

# Deploying Red Hat Enterprise Virtualization On Tintri VMstore Systems Best Practices Guide

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## **Intended Audience**

This Best Practices Guide for deploying Red Hat Enterprise Virtualization (RHEV) on Tintri VMstore systems will assist individuals who are responsible for the design and deployment of Tintri VMstore<sup>™</sup> systems for running RHEV environments. This document will discuss configuration of the Red Hat Enterprise Virtualization Manager (RHEV-M) and configuring host servers in a RHEV cluster, using Tintri per-VM features to deploy, configure and manage data protection of virtual machines (VMs) hosted on Tintri VMstores.

### Introduction

Deploying storage for your virtualized environments should be a straightforward process. Tintri VMstore is designed so that IT administrators with a working knowledge of vSphere can successfully deploy Tintri's purpose-built VM storage for RHEV in minutes.

Tintri VMstore delivers extreme performance and VM density, and a wide variety of powerful features, which are seamlessly integrated with RHEV. Examples include snapshots, clones, instant bottleneck visualization, and automatic virtual disk alignment. Tintri VMstore extends and simplifies the management of virtual machines (VMs) through native VM-level data management constructs so both compute and storage use the same fundamental management object: a VM.

This guide highlights the key considerations and configuration settings that promote a high-performance and reliable networking environment for connecting your RHEV assets and clusters to Tintri VMstore systems.

## **Consolidated List of Practices**

The table below includes the recommended practices in this document. Click the text in the "Recommendation" column or see the section later in the document that corresponds to each recommendation for additional information.

Tags	Recommendation
Architecture Overview	<b>DO:</b> Create separate RHEV clusters as needed for multiple hosts that are of different CPU type.
Storage Configuration	<b>DO:</b> Ensure that the data network on both controllers reflects the same network speeds and also Duplex is set to full on the Tintri VMstores.
Storage Configuration	DO: Create multiple NFS submounts for different hypervisors hosted on a Tintri VMstore.
Storage Configuration	<b>DO:</b> Follow RHEV deployment requirement to create separate submounts for RHEV ISO domain and RHEV Data domains.
Storage Configuration	DO: Prevent unsecured user access to the Tintri VMstore.
Storage Configuration	<b>DO:</b> Use RHEV bonding to create bonded logical networks for the different network interfaces.

Storage Configuration	<b>DO:</b> Share ISO domains across RHEV Data Centers. ISO images that have been created in one ISO domain can be used by other Data Centers that is managed by the RHEV-M without duplicating efforts.
Storage Configuration	DO: RHEV Data Domains, within the same RHEV Data Center, can be shared between different RHEV Clusters. RHEV restrictions prevent sharing of RHEV Data Domains between RHEV Data <u>Centers.</u>
Storage Configuration	DO: Use Tintri VMstore SnapVM <sup>™</sup> and CloneVM <sup>™</sup> features to snap and clone VMs between Data Centers. Refer to the SnapVM <sup>™</sup> , CloneVM <sup>™</sup> and ReplicateVM <sup>™</sup> section of this document.
Storage Configuration	<b>DO NOT:</b> Create a RHEV Export Domain with Tintri VMstores. It is not necessary to create RHEV Export Domains with Tintri VMstores.
Storage Configuration	<b>DO:</b> Create one RHEV Data domain per RHEV Data Center. A RHEV-M Data Center admin can take advantage of Tintri VMstore features with a single RHEV Data domain per Data Center to manage images and migration.
RHEV Virtual Machines on Tintri VMstores	<b>DO:</b> It is recommended to use <i>Allocation Policy: Thin Provision</i> for virtual disks for space savings and capacity planning purposes.
RHEV Virtual Machines on Tintri VMstores	<b>DO NOT:</b> Create more than 10 VMs per physical core.
Zero-Copy Virtual Machine Provisioning	DO: Use Tintri SnapVM <sup>™</sup> and CloneVM <sup>™</sup> features for virtual machine templates and to create virtual machine clones in RHEV Data Centers.
Zero-Copy Virtual Machine Provisioning	DO NOT: Use RHEV Templates with Tintri VMstores. Use Tintri SnapVM <sup>™</sup> and CloneVM <sup>™</sup> .
Zero-Copy Virtual Machine Provisioning	<b>DO:</b> Use Tintri VMstore's Protect feature to ensure that your RHEV virtual machines and RHEV supported applications are protected locally on the VMstore and across RHEV environments with multiple Tintri VMstores.

## **Architecture Overview**

Figure 1 shows an example of a deployment of RHEV with two Tintri VMstores, three host servers, and a RHEV-M instance. A RHEV data center can have more than one cluster but the physical hosts within a cluster should be from the same CPU family.

