

# Using the vCenter Orchestrator Plug-In for vCloud Director 1.0

vCenter Orchestrator 4.1

vCloud Director 1.0

vCloud Director 1.0.1

This document supports the version of each product listed and supports all subsequent versions until the document is replaced by a new edition. To check for more recent editions of this document, see <http://www.vmware.com/support/pubs>.

EN-000420-00

**vmware**<sup>®</sup>

You can find the most up-to-date technical documentation on the VMware Web site at:

<http://www.vmware.com/support/>

The VMware Web site also provides the latest product updates.

If you have comments about this documentation, submit your feedback to:

[docfeedback@vmware.com](mailto:docfeedback@vmware.com)

Copyright © 2011 VMware, Inc. All rights reserved. This product is protected by U.S. and international copyright and intellectual property laws. VMware products are covered by one or more patents listed at <http://www.vmware.com/go/patents>.

VMware is a registered trademark or trademark of VMware, Inc. in the United States and/or other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.

**VMware, Inc.**  
3401 Hillview Ave.  
Palo Alto, CA 94304  
[www.vmware.com](http://www.vmware.com)

# Contents

Using the vCenter Orchestrator Plug-In for vCloud Director 1.0 5

- 1 Introduction to the VMware vCenter Orchestrator Plug-In for vCloud Director 7**
  - vCloud Director Plug-In Components 7
    - Role of vCenter Orchestrator with the vCloud Director Plug-In 8
    - Plug-In Interaction with vCloud Director 8
  - Installing and Configuring the vCloud Director Plug-In 8
    - vCloud Director Plug-In Functional Prerequisites 8
    - Install the vCloud Director Plug-In 8
    - Configure the vCloud Director Plug-In 9
  
- 2 vCloud Director Plug-In Scripting API 11**
  - Access the vCloud Director Plug-In API 11
  - User API Classes 12
  - Admin API Classes 14
  - Admin Extensions API Classes 15
  - Parameters for vCloud Director Plug-In API Methods 16
  
- 3 Using the vCloud Director Plug-In Workflow Library 17**
  - Using the vCloud Director Plug-In Inventory 17
  - Access the vCloud Director Plug-In Workflow Library 17
  - Standard User Workflows 18
    - Catalog Item Workflows 18
    - Media Workflows 18
    - Plug-In Configuration Workflows 18
    - Task Workflows 18
    - vApp Workflows 19
    - vApp Template Workflows 20
  - Admin Workflows 20
    - Catalog Workflows 20
    - Group Workflows 21
    - Network Workflows 21
    - Organization Workflows 21
    - Role Workflows 21
    - User Workflows 21
    - vDC Workflows 22
  - Admin Extension Workflows 22
    - Licensing Reports Workflows 22
    - VIM Server Workflows 22
    - VMW Host Workflows 22

VMW Network Pool Workflows	23
VMW Provider Network Workflows	23
VMW Provider vDC Workflows	23
Sample Workflows	24
Run the Provision New Organization with Default Settings Workflow	24
Run the Provision New Media New vApp Template and New vApp Workflow	25
Run the Provision New Network Pool Backed by a New DVS Port Group Workflow	25
Run the Provision Provider vDC on Top of New ESX Server Workflow	26
Run the Run a Full Provisioning Cycle Workflow	27
Index	31

# Using the vCenter Orchestrator Plug-In for vCloud Director 1.0

---

*Using the vCenter Orchestrator Plug-In for vCloud Director 1.0*, provides information and instructions about configuring and using versions 1.0.1 and 1.0.2 of the VMware<sup>®</sup> vCenter Orchestrator plug-in for VMware<sup>®</sup> vCloud Director.

## Intended Audience

This information is intended for anyone who is installing and configuring the plug-in, using the API of the plug-in, and running sample workflows. *Using the vCenter Orchestrator Plug-In for vCloud Director 1.0* is written for experienced users who are familiar with virtual machine technology, with Orchestrator workflow development, and with vCloud Director.

For more information about Orchestrator, see

[http://www.vmware.com/support/pubs/orchestrator\\_pubs.html](http://www.vmware.com/support/pubs/orchestrator_pubs.html).

For more information about vCloud Director, see [http://www.vmware.com/support/pubs/vcd\\_pubs.html](http://www.vmware.com/support/pubs/vcd_pubs.html).



# Introduction to the VMware vCenter Orchestrator Plug-In for vCloud Director

# 1

The vCloud Director plug-in (VMware vCenter Orchestrator plug-in for vCloud Director) allows interaction between vCenter Orchestrator and vCloud Director.

You can use the plug-in to run Orchestrator workflows that automate vCloud Director processes. The plug-in contains a set of standard workflows. You can also create custom workflows that implement the plug-in API to automate tasks in your vCloud Director environment.

This chapter includes the following topics:

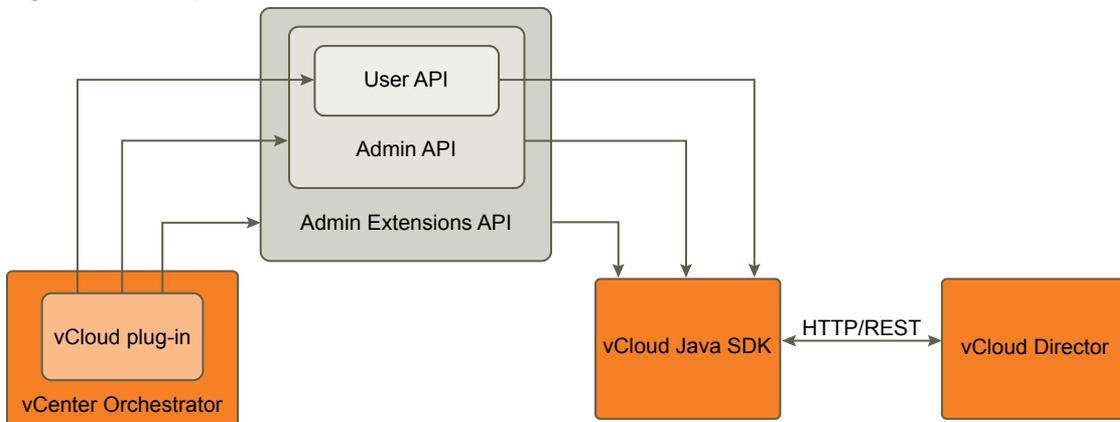
- [“vCloud Director Plug-In Components,”](#) on page 7
- [“Installing and Configuring the vCloud Director Plug-In,”](#) on page 8

## vCloud Director Plug-In Components

The vCloud Director plug-in relies on a number of components to function properly.

vCenter Orchestrator and vCloud Director provide the platform for the plug-in, and the plug-in provides interaction between those products.

