An introduction to using CloudForms Management Engine's main features
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Abstract
This guide provides instructions for using the CloudForms Management Engine features relevant to non-administrative users. It establishes basic system and operational concepts through task based scenarios and examples.
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Chapter 1. Introduction to Red Hat CloudForms

CloudForms Management Engine delivers the insight, control, and automation enterprises need to address the challenges of managing virtual environments. This technology enables enterprises with existing virtual infrastructures to improve visibility and control, and those starting virtualization deployments to build and operate a well-managed virtual infrastructure.

Red Hat CloudForms 3.1 is comprised of a single component, the CloudForms Management Engine. It has the following feature sets:

- **Insight**: Discovery, Monitoring, Utilization, Performance, Reporting, Analytics, Chargeback, and Trending.
- **Control**: Security, Compliance, Alerting, and Policy-Based Resource, and Configuration Enforcement.
- **Automate**: IT Process, Task and Event, Provisioning, and Workload Management and Orchestration.
- **Integrate**: Systems Management, Tools and Processes, Event Consoles, Configuration Management Database (CMDB), Role-based Administration (RBA), and Web Services.

1.1. Architecture

The diagram below describes the capabilities of CloudForms Management Engine. Its features are designed to work together to provide robust management and maintenance of your virtual infrastructure.

![Figure 1.1. Features](image)

The architecture comprises the following components:
The CloudForms Management Engine Appliance (Appliance) which is supplied as a secure, high-performance, preconfigured virtual machine. It provides support for HTTPS communications.

The CloudForms Management Engine Server (Server) resides on the Appliance. It is the software layer that communicates between the SmartProxy and the Virtual Management Database. It includes support for HTTPS communications.

The Virtual Management Database (VMDB) resides either on the Appliance or another computer accessible to the Appliance. It is the definitive source of intelligence collected about your Virtual Infrastructure. It also holds status information regarding Appliance tasks.

The CloudForms Management Engine Console (Console) is the Web interface used to view and control the Server and Appliance. It is consumed through Web 2.0 mash-ups and web services (WS Management) interfaces.

The SmartProxy can reside on the Appliance or on an ESX Server. If not embedded in the Server, the SmartProxy can be deployed from the Appliance. Each storage location must have a SmartProxy with visibility to it. The SmartProxy acts on behalf of the Appliance communicating with it over HTTPS on standard port 443.

1.2. Terminology

The following terms are used throughout this document. Review them before proceeding.

Account Role

A designation assigned to a user allowing or restricting a user to parts and functions of the CloudForms Management Engine console.

Action

An execution that is performed after a condition is evaluated.

Alert

CloudForms Management Engine alerts notify administrators and monitoring systems of critical configuration changes and threshold limits in the virtual environment. The notification can take the form of either an email or an SNMP trap.

Analysis Profile

A customized scan of hosts, virtual machines, or instances. You can collect information from categories, files, event logs, and registry entries.

Cloud

A pool of on-demand and highly available computing resources. The usage of these resources are scaled depending on the user requirements and metered for cost.

CloudForms Management Engine Appliance

A virtual machine on which the virtual management database (VMDB) and CloudForms Management Engine server reside.

CloudForms Management Engine Console

A web-based interface into the CloudForms Management Engine Appliance.
CloudForms Management Engine Role

A designation assigned to a CloudForms Management Engine server that defines what a CloudForms Management Engine server can do.

CloudForms Management Engine Server

The application that runs on the CloudForms Management Engine Appliance and communicates with the SmartProxy and the VMDB.

Cluster

Hosts that are grouped together to provide high availability and load balancing.

Condition

A test of criteria triggered by an event.

Discovery

Process run by the CloudForms Management Engine server which finds virtual machine and cloud providers.

Drift

The comparison of a virtual machine, instance, host, cluster to itself at different points in time.

Event

A trigger to check a condition.

Event Monitor

Software on the CloudForms Management Engine Appliance which monitors external providers for events and sends them to the CloudForms Management Engine server.

Host

A computer on which virtual machine monitor software is loaded.

Instance/Cloud Instance

A on-demand virtual machine based upon a predefined image and uses a scalable set of hardware resources such as CPU, memory, networking interfaces.

Managed/Registered VM

A virtual machine that is connected to a host and exists in the VMDB. Also, a template that is connected to a provider and exists in the VMDB. Note that templates cannot be connected to a host.

Managed/Unregistered VM

A virtual machine or template that resides on a repository or is no longer connected to a provider or host and exists in the VMDB. A virtual machine that was previously considered registered may become unregistered if the virtual machine was removed from provider inventory.

Provider
A computer on which software is loaded which manages multiple virtual machines that reside on multiple hosts.

**Policy**

A combination of an event, a condition, and an action used to manage a virtual machine.

**Policy Profile**

A set of policies.

**Refresh**

A process run by the CloudForms Management Engine server which checks for relationships of the provider or host to other resources, such as storage locations, repositories, virtual machines, or instances. It also checks the power states of those resources.

**Regions**

Regions are used to create a central database for reporting and charting. Regions are used primarily to consolidate multiple VMDBs into one master VMDB for reporting.

**Resource**

A host, provider, instance, virtual machine, repository, or datastore.

**Resource Pool**

A group of virtual machines across which CPU and memory resources are allocated.

**Repository**

A place on a datastore resource which contains virtual machines.

**SmartProxy**

The SmartProxy is a software agent that acts on behalf of the CloudForms Management Engine Appliance to perform actions on hosts, providers, storage and virtual machines.

The SmartProxy can be configured to reside on the CloudForms Management Engine Appliance or on an ESX server version. The SmartProxy can be deployed from the CloudForms Management Engine Appliance, and provides visibility to the VMFS storage. Each storage location must have a SmartProxy with visibility to it. The SmartProxy acts on behalf of the CloudForms Management Engine Appliance. If the SmartProxy is not embedded in the CloudForms Management Engine server, it communicates with the CloudForms Management Engine Appliance over HTTPS on standard port 443.

**SmartState Analysis**

Process run by the SmartProxy which collects the details of a virtual machine or instance. Such details include accounts, drivers, network information, hardware, and security patches. This process is also run by the CloudForms Management Engine server on hosts and clusters. The data is stored in the VMDB.

**SmartTags**

Descriptors that allow you to create a customized, searchable index for the resources in your clouds and infrastructure.

**Storage Location**
A device, such as a VMware datastore, where digital information resides that is connected to a resource.

**Tags**

Descriptive terms defined by a CloudForms Management Engine user or the system used to categorize a resource.

**Template**

A template is a copy of a preconfigured virtual machine, designed to capture installed software and software configurations, as well as the hardware configuration, of the original virtual machine.

**Unmanaged Virtual Machine**

Files discovered on a datastore that do not have a virtual machine associated with them in the VMDB. These files may be registered to a provider that the CloudForms Management Engine server does not have configuration information on. Possible causes may be that the provider has not been discovered or that the provider has been discovered, but no security credentials have been provided.

**Virtual Machine**

A software implementation of a system that functions similar to a physical machine. Virtual machines utilize the hardware infrastructure of a physical host, or a set of physical hosts, to provide a scalable and on-demand method of system provisioning.

**Virtual Management Database (VMDB)**

Database used by the CloudForms Management Engine Appliance to store information about your resources, users, and anything else required to manage your virtual enterprise.

**Virtual Thumbnail**

An icon divided into smaller areas that summarize the properties of a resource.

**Zones**

CloudForms Management Engine Infrastructure can be organized into zones to configure failover and to isolate traffic. Zones can be created based on your environment. Zones can be based on geographic location, network location, or function. When first started, new servers are put into the default zone.

### 1.3. Requirements

To use CloudForms Management Engine, the following requirements must be met:

- One of the following web browsers:
  - Mozilla Firefox for versions supported under Mozilla's Extended Support Release (ESR) [1]
  - Internet Explorer 8 or higher
  - Google Chrome for Business
- A monitor with minimum resolution of 1280x1024.
Adobe Flash Player 9 or above. At the time of publication, you can access it at [http://www.adobe.com/products/flashplayer/](http://www.adobe.com/products/flashplayer/).