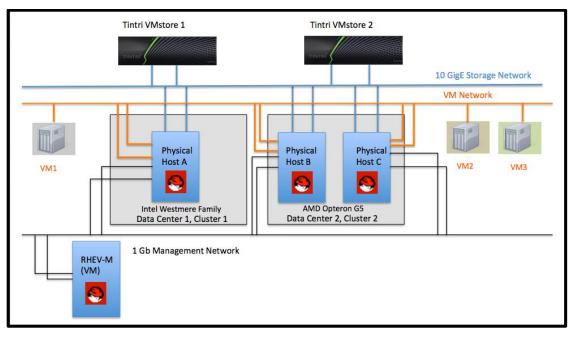


Figure 1: Architectural overview of Tintri VMstore deployment in a RHEV Environment.

If the host is not from the same CPU family type, attempts to configure a host server to an existing cluster will fail with an error message similar to the following:

Host DC-RHEV2. \_\_\_\_\_\_ moved to Non-Operational state as host does not meet the cluster's minimum CPU level. Missing CPU features : model\_Opteron\_G5, svm

DO: Create separate RHEV clusters as needed for multiple hosts that are of different CPU type.

The architecture referenced in this paper is an example of a supported RHEV configuration in a single site. A single RHEV Data Center can also have multiple clusters, each with hosts of different CPU family types. The configuration example, in this document, is used to show that ISO domains can be shared between Data Centers without having to create multiple ISO domains on Tintri VMstores. For detailed information on sharing ISO domains between RHEV Data Centers, review the Storage Configuration section.

**NOTE:** RHEV-M UI can be accessed using any supported web browsers. A list of the supported web browsers for RHEV 3.3 is located in the <u>RHEV Manager Client Requirements</u> section.

## Configuration

For RHEV-M server requirements, review the <u>Red Hat Enterprise Virtualization Manager Hardware</u> <u>Requirements</u>. The <u>Virtualization Host Hardware Requirements</u> additional detailed information on RHEV host server requirements such as a list of supported CPU models for RHEV. Use the information in these links to determine if your hosts meet the minimum requirements for RHEV.

#### **Host Configuration**

Load and run the RHEV 3.3 hypervisor ISO to configure your RHEV hosts.

**NOTE:** Tintri VMstore supports RHEV 3.3 and later. Tintri VMstore OS 3.0.0.5 or later is required for multi-hypervisor support with RHEV.

#### **Possible Error Condition**

Although unlikely, hosts from the same CPU family type could encounter the following error message when attempting to register a host with the RHEV-M: "2014-08-05 17:07:10,775 ERROR [org.ovirt.engine.core.bll.VdsDeploy] (pool-4-thread-49) [1df0d989] Error during host 111.111.111.111 install, prefering first exception: org.ovirt.otopi.dialog.SoftError: Host 111.111.111 reports unique id which already registered for HQTM-AMD01.fully.qualified.domain.name". This error condition is not related to Tintri but an issue with RHEV.

To fix this issue, run the following commands as root on your RHEV hosts and compare the output between the host systems:

- 1. hostname
- 2. cat /etc/vdsm/vdsm.id
- 3. cat /etc/libvirt/libvirtd.conf lgrep host\_uuid

If two host machines have the same conflicting vdsm.id, run the following commands on the new RHEV host to give it a unique vdsm id:

- 1. uuidgen > /etc/vdsm/vdsm.id
- 2. service vdsm restart

Re-execute the *cat* commands to verify that a new vdsm.id has been generated for the host. Registering host *111.111.111.111.111* with RHEV-M should complete successfully with the new vdsm.id. Figure 2 shows an example of a RHEV hosts added into the RHEV clusters.

Data Centers	Clusters	Hosts	Networks	Storage	Disks	Virtual Machines	Pools	Templates	Volumes	Users				
New Edit Re	move Activate	Maintenance	Select as SPM	Configure Lo	cal Storage P	ower Management 👻 🧍	issign Taga R	lefresh Capabilitier	Red Hat Ac	cess: Support				
Name			Hostr	name/IP	Cluste	r I	Data Center	Sta	tus	Virtual Machines	Memory	CPU	Network	SPM
dc-rhev3.1			li internetti	6	DC-C	iuster [	DCDataCente	r Up		0	7%	096	0%6	SPM
	D01.		5		Defau	it (	Default	Up		0	2%	0%	0%	Norma
A HOTM-AM	D02.		Garage	17	Defau	it I	Default	Up		6	4%	0%	0%	SPM

Figure 2: RHEV Hosts configured in RHEV Clusters.