**Figure 1-1.** Component Relations



The vCloud Director plug-in implements the User, Admin, and Admin Extensions API classes that correspond to the types of API classes in vCloud Director. All users can read User API classes and users with appropriate rights can modify these classes. Users with administrative rights can modify Admin API and User API classes. The Admin Extensions API classes are VMware-specific and only system administrators can modify these classes. System administrators can also modify Admin API and User API classes.

The vCloud Java SDK provides the communication platform between the JavaScript API of the plug-in and the vCloud Director REST API.

## Role of vCenter Orchestrator with the vCloud Director Plug-In

You must use the Orchestrator configuration interface to install and configure the vCloud Director plug-in. You use the Orchestrator client to run and create workflows and access the plug-in API.

The vCloud Director plug-in is powered by vCenter Orchestrator 4.1. Orchestrator is a development and process-automation platform that provides a library of extensible workflows to manage the VMware vCenter infrastructure and other technologies.

Orchestrator allows integration with management and administration solutions through its open plug-in architecture. vCloud Director is one example of an administration solution that you can integrate with Orchestrator by using plug-ins.

## Plug-In Interaction with vCloud Director

You use the plug-in to run Orchestrator workflows that interact with vCloud Director to perform automated tasks in the vCloud infrastructure.

With vCloud Director, you can build secure, multitenant clouds by combining virtual infrastructure resources into virtual datacenters. The virtual datacenters are a fully automated, catalog-based service that users access through Web-based portals and programmatic interfaces.

## Installing and Configuring the vCloud Director Plug-In

You must use the Orchestrator configuration interface to install and configure the vCloud Director plug-in.

### vCloud Director Plug-In Functional Prerequisites

To be able to install and use the vCloud Director plug-in, your system must meet the following product prerequisites.

#### vCenter Orchestrator

Verify that you have a running instance of Orchestrator. You can log in to the Orchestrator configuration interface at [http://orchestrator\\_server:8282](http://orchestrator_server:8282). Versions 1.0.1 and 1.0.2 of the plug-in work with vCenter Orchestrator 4.1.

For information about setting up Orchestrator, see the *vCenter Orchestrator Installation and Configuration Guide*.

#### vCloud Director

Verify that you have access to a vCloud Director instance. You can test your user credentials at [https://vcloud\\_director\\_server](https://vcloud_director_server). Versions 1.0.1 and 1.0.2 of the plug-in work with vCloud Director 1.0 and 1.0.1.

For information about setting up vCloud Director, see the *vCloud Director Installation and Configuration Guide*.

## Install the vCloud Director Plug-In

To be able to use the vCloud Director plug-in, you must download the `.vmoapp` file containing the plug-in and install it using the Orchestrator configuration interface.

### Prerequisites

- Verify that you are logged in to the Orchestrator configuration interface at [http://orchestrator\\_server:8282](http://orchestrator_server:8282).
- Verify that you have downloaded the `.vmoapp` file from <http://www.vmware.com/products/datacenter-virtualization/vcenter-orchestrator/plugins.html>.

**Procedure**

- 1 On the **General** tab, click **Install Application**.
- 2 Upload the vCloud Director plug-in.
  - a Click the magnifying glass icon.
  - b Select the .vmoapp file to install.
  - c Click **Open**.
  - d Click **Install**.

The vCloud Director plug-in tab appears in the Orchestrator configuration interface.
- 3 On the **Startup Options** tab, click **Restart service** to complete the plug-in installation.

**Configure the vCloud Director Plug-In**

To be able to manage vCloud Director instances by using the vCloud Director plug-in, you must configure the connection parameters for each vCloud Director instance.

**Prerequisites**

Verify that you are logged in to the Orchestrator configuration interface at [http://orchestrator\\_server:8282](http://orchestrator_server:8282).

**Procedure**

- 1 Click **vCloud Director**.
- 2 Click **New vCloud Director Connection**.
- 3 From the **Available** drop-down menu, select **Enabled**.
- 4 In the **Host** text box, type the IP address or the DNS name of the vCloud Director instance.
- 5 In the **Port** text box, type the port number.  
The default port is 443.
- 6 (Optional) Modify the SSL connection settings.

Leave the **Secure channel** check box selected to establish a secure connection to the vCloud Director instance.

- 7 In the **Maximum connections** text box, type the maximum number of concurrent connections to the vCloud Director instance.
- 8 Specify the method you use to manage user access on the vCloud Director instance.

Option	Action
<b>Session per user</b>	<p><b>CAUTION</b> Each user who logs in to Orchestrator creates a new session to the vCloud Director instance. Multiple sessions can rapidly strain CPU, memory and bandwidth.</p> <p>Select this option if your vCloud Director is in an Active Directory domain. Make sure that the user has the necessary permissions to perform the required operations.</p>
<b>Share a unique session</b>	<p>Select this option to allow Orchestrator to create only one connection to the vCloud Director instance. Type the credentials of a user who is a vCloud Director administrator.</p>

- 9 In the **Organization** text box, type the name of the organization that users can access.
  - If you type **System**, administrators can run User API, Admin API, and Admin Extensions API operations in all organizations on the vCloud Director instance.
  - If you type the name of a specific organization, administrators can run only User API and Admin API operations in the specified organization.
- 10 Click **Apply changes**.
- 11 Repeat [Step 2](#) through [Step 10](#) for each vCloud Director instance.

# vCloud Director Plug-In Scripting API

---

# 2

The vCloud Director plug-in scripting API contains classes, with their respective attributes and methods, that allow interaction between vCenter Orchestrator and vCloud Director. The scripting API maps the classes of the vCloud API to Orchestrator JavaScript classes that you can use to develop custom Orchestrator workflows that interact with vCloud Director.

The main categories of API classes are User API, Admin API, and Admin Extensions API. With the User API, you can perform basic tasks. The Admin API adds administrative capabilities. With the Admin Extensions API, you can manage components of the VMware infrastructure.

