

vRealize Business for Cloud User Guide

vRealize Business for Cloud Standard 7.3 and vRealize Business for Cloud Advanced 7.3

vRealize Business 7.3

vRealize Business for Cloud 7.3

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vRealize Business for Cloud User's Guide

The VMware® *vRealize Business™ Standard User's Guide* provides information about the vRealize Business for Cloud user interface, explains key terms and concepts, and describes various tasks that you can perform to gain better visibility of your infrastructure.

Intended Audience

This information is intended for users or administrators of vRealize Business for Cloud for using the vRealize Business for Cloud user interface.

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>.

vRealize Business for Cloud Feature Overview

1

vRealize Business for Cloud is a cloud planning, budgeting and cost visibility tool, helps to make decision in an enterprise IT data centers. It provides a single pane of management for both private cloud or public cloud infrastructure.

vRealize Business for Cloud supports the following capabilities.

- Public cloud comparison, cost and usage visibility, including integrations with AWS, and Azure.
- Advanced pricing of services and integration with vRealize Automation.
- Role based access controls for consumption analysis.
- Budget configuration and visibility
- Cost analysis of data center storage systems, such as EMC SRM.
- Cost and usage visibility of vCloud Suite components such as vSphere, VMware vCloud Director, vRealize Automation and vRealize Operations Manager.
- Generate reports.

This chapter includes the following topics:

- [The vRealize Business for Cloud Standard Edition Features](#)
- [UI Options Available with vRealize Business for Cloud Standard and vRealize Business for Cloud Advanced Editions](#)
- [The Launch Pad](#)
- [Viewing the vRealize Business for Cloud Overview Page](#)
- [View and Update System Status](#)

The vRealize Business for Cloud Standard Edition Features

You can access the vRealize Business for Cloud Standard edition by using the vCloud Suite license and vRealize Suite license keys. However, you must consider the limitations and feature options that are available in the vRealize Business for Cloud Standard edition. Certain vRealize Business for Cloud options may not be available as part of the Standard edition.

For more information about the available UI options, see [UI Options Available with vRealize Business for Cloud Standard and vRealize Business for Cloud Advanced Editions](#).

The vRealize Business for Cloud Standard edition supports the following capabilities.

- Cost and usage visibility of vCloud Suite components such as vSphere, VMware vCloud Director, vRealize Automation and vRealize Operations Manager.
- Basic pricing integration with vRealize Automation.
- Cloud comparison except data center optimization.
- Simple reporting.

UI Options Available with vRealize Business for Cloud Standard and vRealize Business for Cloud Advanced Editions

The vRealize Business for Cloud user interface options vary based on the license key. You can see all the available options by using the vRealize Business for Cloud, vCloud Suite Advanced or Enterprise and vRealize Suite Advanced or Enterprise licenses. Certain vRealize Business for Cloud options might not be available as part of vCloud Suite Standard and vRealize Suite Standard licenses.

Table 1-1. User Interfaces comparison of vRealize Business for Cloud Standard edition and vRealize Business for Cloud Advanced edition.

Tasks that you can perform	Options available in the vRealize Business for Cloud Standard edition	Options available in the vRealize Business for Cloud Advanced edition	Navigation on the vRealize Business for Cloud user interface in the vRealize Automation-integrated setup and the standalone setup
Managing Private Cloud Accounts such as vCenter Server	Yes	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Manage Private Cloud Connections ■ For the standalone setup: Administration > Manage Private Cloud Connections <p>Note You cannot add the EMC SRM servers by using the vCloud Suite Standard and vRealize Suite Standard licenses.</p>
Managing Private Cloud Accounts such as vCloud Director	No	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Manage Private Cloud Connections ■ For the standalone setup: Administration > Manage Private Cloud Connections

Table 1-1. User Interfaces comparison of vRealize Business for Cloud Standard edition and vRealize Business for Cloud Advanced edition. (continued)

Tasks that you can perform	Options available in the vRealize Business for Cloud Standard edition	Options available in the vRealize Business for Cloud Advanced edition	Navigation on the vRealize Business for Cloud user interface in the vRealize Automation-integrated setup and the standalone setup
Managing Private Cloud Accounts such as EMC SRM servers	No	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Manage Private Cloud Connections > Storage Server ■ For the standalone setup: Administration > Manage Private Cloud Connections > Storage Server
Managing Public Cloud Accounts such as AWS, Azure and cloud providers for comparison	No	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Manage Hybrid & Public Cloud Accounts ■ For the standalone setup: Administration > Manage Hybrid & Public Cloud Accounts
Updating Reference Database	Yes	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Update Reference Database ■ For the standalone setup: Administration > Update Reference Database
Generating and downloading the log files to analyze the issues	Yes	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Support File ■ For the standalone setup: Administration > Support File
Updating License	Yes	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Update License ■ For the standalone setup: Administration > Update License
Generating a token for vRealize Business Enterprise integration	No	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > vRealize Business Integration ■ For the standalone setup: Administration > vRealize Business Integration
Managing data collectors	Yes	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Manage Data Collector ■ For the standalone setup: Administration > Manage Data Collector
Calculating depreciation	Yes	Yes	<ul style="list-style-type: none"> ■ For the integrated setup: Administration > Business Management > Calculation Preference ■ For the standalone setup: Administration > Calculation Preference

Table 1-1. User Interfaces comparison of vRealize Business for Cloud Standard edition and vRealize Business for Cloud Advanced edition. (continued)

Tasks that you can perform	Options available in the vRealize Business for Cloud Standard edition	Options available in the vRealize Business for Cloud Advanced edition	Navigation on the vRealize Business for Cloud user interface in the vRealize Automation-integrated setup and the standalone setup
Viewing the supported vRealize Business for Cloud Features	Yes	Yes	Business Management > LaunchPad
Viewing the vRealize Business for Cloud Overview	Yes	Yes	Business Management > Dashboard
Viewing private cloud cost, expenses, and charge information	Yes	Yes	Business Management > Expenses > Private Cloud (vSphere)
Viewing AWS information	No	Yes	Business Management > Expenses > Public Cloud (AWS)
Viewing Azure information	No	Yes	Business Management > Expenses > Public Cloud (Azure)
Viewing the private cloud operational analysis information	Yes	Yes	Business Management > Expenses > Private Cloud (vSphere)
Viewing price values and policies, charges, business unit list and business unit map	Yes	Yes	Business Management > Consumption
Editing the price	Yes	Yes	Business Management > Consumption > Pricing > Edit > Edit Pricing
Editing the budget value	No	Yes	Business Management > Consumption > Pricing > Edit > Edit Budget
Editing business hierarchy	Yes	Yes	Business Management > Consumption > Business Units Consumption > Edit > Edit Business Hierarchy
Viewing the showback statement and reclamation opportunities	No	Yes	Business Management > Consumption > Showback > Showback Statement
Comparing cost across cloud and data centers	Yes	Yes	Business Management > What-If Analysis
Viewing data center optimization information	No	Yes	Business Management > What-If Analysis > Data Center Optimization
Generating reports	Yes	Yes	Business Management > Reports
Scheduling reports	Yes	Yes	Business Management > Reports > Schedule Report
Creating Custom Reports	Yes	Yes	Business Management > Reports

The Launch Pad

The Launch pad in vRealize Business for Cloud is categorized based on three main sections that includes Business Insight, Cloud Operations, and Cloud planning. You can quickly navigate to these sections to get the specific required information.

Section	Description
Business Insight	Use this section to get business related information such as your total expense, your consumption charges, to configure budget for your consumers and to view the data center optimization information.
Cloud Operations	Use this section to perform an operational analysis of your cloud infrastructure, such as private cloud, AWS, And Azure.
Cloud Planning	Use this section to compare the cost of running virtual machines across cloud providers and across data centers in your private cloud infrastructure.

Viewing the vRealize Business for Cloud Overview Page

The Overview page provides the information about your infrastructure expense and its utilization details for the current month.

- **Infrastructure Overview:** Displays the workload across cloud infrastructure. Each color represents the virtual machine count for each configured account type, such as private cloud, AWS, Azure. You can point the mouse on the each color to see total virtual machine count for the specific account type.
- **Top Datacenters:** Displays the utilization percentage of compute, memory and storage resources for the top five datacenters based on CPU utilization. Each color represents the used and remaining capacity of the data centers. This helps you for data center optimization.
- **Infrastructure Utilization:** Displays the total number of virtual machines and the count of powered-on machines for the top five datacenters based on total VM count. If a vCenter Server is associated with vRealize Operations Manager, you can also see the count of reclaimable virtual machines for each datacenter.
- **Expenses across Clouds:** Displays the total expense of your account types, such as private cloud, AWS, Azure. You can point the mouse on each color to see the total expense of the specific account type. The estimated expense value is calculated based on cost utilization for the last six months.

Note The projected expense for public cloud is calculated by using the following equation:

Projected cost = $A + ((B/24) * n)$, where, A is the total cost till date, B is the cost of previous day and n is the remaining number of hours for the current month.

- **Top Business Units:** Displays the top five business units based on total VM count. You can also see the amount charged for the consumption. You can point the mouse on each colored icon to see the previous month charge value. If your current month is charge is lower than previous month value, you see the green arrow. Similarly, If your current month is charge is higher than previous month value, you see the red arrow. If the charge remains same when compared with the previous month, you see a neutral black icon.
- **Cost Vs Price:** Displays the total projected charge value for the current month. You can also see the cost versus price graphs in different colors, that indicates your estimated expense (the cost value) for maintaining the datacenters and the amount you are charging consumers for the current month. This helps you to analyse whether your under recovery or over recovery. You can point the mouse on small circles to the estimated cost and price values.

Note vRealize Business for Cloud considers the inventory date and data from the previous day of deployment for costing and pricing purposes.

View and Update System Status

You can view and update the status of critical internal business processes to understand the overall system health. The system processes run at default defined intervals to ensure that your inventory and cost data are always up-to-date.

You can modify these intervals by updating the respective job property in the `configclient.py` utility. For information about how to modify the default job intervals, see [View and Modify Default Job Intervals for Updating the System Status](#).

Note You cannot modify the job interval for Azure and VMware NSX Manager.

- Cost calculation involves the steps for computing base rates, allocated costs, cost for each virtual machine, and auto-generation of reports. Cost calculation occurs daily, but you can also trigger the process manually.
- Data collector connects to the vCenter Server instances and collects the inventory data and usage statistics. After collecting inventory data and usage statistics, vRealize Business for Cloud displays timestamp of the last executed job in local time. The vCenter Server data collection jobs are scheduled to run at default intervals.
- Storage collector connects to EMC SRM server instances and collects data and usage details. After completing the collection process, vRealize Business for Cloud server displays the details and timestamp of the process.
- vCloud Director connector connects to vCloud Director to collect data about consumers of the virtual machine according to organization and organization vDC. vCloud Director connection information appears only after you add vCloud Director to vRealize Business for Cloud.



- vRealize Automation connector collects data about consumers of a virtual machine in terms of blueprints, provisioning groups and tenants from IaaS component of vRealize Automation, if IaaS is configured. vRealize Automation connection information appears only after you configure IaaS component of vRealize Automation.
- Public cloud connection connects to the configured AWS accounts to collect inventory and usage data. Public cloud connection information appears only after you configure an account.
- VMware NSX Manager collector connects to VMware NSX Manager and collects all the network service instances associated with edge gateways. The associated vCloud Director endpoint establishes the mapping of network services with the business units based on the network consumption.

You can also view and update cost calculation, vRealize Automation, vCloud Director, and public cloud connection information.

Procedure

- 1 Log in to the vRealize Automation interface at https://vRealize_Automation_host_name/vcac/org/tenant_URL by using credentials of a tenant administrator.
- 2 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 3 Click **Business Management**.
- 4 Click **Status**.

vRealize Business for Cloud displays the system status information. Information related to data collectors, cost calculation, vRealize Automation, public cloud connection, and vCloud Director connection is displayed.

- You see the Green successful status  icon, if all the processes are running correctly.
- You see the Red unsuccessful status  icon, if the mandatory jobs fail.

- You see the Warning status  icon, if the non-mandatory jobs fail.

Note By default, the vCenter Server data collection jobs like Inventory, Storage, Tags, and Usage statistics are set as critical jobs as these are mandatory for cost calculation and the vRealize Operations Manager synchronization job is set as non-mandatory.

If there is a problem with any of the mandatory job processes, the system displays the Red status and if there is a problem with the non-mandatory jobs, the system displays warning status.

However, you can change the set values for the job criticality by updating the following lines in the `configclient.py` utility.

- To configure the Tags and Storage jobs as non-mandatory, add the following lines in the file.

```
configclient.py SET -k dc.job.critical.vc.tags -v false
configclient.py SET -k dc.job.critical.vc.storage -v false
```

- To configure the vRealize Operations Manager synchronization job as mandatory, add the following line in the file.

```
dc.job.critical.vc.vcops=true
```

- 5 (Optional) To run a process and update the cost data and connections, click **Update now** next to the respective process.

View and Update vRealize Business for Cloud Default Settings

You can modify the default configurations of vRealize Business for Cloud, by using the `configclient.py` utility, which is located at `/usr/ITFM-Cloud/va-tools/bin/`.

Prerequisites

Enable the SSH service. See the *Enable or Disable SSH Settings* section in the Install Guide.

Procedure

- 1 To view the existing configured values, perform the following steps:
 - a Log in to the Shell prompt by performing an SSH into IP address of vRealize Business for Cloud virtual appliance.
 - b View the values by running the command in the following format:

```
configclient.py GET -k key
```

For example, to see the storage interval, run the following command on the shell prompt.

```
configclient.py GET -k dc.job.interval.vc.storage
```

You see the configured value. For example, 720.

2 To modify the values, perform the following steps:

- a Log in to the Shell prompt by performing an SSH into IP address of vRealize Business for Cloud virtual appliance.
- b Navigate to the `/usr/ITFM-Cloud/va-tools/bin/` directory.

```
cd /usr/ITFM-Cloud/va-tools/bin/.
```

- c Modify the value by running the command in the following format:

```
configclient.py SET -k key -v Value
```

```
configclient.py SET -k dc.job.interval.vc.tags -v 60
```

Note You can modify several configurations.

Key	Value
Rate for Virtual Infrastructure Labor and Operating System Labor by default.	See Add Additional Charges
All data collection job intervals	See View and Modify Default Job Intervals for Updating the System Status
Statistics models for calculating the CPU, RAM and disk space	See Configuring vRealize Operations Manager Statistics

View and Modify Default Job Intervals for Updating the System Status

The data collection from all endpoints is scheduled to run at default intervals, which you can modify by updating the respective job property.

