

VMware vRealize Operations Management Pack for vCloud Director 4.5 Guide

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VMware, Inc.
3401 Hillview Ave.
Palo Alto, CA 94304
www.vmware.com

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vRealize Operations Management Pack for vCloud Director Guide

The *vRealize Operations Management Pack for vCloud Director Guide* describes how to install the Management Pack for vCloud Director for vRealize Operations Manager.

Intended Audience

This information is intended for anyone who needs to install and configure the Management Pack for vCloud Director.

Introduction to the Management Pack for vCloud Director

1

You can use the Management Pack for vCloud Director with vRealize Operations Manager. The Management Pack for vCloud Director monitors the health of supported vCloud Director entities and sends early warning smart alerts for monitored Provider vDC objects.

This chapter includes the following topics:

- [“Data that the Management Pack for vCloud Director Collects,”](#) on page 7
- [“Customizing Your Configuration,”](#) on page 8
- [“How the Management Pack for vCloud Director Processes Events,”](#) on page 9
- [“Using the vCloud Entity Status Resource Tag,”](#) on page 9
- [“vCloud Director Entities in vRealize Operations Manager,”](#) on page 9
- [“Installation and Configuration Requirements,”](#) on page 10

Data that the Management Pack for vCloud Director Collects

The Management Pack for vCloud Director collects information for Provider vDC, Organization, Organization vDC, vApp and VM entities from the vCloud Director database and creates the corresponding objects in vRealize Operations Manager. The Management Pack for vCloud Director can optionally import events for these vCloud Director entities.

The Management Pack for vCloud Director maps the vApps that it imports to virtual machine objects that the vCenter adapter has already imported and creates object relationships between the vApps and the virtual machines.

The Management Pack for vCloud Director does not collect performance data from vCloud Director. Instead, the Management Pack for vCloud Director enables vRealize Operations Manager to present health data by mapping vCloud Director entities to vCenter Server objects. The vCenter adapter collects performance data for vCenter Server objects.

The list of object types that Management Pack for vCloud Director collects are as follows.

- vCloud World
- Organization
- PVDC - Provider Virtual Data Center
- VM - Virtual Machine
- OVDC - Organization Virtual Data Center
- vApp
- Cloud Cell

- vCloud vCenter
- vCloud Host
- vCloud Datastore
- Org VDC Storage Policy
- Provider VDC Storage Policy
- Organization VDC Network
- vCloud Virtual Machine
- vCloud Network Pool
- vCloud External Network
- vCloud Entity Status - The Management Pack for vCloud Director creates several types of entity status in vRealize Operations Manager user interface and depending on the object entity status, these objects are added to the appropriate object type.
- vCloud Edge Gateway
- vCloud Licensing
- vCloud vApp Network
- vCloud Datastore Cluster

Customizing Your Configuration

You can customize your Management Pack for vCloud Director configuration by modifying configuration properties.

vCloud Director Configuration Properties

In the Management Pack for vCloud Director 4.5 release, the Advanced Settings option in the Configuration window includes some of the properties from the `vcloud.properties` file.

- vApp Collection Interval (Minutes)
- VM Collection Interval (Minutes)
- Process Events

By default, the Management Pack for vCloud Director instance collects virtual machines and virtual appliances every 30 minutes. You can use the VM Collection Interval (Minutes) option to change the virtual machine collection interval and the vApp Collection Interval (Minutes) option to change the virtual appliance collection interval.

Modifying Configuration Properties

The `vcloud.properties` file contains configuration properties that control how the Management Pack for vCloud Director models vCloud Director services, synchronizes object relationships, and reports object down alerts.

The `vcloud.properties` file is available in the `conf` folder of the management pack installation folder (for example, typical installation path for a vRealize Operations Manager 6.5 and above virtual appliance is `/usr/lib/vmware-vcops/user/plugins/inbound/vcloud_adapter3/`). Edit this file on each of the vRealize Operations Manager nodes where Management Pack for vCloud Director instance is configured and save the file. Management Pack for vCloud Director 4.5 instance does not require a vRealize Operations Manager service restart. However, you must copy the edited version of the file to each vRealize Operations Manager node where the Management Pack for vCloud Director instance is configured.

How the Management Pack for vCloud Director Processes Events

The Management Pack for vCloud Director can import events for vCloud Director entities that have the System organization and the Provider vDC, Organization, Organization vDC, or vApp entity type. These events appear as change events in the user interface.

The `PROCESS_EVENTS` property in the instance-level properties file determines whether the Management Pack for vCloud Director processes events.

The Management Pack for vCloud Director uses the value of the `LAST_EVENT_TIME` property in the `vcloud_<instance_id>.properties` file to filter out events that are already processed. During the first collection cycle, vRealize Operations Manager sets the `LAST_EVENT_TIME` property to the current time minus the value of the `MIN_BACK_INTIME_FOR_FIRST_EVENT_PROCESSING` property. The `MIN_BACK_INTIME_FOR_FIRST_EVENT_PROCESSING` property is in the adapter-level properties file and its default value is 60 minutes.

The Management Pack for vCloud Director uses a white list file, called `events_white_list.txt`, to apply additional filtering to events that it retrieves from vCloud Director. The Management Pack for vCloud Director filters events based on the white list before it imports the events into vRealize Operations Manager. You can modify the events in the white list file.

NOTE Because the Management Pack for vCloud Director logs in to vCloud Director as an administrator of the System organization, it has access to only the subset of events that are available to that user. The events for vApps are not available.

Using the vCloud Entity Status Resource Tag

The Management Pack for vCloud Director associates each vCloud Director entity that it maps to an object with a vCloud Entity Status resource tag.

The vCloud Entity Status resource tag values are `NotExisting`, `Deployed-vApps`, and `NotDeployed-vApps`. Each resource tag value includes the name of a vCloud Director instance, for example, `NotExisting:mycloud`.

You can select the `Deployed-vApps` and `NotDeployed-vApps` tag values to filter objects based on their deployment status.

You can select the `NotExisting` tag value to locate objects that no longer exist in the vCloud Director inventory and remove them from the user interface. When objects are removed from the vCloud Director inventory, they remain in the user interface until you remove them.