This chapter includes the following topics:

- [“Access the vCloud Director Plug-In API,”](#) on page 11
- [“User API Classes,”](#) on page 12
- [“Admin API Classes,”](#) on page 14
- [“Admin Extensions API Classes,”](#) on page 15
- [“Parameters for vCloud Director Plug-In API Methods,”](#) on page 16

## Access the vCloud Director Plug-In API

Orchestrator provides an API Explorer to allow you to search the vCloud Director plug-in API and see the documentation for JavaScript objects that you can use in scripted elements.

### Procedure

- 1 Log in to the Orchestrator client as an administrator.
- 2 Access the API Explorer from either the Orchestrator client or from the **Scripting** tabs of the workflow, policy, and action editors.
  - To access the API Explorer from the Orchestrator client, click **Tools > API Explorer** in the Orchestrator client toolbar.
  - To access the API Explorer from the **Scripting** tabs of the workflow, policy, and action editors, click **Search API** on the left.
- 3 To expand the hierarchical list of vCloud Director plug-in API objects, double-click the **vCloud** module in the left pane.

### What to do next

You can copy code from API elements and paste it into scripting boxes. For more information about API scripting, see the *vCenter Orchestrator Developer's Guide*.

## User API Classes

User API classes are typically readable by all users, and can be modified by users with appropriate rights.

With the User API, you can examine organizations and virtual datacenters (vDCs). You can create vApps in the organizations and in vDCs, and manage the created vApps. You can control vApp networks and create vApp templates and media files, such as ISO and floppy images. You can store vApp templates and media files in catalogs for easy access and sharing between organizations and vDCs.

The following classes belong to the User API.

Class Name	Description
VclAccessLevel	Defines the access level type.
VclAccessSetting	Defines the level of access granted to the user or group referenced in the subject element.
VclAccessSettings	Contains VclAccessSetting elements.
VclAllocationModel	Defines how resources are allocated in a vDC.
VclCapacityWithUsage	Defines the CPU and memory capacity that can be allocated from a vDC, and optionally reports how much of that capacity is in use.
VclCatalog	Contains VclCatalogItem elements.
VclCatalogItem	Contains a reference to a cataloged entity, such as an image or a template.
VclCompositionItemParam	Defines a composition item.
VclComputeCapacity	Defines compute resources available in a vDC.
VclControlAccessParams	Appears in catalogs and vApps. All users can read the class, but only system administrators can modify it.
VclCustomizationSection	Defines a vApp template customization settings section.
VclDhcpService	Defines the properties of the network's DHCP service.
VclEntityType	Basic entity type in the vCloud object model.
VclFenceMode	Defines how a network is connected to its parent network.
VclFile	Defines a transfer file storage item.
VclFilesList	Defines a list of transfer files.
VclFirewallPolicy	The policy enumeration type for a firewall rule.
VclFirewallRule	Defines a single firewall rule.
VclFirewallService	Defines the firewall service capabilities of a network.
VclGuestCustomizationSection	Defines guest customization settings.
VclInstantiationParams	Defines a list of VclOvfSection elements to configure for instantiating a vApp.
VclIpAddressAllocationMode	Enumeration of IP address allocation modes.
VclIpAddresses	Defines a list of IP addresses.
VclIpRange	Defines a range of IP addresses available on a network.
VclIpRanges	Defines a list of IP ranges.
VclIpScope	Defines the address range, gateway, netmask, and other properties of a network.
VclLeaseSettingsSection	Defines the lease settings section for a vApp.
VclMedia	Used as the body of a request to upload virtual media, such as an ISO or a floppy image. The element can also be used in the response.
VclMediaImageType	Enumeration of media image types.

Class Name	Description
VclNatMappingMode	Enumeration of NAT mapping mode types.
VclNatOneToOneBasicRule	Defines the NAT basic rule for one to one mapping of internal and external IP addresses from a network.
VclNatOneToOneVmRule	Defines the NAT rule for one to one mapping of virtual machine NIC and external IP addresses from a network.
VclNatPolicy	Enumeration of NAT policy values.
VclNatPortForwardingRule	Defines the NAT rule for port forwarding between an internal IP or port and an external IP or port.
VclNatRule	Defines a single NAT rule.
VclNatService	Defines the NAT capabilities of a network.
VclNatType	Enumeration of NAT type values.
VclNatVmRule	Defines the NAT rule for port forwarding between a virtual machine NIC or port and an external IP or port.
VclNetworkAssignment	In a complex vApp, associates the network defined in each child vApp with a network in the parent vApp.
VclNetworkConfigSection	Extends the VclOvfNetworkSection element by adding a link to a vCloud network and a VclNetworkConfiguration element that defines the configuration of that network.
VclNetworkConfiguration	Defines the properties of a vCloud network.
VclNetworkConnection	Defines the properties network connection.
VclNetworkConnectionSection	Defines a list of network cards existing in a virtual machine.
VclNetworkFeatures	Defines a set of network features.
VclOrgNetwork	Defines a network that is available in an organization.
VclOrganization	A high-level abstraction that provides a container and a unit of administration for a collection of resources and users.
VclReference	A reference element.
VclResourceEntities	Contains resource entity elements in a vDC.
VclResourceReference	Defines a reference to a resource.
VclScreenTicket	Contains a string that represents a screen ticket, which is required to access a vApp console.
VclTask	Whenever the result of a request cannot be returned immediately, the server creates a task entity and returns its URL to the client. The client can use the URL in a subsequent GET request, to obtain the current status of the task.
VclTaskStatus	Defines the current status of a task.
VclTasksInProgress	Contains VclTask elements owned by a containing entity, such as an organization.
VclTasksList	Contains VclTask elements.
VclVApp	Defines the result of an instantiation of a VclVAppTemplate element.
VclVAppNetworkConfiguration	Defines the configuration of a vApp network.
VclVAppTemplate	Provides an immutable description of a vApp. A VclVAppTemplate element is created when you upload an OVF package to a vDC.
VclVdc	Defines a deployment environment for vApps.
VclVdcs	Defines a list of references to vDCs.
VclVirtualCpu	A helper class that accesses the VirtualCpu resource in the vCloud API.