#### **Storage Configuration**

Each Tintri VMstore is fully redundant with two controllers – an active and a standby. In figure 3, controller A is the active controller on the Tintri T650 in the example. The two 10GbE ports used for data can be configured in either active-standby or in active-active (using LACP) configurations. The T650 in figure 3 is configured in active-standby mode. The active data network is on port A.2a and port A.2b is the slave port in this example. The active and slave ports are both connected to a 10GbE network switch. The configuration of the data network on the standby controller B will also look similar to Controller A.

**DO:** Ensure that the data network on both controllers reflects the same network speeds and also Duplex is set to full on the Tintri VMstores.

Controllers			
Active			Controller A
🖪 Admin network	Active	Down	
E Data network		Slave	
Port	A.2a	A.2b	
Speed:	10 Gbps	10 Gbps	
Duplex:	full	full	
Jumbo frame:	disabled		
MAC:	9		
Ib:	1!	! VLAN 51	
Netmask:	2		
Gateway:	none		

Figure 3: Active Controller on a Tintri VMstore.

#### Submounts

Before a Tintri VMstore is added to a RHEV host as storage, we recommend that you create separate NFS submounts if you plan to use Tintri VMstore in a multi-hypervisor configuration. Create submounts for RHEV ISO domain type and RHEV Data domain type on a Tintri VMstore.

**DO:** Create multiple NFS submounts for different hypervisors hosted on a Tintri VMstore. This will simplify and distinguish submounts for planned multi-hypervisor support in the data center and assist Tintri support with troubleshooting issues with RHEV.

**DO:** Follow RHEV deployment requirement to create separate submounts for RHEV ISO domain and RHEV Data domains.

The following steps illustrate how to create NFS submounts on a Tintri VMstore from a Red Hat Enterprise Linux host that has access to the Tintri VMstore data network:

- 1. mount -t nfs -o vers=3 TintriVMstore. fully.qualified.domain.name:/tintri /mnt
- 2. cd /mnt
- 3. mkdir RHEV1\_Data
- 4. mkdir RHEV1\_ISO
- 5. chown 36:36 RHEV1\_Data
- 6. chmod 666 RHEV1\_Data
- 7. Repeat steps 5 and 6 for RHEV1\_ISO

The NFS submount created should have the following properties when compared to the figure 4. This NFS submount is now ready to be deployed as a RHEV Storage.



Figure 4: Tintri VMstore NFS submount for RHEV Data Domain.

Repeat steps 1 through 6 as needed additional RHEV Data Centers and RHEV Domain types on Tintri VMstores.

#### Hypervisor Setup on Tintri VMstore UI

In the Tintri VMstore UI, select *Settings* from the upper right hand corner of the web interface. *Adjust your VMstore's settings* window will pop-up. Select the Hypervisor managers on the left hand column and add the RHEV-M hypervisor. In the following example, the RHEV Manager *dc-rhev.fully.gualified.domain.name* is added to a Tintri VMstore using the default *@internal* domain.

**DO:** Prevent unsecured user access to the Tintri VMstore. When all the required RHEV Storage Domain submounts have been created, **unmount** TintriVMstore.*fully.qualified.domain.name*:/tintri from /mnt in step 1.

When the RHEV credentials are configured, click on *Test hypervisor managers* to test the configuration. Figure 5 shows an example of configuring a RHEV-M with Tintri VMstore.

RHEV-M:	vCenter  RHEV-M	
	* admin@internal	
Password:	• •••••	
Test hunger	visor managers	4

Figure 5: Configuring RHEV-M with Tintri VMstore.

You have successfully configured RHEV-M with a Tintri VMstore. The whole process of adding a Tintri VMstore to a RHEV environment literally takes minutes when a Tintri VMstore is properly racked, powered, and networked.

#### **Host Network Configuration**

When configuring network interfaces, we recommend that you use RHEV network bonding to ensure that no single physical port connection is a point of network failure. In figure 6, physical host C's storage network is **bondO** and connected to a 10 GigE network switch using VLAN 51. In addition to network bonding, the use of VLAN ensures that the logical networks for RHEV VM network, RHEV management network, and RHEV storage network in the RHEV cluster are properly identified and separated. It is also recommended to verify that the network speeds for the physical network are identical in a logical network bond.

**DO:** Use RHEV bonding to create bonded logical networks for the different network interfaces on the RHEV host. Ensure that the network speed match for each bonded network interface.

General	Virtual Machines	Network Interfaces	Host Hooks	Permissions	Hardware I	nformation				Red Hat Search	Red Hat Documentation
Setup Host N	etworks Save Network	Configuration									1
Name	Ac	idress	MAC		Speed (Mbps)	Rx (Mbps)	Tx (Mops)	Drops (Pkts)	Bond	VLAN	Network Name
•	eth4		90:E	2:BA:74:87:88	10000	2 1	< 1	0	bond0	sbond0.51	Storage
•	eth5		90:E	2.BA:74:87:89	10000	<1	< 1	0	/ Donad		4) Storage
							Phys Host	с	_		

Figure 6: Host Network Configuration.

