

Using vRealize Operations Tenant App for vCenter as a Service Provider

Management Packs for vRealize Operations Manager 2.5

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

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vRealize Operations Tenant App for vCenter as a Service Provider

The *Using vRealize Operations Tenant App for vCenter as a Service Provider* guide provides information about configuring tenant users for vCenter.

Intended Audience

This information is intended for anyone who wants to use the tenant view of vCenter. The information is written primarily for service providers to create users for a tenant in vCenter.

VMware Technical Publications Glossary

VMware Technical Publications provides a glossary of terms that might be unfamiliar to you. For definitions of terms as they are used in VMware technical documentation, go to <http://www.vmware.com/support/pubs>.

Introduction

1

VMware supports its partners to host and sell cloud services built on VMware technology using vCenter. vCenter provides core of virtualization and allows you to segment the virtual infrastructure and offer it as a service.

There are several variants of infrastructure that are sold by these partners such as, 'Pay as you go', 'Raw capacity', and 'Raw capacity with minimum guarantee'. The combination of these can be offered to same tenants and it becomes challenging to track usage over a period and charge appropriately. It becomes critical for the service providers as the tenants demand for transparency in billing, and it is imperative that service providers offer it.

vRealize Operations Tenant App addresses this by accurately metering the infrastructure. It provides options to configure different models for pricing this metered infrastructure. It also provides tenant-specific views that help tenants validate their charges by analyzing their usage.

The Using vRealize Operations Tenant App for vCenter as a Service Provider documentation provides information about configuring a tenant app for vCenter. Service providers can configure and create users for a tenant to use the vRealize Operations Tenant App for vCenter.

Customer Experience Improvement Program

2

As part of the enhanced Customer Experience Improvement Program ("CEIP"), Tenant App collects certain technical data about the organization's use of VMware products and services regularly. This data is collected to allow VMware diagnose and improve its products and services, fix product issues, provide technical support, and to advise you on how to deploy and use VMware's products.

Configuring VMware products to participate in the CEIP allows the Tenant App to send product usage data to VMWare as part of the Customer Experience Improvement Program. You can disable your participation in this program at any time.

Prerequisites

For additional information regarding the CEIP, refer to the Trust and Assurance Center at [Customer Experience Improvement Program](#).

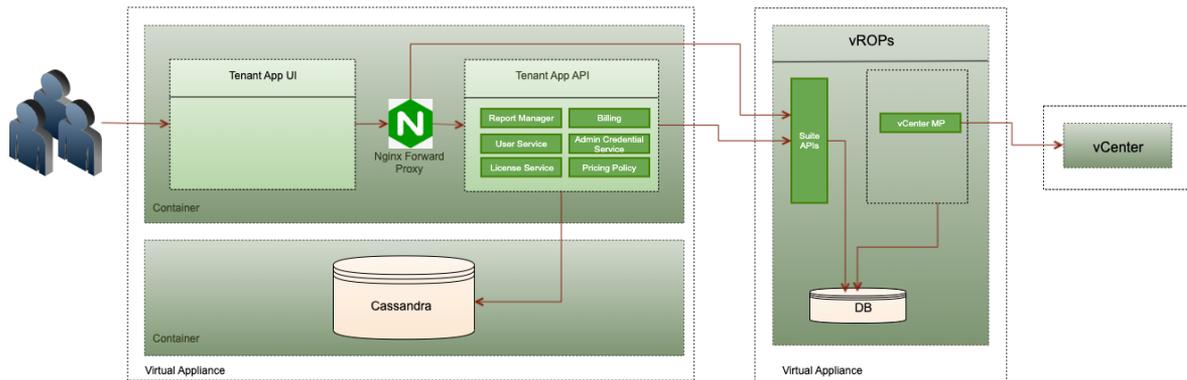
Procedure

- 1 In the Tenant App UI, click **Admin** and select **CEIP Settings** from the drop-down menu.
- 2 Select the **Join the VMware Customer Experience Improvement Program** option to enable the program or deselect the option to disable the program.
- 3 Click **Ok** to save your preference.