Following table lists the jobs from all endpoints, the job properties and their default intervals that you can modify for data collection.

Note You can use the `configclient.py` utility to modify these intervals by running the `set` command in the following format.

```
configclient.py SET -k key -v Value
```

For example, to run the storage data collection every hour, run the following command in the Shell prompt:

```
configclient.py SET -k dc.job.interval.vc.tags -v 60
```

For more information about how to use the `configclient.py` utility, see [View and Update vRealize Business for Cloud Default Settings](#).

Table 1-2. Data Collection Jobs

Endpoint	Jobs	Key (job property)	Value (default interval in minutes)	Description
vCenter Server	Inventory	Not applicable	Runs immediately after an inventory update	NA
	Tags	dc.job.interval.vc.tags	360	Runs every 6 hours
	vRealize Operations Manager	dc.job.interval.vc.vcops	30	Runs every 30 minutes
	Storage	dc.job.interval.vc.storage	720	Runs every 12 hours
	Usage Statistics	dc.job.interval.vc.stats	1440	Runs every 24 hours
EMC SRM		dc.job.interval.srm	1440	Runs every 24 hours
vRealize Automation		dc.job.interval.vra	220	Runs every 3 hours and 40 minutes
Public cloud	AWS	dc.job.interval.aws	1440	Runs every 24 hours
	Azure	Note You cannot configure Azure interval. You can manually trigger the job when required.	1440	Runs every 24 hours
vCloud Director		dc.job.interval.vcd	60	Runs every hour
VMware NSX Manager		Note You cannot configure VMware NSX Manager interval. You can manually trigger the job when required.	1440	Runs every 24 hours

Note To run a data collection process immediately, click **Status** and click the **Update Now** option next to the respective process.

If a failure occurs during the data collection process, vRealize Business for Cloud retries to run the process maximum of five times, by default. Use the `configclient.py` utility to modify the retry value for updating the `dc.failed.job.max.retry.count` parameter.

For example, `configclient.py SET -k dc.failed.job.max.retry.count -v 3`.

And by default, vRealize Business for Cloud takes two minutes to retry the process. Use the `configclient.py` utility to modify this value for updating the `dc.failed.job.retry.period` parameter.

For example, `configclient.py SET -k dc.failed.job.retry.period -v 1`.

Configuring vRealize Operations Manager Statistics

vRealize Operations Manager uses different models for calculating available CPU, RAM and disk space.

You can configure vRealize Business for Cloud to synchronize with vRealize Operations Manager models for capacity calculations.

By using the `configclient.py` utility, you can modify the CPU, RAM and disk space properties according to the vRealize Operations Manager policies. For information about how to modify the values, see [View and Update vRealize Business for Cloud Default Settings](#).

Key	Value
cpu.stats.model	■ demand
	■ alloc
memory.stats.model	■ demand
	■ alloc
	■ consumed
diskspace.stats.model	■ demand
	■ alloc

By default, vRealize Business for Cloud uses the allocation and demand models to calculate available memory and to calculate the available CPU and disk capacity, vRealize Business for Cloud uses demand and consumption-based models.

Note Even when vRealize Business for Cloud contains multiple vCenter Server accounts that are monitored by different vRealize Operations Manager, all the vRealize Operations Manager instances use the same model. If you want to configure a specific vRealize Operations Manager instance with a different model, you must configure the respective vRealize Operations Manager instance.

Computing the Cost of Your Private Cloud

2

Expenses are the costs that are incurred in managing a data center. You can input the expenses manually. If you do not input the expense, the values are obtained from the reference database of the vRealize Business for Cloud. After you determine the total expense for your cloud infrastructure, you can allocate these costs to the underlying resources that constitute the services. These resources are CPU, RAM, storage, and operating system (license and labor).

This chapter includes the following topics:

- [Overview of Private Cloud Expenses](#)

Overview of Private Cloud Expenses

The private cloud expenses are categorized into different types such as Hardware, Storage on Demand, Licensing, Maintenance, Labor, Network, Facilities, and Additional Costs. You can see the total projected expense on your private cloud accounts for the current month and the trend of cost over time.

You can modify the expense of your data center. These costs can be in terms of percentage value or unit rate, and might not always be in terms of the overall cost. Based on your inputs, the final amount of expenses is calculated. If you do not provide inputs regarding expenses, the default values are taken from the reference database.

You can see the projected cost of private cloud for the current month and the trend of total cost over time. For all the expenses, vRealize Business for Cloud displays the monthly trend of the cost variations, the actual expense and a chart that represents the actual expense and the reference cost of the expense.

Note If the vCenter Server was added from more than six months, the trend displays the total cost for the last six months only. Otherwise, the trend displays the total cost from the month the vCenter Server was added into vRealize Business for Cloud.

Table 2-1. Expense Types


Cost Drivers	Description
Hardware	You see the server cost based on CPU age and server cost details. For the complete server cost information, click the Hardware list with the complete cost information link.
Storage on Demand	You see the storage total distribution based on category and the uncategorized cost details. For the complete list of data stores and its cost information related to storage, click the Storage On Demand list with the complete cost information link.
Licensing	<p>You see the licenses cost distribution for the operating systems cost and VMware license of your cloud environment. You can hover the mouse over the chart to see the cost details for each license. For the complete licensing cost information, click the Licensing list with the complete cost information link.</p> <p>Note For Non-ESX physical servers, VMware license is not applicable.</p>
Maintenance	You see the maintenance cost distribution for the server hardware and operating system maintenance. You can hover the mouse over the chart to see the cost details for each maintenance type. For the complete cost information related to maintenance, click the Maintenance list with the complete cost information link.
Labor	<p>You see the labor cost distribution for the servers, virtual infrastructure, and operating systems. You can hover the mouse over the chart to see the cost details for each labor type. For the complete cost information related to labor, click the Labor list with the complete cost information link.</p> <p>Note</p> <ul style="list-style-type: none"> ■ Labor cost includes expense on backup appliance virtual machine (VDP virtual appliance). ■ For physical servers, operating system labor cost and servers labor costs are applicable, virtual infrastructure cost is not considered.
Network	<p>You see the networks costs by NIC type. You can hover the mouse over the chart to see the cost details for each NIC type. For complete cost information related to network, click the Network list with the complete cost information link.</p> <p>Note For physical servers, the network details are not captured. So, the network cost is considered as zero.</p>
Facilities	You see the cost distribution for the facilities such as rent or real estate and power or cooling. You can hover the mouse over the chart to see the cost details for each facility type. For the complete cost information related to facilities, click the Facilities list with the complete cost information link.
Additional Costs	You see the for additional expenses such as backup and restore, high availability, management licensing, VMware software licensing.



You can select a data center to view the information specific to the data center.

Editing Private Cloud Expenses

You can manually edit monthly cost of all the eight expense types from the current month onwards.

The configuration used for cost drivers determines how vRealize Business for Cloud calculates and displays the cost.

- If the costs are based on the industry benchmark values, a vertical Orange color band  is displayed.

- If the costs are calculated according to the hardware configuration, a vertical Green color band  is displayed.
- If the costs have been manually entered, a vertical Blue color band  is displayed.

Edit Monthly Cost of Hardware

You can view, add, edit, or delete the cost of each server group, based on their configuration and the purchase date of a batch server running in your cloud environment. After you update the server hardware cost, vRealize Business for Cloud updates the total monthly cost and average monthly cost for each server group. You can also see the details about the list of storage arrays that the EMC SRM identifies in the server.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Hardware** tab.
- 6 Select the **Servers** tab.

vRealize Business for Cloud groups all server hardware from all data centers in your inventory based on their hardware configuration.




Category	Description
Name	Displays the name of the server in your inventory.
Number of Servers	Displays the total number of servers of any particular hardware configuration in your inventory.
Description	Displays the description of the server group.
Average Monthly Cost for Server	Displays the average monthly cost for server. This value is calculated as a weighted average of prices of purchased and leased batches.
Total Monthly Cost	Displays the total cost of servers in your inventory. This value is arrived by multiplying the cost value with number of servers.

- 7 (Optional) Select a data center from the **All Data Centers** drop-down list to view or edit the server hardware information of a specific the data center.

8 To edit the server hardware cost, create a batch or batches for the server group.

- Click the **Upload a CSV file** link and click **Browse** to upload the CSV file containing your server purchase details.

Note

- The CSV must contain all the mentioned fields.
serverModelName,manufacturer,numCpus,cpuType,cpuGhz,memGb,numberOfServers,dateOfPurchase,pricePerServer,batchType,dataCenterName
 - Use a Notepad to edit the CSV file. Editing in the Microsoft Excel might change the date format.
 - The currency in the CSV file must match the currency you have configured during deployment.
-
- Click the  icon.
 - Click the **Purchased Servers** or **Leased Servers** link to edit server batch according to their price or lease rent.
 - To add the details of the servers, click the  icon and update the date, number of servers and cost per server or rent cost per server values.
 - (Optional) To delete a server details, click the  icon. The selected server group information is deleted.

The batch cost and the average cost of each server is updated.

9 Select the **SRM** tab to edit cost for storage arrays and modify the service level weightage.

vRealize Business for Cloud displays a list of storage arrays that exists in the linked EMC SRM. You can see the array name, description, array disk count and its details, array purchase date, reference cost and monthly cost of storage hardware.

Category	Description
Name	Displays the storage array name.
Description	Displays the storage array details such as array model (VMAX40K, VMAX10K), array family (VNX, VMAX) and array type (BLOCK, FILE).
Disk Count	Displays the total number of disks for each storage array.
Reference Cost	Displays the reference cost for a specific storage array and the cost of disks in the array.
Monthly Cost	Displays the monthly cost for a specific storage array and the cost of disks in the array.

Category	Description
Purchase Date	Displays the date of purchase of a specific storage array, which you can modify.
Total Cost	Displays the total cost for a specific storage array, which you can modify. Note The total cost is same as reference cost, by default. You can modify the total cost by considering both array cost and disk cost, if needed. The array total cost includes hardware, license, labor, maintenance, facilities and network costs.

Note You can edit the cost and purchase date of multiple arrays together. The monthly cost of array is automatically computed based on the modified total cost and purchase date.

10 Click **Save**.

According to your inputs, vRealize Business for Cloud updates the total monthly cost and average monthly cost for the server.

Edit Service Level Weightage

A Service level categorizes LUNs based on their storage disk efficiency and performance. You see a list of service level names, which indicates the disk quality comprising the LUNs in EMC SRM. Also, you can see the weightage value for a service level, which helps to calculate the base rate for the LUNs of that particular service level.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Under the **Hardware** tab, select **SRM**.
- 6 Click the **Edit Service Level Weightage** link.
- 7 Modify the weightage value for a service level that you want to update.

You can set the weightage value range from **1** to **10**.

If a LUN is not assigned with a service level, the default service level weightage value is used to calculate the base rate.
- 8 Click **Save**.

Edit Monthly Cost of Storage on Demand

The storage hardware is categorized according to the datastore storage category and storage type. You can edit the monthly cost per storage GB for the datastores based on their storage category (using tags) and storage type (NAS, SAN, Fiber Channel or Block).

Prerequisites

To edit the cost based on storage category, you must create tags and apply them to the datastores on the vCenter Server user interface. For more information, see the VMware vSphere Documentation.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Storage On Demand** tab.
- 6 Select **Storage Category** or **Storage Type**.
By default, **Storage Category** is selected.
- 7 (Optional) Select a tag category.

This option is available only when you select **Storage Category** and you have at least one datastore tagged in vCenter Server.

Note You can select only one tag category to edit the monthly cost per GB based on tags. When you modify the tag category selection, vRealize Business for Cloud overrides the earlier tag category and recategorizes datastores based on the new tag category selection.

Assume that you have two tag categories (for example, Profile and Tiers) with three tags in each category (Bronze, Silver, Gold in Profile and Tier1, Tier2, Tier 3 in Tiers), you can select either Profile or Tiers from **Tag Category** to categorize the datastores based on tags.

Category	Description
Category or Storage Type	<ul style="list-style-type: none"> ■ Category displays the tag categories for datastores and also the tags associated with the category. For example, Profile:Silver, Profile:Bronze. <hr/> <p>Note</p> <ul style="list-style-type: none"> ■ If you have performed a fresh installation of vCenter Server 6.0, and not assigned tags to the datastores, vRealize Business for Cloud displays storage category for datastores as uncategorized. ■ If you are using earlier versions of vCenter Server like 5.1.x or 5.5.x, vRealize Business for Cloud displays the storage profile for datastores. <hr/> <ul style="list-style-type: none"> ■ Storage Type displays the storage details for the datastores of type Virtual SAN or part of EMC SRM managed storage arrays. For example, Block Device, Fiber Channel, NAS, SAN. If the datastore is not on any of the storage device type, vRealize Business for Cloud displays the datastore as uncategorized.
Datastores	Displays the total number of datastores for a specific category or type. You can click the datastore value to see list of datastores and its details such as monthly cost, total GB for each datastore.
Total GB	Displays the total storage for a specific category or type.
Reference Cost	Displays the reference cost.
Monthly Cost Per GB	Displays the monthly cost per GB for a specific category or type. You can edit this value for defining the monthly cost per GB for datastores.
Monthly Cost	Displays the total monthly cost for a specific category or type.

8 (Optional) Select a data center from the **All Data Centers** dropdown list to view or edit the storage information of a specific the data center.

9 To edit the storage cost based on tag category and storage type, perform the following steps.

- Select the **Storage Category** or **Storage Type**.
- Click on a value in the Monthly Cost Per GB field on the table to update the cost for that particular tag or type.
- Modify the cost value.

Example: For storage category, you can enter \$0.5 for Bronze, \$1.0 for Silver, \$1.5 for Gold. Similarly, for storage types, you can enter \$2.0 for Block Device, \$2.5 for Fiber Channel, \$3.0 for NAS.

10 Click **Save** to save the updated storage monthly cost changes.

Results

According to your updated values, vRealize Business for Cloud re-calculates and displays the monthly cost of your storage.

View Data Store Information

You can see the details about data stores added in vRealize Business for Cloud. The details includes, the storage profile name that the data store belongs to, data store count in that

particular storage profile, monthly cost per GB, monthly cost of data stores, reference cost, list of data stores, data store URL.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Storage On Demand** tab.
- 6 In the storage monthly cost table, click on the data stores count value.
 You see the data stores details that belongs to the selected storage category or storage type.