Additionally, the RHEV storage network is setup with *(Mode 1) Active-Backup* to ensure port availability in bond0 for the RHEV storage network from the host side. Active-Backup should work with all switch vendors and topologies. Figure 7 shows the RHEV supported network bonds on a RHEV host.

(Mode 1) Active-Backup
(Mode 2) Load balance (balance-xor)
(Mode 4) Dynamic link aggregation (802.3ad) (Mode 5) Adaptive transmit load balancing (balance-tlb)
Custom:

Figure 7: RHEV supported Network Bonds.

**NOTE:** Refer to your specific switch vendor documentation if other bonding technology is preferred. Be sure to update the switch ports as well if another bonding method is used.

In the Logical Networks tab of the Clusters view in the RHEV-M UI, select the Manage Networks to assign the type of networks for each logical network created as shown in figure 8. Use the *Required* checkbox to ensure that the cluster has the minimum number of logical networks. If a RHEV host does not have the required logical networks, RHEV will prevent the host from being added into the cluster.

🔏 Manage	Networks 🔞				8
Name	🕑 Assign All	Required All	VM Network	Display Network	Migration Network
rhevm	Assign	Required			
DCNEW	🖉 Assign	Required			
VMNetwork1	🖉 Assign	Required	1		
					OK Canaal
					OK Cancel

Figure 8: RHEV Manage Networks.

#### **Storage Domains**

To add a new domain/storage type to a RHEV environment, ensure the following minimum parameters are updated:

- Name:
  - Example of an invalid name: Tintri 650
  - Example of a valid name: Tintri\_650
- Data Center:
  - o RHEV Data Center that will have access to this storage
- Domain Function/Storage Type:
  - RHEV allows one ISO domain per Data Center.
  - An ISO domain on a Tintri VMstore can be shared between multiple Data Centers as long as the VMstore data network is accessible from the host
  - Select ISO/NFS for ISO domain on a Tintri VMstore
  - Select Data/NFS for a RHEV Data domain on a Tintri VMstore
- Use Host:
  - This is a RHEV host that has storage network access to the Tintri VMstore
- Export path:
  - Example: TintriVMstore. *fully.qualified.domain.name*:/tintri/RHEV\_DC2

A RHEV installation has three types of domains:

- 1. RHEV Export Domain. This is a temporary storage repository for moving images between data centers and RHEV environments. It is not necessary to create RHEV export domains when using Tintri VMstores.
- 2. RHEV ISO Domain. Create one RHEV ISO domain that can be shared across RHEV Data Centers.
- 3. RHEV Data Domains. Create one RHEV Data domain per RHEV Data Center.

We recommend that you take advantage of Tintri's SnapVM<sup>™</sup>, CloneVM<sup>™</sup>, and ReplicateVM<sup>™</sup> features to more efficiently move images, clone VMs, and replicate VMs to protect your RHEV environment without using a RHEV Export Domain.

**DO:** Share an ISO domain across RHEV Data Centers. ISO images that have been created in one ISO domain can be used by other Data Centers that are managed by the RHEV-M without duplicating efforts. You can create additional ISO domains on other Tintri VMstores as a backup but it cannot be added to RHEV Data Centers that have an existing ISO domain.

**DO:** RHEV Data domains can be shared between different RHEV Clusters within the same RHEV Data Center. RHEV restrictions prevent sharing of RHEV Data domains between RHEV Data Centers.

**DO:** Use Tintri VMstore SnapVM<sup>™</sup> and CloneVM<sup>™</sup> features to snap and clone VMs between Data Centers. Refer to the SnapVM<sup>™</sup>, CloneVM<sup>™</sup> and ReplicateVM<sup>™</sup> section of this document.

**DO NOT:** Create a RHEV Export Domain with Tintri VMstores. It is not necessary to create RHEV Export Domains with Tintri VMstores.

**NOTE:** The maximum number of ISO (one) domains allowed in a RHEV Data Center is a RHEV restriction. This was validated with RHEV version 3.3.4-0.53.el6ev.

With a new RHEV Storage Domain, configure the Domain name, the Data Center that the Storage Domain should belong to (see figure 9). If an ISO storage type has not been configured for the RHEV Data Center, select the drop-down menu in step 3. Select ISO/NFS option in step 4 to configure an ISO storage type for the RHEV Data Center. If an ISO storage type is already configured for the Data Center, the ISO/NFS option is not available in the drop down menu. Determine the *Use Host* in step 5 and complete the *Export Path* in step 6. It is a RHEV recommendation to use default values for the *Advanced Parameters*.