The CloudForms Management Engine Appliance must already be installed and activated in your enterprise environment.

The SmartProxy must have visibility to the virtual machines and cloud instances that you want to control.

The resources that you want to control must have a SmartProxy associated with them.

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**Important**

Due to browser limitations, Red Hat supports logging in to only one tab for each multi-tabbed browser. Console settings are saved for the active tab only. For the same reason, CloudForms Management Engine does not guarantee that the browser’s Back button will produce the desired results. Red Hat recommends using the breadcrumbs provided in the Console.

---

### 1.4. Getting Help and Giving Feedback

If you experience difficulty with a procedure described in this documentation, visit the Red Hat Customer Portal at [http://access.redhat.com](http://access.redhat.com). Through the customer portal, you can:

- search or browse through a knowledgebase of technical support articles about Red Hat products
- submit a support case to Red Hat Global Support Services (GSS)
- access other product documentation

Red Hat also hosts a large number of electronic mailing lists for discussion of Red Hat software and technology. You can find a list of publicly available mailing lists at [https://www.redhat.com/mailman/listinfo](https://www.redhat.com/mailman/listinfo). Click on the name of any mailing list to subscribe to that list or to access the list archives.

**Documentation Feedback**

If you find a typographical error in this manual, or if you have thought of a way to make this manual better, please submit a report to GSS through the customer portal.

When submitting a report, be sure to mention the manual’s identifier: *User Guide*

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

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Chapter 2. Navigating the CloudForms Management Engine Console

The CloudForms Management Engine Console is a web interface used to manage your virtual environment. It is highly customizable and allows easy access to your management tasks.

**Note**

While the appliance is starting, you cannot log in to the console. The console retries the connection every 10 seconds until all workers and processes have started.

### 2.1. Console Requirements

To access the CloudForms Management Engine Console, you must have one of the following web browsers:

- Mozilla Firefox for versions supported under Mozilla’s Extended Support Release (ESR) [2]
- Internet Explorer 8 or higher

You will need a monitor with minimum resolution of 1280x1024 and Adobe Flash Player 9 or above. At the time of this writing, you can access it at [http://www.adobe.com/products/flashplayer/](http://www.adobe.com/products/flashplayer/)

**Note**

Due to browser limitations, Red Hat supports logging in to only one tab for each multi-tabbed browser. Console settings are saved for the active tab only. For the same reason, CloudForms Management Engine does not guarantee that the browser’s Back button will produce the desired results. CloudForms Management Engine recommends using the breadcrumbs provided in the console.

### 2.2. Accessing the Console

Log in to the CloudForms Management Engine Console using the following procedure.

**Procedure 2.1. To Access the CloudForms Management Engine Console**

1. From a computer with network access to the CloudForms Management Engine Appliance, open your Web browser.
2. Go to [https://<CloudForms Management Engine Appliance IP>](https://<CloudForms Management Engine Appliance IP>).
3. Read and accept any security certificate dialogs.
4. Log in to the Console with a user name of `admin` and the default password of `smartvm`.

**Result:**

The CloudForms Management Engine Console now displays.
Important

Change your default password immediately after logging in for the first time.

2.3. Navigating the Console

![CloudForms Management Engine's Main Navigation Menu](image)

**Figure 2.1. CloudForms Management Engine's Main Navigation Menu**

1. Primary Navigation Bar
2. Secondary Navigation Bar

Click an item on the Primary Navigation Bar to go to that category. Then, you can click on a secondary item to refine the type of function.

The Console consists of the following items on the Primary Navigation Bar:

- **Cloud Intelligence** uses Really Simple Syndication (RSS) feeds and charts to display information on your virtual enterprise devices. It also includes reports both out of the box and custom.
- **Services** provides a view of all of your discovered Catalogs of services and Workloads (Virtual Machines and Cloud Instances combined).
- **Clouds** enables you to see your Cloud Providers, Availability Zones, Hardware Flavors, Security Groups and Cloud Instances.
- **Infrastructure** enables you to see your Virtualization Providers, Clusters, Hosts, Virtual Machines, Resource Pools, Datastores, and Repositories.
- **Control** manages your policies through the Explorer, Simulation, Import/Export and the Log tabs. It further defines your policies by using Events, Conditions, and Actions.
- **Automate** provides models for process integration and adaptive automation for events and activities.
- **Optimize** enables you to identify bottlenecks and plan placement of Virtual Machines.

In addition to the items on the navigation bar, you can also use **Configure** to manage the user interface, create tags, set server, database and SmartProxy options, administer users, and update the software and view the documentation.

2.4. Viewing Infrastructure and Cloud Information

2.4.1. Providers

A provider is a server with software to manage multiple virtual machines that reside on multiple hosts. **Infrastructure → Providers** displays the providers in your environment.
The web interface uses virtual thumbnails to represent providers. Each thumbnail contains four quadrants by default, which display basic information about each provider.

1. Number of hosts
2. Management system software
3. Currently unused
4. Authentication status

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>Validated: Valid authentication credentials have been added.</td>
</tr>
<tr>
<td>!</td>
<td>Invalid: Authentication credentials are invalid.</td>
</tr>
<tr>
<td>?</td>
<td>Unknown: Authentication status is unknown or no credentials have been entered.</td>
</tr>
</tbody>
</table>

### 2.4.2. Clusters

Clusters provide high availability and load balancing for a group of hosts. The Clusters page under Infrastructure displays the clusters discovered in your enterprise environment.

**Note**

Any filter applied will be in effect here.

Use the Clusters Taskbar to manage the analysis and tagging of your clusters. These buttons manage multiple clusters at one time. To manage one cluster, click on that cluster in the main area of the screen.

### 2.4.3. Hosts
The **Hosts** page under **Infrastructure** displays the hosts discovered in your enterprise environment.

**Note**

Any applied filters will be in effect here.

![Hosts Page Screenshot](image)

After adding or sorting your hosts, click on one to examine it more closely and see its virtual machines, SmartProxy settings, and properties.

1. Top left quadrant: Number of virtual machines on this host
2. Bottom left quadrant: Virtual machine software
3. Top right quadrant: Power state of host
4. Bottom right quadrant: Authentication status

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Validated Icon" /></td>
<td>Validated: Valid authentication credentials have been added.</td>
</tr>
<tr>
<td><img src="image" alt="Invalid Icon" /></td>
<td>Invalid: Authentication credentials are invalid</td>
</tr>
<tr>
<td><img src="image" alt="Unknown Icon" /></td>
<td>Unknown: Authentication status is unknown or no credentials have been entered.</td>
</tr>
</tbody>
</table>

### 2.4.4. Virtual Machines

The heterogeneous virtual machine container and guest support combined with the ability to analyze information inside the virtual machine - such as disk space, patch level or installed applications - provides in-depth information across the virtual environment. This rich set of information enables CloudForms Management Engine users to improve problem resolution times and effectively manage virtual machines.
The **Virtual Machines** pages display all virtual machines that were discovered by your Server. Note that if you have applied a filter to a user, it will be in effect here. The **Virtual Machines** taskbar is a menu driven set of buttons that provide access to functions related to virtual machines.

1. History button
2. Refresh screen button
3. Taskbar
4. Name search bar/Advanced Search button
5. View buttons
6. Download buttons
7. Navigation bar
8. Sort dropdown
9. Main area in Grid View
10. Provider/Filter Navigation

The console uses **Virtual Thumbnails** to describe virtual machines and templates. Each thumbnail contains four quadrants by default. This allows you to glance at a virtual machine for a quick view of its contents.