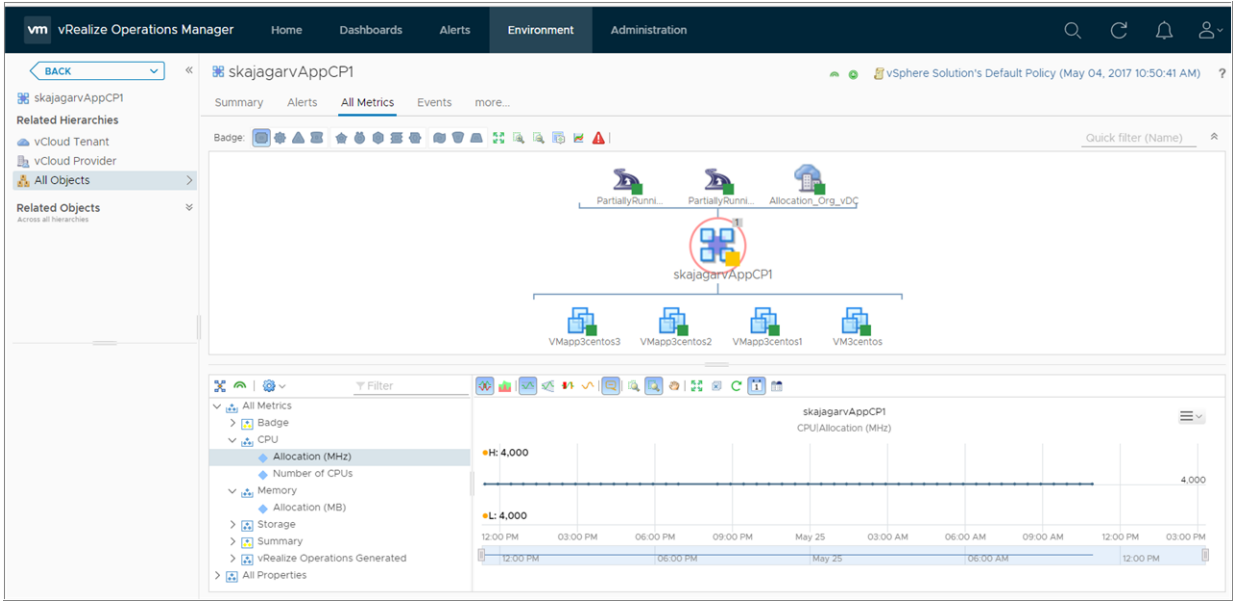
vCloud Director Entities in vRealize Operations Manager

With the Management Pack for vCloud Director, you can monitor vCloud Director entities in the user interface. The vCloud Director entities that the adapter imports, and how those entities appear in the user interface, depend on your particular environment.

All Metrics Tab

This example shows the type of information that appears on the All Metrics tab. The All Metrics tab shows the topology of the virtual machines.

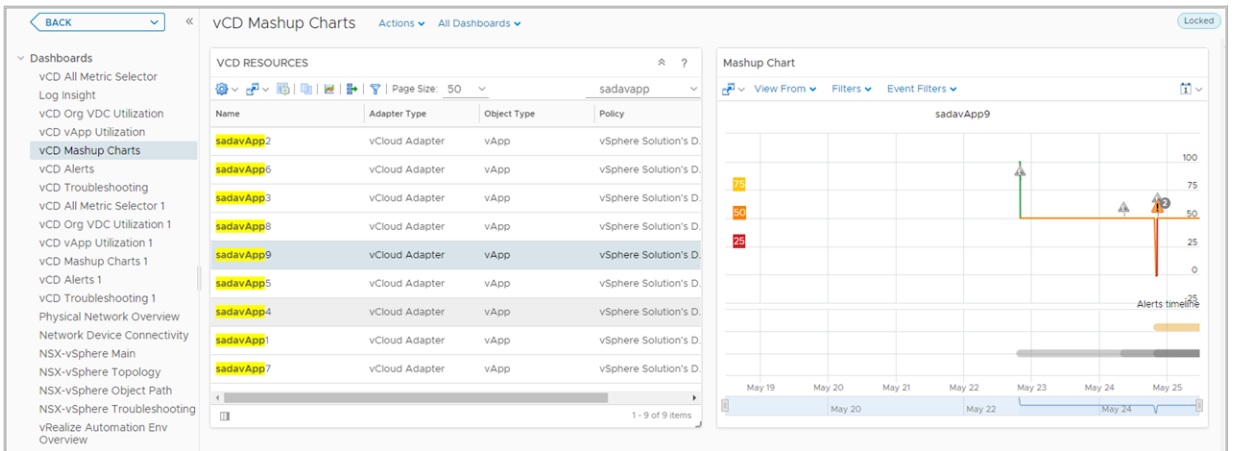
Figure 1-1. Example of the All Metrics Tab



Resources and Mashup Charts Widgets

This example shows vCloud Director entities in the Resources and Mashup Charts widgets. Collection state and status for each entity appear in the Resources widget and the Mashup Charts widget shows historical health trends.

Figure 1-2. Examples of vCloud Director Entities in the Resources and Mashup Charts Widgets



Installation and Configuration Requirements

The Management Pack for vCloud Director has certain installation and configuration requirements.

Compatible vCloud Director Versions

The Management Pack for vCloud Director is compatible with the following versions of vCloud Director:

- vCloud Director 8.20 and 8.10 (supported, tested)
- Other vCloud Director 5.x versions and above (supported, not tested)

Compatible vRealize Operations Manager Versions

The Management Pack for vCloud Director is compatible with the following versions of vRealize Operations Manager:

- vRealize Operations Manager 6.5 and above.

Compatible vCenter Server Versions

The Management Pack for vCloud Director is compatible with the following versions of vCenter Server:

- vCenter Server 5.5
- vCenter Server 6.0

vCenter Adapter Requirements

You must install and configure the vCenter adapter along with the Management Pack for vCloud Director.

The Management Pack for vCloud Director uses the virtual machine collected by the vCenter adapter to create relationships between virtual machines and the virtual appliances collected by the vCloud Director.

For information about installing and configuring the vCenter adapter, see the *VMware vCenter Adapter Installation and Configuration Guide*.

NOTE The vCenter adapter is installed by default when you install vRealize Operations Manager.

Credential Requirements

You must provide the user name and password of a vCloud Director user when you create a credential for a Management Pack for vCloud Director. You must have an Administrator, SSO, or tenant credentials with administrative privileges.

Additional Software Requirements

The Management Pack for vCloud Director uses VCD Java SDK (vsdjavasdk) 8.0 to communicate with vCloud Director. The JAR files for the SDK are provided in the `lib` folder under the Management Pack for vCloud Director installation folder.

Installing the Management Pack for vCloud Director

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You can download the Management Pack for vCloud Director from the VMware Solution Exchange website.