New Domain 💿					8	
Name	Tintri650_store2	1	Description	T650 Storage		1
Data Center	Default (NFS)	2 ; !	Comment	Storage for AME	001 and AMD02	I
Domain Function / Stora	ige Type	Data / NFS	3	•	Format V3 \$	
Use Host	HQTM-AMD01	•	5		4	Data / NFS ISO / POSIX compliant FS ISO / NFS
	Remote path to NFS exp e.g. server.example.co	port, takes either th	e form: FQDN:/pa	th or IP:/path		Export / NFS
Advanced Paramete						
* It is recommended	to keep the default va	lues in the fields I	below unchanged	d.		
Override Defa	ault Options					
NFS Version	V3 (defai	ult)	\$			
Retransmissions (	(#)					
Timeout (deciseco	onds)					
					OK Cancel	

Figure 9: Adding a new Storage Domain to a RHEV Data Center.

A single RHEV ISO domain or ISO storage can be shared between multiple RHEV Data Centers. The RHEV host within a Data Center must be able to access the Tintri VMstore via the storage network. Complete the process of adding a new domain for the RHEV Data Center by selecting *OK*. In figure 10, *Data Center: Default* is configured with a RHEV Data Domain and a RHEV ISO domain. If the Data Center does not have an existing ISO storage, the *Attach ISO* option is available. Select and attach an existing ISO storage to share between Data Centers.

Data Centers Clus	sters Ho	osts Netwo	orks Storage	Disks	Virtual Machines	Pools	Templates	Volumes	Users	And in case of the local division of the loc	
New Edit Remove	Force Remove	5 Guide Me	Red Hat Access: S	upport							
Name	Store	age Type	Status		Compatibility Version	Description	i.			Comment	
DCDataCenter	NFS		Up		3.3	My new da	ata center				
📥 Default		1									
Storage Logical	Networks	Network QoS	Clusters	Permissions			_	_			Red Ha
Attach Data Attach ISC	Attach Expo	Network QoS									Red Ha
~	Attach Expo				Free Space	Use	d Space	Tota	al Space	Des	Red Ha
Attach Data Attach ISC	Attach Expo	<b>rt</b> Detach Acti	ivate Maintenance		Free Space 23769 GB		d Space 7 GB		al Space 16 GB		Red Ha

Figure 10: RHEV Data Center with two Storage Domains.

*Tintri650\_store2-2* ISO storage, as shown in figure 11, is shared between 2 Data Centers in this lab. Using a single ISO storage and sharing it between Data Centers allow the ISO images to be efficiently used by the Data Centers without having to recreate duplicate ISO images on multiple ISO domains.

Tintri650_store2-2	ISO			31216 GB
	1			
	-			
4			 	
	7 T		 	
General Data Center	Images Pe	rmissions		
Attach Detach Activate N	laintenance			
Attach Detach Activate M			Domain Status in Da	ta-Center
🔺 DCDataCenter 🛛 🧲	2		Active	
🔺 Default 🛛 🗲			Active	

Figure 11: Tintri NFS submount shared between 2 RHEV Data Centers as an ISO Domain.

Although you can create multiple RHEV Data domains for each RHEV Data Center, we recommend that you create one RHEV Data domain on a Tintri VMstore for each Data Center. This simplifies management of RHEV Data domains for each Data Center.

However, if there are requirements to create more than 1 RHEV Data domain per RHEV Data Center, you can certainly do so and the configuration is supported with Tintri VMstore systems. There are no Tintri VMstore restrictions that will prevent multiple RHEV Data domains for each Data Center.

**DO:** Create one RHEV Data domain per RHEV Data Center. A RHEV-M Data Center admin can take advantage of Tintri VMstore features with a single RHEV Data domain per Data Center to manage images and migration.

There may be some requirements to use a particular ISO storage in a RHEV Data Center. For example, if a RHEV administrator decided to point to a different ISO storage, you must detach the existing RHEV ISO domain from the RHEV Data Center before adding a new ISO domain.

To detach a RHEV storage domain from an existing Data Center, select the Data Centers tab from the RHEV-M UI (see figure 12). Identify and select the Data Center to perform the Storage Domain detach. Select the Storage tab in the bottom pane of the window, right click on the storage domain and set the

domain to maintenance status. Right click on the domain again and select *Detach* to remove it from the existing Data Center. An ISO storage domain can be attached and detached from an existing Data Center without impacting other RHEV Data Centers. If there is such a need to retire any existing RHEV storage, the same process can be used to detach a RHEV Data domain from an older Tintri VMstore and attach a RHEV Data domain from a new Tintri VMstore to the Data Center for system upgrades.