Class Name	Description
VclVirtualDisk	A helper class that accesses the <code>VirtualDisk</code> resource in the vCloud API. The <code>VirtualDisk</code> resource can be a disk or its controller.
VclVirtualMedia	A helper class that accesses the <code>VirtualMedia</code> resource in the vCloud API.
VclVirtualMemory	A helper class that accesses the <code>VirtualMemory</code> resource in the vCloud API.
VclVirtualNetworkCard	A helper class that accesses the <code>VirtualNetworkCard</code> resource in the vCloud API.
VclVmPendingQuestion	A question issued for a virtual machine in a waiting for input state.
VclVmQuestionAnswerChoice	An answer to a question issued for a virtual machine in a waiting for input state.

## Admin API Classes

Admin API classes are typically readable by all users, but can be created and modified only by a system administrator, organization administrator, or another privileged user.

With the Admin API, you can administrate and create organizations, vDCs, organization networks, and authorization entities, such as roles, rights, users, and groups. You can create, delete, and modify a catalog of templates and media files.

The following classes belong to the Admin API.

Class Name	Description
VclAdminCatalog	A helper class for the <code>AdminCatalog</code> resource in the vCloud Admin API.
VclAdminOrgNetwork	A helper class for the <code>OrgNetwork</code> resource in the vCloud Admin API.
VclAdminOrganization	Provides an administrative view of an Organization.
VclAdminVdc	Provides an administrative view of a vDC.
VclAdminVdcParams	A helper class that contains input parameters for the <code>addAdminVdc()</code> method from the <code>VclAdminOrganization</code> class.
VclAvailableNetworks	Contains references to network elements in a vDC.
VclGroup	Defines a group in the vCloud environment.
VclGroupList	Contains elements that reference groups in an organization.
VclLdapAuthenticationMechanism	Defines the authentication mechanism used by the LDAP service.
VclLdapConnector	Defines the type of the LDAP service.
VclNetworkPoolReferences	Contains elements that reference network pools in a provider vDC.
VclOrgEmailSettings	Defines the email settings for an organization.
VclOrgLdapGroupAttributes	Defines how a group is imported from LDAP, if <code>VclOrgLdapMode</code> is custom.
VclOrgLdapMode	Defines whether an organization is connected to an LDAP service, and whether it uses the system default LDAP service or a custom LDAP service.
VclOrgLdapSettings	Defines the hostname and connection details for an organization's LDAP service, if <code>VclOrgLdapMode</code> is custom.
VclOrgLdapUserSettings	Defines how LDAP attributes are used when importing a user, if <code>VclOrgLdapMode</code> is custom.
VclOrgLeaseSettings	Defines default lease durations and policies for an organization.
VclOrgSettings	Establishes quotas and policies for an organization and contains elements that specify how the organization connects to LDAP and email services.
VclProviderNetwork	A helper class for the <code>ExternalNetwork</code> resource in vCloud Admin API.
VclProviderVdc	Contains a collection of all the resources available in a vCloud.
VclProviderVdcCapacity	Defines the resource capacity for a provider vDC.

Class Name	Description
VclRight	Defines a right in the system.
VclRightReferences	Contains ReferenceType elements that reference the predefined RightType objects.
VclRole	Defines a role that has a collection of rights.
VclRootComputeCapacity	Defines compute capacity with units.
VclSmtpServerSettings	Specifies connection details for an organization's SMTP server, if VclOrgEmailSettings is not set to use the default SMTP server.
VclUser	Defines a user in the vCloud environment.
VclUserParams	A helper class that passes parameters for creating and updating a user in an organization.
VclUsersList	Contains elements that reference users in an organization.

## Admin Extensions API Classes

Admin Extensions API classes can be created and modified only by a system administrator.

The Admin Extensions API is specific to VMware. With the Admin Extensions API, you can manage entities, such as provider vDCs, network pools, and vCenter Server hosts.

The following classes belong to the Admin Extensions API.

Class Name	Description
VclImportVmAsVAppParams	Defines parameters for importing a virtual machine as a vApp.
VclImportVmAsVAppTemplateParams	Defines parameters for importing a virtual machine as a vApp template.
VclLicensingManagedServer	Captures a single set of metrics for a managed server for a given sample.
VclLicensingReport	A read-only licensing metric report.
VclLicensingReportSample	Defines a single licensing data collection point.
VclLicensingVirtualMachine	Defines a single set of virtual machine metrics.
VclManagedServerMetrics	Defines licensing metrics for managed servers.
VclNumericRange	Defines a range of integers.
VclResourcePool	Defines vSphere resource pool information.
VclShieldManagerParams	Defines credentials to a shield manager server.
VclVMWFencePoolParams	A helper class that passes parameters for creating VclVMWNetworkPool elements.
VclVMWHost	Defines a connection from the plug-in to a vCloud Director instance.
VclVMWNetworkPool	The base type for a network pool.
VclVMWNetworkPoolType	Defines a set of types that are used when creating network pools.
VclVMWPortGroupPoolParams	A helper class that passes parameters for creating VclVMWNetworkPool elements.
VclVMWProviderNetwork	The external network type.
VclVMWProviderNetworkParams	A helper class that passes parameters for creating VMWProviderNetwork elements.
VclVMWProviderVdc	The extension representation of provider vDC type.
VclVMWProviderVdcParams	A helper class that passes parameters for creating VMWProviderVdc elements.
VclVMWVlanPoolParams	A helper class that passes parameters for creating VMWVlanPool elements.
VclVmObjectRef	Defines the MoRef and the type for a vSphere object.

Class Name	Description
VclVimObjectRefs	Lists VimObjectRef elements.
VclVimObjectType	Defines a set of types that are used when referencing VIM objects.
VclVimServer	Defines the vSphere server information.
VclVimServerParams	A helper class that passes parameters to register a vSphere server.
VclVirtualMachineMetrics	Defines licensing metrics for virtual machines.
VclVmObjectRef	Defines vSphere object information about a virtual machine.

## Parameters for vCloud Director Plug-In API Methods

Some `getObject(String)` methods require enumeration types, which are specific to the vCloud Director plug-in, as input parameters.

You can use the following values as parameters for the `getObject(String)` methods in the respective classes.