Deployment Architecture for vRealize Operations Tenant App for vCenter

3

The following architecture provides an overview of integration of Tenant App with vCenter.



- vRealize Operations Manager collects resources from vCenter and displays it in the vRealize Operations Manager Database.
- vRealize Operations Tenant App for vCenter interacts with vRealize Operations Manager using the Suite APIs (internal/external) to collect resources and pricing information.
- All requests from Tenant App for vRealize Operations vCenter are sent through Nginx Forward Proxy and the configuration is as displayed in the Deployment Architecture workflow diagram.

Integration with vRealize Operations Manager

4

You can integrate vRealize Operations Tenant App for vCenter with vRealize Operations Manager to deploy the tenant view.

This chapter includes the following topics:

- [Deploy the OVF File for a Tenant App](#)
- [Reset Root Password in Tenant App](#)
- [Log in to the Tenant App](#)
- [Changing Default SSL Certificates](#)
- [Register a Different vRealize Operations Manager for Tenant App](#)
- [HA and Backup Configurations for Tenant App](#)

Deploy the OVF File for a Tenant App

To deploy a vRealize Operations Tenant App for vCenter, you have to download and install the OVF file from the Solution Exchange website. You can install the Tenant App OVF file through vSphere Web Client.

Prerequisites

- Ensure that the vRealize Operations Manager is installed and the Tenant App is installed on the internal network same as vRealize Operations Manager.
- Ensure that the correct license key is entered in the vRealize Operations Manager.
- Verify that you are connected to a vCenter Server system with a vSphere Web Client, and log in to the vSphere Client.
- Verify that you have a data center created and a host system already added to it.

Procedure

- 1 From the vSphere Web Client navigator, select the host system in the management vCenter where you want to deploy the OVF file.
- 2 Click the **Actions** drop-down menu and select **Deploy OVF Template**.

- 3 From the Deploy OVF Template dialog box, select **Local File**.
- 4 Click **Browse** to locate the OVA file that you downloaded from the Product download page and click **Next**.
- 5 Rename the OVA file and location at which the OVF is deployed and click **Next**.
- 6 Verify the resource where you want to run the deployed OVF template and click **Next**.
- 7 Review the template details and click **Next**.
- 8 Scroll through the License Agreement and click **Accept > Next**.
- 9 Select a virtual disk format to store the files for the deployed template and click **Next**.
- 10 Click **Browse** to select a Destination Network or retain the default destination, and click **Next**.
- 11 Customize the template by providing the following information.

Option	Description
vRealize Operations Manager Hostname or IP Address	This is a mandatory field. Enter the IP address or the host name of vRealize Operations Manager. Note If you have provided the host name, ensure that it is resolvable through DNS.

- 12 Click **Next**.
- 13 Review the settings and click **Finish**.

Reset Root Password in Tenant App

You can reset the password in Tenant App using root credentials.

Procedure

- 1 SSH to your Tenant App Virtual Appliance and log in using root credentials.
- 2 Run the `passwd` command to change the password for root.
- 3 Enter your new password.

The password is successfully updated.

Note By default, the Tenant App Virtual Appliance is configured with root credentials as 'vmware'.

Log in to the Tenant App

To access the tenant view UI, use the IP address of the deployed OVF file.

Prerequisites

Verify that you have deployed the OVF file.

Procedure

- 1 Open a Web browser and enter the IP address of the deployed OVF file.
- 2 Select the **vCenter** option in the 'Welcome to the vRealize Operations Tenant App' page.
- 3 Enter the vRealize Operations Manager administrator user name and password.
- 4 Click **Login**.
- 5 Go to **Administration > Solutions**, and click **vrealize Operations** to save the vRealize Operations Manager administrator credentials.