1. Top left quadrant: Operating system of the Virtual Machine
2. Bottom left quadrant: Virtual Machine Hosts software
3. Top right quadrant: Power state of Virtual Machine or Status icon
4. Bottom right quadrant: Number of Snapshots for this Virtual Machine
<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="T" /></td>
<td>Template: Virtual Template</td>
</tr>
<tr>
<td><img src="image" alt="R" /></td>
<td>Retired: Virtual Machine has been retired</td>
</tr>
<tr>
<td><img src="image" alt="A" /></td>
<td>Archived: Virtual Machine has no Host or Datastore associated with it.</td>
</tr>
<tr>
<td><img src="image" alt="O" /></td>
<td>Orphaned: Virtual Machine has no Host but does have a Datastore associated with it.</td>
</tr>
<tr>
<td><img src="image" alt="D" /></td>
<td>Disconnected: Virtual Machine is disconnected.</td>
</tr>
<tr>
<td><img src="image" alt="O" /></td>
<td>On: Virtual Machine is powered on.</td>
</tr>
<tr>
<td><img src="image" alt="O" /></td>
<td>Off: Virtual Machine is powered off.</td>
</tr>
<tr>
<td><img src="image" alt="O" /></td>
<td>Suspended: Virtual Machine has been suspended.</td>
</tr>
</tbody>
</table>

The **Virtual Machines** page has three accordions organizing your virtual machines and templates in different ways. All of these accordions share a set of common controls:

- Use **VMs and Templates** to view your virtual machines and templates organized by Provider. In addition, you can see archived and orphaned items here.
- Use the **VMs** to view, apply filters, and collect information about all of your virtual machines.
- Use **Templates** to view, apply filters, and collect information about all of your templates.

Through the console, you are able to view your virtual machines in multiple ways. For your virtual machines, you can:

- Filter virtual machines
- Change views
- Sort
- Create a report
- Search by MyTags
- Search by collected data

### 2.4.5. Datastores

A storage location is considered a device where digital information resides and is connected to a resource. CloudForms Management Engine detects, analyzes, and collects capacity and utilization data for both VMFS and NFS datastores. Datastores connected to a provider are automatically created on discovery. On creation of a repository, a datastore is automatically created.
After detecting datastores, you might want to examine them more closely to see virtual machines, hosts, and available space.

1. Top left quadrant: File system type
2. Bottom left quadrant: Number of hosts
3. Top right quadrant: Number of virtual machines
4. Bottom right quadrant: Available space

2.4.6. Instances

The Instance container combined with the ability to analyze information inside each instance provides in-depth information across the cloud environment. This rich set of information enables CloudForms Management Engine users to improve problem resolution times and effectively manage instances in their cloud environment.

The Instances pages display all instances the server discovered from your cloud providers. The Instances taskbar is a menu driven set of buttons that provide access to functions related to instances.
Console uses **Virtual Thumbnails** to describe instances and images. Each thumbnail contains four quadrants by default. This allows you to glance at an instance for a quick view of its contents.

1. Top left quadrant: Operating system of the Instance
2. Bottom left quadrant: Instance Cloud Provider
3. Top right quadrant: Power state of Instance or Status icon
4. Bottom right quadrant: Number of Snapshots for this Instance
<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Template" /></td>
<td>Template: Cloud Image</td>
</tr>
<tr>
<td><img src="image" alt="Retired" /></td>
<td>Retired: Instance has been retired</td>
</tr>
<tr>
<td><img src="image" alt="Archived" /></td>
<td>Archived: Instance has no provider or availability zone associated with it.</td>
</tr>
<tr>
<td><img src="image" alt="Orphaned" /></td>
<td>Orphaned: Instance has no availability zone but does have a provider associated with it.</td>
</tr>
<tr>
<td><img src="image" alt="Disconnected" /></td>
<td>Disconnected: Instance is disconnected.</td>
</tr>
<tr>
<td><img src="image" alt="On" /></td>
<td>On: Instance is powered on.</td>
</tr>
<tr>
<td><img src="image" alt="Off" /></td>
<td>Off: Instance is powered off.</td>
</tr>
<tr>
<td><img src="image" alt="Suspended" /></td>
<td>Suspended: Instance has been suspended.</td>
</tr>
</tbody>
</table>

The **Instances** page has four accordions organizing your instances and images in different ways. All of these accordions share a set of common controls:

- Use **Instances by Provider** and **Images by Provider** to view your instances and images organized by Provider. In addition, you can see archived and orphaned items here.
- Use the **Instances** to view, apply filters, and collect information about all of your instances.
- Use **Images** to view, apply filters, and collect information about all of your images.

Through the console, you are able to view your instances in multiple ways. For your instances, you can:

- Filter instances
- Change views
- Sort
- Create a report
- Search by Tags
- Search by collected data

Chapter 3. Virtual Machines

When a virtual machine or cloud instance is provisioned, it goes through multiple phases. First, the request must be made. The request includes ownership information, tags, virtual hardware requirements, the operating system, and any customization of the request. Second, the request must go through an approval phase, either automatic or manual. Finally, the request is executed. This part of provisioning consists of pre-processing and post-processing. Pre-processing acquires IP addresses for the user, creates CMDB instances, and creates the virtual machine or instance based on information in the request. Post-processing activates the CMDB instance and emails the user. The steps for provisioning may be modified at any time using CloudForms Management Engine.

3.1. Provisioning a Virtual Machine from a Template

You can provision virtual machines through various methods. One method is to provision a virtual machine directly from a template stored on a provider.

Procedure 3.1. To Provision a Virtual Machine from a Template

1. Navigate to Infrastructure → Virtual Machines.
2. Click (Lifecycle), and then + (Provision VMs).
3. Select a template from the list presented.
4. Click Continue.
5. On the Request tab, enter information about this provisioning request.
In **Request Information**, type in at least a **First Name** and **Last Name** and an email address. This email is used to send the requester status emails during the provisioning process for items such as auto-approval, quota, provision complete, retirement, request pending approval, and request denied. The other information is optional. If the CloudForms Management Engine server is configured to use LDAP, you can use the **Look Up** button to populate the other fields based on the email address.

**Note**

Parameters with a * next to the label are required to submit the provisioning request. To change the required parameters, see [Section 3.2, “Customizing Provisioning Dialogs”](#).

6. Click the **Purpose** tab to select the appropriate tags for the provisioned virtual machines.

7. Click the **Catalog** tab to select the template to provision from. This tab is context sensitive based on provider.

8. For templates on VMware providers:
a. For **Provision Type**, select **NetApp**, **VMware**, or **PXE**.

   i. If **VMware** is selected, select **Linked Clone** to create a linked clone to the virtual machine instead of a full clone. Since a snapshot is required to create a linked clone, this box is only enabled if a snapshot is present. Select the snapshot you want to use for the linked clone.

   ii. If **PXE** is selected, select a PXE **Server** and **Image** to use for provisioning

b. Under **Count**, select the number of virtual machines to create in this request.

c. Use **Naming** to specify a virtual machine name and virtual machine description. When provisioning multiple virtual machines, a number will be appended to the virtual machine name.

9. For templates on Red Hat providers:

   a. Select the **Name** of a template to use.

   b. For **Provision Type**, select either **ISO**, **PXE**, or **Native Clone**. You must select **Native Clone** in order to use a Cloud-Init template.

      i. If **Native Clone** is selected, select **Linked Clone** to create a linked clone to the virtual machine instead of a full clone. This is equivalent to **Thin Template Provisioning** in Red Hat Enterprise Virtualization. Since a snapshot is required to create a linked clone, this box is only enabled if a snapshot is present. Select the snapshot to use for the linked clone.

      ii. If **ISO** is selected, select an ISO **Image** to use for provisioning

      iii. If **PXE** is selected, select a PXE **Server** and **Image** to use for provisioning

c. Under **Count**, select the number of virtual machines you want to create in this request.

d. Use **Naming** to specify a **VM Name** and **VM Description**. When provisioning multiple virtual machines, a number will be appended to the **VM Name**.

10. Click the **Environment** tab to decide where you want the new virtual machines to reside.
a. If provisioning from a template on VMware, you can either let CloudForms Management Engine decide for you by checking **Choose Automatically**, or select a specific cluster, resource pool, folder, host, and datastore.

b. If provisioning from a template on Red Hat, you can either let CloudForms Management Engine decide for you by checking **Choose Automatically**, or select a datacenter, cluster, host and datastore.