Class Name	Method Name	Possible Values
VclEntityType	<code>getObject(String):VclEntityType</code>	AdminCatalog AdminOrganization AdminVdc AdminOrgNetwork Catalog CatalogItem Group VimServer VmHost VmNetworkPool VmProviderNetwork VmProviderVdc Media OrgNetwork Organization ProviderNetwork ProviderVdc Right Role Task TaskList User VApp VAppTemplate Vdc
VclHostSessionMode	<code>getObject(String):VclHostSessionMode</code>	PER_USER_SESSION SHARED_SESSION
VclTaskStatus	<code>getObject(String):VclTaskStatus</code>	SUCCESS ERROR QUEUED RUNNING CANCELED
VclVMNetworkPoolType	<code>getObject(String):VclVMNetworkPoolType</code>	VLAN_POOL FENCE_POOL PORT_GROUP_POOL

# Using the vCloud Director Plug-In Workflow Library

# 3

The vCloud Director plug-in workflow library contains workflows that allow you to run automated processes related to the management of vCloud Director instances.

The workflows are grouped into categories depending on their functional area. You can integrate standard workflows from the workflow library in custom workflows.

This chapter includes the following topics:

- [“Using the vCloud Director Plug-In Inventory,”](#) on page 17
- [“Access the vCloud Director Plug-In Workflow Library,”](#) on page 17
- [“Standard User Workflows,”](#) on page 18
- [“Admin Workflows,”](#) on page 20
- [“Admin Extension Workflows,”](#) on page 22
- [“Sample Workflows,”](#) on page 24

## Using the vCloud Director Plug-In Inventory

The vCloud Director plug-in exposes all objects in the connected vCloud Director instances in the **Inventory** view. You can use the **Inventory** view to add authorization elements or to run workflows on vCloud Director objects.

You can enable the **Use contextual menu in inventory** option to display the workflows that are available for an inventory object. When the option is enabled and you right-click an object in the Orchestrator inventory, all available workflows for the object are displayed.

## Access the vCloud Director Plug-In Workflow Library

You must use the Orchestrator client to access the elements from the vCloud Director plug-in workflow library.

### Procedure

- 1 Log in to the Orchestrator client as an administrator.
- 2 Click the **Workflows** view in the Orchestrator client.

Option	Action
<b>Access the set of standard workflow categories</b>	In the hierarchical list, select <b>Library &gt; vCloud Director</b> and expand the selection.
<b>Access the set of administrative workflow categories</b>	In the hierarchical list, select <b>Library &gt; vCloud Director &gt; Admin</b> and expand the selection.

Option	Action
<b>Access the set of administrative extension workflow categories</b>	In the hierarchical list, select <b>Library &gt; vCloud Director &gt; Admin &gt; Extension</b> and expand the selection.
<b>Access the set of complex sample workflows</b>	In the hierarchical list, select <b>Library &gt; vCloud Director Samples</b> and expand the selection.

## Standard User Workflows

The vCloud Director workflow category contains standard workflows related to vCloud Director management.

### Catalog Item Workflows

The Catalog Item workflow category contains workflows related to catalog item management.

You can access these workflows from **Library > vCloud Director > Catalog Item**.

Workflow Name	Description
Add Catalog Item	Adds a new item to a catalog. The new item can be a media file or a vApp template.
Delete Catalog Item	Deletes a catalog item from a catalog.
Update Catalog Item	Updates a catalog item.

### Media Workflows

The Media workflow category contains workflows related to media management.

You can access these workflows from **Library > vCloud Director > Media**.

Workflow Name	Description
Clone Media	Clones a media file.
Delete Media	Deletes a media file.
Update Media	Updates a media file.
Upload Media	Uploads a media file. The uploaded media can be an ISO file or a floppy file.

### Plug-In Configuration Workflows

The Plug-in Configuration workflow category contains workflows related to vCloud Director connection management.

You can access these workflows from **Library > vCloud Director > Plug-in Configuration**.

Workflow Name	Description
Add Connection	Adds a new vCloud Director connection to the plug-in configuration.
Delete Connection	Deletes a vCloud Director connection from the plug-in configuration.

### Task Workflows

The Task workflow category contains workflows related to task management.

You can access these workflows from **Library > vCloud Director > Task**.

Workflow Name	Description
Wait For Task	Waits for a task to be completed.

## vApp Workflows

The vApp workflow category contains workflows related to vApp management.

You can access these workflows from **Library > vCloud Director > vApp**.

Workflow Name	Description
Capture vApp	Captures a vApp as a vApp template.
Clone vApp	Clones a vApp.
Compose vApp	Composes a vApp from virtual machines of other vApps.
Delete vApp	Deletes a vApp.
Share vApp	Updates the sharing configuration of a vApp.
Update vApp	Updates a vApp.

## vApp Power Workflows

The Power workflow category contains workflows related to vApp power management.

You can access these workflows from **Library > vCloud Director > vApp > Power**.

Workflow Name	Description
Deploy vApp	Deploys a vApp and optionally powers it on.
Discard Suspended State vApp	Discards the state of a suspended vApp.
Power Off vApp	Powers off a vApp. Does not free the resources reserved for the vApp.
Power On vApp	Powers on a vApp.
Reboot vApp	Sends a notification to the vApp's guest virtual machines to reboot.
Reset vApp	Resets a vApp.
Shutdown vApp	Sends a notification to the vApp's guest virtual machines to shut down.
Suspend vApp	Suspends a vApp. Does not free the resources reserved for the vApp.
Undeploy vApp	Stops or suspends a vApp and frees the resources reserved for the vApp.

## VM Workflows

The VM workflow category contains workflows related to virtual machine management.

You can access these workflows from **Library > vCloud Director > vApp > VM**.

Workflow Name	Description
Delete VM	Deletes a virtual machine.
Eject Media	Ejects media from a virtual machine.
Insert Media	Inserts media into a virtual machine.

## VM Power Workflows

The Power workflow category contains workflows related to virtual machine power management.

You can access these workflows from **Library > vCloud Director > vApp > VM > Power**.

Workflow Name	Description
Deploy VM	Deploys a virtual machine and optionally powers it on.