Edit Monthly Cost of License

You can edit the total operating system licensing cost and VMware license cost of your cloud environment. You can edit the license cost by either selecting the ELA charging policy or selecting the per socket value.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Licensing** tab.

vRealize Business for Cloud displays all the licenses in your cloud environment.

Category	Description
Name	Displays the category of the operating system. If the operating system is not Windows or Linux, vRealize Business for Cloud categorizes the operating system under Other Operating Systems .
VMs	Displays the number of virtual machines that are running on the specific operating system.

Category	Description
Sockets	Displays the number of sockets on which the specific operating system is running.
Charged by	Displays whether cost is charged by socket or ELA.
Total Cost	Displays the total cost of the specific operating system.
Reference Cost	Displays the reference cost as defined in the vRealize Business for Cloud reference database.

- 6 (Optional) Select a data center from the **All Data Centers** drop-down list to view or edit the licensing cost calculations of a specific the data center.

Note For physical servers, VMware license is not applicable.

- 7 Click the edit icon for which you want to change the monthly cost.

The license details page is displayed, which summarizes operating system and VMware license information running in your environment.

- 8 Edit the monthly cost of operating systems.

- Select the monthly cost of a operating system per socket and modify the cost value.
- Select the monthly cost of a operating system ELA and modify the cost value.

Note For the Windows operating system group, an additional option lets you charge for Windows desktops according to the ELA policy.

- 9 Click **Save**.

Results

According to your inputs, vRealize Business for Cloud calculates and displays the total cost and updates the Charged by column with the option that you have selected.

Edit Monthly Cost of Maintenance

You can edit the monthly cost of maintaining your cloud environment. Maintenance cost is categorized into hardware maintenance cost and operating system maintenance cost. Hardware maintenance cost is calculated as a percentage of the purchase cost of servers. Operating system maintenance cost is calculated as a percentage of the Windows licensing costs.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.

- 4 Select **Cost Drivers**.
- 5 Select the **Maintenance** tab.
- 6 (Optional) Select a data center from the **All Data Centers** drop-down list to view or edit the maintenance information of a specific the data center.
- 7 Edit the monthly maintenance cost.
 - Edit the percentage value of the hardware maintenance cost.
 - Edit the percentage value of the operating system maintenance cost.
- 8 Click **Save**.
- 9 (Optional) Click **Reset** to clear the updated values.

Results

The monthly maintenance cost is updated.

Edit Monthly Cost of Labor

You can edit the monthly cost of labor for your cloud environment. The labor cost is combination of the total cost of the server administrator, virtual infrastructure administrator, and the operating system administrator.

Procedure


- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Labor** tab.

The monthly labor cost is displayed.

Category	Description
Category	Displays the categories of labor cost, servers, virtual infrastructure, and operating system
Calculated by	Displays whether the cost is calculated hourly or monthly
Total Monthly Cost	Displays the total monthly cost of the particular category
Reference Cost	Displays the reference cost for the category from the vRealize Business for Cloud database

- 6 (Optional) Select a data center from the **All Data Centers** drop-down list to view or edit the labor cost of a specific the data center.

Note For physical servers, operating system labor cost and servers labor costs are applicable, virtual infrastructure cost is not considered.

- 7 Click the  icon for which you want to change the monthly labor cost.
The total number of servers is displayed.
- 8 Select either the hourly rates or the total monthly labor cost and modify the values.
- 9 Click **Save**.

Results

The total monthly cost is updated. The hourly rate option or the monthly cost option that you select is updated in the **Calculated by** column.

Edit Monthly Cost of the Network

You can edit the monthly cost for each Network Interface Controller (NIC) type or can edit the total cost of all the networking expenses associated with the cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Network** tab.
- 6 (Optional) Select a data center from the **All Data Centers** drop-down list to view or edit the network cost of a specific the data center.

Note For physical servers, the network details are not captured. So, the network cost is considered as zero.

- 7 Edit the monthly cost of network.
 - Modify the values for 1 Gigabit NIC and the 10 Gigabit NIC.
 - Modify the total monthly cost of all network expenses associated with the cloud.
- 8 Click **Save**.

- 9 Click **Reset** to set the earlier defined values.

Results

The total monthly network expenses are updated.

Edit Monthly Cost of Facilities

For your cloud environment, you can specify the total monthly cost of facilities or edit the facilities cost for real estate, power, and cooling requirements.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Facilities** tab.
- 6 (Optional) Select a data center from the **All Data Centers** drop-down list to view or edit the facilities information of a specific the data center.
- 7 Edit the monthly facilities cost.
 - Modify the cost of rent or real estate per rack unit and modify the monthly cost of power and cooling per kilowatt-hour.
 - Modify the total monthly cost of facilities.
- 8 Click **Save** to save to update the changes.
- 9 Click **Reset** to set the earlier defined values.

Results

The monthly facilities cost is updated.

Edit Additional Costs

The additional cost lets you add any additional or extra expense that is not covered by other expenses categorized by vRealize Business for Cloud. No reference value is present for this expense.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.
- 4 Select **Cost Drivers**.
- 5 Select the **Additional Costs** tab and click the add icon.
- 6 Enter the monthly costs for the expenses that are not considered in any other expense types such as, the cost of management software, disaster recovery, and high availability.
- 7 Click **Save**.
- 8 (Optional) Click **Reset** to set the earlier defined values.

Results

The monthly cost for additional costs is updated.

Viewing the Public Cloud Information

3

vRealize Business for Cloud integrates with AWS and Microsoft Azure and provides detailed analysis of the bills. vRealize Business for Cloud provides the users an overview of how their investments are spread across Amazon Web Services (AWS) and Microsoft Azure.

This chapter includes the following topics:

- [Overview of Amazon Web Services Expenses](#)
- [Overview of Microsoft Azure Expenses](#)

Overview of Amazon Web Services Expenses

The Amazon Web Services Overview page lets you view estimated total monthly expense, expense per account, expense distribution per service and virtual machine summary.

Amazon Web Services Overview includes widgets to show the expense details.

Note The Total Expense trend displays the total expense for the last twelve months based on the cost in the bill, irrespective of when the account was added into vRealize Business for Cloud.

- **Total Expense** - The graph displays the total estimated monthly expense of all Amazon Web Services accounts configured in vRealize Business for Cloud. And also, you can see the monthly expense trend.
- **Services** - This graph displays the estimated expense distributed among different services across all accounts.
- **Accounts** - This graph displays the estimated expense percentage for each account.
- **EC2 Cost Breakdown** - This graph displays the expense distribution of Amazon Elastic Compute Cloud (EC2) service. EC2 service expense includes reserved model cost, demand model cost (PAYG), and other cost that is not perceived in the bill.
- **Largest Changes in Accounts** - This graph displays the top three expense changes compared to expense in the previous month.

- **VMs at a Glance** - This graph displays the total virtual machine count and average expense per month. It also displays the virtual machine count based on power status whether stopped, running or terminated, number of virtual machines in each state, and the cost of virtual machines in each state.

Note The projected expense for public cloud is calculated by using the following equation:

Projected cost = $A + ((B/24) * n)$, where, A is the total cost till date, B is the cost of previous day and n is the remaining number of hours for the current month.

View AWS Charges

You can view the AWS total monthly cost grouped by service name and the resource count under each service. You can also see the service and account details and cost details. You can change or edit the view, by hiding, sorting, freezing and grouping the columns. You can select a report type to display the values through charts and also define a filter to view the specific values.

Prerequisites

Verify that you have added a AWS account in vRealize Business for Cloud. See *vRealize Business for Cloud Installation and Administration Guide*.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses**, select **Public Cloud (AWS)**.
- 4 Click **Charges**.

You see the service names, resource count, and total monthly cost. You can expand the view to see the service details such as the account, service ID, name, availability zone, tags, last seen information, resource existence and cost information.

Note Each AWS service will have an entry with the name **Service Cost**, by default. This is the fixed cost of the service which is not associated with any resources.

View Amazon Web Services Instances Information

You can view the details of virtual machines that are hosted on AWS account including service, account cost, price and availability information.

Prerequisites

Verify that you have added a AWS account in vRealize Business for Cloud. See *vRealize Business for Cloud Installation and Administration Guide*.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Expand **Expenses**, select **Public Cloud (AWS)**.

- 4 Click **Instances**.

You see all the details of virtual machines that are configured to the AWS accounts. The information includes account ID and name, instance type, the state of the virtual machine, availability zone of the virtual machine, tags, last seen as information, the pricing policy name and total price, the direct and other cost incurred on the virtual machine and also the existence of the virtual machine.

- 5 Click the **instance name** to see the details of that instance.

Section	Description
Header	Displays the instance name, total cost for the current month, state of the instance, and availability zone.
Widgets	Display the operational details for the instance, such as: <ul style="list-style-type: none"> ■ Total cost trend for the past six months. ■ CPU utilization trend in percentage for the past 30 days, graphically. ■ The disk input and output operations per minute for the past 30 days, graphically. ■ The incoming and outgoing data on a network in bytes for past the 30 days, graphically.

View Total Cost And Operational Statistics of EC2 and EBS Services

You can view the total cost and operational statistics of Amazon Elastic Compute Cloud (EC2) services and Elastic Block Store (EBS) in vRealize Business for Cloud.

Prerequisites

Verify that you have added a AWS account in vRealize Business for Cloud. See *vRealize Business for Cloud Installation and Administration Guide*.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses**, select **Public Cloud (AWS)**.
- 4 Click **EC2/EBS** to see the details of EC2 and EBS services.

Section	Description
Header	Displays information such as the total cost of EC2 for the current month, the total number of EC2 instances, and the total number of EBS volumes.
Cost Summary	Displays the trend of total monthly expense for all EC2 instances configured in vRealize Business for Cloud and the expense distribution across EC2 instance types, for example, t2.micro, m3.medium, c3.large, m3.xlarge.
EC2 Summary	Displays the top five EC2 instance types based on its count of instances being used and also instances with least CPU utilization .
EBS Summary	Displays the disk input and output operations per minute for the past 30 days graphically and top five EBS volumes having the maximum size.
Network Operations	Displays the incoming and outgoing data on a network in bytes for past the 30 days graphically.

Overview of Microsoft Azure Expenses

Microsoft Azure Overview lets you view estimated total monthly expense, expense per account type, expense distribution per service and virtual machine summary.

- **Total Expense** - The graph displays the Azure expense, which includes the actual expense and the total estimated monthly expense. And also, you can see the monthly expense trend.

Note The Total Expense trend displays the total expense for the last twelve months based on the cost in the bill, irrespective of when the account was added into vRealize Business for Cloud.

- **Services** - This graph displays the estimated expense distributed among different services like Virtual Machines, Storage, Networking, Data Management, and other services across all accounts.
- **Accounts** - This graph displays the actual expense for Enterprise Agreement (EA) and Non-Enterprise Agreement (Non-EA) accounts.
- **Largest Changes in Accounts** - This graph displays the expense changes of EA and non-EA accounts compared to expense in the previous month.

- **VMs at a Glance** - This graph displays the total virtual machine count and average expense of each virtual machine per month. It also displays the virtual machine count based on its power status whether stopped, running or terminated.

View Azure Non-EA Account Details

You can view the total cost and operational statistics of Azure Non-EA accounts in vRealize Business for Cloud.

Prerequisites

Verify that you have added an Azure non-EA account in vRealize Business for Cloud. See *vRealize Business for Cloud Installation and Administration Guide*.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Expenses**, select **Public Cloud (Azure)**.
- 4 Click **Non-EA VM Stats** to see the details of Azure Non-EA accounts.

Section	Description
Header	Displays the total cost for the current month, and the total number of instances.
Cost Summary	Displays the trend of total monthly expense for all Non-EA accounts configured in vRealize Business for Cloud and the expense distribution across instance types, for example, Standard_A1, Basic_A4, Standard_D5_V2, Standard_Nv24 .
Virtual Machine Summary	Displays the operational details, such as: <ul style="list-style-type: none"> ■ Top five instance types based on its number of instances being used ■ Top instances with least CPU utilization. ■ The disk input and output operations per minute for the past 30 days graphically ■ The incoming and outgoing data on a network in bytes for past the 30 days graphically.

View Azure Instances Information

You can view the details of virtual machines that are hosted on Azure account including service, account cost, price and availability information.

Prerequisites

Verify that you have added an Azure account in vRealize Business for Cloud. See *vRealize Business for Cloud Installation and Administration Guide*.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Expand **Expenses**, select **Public Cloud (Azure)**.

- 4 Click **Overview**.

You see all the details of the Azure accounts. The information includes widgets for total expense, services, accounts, largest changes in accounts, and VMs at a glance.

- 5 Click the **VMs at a Glance**.

You see all the details of the virtual machines that are configured to the Azure accounts. The information includes account ID and name, instance type, the state of the virtual machine, region of the virtual machine, tags, the pricing policy name and total price, the direct and other cost incurred on the virtual machine, the existence of the virtual machine, and enterprise account confirmation.

- 6 Click the non-EA **instance name** to see the statistics of that instance.

You can click only the non-EA accounts.

Section	Description
Header	Displays the instance name, total cost for the current month, state of the instance, and region.
Widgets	Display the operational details for the instance, such as: <ul style="list-style-type: none"> ■ Total cost trend for the past six months. ■ CPU utilization trend in percentage for the past 30 days, graphically. ■ The disk input and output operations per second for the past 30 days, graphically. ■ The incoming and outgoing data on a network in bytes for past the 30 days, graphically.

Overview of Operational Analysis

4

After you determine the total expense for your cloud infrastructure, you can allocate these costs to the underlying resources that constitute the services. These resources are CPU, RAM, storage, and operating system (license and labor). The operational analysis considers the CPU, RAM, and storage as first class components of the cloud infrastructure.

The operational analysis module accepts the total monthly operating cost in your cloud infrastructure as modeled by using the cost driver component as input, and arrives at base rate for CPU, storage base rates and RAM expressed in terms of dollar per gigahertz of CPU and dollar per gigabytes of storage base rates and RAM. The derived base rates for CPU, memory, and storage configured in the cost driver are then used to attribute the total cloud cost for the month to the virtual machines to arrive at the total cost of operating virtual machines for the month. Certain costs are directly attributed to the virtual machines, for example desktop operating system licenses and labor costs. These are not part of resource base rates, and are classified under the heading of OS (License and Labor).