Data Centers Clusters	Hosts Netwo	orks Storage Dis	ks Virtual Machines	Pools Template	es Volumes Use
New Edit Remove For	e Remove 🛛 🔒 Guide Me	Red Hat Access: Support			
Name	Storage Type	Status	Compatibility Version	Description	
<ul> <li>DCDataCenter</li> </ul>	NFS	Up	3.3	My new data center	
Default	NFS				
Storane Lonical Net	numrke Natuurk On S	Clusters Permission	ns		
Storage Logical Ne		Clusters Permissio	ns		
~	tworks Network QoS		ns	_	
~			Free Space	Used Space	Total Space
Attach Data Attach ISO A	attach Export Detach Activ	vate Maintenance		Used Space 7727 GB	Total Space 31216 GB
Attach Data Attach ISO A	Attach Export Detach Activ	vate Maintenance Status	Free Space	a leven better	

Figure 12: Detach RHEV Storage from a RHEV Data Center.

#### Adding ISO images to the ISO Domain

				1		
5 ·		1111111	1-1111-1111-111	1-111111111111 root@HQTM-ADM01 - WinSCP		>
Local Mark Files Commands Session Options Remote Help						
🖶 🔀 📚 Synchronize 📘 🧬 💽 🛞 🗍 Queue 🔹 Trar	nsfer Settings Defaul	t •	2 -			
Vew Session						
🚙 E: New Volume 🔹 🥶 🕎 🛛 🐟 📼 💌 😭 🎓 🌮	9 <sub>0</sub>			📳 1111111-1111 🔹 🚰 🕎   🐟 - 🐟 - 🖹 🔯 🏠 🖓 Find Files 🧏		
🕼 Upload 🎲 🔐 Edit 🗙 🛃 🖏 Properties 📑 🔂 I 🛨 🖂 🕅	0			🔐 Download 🎲   🔐 E🌺 📈 🔂 Properties 📑 🕞 🕞 🗉 🗹		
E:\ISO				/rhev/data-center/mnt/%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%	522/images/11111111-1111-1111-1111-1111	111111
Name Ext *	Size	Туре	Changed	Name Ext	Size	Changed
🗸 🗸		Parent directory	8/8/2014 2:58:04 F	÷0		8/7/2014 10:48:18 4
en_windows_7_enterprise_with_sp1_x64_dvd_u_677651.iso	3,035 MiB	Disc Image File	8/8/2014 2:59:23 F	en_windows_7_enterprise_with_sp1_x64_dvd_u_677651.iso	3,035 MiB	8/8/2014 3:06:57 PM
en_windows_8.1_with_update_x64_dvd_4065090.iso	3,924 MiB	Disc Image File	8/8/2014 3:00:50 F	en_windows_8.1_with_update_x64_dvd_4065090.iso	3,924 MiB	8/8/2014 3:13:52 PM
en_windows_server_2012_r2_with_update_x64_dvd_4065220.iso	4,333 MiB	Disc Image File	8/7/2014 1:29:00 F	en_windows_server_2012_r2_with_update_x64_dvd_4065220.iso	4,333 MiB	8/7/2014 2:37:18 PM
😼 qemu-ga-x64.msi	788 KiB	Windows Installer	4/3/2014 12:36:51	@ rhel-server-6.5-x86_64-dvd.iso	3,675 MiB	8/7/2014 2:28:58 PM
🛐 qemu-ga-x86.msi	736 KiB	Windows Installer	4/3/2014 12:36:52	E rhev-tools-setup.iso	286 MiB	8/7/2014 2:52:30 PM
📧 rhel-server-6.5-x86_64-dvd.iso	3,675 MiB	Disc Image File	8/7/2014 1:28:52 F	RHEV-toolsSetup_3.3_14.iso	286 MiB	8/7/2014 2:54:38 PM
🕏 RHEVM_52998.exe	93,589 KiB	Application	8/5/2014 9:02:22 4	virtio-win-1.6.4_x86.vfd	2,880 KiB	8/7/2014 2:54:43 PM
📧 rhev-tools-setup.iso	286 MiB	Disc Image File	3/18/2014 8:19:08	🕑 virtio-win-1.6.8.iso	118 MiB	8/7/2014 2:54:57 PM
The second se	206 MAD	Disc Image File	3/18/2014 8:19:08	virtio-win-1.6.8_amd64.vfd	2.880 KiB	8/7/2014 2:55:00 Pt
RHEV-toolsSetup_3.3_14.iso	200 IVIID					

Figure 13: Using winSCP to copy ISO images to the ISO Domain.