Note It is necessary to save the administrator credentials in the vRealize Operations Tenant App for vCenter to access the vRealize Operations Manager Suite APIs and obtain information about organizations and tenants.

Changing Default SSL Certificates

By default, the vRealize Operations Tenant App for vCenter has a self-signed certificate. You can modify the default certificate, if necessary. When you attempt to use vRealize Operations Tenant App for vCenter over a trusted SSL Internet connection, and open the interface in a Web browser; you receive warnings that the connection is untrusted (in Mozilla Firefox) or that problems have been detected with the website's security certificate (in Internet Explorer).

You can resolve a problem by installing a signed certificate.

Procedure

- 1 Go to **Administration > Support**, and click **SSL Certificate**.
- 2 Click **Browse** to select a PEM file.
- 3 Click **Upload**.

Note For information on generating certificates, see [Configure a Certificate for use with vRealize Operations Tenant App](#).

Register a Different vRealize Operations Manager for Tenant App

You can register a different vRealize Operations Manager for Tenant App when the vRealize Operations Manager registered with Tenant App becomes unavailable or when there is a change in the requirement of vRealize Operations Manager for Tenant App.

Procedure

- 1 Log in to the vCenter environment where Tenant App is deployed.
- 2 Power off the Tenant App Virtual Machine.

- 3 Navigate to **Configure > Settings > vApp Options** and click **Properties**.
- 4 Search for vrops_host, and click **SET Value**.
- 5 Enter the new vRealize Operations Manager IP.
- 6 Power on the Tenant App.

HA and Backup Configurations for Tenant App

All the data that is processed by Tenant App is stored in vRealize Operations Manager except for the bills generated for the tenant and configuration or the tenant UI access. Therefore, the Tenant App does not have a HA and Backup guide of its own.

Upgrade vRealize Operations Tenant App for vCenter

5

You can upgrade to the latest version of the vRealize Operations Tenant App for vCenter.

Procedure

- 1 Log in to the web console at **`https://<vROps Tenant App for vCenter IP address>:5480`**.
- 2 Click the **Update** tab.
- 3 Click **Check Updates** to view the available updates and to enable the **Install Updates** option.
- 4 (Optional) Click **Install Updates**.
After successful upgrade, you have to manually reboot the virtual appliance.
- 5 Click the **System** tab, and verify the updated version number of the appliance.

Upgrade vRealize Operations Tenant App Using the Downloadable ISO Image

6

You can upgrade the vRealize Operations Tenant App by using a downloadable ISO image.

Procedure

- 1 Right-click the TenantApp virtual machine and select **Edit Settings**.
- 2 On the **Virtual Hardware** tab, select **CD/DVD Drive > Datastore ISO File**.
- 3 Navigate to the ISO image in the datastore.
- 4 For **File Type**, select **ISO Image** and click **OK**.
- 5 Select the option to connect at power-on and follow the prompts to add the CD/DVD drive to the TenantApp virtual machine.
- 6 Power on the TenantApp virtual machine.
- 7 In a Web browser, log in to the virtual appliance management interface (VAMI). The URL for the VAMI is **https:// tenantapp_appliance_address:5480**
- 8 Click the **Update** tab.
- 9 Click **Settings**, select **Use CDROM Updates**, and click **Save Settings**.
- 10 Click **Status** and click **Check Updates**. The appliance version appears in the list of available updates.
- 11 Click **Install Updates** and click **OK**.
- 12 After the updates install, click the **System** tab and click **Reboot**

What to do next

Log out of the TenantApp Client, clear the browser cache, and log in again to see the upgraded appliance.

Configuring vRealize Operations Tenant App with vCenter

7

After you have deployed the OVF template in the vSphere Web Client, configure vCenter from the vRealize Operations Tenant App directly.

Procedure

- 1 On the left pane, click **Administration > Solutions** and click **Add**.
- 2 Provide the vCenter server details.