The Resources table under **Operational Analysis** displays cost breakdown information in terms of the current month cost, trend, and total percentage value of CPU, RAM, storage, operating system (license and labor) consumption in your cloud environment. You can filter the resource cost information, its generation details and virtual machine cost based on each data center or view all data centers cost information together, by using the **All Data Centers** drop-down list.

This chapter includes the following topics:

- [Calculating the Base Rate and the Expected CPU Utilization Percentage](#)
- [Edit Cost Utilization](#)
- [Virtual Machine Cost Allocation](#)

Calculating the Base Rate and the Expected CPU Utilization Percentage

vRealize Business for Cloud calculates the base rates of CPU and memory so that they can be used for virtual machine cost computation. Base rates are determined for each cluster, which are homogeneous provisioning groups. Hence, base rates might change across clusters, but are the same within a cluster. Unclustered hosts in a vCenter Server are grouped according to their

vendor, model, and configuration. If you have enabled the data center mode, unclustered hosts are grouped under data centers.

- 1 vRealize Business for Cloud first arrives at the fully loaded cost of the cluster from the cost drivers. After the cost of a cluster is determined, this cost is split into CPU and memory costs based on the industry standard cost ratios for the different models of the server.
- 2 The CPU base rate is first computed by dividing the CPU cost of the cluster by the CPU capacity of the cluster. CPU base rate is then prorated by dividing the CPU base rate by expected CPU utilization percentage to arrive at true base rate for charging the virtual machines.
- 3 The memory base rate is first computed by dividing the memory cost of the cluster by the memory capacity of the cluster. Memory base rate is then prorated by dividing the memory base rate by expected memory utilization percentage to arrive at true base rate for charging the virtual machines.
- 4 You can either provide the expected CPU and memory utilization or can derive the expected CPU and memory utilization based on 3-month utilization average of ESXi hosts.

Edit Cost Utilization

You can adjust how the cost allocation happens in your virtual infrastructure. The total loaded cloud cost involves hardware, operating systems, maintenance, network, labor, and facilities costs. You can control how these costs are allocated on to your virtual infrastructure.

Note that you can filter and view the cost information for each data center or view all data centers cost information together, by using the **All Data Centers** drop-down list.

View Information for Server Cluster

vRealize Business for Cloud categorizes all the ESXi hosts according to their cluster configuration. For ESXi hosts that are not clustered, categorization is based on five parameters, which are server model, CPU model, core count, CPU capacity, and memory size.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Operational Analysis**, click **Private Cloud (vSphere)**.
- 4 Click **Edit Utilization**.

Results

The Server Clusters table provides information on the basis of the cluster configuration.

Table 4-1. Server Clusters

Category	Description
Type	Displays the icon that identifies whether this is a group of clustered or unclustered hosts.
Description	Displays the name of the cluster. If the ESXi hosts are not clustered, vRealize Business for Cloud displays the server model, CPU model, core count, CPU capacity, and memory size.
Data Center Name	Displays the name of the data center in which the server cluster resides.
Servers	Displays the total number of servers belonging to a cluster. You can click on the total count to see the server IP address and its description.
Utilization % of Capacity	<p>Displays the percentage of utilization of the cluster's CPU and RAM capacity in terms of gigahertz and gigabytes respectively for the current month. The utilization is represented in different colors:</p> <ul style="list-style-type: none"> ■ Green represents the utilized capacity ■ White represents the allocated capacity ■ Grey represents the unreserved capacity
Total Cost	Displays the total cost of the cluster.
Expected CPU utilization %	Displays the percentage of expected CPU utilization. You can set the expected CPU utilization. For more information, see Set the Expected CPU and Memory Utilization for the Host .
Expected memory utilization %	Displays the percentage of expected memory utilization. You can set the expected memory utilization. For more information, see Set the Expected CPU and Memory Utilization for the Host .
Base rates	Depending on the expected CPU utilization value that you have defined, vRealize Business for Cloud calculates the base rate for the cluster and displays the information for CPU and RAM in terms of dollar per gigahertz and dollar per gigabytes respectively.
Unallocated Costs	<p>Derived by multiplying the unused capacity of CPU and RAM by CPU and RAM base rates. Here,</p> $\text{unused capacity} = \text{total capacity} - (\text{used} + \text{reserved capacity}).$ <p>Note The unused capacity is displayed as zero if total capacity is less than addition of used and reserved capacity.</p>

Set the Expected CPU and Memory Utilization for the Host

You can set the expected CPU and memory utilization for the host by using the system defined value, which is computed by using historical averages, by defining a global value, or by defining a value at each cluster level. This value is used for calculating the virtual machine cost allocation.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Operational Analysis**, click **Private Cloud (vSphere)**.
- 4 Click **Edit Utilization**.
- 5 You can select the data center for which you want to view or edit base rates of CPU and RAM by using the **All Data Centers** drop-down list.
- 6 Set expected CPU and memory utilization.
 - You can select the system defined value, which computes the expected CPU and memory utilization by using historical averages. This option is selected by default.
 - You can set the fixed utilization percentages for the expected CPU and memory utilization percentages in terms of percentage value. If you select this option, the value that you type is applied to the all server clusters.
 - You can set the expected CPU and memory utilization percentages for each cluster by typing the value in the **Expected CPU Utilization %** and **Expected Memory Utilization %** text boxes. Select the option and then set the expected utilization by navigating to the Expected CPU Utilization % and Expected Memory Utilization % column.
- 7 Click **Save**.

Results

vRealize Business for Cloud uses the value that you have provided to calculate and display the updated base rates of CPU and RAM in terms of cost per gigahertz and cost per gigabytes for the server cluster. vRealize Business for Cloud also updates the unallocated costs for the server cluster.

Virtual Machine Cost Allocation

vRealize Business for Cloud uses the utilization cost model to allocate the cost. The utilization cost model allocates the cost in proportion to the actual utilization of server CPU and memory resources of the virtual machines.

After the base rate is computed, vRealize Business for Cloud reads different attributes of the virtual machine, such as usage, additional services of virtual machine such as fault tolerance, and then prepares the costs by using each parameter. These costs are computed on a daily basis and are added to calculate the monthly costs.

The list of virtual machines in the Resource Cost page are categorized according to the server generation that the virtual machine belongs to. If a virtual machine is deleted, the cost of virtual machine is not considered for the current month. Generation refers to the release date of server in the market. For example, the virtual machines hosted on servers released in the year 2009 appear under a single group heading.

View Server and Virtual Machine Information

You can view the information related to total cost of virtual machines in your environment and the average cost of all the virtual machines. You can also view detailed information related to CPU, RAM, and storage cost related to a particular virtual machine.

Note The cost values are displayed as zero in the beginning of the month as there is no utilization on which cost can be computed.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Expand **Expenses** and expand **Private Cloud (vSphere)**.

- 4 Expand **Operational Analysis**, click **Private Cloud (vSphere)**.

- 5 Select the **Compute** tab.

All the live virtual machines in your cloud environment are displayed according to the generation of server that they belong to.

- 6 Click the link where the number of live virtual machines is displayed.

vRealize Business for Cloud displays all the virtual machines belonging to a particular generation. The number of vCPUs, CPU cost, RAM cost, storage cost, direct virtual machine cost, and total cost of the virtual machine that you have selected is displayed.

- 7 To view the ESXi host details to which the virtual machine belongs to and to view the virtual machine resource cost history, click the ► icon.

The name or IP address, configuration, and the host cluster information of the virtual machine is displayed. The resource cost history of the virtual machine is displayed in a graphical manner where the X axis represents the month and the Y axis represents the cost in dollars for that month.

- 8 To view all the servers belonging to a particular generation, click the link where the number of servers is listed.

The ESXi host name and description is displayed.

- 9 Select the **Storage** tab, to see the list of all data stores and its details such as base rate, total capacity, used capacity, total cost and unallocated cost. You can also determine whether the data store is a part of EMC SRM managed storage array or not based on the value in the Source field (EMC SRM Managed Storage or Other).

Overview of Consumption Analysis

5

Consumption analysis attempts to determine who consumes the resources, the purpose for which they are being consumed, and the costs associated with the resources.

vRealize Business for Cloud classifies the consumers based on the business units.

This chapter includes the following topics:

- [Pricing Integration with vRealize Automation](#)
- [About Pricing Policies](#)
- [Add or Edit Price for Virtual Machines](#)
- [Set the Budget Value to Estimate Your Cost](#)
- [View Consumption Charges](#)
- [View Business Unit List](#)
- [View Business Unit Heat Map](#)
- [View the Showback Statement](#)

Pricing Integration with vRealize Automation

When vRealize Automation is configured with vRealize Business for Cloud, the pricing for all infrastructures in vRealize Automation must be configured in vRealize Business for Cloud.

vRealize Business for Cloud provides pricing information to vRealize Automation 6.x and 7.x versions differently.

Costing in vRealize Automation

- If vRealize Business for Cloud is integrated with vRealize Automation 6.x, vRealize Business for Cloud provides the pricing information for memory (GB) and virtual CPU at each host or cluster level. vRealize Business for Cloud computes the price based on the pricing policies configured in vRealize Business for Cloud and provides to vRealize Automation. The price computation is based on the average daily prices of all the virtual machines under a specific host or cluster. vRealize Automation uses these price values to fill the cost profiles. For more information, see the vRealize Automation documentation.
- If vRealize Business for Cloud is integrated with vRealize Automation prior to 7.3 version, during the provision of a new machine in vRealize Automation, vRealize Automation communicates with vRealize Business for Cloud to obtain the upfront price of the machines. vRealize Business for Cloud calculates these upfront price based on the pricing policies and resource allocation in vRealize Business for Cloud. Pricing policies are based on reservations, reservation policies and blueprints. In addition, vRealize Business for Cloud also allows to model any operational cost, one time cost and cost on custom properties.
- If vRealize Business for Cloud is integrated with vRealize Automation 7.3 or later,
 - vRealize Automation communicates with vRealize Business for Cloud to obtain the upfront price of the machines. vRealize Business for Cloud calculates these upfront price based on the pricing policies and resource allocation in vRealize Business for Cloud.

Note vRealize Business for Cloud does not consider the pricing methodology that have defined for resources for calculating the upfront price. Upfront price is always computed based on the allocation of a resource.

- vRealize Business for Cloud calculates the expense (month-to-date) value for the virtual machines deployed on vRealize Automation that appears on **Items > Deployment**. During virtual machine cost calculation, vRealize Business for Cloud identifies the deployment constructs present in vRealize Automation and add the price for those objects.

Note Verify that the blueprint value you see in the vRealize Automation Virtual Machine report on vRealize Business for Cloud matches the value on the expense (month-to-date) column in vRealize Automation (**Items > Deployment**).

Pricing and showback in vRealize Business for Cloud for vRealize Automation

- When vRealize Business for Cloud is integrated with vRealize Automation 6.x, vRealize Business for Cloud supports only Reservations for Compute Grouping

Strategy and vRealize Business for Cloud supports the Storage Path based pricing for Storage Grouping Strategy.

- When vRealize Business for Cloud is integrated with vRealize Automation 7.x , vRealize Business for Cloud supports pricing based on Blueprints, Reservations and Reservation Policies for Compute Grouping Strategy. In addition, vRealize Business for Cloud supports the Storage Path and Storage Reservation policies for Storage Grouping Strategy.
-

About Pricing Policies

vRealize Business for Cloud can auto-generate pricing policies based on cost calculations. By default, these policies provide pricing recommendations for private, public, and hybrid cloud, which you can modify.

Pricing policy provides integration with vRealize Automation and replaces the vRealize Automation cost profiles. vRealize Business for Cloud calculates price of virtual machines provisioned by vRealize Automation including the virtual machines that vRealize Business for Cloud does not monitor (for example, KVM, Openstack and HyperV). You can see the price on the vRealize Automation catalog UI based on vRealize Business for Cloud policies.

When vRealize Automation is configured with vRealize Business for Cloud, the pricing for all infrastructures in vRealize Automation must be configured in vRealize Business for Cloud.

vRealize Business for Cloud pricing policy handles Virtual Storage Area Network (Virtual SAN) cost separately from storage expenses, by excluding datastores that the Virtual SAN identifies and grouping them under Virtual SAN category.

The virtual machines in vRealize Business for Cloud are assessed or evaluated based on the its endpoint policy like vRealize Automation, vCenter Server or vCloud Director or grouped under the Catch All policy.

Each virtual machine flows through an hierarchy of policies and maps to a single policy.

Note When more than 1 NIC exists in the vRealize Business for Cloud virtual appliance, you must edit the `security.properties` file to update the `vcbm.host` parameter with the correct hostname (the common name of the certificate) and restart pricing-api service.

Add or Edit Price for Virtual Machines

You can modify or define price of the virtual machines existing the your private, public and hybrid cloud environments.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Pricing**, click **Edit** and select **Edit Pricing**.
- 5 Select the infrastructure tab for which you want to modify.
Based on your selection, the policy options varies.
- 6 Expand the policy type to see the policy options.

Infrastructure Tab	Options
Private Cloud (vSphere)	vSphere VMs <ul style="list-style-type: none"> ■ Custom Policies ■ vRealize Automation ■ Custom Policies ■ vCloud Director ■ Custom Policies ■ vCenter ■ Catch All Policies Other Private Cloud Services <ul style="list-style-type: none"> ■ Network Services
Public Cloud (AWS)	<ul style="list-style-type: none"> ■ Custom Policies ■ vRealize Automation ■ Custom Policies ■ Amazon EC2 ■ Catch All Policies Other AWS Services <ul style="list-style-type: none"> ■ Amazon Web Services

Infrastructure Tab	Options
Public Cloud (Azure)	<ul style="list-style-type: none"> ■ Custom Policies ■ vRealize Automation ■ Custom Policies ■ Azure VMs ■ Catch All Policies <p>Other Azure Services</p> <ul style="list-style-type: none"> ■ Azure Services
Other Cloud Providers	<ul style="list-style-type: none"> ■ Custom Policies ■ vRealize Automation ■ Catch All Policies
<p>Note You might not see this option if you are using the vRealize Business for Cloud standalone setup or vRealize Operations Manager integrated vRealize Business for Cloud setup.</p>	

Note If you are using vRealize Business for Cloud standalone setup, you do not see the options related to **vRealize Automation**.