This chapter includes the following topics:

- [“Install the Management Pack,”](#) on page 13
- [“Configuring the Management Pack for vCloud Director,”](#) on page 14
- [“Management Pack for vCloud Director Folders and Files,”](#) on page 18

Install the Management Pack

The Management Pack for vCloud Director consists of a PAK file that contains out of the box dashboards for the newer resource objects that are brought in from vCloud Director.

The solution that you downloaded includes a PAK file. Save that PAK file to a temporary folder on your local system.

Procedure

- 1 Log in to the vRealize Operations Manager user interface with administrator privileges.
- 2 In the left pane of vRealize Operations Manager, click the **Administration** icon and click **Solutions**.
- 3 On the **Solutions** tab, click the plus sign.
- 4 Browse to locate the temporary folder and select the PAK file.
- 5 Click **Upload**. The upload might take several minutes.
- 6 Read and accept the EULA, and click **Next**. Installation details appear in the window during the process.
- 7 When the installation is finished, click **Finish**.

What to do next

Configure an adapter instance for the management pack.

Configuring the Management Pack for vCloud Director

To configure the Management Pack for vCloud Director, you must add an adapter instance and credential in vRealize Operations Manager. You can optionally modify adapter-level and instance-level properties.

Configure the Management Pack for vCloud Director

You must create an adapter instance for the Management Pack for vCloud Director. The adapter instance defines the adapter type and identifies the vCloud Director host system.

You can optionally list the Provider vDCs or Organizations for which the adapter instance collects data.

Prerequisites

- Install the Management Pack for vCloud Director. See [Chapter 2, “Installing the Management Pack for vCloud Director,”](#) on page 13.
- Verify that your system meets the configuration requirements. See [“Installation and Configuration Requirements,”](#) on page 10.

Procedure

- 1 In the left pane of vRealize Operations Manager, click the **Administration** icon and click **Solutions**.
- 2 Select Management Pack for vCloud Director and click the **Configure** icon.
- 3 Configure the instance settings.

Option	Description
Display Name	Name for the adapter instance.
Description	(Optional) Describe the instance.
vCloud Director Host	Type the host name or IP address of the vCloud Director host system. If a public REST API base URL is assigned in vCloud Director, type the public address. For example, if the VCD public REST API base URL is <code>https://vcloud.somehost.com</code> , type vcloud.somehost.com .
Autodiscovery	Discover vCloud Director objects automatically. <ul style="list-style-type: none"> ■ To set automatic discovery for objects, select True. ■ To set the automatic discovery off, select False. You must use manual discovery to import vCloud Director entities.
Filter By Provider vDCs List	List the names of the Provider vDCs to import. You can limit the vCloud Director entities that the adapter instance imports. Use a semicolon (;) to separate multiple names. For example, <code>pvc1; pvc2; pvc3</code> . Refer to the Note for more information.
Filter By Organizations List	List the names of the Organizations to import. Use a semicolon (;) to separate multiple names. For example, <code>org1; org2; org3</code> . Refer to the Note for more information.

Option	Description
Credentials	<p>Select the credential to use to sign on to the data source from the drop-down menu, or click the plus sign to add a new credential. You can select one of the following credentials:</p> <ul style="list-style-type: none"> ■ SSO Credentials ■ vCloud Director Credentials ■ vCloud Director Tenant Credentials <hr/> <p>SSO Credentials</p> <ul style="list-style-type: none"> ■ Credential Name. Enter a name for the credential. ■ SSO Host. Enter the SSO host details. ■ SSO Port. Enter the SSO port number. ■ User Name. Enter the name of the user. ■ Password. Enter the password. <hr/> <p>vCloud Director Credentials</p> <ul style="list-style-type: none"> ■ Credential Name. Enter a name for the credential. ■ User Name. Enter the name of a vCloud Director user. ■ Password. Enter the password of a vCloud Director user. <hr/> <p>vCloud Director Tenant Credentials</p> <ul style="list-style-type: none"> ■ Credential Name. Enter a name for the credential. ■ User Name. Enter the name of the tenant user in the following format: <username>@org ■ Password. Enter the password of the tenant user.
Organization	<p>To discover the vCloud Director object belonging to an organization, enter the organization name if it is not a tenant. The default value of organization is System if you are using vCloud credentials. Otherwise it is the name of your organization if you are using tenant credentials.</p>

NOTE

- If you leave the Filter By Provider vDCs List and the Filter By Organizations List lists blank, the adapter instance imports all of the supported entities from the vCloud Director hierarchy.
 - If you list Organizations and leave the Provider vDC list blank, the Management Pack for vCloud Director imports only the Organizations that you list and the entities that are related to those Organizations.
 - If you list Provider vDCs and leave the Organizations list blank, the Management Pack for vCloud Director imports only the Provider vDCs that you list and the entities that are related to those vDCs.
 - If you list Provider vDCs and Organizations, the Management Pack for vCloud Director imports the union of the two sets.
- 4 Click **Test** to test the connection to the vCloud Director host system.
 - 5 Click **OK** to save your configuration.

What to do next

If you disabled autodiscovery for the Management Pack for vCloud Director, use manual discovery to import vCloud Director entities. For information about using the manual discovery process, see the online help.

Filtering the Events that the Management Pack for vCloud Director Imports

The vCloud Director uses white list files, called `events_white_list.txt` for admin and Single Sign-on credentials (SSO) and `org_tenant_events_white_list.txt` file for tenant credentials, to filter events that it retrieves from vCloud Director.

The `events_white_list.txt` and the `org_tenant_events_white_list.txt` files are in the `conf` folder. You modify the `events_white_list.txt` on the vRealize Operations Manager virtual machine.

By default, `events_white_list.txt` contains the following events:

```
VDC_CREATE_REQUEST
VDC_CREATE
VDC_DELETE_REQUEST
VDC_DELETE
VDC_FAST_PROVISIONING_MODIFY
VDC_THIN_PROVISIONING_MODIFY
VDC_MODIFY
PROVIDERVDC_CREATE_REQUEST
PROVIDERVDC_CREATE
PROVIDERVDC_MODIFY
PROVIDERVDC_DELETE_REQUEST
PROVIDERVDC_DELETE
ORG_CREATE
ORG_MODIFY
ORG_DELETE
EDGE_GATEWAY_CREATE
EDGE_GATEWAY_REPAIR
EDGE_GATEWAY_DELETE
EDGE_GATEWAY_MODIFY
```

You can add or remove events from the `events_white_list.txt`. If you do not list events to import and leave the file empty, the Management Pack for vCloud Director imports all events.