Field	Description
Display Name	Provide a name for the instance.
Description	Describe the purpose of the vCenter server.
vCenter Server	Provide the hostname of the vCenter server.
VC Username	Provide the vCenter username.
Password	Provide the vCenter password.

- 3 Click **Test Connection**. The test connection is successful only when the user name and password are valid.
- 4 Click **Save**.

Dashboards start displaying data collected from vCenter.

Access Management for Tenants



Service providers can access components like Virtual Machines, Clusters, and Resource Pools. They can create users and give them access to a tenant.

Service providers can also import user account information that resides on another machine. To do this, the service providers must define the criteria used to import the user accounts from the source machine as an Active Directory user or an OpenLDAP user.

This chapter includes the following topics:

- [Adding Users to a Resource Pool](#)
- [Managing Accessibility of Pages](#)
- [Managing Accessibility of Metrics](#)

Adding Users to a Resource Pool

To provide access to certain resource details, add users to a resource pool. The users with this access can view the **Tenant Overview** for a particular resource.

Prerequisites

- To integrate with OpenLDAP or Active directory, verify that you have added authentication sources in vRealize Operations Manager and the user names are present in Active Directory or OpenLDAP. For more information on adding authentication sources, see *vRealize Operations Manager* documentation.

Procedure

- 1 On the vRealize Operations Tenant App for vCenter page, navigate to **Administration > Manage Tenants**, and click **Create New Tenant**.
- 2 Provide a name for the tenant and click **Next**.
- 3 Select the resources to add to the tenant and click **Finish**.
- 4 To assign users to a tenant, click **Administration > Access Management**.
- 5 Go to the **Manage Users** tab and click **ADD USER**.
- 6 Select any tenant and click **Next**.
- 7 To create a new local user, provide required details and click **Add User**.

- 8 To import an existing user from Active Directory or Open LDAP, click **Import** and select the import location.
- 9 Click **Search** and then **Add User**.

Results

You have created a user with permissions to access a resource pool through Tenant App.

Managing Accessibility of Pages

Service providers can toggle the page access for their tenants.

Procedure

- 1 On the left pane, click **Administration** and then, click **Access management > Manage Pages**.
- 2 Use the **Enable Page Access?** option to enable or disable page access for individual pages. You can also enable or disable all page access by clicking the **Enable All** or **Disable All** button on the tool bar.
- 3 Click **Save** to save the details.

Results

Note Pages that are access disabled are not visible to the tenant.

Managing Accessibility of Metrics

Service providers can toggle the metric access for their tenants.

Procedure

- 1 On the left pane, click **Administration** and then, click **Access management > Manage Metrics**.
- 2 Select the **Show price values to tenants** option to display the Total Cost to the tenant.
- 3 Select the **Resource Type** for which you want to enable or disable the metric access.
- 4 Select the metric for which you want to enable or disable metric access to the tenant.
- 5 Click **Save** to save the details.

Results

Note Metrics that are access disabled are not visible to the tenant.

Creating and Assigning Pricing Policies

9

You can calculate the cost for each virtual machine and resources.

Prerequisites

- Configure vCenter. For details, see [Chapter 7 Configuring vRealize Operations Tenant App with vCenter](#)

Procedure

- 1 On the left pane, click **Metering > Configuration** tab.
- 2 Select **Pricing Policies > Add New Policy**.