7 Modify the auto-generated policies.

Action	Procedure
Create or modify a custom policy	<p>To price accurate values for the specific virtual machines, you can create the custom policies.</p> <ol style="list-style-type: none"> To add a custom policy, expand Custom Policies, click Add, enter the price values for compute or storage policies and click Save. For more information, see the <i>Add or Modify Compute and Storage</i> section in the guide. To modify a custom policy, expand Custom Policies of the categorization type that you want to modify, select the policy from the list to make required changes and click Save. For more information, see the <i>Add or Modify Compute and Storage</i> section in the guide. To edit the identification infrastructure, click Edit next to the Infrastructure option and make the necessary changes. For more information, see the <i>Edit Identification Infrastructure</i> section in the guide. Modify the rates inline on the respective fields. To add a calculation method and rate for additional services, click Edit next to the Additional Services option. For more information see, <i>Add or Edit Additional Service Cost</i> section in the guide. Select Active or Inactivate to activate or deactivate the custom policy or click the respective options next to the policy entries in the list. You can also suspend, clone or delete a policy from the list. Drag and drop the policies in the list to change the rank of the policies. <p>Note You cannot activate, delete or modify the auto-generated policies.</p> <p>Note Each source such as vRealize Automation, vCenter Server, vCloud Director, and Amazon EC2 has an individual custom policy section.</p>
Modify a cloud provider policy (Private, Public or Hybrid and others)	<ol style="list-style-type: none"> To modify the infrastructure grouping strategy, click Edit on the title bar and make the necessary changes. For more information, see the <i>Edit Group Configuration</i> section. To modify the rates, expand the list, select Compute or Storage tabs, modify the rates and click Save. For more information, see the <i>Add or Modify Compute and Storage</i> section in the guide. To add calculation method and rate for additional services, click Edit next to the Additional Services. For more information see, <i>Add or Edit Additional Service Cost</i> section in the guide.

Add or Modify Compute and Storage Policies

You can add or edit a pricing policy and use the policy to determine the cost of virtual machines.

Procedure

- Log in to vRealize Business for Cloud as an administrator.
 - `https://vRealize_Automation_host_name/vcac/org/tenant_URL` (for the vRealize Automation integrated setup)
 - `https://vRealize_Business_for_Cloud_host_name/itfm-cloud`(for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Pricing**, click **Edit** and select **Edit Pricing**.
- 5 Select **Private Cloud (vSphere)** tab.
- 6 Expand a policy, custom policy or any private cloud provider.
- 7 Select the **Compute** or **Storage** tabs.
- 8 Perform the following on the Add Custom Policy page.
 - a Enter the policy name.
 - b To select an infrastructure, click **Edit** next to the Infrastructure option. For more information, see the *Edit Identification Infrastructure* section in the guide.
 - c Enter the compute rate and storage rate for the policy. You can use the storage policy to determine the storage price.
 - d To add a calculation method and rate for additional services, click **Edit** next to the Additional Services. For more information see, *Add or Edit Additional Service Cost* section in the guide.

Note

- You see the running cost for CPU, memory and storage resources. Running cost is calculated based on the allocation or utilization pricing method that you configure on the **Administration** tab (**Calculation Preferences > Pricing Methodology at Resource Level**) for each resource.
 - If you have set the allocation pricing method for CPU, you see the vCPU daily price and if you have set the utilization pricing method, you see the GHz CPU daily price.
-
- e Click **Save**.
The pricing policy is created. By default, the policy is deactivated, which means inactive. The inactive policies are not charged during pricing.
 - f Select **Active** to activate the policy.
You can deactivate the policy by selecting **Inactivate**.

Edit a Group Configuration

You can define or edit the group strategy for each datasource.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)

- https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)

2 Click **Business Management**.

3 Expand **Consumption**, select **Pricing and Charges**.

4 Select **Pricing**, click **Edit** and select **Edit Pricing**.

5 Select the infrastructure tab for which you want to modify.

Based on your selection, the policy options varies.

6 Click **Edit** on the datasource bar.

The Group Configuration window opens.

7 Perform the following steps on the Group Configuration window.

- a Enable or disable the group status.
- b Select the grouping strategy from the drop-down list.

Based on the datasource you have selected, the options for the grouping strategy are populated.

Datasource	Grouping Strategy Options
vCenter Server	Compute Grouping Strategy <ul style="list-style-type: none"> ■ Cluster ■ Resource Pool Storage Grouping Strategy <ul style="list-style-type: none"> ■ Storage Profile ■ Storage Type ■ Datastore ■ Datastores Cluster ■ Storage Policy
vCloud Director	Compute Grouping Strategy <ul style="list-style-type: none"> ■ Organization vDC <p>Note</p> <ul style="list-style-type: none"> ■ vCloud Director pricing policies are supported at Organization vDC level and virtual machine level based on allocation models defined on vCloud Director user interface. When you set the allocation pool or reservation pool allocation models, vRealize Business for Cloud assigns the pricing policy at Organization vDC level. When you set the pay-as-you-go allocation models, vRealize Business for Cloud assigns the pricing policy at virtual machine level. ■ If the pricing level is Organization vDC, vRealize Business for Cloud considers allocation methodology for calculating the price, even when you have set the utilization pricing method. ■ Virtual machines under Organization vDC of type Allocation Pool and Reservation Pool will display the total price value as N/A in all the reports. However, you can see the price for these virtual machines in the Organization vDC reports.
vRealize Automation	Compute Grouping Strategy <ul style="list-style-type: none"> ■ vRealize Automation Reservation ■ vRealize Automation Reservation Policy ■ vRealize Automation Blueprint <p>Note When integrated with the vRealize Automation 6.x version, vRealize Business for Cloud supports only vSphere reservations.</p> Storage Grouping Strategy <ul style="list-style-type: none"> ■ vRA Storage Reservation Policy ■ Storage Path <p>Note When integrated with the vRealize Automation 6.x version, vRealize Business for Cloud does not support the Storage Path categorization.</p>

Datasource	Grouping Strategy Options
Amazon EC2	Compute Grouping Strategy <ul style="list-style-type: none"> ■ Amazon Account ■ Amazon Instance Type
Amazon Web Services	Service Grouping Strategy <ul style="list-style-type: none"> ■ Amazon Service Name
Azure VMs	Compute Grouping Strategy <ul style="list-style-type: none"> ■ Azure Account ■ Azure Instance Type
Azure Services	Service Grouping Strategy <ul style="list-style-type: none"> ■ Azure Service Name

Edit Identification Infrastructure

You can select the infrastructure type for a pricing policy. Based on the infrastructure you select, the policy sets the price for the virtual machines with the current infrastructure.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Select **Pricing**, click **Edit** and select **Edit Pricing**.
- 4 Select the infrastructure tab for which you want to modify.
Based on your selection, the policy options varies.
- 5 Select a policy category and select an existing policy or click **Add** to create a policy. Select an infrastructure.

vRealize Business for Cloud lists the Infrastructure types that are available for your selected infrastructure.

- 6 To select an infrastructure, click **Edit** next to the Infrastructure option and click the infrastructure source, infrastructure type and infrastructure selection.

Infrastructure	Options
Compute Pricing Policy	<p>For vCenter Server, the policy is based on:</p> <ul style="list-style-type: none"> ■ Cluster ■ Resource Pool <p>For vCloud Director, the policy is based on:</p> <ul style="list-style-type: none"> ■ Organization <p>For vRealize Automation, the policy is based on:</p> <ul style="list-style-type: none"> ■ Reservation ■ Reservation Policy ■ Blueprint ■ Any If you have multiple reservations, during provisioning of virtual machines in vRealize Automation, the upfront cost displays the range of values, instead of single value in vRealize Business for Cloud. <p>Note If you are using vRealize Business for Cloud in the standalone mode, you do not see the options related to vRealize Automation.</p> <p>For Amazon EC2, the policy is based on:</p> <ul style="list-style-type: none"> ■ Amazon Account ■ Amazon Instance Type <p>For AWS, the policy is based on Amazon Service Name</p>
Storage Pricing policy	<p>For vCenter Server, the policy is based on:</p> <ul style="list-style-type: none"> ■ Datastore ■ Profile ■ Storage Type ■ Datastores Cluster ■ Storage Policy <p>For vRealize Automation, the policy is based on:</p> <ul style="list-style-type: none"> ■ Storage Reservation Policy ■ Storage Path <p>Note Storage Pricing Policy is not available for vCloud Director.</p>
Infrastructure Selection	Select a name from the list.

- 7 Click **Save**.

Add Additional Charges

You can add additional cost for customizing the pricing policies.

For information about configuring default settings for Virtual Infrastructure Labor and Operating System Labor, see [View and Update vRealize Business for Cloud Default Settings](#).

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Select **Pricing**, click **Edit** and select **Edit Pricing**.
- 4 Select the infrastructure tab for which you want to modify.
Based on your selection, the policy options varies.
- 5 Select an existing policy or click **Add** to create a custom policy.
- 6 Click **Edit** next to the Additional Services option.
- 7 Click the add option in the Additional Services window.
- 8 Select an inventory item from the Identification list.
Based on your selection, the tag value field is filled.

Note

- You can add price for the Fault Tolerant property of virtual machines that exists in vCenter Server only. The pricing is not supported for fault tolerant virtual machines that are part of other endpoints.
- You can configure whether to set the rate for Virtual Infrastructure Labor and Operating System Labor services by using the `configclient.py` utility. Run the following command on the appropriate folder in the shell prompt: `configclient.py SET -k pricing.additional.createByDefault -v true`.

- 9 Select a tag value from the list.
- 10 Select one of the calculation method.

Option	Description
Fixed	Sets a defined rate for the particular virtual machine that is associated with this policy or tag, remains same everyday.
% Over Compute	Adds defined percentage value in addition to the compute cost.
% Over Storage	Adds defined percentage value in addition to the storage cost.
% Total Cost	Adds defined cost percentage value in addition to the compute cost and storage cost.
Fixed One Time Fee	Adds the defined rate to the virtual machine in the first month after first deployment. So this is the cost for the one time setup.

- 11 Enter the rate of percentage or the rate for updating the pricing policy for the virtual machines.
- 12 Click **Save** to save the additional service cost to the virtual machines.

Add and Edit Network Price

You can add the fixed and recurring charges for network services consumed by business units. vRealize Business categorizes these charges as additional services.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Pricing**, click **Edit** and select **Edit Pricing**.
- 5 Click **Private Cloud (vSphere)**.
- 6 Expand the **Network Services** section.

You see the list of all business units in your private cloud.
- 7 Expand a business unit.

By default, you see five services named Edge Gateway, Elastic IP, Firewall, Load Balancer, and VPN. If you have added the VMware NSX Manager and its corresponding VMware vCloud Director and vCenter Server into vRealize Business for Cloud, you see the list of additional services consumed by business unit, its count and charge details.
- 8 To add a new network service for a specific business unit, expand the business unit section and perform the following steps:
 - a Click **Add**.
 - b Enter a name for a service.
 - c Specify the service count, one-time charge, and recurring charge for the policy.
 - d Click **Save**.

You see the new service details listed under the specific business unit.

9 Modify the charges of the service.

- a Expand the business unit that you want to edit under **Network Services**.
- b Modify the values for service count, one-time charge, and recurring charge.
- c Click **Save** to save the charges.

After the cost calculation completes, the charges you add are reflected under **Additional Services** in the **Showback > Reports** section.

Create a Cross-Infrastructure Policy

vRealize Business for Cloud supports cross-infrastructure policy by not limiting the additional services to a policy.

Procedure

- 1** Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2** Click **Business Management**.
- 3** Select **Pricing**, click **Edit** and select **Edit Pricing**.
- 4** Select the infrastructure tab for which you want to modify.
Based on your selection, the policy options varies.
- 5** Click **Cross-Infrastructure Policy**.
- 6** Click the add option in the Additional Services window.
- 7** Select an inventory item from the Identification list.
Based on your selection, the tag value field is filled.

Note

- You can add price for the Fault Tolerant property of virtual machines that exists in vCenter Server only. The pricing is not supported for fault tolerant virtual machines that are part of other endpoints.
 - You can configure whether to set the rate for Virtual Infrastructure Labor and Operating System Labor services by using the `configclient.py` utility. Run the following command on the appropriate folder in the shell prompt: `configclient.py SET -k pricing.additional.createByDefault -v true`.
-

- 8** Select a tag value from the list.

- 9 Select one of the calculation method.

Option	Description
Fixed	Sets a defined rate for the particular virtual machine that is associated with this policy or tag, remains same everyday.
% Over Compute	Adds defined percentage value in addition to the compute cost.
% Over Storage	Adds defined percentage value in addition to the storage cost.
% Total Cost	Adds defined cost percentage value in addition to the compute cost and storage cost.
Fixed One Time Fee	Adds the defined rate to the virtual machine in the first month after first deployment. So this is the cost for the one time setup.

- 10 Enter the rate of percentage or the rate for updating the pricing policy for the virtual machines.

- 11 Click **Save** to save the additional service cost to the virtual machines.

Results

The cross-infrastructure value appears in the additional services section of each policy, which is greyed. You can edit or delete this value from the **Cross-Infrastructure Policy** link.

Set the Budget Value to Estimate Your Cost

You can set a budget for the consumers added to vRealize Business for Cloud. The consumer budgeting is disabled, by default.

Prerequisites

Verify that you have defined the consumer categorization in **Business Unit List**. See [Edit the Business Hierarchy](#).

Procedure

- Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)
- Click **Business Management**.
- Expand **Consumption**, select **Pricing and Charges**.
- Click **Business Unit List > Edit**.
- Select **Edit Budget**.
- Select the **Enable consumer budgeting** option.

7 Select the budget type.

You can update the budget for a particular month, for a quarter, or for a year.

If you update the budget for a year, the amount is distributed for each month equally. If you update the quarterly budget, the amount is distributed for three months in the selected quarter.

8 Enter the budget value in the table for the required consumer.**9** (Optional) Click **Export** to export a budget data in XLS format.

The data is exported on monthly basis.

10 (Optional) Click **Import** and select the XLS budget file to import the updated budget values.

Note The XLS file must be in monthly format only.

11 (Optional) Click **Get Template** to get a template file for updating the budget values, which you can import later.**12** Click **Save** to save the updated budget values.

View Consumption Charges

Consumption charges is a dashboard that shows the monthly charge trends of business units. You can compare charge with cost, and see the list of top consumers in terms of charge values and the identify the top three consumers.

