject
   ```

4. Select **OK**.

Related Topic:

Save the HP DMA Configuration Wizard for HP OO on page 15

Chapter 5: Troubleshooting

This section provides troubleshooting information related to integrating HP DMA with HP OO and running the HP DMA Configuration Wizard for Operations Orchestration.

Connection Error

When you run the DMA Wizard for HP Operations Orchestration you may receive the following error message:

```
Error establishing connection to <ip address>.  Verify that the certificate
is valid or try setting the trustAllCerts.

Caused by: javax.net.ssl.SSLPeerUnverifiedException: peer not authenticated
```

This can occur when you are integrating HP DMA 10.22 (or later) to HP OO because the SSL protocols have changed.

Solution

Perform the following steps to solve this problem:

1. Stop the HP DMA Server:

   ```
   $ service dma stop
   ```

2. Create a backup of the `/opt/hp/dma/server/tomcat/conf/server.xml` file.
3. Edit the `server.xml` file.
4. Search for `sslEnabledProtocols` and add `TLSv1` into the value. The new value will look like this:

   ```
   TLSv1,TLSv1.1,TLSv1.2
   ```

5. Save `server.xml`.
6. Restart the HP DMA server:

   ```
   $ service dma start
   ```

7. Try running the wizard again. It should now work as expected.

Glossary

A

automation items

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

B

bridged execution

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

C

capability

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

connector

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

cross-platform

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

custom field

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

D

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.

M

mapping

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

O

organization

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

P

parameters

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

policy

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

R

raw devices

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

operations from the user address space to the operating system kernel buffers.

role

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

S

smart group

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

software repository

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

solution pack

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

steps

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

T

target instance

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

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.

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