3 To create a pricing policy:

Option	Description
Base Settings	<ul style="list-style-type: none"> a Enter the Policy Name. The policy name uniquely identifies your policy. b Select the Pricing Policy Type from the drop-down menu. The pricing policy type determines your billing model based on the Organization VDC type. c The Currency field displays the currency as set in the vRealize Operations Manager. d Enter a valid description for the Policy Description and click Next.
CPU Rate	<p>You can charge the CPU rate based on GHz or vCPU Count.</p> <ul style="list-style-type: none"> a For Base Rate, select the Charge Period and Charge Based on from the drop-down menu. The Charge Period indicates the frequency of charging and Charge Based on indicates the pricing model based on which the charge is applied. b Enter a valid number for Default Base Rate . c Using slabs, you can optionally charge different rates depending on the number of vCPUs used. Enter valid numbers for Base Rate Slab and click Add Slab. The base rate slab allows you to change the rate of charging based on the resources used. For example, if you enter 5 in Greater than or equal and 5 as Base Rate, it means if the usage is 5 vCPU and above, then the Base Rate of 5 will be applied for whole usage. d Select the Charge Based on Power State by selecting the charge from the drop-down menu. This decides whether the charge should be applied based on the power state of the VM. e For Fixed Cost, enter a valid number. Fixed costs do not depend on the units of charging. f Click Next.
Memory Rate	<ul style="list-style-type: none"> a For Base Rate, select the Charge Period and Charge Based on from the drop-down menu. The Charge Period indicates the frequency of charging and Charge Based on indicates the pricing model based on which the charge is applied. b Select the Charge Based on Power State from the drop-down menu. This decides if the charge should be applied based on the power state of the VM. c Enter a valid number for Default Base Rate. d Using slabs, you can optionally charge different rates depending on the memory allocated. Enter valid numbers for Base Rate Slab and click Add Slab. The base rate slab allows you to change the rate of charging based on the resources used. For example, if you enter 50 in Greater than or equal and 10 as Base Rate, it means if the usage is 50 GB and above, then the Base Rate of 10 will be applied for whole usage. e For Fixed Cost, enter a valid number. Fixed costs do not depend on the units of charging. f Click Next.

Option	Description
Storage Rate	<p>You can charge for storage either based on storage policies or independent of it. The Default Rate option appears only when you have selected Aggregate storage charges from Storage profiles for payg Org-VDCs in the Pricing Settings tab. To charge independent of storage policies, select provide the following details:</p> <hr/> <p>Note This way of setting rates will be deprecated in the future release and it is advisable to instead use the Storage Policy option.</p> <hr/> <ol style="list-style-type: none"> For Base Rate, select the Charge Period and Charge Based on from the drop-down menu. The Charge Period indicates the frequency of charging and Charge Based on indicates the pricing model based on which the charge is applied. Enter a valid number for Base Rate. Select the Charge Based on Power State from the drop-down menu. This decides if the charge should be applied based on the power state of the VM. For Fixed Cost, enter a valid number. Fixed costs do not depend on the units of charging. Click Add and then click Next. <p>To charge based on storage policies, select Storage Policy, and provide the following details:</p> <hr/> <p>Note Storage prices are calculated based on usage by storage policies that are independent of underlying VMs and templates, or by aggregating the usage from underlying VMs and templates. The difference is that the former considers indirect disks such as log disks and swap disks, whereas the latter considers only the storage used directly by the VMs. You can change this setting under Configuration > Pricing Settings.</p> <hr/> <ol style="list-style-type: none"> Select the Storage Policy Name from the drop-down menu. <hr/> <p>Note The rate specified using the Default option is used for any storage policy for which rate is not explicitly specified.</p> <hr/> <ol style="list-style-type: none"> For Base Rate, select the Charge Period and Charge Based on from the drop-down menu. The Charge Period indicates the frequency of charging and Charge Based on indicates the pricing model based on which the charge is applied. Select the Charge Based on Power State from the drop-down menu. This decides if the charge should be applied based on the power state of the VM. Enter a valid number for Default Base Rate. Using slabs, you can optionally charge different rates depending on the storage allocated. Enter valid numbers for Base Rate Slab and click Add Slab. <p>The base rate slab allows you to change the rate of charging based on the resources used. For example, if you enter 50 in Greater than or equal and 10 as Base Rate, it means if the usage is 50 GB and above, then the Base Rate of 10 will be applied for whole usage.</p> <hr/> <ol style="list-style-type: none"> Click Add and then click Next.