Procedure

1 Log in to vRealize Business for Cloud as an administrator.

- https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
- https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)

2 Click **Business Management**.**3** Expand **Consumption**, select **Pricing and Charges**.**4** Select **Charges**.

Note If you have data for more than six months, the trend considers the values of last twelve months, otherwise the trend displays last six months data or from the month the data is available.

Table 5-1. You see different widgets with the cost information.

Widget	Description
Price	You can see the total charge value for all business units.
Price Over Time	The graph shows the monthly charge trend of all business units. Charge is computed based on the virtual machine configuration and the pricing policy defined for the virtual machines.
Price/Cost	<p>You can see the charge and cost difference amount for the current month, which determines the recovery status (over recovery or under recovery).</p> <p>Note If the charge is more than the cost, then the value is termed as over recovery. And if the charge is less than the cost, then the value is termed as under recovery.</p> <p>The first graph in the widget represents the recovery trend for a year (based on the data points).</p> <p>The second graph in the widget represents the charge cost comparison over time in a graphical format.</p>
Top Business Units (Price)	This graph displays the top three consumer business units having the highest charges and the remaining consumers are grouped under Other Consumers.
Recovery Margins	This graph displays the top consumers in terms of charge and its cost values.

Edit the Business Hierarchy

You can view details of how the cost of your virtual infrastructure is spread across different consumers. This helps you in budgeting and comparison across different consumer groups within the enterprise. You can define or map the virtual machines based on business units in vRealize Business for Cloud. You can categorize your consumer lists according to your vCenter Server, vRealize Automation, and vCloud Director hierarchies.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Business Unit List**.
- 5 From the **Edit** menu, click **Edit Business Hierarchy**.

- 6 Click **Edit** on the datasource bar to define or edit the group strategy for each hierarchy.

The Group Configuration window opens.

- 7 Perform the following to configure each group strategy.

- a Enable or disable the group status.
- b Select a group strategy for the business units or business services.

Datasource	Grouping Strategy
vRealize Automation	<ul style="list-style-type: none"> ■ For the business units, select Business Group. Grouping or categorization is done according to the business groups present in vRealize Automation. Each tenant is considered as a line of business and each business group is listed as a business unit. ■ For the business services, select Blueprint.
vCloud Director	<ul style="list-style-type: none"> ■ For the business units, select Organization or Virtual Data Center. ■ For the business services, select vApp.
vCenter Server	<p>For business units and business services, define the strategy by setting rules or uploading a CSV file.</p> <ul style="list-style-type: none"> ■ If you are setting rules, define the business units according to one of the following options: <ul style="list-style-type: none"> ■ Categorize by folder. For example, folders whose name or labels begin with BU_. ■ Select all folders at vCenter Server hierarchy level <p>Note The selected folder level corresponds to folders in the VMs and Templates view of vCenter Server. When you select this option, vRealize Business for Cloud identifies virtual machines that are within the folders and ignores the virtual machines that are at same level as folders. To see all virtual machines regardless of folder structure mentioned in the VMs and Templates view of vCenter Server, you must use the categorize by tags or by virtual machine name options.</p> <ul style="list-style-type: none"> ■ Categorize by tags - select the VMs with tag family ■ Categorize by virtual machine name <p>Note Enter the group pattern within parenthesis. For example, to list the virtual machine names having vRB in the beginning or at the end of the name, enter ((vRB)(.*)) or ((.*) (vRB)) respectively. To list all virtual machines with vRB anywhere in the name, enter ((.*) (vRB) (.*)).</p> ■ If you are uploading a CSV file, click Upload and select a valid CSV file. The CSV file that you are uploading must contain the information under the headings vmMoid, vcServerUUID, and businessUnitName.
Amazon Web Services	Select Account Name as the grouping strategy.

- c Click **Save**.

- 8 To change the logical name of a business unit, perform the following steps.
 - a Expand a datasource section or group.
 - b Click on the logical name that you want change.
 - c Rename the business unit.
 - d Click **Save**.

Results

vRealize Business for Cloud refreshes its data if the business unit definition has changed.

Assign Business Units to the Users

You can assign one or more business units to the user by using the **Role Assignment** option.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Business Unit List**.
- 5 From the **Edit** menu, click **Edit Business Hierarchy**.
- 6 Under the **Business Units** tab, click **Role Assignment**.
- 7 In the Users section, select a user to whom you want to assign a business unit.
- 8 In the Business Units section, click on the business unit names to assign it to the selected user.

You can perform the same action to delete a business unit that is assigned to the user.
- 9 Click **Save**.

View Business Unit List

You can see the information about business units from different data sources. The information includes virtual machine count for each business unit, cost distribution for the resources (CPU, RAM, storage, and operating system). You can hover the mouse on the bar chart to see each resource cost value. You can also see the total cost, total budget and charge values for all business units. The business units can be from private or public cloud or from both.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Business Unit List**.

You see the list of business units (logical names) and its cost information. By default, logical names is same as the names of the business units.

Note The information includes both private cloud and public cloud details.

- 5 Click on a business unit name to see more details such as virtual machine and its storage details, additional services and cost, charge and budget information.
- 6 Click the drop-down arrow next to the column name to edit the business unit list view.
 - Select **Sort Ascending** or **Sort Descending** to sort the columns entries.
 - Click **Columns** to select the columns that you want to display in the business unit list view.

View Business Unit Details

The business unit details page provides you the specific information related to a particular business unit. The information includes cost, budget and charge values of an individual business unit, the charge distribution for CPU, RAM, storage and operating system and the cost versus charge trend for a specific business unit. It also provides information about the virtual machines and additional services of a business unit.

Note The cost values are displayed as zero in the beginning of the month as there is no utilization on which cost can be computed.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.

- 4 Select **Business Unit List**, and click on a business unit name.

All the cost, charge and budget information related to the selected business unit appears. You can see the charge distribution and cost versus charge trend for the business unit.

- 5 Click the **Virtual Machines** tab to see the list of virtual machines and its details present in the business unit.
- 6 Click the **Additional Services** tab to see the charge values that are not attributed to any virtual machine.

Note The additional services includes information related to the AWS only.

View Business Unit Heat Map

The business unit heat map enables you to easily identify whether the business units are over or under budget or over or under recovery. You can also see a number of blocks that represents the business unit and a tooltip on each block displays the values.

Prerequisites

Verify that you have set the budget values.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Pricing and Charges**.
- 4 Select **Business Unit Map**.

Several widgets appear with business unit information.

Widget	Description
Over Budget	Displays the total number of business units that have exceeded the set budget value. (charge is greater than budget)
Under Budget	Displays the total number of business units that are below the budget value.
Over Recovery	Displays the total number of business units in which the charge value has exceeded the cost value.
Under Recovery	Displays the total number of business units in which the charge value is below the cost value.

- 5 Select a widget to see different blocks that represents different business units.

The size of each business unit block represents the absolute amount of recovery and the color shade or the thickness represents the percentage value of the recovery. You can hover the mouse on each block to see the values on the tooltip.

View the Showback Statement

The showback Statement provides information about the business units and services, the projected monthly charge and budget values of your environment for the current month. The charge values of virtual machines and services are based on the pricing policies.

The showback statement is available for use to the administrators and also to the tenant controllers.

Procedure

- 1 Log in to the vRealize Business for Cloud as a tenant administrator or a tenant controller.
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Showback**.
- 4 Click **Showback Statement**.

The showback statement includes several information.

Note If you have data for more than six months, the trend considers the values of last twelve months, otherwise the trend displays last six months data or from the month the data is available.

Widget	Description
Business Units	Displays all business units having the charge values. You can click on each business unit to see the charge values related to that business unit.
Monthly Budget	Displays the total budget for the current month, If the budget is not enabled, you see N/A.
Month to Date Charge	Displays the total charge value for the current month.
Projected Monthly Charge	Displays the projected charge for the current month.
Charge Projection	Displays charge to date and the charge trend for the current month. Also displays the budget value trend for comparison.
Charge vs Budget	Displays the comparison of charge and budget for the last six months or last twelve months (if data is available) and values for the current month.
Top Business Services	Displays the top six business services in terms of charge, including Other Business Services.

Widget	Description
Over / Under Budget	Displays the top business units that are compared with the budget values.
Private Cloud Reclamation	<p>Displays the charge on oversized, powered off and idle virtual machines. This information helps to identify the amount of resources that can be reclaimed and provisioned to other objects in your environment or amount of potential savings that can be done in each month.</p> <p>You can click on each value to see information about which virtual machines are related to the specific charge and know the recommendations to make the best use of the resources.</p>

You also see the **User Selection** and **Business Unit** drop-down option. By default, you see the showback statement for all the users. However, when you select a value in these drop-down options, the page gets refreshed with the specific data for the selected value. If your infrastructure data do not contain any business unit information, you do not see the **User Selection** option. The **Business Unit** drop-down list gets populated based on the value you select in the **User Selection** list.

Note The Business Unit drop-down is not available for tenant controllers.

View Charge, Capacity and Uptime information of Virtual Machines

You can see a list of virtual machines in vRealize Business for Cloud that are part of from both private and public cloud environments and details of virtual machines such as the virtual machine charges and the business units associated with virtual machines. You can also see the CPU, RAM and storage capacity of virtual machines and monthly powered-on uptime in hours for the vCenter Server virtual machines.

Prerequisites

Define and categorize vCenter Server, vCloud Director, or vRealize Automation hierarchy by which you want to view the information. For information about how to categorize hierarchy, see [Edit the Business Hierarchy](#).

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - `https://vRealize_Automation_host_name/vcac/org/tenant_URL` (for the vRealize Automation integrated setup)
 - `https://vRealize_Business_for_Cloud_host_name/itfm-cloud`(for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Showback**.
- 4 Under Data Sets, click **Virtual Machines**.

By default, you see the values for the current month. If you want to see the data for the other months, you must clear the filter.

vRealize Business for Cloud displays the names of virtual machine and its total charge for the current month, including the business unit and business service associated with the virtual machines, count of virtual CPUs, configured RAM, and storage. You can view the charge information related to CPU, RAM, storage, and additional price (derived from additional services). Using the Deleted column, you can identify whether the virtual machine exists or deleted. You can also see the duration for which the vCenter Server virtual machines were up and running for a specific month by using the Monthly Uptime column.

Generate the Daily Price Report of Virtual Machines

You can generate a report with the price of all vRealize Business for Cloud registered vCenter Server virtual machines. The report provides you the actual price of virtual machines based on its resource allocation or utilization for the day.

The resource pricing model columns helps you to identify whether the virtual machine price is calculated based on resource utilization or resource allocation.

- If you have set the allocation based pricing for the resources (CPU, memory and storage), the virtual machine price is calculated based on its allocation.

Daily Allocation Price of CPU = Allocated CPU * uptime * CPU rate

Daily Allocation Price of memory = Allocated memory * uptime * memory rate

Daily Allocation Price of Storage = Allocated storage * resource rate

Note If your infrastructure had a change in resource allocation (for example, increase in memory allocation) on a particular day, vRealize Business for Cloud considers the change in allocation to calculate the accurate virtual machine price.

- If you have set the utilization based pricing for the resources (CPU, memory and storage), the virtual machine price is calculated based on its resource utilization.

Daily utilization price of a resource = resource utilization value * resource rate

Note The daily price of a virtual machine is the sum of daily price of all resources.

Daily Price of a VM = Daily Price of RAM (allocation or utilization) + Daily Price of Memory (allocation or utilization) + Daily Price of Storage (allocation or utilization)

Prerequisites

Verify that you have added vCenter Server to vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)

- https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Showback**.
- 4 Under Data Sets, click **Virtual Machines**.
- 5 Click **Daily Price Report**.

You see the list of vCenter Server virtual machines and its daily price for the last three months.

Note If your infrastructure had a change in resource allocation on a particular day, you will see two rows for that specific virtual machine.

View the Power State Change of Virtual Machines

You can view the power states of vCenter Server virtual machines on daily basis for a specific month and its corresponding duration. This helps in reconciliation of virtual machine charge discrepancy during billing.

Prerequisites

Verify that you have added vCenter Server to vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud(for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Showback**.
- 4 Under Data Sets, click **Virtual Machines**.
- 5 Scroll to the right of the table to see the Monthly Uptime (Hours) column.
- 6 Double-click the monthly uptime value for a vCenter Server virtual machine.

If the virtual machine is part of public cloud or any private cloud other than vCenter Server, or if the virtual machine was not powered on in that specific month, you see the following message:

No up-time samples found for this VM. Either it is a non-vCenter VM or this VM was not powered-on at all in the current month.

Results

You see detailed information about the virtual machine's power status and its duration for each day of the specific month.

View the Additional Services

You can see the information about all additional services that you have added to the pricing policies.

Prerequisites

Add additional services to the pricing policies. See [Add Additional Charges](#).

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - `https://vRealize_Automation_host_name/vcac/org/tenant_URL` (for the vRealize Automation integrated setup)
 - `https://vRealize_Business_for_Cloud_host_name/itfm-cloud` (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Consumption**, select **Showback**.
- 4 Under Data Sets, click **Additional Services**.

By default, you see the information for the current month. To see the data for the other months, you must clear the filter.

You see the list of additional service names that you have added to the virtual machines with the total monthly price for each service. You can also see the month, the business unit name, account ID to which the service belongs.

5 Click **Edit** and perform the following actions to edit.

Option	Description
Columns	<ul style="list-style-type: none"> ■ Under the View column, select the reports field names to display or hide in the view. ■ Lock or unlock the field to freeze the positions in the view. ■ Sort the field values in ascending or descending order.
Grouping and Charts	<ul style="list-style-type: none"> ■ Select a report field name from Group by column drop-down list to group the report based on the selected column name. ■ Select a report field name from the Function Column drop-down list and an operation such as Max, Min, Average or Sum from the Functions drop-down list to display the group summary. ■ Select the Report Chart option and click on a report type to create a chart based on the values.
Filters	<ul style="list-style-type: none"> ■ Enter a search string or value in the Cross Column Filter search box and click OK. You can also select the values from the auto-fill list. ■ Click Add to create a filter and in the Add Filter window, select a field name and provide the filter criteria based on which you want to filter the values. Click Add. ■ To modify a filter, select the filter from the table and click the edit option. Enter the new filter criteria and click Set. ■ To delete a filter, select the filter from the table and click the delete option.

6 Click **OK** to save the changes.

7 Click **Clear Filters** to clear the filter criteria you have defined.

8 Click **Save** to save the report with the defined filters and view them with updated values later.

9 To filter for specific information, enter the string in the search field or enter few characters of the string and select the values from the auto-fill list.

vRealize Business for Cloud filters and displays the result based on the search string.