By default, `org_tenant_events_white_list.txt` contains the following events:

```
VDC_CREATE_REQUEST
VDC_CREATE
VDC_DELETE_REQUEST
VDC_DELETE
VDC_FAST_PROVISIONING_MODIFY
VDC_THIN_PROVISIONING_MODIFY
VDC_MODIFY
ORG_CREATE
ORG_MODIFY
ORG_DELETE
ORG_CATALOGSYNC
VDC_STORAGEPROFILE_ADD
VDC_STORAGEPROFILE_MODIFY
VDC_STORAGEPROFILE_REMOVE
NETWORKPOOL_REPAIR
NETWORKPOOL_DELETE
NETWORKPOOL_CREATE
```


NETWORKPOOL_MODIFY
 NETWORK_CREATE
 NETWORK_MODIFY
 NETWORK_DELETE

You must not modify events from the `org_tenant_events_white_list.txt` file.

Configuring Adapter Properties

You configure adapter-level properties in the `vcloud.properties` file and instance-level properties in the `vcloud_instanceID.properties` file. The adapter-level configuration file contains properties that affect all adapter instances. The instance-specific configuration files contain properties that affect only particular adapter instances. The adapter-level properties file is in the `conf` folder. The instance-level properties file is in the `work` folder.

Adapter-Level Properties

You define adapter-level properties in the `vcloud.properties` file in the `conf` folder. Adapter-level properties affect all instances of the Management Pack for vCloud Director.

Table 2-1. Adapter-Level Properties

Property	Description
MIN_BACK_INTIME_FOR_FIRST_EVENT_PROCESSING	Determines the number of minutes between event processing. For example, if this property is set to 60 (the default value) and the adapter starts at 11 a.m., the adapter imports only events that are generated after 10 a.m. on the same day. Setting this property ensures that the adapter does not retrieve events that belong to vCloud Director entities that might no longer exist.
USE_CERTIFICATES	Determines whether the adapter uses the certificates in the collector truststore. If you set this property to true, the adapter uses the certificates in the truststore each time it logs in to vCloud Director. If the certificates are not valid or are missing, the adapter fails to connect to vCloud Director. If you set this property to false, the adapter always logs in to vCloud Director without using certificates.

For information about configuring adapter-level properties for alerts, see [“Customizing Your Configuration,”](#) on page 8.

Instance-Level Properties

Each adapter instance has a properties file in the `work` folder called `vcloud_instanceID.properties`, where `instanceID` is the object ID of the adapter instance. Instance-level properties affect only a particular vCloud Director adapter instance.

The Management Pack for vCloud Director creates and initializes the instance-level properties file during the first collection cycle of the adapter instance.

The `LAST_EVENT_TIME` property in the instance-level properties file tracks the last event time that the adapter instance retrieves from vCloud Director. During the first collection cycle, the `LAST_EVENT_TIME` property is set to the current time minus the value of the `MIN_BACK_INTIME_FOR_FIRST_EVENT_PROCESSING` property. The `MIN_BACK_INTIME_FOR_FIRST_EVENT_PROCESSING` property is in the `vcloud.properties` file and its default value is 60 minutes.

You should not need to modify the `LAST_EVENT_TIME` property except during adapter testing.

Import Dashboard

Perform the following procedure on vRealize Operations Manager standalone to import a dashboard to the Management Pack for vCloud Director.

Prerequisites

Verify that vCloud Adapter instance is already created in vRealize Operations Manager and wait for few collection cycles to complete.

Procedure

- 1 Login by using SSH to the vRealize Operations Manager virtual machine.
- 2 Navigate to the directory `/usr/lib/vmware-vcops/tools/dbcli`.
- 3 Run the command `./dbcli.sh dashboard import <admin-user-name>
$ALIVE_BASE/user/plugins/inbound/vcloud_adapter3/conf/dashboards/<dashboardname>.xml --retry
10`.

Management Pack for vCloud Director Folders and Files

The installer places the Management Pack for vCloud Director files in the `vcloud_adapter3` folder.

Table 2-2. Management Pack for vCloud Director Folders and Files

Folder	File	Description
conf	describe.xml	Describes the object types of the adapter.
	events_white_list.txt org_tenant_events_white_list.txt	Filters the events that the adapter retrieves from vCloud Director.
	vcloud.properties	Contains properties that apply to all adapter instances.
	version.txt	Contains version information.
	history.txt	Contains the history of the adapter changes.
	open_source_license.txt	Open source license file.
work	vcloud_instanceID.properties	Contains properties that apply to a specific adapter instance.
	VEntitiesLog_instanceID.txt VEntitiesLog_instanceID.txt.bck	Logs relationships for a specific adapter instance.
	allParents_instanceID.txt allParents_instanceID.txt.bck	Keeps track of all parent objects for a specific adapter instance.
lib		Contains all library files.