Option	Description
Guest OS Rate	<p>Use the Guest OS Rate to charge differently for different operating systems .</p> <ol style="list-style-type: none"> Enter the Guest OS Name. Select the Charge Period and Charge Based on Power state from the drop-down menu. Enter the Base Rate and click Add and then, click Next .
vCenter Tag Rate	<p>Use the vCenter Tag Rate to charge differently for different tags set on VM .</p> <ol style="list-style-type: none"> Enter the Tag Category and Tag Value. Select if you want to charge based on Fixed Rate or Alternate Pricing Policy. Select the alternate Pricing Policy name. This option appears only when you charge based on Alternate Pricing Policy. Select the Priority for the alternate pricing policy. This option appears only when you charge based on Alternate Pricing Policy. When the metadata or tag-based charges overlap, setting a priority allows you to define which policy should be processed first. Select the Charge Period and Charge Based on Power state from the drop-down menu. Enter the Base Rate and click Add, and then, click Next.
One Time Fixed Cost	<p>Use the One Time Fixed Cost section to charge for one time incidental charges on Virtual Machines. These costs do not repeat on a recurring basis.</p> <ol style="list-style-type: none"> Enter the One time fixed cost to charge for the setup fee of the VMs. Using tags, you can charge for other incidental charges such as 'OS patching charge' based one time fixed costs. Under vCenter Tag, enter the Tag Key and Tag Value. Enter the One time fixed cost and click Add. Click Next.
Rate Factors	<p>Use Rate Factors to either increase or discount the prices against individual resources consumed by the Virtual Machines or by whole charges against the Virtual Machine.</p> <ol style="list-style-type: none"> For any resource with Tag, enter the Tag Key and Tag Value under vCenter Tag. Select Change the price of and increase or decrease the price by entering a valid number in By applying a factor of. For example, if you want to increase the price of CPU which has a tag 'Tag1-Value1' by 20% then select CPU from the Change the price of drop-down menu and enter 1.2 in By applying a factor of. Click Add and then, click Next.
Review	Review the summary and click Finish .

4 On the **Resources** tab, select a resource pool or a cluster and click **Assign**.

5 Select a policy and click **Assign**.

The policy is assigned to the selected resource.

Cloning Policies

You can clone an existing policy with a different name.

Procedure

- 1 To clone an existing pricing policy, select the pricing policy in the **Pricing Policies** tab, and click **Clone**.
- 2 Enter a name for the duplicate policy and click **Clone**.

A duplicate of the existing policy is created with a different name.

Billing in Tenant App

10

Tenant App generates monthly bills to provide an account of the overall expenses used for resources in an organization.

This chapter includes the following topics:

- [Generate a New Bill](#)

Generate a New Bill

You can generate bills from the vRealize Operations Tenant App for vCenter by selecting a resource name from an organization.

Prerequisites

Verify that pricing policies are created for a selected resource.

Procedure

- 1 On the left pane, click **Metering > Bills**.
- 2 Click **GENERATE NEW BILL**.
- 3 Select a resource from the list of resources and click **Next**.
- 4 Select a policy name and click **Next**.
- 5 Enter a **Title** and specify the period for generating a new bill from the selected resources and policies.
- 6 To schedule a bill, enable the **Schedule bill** option and specify the details to generate the bill on the required date. For example, if the **Recurrence** is **Monthly**, **From Day** is **1**, **To Day** is **31**, **Month** is **Previous** and **Generate bill on** is **3**, then the details are collected for the previous month starting from first of the month to 31st and the bill is generated on the third of every month.
- 7 Click **Finish**.

What to do next

You can view the bill that you generated. Go to **My Bills** and select one of the bills from the list and then, click **View** to view the bill. Go to **Bill Schedules** to view the details of the scheduled bills.

Alerts

11

You can view the overall list of alerts that are generated by the resources available in the data center.