10 Click **Export** to save the values in a Microsoft Excel file.

An .xls file is downloaded with the values that appear on the screen.

Comparing Clouds models in vRealize Business for Cloud

6

vRealize Business for Cloud compares the cost of the virtual machine groups in the private cloud with that of similar groups in the public cloud models, such as Amazon Web Services, Microsoft Azure. vRealize Business for Cloud estimates the costs of running a completely new instance or an existing instance of a virtual machine in the private cloud by using the expenses of your private cloud, and then provides you with a comparison of the cost of the same configuration in Amazon Web Services, and Microsoft Azure public cloud models.

The vRealize Business for Cloud lets you add virtual machine groups or import virtual machine groups from your private cloud for cost comparison. vRealize Business for Cloud calculates the virtual machine cost for the private cloud on the basis of CPU cores, CPU speed, RAM, price plan, up time, operating system for a single virtual machine, and Network Attached Storage (NAS) and Storage Area Networks (SAN) for group storage. vRealize Business for Cloud searches the instance type to get the configuration requirements with the smallest CPU and memory, and have available prices for the requested operating system, region, and policy.

This chapter includes the following topics:

- [Compare Cost of New Virtual Machines Across Cloud Providers](#)
- [Plan Your Procurement](#)
- [Compare Cost of Existing Virtual Machines Across Cloud Providers](#)
- [Assess the Cost for Running Your Cloud on VMware Cloud on AWS](#)
- [Assess the Cost for Running Your Cloud on VMware Cloud on AWS](#)
- [Compare Cost of Virtual Machines Across Data centers](#)
- [Edit, Reset or Delete a Virtual Machine Group](#)
- [View the Data Center Optimization Information](#)

Compare Cost of New Virtual Machines Across Cloud Providers

You can add new virtual machines to your private cloud and compare its cost with the cost on other public cloud providers. vRealize Business for Cloud calculates and displays the cost of

running virtual machines with similar configurations in your private cloud, Amazon Web Services, Microsoft Azure, VMware Cloud on AWS, or any other public cloud providers that is added and imported in vRealize Business for Cloud.

Prerequisites

Ensure that you have added a vCenter Server endpoint into vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **What-If Analysis**.
- 4 Select **Public Cloud**.

By default, vRealize Business for Cloud compares the cost of running the default virtual machine group on three providers such as, Private Cloud, AWS and Azure.
- 5 To verify the cost on a different cloud provider, click **Manage Cloud Providers**.

You see a list of additional providers, such as Amazon Government.
- 6 Drag and drop the provider that you want to select for cost comparison and click **Done**.

You can modify the selection of all three cloud providers.

You can see the cost of running the default virtual machine group on the selected data provider and can compare the cost on each selected providers.
- 7 Perform one of the following steps to add virtual machines for cloud comparison.
 - Click the **Add VM Group** link to add new virtual machines group.
 - Click the **Use current VMs as template** link to select the virtual machines that you want to import from your private cloud.
 - Click the **Import from Blueprint** link to import a blueprint from vRealize Automation.

Note

- This option is available only under **What-If Analysis > Public Cloud**.
 - Ensure that the blueprint has a vSphere component and belongs to the same tenant.
 - Ensure that vRealize Business for Cloud is integrated with vRealize Automation 7.0 or later.
-

- 8 (Optional) Modify the virtual machine settings according to your requirements and click **Save**.

Results

The cost of your infrastructure with additional virtual machines is updated for your private cloud and other public cloud providers. If you select more than one virtual machine, vRealize Business for Cloud groups the virtual machines together according to their CPU, RAM, and operating system configurations, and shows the number of virtual machines in this group.

Note The location you select applies to all group configurations. For the existing group configurations from the earlier vRealize Business for Cloud, the top used location is assigned to all configurations. You cannot assign different location for each group configuration.

Plan Your Procurement

You can add one or more virtual machine group and verify the cost of running these groups on all data centers that exists in vRealize Business for Cloud. Based on the cost information, you can plan on which data center you can deploy your virtual machine group.

Prerequisites

Ensure that you have added a vCenter Server endpoint into vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **What-If Analysis**.
- 4 Select **Private Cloud**.

You see a sample group added by default.
- 5 Click the **Add VM Group** link to add new virtual machines group.
- 6 Modify the virtual machine group configurations according to your requirement.
- 7 Click **Run Scenario**.

Results

You see the configuration summary of the virtual machine group and the cost of running the group on each data centers that exists in vRealize Business for Cloud. If the configuration does not match the data center configuration, you see the message stating that the configuration does not match and also provides details about additional data center configuration required to match your virtual machine requirements.

Compare Cost of Existing Virtual Machines Across Cloud Providers

You can compare the cloud cost by importing virtual machines from your private cloud. vRealize Business for Cloud calculates and displays the cost of running virtual machines with similar configurations in your private cloud, Amazon Web Services, and Microsoft Azure, vCloud Hybrid Service, or any other public cloud provider that you had already added and imported in vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **What-If Analysis**.
- 4 Select **Migration**.

By default, vRealize Business for Cloud compares the cost of running the default virtual machine group on three providers such as, Private Cloud, AWS and Azure.
- 5 To verify the cost on a different cloud provider, click **Manage Cloud Providers**.

You see a list of additional providers, such as Amazon Government.
- 6 Drag and drop the provider that you want to select for cost comparison and click **Done**.

You can modify the selection of all three cloud providers.

You can see the cost of running the default virtual machine group on the selected data provider and can compare the cost on each selected providers.
- 7 Click the **Import VMs** link to browse or search the virtual machine that you want to import.

You can search for virtual machines based on the name, tag, or folder.

The selected virtual machine is added into its own group. The corresponding cost details are updated for your private cloud and other public cloud providers.

Assess the Cost for Running Your Cloud on VMware Cloud on AWS

You can assess the cost of running your applications and VMs from your private cloud on VMware Cloud on AWS. vRealize Business for Cloud calculates and displays the cost of running

your applications and virtual machines on VMware Cloud on AWS with similar configurations in your private cloud.

Note This information is applicable only for the vRealize Business for Cloud 7.3.1 release.

Prerequisites

You must have defined applications or business services from **Business Management > Consumption > Applications** to select the applications or business services.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - `https://vRealize_Automation_host_name/vcac/org/tenant_URL` (for the vRealize Automation integrated setup)
 - `https://vRealize_Business_for_Cloud_host_name/itfm-cloud` (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Expand **What-If Analysis**.

- 4 Select **VMC Assessment**.

By default, **Scenario Name** is populated with current date (Scenario_DD_MMM_YYYY). You can modify this value.

- 5 Select the defined applications or virtual machines (VMs) for which you want to perform a comparative analysis.

From	Select
Select Application	Your application or business service. If you have not defined any application or business service, click Define Applications (Business Services) to define an application.
Select Virtual Machines	The VMs using the following filters: <ul style="list-style-type: none"> ■ Select Datacenter ■ Select Cluster ■ Select Virtual Machines

You can also perform the selection in the following combinations:

- Applications and individual virtual machines.
- Applications or individual virtual machines.

The applications and VMs that you have selected appear below the selection that you have made.

6 Click **Run Scenario**.

You can see the comparative cost based on the utilization of the selected applications or virtual machines for both your private cloud and VMware Cloud on AWS.

Private Cloud	VMware Cloud on AWS
<ul style="list-style-type: none"> ■ Allocated Capacity shows the CPU, memory, and storage allocated for your private cloud. ■ Actual Utilized Capacity shows the CPU, memory, and storage utilized by your applications and VMs. ■ Standard utilization is calculated at 15% CPU and 75% memory use. ■ Lesser standard utilization cost than actual utilization indicate that your private cloud utilization can be improved. 	<ul style="list-style-type: none"> ■ Shows the number of hosts required on VMware Cloud on AWS for the migration. Your first purchase includes a minimum of four hosts. ■ The actual utilized capacity of each host is shown with blue color fill. ■ Total cost is derived by multiplying the effective monthly purchase cost for each host by the number of required hosts. ■ Required CPU and memory are calculated based on utilization. ■ Required storage is calculated based on allocated capacity in your private cloud.

7 (Optional) To modify the reserved capacity, click **Edit Required Capacity** on the VMware Cloud on AWS pane and move the sliders of the following values:

- **Compute**
- **Memory**

The total cost for the migration is adjusted based on the changes you have made. For example, if you select 25% as reserved capacity for memory of a host with 512 GB RAM , then the system considers the host capacity to be 75% (384 GB).

8 (Optional) To edit the hybrid loyalty discount, click **Edit** under **Total Cost Per Month** and enter the discount percentage.

Apply the discount percentage only if you have a valid discount available.

The discount is applied only to the 1-year and 3-year subscription plans. The discount is not applicable for on-demand plan.

9 (Optional) To modify the scenario:

- Click **Edit Scenario** besides the *scenario_name*.
- Modify the value of **Scenario Name**.
- If necessary, modify the selected applications and virtual machines.
- Click **Run Scenario**.

10 (Optional) To export the migration assessment, click **EXPORT TO CSV**.

The assessment is saved as a `vmc_migrations_export_current date.csv` file.

Assess the Cost for Running Your Cloud on VMware Cloud on AWS

You can assess the cost of running your applications and VMs from your private cloud on VMware Cloud on AWS. vRealize Business for Cloud calculates and displays the cost of running your applications and virtual machines on VMware Cloud on AWS with similar configurations in your private cloud.

Note This information is applicable only for the vRealize Business for Cloud 7.3.1 release.

Prerequisites

You must have defined applications or business services from **Business Management > Consumption > Applications** to select the applications or business services.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Expand **What-If Analysis**.

- 4 Select **VMC Assessment**.

By default, **Scenario Name** is populated with current date (Scenario_DD_MMM_YYYY). You can modify this value.

- 5 Select the defined applications or virtual machines (VMs) for which you want to perform a comparative analysis.

From	Select
Select Application	<p>Your application or business service.</p> <p>If you have not defined any application or business service, click Define Applications (Business Services) to define an application.</p>
Select Virtual Machines	<p>The VMs using the following filters:</p> <ul style="list-style-type: none"> ■ Select Datacenter ■ Select Cluster ■ Select Virtual Machines

You can also perform the selection in the following combinations:

- Applications and individual virtual machines.
- Applications or individual virtual machines.

The applications and VMs that you have selected appear below the selection that you have made.

6 Click **Run Scenario.**

You can see the comparative cost based on the utilization of the selected applications or virtual machines for both your private cloud and VMware Cloud on AWS.

Private Cloud	VMware Cloud on AWS
<ul style="list-style-type: none"> ■ Allocated Capacity shows the CPU, memory, and storage allocated for your private cloud. ■ Actual Utilized Capacity shows the CPU, memory, and storage utilized by your applications and VMs. ■ Standard utilization is calculated at 15% CPU and 75% memory use. ■ Lesser standard utilization cost than actual utilization indicate that your private cloud utilization can be improved. 	<ul style="list-style-type: none"> ■ Shows the number of hosts required on VMware Cloud on AWS for the migration. Your first purchase includes a minimum of four hosts. ■ The actual utilized capacity of each host is shown with blue color fill. ■ Total cost is derived by multiplying the effective monthly purchase cost for each host by the number of required hosts. ■ Required CPU and memory are calculated based on utilization. ■ Required storage is calculated based on allocated capacity in your private cloud.

7 (Optional) To modify the reserved capacity, click **Edit Required Capacity on the VMware Cloud on AWS pane and move the sliders of the following values:**

- **Compute**
- **Memory**

The total cost for the migration is adjusted based on the changes you have made. For example, if you select 25% as reserved capacity for memory of a host with 512 GB RAM , then the system considers the host capacity to be 75% (384 GB).

8 (Optional) To edit the hybrid loyalty discount, click **Edit under **Total Cost Per Month** and enter the discount percentage.**

Apply the discount percentage only if you have a valid discount available.

The discount is applied only to the 1-year and 3-year subscription plans. The discount is not applicable for on-demand plan.

9 (Optional) To modify the scenario:

- Click **Edit Scenario** besides the *scenario_name*.
- Modify the value of **Scenario Name**.
- If necessary, modify the selected applications and virtual machines.
- Click **Run Scenario**.

10 (Optional) To export the migration assessment, click **EXPORT TO CSV.**

The assessment is saved as a `vmc_migrations_export_current date.csv` file.

Compare Cost of Virtual Machines Across Data centers

You can compare the cost of data centers by adding new virtual machines or by importing the existing virtual machines and plan on which data center you can deploy your virtual machine. You can create the virtual machine groups and compare cost across any three data centers.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Expand **What-If Analysis**.

- 4 Select **Data Center Comparison**.

By default, vRealize Business for Cloud selects three data centers and displays the cost of running a default virtual machines group on each data centers.

- 5 To verify the cost on a different data center, click **Manage Cloud Providers**.

You see the list of all existing data centers that you can select to compare the cost.

- 6 Drag and drop the data center that you want to select for cost comparison and click **Done**.

You can modify the selection of all three data centers.

You see the cost of running a default virtual machine group on the selected data centers and compare the cost on each of the data centers.

- 7 Perform one of the following steps to add virtual machines for cloud comparison.
 - Click the **Add VM Group** link to add new virtual machines group.
 - Click the **Use current VMs as template** link to select the virtual machines that you want to import from your private cloud.
 - Click the **Import from Blueprint** link to import a blueprint from vRealize Automation.

Note

- This option is available only under **What-If Analysis > Public Cloud**.
 - Ensure that the blueprint has a vSphere component and belongs to the same tenant.
 - Ensure that vRealize Business for Cloud is integrated with vRealize Automation 7.0 or later.
-

- 8 (Optional) Modify the virtual machine settings according to your requirements and click **Save**.

Results

You can see the cost of the virtual machines with the specified configurations on three data centers. If the configuration does not match the data center configuration, you see the message stating that the configuration does not match.

Edit, Reset or Delete a Virtual Machine Group

You can edit, reset, or delete the virtual machine settings that you have added or imported from your private cloud environment. The corresponding cost details are updated in the private cloud and other public clouds that you have added to vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **What-If Analysis**.
- 4 Select **Compare new VMs**, **Compare existing VMs**, **Private Cloud Comparison** or **Procurement Planning**.
- 5 Click the Edit Group icon that exists next to the group name.