Workflow Name	Description
Discard Suspended State VM	Discards the state of a suspended virtual machine.
Power Off VM	Powers off a virtual machine. Does not free the resources reserved for the virtual machine.
Power On VM	Powers on a virtual machine.
Reboot VM	Sends a notification to the virtual machine guest to reboot.
Reset VM	Resets a virtual machine.
Shutdown VM	Sends a notification to the virtual machine guest to shut down.
Suspend VM	Suspends a virtual machine. Does not free the resources reserved for the virtual machine.
Undeploy VM	Stops or suspends a virtual machine and frees the resources reserved for the virtual machine.

## VM Screen Workflows

The Screen workflow category contains workflows related to virtual machine screen management.

You can access these workflows from **Library > vCloud Director > vApp > VM > Screen**.

Workflow Name	Description
Acquire Ticket	Acquires a ticket for the remote console of a virtual machine.
Get Thumbnail	Gets a screenshot of a virtual machine's desktop.

## vApp Template Workflows

The vApp Template workflow category contains workflows related to vApp template management.

You can access these workflows from **Library > vCloud Director > vApp Template**.

Workflow Name	Description
Delete vApp Template	Deletes a vApp template.
Download vApp Template	Downloads a vApp template as an OVF.
Instantiate vApp Template	Instantiates a vApp template as a vApp.
Update vApp Template	Updates a vApp template.
Upload vApp Template	Uploads an OVF as a vApp template.

## Admin Workflows

The Admin workflow category contains workflows related to vCloud Director administrative management.

## Catalog Workflows

The Catalog workflow category contains workflows related to catalog management.

You can access these workflows from **Library > vCloud Director > Admin > Catalog**.

Workflow Name	Description
Add Catalog	Adds a catalog to an organization.
Delete Catalog	Deletes a catalog.
Publish Catalog	Publishes or unpublishes a catalog to all organizations external to the catalog's organization.
Share Catalog	Updates the sharing configuration of a catalog.
Update Catalog	Updates a catalog.

## Group Workflows

The Group workflow category contains workflows related to group management.

You can access these workflows from **Library > vCloud Director > Admin > Group**.

Workflow Name	Description
Delete Group	Deletes a group.
Import Group	Imports a group from the configured directory service to an organization.
Update Group	Updates a group.

## Network Workflows

The Network workflow category contains workflows related to organization network management.

You can access these workflows from **Library > vCloud Director > Admin > Network**.

Workflow Name	Description
Add Org Network	Adds an organization network to an organization.
Delete Org Network	Deletes an organization network.

## Organization Workflows

The Organization workflow category contains workflows related to organization management.

You can access these workflows from **Library > vCloud Director > Admin > Organization**.

Workflow Name	Description
Add Organization	Adds an organization to a vCloud Director instance.
Delete Organization	Deletes an organization.
Update Organization	Updates an organization.

## Role Workflows

The Role workflow category contains workflows related to role management.

You can access these workflows from **Library > vCloud Director > Admin > Role**.

Workflow Name	Description
Add Role	Adds a role to a vCloud Director instance.
Delete Role	Deletes a role.
Update Role	Updates a role.

## User Workflows

The User workflow category contains workflows related to user management.

You can access these workflows from **Library > vCloud Director > Admin > User**.

Workflow Name	Description
Add User	Adds a user to an organization or imports it from LDAP.

Workflow Name	Description
Delete User	Deletes a user.
Update User	Updates a user.

## vDC Workflows

The vDC workflow category contains workflows related to vDC management.

You can access these workflows from **Library > vCloud Director > Admin > vDC**.

Workflow Name	Description
Add vDC	Adds a vDC to an organization.
Delete vDC	Deletes a vDC.
Update vDC	Updates a vDC.

## Admin Extension Workflows

The Extension workflow category contains workflows related to vCloud Director administrative extensions management.

### Licensing Reports Workflows

The Licensing Reports workflow category contains workflows related to licensing reports management.

You can access these workflows from **Library > vCloud Director > Admin > Extensions > Licensing Reports**.

Workflow Name	Description
Print Licensing Reports	Prints the licensing reports of a vCloud Director instance.

### VIM Server Workflows

The VIM Server workflow category contains workflows related to vCenter Server management.

You can access these workflows from **Library > vCloud Director > Admin > Extensions > VIM Server**.

Workflow Name	Description
Import VM as vApp	Imports a virtual machine from an available vCenter Server as a vApp.
Import VM as vApp Template	Imports a virtual machine from an available vCenter Server as a vApp template.
Reconnect VIM Server	Tries to force a reconnection to a vCenter Server from its vCloud Director instance.
Register VIM Server	Registers a vCenter Server to a vCloud Director instance.
Unregister VIM Server	Unregisters a vCenter Server.
Update VIM Server	Updates a vCenter Server.

### VMW Host Workflows

The VMW Host workflow category contains workflows related to ESX host management.

You can access these workflows from **Library > vCloud Director > Admin > Extensions > VMW Host**.

Workflow Name	Description
Enable VMW Host	Enables or disables an ESX host.
Prepare VMW Host	Prepares or unprepares an ESX host.

Workflow Name	Description
Repair VMW Host	Tries to repair an ESX host.
Upgrade VMW Host	Tries to upgrade an ESX host.

## VMW Network Pool Workflows

The VMW Network Pool workflow category contains workflows related to ESX network pool management.

You can access these workflows from **Library > vCloud Director > Admin > Extensions > VMW Network Pool**.

Workflow Name	Description
Add VMW Network Pool	Adds a network pool to a vCloud Director instance.
Delete VMW Network Pool	Deletes a network pool.
Update VMW Network Pool	Updates a network pool.

## VMW Provider Network Workflows

The VMW Provider Network workflow category contains workflows related to ESX provider network management.

You can access these workflows from **Library > vCloud Director > Admin > Extensions > VMW Provider Network**.

Workflow Name	Description
Add VMW Provider Network	Adds an external network to a vCloud Director instance.
Delete VMW Provider Network	Deletes an external network.
Update VMW Provider Network	Updates an external network.

## VMW Provider vDC Workflows

The VMW Provider vDC workflow category contains workflows related to ESX provider vDC management.

You can access these workflows from **Library > vCloud Director > Admin > Extensions > VMW Provider vDC**.

Workflow Name	Description
Add VMW Provider vDC	Adds a provider vDC to a vCloud Director instance.
Delete VMW Provider vDC	Deletes a provider vDC.
Update VMW Provider vDC	Updates a provider vDC.