The tenant app provides a mechanism to view all the alerts with:

- Criticality of an alert
- Alert Definition
- Object Name
- Object Type

From the home page, navigate to **Monitoring > Alerts** to access alerts.

Dashboards in vRealize Operations Tenant App for vCenter Components

12

A service provider can view dashboards of the vRealize Operations Tenant App for vCenter.

Note

- VMware vRealize Operations Manager users with Standard or Chargeback license cannot view the Dashboards and Monitoring tabs. However, the options under the Metering and Administration menu items are available. The same behavior is observed when the license for VMware vRealize Operations Manager expires.
- Dashboards, Monitoring, and Troubleshooting capabilities of vRealize Operations Tenant App are included in the vRealize Operations Advanced and Enterprise editions.

This chapter includes the following topics:

- [Tenant Overview](#)
- [Virtual Machines](#)
- [Clusters and Resource Pools](#)
- [Metric Selector](#)

Tenant Overview

The Tenant Overview dashboard provides a summary of multiple resources.

Table 12-1. Tenant Overview

Widget	Description
Tenant Summary	Provides the number of clusters, resource pools, and virtual machines that are available in a resource.
System Status	Provides a list of all the alerts and alert definitions for a list of objects.
VM Utilization Summary	Provides the summary of VM utilization for a resource.

Virtual Machines

You can view a list of VMs that are associated within a resource.

To see a detailed view of your virtual machine, click a virtual machine from the list of VMs.

Widget	Description
VM summary	Provides an overall summary of the VM status and its memory allocation.
CPU Information	<ul style="list-style-type: none"> ■ CPU Usage (MHz). This field provides you with the overall CPU usage of the selected VM. ■ CPU Usage (%). This field provides you with the percentage of CPU usage of a selected VM.
Memory Information	<ul style="list-style-type: none"> ■ Memory Usage (KB). This field provides an overall memory usage of the selected VM. ■ Memory Usage (%). This field provides the percentage of memory usage of a selected VM.
Storage Information	<ul style="list-style-type: none"> ■ Read/Write Throughput (KBPS) ■ Read/Write (IOPS)
Network Information	<ul style="list-style-type: none"> ■ Network Rate (KBPS) ■ Network Packets Dropped (Count)

Clusters and Resource Pools

This page provides a list of clusters and resource pools that are configured with vCenter.

Click **Export**, to export the list of clusters, and resource pools in an excel format.

Metric Selector

With metric selector, you can view the metrics over a time. You can select a resource type, resource, metric, and time range to view the metric graph. All metrics time stamps are in the UTC time zone in the vRealize Operations Tenant App for vCenter.

Use the **Manage Metrics** tab to manage metric access to tenants. For details, see [Managing Accessibility of Metrics](#).

Understanding vRealize Operations Tenant App API

13

Service Providers can use the API to build interactive clients of vRealize Operations Tenant App. The API follows the REST style and is available to all licensed users.

The Tenant App clients communicate with the server over HTTP, exchanging representations of Tenant App objects. These representations take the form of JSON elements. You use HTTP GET requests to retrieve the current representation of an object, HTTP POST, and PUT requests to create or modify an object, and HTTP DELETE requests to delete an object.

This chapter includes the following topics:

- [How the Tenant App API Works](#)

How the Tenant App API Works

Use a web browser to communicate with the vRealize Operations Tenant App analytics engine, either through the product user interface or through API calls.

The adapter instance collects data from objects in your monitored environment. The Tenant App analytics engine processes the data and displays the complete model in the graphical interface.

Why Use the API

The API is most useful when there is a need to automate a well-defined workflow, such as repeating the same tasks to configure the access control for new Tenant App users. The API is also useful when performing queries on the Tenant App data repository, such as retrieving data for particular assets in your virtual environment. In addition, you can use the API to extract all data from the Tenant App data repository and load it into a separate analytics system.

vRealize Operations Tenant App Terminology

The JSON syntax you use to describe the objects for an adapter corresponds to the API code syntax but differs from what you find in the user interface. The following terms appear in the user interface. Included with the description of each term is the corresponding JSON syntax used in an API call.