You can see the cost details such as Compute cost, Labor cost and Storage cost.
- 6 Edit the virtual machine configurations as required (for example, location, VMs count, CPU cores, CPU speed, RAM and storage information).

You can click **More...** to modify additional settings.
- 7 Click **Save**.

You can see the cost changes based on your updated configurations.
- 8 To restore the default configurations of the virtual machine group, click **Reset** and confirm your action on the warning message.

For **Compare new VMs** and **Private Cloud Comparison** options, the default configuration of the sample virtual machine group will be restored to 2 cores, 1.6GHz CPU, 3.5GB RAM. When you click **Reset** for **Compare existing VMs**, vRealize Business for Cloud deletes all the added virtual machine groups.
- 9 To delete a virtual machine group, click the delete icon next to group name.

You cannot delete the default group that exists on vRealize Business for Cloud.

View the Data Center Optimization Information

vRealize Business for Cloud provides visibility into each of the datacenters to visualize the cost of used and remaining capacity of the data centers. The cost is calculated based on the percentage values collected from vRealize Operations Manager. The cost is classified into compute cost and storage cost.

Prerequisites

Ensure that the vCenter Server is integrated with vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Expand **Planning**, and select **Data Center Optimization**.

You see the total compute cost, storage cost and the labor cost for all data centers and the data centers total monthly cost. You can see the total cost and cost for compute, storage and labor resources of each data center.

vRealize Business for Cloud Reports

7

The Reports page provides links to the vRealize Business for Cloud reports grouped based on infrastructure endpoints that provides information related to your private and public cloud environment.

In addition, you can generate the Hybrid Cloud Assessment Report, Daily Pricing report, Showback Report, Custom reports. You can also schedule a report that you can share with specific recipients on regular intervals.

This chapter includes the following topics:

- [View a Custom Report](#)
- [Edit a Report](#)
- [Schedule a Report](#)
- [Use Public API to Generate vRealize Business for Cloud Reports](#)

View a Custom Report

You can edit a report and save the report as Custom Report for later use.

Prerequisites

You must edit and save a report as a custom report.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)

- 2 Click **Business Management**.

- 3 Under Reports, click **Custom Reports**.

You can see a list of custom reports that you have created.

- 4 Click the report for which you want to view the details.

Edit a Report

You can edit a report to change the view, export, filter or group based on fields.

Prerequisites

Verify that you have a valid report.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Under Reports, select a report or view that you want to edit.
- 4 Click **Edit** and perform the following actions to edit.

Option	Description
Columns	<ul style="list-style-type: none"> ■ Under the View column, select the reports field names to display or hide in the view. ■ Lock or unlock the field to freeze the positions in the view. ■ Sort the field values in ascending or descending order.
Grouping and Charts	<ul style="list-style-type: none"> ■ Select a report field name from Group by column drop-down list to group the report based on the selected column name. ■ Select a report field name from the Function Column drop-down list and an operation such as Max, Min, Average or Sum from the Functions drop-down list to display the group summary. ■ Select the Report Chart option and click on a report type to create a chart based on the values.
Filters	<ul style="list-style-type: none"> ■ Enter a search string or value in the Cross Column Filter search box and click OK. You can also select the values from the auto-fill list. ■ Click Add to create a filter and in the Add Filter window, select a field name and provide the filter criteria based on which you want to filter the values. Click Add. ■ To modify a filter, select the filter from the table and click the edit option. Enter the new filter criteria and click Set. ■ To delete a filter, select the filter from the table and click the delete option.

- 5 Click **OK** to save the changes.
- 6 Click **Clear Filters** to clear the filter criteria you have defined.

- 7 Click **Save** to save the report with the defined filters and view them with updated values later.
- 8 To filter for specific information, enter the string in the search field or enter few characters of the string and select the values from the auto-fill list.

vRealize Business for Cloud filters and displays the result based on the search string.

- 9 Click **Export** to save the values in a Microsoft Excel file.

An .xls file is downloaded with the values that appear on the screen.

Results

You can view these reports in Custom Reports.

Schedule a Report

You can schedule a report to share your latest or up-to-date data at regular intervals (daily, weekly, or monthly) to the specific recipients.

Prerequisites

You must have configured all of your SMTP server properties in vRealize Business for Cloud.

Procedure

- 1 Log in to vRealize Business for Cloud as an administrator.
 - https://vRealize_Automation_host_name/vcac/org/tenant_URL (for the vRealize Automation integrated setup)
 - https://vRealize_Business_for_Cloud_host_name/itfm-cloud (for the vRealize Business for Cloud standalone setup)
- 2 Click **Business Management**.
- 3 Select **Reports** and click **Schedule Report**.
- 4 Schedule a report by providing the details such as report category, name, frequency, date and time and the recipient email IDs.

You see the list of scheduled reports in the table.

Note While scheduling a monthly report, if you select the date as 28, 29, 30 or 31, vRealize Business for Cloud generates the report only on the last day of each month (ignoring the selected date). This is because the number of days in a month varies between 28 to 31.

- 5 Click **Save**.
- 6 To modify the report, select a report and click the edit option.
- 7 To delete the scheduled report, click the delete option.

Configure SMTP Server Properties in vRealize Business for Cloud

vRealize Business for Cloud needs an SMTP server to email the reports to recipients. You can configure your SMTP server properties in vRealize Business for Cloud to email the reports.

Prerequisites

You must have configured an SMTP server in your environment that can be used by vRealize Business for Cloud.

Procedure

- 1 Log in to the Shell prompt by performing an SSH into the IP address of the vRealize Business for Cloud virtual appliance.
- 2 Navigate to the `/usr/ITFM-Cloud/va-tools/bin/` directory.
`cd /usr/ITFM-Cloud/va-tools/bin/.`
- 3 To configure your SMTP server properties, run the `configclient.py SET -k <key> -v <value>` command.

The following table lists the keys that must be configured, including example values.

Key	Description	Example Values
mail.host	SMTP server host name	mail.abc.com
mail.port	SMTP server port number	25
mail.senderEmail	Email address, which need not be a real email address	noreply@abc.com
mail.password	Password of your SMTP host.	password If there is no password set for your SMTP host, you can enter an empty ("") string.
mail.transport.strategy	Transport protocol configuration type	SMTP_PLAIN
mail.proxy.host	Host name of proxy server.	proxy.mail.abc.com If you do not use this key, you must enter an empty ("") string.
mail.proxy.port	Port number of proxy server.	26 If you do not use this key, you must enter an empty ("") string.
mail.proxy.userName	User name of proxy server.	proxyuser@abc.com If you do not use this key, you must enter an empty ("") string.
mail.proxy.password	Password of proxy server.	proxypassword If you do not use this key, you must enter an empty ("") string.

Key	Description	Example Values
mail.dkimPrivateKey.path	Path to the DomainKeys Identified Mail (DKIM) private key.	/usr/key If you do not use this key, you must enter an empty ("") string.
mail.dkimPrivateKey.signingDomain	Signing domain for the DKIM private key.	abc.com If you do not use this key, you must enter an empty ("") string.
mail.dkimPrivateKey.selector	Selector for the DKIM private key.	xyz If you do not use this key, you must enter an empty ("") string.

You must configure all the parameters listed in the table, even if they are not applicable to your environment. You must add "" for keys that you do not use in your environment.

For example, if you do not use a mail proxy host, you must configure the key as following.

```
./configclient.py SET -k mail.proxy.host -v ""
```

- 4 Run the `monit restart vrbc-xenon-services` command.

The `vrbc-xenon-services` restarts.

- 5 For the configuration to take effect, restart the vRealize Business for Cloud virtual appliance.

Use Public API to Generate vRealize Business for Cloud Reports

vRealize Business for Cloud allows your to export a set of default reports. In addition, you can create and export customized reports based on these default reports according to your requirements.

Procedure

- 1 Log in to vRealize Business for Cloud virtual appliance.
- 2 Based on your setup, run one of the following commands to generate the token:

- For vRealize Automation integrated vRealize Business for Cloud setup

```
wget --no-check-certificate -S -q --header "Accept: application/json" --
header='Content-Type: application/json' --post-data
'{"username":"USER_NAME","password":"PASSWORD","tenant":"TENANT"}' -output-document -
vRA_SERVER/identity/api/tokens
```

where

- *USER_NAME* is the user name with administrator permissions to access vRealize Business for Cloud.
- *PASSWORD* is the password for the administrator account.
- *TENANT* is the vRealize Business for Cloud registered tenant.

- `vRA_SERVER` is the IP address or FQDN of the vRealize Automation server.
- For VMware Identity Manager integrated vRealize Business for Cloud setup

```
wget --no-check-certificate -S -q --post-data=string --header 'authorization: Basic
CODE' --output-document - VIDM_SERVER/SAAS/API/1.0/oauth2/token?
grant_type=client_credentials
```

where

 - `CODE` is `Base64(client_id:client_secret)`.
 - `VIDM_SERVER` is the IP address or FQDN of the VMware Identity Manager server.

You see the token in the output. For example,

```
HTTP/1.1 200 OK Server: Apache-Coyote/1.1 Cache-Control: no-cache, no-store
Pragma: no-cache Expires: Wed, 31 Dec 1969 23:59:59 GMT Content-Type:
application/json; charset=UTF-8 Content-Length: 383 Date: Wed, 25 Nov 2015
17:25:11 GMT {"expires":"2015-11-22T01:25:11.000Z","id":
"MTQ00DQ3MjMxMTQzMDo2MjlhMWU4MTdhOTEwNTM5Y2MyNzpwZW5hbnQ6aXRibXN1c2VybmFtZTphZG1p
bkBpdGJtcy5jb21AdnNwaGVyZS5sb2NhbnGV4cGlyYXRpb246MTQ00
DUwMTExMTAwMDpjNTQzNjE3YjM3NDMyZTEwMTI4MzViZDNlYzEyNDA4MGQwMjI5NTVhMTU4OTUxNjM0ZD
IzZjIjhoTk40TQ0ZDM5YmY2Y2UwZjUxNDVjYjRhNGUzZWZjMjNmYjM1
NGRjZDdkYTdlOGJjMzA1MjBhM2ZhZDg0NTdhYmNiMDEwZTA3OA==","tenant":"itbms"}
```

The ID value is the token to authenticate.

```
"MTQ00DQ3MjMxMTQzMDo2MjlhMWU4MTdhOTEwNTM5Y2MyNzpwZW5hbnQ6aXRibXN1c2VybmFtZTphZG1p
bkBpdGJtcy5jb21AdnNwaGVyZS5sb2NhbnGV4cGlyYXRpb246MTQ00
DUwMTExMTAwMDpjNTQzNjE3YjM3NDMyZTEwMTI4MzViZDNlYzEyNDA4MGQwMjI5NTVhMTU4OTUxNjM0ZD
IzZjIjhoTk40TQ0ZDM5YmY2Y2UwZjUxNDVjYjRhNGUzZWZjMjNmYjM1
NGRjZDdkYTdlOGJjMzA1MjBhM2ZhZDg0NTdhYmNiMDEwZTA3OA=="
```

Note The token has an expiry date.

```
"2015-11-22T01:25:11.000Z"
```

3 Run the command to get a custom report or a default report.

- For a custom report, run the following command:

```
wget --no-check-certificate -S -q --header "Accept: application/json" --
header='Content-Type: application/json' --header='Authorization: Bearer <TOKEN>' -O -
https://VRB_SERVER/itfm-cloud/rest/reports-api/export-csv?name=REPORT_NAME, where
```

 - `VRB_SERVER` is the IP address or FQDN of the vRealize Business for Cloud server.
 - `REPORT_NAME` is the name you provide for a custom report.
- For a default report, you can run the command to export the complete data or to export data of a specific period.
 - To export the complete data, run the following command:

`wget --no-check-certificate -S -q --header "Accept: text/plain" --header='Content-Type: text/plain' --header "accept-encoding: gzip" --header='Authorization: Bearer TOKEN' -O - https://VRB_SERVER/itfm-cloud/rest/reports/export-filters/DEFAULT_REPORT_NAME>>out.xls`, where *DEFAULT_REPORT_NAME*, is the standard report names mentioned in the table.

Report Type	Standard Report Name
vCenter Server reports	<ul style="list-style-type: none"> ■ servers ■ datastores ■ vsan-datastores ■ vms ■ clusters
vCloud Director reports	<ul style="list-style-type: none"> ■ vcd-orgs ■ vcd-org-vdcs ■ vcd-vms ■ vcd-vapps
vRealize Automation virtual machine reports	<ul style="list-style-type: none"> ■ vcac-vms
Storage reports	<ul style="list-style-type: none"> ■ storage-arrays ■ storage-luns
AWS reports	<ul style="list-style-type: none"> ■ aws-resources ■ aws-vms
Showback reports	<ul style="list-style-type: none"> ■ showback-vms ■ showback-add-svcs
Budget reports	rest/budget/export

- To export a report for a specific period, run the following command.

`wget --no-check-certificate -S -q --header "Accept: text/plain" --header='Content-Type: text/plain' --header "accept-encoding: gzip" --header='Authorization: Bearer <TOKEN>' -O - 'https://VRB_SERVER/itfm-cloud/rest/reports/export-filters/DEFAULT_REPORT_NAME?startmonth=yyyy-mm&&endmonth=yyyy-mm'>>out.xls`, where *DEFAULT_REPORT_NAME* is the standard report names mentioned in the table.

- If you specify **startmonth** and **endmonth**, vRealize Business for Cloud generates a report from the first day of the month you specify in **startmonth** till the month that you specify in **endmonth** (till the last day of previous month.)

For example, if you enter **startmonth=2016-02&&endmonth=2016-06**, you see the report is exported from first day of February till the last day of May.

- If you specify **startmonth** only, vRealize Business for Cloud generates report from the first day of the month you specified till the current month.

For example, if you specify **startmonth=2016-02**, you see the report is exported from the first day of February till the current month.

- If you specify `endmonth` only, vRealize Business for Cloud generates report from the month the data is available till the month that you specified in the `endmonth` (till the last day of the previous month).

For example, if you specify `endmonth=2016-10`, you see the report is exported till the last day of September.

Note You can specify the period for the vCenter Server virtual machine reports (**vms**), vRealize Automation virtual machine reports (**vcac-vms**), AWS reports (**aws-vms**, **aws-resources**), and Showback reports (**showback-vms**, **showback-add-svcs**). You cannot generate vCloud Director and budget reports for a specific period.

You see the reports are exported in the CSV or XLS format.