11. Click the **Hardware** tab to set hardware options.

<table>
<thead>
<tr>
<th>VM Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Sockets</strong></td>
</tr>
<tr>
<td><strong>Cores per Socket</strong></td>
</tr>
<tr>
<td><strong>Memory (MB)</strong></td>
</tr>
<tr>
<td><strong>Disk Format</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VM Limits</th>
</tr>
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<tbody>
<tr>
<td><strong>CPU (MHz)</strong></td>
</tr>
<tr>
<td><strong>Memory (MB)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VM Reservations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU (MHz)</strong></td>
</tr>
<tr>
<td><strong>Memory (MB)</strong></td>
</tr>
</tbody>
</table>

a. In **VM Hardware**, set the number of CPUs, amount of memory, and disk format: thin, pre-allocated/thick or same as the provisioning template (default).

b. For VMware provisioning, set the **VM Limits** of CPU and memory the virtual machine can use.

c. For VMware provisioning, set the **VM Reservation** amount of CPU and memory.

12. Click **Network** to set the vLan adapter. Additional networking settings that are internal to the operating system appear on the **Customize** tab.

<table>
<thead>
<tr>
<th>Network Adapter Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>vLan</strong></td>
</tr>
</tbody>
</table>

a. In **Network Adapter Information**, select the **vLan**.
13. Click **Customize** to customize the operating system of the new virtual machine. These options vary based on the operating system of the template.

![Customize Option]

14. For Windows provisioning:

   a. To use a customer specification from the Provider, click **Specification**. To select an appropriate template, choose from the list in the custom specification area. The values that are honored by CloudForms Management Engine display.

   ![Custom Specification]

   **Note**

   Any values in the specification that do not show in the CloudForms Management Engine console's request dialogs are not used by CloudForms Management Engine. For example, for Windows operating systems, if you have any run once values in the specification, they are not used in creating the new virtual machines. Currently, for a Windows operating system, CloudForms Management Engine honors the unattended GUI, identification, workgroup information, user data, windows options, and server license. If more than one network card is specified, only the first is used.

   ![Override Specification Values]

   To modify the specification, select **Override Specification Values**.

   b. Select **Sysprep Answer File**, to upload a Sysprep file or use one that exists for a custom specification on the Provider where the template resides. To upload a file, click **Browse** to find the file, and then upload. To use an answer file in **Customization Specification**, click on the item. The answer file will automatically upload for viewing. You cannot make modifications to it.

15. For Linux provisioning:

   a. Under **Credentials**, enter a **Root Password** for the **root** user to access the instance.
b. Enter a **IP Address Information** for the instance. Leave as **DHCP** for automatic IP assignment from the provider.

c. Enter any **DNS** information for the instance if necessary.

d. Select **Customize Template** for additional instance configuration. Select from the Kickstart or Cloud-Init customization templates stored on your appliance.

16. Click the **Schedule** tab to select when provisioning begins.

   a. In **Schedule Info**, select when to start provisioning. If you select **Schedule**, you will be prompted to enter a date and time. Select **Stateless** if you do not want the files deleted after the provision completes. A stateless provision does not write to the disk so it requires the PXE files on the next boot.

   b. In **Lifespan**, select to power on the virtual machines after they are created, and to set a retirement date. If you select a retirement period, you will be prompted for when you want a retirement warning.

Provision Virtual Machines

<table>
<thead>
<tr>
<th>Request</th>
<th>Purpose</th>
<th>Catalog</th>
<th>Environment</th>
<th>Hardware</th>
<th>Network</th>
<th>Schedule</th>
</tr>
</thead>
</table>

**Schedule Info**

<table>
<thead>
<tr>
<th>When to Provision</th>
<th>Stateless</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Schedule □</td>
<td>□ Immediately on Approval</td>
</tr>
</tbody>
</table>

**Lifespan**

<table>
<thead>
<tr>
<th>Power on virtual machines after creation</th>
<th>Time until Retirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪</td>
<td>Indefinite</td>
</tr>
</tbody>
</table>

17. Click **Submit**.

**Result:**

The provisioning request is sent for approval. For the provisioning to begin, a user with the administrator, approver, or super administrator account role must approve the request. The administrator and super administrator roles can also edit, delete, and deny the requests. You will be able to see all provisioning requests where you are either the requester or the approver.

After submission, the appliance assigns each provision request a **Request ID**. If an error occurs during the approval or provisioning process, use this ID to locate the request in the appliance logs. The Request ID consists of the region associated with the request followed by the request number. As regions define a range of one trillion database IDs, this number can be several digits long.

**Example 3.1. Request ID Format**
3.2. Customizing Provisioning Dialogs

The default set of provisioning dialogs shows all possible options. However, CloudForms Management Engine also provides the ability to customize which tabs and fields are shown. You can decide what fields are required to submit the provisioning request or set default values.

For each type of provisioning, there is a dialog that can be created to adjust what options are presented. While samples are provided containing all possible fields for provisioning, you can remove what fields are shown. However, you cannot add fields or tabs.

Edit the dialogs to:

1. Hide or show provisioning tabs.
2. Hide or show fields. If you hide an attribute, the default will be used, unless you specify otherwise.
3. Set default values for a field.
4. Specify if a field is required to submit the request.
5. Create custom dialogs for specific users.

3.3. Adding a Provision Dialog for All Users

Procedure 3.2. To Add a Provision Dialog for All Users

1. Navigate to Automate → Customization.
2. Click the Provisioning Dialogs accordion.
3. Click the type of dialog you want to create: Host Provision, VM Provision or VM Migrate.
4. Select one of the default dialogs.
5. Click (Configuration), and then (Copy this Dialog).
6. Type a new Name and Description for the dialog.
7. In the Content field,
   - To remove a tab from display, change its display value to ignore. By choosing ignore, you not only hide the tab, but also skip any fields on that tab that were required. To show the tab, change the display value to show.
   - To hide a field, change its display value from edit to hide. To display fields of most data types, use edit. To display a button, use show. To set a default value for a field, use :default => defaultvalue to the list of parameters for the field. Set the required parameter to either true or false based on your needs. Note that if you set required parameter to true, the field must have a value for the provision request to be submitted.
8. Click Add.
If you are using Provisioning Profiles, you can specify a specific file that holds the customizations. To do this, you must create an instance mapping to this file in the CloudForms Management Engine Applications/provisioning/profile/VM provisioning by group class. By default, if you are using provisioning profiles and the group does not have a defined instance, the appropriate default dialog file will be used based on the type of provisioning selected.

### 3.4. Controlling Virtual Machines

You can start, stop, and suspend a virtual machine through the CloudForms Management Engine console. To do this, the following requirements must be met:

- The virtual machine must be discovered.
- The virtual machine must be registered to a host and have a SmartProxy associated with it.
- The virtual machine cannot be in Infrastructure → Repositories.

#### 3.4.1. Controlling the Power State of Virtual Machines

Start, stop, and suspend any number of virtual machines through the CloudForms Management Engine console using the following procedure.

**Procedure 3.3. To Control the Power State of Virtual Machines**

1. Navigate to Infrastructure → Virtual Machines.
2. Check the virtual machines that you want to change the power state for.
3. Click (Power Operations). Note that the only operations that will be available are the ones that apply to the virtual machines' current power state.
4. Click the button for the power operation you want.
   a. Click (Power On) to start the selected virtual machines.
   b. Click (Power Off) to stop the selected virtual machines.
   c. Click (Suspend) to suspend the selected virtual machines.
   d. Click (Reset) to stop the selected virtual machines.
   e. Click (Shutdown Guest) to stop the guest operating system.
   f. Click (Restart Guest) to restart the guest operating system.
5. Click OK to confirm.
Chapter 4. Reports

Click the Reports accordion under Cloud Intelligence → Reports to see a list of reports available. These reports have been constructed to help you view the most commonly requested and significant data. From here, you can also create reports if you have appropriate access. CloudForms Management Engine provides a large group of default reports organized into categories. Each category has its own set of subfolders.

- Use **Configuration Management** to see hardware, application, network, service, user account, operating system, and snapshot information for all of your items.
- Use **Migration Readiness** to see information specifically related to items required to migrate a virtual machine.
- Use **Operations** to look at free space on registered and unregistered virtual machines, to see power states for virtual machines, and to see which offline virtual machines have snapshots or have never been analyzed. You are also provided with reports specifically related to the operation of CloudForms Management Engine, such as user ids and snapshots taken by CloudForms Management Engine.
- Use **VM Sprawl** to check on usage information and disk waste.
- Use **Relationships** to see virtual machine, folder, and cluster relationships.
- Use **Events** to view operations and configuration management events.
- Use **Performance by Asset Type** to see a report on the performance of your virtual infrastructure. You must be capturing capacity and utilization data to get this information.
- Use **Running Processes** to view the information on processes running on a virtual machine. You must have domain credentials entered for the zone to collect the info for these reports, and the virtual machine must have been analyzed at least once.
- **Trending** shows projections of datastore capacity and host CPU and memory use.
- **Provisioning** shows provisioning activity based on the approver, datastore, requester, and virtual machine.