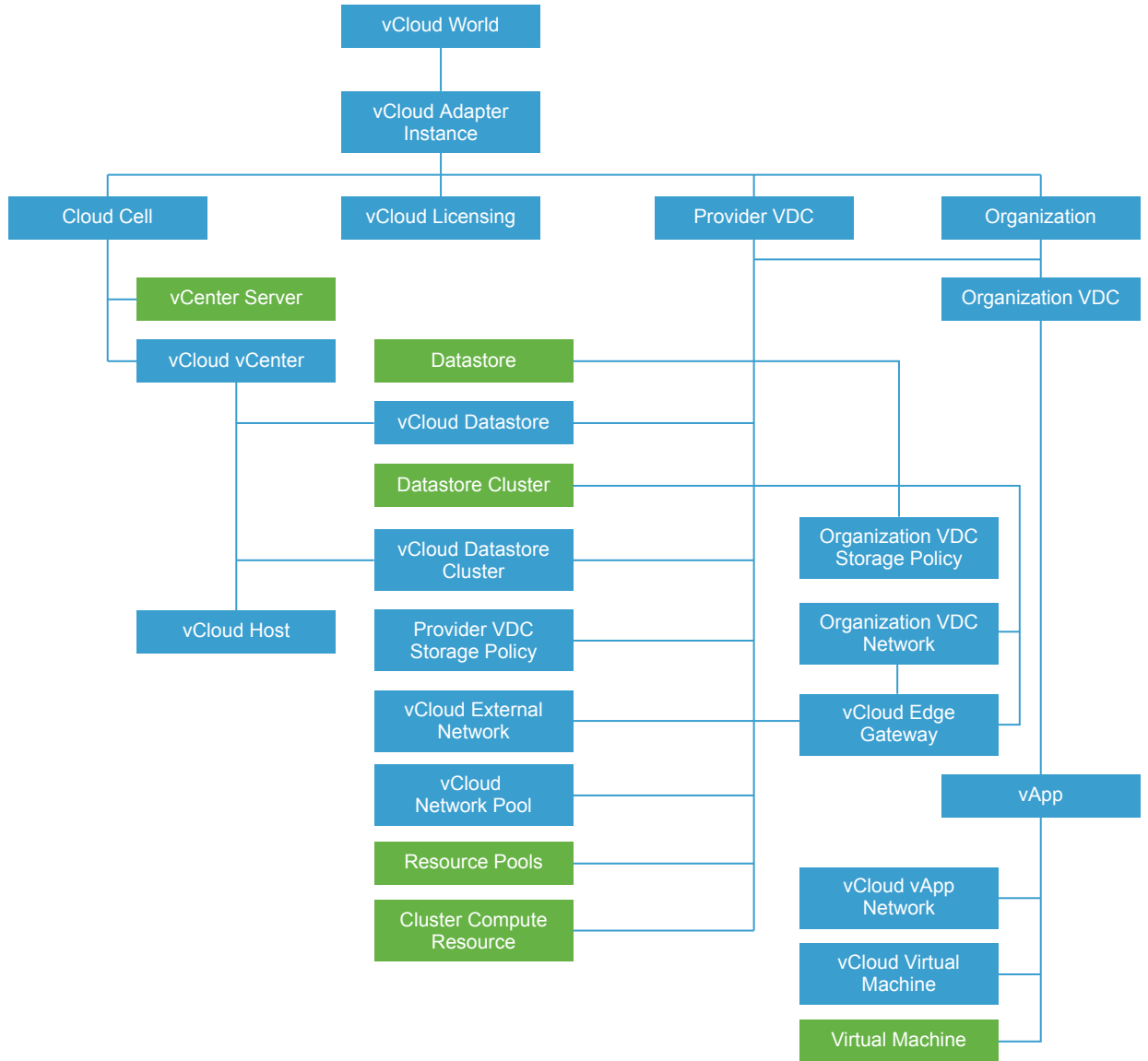
vCloud Director Resource Relationship

3

This chapter describes the resource relationship hierarchy of a vCloud Director adapter instance.

Resource Relationship Hierarchy

The following image displays the relationship hierarchy of a vCloud Director adapter instance.



The resources in a Management Pack for vCloud Director instance can be classified as parent resource or child resource. If both the parent and child resources are vCloud resources, it implies that the child resource belongs to the parent. For example, Organization VDC is part of Provider vDC. Also, a relationship is established, if the parent is a vCloud resource and the child is a vCenter resource.

Default Dashboards of Management Pack for vCloud Director

4

Following default dashboards are visible after an adapter instance is created in the vCloud Director.

Table 4-1. Dashboards in the Management Pack

Dashboard Name	Purpose
vCD All Metric Selector	This dashboard visualizes all the metrics associated with a particular object that are collected by the Management Pack for vCloud Director at a single place. The metrics for the selected object is displayed if you select the object.
vCD Organization vDC Utilization	This dashboard provides a quick view of the top 10 Organization vDC based on the CPU usage, memory usage, storage usage, vApps, network usage, storage Allocation, etc. Based on these metrics, you can determine the performances of the respective Organization vDC.
vCD vApp Utilization	This dashboard provides a quick view of the top 10 vApps based on the CPU allocation, memory allocation, storage allocation, number of virtual machines, and number of CPUs. Based on these metrics, you can determine the performances of the respective vApp.
vCD Mashup charts	This dashboard can be used as a reference for getting the health of the particular objects collected by the vCloud Director. This dashboard also provides us with another metrics known as Anomaly Count Graph, which draws out the number of anomalies for a object in the form of metrics.
vCD Alerts	This dashboard pulls the alerts pulled from the Management Pack for vCloud Director and relationship of the object which causes the alert and its Interesting Metric is displayed.
vCD Troubleshooting	This dashboard shows all objects and its relationship in Management Pack for vCloud Director based on the selection of object, corresponding health anomalies and its Interesting Metric is displayed.

NOTE The vCD Troubleshooting dashboard is not created even if the Management Pack for vCloud Director is created because vRealize Operations Manager takes few collection cycle to create a self generated object type. You need to import the dashboard by running the Database Command Line Interface (DBCLI) command. For more information on importing a dashboard, see [“Import Dashboard,”](#) on page 18.

Metrics

You can use the the Management Pack for vCloud Director to collect metrics for object types such as, cloud cell, organization, organization VDC, vApp and so on.

The Management Pack for vCloud Director uses the organization tenant credentials to collect metrics for organization, organization vDC, organization vDC storage profile, vCloud network pool, vCloud external network pool, vApp, and vCloud virtual machine objects. A user with organization tenant credentials can discover metrics that does not need administrator privileges.

The list of metrics that the vCloud Director collects are as follows.

Table 5-1. vCloud Director Metrics

Objects	Metrics
Cloud Cell	Summary Status
Organization	<ul style="list-style-type: none"> ■ Summary Deployed VM Quota ■ Summary Enabled ■ Summary Number of Catalogs ■ Summary Number of Disks ■ Summary Number of Groups ■ Summary Number of Organization VDCs ■ Summary Number of Running VMs ■ Summary Number of vApps ■ Summary Storage VM Quota

Table 5-1. vCloud Director Metrics (Continued)

Objects	Metrics
Organization VDC	<ul style="list-style-type: none"> ■ Summary Allocation Model ■ Summary Enabled ■ Summary Maximum Number of VMs ■ Summary Number of Disks ■ Summary Number of Medias ■ Summary Number of Resource Pools ■ Summary Number of Storage Policies ■ Summary Number of vApp Templates ■ Summary Number of vApps ■ Summary Status ■ CPU Allocation(MHz) ■ CPU Free (%) ■ CPU Free (MHz) ■ CPU Overhead (MHz) ■ CPU Reserved (%) ■ CPU Reserved (MHz) ■ CPU Used (%) ■ CPU Used (MHz) ■ CPU vCPU Speed (MHz) ■ Memory Allocation(MB) ■ Memory Free (%) ■ Memory Free (MB) ■ Memory Overhead (MB) ■ Memory Reserved (%) ■ Memory Reserved (MB) ■ Memory Used (%) ■ Memory Used (MB) ■ Storage Allocation (MB) ■ Storage Fast Provisioning ■ Storage Free (%) ■ Storage Free (MB) ■ Storage Overhead(MB) ■ Storage Thin Provisioning ■ Storage Used (%) ■ Storage Used (MB) ■ Network Available Networks ■ Network Maximum Provisioned Networks ■ Network Number of Networks Used

Table 5-1. vCloud Director Metrics (Continued)

