



# RED HAT ENTERPRISE VIRTUALIZATION: IMAGE MANAGER

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## IMAGE MANAGER

Red Hat Enterprise Virtualization *Image Manager* includes a powerful set of features for creating and managing virtual machine images.

Red Hat Enterprise Virtualization Image Manager includes :

- Thin provisioning – allowing administrators to more efficiently utilize their storage
- Snapshots – creating a “point in time” image of a virtual machine's storage, allowing the administrator to roll back the virtual machines state
- Templates – enabling users to rapidly provision virtual machines based on master images stored in a central image library

## SUPPORTED STORAGE SYSTEMS

Red Hat Enterprise Virtualization leverages the mature and scalable storage management features of Red Hat Enterprise Linux to support a wide variety of storage systems.

All storage systems certified on Red Hat Enterprise Linux 5 are supported by Red Hat Enterprise Virtualization including:

- **Network Attached Storage**  
Using NFS to provide a cost effective solution for storing and managing virtual machine images, snapshots and templates.
- **iSCSI**  
With support for software and hardware based iSCSI initiators. Network interface bonding and multipath I/O are used to provide improved performance and reliability.
- **Fibre Channel**  
Including support for all Host Bus Adapters and

storage arrays supported by Red Hat Enterprise Linux to deliver the most comprehensive list of supported storage platforms.

## THIN PROVISIONING

Red Hat Enterprise Virtualization allows you to provision your storage as “pre-allocated” (*thick* provisioned) or “sparse” (*thin* provisioned) storage.

- **Pre-allocated storage**  
All the storage required for a virtual machine is allocated up front. For example a 20 GB pre-allocated logical volume created for the data partition of a virtual machine will take up 20 GB of storage space immediately upon creation.
- **Thin provisioned storage**  
In this model the administrator defines the total storage to be assigned to a virtual machine but the storage is only allocated on disk when required by the virtual machine. For example, a 20 GB thin provisioned logical volume would take up 0 GB of storage space when first created. When the operating system is installed it may take up the size of the installed files, and would continue to grow as data is added up to a maximum 20 GB size.

Traditionally administrators would allocate storage based on projected requirements – for example, allocating enough storage to handle the forecasted requirements of the application along with some added “buffer.” This model resulted in storage capacity being allocated but unused for several months or years if ever used at all, leading to a waste of valuable storage resources.

With thin provisioning, storage costs are reduced by improving storage utilization – eliminating wasted, unused storage space and allowing administrators to over-allocate



storage. Rather than allocating all the storage required up front, thin provisioning allows the storage to be allocated only when data is written to the disk. In this model storage, administrators can defer purchasing new storage capacity until it is required rather than acquiring the hardware when the storage is first committed.

Thin provisioning also helps to reduce application down time by removing the need to shutdown applications in order to allocate more storage capacity to the virtual machine. Red Hat Enterprise Virtualization Manager tracks storage utilization comparing usage and allocation and allows the administrator to configure alerts for when specific thresholds are met – allowing the administrator to provision more storage when required.

## SNAPSHOTS

A snapshot is a “point in time” image of a virtual machine which allows the administrator to save the current state of a virtual machine. Multiple snapshots can be taken over time and managed through Red Hat Enterprise Virtualization Manager. Snapshots may be *previewed* allowing the user to run a virtual machine rolled back to a previous point in time, at which point the changes recorded after the snapshot can be recommitted or deleted.

Snapshots can be used to provide “restore points” - for example taking a snapshot of a virtual machine before an application upgrade to provide a rollback point in case issues are encountered with an upgrade. Snapshots provide a foundation for a backup and disaster recovery infrastructure.

General							Network Interfaces							Virtual Disks							Snapshots							Applications						
Create Preview Commit Undo																																		
August, 2009																																		
Su	Mo	Tu	We	Th	Fr	Sa	Time	Description	Disks																									
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30	31	1	2	3	4	5																												

Rather than storing a full copy of a virtual disk image, which maybe tens or hundreds of gigabytes in size, the snapshot records only the the “*deltas*” or differences between the

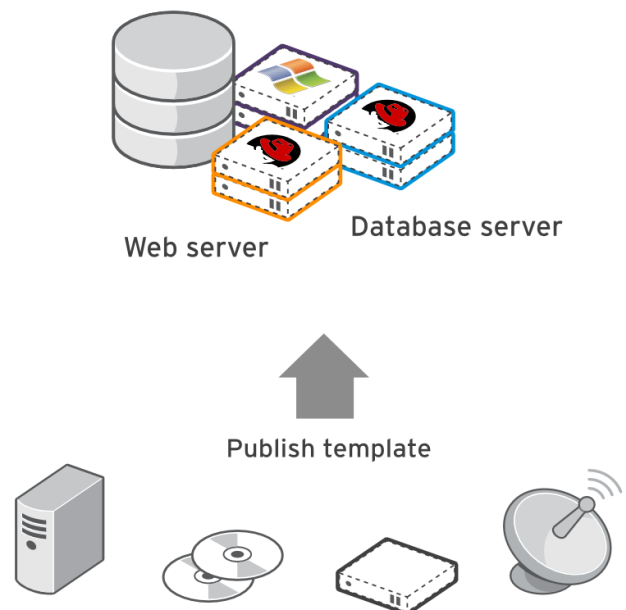
original image and the current state, operating at the block level to ensure compatibility with any file system used by the virtual machine's guest operating system.

## TEMPLATES

A template is a virtual machine image used as a “golden image” to provision virtual machines. A template contains a complete operating system image including applications and optional data and configuration settings.

Templates can be created from an existing virtual machine either installed manually from CD image or via a provisioning and deployment tool such as Red Hat Network Satellite or other 3<sup>rd</sup> party tools.

The administrator can define multiple templates that are stored with the image library. Using templates an administrator can rapidly provision a new virtual machine that complies with the corporate standard for an installation in a matter of seconds. For Windows base systems, Image Manager ensures that systems are correctly provisioned: generating new unique system identifiers and registering the system with Active Directory.



## SOFTWARE REQUIREMENTS

Image Manager is included within all editions of Red Hat Enterprise Virtualization.