## Sample Workflows

The vCloud Director Samples workflow category contains complex provisioning workflows. The sample workflows implement workflows from the standard vCloud Director workflow category to perform multistep automated processes in the cloud. You can run the sample workflows to test standard provisioning use cases.

### Run the Provision New Organization with Default Settings Workflow

You can run a workflow to provision an organization that uses default settings. You can modify the settings after the organization is created.

An organization is the fundamental vCloud Director grouping. An organization contains users, the vApps they create, and the resources the vApps use. An organization can be a department in your own company or an external customer that you are providing cloud resources to.

The new organization uses the following default settings.

- Is enabled and allows publication of catalogs to all organizations.
- Does not use LDAP.
- Uses the default SMTP and notification settings from the vCloud Director instance.
- Has an unlimited quota for running virtual machines and stored virtual machines.
- Contains one vDC and two catalogs, one public and one private.

#### Prerequisites

- Verify that the vCloud Director plug-in is enabled and configured in the Orchestrator configuration interface.
- Verify that you are logged in to the Orchestrator client as an administrator.

#### Procedure

- 1 Click the **Workflows** view in the Orchestrator client.
- 2 In the workflows hierarchical list, select **Library > vCloud Director Samples** to navigate to the Provision new Organization with default settings workflow.
- 3 Right-click the Provision new Organization with default settings workflow and select **Start workflow**.
- 4 Select the vCloud Director instance on which to add the new organization.
- 5 Select the provider vDC and network pool to be used by the new organization.
- 6 Specify the organization options.
  - a Type a name and a full name of the organization.
  - b (Optional) Modify the default lease settings.
- 7 Specify the organization vDC options.
  - a Select the allocation model for the vDC. You can select **AllocationVApp**, **AllocationPool**, or **ReservationPool**.
  - b Provide the resource reservation values.
- 8 Select whether to provision the new organization with default media, vApp template, and vApp. If you select **Yes**, provide the required media, vApp template, and vApp parameters.
- 9 Click **Submit** to run the workflow.

## Run the Provision New Media New vApp Template and New vApp Workflow

You can run a workflow to provision a given organization with new media, a new vApp template, and a new vApp.

### Prerequisites

- Verify that the vCloud Director plug-in is enabled and configured in the Orchestrator configuration interface.
- Verify that you are logged in to the Orchestrator client as an administrator.
- Verify that you have access to an existing organization.

### Procedure

- 1 Click the **Workflows** view in the Orchestrator client.
- 2 In the workflows hierarchical list, select **Library > vCloud Director Samples** to navigate to the Provision new Media new vApp Template and new vApp workflow.
- 3 Right-click the Provision new Media new vApp Template and new vApp workflow and select **Start workflow**.
- 4 Select an organization in which to provision the new media, vApp template, and vApp.
- 5 Specify the media options.
  - a Type a name and a description of the media.
  - b Select the image type of the media. You can select **ISO** or **Floppy**.
  - c Type the local path to the media image file.
- 6 Specify the vApp template options.
  - a Type a name and a description of the vApp template.
  - b Type the local path to the vApp template OVF file.
- 7 Specify the vApp options.
  - a Type a name and a description of the vApp.
  - b (Optional) Modify the default lease settings.
- 8 Click **Submit** to run the workflow.

The workflow uploads the media and the vApp template and instantiates the vApp from the vApp template with default parameters. Using the default parameters, the instantiated vApp is not deployed and not powered on. The EULA is accepted and no networks are connected.

## Run the Provision New Network Pool Backed by a New DVS Port Group Workflow

You can run a workflow to create a vCloud network pool that is backed by newly created vSphere port groups.

A network pool is a collection of virtual machine networks that are available to be consumed by vDCs to create vApp networks and by organizations to create organization networks. Network traffic on each network in a pool is isolated from all other networks at layer 2 (Data Link Layer).

### Prerequisites

- Verify that the vCloud Director plug-in is enabled and configured in the Orchestrator configuration interface.
- Verify that you are logged in to the Orchestrator client as an administrator.

- Verify that you have access to a vCenter Server that is within the vCloud Director instance.

#### Procedure

- 1 Click the **Workflows** view in the Orchestrator client.
- 2 In the workflows hierarchical list, select **Library > vCloud Director Samples** to navigate to the Provision new network pool backed by a new DVS port group workflow.
- 3 Right-click the Provision new network pool backed by a new DVS port group workflow and select **Start workflow**.
- 4 Select the vCloud Director instance in which to add the new network pool.
- 5 Select the vCenter Server from the vCloud Director instance to back the new port groups.
- 6 Type the name of the cluster from the vCenter Server to back the new port groups.
- 7 Type the Managed Object Reference (MoRef) ID of the distributed virtual switch (DVS) to contain the new port groups.

You can check the MoRef ID by selecting the DVS from the vCenter Server 4.1 **Inventory** view, and searching for the id value on the **General** tab in the right pane.

- 8 Specify the options for the new port groups.
  - a Type the number of port groups to be created.
  - b Select the type of the port groups. You can select **earlyBinding**, **lateBinding**, or **ephemeral**.
  - c Type a name prefix for the port groups.
  - d Type the number of DVS ports to be created for each port group.
- 9 Type a name and a description of the network pool.
- 10 Click **Submit** to run the workflow.

The workflow first creates a number of port groups with the specified number of ports, and then creates a network pool backed by those port groups. The created port groups are backed by an existing distributed virtual switch from a cluster inside one of the vCenter Server hosts attached to the vCloud Director instance.

## Run the Provision Provider vDC on Top of New ESX Server Workflow

You can run a workflow to attach a new ESX host to the vCloud Director instance and optionally create a new provider vDC that is backed by the attached ESX host.

A provider vDC is a group of compute, memory, and storage resources from one vCenter Server host. You can use vCloud Director to allocate portions of a provider vDC to your organizations.

#### Prerequisites

- Verify that the vCloud Director plug-in is enabled and configured in the Orchestrator configuration interface.
- Verify that you are logged in to the Orchestrator client as an administrator.
- Verify that you have access to a vCenter Server that is within the vCloud Director instance.

#### Procedure

- 1 Click the **Workflows** view in the Orchestrator client.
- 2 In the workflows hierarchical list, select **Library > vCloud Director Samples** to navigate to the Provision provider vDC on top of new ESX server workflow.
- 3 Right-click the Provision provider vDC on top of new ESX server workflow and select **Start workflow**.