Objects	Metrics
Provider VDC	<ul style="list-style-type: none"> ■ Summary Status ■ Summary Enabled ■ Summary Number of Datastores ■ Summary Number of Organization VDCs ■ Summary Number of Resource Pools ■ Summary Number of Storage Policies ■ CPU Allocation(MHz) ■ CPU Free (%) ■ CPU Free (MHz) ■ CPU Limit (MHz) ■ CPU Over Allocation(%) ■ CPU Overhead (MHz) ■ CPU Used (%) ■ CPU Used (MHz) ■ CPU Total (MHz) ■ Memory Allocation(MB) ■ Memory Free (%) ■ Memory Free (MB) ■ Memory Limit (MB) ■ Memory Over Allocation(%) ■ Memory Overhead (MB) ■ Memory Used (%) ■ Memory Used (MB) ■ Memory Total (MB) ■ Storage Allocation (MB) ■ Storage Free (%) ■ Storage Free (MB) ■ Storage Limit (MB) ■ Storage Over Allocation(%) ■ Storage Overhead(MB) ■ Storage Total (MB) ■ Storage Used (%) ■ Storage Used (MB)
Organization VDC Network	Direct <ul style="list-style-type: none"> ■ Summary Status ■ Summary Type ■ Network Network Pool Used (%) ■ Network Network Pool Used ■ Network Network Pool Free (%) ■ Network Network Pool Used ■ Network Network Pool Total
Provider VDC Storage Policy	<ul style="list-style-type: none"> ■ Storage Free (%) ■ Storage Free (MB) ■ Storage Used (%) ■ Storage Used (MB) ■ Storage Total (MB) ■ Storage Provisioned (%) ■ Storage Provisioned (MB) ■ Storage Requested (%) ■ Storage Requested (MB)

Table 5-1. vCloud Director Metrics (Continued)

Objects	Metrics
Organization VDC Storage Policy	<ul style="list-style-type: none"> ■ Summary Status ■ Summary Default ■ Storage Free (%) ■ Storage Free (MB) ■ Storage Used (%) ■ Storage Used (MB) ■ Storage Total (MB)
vCloud Datastore	<ul style="list-style-type: none"> ■ Storage Free (%) ■ Storage Free (MB) ■ Storage Used (%) ■ Storage Used (MB) ■ Storage Total (MB) ■ Storage Provisioned (%) ■ Storage Provisioned (MB) ■ Storage Requested (%) ■ Storage Requested (MB)
vCloud External Network	<ul style="list-style-type: none"> ■ Summary Status ■ Network Network Pool Used (%) ■ Network Network Pool Used ■ Network Network Pool Free (%) ■ Network Network Pool Used ■ Network Network Pool Total
vCloud Network Pool	<ul style="list-style-type: none"> ■ Summary Status ■ Summary Type ■ Network Network Pool Used (%) ■ Network Network Pool Used ■ Network Network Pool Free (%) ■ Network Network Pool Free ■ Network Network Pool Total
vCloud Host	<ul style="list-style-type: none"> ■ Summary Enabled ■ Summary Status ■ Summary Ready
vCloud vCenter	Summary Status
vApp	<ul style="list-style-type: none"> ■ Summary Status ■ Summary Number of VMs ■ Storage Allocation (MB) ■ Memory Allocation (MB) ■ CPU Usage Allocation (MHz) ■ CPU Usage Number of CPUs ■ APP Storage Lease ■ Summary Expired ■ Summary Enabled ■ Summary Deployed ■ Summary Snapshot Size ■ Summary Deployment Lease ■ Summary Storage Lease <p>NOTE By default, this resource is disabled. You have to change the settings to collect the Summary Snapshot Size and Summar Deployment Lease metrics.</p>

Table 5-1. vCloud Director Metrics (Continued)

Objects	Metrics
vCloud Virtual Machine	<ul style="list-style-type: none"> ■ Summary Status ■ Summary Chain Length ■ Summary Guest Customization ■ Summary Snapshot Size (MB) ■ VM Chain Length ■ VM Guest Customization
vCloud Licensing	<ul style="list-style-type: none"> ■ Available Physical Memory (MB) ■ Is Valid Serial No ■ Physical CPUs ■ Physical Memory Used (MB) ■ Running VMs ■ vCPUs ■ vRAMs (MB)
vCloud Edge Gateways	<ul style="list-style-type: none"> ■ HA Status ■ Number of External Networks ■ Number of Organization VDC Networks
vCloud vApp Networks	<ul style="list-style-type: none"> ■ Summary Busy

Alert Definitions

Alert definitions are combinations of symptoms and recommendations that identify problem areas in your environment and generate alerts on which you can act. Symptom and alert definitions are defined for vCloud Director objects. The alerts are based on the risk or health of a certain percentage of child objects.

Table 6-1. Alert Definitions

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
Cloud cell is not available	Cloud cell	Summary Status = 0	Availability	Critical	<ul style="list-style-type: none"> ■ Verify the application and system event log details. ■ Restart the affected service, daemon, or server. ■ Ensure that the vCloud Director services are available.
Organization Deployed VM is approaching quota	Organization	Summary Number of Running VMs / Summary Deployed VM Quota < 75%	Capacity	Warning	<ul style="list-style-type: none"> ■ Increase the deployment quota for the virtual machine. ■ Power off idle virtual machines.
Organization Deployed VM is approaching quota	Organization	Summary Number of Running VMs / Summary Deployed VM Quota < 85%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Increase the deployment quota for the virtual machine. ■ Power off idle virtual machines.
Organization Deployed VM is approaching quota	Organization	Summary Number of Running VMs / Summary Deployed VM Quota < 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Increase the deployment quota for the virtual machine. ■ Power off idle virtual machines.
Organization VDC CPU usage reserved is nearing capacity	Organization VDC	Org vDC CPU Usage Reserved (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Decrease the CPU reservations on the Organisation VDC object type. ■ Add more CPU resources to the Organisation VDC object type.