4.1. Running Reports

There are two different ways to generate a report: either scheduling the report, or manually by clicking the report generation button on the Reports page. CloudForms Management Engine uses interactive report generation so that reports are placed on a queue. A visual indicator of the reports status is shown. All reports are automatically saved so that they can be downloaded and analyzed later.

4.1.1. Generating a Single Report

**Procedure 4.1. To Generate a Single Report**

1. Navigate to **Cloud Intelligence → Reports**
2. Click the **Reports** accordion and select the report you want to view.
3. Click **Queue**,
4. The report generation is placed on the queue and its status shows in the reports page.

<table>
<thead>
<tr>
<th>Queued At</th>
<th>Run At</th>
<th>Source</th>
<th>User ID</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/21/11 14:14:11 UTC</td>
<td>10/21/11 14:00:08 UTC</td>
<td>Requested by user</td>
<td>admin</td>
<td>Queued</td>
</tr>
<tr>
<td>10/21/11 14:00:22 UTC</td>
<td></td>
<td>Requested by user</td>
<td>admin</td>
<td>Finished</td>
</tr>
</tbody>
</table>

5. Click (Reload current display) to update the status.

6. When a report has finished generating, click on its row to view it.

### 4.1.2. Scheduling a Report

#### Procedure 4.2. To Schedule a Report

You can view historical data by creating reports on a scheduled basis. In addition, scheduled reports can be emailed directly to users.

1. There are two ways to schedule a report. Select a report from the Reports accordion and click Configuration, + Add a New Schedule, or click the Schedules accordion and click Configuration, + Add a New Schedule.

   a. In the **Basic Information** area, type in a **Name** and **Description** for the schedule.

   b. By default, **Active** is checked to enable the scan.

   c. Check **E-Mail after Running** to send an email after the report has been generated. The email will be sent to the users email address as show in the **Accounts** area in **Configuration**. The email will include a link to the report. See the **Settings and Operations Guide** to learn how to verify the address, and to validate outgoing email settings.

2. The **Report Selection** area is pre-populated if you added the schedule directly from the report. If you are adding from the schedule according, use the **Filter** drop downs to select the report that you want to schedule.

3. In the **Timer** area, click the **Run** drop down to specify how often you want the analysis to run. Your options after that will depend on which run option you choose.
4.  
   a. Click **Once** to have the analysis run just one time.
   
   b. Click **Daily** to run the analysis on a daily basis. You will be prompted to select how many days you want between each analysis.
   
   c. Click **Hourly** to run the analysis hourly. You will be prompted to select how many hours you want between each analysis.
   
   d. Type or select a date to begin the schedule in **Starting Date**.
   
   e. Select a **Starting Time** based on a 24 hour clock in the CloudForms Management Engine Appliances Time Zone.

4.  
   a. To send an email that includes an attachment with the report contents, check **Send an E-mail**. Parameters required for sending an email are displayed.

   b. In **From (leave blank for default)**, type in the sending email.
   
   c. Use **Add a User**, to select a specific user. The user must have a valid email address entered under accounts.
   
   d. Use **Add (enter manually)** to type in the address not registered to a User. Then, click **(Add)**.

5. If you are sending an email after the report runs, then you can select further options under **Email Options**.

---

Chapter 4. Reports

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a. Check **Send if Report is Empty** if you want an email even if no records exist in the report.

b. Next to Attachments, check if you would like the report attached as a **Text**, **CSV**, or **PDF** file.

6. Click **Add** when you are finished.

**Note**

You may need to disable, change the report filter, or change the frequency of a schedule. To do this, you will need to edit the schedule.

### 4.1.3. Modifying a Report Schedule

**Procedure 4.3. To Modify a Report Schedule**

1. Navigate to **Cloud Intelligence → Reports**

2. Click the **Schedules** accordion and select the schedule you want to edit.

3. Click (Configuration), then click (Edit this Schedule).

4. Make the required changes.

5. Click **Save**.

### 4.1.4. Running a Scheduled Report Immediately

**Procedure 4.4. To Run a Scheduled Report Immediately**

1. Navigate to **Cloud Intelligence → Reports**.

2. Click the **Schedules** accordion and select the schedule you want to run.

3. Click (Configuration), then click (Queue).

### 4.2. Viewing Reports

Once you have created a schedule for a report, you can view it at any time after the first scheduled time has occurred.

**Procedure 4.5. To View a Report**
1. Navigate to **Cloud Intelligence → Reports**.

2. Click the **Saved Reports** accordion or the **Reports** accordion.

3. Click on the instance of the report you want to view.

### 4.2.1. Changing Report Views

Some reports can be viewed as charts as well as lists. Note that this will depend on the type of data and on how the report has been created. Where applicable, you will see these additional buttons.

**Procedure 4.6. To Change the View of a Report**

1. Navigate to **Cloud Intelligence → Reports**.

2. Click the report to view. Click one of the following buttons for the view you want.

   - Click for **Graph View**.
   - Click for **Hybrid View**.
   - Click for **Tabular View**.

### 4.2.2. Report Download Buttons

When you click on one of the supplied reports, you are presented with a group of buttons to download the report in one of three formats or to view the report in a full screen.

#### Note

Edit and delete buttons are only visible to administrators and super administrators. Edit and delete functions are only available to customer-created reports. The CloudForms Management Engine pre-configured reports cannot be edited or deleted, but they can be copied.

### 4.2.3. Downloading a Report

Download reports to analyze the data using other tools or to print the report.

**Procedure 4.7. To Download Reports**

1. Navigate to **Cloud Intelligence → Reports**.

2. Click the report you want to view.

3. Click on the row for the instance of the report you want to download. If the report needs to be generated, see *Running Reports*.

4. Click on the report download buttons for the type of export you want.

   - Click **(Download this report in text format)** to download as text.
> Click (Download this report in csv format) to download as a comma separated file.

> Click (Download this report in PDF format) to download as PDF.

> The report is automatically named with the type of report and date.

### 4.2.4. Showing a Report in Full Screen

View the report in full screen to zoom into the report screen. From full screen, you can also print the chart that accompanies a report.
Chapter 5. Chargeback and Timelines

5.1. Chargeback

The chargeback feature allows you to calculate monetary virtual machine charges based on owner or company tag. To use this feature you must be collecting capacity and utilization data. See Settings and Operations Guide, Server Control Settings and Capacity & Utilization Collection Settings.

5.1.1. Chargeback Rates

CloudForms Management Engine provides a default set of rates for calculating chargeback costs, but you can create your own set of computing and storage costs by navigating to Cloud Intelligence → Chargeback and clicking the Rates accordion.

Chargeback costs are computed using a set formula based on hourly cost per unit and hourly usage. For example, calculating the Memory Used Cost in dollars ($) for a day can be expressed in the following ways:

- Memory allocation per hour (in MB) * Hourly Allocation cost per megabyte * Number of Memory Allocation metrics available for the day
- Sum of Memory allocation for the day (in MB) * Hourly Allocation cost per megabyte
- Sum of Memory allocation for the day (in MB) * Daily Allocation cost per megabyte / 24

Example 5.1. Memory Used Cost

In a scenario where 9.29 GB of memory is used in a day with the chargeback rate set at one dollar ($1) per megabyte per day, the Memory Used Cost would be $396.42.

- 9.29 GB = 9514.08 MB
- 9514.08 MB * $1 (per MB per day) = $9514.08
- $9514.08 / 24 = $396.42 Memory Used Cost

5.1.2. Creating Chargeback Rates

CloudForms Management Engine allows you to create your own set of computing and storage costs.