Using winSCP to copy ISO images from a Windows system to the RHEV ISO domain can sometimes fail to rename the target file. In such cases, rename or move the temporary transfer file using your RHEV host that has access to the ISO domain (see figure 14).

-rw-r--r--. 1 root root 299448320 2014-09-16 00:25 RHEV-toolsSetup\_3.3\_14.iso.filepart
[root@HQTM-AMD01 11111111-1111-1111-11111111111]# mv RHEV-toolsSetup\_3.3\_14.iso.filepart RHEV-toolsSetup\_3.3\_14.iso
[root@HQTM-AMD01 11111111-1111-1111-11111111111]#

Figure 14: Renaming ISO target file names in ISO Storage from a RHEV host.

Selecting the Images tab in the RHEV-M UI of the ISO domain will automatically refresh the image list. You have now successfully populated a RHEV ISO domain with an ISO image using winSCP (see Figure 15).

General Data Center In	nages Permissions		
File Norma	-	Tune	Actual Size
File Name		Туре	Actual Size
en_windows_7_enterprise_with_s	p1_x64_dvd_u_677651.iso	ISO	< 1 GB
RHEV-toolsSetup_3.3_14.iso	<b></b> 1	ISO	< 1 GB

Figure 15: ISO Image in RHEV ISO Storage.

## **RHEV Virtual Machines on Tintri VMstores**

Deploying and configuring a properly racked, powered, and networked Tintri VMstore with RHEV is easy and literally takes minutes. Creating virtual machines with RHEV is also easy. A Linux RHEV-M can be accessed from any supported web browser to manage your RHEV environment. For example, the test lab used for this best practice guide is accessed from a Windows 2008 R2 machine using Internet Explorer. By default, useful RHEV tools are located on the RHEV-M. The two directories within the RHEV-M that has useful tools are:

- /usr/share/rhev-guest-tools-iso
- /usr/share/virtio-win

To use SPICE console for managing your virtual machines with RHEV, the virt-viewer can be downloaded from <u>Virtual Machine Manager</u>.

To configure a VM in RHEV:

- 1. Determine which Cluster the VM will be created in.
- 2. Identify the Operating System
- 3. Determine the Boot Sequence
- 4. Attach the correct ISO version that corresponds with the Operating System (see figure 16).

🝓 New Virtual Mac	hine 🕐		8
General	Cluster	Default/Default	-
System	Based on Template	Blank	-
Initial Run	Operating System	Windows 7 x64	F
Console			_
Host	Optimized for	Desktop	-
High Availability	Boot Sequence:		
Resource Allocation	First Device	CD-ROM	•
Boot Options	Second Device	Hard Disk	-
Custom Properties	Attach CD	en_windows_7_enterprise_witt I	0
Hide Advanced Optio	ons	OK Cance	el

Figure 16: Attach CD to Virtual Machine.

Close the *New Virtual Machine* window by clicking on *OK*. A *New Virtual Machine* – *Guide Me* window pops up. Click on *Configure Virtual Disks* to attach a disk to the virtual machine. In the *Add Virtual Disk* window, determine the following for your virtual disk (see figure 17):

- 1. Size
- 2. Interface: VirtIO
- 3. Allocation Policy: Thin Provision
- 4. Storage Domain:
- 5. Is Bootable:
  - a. Sets the bootable flag on the disk for the OS install on this virtual disk

💁 Add Virtual Disk 💿		8
Attach Disk		
♥ Internal	🛡 External (Direct Lun)	
Size(GB)	70	T Wipe After Delete
Alias	DOM_Disk1	Is Bootable
Description		□ Is Shareable
Interface	VintO	
Allocation Policy	Thin Provision	1
Storage Domain	RHEV2 (23759 GB free of 31216 GE  RHEV2 (23759 GB free of 31216 GB) RHEV2 (23759 GB free of 30000 GB) RHEV2 (23759 GB free of 312)	2
		OK Cancel

Figure 17: Adding Virtual Disk.

Tintri VMstore supports *Allocation Policy: Preallocated* and *Allocation Policy: Thin Provision*. However, preallocated disk provisioning is more expensive and wasteful. A VM with preallocated virtual disk does not necessarily utilize all of the assigned capacity. We recommended that you use *Thin Provision*. If additional disk capacity is required with the virtual disk, power off the VM, deactivate the virtual disk from RHEV-M and extend size as needed for the thin provisioned virtual disk (see figure 18).

📥 Edit Virtual Disk 🕥					
9 Internal	♥ External (Direct Lun)				
Size(GB)	20	Wipe After Delete			
Extend size by(GB)	50	Is Bootable			
Alias	DCW3_Disk1	Is Shareable			
Description					
Interface	VirtIO	<b>1</b>			
Allocation Policy	Thin Provision	*			
Storage Domain	Tintri650 (23710 GB free of 31216	G 💌			
		OK Cancel			

Figure 18: Extend existing Virtual Disk size.