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
Organization VDC CPU usage reserved is nearing capacity	Organization VDC	Org vDC CPU Usage Reserved (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Decrease the CPU reservations on the Organisation VDC object type. ■ Add more CPU resources to the Organisation VDC object type.
Organization VDC CPU usage reserved is nearing capacity	Organization VDC	Org vDC CPU Usage Reserved (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Decrease the CPU reservations on the Organisation VDC object type. ■ Add more CPU resources to the Organisation VDC object type.
Organization VDC memory usage reserved is nearing capacity	Organization VDC	Org vDC MemoryUsage Reserved (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Decrease the memory reservations on the Organisation VDC object type. ■ Add more memory resources to the Organisation VDC object type.
Organization VDC memory usage reserved is nearing capacity	Organization VDC	Org vDC MemoryUsage Reserved (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Decrease the memory reservations on the Organisation VDC object type. ■ Add more memory resources to the Organisation VDC object type.
Organization VDC memory usage reserved is nearing capacity	Organization VDC	Org vDC MemoryUsage Reserved (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Decrease the memory reservations on the Organisation VDC object. ■ Add more memory resources to the Organisation VDC object.
Organization VDC has high CPU workload	Organization VDC	Summary Allocation Model = 2 OR 3 AND CPU Usage Used (%) > 80%	Performance	Warning	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Organization VDC has high CPU workload	Organization VDC	Summary Allocation Model = 2 OR 3 AND CPU Usage Used (%) > 90%	Performance	Immediate	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
Organization VDC has high CPU workload	Organization VDC	Summary Allocation Model = 2 OR 3 AND CPU Usage Used (%) > 95%	Performance	Critical	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Organization VDC has high memory workload	Organization VDC	Summary Allocation Model = 2 OR 3 AND Memory Used (%) > 80%	Performance	Warning	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual center. ■ Power off unused virtual machines.
Organization VDC has high memory workload	Organization VDC	Summary Allocation Model = 2 OR 3 AND Memory Used (%) > 90%	Performance	Immediate	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Organization VDC has high memory workload	Organization VDC	Summary Allocation Model = 2 OR 3 AND Memory Used (%) > 95%	Performance	Critical	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Organization VDC is running out of available networks	Organization VDC	Network Available Networks < 1	Capacity	Critical	<ul style="list-style-type: none"> ■ Remove unused networks from the Organization VDC object type. ■ Request additional network from the provider.
Organization VDC is running out of storage space	Organization VDC	Storage Summary Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Organization VDC is running out of storage space	Organization VDC	Storage Summary Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Organization VDC is running out of storage space	Organization VDC	Storage Summary Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Provider VDC is not available	Provider VDC	Summary Enabled=0 OR Summary Status=0	Availability	Critical	<ul style="list-style-type: none"> ■ Ensure the virtual data center is enabled in vCloud Director. ■ Enable the virtual data center in vCloud Director if the virtual data center is not enabled.

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
Provider VDC has unexpected high CPU workload	Provider VDC	CPU Usage Used (%) > Dynamic Threshold AND CPU Usage Used (%) > 80%	Performance	Warning	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has unexpected high CPU workload	Provider VDC	CPU Usage Used (%) > Dynamic Threshold AND CPU Usage Used (%) > 90%	Performance	Immediate	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has high CPU workload	Provider VDC	CPU Usage Used (%) > 80%	Performance	Warning	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has high CPU workload	Provider VDC	CPU Usage Used (%) > 90%	Performance	Immediate	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has high CPU workload	Provider VDC	CPU Usage Used (%) > 95%	Performance	Critical	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has high memory workload	Provider VDC	Memory Used (%) > 80%	Performance	Warning	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has high memory workload	Provider VDC	Memory Used (%) > 90%	Performance	Immediate	<ul style="list-style-type: none"> ■ Migrate virtual machines to a different virtual data center. ■ Power off unused virtual machines.
Provider VDC has high memory workload	Provider VDC	Storage Summary Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Provider VDC is running out of storage space	Provider VDC	Storage Summary Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
Provider VDC is running out of storage space	Provider VDC	Storage Summary Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Provider VDC storage policy is running out of storage space	Provider VDC Storage Policy	Storage Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Provider VDC storage policy is running out of storage space	Provider VDC Storage Policy	Storage Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Provider VDC storage policy is running out of storage space	Provider VDC Storage Policy	Storage Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
vCloud datastore is running out of disk space	vCloud Datastore	Summary Status = 1 AND Storage Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Add more capacity to the datastore. ■ Change the storage policy for some virtual machines to migrate to a different datastore. ■ Delete unused snapshots of virtual machines. ■ Delete any unused templates of the datastore.
vCloud datastore is running out of disk space	vCloud Datastore	Summary Status = 1 AND Storage Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Add more capacity to the datastore. ■ Change storage policy for some virtual machines to migrate to a different datastore. ■ Delete unused snapshots of virtual machines. ■ Delete any unused templates in the datastore.
vCloud host is not available	vCloud Host	Summary Available = 0 OR Summary Enabled = 0 OR Summary Ready = 0 OR Summary Status = 0	Availability	Warning	<ul style="list-style-type: none"> ■ Check the application and system event log details. ■ Take the host out of maintenance mode. ■ Prepare the host.

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
vCloud network pool is running out of networks	vCloud Network Pool	Network Network Pool Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Increase the network pool size. ■ Add additional network to the network pool.
vCloud network pool is running out of networks	vCloud Network Pool	Network Network Pool Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Increase the network pool size. ■ Add additional network.
vCloud network pool is running out of networks	vCloud Network Pool	Network Network Pool Used (%) > 75%	Capacity	Critical	<ul style="list-style-type: none"> ■ Increase the network pool size. ■ Add additional network.
vCloud vCenter is not available	vCloud vCenter	Summary Chain Length > 5	Availability	Critical	<ul style="list-style-type: none"> ■ Check the application and system event log details. ■ Restart the affected service, daemon, or server.
vCloud Virtual Machine snapshot chain length is getting high	vCloud Virtual Machine	Summary Chain Length > 15	Configuration	Immediate	<ul style="list-style-type: none"> ■ Remove the virtual machine snapshots. ■ Consolidate the virtual machines.
vCloud virtual machine snapshot chain length is getting high	vCloud Virtual Machine	Summary Chain Length > 25	Configuration	Critical	<ul style="list-style-type: none"> ■ Remove the snapshots. ■ Consolidate virtual machine.
vCloud virtual machine has large disk snapshots	vCloud Virtual Machine	Summary Snapshot Size (GB) > 1	Configuration	Warning	<ul style="list-style-type: none"> ■ Remove the snapshots. ■ Consolidate the virtual machine.
Organization VDC network is running out of IP addresses	Organization VDC Network	Network Network Pool Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional IP addresses.
Organization VDC network is running out of IP addresses	Organization VDC Network	Network Network Pool Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional IP addresses.
Organization VDC network is running out of IP addresses	Organization VDC Network	Network Network Pool Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional IP addresses.
Organization VDC storage policy is running out of storage space	Organization VDC Storage Policy	Storage Used (%) > 90%	Capacity	Warning	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
Organization VDC storage policy is running out of storage space	Organization VDC Storage Policy	Storage Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
Organization VDC storage policy is running out of storage space	Organization VDC Storage Policy	Storage Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Remove unused virtual machines or templates. ■ Request additional storage.
vCloud External network IP Pool is running out of IP addresses	vCloud External Network	Summary Status = 1 AND Network Network Pool Used (%) > 80%	Capacity	Warning	<ul style="list-style-type: none"> ■ Allocate additional IP addresses. ■ Create an additional vCloud External Network.
vCloud external network IP pool is running out of IP addresses	vCloud External Network	Summary Status = 1 AND Network Network Pool Used (%) > 90%	Capacity	Immediate	<ul style="list-style-type: none"> ■ Allocate additional IP addresses. ■ Create an additional vCloud External Network.
vCloud external network IP pool is running out of IP addresses	vCloud External Network	Summary Status = 1 AND Network Network Pool Used (%) > 95%	Capacity	Critical	<ul style="list-style-type: none"> ■ Allocate additional IP addresses. ■ Create an additional vCloud External Network.
vApp is expired	vApp	Others is_expired = 1	Availability	Warning	Renew the lease of the vApp.
Organization is disabled	Organization	Organization is disabled	Health	Warning	None
vApp has expired	vApp	vApp has expired	Health	Warning	Renew vApp Lease
vApp as Powered Off	vApp	vApp has Powered Off	Health	Immediate	None
vApp is in Suspended State	vApp	vApp is in Suspended State	Health	Warning	None
vApp is in mixed state (one or more VMs powered off)	vApp	vApp is in mixed state (one or more VMs powered off)	Health	Warning	None
Failed to create vApp	vApp	Failed to create vApp	Health	Critical	None
vApp is inconsistent state	vApp	vApp is in inconsistent state	Health	Critical	None