Procedure 5.1. To Create Chargeback Rates

1. Navigate to Cloud Intelligence → Chargeback.
2. Click the Rates accordion and select either Compute or Storage.
3. Use Compute to set chargeback rates for CPU, disk I/O, memory, network I/O, and fixed items.
   - Use Storage to set chargeback rates for fixed and storage items.
4. Click (Configuration), (Add a new Chargeback Rate) to create a new chargeback rate.
5. Type in a **Description** for the chargeback rate.

6. For each item that you want to set, type in a rate and select a time option.

7. Click **Add**.

### 5.1.3. Assigning Chargeback Rates

CloudForms Management Engine allows you to assign chargeback rates by choosing from **Compute** and **Storage**.

#### Procedure 5.2. To Assign Chargeback Rates

1. Navigate to **Cloud Intelligence → Chargeback**.

2. Click the **Assignments** accordion, and click either **Compute** or **Storage**.

   - Use **Compute** to assign a compute chargeback rate. You can assign chargeback rates to **The Enterprise**, **Selected Clusters**, **Selected Infrastructure Providers**, or **Tagged VMs and Instances**.
   
   - Use **Storage** to assign a storage chargeback rate. You can assign chargeback rates to **The Enterprise**, **Selected Datastores**, or **Tagged Datastores**

3. From the **Basic Info** area, use the **Assign To** dropdown to select a type of assignee to assign the rate set to. The options displayed will vary based on the type you selected.

4. For each item that you want to set, select the chargeback rate that you want to use.

5. Click **Save**.

**Result:**

The rate is assigned. The next time you generate a chargeback report, these values will be used.

---

#### Note

Note that when viewing chargeback, there is a rate for a virtual machine for the number of the CPUs. The chargeback for this parameter is calculated based on when the virtual machine is running. If the virtual machine is not running, then it is not charged for CPU allocation.

### 5.1.4. Creating a Chargeback Report

CloudForms Management Engine allows you to create chargeback reports to monitor costs you charged.

#### Procedure 5.3. To Create a Chargeback Report

1. Navigate to **Cloud Intelligence → Reports**.

2. Click the **Reports** accordion.

3. Click **(Configuration)**, **(Add a new Report)**.

4. On the **Columns** tab, fill out the **Basic Report Info** area.
5. Add fields in the Configure Report Columns area.
   - From Base the report on table dropdown, select Chargebacks.
   - Select fields that you want in the report from Available Fields, then click (Move selected fields down). In addition to the fields, you can also select any tags that you have created and assigned.
   - Change the order of the fields in the report by clicking (Move selected fields up) or (Move selected fields down).

6. Click the Formatting tab to set the size of paper for a PDF and column header format.
   - From the PDF Output area, select the page size from the dropdown.
   - From Specify Column Headers and Formats, type the text you want displayed for each field. For each numeric field, you can also set the numeric format.

7. Click the Filter tab to set filters for the data displayed in the report.
   - From Chargeback Filters, select how you want the costs to show, the tag category, the tag, and how you want the items grouped.
   - From Chargeback Interval, select the time interval. You must have a full interval worth of data in order to select an option other than Partial in the Daily Ending With dropdown.

8. Click the Preview tab, and then Load to see what the report will look like.

9. When you are satisfied that you have the report that you want, click Add to create the new report.

Result:

The new report is created. To make the report accessible from the Report menu, you must add it to a report menu. See Customizing Report Menus in the Insight Guide.

5.2. Timelines

5.2.1. Accessing and Using a Timeline

You can use timelines to view the history record for virtual machines.
Note

Amazon does not provide events, so CloudForms Management Engine does not support timelines for virtual machines hosted by Amazon.

Procedure 5.4. To Access and Use a Timeline

1. Navigate to Cloud Intelligence → Timelines.

2. From the accordion on the left, click a category of Timeline.
   - Select Configuration Management to see when items were brought under management.
   - Select Events to view timelines related to operations and changes in configuration.

3. Drag the relevant time band, such as hour, day, or month to go to the time you want to see. Note that some timelines, such as Events Operations: All Events, use minutes, hours, and days instead going back only 30 days.

4. To see more detail for a resource in the timeline, click on it. A balloon appears with a clickable link to the resource.

5.2.2. Downloading a Timeline's Data

You can download timeline data for further analysis or printing.

Procedure 5.5. To Download a Timeline's Data

1. Navigate to Cloud Intelligence → Timelines, and click the timeline you want to download.

2. Click on the download button for the format you want.
   - Click (Download this Timeline data in text format) to download as text.
   - Click (Download this Timeline data in csv format) to download as a comma separated file.
   - Click (Download this Timeline data in PDF format) to download as PDF.
Chapter 6. Capacity and Utilization Charts

CloudForms Management Engine generates charts from the collected data which can be used to plan your hardware and virtual machine needs. Depending on the type of data, these charts may include lines for averages, maximums, minimums, and trends.

**Note**

For reporting of daily capacity and utilization data, incomplete days (days with less than 24 hourly data points from midnight to midnight) that are at the beginning or end of the requested interval are excluded. Days with less than 24 hourly data points would be inaccurate and including them would skew trend lines. Therefore, at least one full day of hourly data from midnight to midnight is necessary for displaying the capacity and utilization charts under the infrastructure tab.

### 6.1. Capacity and Utilization Charts for Host, Clusters, and Virtual Machines

<table>
<thead>
<tr>
<th>Resource Type</th>
<th>CPU Usage</th>
<th>CPU States</th>
<th>Disk I/O</th>
<th>Memory Usage</th>
<th>Network I/O</th>
<th>Running VMS</th>
<th>Running Hosts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>NA</td>
</tr>
<tr>
<td>Cluster</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>NA</td>
</tr>
<tr>
<td>Virtual Machine</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

For the procedure to view Capacity and Utilization Charts for a Host, see Section 6.4, “Viewing Capacity and Utilization Charts for a Host”.

For the procedure to view Capacity and Utilization Charts for a Cluster, see Section 6.5, “Viewing Capacity and Utilization Charts for a Cluster”.

For the procedure to view Capacity and Utilization Charts for a Virtual Machine, see Section 6.3, “Viewing Capacity and Utilization Charts for a Virtual Machine”.

### 6.2. Capacity and Utilization Charts for Datastores

Charts created include:

<table>
<thead>
<tr>
<th>Space by VM Type</th>
<th>Virtual Machines and Hosts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Used Space</td>
<td>Number of VMs by Type</td>
</tr>
<tr>
<td>Disk files Space</td>
<td>Hosts</td>
</tr>
<tr>
<td>Snapshot Files Space</td>
<td>Virtual Machines</td>
</tr>
<tr>
<td>Memory Files Space</td>
<td></td>
</tr>
<tr>
<td>Non-VM Files</td>
<td></td>
</tr>
<tr>
<td>Used Disk Space</td>
<td></td>
</tr>
</tbody>
</table>

For the procedure to view Capacity and Utilization Charts for a Datastore see Section 6.6, “Viewing Capacity and Utilization Charts for a Datastore”.
6.3. Viewing Capacity and Utilization Charts for a Virtual Machine

You can view capacity and utilization data for virtual machines that are part of a cluster. Note that daily charts only include full days of data. If all 24 data points for a day are not available, daily charts are not displayed. For some capacity and utilization data, CloudForms Management Engine calculates and shows trend lines in the charts which are created using linear regression. The calculation uses the capacity and utilization data collected by CloudForms Management Engine during the interval you specify.

**Note**

You must have a server with network visibility to your provider assigned the server role of **Capacity & Utilization Collector** to use this feature. For more information, refer to the *CloudForms Management Engine Settings and Operations Guide*.

The virtual machine must be powered on to collect the data.

**Procedure 6.1. To View Capacity and Utilization Charts for a Virtual Machine**

1. From **Infrastructure → Virtual Machines**, click the accordion that you want to view capacity data for.

2. Click the item you want to view.

3. Click 📊 (Monitoring), and then 📊 (Utilization).

4. From **Interval**, select to view **Daily**, **Hourly**, or **Most Recent Hour** data points. When choosing **Daily**, you can also select the **Date**, and how far back you want to go from that date. When selecting **Hourly**, you can select the date for which you want to view hourly data. If you are using **Time Profiles**, you will be able to select that as an option, also.
5. From **Compare to**, select **Parent Host** or **Parent Cluster**. The capacity and utilization charts for both items will show simultaneously.