**DO:** We recommend that you use *Allocation Policy: Thin Provision* for virtual disks for space savings and capacity planning purposes.

NOTE: When cloning with Tintri VMstores, Tintri converts thick provisioned disks to thin provisioned.

If you need to expand existing capacity on an active virtual machine, use the RHEV-M *Add Disk* option to add additional thin provisioned virtual disk to the powered up virtual machine (see figure 19). When a new virtual disk has been created, use the *Add* option in the *Virtual Machines* tab to attach the new virtual disk to the virtual machine.

Data Cer	nters Clusters	Hosts	Networks	Storage	Disks	Virtual Mad	chines	Pools
New VM	Edit Remove Ru	un Once 🔺 🚽	🗢 🗏 Migr	ate Cancel Mi	gration Make	Template Export	Create Sna	ipshot
	Name	Host	IP Add	dress	Cluster	Data C	enter	Me
-	DCRH				DC-Cluster	DCDa	taCenter	
-								
	DCRH5	HQTM-AMD	02 XXXXXXX		Cluster2	Defau	lt	D
-	DCW2				Default	Defau	lt	
- 1	DCW3				DC-Cluster	DCDa	taCenter	
-	DCW7-99				DC-Cluster	DCDa	taCenter	
- 🗐	DOM				Default	Defau	lt	
-	RH-4				Default	Defau	lt	
	RH-5	HQTM-AMD	01.XXXXXXXX		Default	Defau	lt	
Genera	Network Int	erfaces D	isks Sna	pshots Ap	olications	Permissions	Session	5
Add Edi	t Remove 🔺 A	ctivate 🤝 Dead	ctivate Move					
O All	Images C D	irect LUN						
Alias		💿 🔛 Virtual	Size Ad	ctual Size	Allocation	Policy Sto	rage Domai	n
A DCR	H2_Disk1	150 GE	- 3	1 GB	Thin Prov	ision Tin	tri650_store	2

Figure 19: Adding Virtual Disk to an existing Virtual Machine.

**DO NOT:** Create more than 10 VMs per physical core. Refer to the <u>Red Hat Enterprise Virtualization</u> <u>Sizing Guide</u> for RHEV recommendation on the recommended number of guests per physical core on a RHEV host.

#### **Installing Drivers and Guest Tools**

Installing SCSI controller drivers for Windows virtual machines are done at OS install phase of a Windows virtual machine. This will allow your Windows virtual machine to detect the unallocated disk volume. With Windows guest virtual machines, you can use the *Change CD* option to switch the ISO image during OS installation to install the required SCSI drivers or use the *Boot Options* in the Run Virtual Machine window to attach a floppy from the ISO domain (see Figure 20).

	Run Virtual Machine(s)      D     - Boot Options
Change CD 🔞	Attach Floppy Attach CD Boot Sequence: Hard Disk CD-ROM Network (PXE)
RHEV-toolsSetup_3.3_14.iso	Run Stateless Start in Pause Mode + Host + Display Protocol
en_windows_7_enterprise_with_sp1_x64_dvd_u_677651.iso en_windows_8.1_with_update_x64_dvd_4065090.iso en_windows_server_2012_r2_with_update_x64_dvd_4065220.iso hel-server-6.5-x86_64-dvd.iso hev-tools-setup.iso	+ Custom Properties
HEV-toolsSetup_3.3_14.iso frio-win-1.6.8.iso	

Figure 20: Using Change CD or Attach Floppy to install RHEV Virtual Machine drivers.

If attempting to install specific SCSI controller driver from the RHEV-toolsSetup ISO image, browse into the subdirectories of the mounted ISO image to find the correct drivers. For example, if the virtual disk is not discoverable during the Windows OS install phase, load the appropriate ISO image and browse into the subfolders for the particular OS version to discover and install the correct device driver (see Figure 21).



Figure 21: Browsing subfolders to install SCSI drivers.

If using the floppy to install the SCSI controller driver, browse into the correct OS folder and click on OK. As shown in figure 22, install the correct SCSI controller drivers and continue with installing the Windows OS on the virtual machine on the discovered disk. The OS install for the Windows virtual machine should complete successfully.

Figure 22: Installing SCSI Controller drivers for Windows OS install.

Once the OS installation is complete, install the rest of the required drivers and agents for your virtual machine. You can also use the RHEV-toolsSetup\_3.3\_14.iso to install the RHEV tools (i.e. network drivers, etc). Run the RHEV-toolssetup to bring up the InstallShield Wizard and install all the drivers and agent tools on the virtual machine (see figure 23).