Table 6-1. Alert Definitions (Continued)

Alert Name	Object Type	Symptom	Impact	Severity	Recommendation
vApp waiting for input	vApp	vApp waiting for input	Health	Immediate	None
vApp is in unresolved state	vApp	vApp is in unresolved state	Health	Warning	None

NOTE In Table 5-1, with reference to allocation models, 1=Pay-as-you-go-model, 2=Allocation Pool Model, and 3=Reservation Pool Model.

The following are informational symptoms that do not have associated alerts generated.

Table 6-2. Informational symptoms

Symptom Name	Object Type	Symptom	Severity
Organization VDC is allocation pool model	Organization VDC	Summary Allocation Model = 2	Info
Organization VDC is reservation pool model	Organization VDC	Summary Allocation Model = 3	Info
Organization VDC is a pay-as-you-go model	Organization VDC	Summary Allocation Model = 1	Info
vApp is in Mixed State (one or more VMs are powered off)	vApp	Summary Status = MIXED	Warning
vApp is Powered Off	vApp	Summary Status = POWERED_OFF	Immediate
vApp Powered On	vApp	Summary Status = POWERED_ON	Info
vApp is in Suspended State	vApp	Summary Status = SUSPENDED	Warning
vApp has expired	vApp	Summary is_expired = 1	Info
vCloud virtual machine powered off	vCloud Virtual Machine	Summary Status = POWERED_OFF	Info
vCloud virtual machine powered on	vCloud Virtual Machine	Summary Status = POWERED_ON	Info
vCloud virtual machine powered suspended	vCloud Virtual Machine	Summary Status = SUSPENDED	Info

Management Pack for vCloud Director Reports

7

A report is a scheduled snapshot of views. The Management Pack for vCloud Director provides a variety of report templates.

Table 7-1. Management Pack for vCloud Director

Name of Report	Description
vCloud Director - Distribution Report	This report provides a distributed view of the utilization of vCloud Director objects such as cloud cell, organization, organization vDC, and provider vDC.
vCloud Director - Summary Report	This report provides a detailed view of vCloud Director objects such as the vCloud network pool, organization vDC storage policy, provider vDC and other areas providing additional detail about key metrics for each object type.
vCloud Director - Detailed Report	This report provides a detailed view of vCloud Director objects such as the vCloud network pool, Organization vDC storage policy, provider vDC and other areas providing additional detail about key metrics for each object type.

NOTE When you generate a report for traversal specification, a report is generated for all the objects associated with the specific traversal specification. If you want a report for all objects, generate a report for the vCloud World object type from all objects.

Troubleshooting the Management Pack for vCloud Director

8

Known troubleshooting information can help you diagnose and resolve problems with the Management Pack for vCloud Director.

This chapter includes the following topics:

- [“Troubleshooting the vCloud Director Adapter Instance,”](#) on page 39
- [“Viewing System Log Files,”](#) on page 39

Troubleshooting the vCloud Director Adapter Instance

Perform these general troubleshooting steps to diagnose and correct problems with a vCloud Director adapter instance.

- 1 Test the connection to the vCloud Director host system. See [“Configure the Management Pack for vCloud Director,”](#) on page 14.
- 2 If the adapter instance cannot connect to the vCloud Director host system, verify the address in the **vCloud Director Host** text box on the Add Adapter Instance window. If a public REST API base URL is assigned in vCloud Director, you must type the public address. See [“Configure the Management Pack for vCloud Director,”](#) on page 14.
- 3 View the collection status and state of the adapter instance object type on the Environment Overview page.
- 4 Check the adapter and collector logs for errors. See [“Viewing System Log Files,”](#) on page 39.

Viewing System Log Files

You can view vCloud Director errors in the vRealize Operations Manager adapter and collector log files. You can view log files in the user interface or in an external log viewer.

The Management Pack for vCloud Director log files are in the `/storage/log/vcops/log/adapters/VCloudAdapter` folder. The collector log files are in the `/storage/log/vcops/log` folder.

Perform the following steps to change the log level from vRealize Operations Manager user interface.

- 1 Navigate to **Administration > Support > Logs**
- 2 Select the collector node from the right pane on which Management Pack for vCloud Director instance is configured.
- 3 Navigate to **Collector > Adapters > vCloud Adapter** and click **Edit**.

You can set the log level for each class in the `log4j.properties` file in the `/usr/lib/vmware-vcops/user/conf/collector` folder, for example:

```
log4j.logger.com.integrien.adapter3.vlcloud.VCloudAdapter=debug
```

The logging level is set to ERROR by default. To troubleshoot issues, set the logging level to INFO. To view detailed messages, including micro steps, queries, and returned results, set the logging level to DEBUG.

Note If you set the logging level to DEBUG, log files can become large very quickly. Set the logging level to DEBUG only for short periods of time.

For information about viewing log files and modifying logging levels, see the online help.

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