**Note**

Daily charts only include full days of data. This means CloudForms Management Engine does not show daily data for a day without a complete 24 data point range for a day.
6.4. Viewing Capacity and Utilization Charts for a Host

View Capacity & Utilization data for hosts that are part of a cluster.

Note

Your CloudForms Management Engine server requires network visibility to the provider assigned the Server Role of Capacity & Utilization Collector to enable this feature. Refer to the CloudForms Management Engine Settings and Operations Guide for more information.

Procedure 6.2. To View Capacity and Utilization Charts for a Host

1. Navigate to Infrastructure → Hosts.
2. Click the Host to view capacity data.
3. Click (Monitoring), and then (Utilization) or from the Host accordion, click Properties → Capacity & Utilization.
4. From Interval, select to view hourly or daily data points and the dates to view data. Use Group by to group the lines by SmartTags. Use Time Profiles to select a time range for the data.
The charts are displayed for CPU, memory, disk, network, and running virtual machines.

**Note**

Daily charts only include full days of data. If a day does not include all the 24 data points for a day, the data does not show for that day.

### 6.5. Viewing Capacity and Utilization Charts for a Cluster

View capacity and utilization for a cluster.

**Procedure 6.3. To View Capacity and Utilization Charts for a Cluster**

1. Navigate to **Infrastructure → Clusters**.
2. Click the Cluster to view Capacity and Utilization data.
3. Click **(Monitoring)**, and then **(Utilization)** or from the accordion menu, click **Properties**, then **Capacity & Utilization**.
4. From **Interval**, select to view hourly or daily data points and the dates to view data. Use **Group by** to group the lines by SmartTags. Use **Time Profiles** to select a time range for the data.
The Capacity & Utilization charts display.

**Note**

Daily charts only include full days of data. If a day does not include all the 24 data points for a day, the data does not show for that day.

### 6.6. Viewing Capacity and Utilization Charts for a Datastore

You can view capacity and utilization data for a datastore.

**Note**

CloudForms Management Engine requires network visibility to your provider assigned the server role of **Capacity & Utilization Collector** to enable this feature. Refer to the **CloudForms Management Engine Settings and Operations Guide** for more information.

**Procedure 6.4. To View Capacity and Utilization Charts for a Datastore**

1. Navigate to **Infrastructure → Datastores**, then click the Datastore that you want to view Capacity and Utilization data for.

2. Click **(Monitoring)**, and then **(Utilization)** or from the Datastore Accordion, click **Properties → Capacity & Utilization**.
3. From **Interval**, select to view hourly or daily data points and the dates to view data. Use **VM Types to Include** to include only managed/registered, managed/unregistered, or unmanaged virtual machines. The following definitions will be helpful.

- **Managed/Registered VM** - A virtual machine connected to a host and exists in the VMDB. Also, a template connected to a management system and exists in the VMDB.

- **Managed/Unregistered VM** - A virtual machine or template that resides on a repository or is no longer connected to a management system or host and exists in the VMDB. A virtual machine previously considered registered might become unregistered if the virtual machine is removed from management system inventory.

- **Not Managed** - Files discovered on a datastore that do not have a virtual machine associated with them in the VMDB. These files might be registered to a management system that CloudForms Management Engine does not have configuration information. Possible causes might be the management system has not been discovered or the management system has been discovered but no security credentials are provided.

Use **Time Profiles** to select a time range for the data.

The Capacity & Utilization Collector charts are displayed.

**Note**

Daily charts only include full days of data. If a day does not include all the 24 data points for a day, the data does not show for that day.

### 6.7. Chart Features

Each chart provides its own set of special features including zooming in on a chart and shortcut menus.

#### 6.7.1. Zooming into a Chart

**Procedure 6.5. To Zoom Into a Chart**

1. Navigate to the chart you want to zoom. If you hover anywhere on the chart, two dashed lines will appear to target a coordinate of the chart.
2. Click (Click to zoom in) in the lower left corner of the chart to zoom into it.

3. To go back to the regular view click (Click to zoom out) on the enlarged chart.

### 6.7.2. Drilling into Chart Data

#### Procedure 6.6. To Drill into Chart Data

1. Navigate to the chart you want to get more detail from.
2. Hover over a data point to see the coordinates.
3. Click on a data point to open a shortcut menu for the chart. In this example, we can use the shortcut menu to go to the hourly chart or display the virtual machines that were running at the time the data was captured.
   - If you are viewing the CPU, Disk, Memory, or Network charts, selecting from the **Chart** option will change all of the charts on the page to the new interval selected.
   - If you are viewing the CPU, Disk, Memory, or Network charts, selecting from the **Display** option will allow you to drill into the virtual machines or Hosts that were running at the time.
   - If you are viewing the VM or Hosts chart, the **Display** menu will allow you to view running or stopped virtual machines. The time of the data point will be displayed in addition to the virtual machines that apply. From here, click on a virtual machine to go its details.

**Result:**
Chapter 7. My Settings

Options under **Configure → My Settings** enable you to control user settings such as how things are displayed, default views, and individual tags. You can also set your color scheme, button options, and external RSS feeds on the main CloudForms Management Engine dashboard.

7.1. Visual Settings

For all of the **Visual** options, click **Save** to update your configuration settings. Click **Reset** to undo any unsaved changes that have been made on the current screen.

7.1.1. Grid and Tile Icons

This group of settings is used to control the view of your virtual thumbnails. Each thumbnail can be viewed as a single icon or as an icon with four quadrants. Use the quadrant view to see a component's properties at a glance.

- **Check Show Infrastructure Quadrants** to see the 4 icons in your provider. Uncheck to see only one icon.
- **Check Show Cloud Provider Quadrants** to see the 4 icons in your hosts. Uncheck to see only one icon.
- **Check Show Host Quadrants** to see the 4 icons in your hosts. Uncheck to see only one icon.
- **Check Show Datastore Quadrants** to see the 4 icons in your Datastores. Uncheck to see only one icon.
- **Check Show Datastore Item Quadrants** to see 4 icons, where applicable, in items inside a Datastore. Uncheck to see only one icon.
- **Check Show VM Quadrants** to see the 4 icons in your virtual machines. Uncheck to see only one icon.
- **Check Show VM Item Quadrants** to see 4 icons, where applicable, in items inside the virtual machines. Uncheck to see only one icon.
- **Check Show Template Quadrants** to see the 4 icons in your templates. Uncheck to see only one icon.
Under **Truncate Long Text** to specify how you want names of items displayed if they are too long to show entirely. Select the option based on the pattern shown.

### 7.1.1.1. Changing Grid and Tile Icon Settings

**Procedure 7.1. To Change Grid and Tile Icon Settings**

1. Navigate to **Configure → My Settings**, then click on the **Visual** tab.
2. In **Grid/Tile Icons**, select the items to display all four quadrants for.
3. Click **Save**.

### 7.1.2. Setting Default Items Per Page

You can set the default number of items to display on each resource page.

**Procedure 7.2. To Set Default Items Per Page**

1. Navigate to **Configure → My Settings**, then click on the **Visual** tab.
2. In **Default Items Per Page** area, select the default number of items you want displayed for each view from the appropriate dropdown.
3. Click **Save**.

### 7.1.3. Setting the Start Page

You can set the default start page after logging in. For example, instead of going to the CloudForms Management Engine dashboard, you can set the default start page to see a list of your virtual machines.

**Procedure 7.3. To Set the Start Page**

1. Navigate to **Configure → My Settings**, then click on the **Visual** tab.
2. In the **Start Page** area, select the page you want to see at login.
3. Click **Save**.

### 7.1.4. Setting Display Settings

You can set your own themes, colors, and time zone for the console. These settings are specific to the logged on user.

**Procedure 7.4. To Set Display Settings**

1. Navigate to **Configure → My Settings**, then click on the **Visual** tab.
2. Make selections from **Display Settings** for the following items.
   - Use **Header Accent Color** to select a color for your console header.
   - Use **Chart Theme** to select a group of colors and font sizes specifically for charts.
   - Use **Time Zone** to select in which time zone you want the console to display.