- 4 Select the vCloud Director instance on which to attach the ESX host.
- 5 Select the vCenter Server from the vCloud Director instance on which the ESX host is attached.
- 6 Specify the cluster options.
  - a Type the name of the cluster.

---

**NOTE** If the cluster does not exist, the workflow creates it.

---

- b Select whether to enable distributed resource scheduling (DRS) and high availability (HA) for the cluster.
  - c Type the name of the NFS-based datastore to share with the other ESX hosts of the vCloud.
  - d Type the server IP or server name of the NFS-based datastore.
  - e Type the name of the shared folder inside the NFS-based datastore.
- 7 Specify the ESX host options.
  - a Type an IP address of the ESX host to be added to the cluster.
  - b Provide the required authentication parameters.
- 8 Select whether to create a provider vDC that is backed by the attached ESX host.  
If you select **Yes**, specify the provider vDC options.
  - a Type a name and a description of the provider vDC.
  - b Select whether to enable the provider vDC.
- 9 Click **Submit** to run the workflow.

The ESX host is attached to one vCenter Server host inside the vCloud and it is included in one cluster inside the vCenter Server host. If the cluster does not exist, the workflow creates it. An existing NFS shared datastore is attached to the ESX host. After the ESX host is ready, you can create a provider vDC inside the vCloud. The new ESX host backs the new provider vDC.

## Run the Run a Full Provisioning Cycle Workflow

You can run a workflow to configure the infrastructure on a vCloud Director instance.

The workflow performs the following actions.

- Attaches an existing vCenter Server to the vCloud Director instance.
- Creates a new provider vDC backed by an existing resource pool from the vCenter Server.
- Prepares all ESX hosts from the provider vDC.
- Creates a new provider network backed by an existing network from the vCenter Server.
- Adds a new organization.
- Adds a new organization vDC to the organization backed by the provider vDC.
- Adds a new bridged organization network to the organization backed by the provider network.
- Adds a new catalog to the organization.
- Uploads a new media and adds it to the catalog.

### Prerequisites

- Verify that the vCloud Director plug-in is enabled and configured in the Orchestrator configuration interface.

- Verify that you are logged in to the Orchestrator client as an administrator.
- Verify that you have access to a vCenter Server that is within the vCloud Director instance.
- Verify that you have access to a vShield Manager.

### Procedure

- 1 Click the **Workflows** view in the Orchestrator client.
- 2 In the workflows hierarchical list, select **Library > vCloud Director Samples** to navigate to the Run a full provisioning cycle workflow.
- 3 Right-click the Run a full provisioning cycle workflow and select **Start workflow**.
- 4 Select the vCloud Director instance on which to set up the infrastructure.
- 5 Provide the required parameters for the vCenter Server to be attached to the vCloud Director instance.
- 6 Provide the required parameters for the vShield Manager to be used with the vCenter Server.
- 7 Specify the provider vDC options.
  - a Type the Managed Object Reference (MoRef) ID of the resource pool from the vCenter Server that will back the new provider vDC.

You can check the MoRef ID by selecting the resource pool from the vCenter Server 4.1 **Inventory** view, and searching for the id value on the **General** tab in the right pane.
  - b (Optional) Create an array of MoRef IDs of the datastores from the vCenter Server shared by all the ESX hosts from the resource pool.
  - c Provide common credentials for all ESX hosts.
  - d Type a name and a description of the new provider vDC.
- 8 Specify the provider network options.
  - a Type a name and a description of the new provider network.
  - b Provide the required network configuration parameters.
  - c Type the MoRef ID of the network from the vCenter Server that backs the new provider network.

You can check the MoRef ID by selecting the network from the vCenter Server 4.1 **Inventory** view, and searching for the id value on the **General** tab in the right pane.
- 9 Specify the organization options.
  - a Type a name, a full name, and a description of the new organization.

The name is used as the unique identifier in the full URL with which users log in to this organization. You can only use alphanumeric characters. The full name appears in the vCloud Director application header when users log in.
  - b (Optional) Modify the default policy values.
  - c Type the default email address of the notification sender.
- 10 Specify the organization vDC options.
  - a Type a name and a description of the new organization vDC.
  - b Select the allocation model for the vDC. You can select **AllocationVApp**, **AllocationPool**, or **ReservationPool**.
  - c Provide the resource reservation values.
- 11 Type the name of the new organization network.

- 12 Provide the required parameters for the new catalog.
- 13 Specify the media options.
  - a Type a name and a description of the media.
  - b Select the image type of the media. You can select **ISO** or **fLoppy**.
  - c Type the local path to the media image file.
- 14 Click **Submit** to run the workflow.



# Index

## A

API access **11**  
API classes  
  Admin **14**  
  Admin Extensions **15**  
  User **12**  
API methods, parameters **16**  
audience **5**

## C

components **7**  
configuration **8**  
configuration process **9**

## F

functional prerequisites **8**

## I

installation **8**  
installation process **8**  
introduction **7**  
Inventory **17**

## O

Orchestrator **8**

## S

sample provisioning workflows  
  Provision new Media new vApp Template and  
  new vApp **25**  
  Provision new network pool backed by a new  
  DVS port group **25**  
  Provision new Organization with default  
  settings **24**  
  Provision provider vDC on top of new ESX  
  server **26**  
  Run a full provisioning cycle **27**  
scripting API **11**

## V

vCloud Director **8**

## W

workflow library **17**  
workflow library access **17**

## workflows

administrative **20**  
administrative extensions **22**  
catalog **20**  
catalog item **18**  
ESX host management **22**  
ESX network pool management **23**  
ESX provider network management **23**  
ESX provider vDC management **23**  
extension **22**  
group **21**  
licensing reports **22**  
media **18**  
network **21**  
organization **21**  
plug-in configuration **18**  
provisioning **24**  
role **21**  
sample **24**  
standard **18**  
task **18**  
user **21**  
vApp **19**  
vApp power management **19**  
vApp template **20**  
vCenter Server management **22**  
vDC **22**  
VIM server **22**  
virtual machine management **19**  
virtual machine power management **19**  
virtual machine screen management **19**  
VMW host **22**  
VMW network pool **23**  
VMW provider network **23**  
VMW provider vDC **23**