Adapter types	Defines the adapter used to discover particular object types. For example, the vCenter adapter discovers objects connected to vSphere data centers. The EMC adapter discovers EMC storage system objects. JSON syntax: <code>adapterkinds</code> .
Object types	The class of entities that represent objects or information sources. Objects report data to the vRealize Operations Manager analytics engine. Virtual machines, datastores, and host systems are examples of object types defined in a vCenter adapter model. JSON syntax: <code>resourcekinds</code> .

Getting Started with the API

API clients and Tenant App servers communicate over HTTPS, exchanging JSON representations of API objects.

Acquire an Authentication Token

The Tenant App requires API requests to be authenticated. The first step in this workflow is to obtain an authentication token.

To obtain an authentication token, the login request supplies the user credentials in a form that Basic HTTP authentication requires. In this example, the user is logging in to a Tenant App instance with URL `https://tenantapp.example.com/`.

Prerequisites

- Secure a channel between the web browser and the Tenant App server. Open a browser and enter the URL of the Tenant App instance such as:

```
https://tenantapp.example.com/
```

The system warns that your connection is not private. Click through to confirm the security exception and establish an SSL handshake.

- Verify that you can access the APIs. Enter the URL of your Tenant App instance with `tenant-app-api/swagger-ui.html` added to the end, such as:

```
https://tenantapp.example.com/tenant-app-api/swagger-ui.html
```

- Verify that you have the login credentials for a user of your Tenant App instance.

Procedure

- 1 POST a request to the login URL to acquire a token.

```
POST https://tenantapp.example.com/suite-api/api/auth/token/acquire
```

2 Examine the response.

A successful request returns an ops authorization token, which you must include in subsequent API requests.

Example: Login Request and Response

This example shows a request and response for a user with login user name: **tenantapp-user** and password: **tenantapp-dummy-password**.

Request header:

```
POST https://tenantapp.example.com/suite-api/api/auth/token/acquire
Content-Type: application/json
Accept: application/json
```

Request body in JSON format:

```
{
  "username" : "tenantapp-user",
  "password" : "tenantapp-dummy-password"
}
```

Response in JSON:

```
200 OK
```

```
{
  "token": "8f868cca-27cc-43d6-a838-c5467e73ec45::77cea9b2-1e87-490e-b626-e878beea23b",
  "validity": 1470421325035,
  "expiresAt": "Friday, November 5, 2019 6:22:05 PM UTC",
  "roles": []
}
```

The response code indicates whether the request succeeded, or how it failed.

- If the request is successful, the server returns HTTP response code 200 (OK) and reusable ops authorization token that expires after six hours. This token must be included in each subsequent API request.
- If the credentials supplied in the POST body are invalid, the server returns HTTP response code 401.

What to do next

The obtained token must be included in each subsequent API request as the Authorization header.

Include the Authorization header in the format: `vRealizeOpsToken <token value>`.

If the token supplied in the Authorization header is invalid or expired, the server returns HTTP response code 401.

For information on individual APIs, open the tenant app api documentation url in the format:

```
https://tenantapp.example.com/tenant-app-api/swagger-ui.html
```

Troubleshooting in vRealize Operations Tenant App for vCloud Director

14

You can troubleshoot general problems that might occur when using the Tenant App.

This chapter includes the following topics:

- [Tenant App Bill Is Zero When Run on a Cluster](#)

Tenant App Bill Is Zero When Run on a Cluster

Cause

The Virtual Machines are configured directly under the host/cluster.

Solution

- 1 In vCenter, add a resource pool under your cluster and move the Virtual Machines under that resource pool.
- 2 Generate a bill from Tenant App using the resource pool or the cluster.