   **Note**

   Note that in time zones where clocks are set forward for daylight savings time, the time zone correctly displays as EDT (Eastern Daylight Time) in the console. When the clocks are set back, it correctly displays as EST (Eastern Standard Time).

3. Click **Save**.

### 7.2. Default Views

You can decide on the default views for your virtual machines, infrastructure, and other pages where the view is customizable. These settings can also be controlled on the actual pages where the items appear.

#### 7.2.1. Setting General View Options

**Procedure 7.5. To Set General View Options**

1. Navigate to **Configure → My Settings**, then click on the **Default Views** tab.
2. In the **General** area, click the appropriate button for the way you want to view each type of screen listed.
3. Click **Grid View** to view virtual thumbnails or icons.

4. Click **Tile View** for a view that combines the virtual thumbnail with some text properties that describe the items.

5. Click **List View** or **Details Mode** or **Text View** for a detailed textual listing of virtual machines.

6. Click **Expanded View** for an expanded view.

7. Click **Compressed View** for a compressed view.

8. Click **Exists Mode** for an exists mode.

9. Click **Graphical View** for a graphical view.

3. Click **Save**.

### 7.2.2. Setting Default Views for Virtual Machines

**Procedure 7.6. To Set Default Views for Virtual Machines**

1. Navigate to Configure → My Settings, then click on the Default Views tab.

2. In the Infrastructure → VMs area, click the button for the way you want to view virtual machines.
3. Click (Grid View) to view just Virtual Thumbnails or icons.

4. Click (Tile View) for a view that combines the Virtual Thumbnail with some text properties that describe the items.

5. Click (Detail View) that provides a text listing of virtual machines.

3. Click **Save**.

### 7.2.3. Setting Default View for Management Engine

**Procedure 7.7. To Set Default View for Management Engine**

1. Navigate to **Configure → My Settings**, then click on the **Default Views** tab.

2. In the **Management Engine** area, click the button for the way you want to view SmartProxies.

   - Click (Grid View) to view virtual thumbnails or icons.
7.2.4. Setting Default Views for Infrastructure Components

**Procedure 7.8. To Set Default Views for Infrastructure Components**

1. Navigate to **Configure → My Settings**, then click on the **Default Views** tab.

2. In the **Infrastructure** area, click the appropriate button for the way you want to view each item.

3. Click **Save**.

**7.2.5. Setting Default Views for Clouds**
Procedure 7.9. To Set Default Views for Clouds

1. Navigate to Configure → My Settings, then click on the Default Views tab.
2. In the Clouds area, click the button for the way you want to view each item.

   - Click Grid View to view virtual thumbnails or icons
   - Click Tile View for a view that combines the virtual thumbnail with some text properties that describe the items
   - Click Detail View that provides a text listing of virtual machines
3. Click Save.

7.2.6. Setting Default Views for Catalog Components

Procedure 7.10. To Set Default Views for Catalog Components

1. Navigate to Configure → My Settings, then click on the Default Views tab.
2. In the Services → Catalog Items, click the button for the way you want to view each item.
3. Click **Save**.

### 7.2.7. Setting Default Views for Services

**Procedure 7.11. To Set Default Views for Services**

1. Navigate to **Configure → My Settings**, then click on the **Default Views** tab.
2. In the **Services** area, click the appropriate button for the way you want to view each item.

![Services](image)

- Click **(Grid View)** to view just virtual thumbnails or icons.
- Click **(Tile View)** for a view that combines the virtual thumbnail with some text properties that describe the items.
- Click **(Detail View)** that provides a text listing of virtual machines.

3. Click **Save**.

### 7.3. Default Filters

You can set the default filters displayed for your hosts, virtual machines, and templates. These settings are available to all users.

#### 7.3.1. Setting Default Filters for Hosts
Procedure 7.12. To Set Default Filters for Hosts

1. Navigate to Configure → My Settings, then click on the Default Filters tab.

2. In the Hosts folder, select the default filters that you want available on the Hosts page. Items that have changed show in blue, bold text. Not all filters are listed in the figure below.

3. Click Save.

7.3.2. Setting Default Filters for Templates

Procedure 7.13. To Set Default Filters for Templates

1. Navigate to Configure → My Settings, then click on the Default Filters tab.

2. From the Templates and Images folder, check the boxes for the default filters that you want available. Items that have changed show in blue and bold text.

3. Click Save.

7.3.3. Setting Default Filters for Virtual Machines

Procedure 7.14. To Set Default Filters for Virtual Machines

1. Navigate to Configure → My Settings, then click on the Default Filters tab.

2. From the VMs and Instances folder, check the boxes for the default filters that you want available. Items that have changed show in blue and bold text.

3. Click Save.

7.4. Time Profiles

Time profiles limit the hours for which data is displayed when viewing capacity and utilization screens. They are also used for performance and trend reports, and for Optimize pages.

7.4.1. Creating a Time Profile
Procedure 7.15. To Create a Time Profile

1. Navigate to **Configure → My Settings**, then click on the **Time Profiles** tab.

2. Click ![Configuration](Configuration) and ![Add a new Time Profile](Add a new Time Profile).

3. Type a meaningful name in the **Description** field.

4. For **Scope**, select **All Users** to create a global time profile available to all users. Only the super administration and administration roles can create, edit, and delete a global profile. Select **Current User** if this time profile should only be available to the user creating it.

5. Check the **Days** and **Hours** for the time profile.

6. For **Timezone**, you can select a specific time zone or, you can let the user select a time zone when displaying data.

7. If you select a specific time zone, you also have the option to **Roll Up Daily Performance** data. This option is only available to users with the administration or super administration role. Enabling the **Roll Up Daily Performance** option reduces the time required to process daily capacity and utilization reports and to display daily capacity and utilization charts.

8. Click **Add**.

**Note**

The following relationships exist between time zones and performance reports:

- The configured time zone in a performance report is used to select rolled up performance data, regardless of the user’s selected time zone.
- If the configured time zone is null, it defaults to UTC time for performance reports.
- If there is no time profile with the report’s configured time zone that is also set to roll up capacity and utilization data, the report does not find any records.

For non-performance reports, the user’s time zone is used when displaying dates and times in report rows.

7.4.2. Editing a Time Profile
Procedure 7.16. To Edit a Time Profile

1. Navigate to **Configure → My Settings**, then click on the **Time Profiles** tab.
2. Check the time profile you want to edit.
3. Click **(Configuration)**, and **(Edit Selected Time Profile)**. 
4. Make the required changes.
5. Click **Save**.

7.4.3. Copying a Time Profile

Procedure 7.17. To Copy a Time Profile

1. Navigate to **Configure → My Settings**, then click on the **Time Profiles** tab.
2. Check the time profile you want to copy.
3. Click **(Configuration)**, and **(Copy Selected Time Profile)**.
4. Make the required changes.
5. Click **Save**.

7.4.4. Deleting a Time Profile

Procedure 7.18. To Delete a Time Profile

1. Navigate to **Configure → My Settings**, then click on the **Time Profiles** tab.
2. Check the time profile you want to edit.
3. Click **(Configuration)**, and **(Delete Selected Time Profile)**.
4. Make the required changes.
5. Click **Save**.
# Revision History

<table>
<thead>
<tr>
<th>Revision</th>
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<th>Team</th>
<th>Notes</th>
</tr>
</thead>
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<tr>
<td>1.3-0</td>
<td>Tue Feb 3 2015</td>
<td>CloudForms Docs Team</td>
<td>Update product name to Red Hat CloudForms</td>
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</table>
| 1.2-0    | Wed Dec 3 2014| CloudForms Docs Team  | BZ#1169428 - Update menu screenshot  
|          |               |                       | BZ#1147179 - Specify chargeback rate is set per day  
|          |               |                       | BZ#1147179 - Documented how chargeback costs are calculated |
| 1.1-0    | Wed Oct 22 2014| CloudForms Docs Team  | Red Hat CloudForms 3.1 (CFME 5.3) asynchronous release. |
| 1.0-0    | Tue Sep 30 2014| CloudForms Docs Team  | Initial book creation. |