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Red Hat Enterprise Linux 5 Virtualization in Real Life

Vinny Valdez, RHCA Sr. Product Architect Red Hat Consulting September 3, 2009



Agenda

- Virtualization Benefits Brief
- Red Hat Enterprise Linux 5.{0-3} Virtualization
- Red Hat Enterprise Linux 5.4+ Virtualization
- The Linux Kernel Scalability, Security, Performance
- Real Life Use Cases
- Best Practices
- Managing your Virtualization Infrastructure
- Red Hat Enterprise Virtualization



Virtualization Benefits Brief



Benefits of Virtualization

- Consolidation
- Increased utilization
- Power/Cooling Savings (Green IT)
- Leverage new technologies (FCoE, 10G)
- Rapid provisioning
- Manage risks and minimize costs
- Extend legacy software lifecycle
- Dynamic software fault tolerance
- Hardware fault tolerance through live migration



Red Hat Enterprise Linux 5.{0-3} Virtualization



Xen Virtualization

Red Hat Enterprise Linux 5 includes Integrated virtualization

- Xen Hypervisor
 - Included in 5.0
 - Fully Supported during product lifetime
 - Until at least 2014 (later with Mission Critical program)
 - Using Xen 3.1.2 (with selected backports)
 - Available for x86, x86_64 and IA64
- Red Hat Enterprise Linux Advanced Platform
 - Includes GFS Cluster file system and Red Hat Cluster Suite
 - Unlimited virtualized guests

Red Hat Enterprise Linux 5.4+ Virtualization



Kernel Virtual Machine

- KVM Hypervisor
 - Added in RHEL 5.4
 - Included in bare metal kernel
 - Hypervisor available for **x86_64 only** (guests can be mixed)
 - Requires Intel VT-x (VMX) or AMD AMD-V (SVM)
 - Support for RHEL {3-5} guests, other Linux distros
 - Support for Microsoft Windows Servers guests (Windows Server 2003, 2008), and Windows XP, Windows Vista
 - Paravirtualized drivers for network and disk (WHQL certified)
 - Microsoft SVVP Certification
- Xen will continue to be shipped and supported in RHEL 5.4+ (2014)

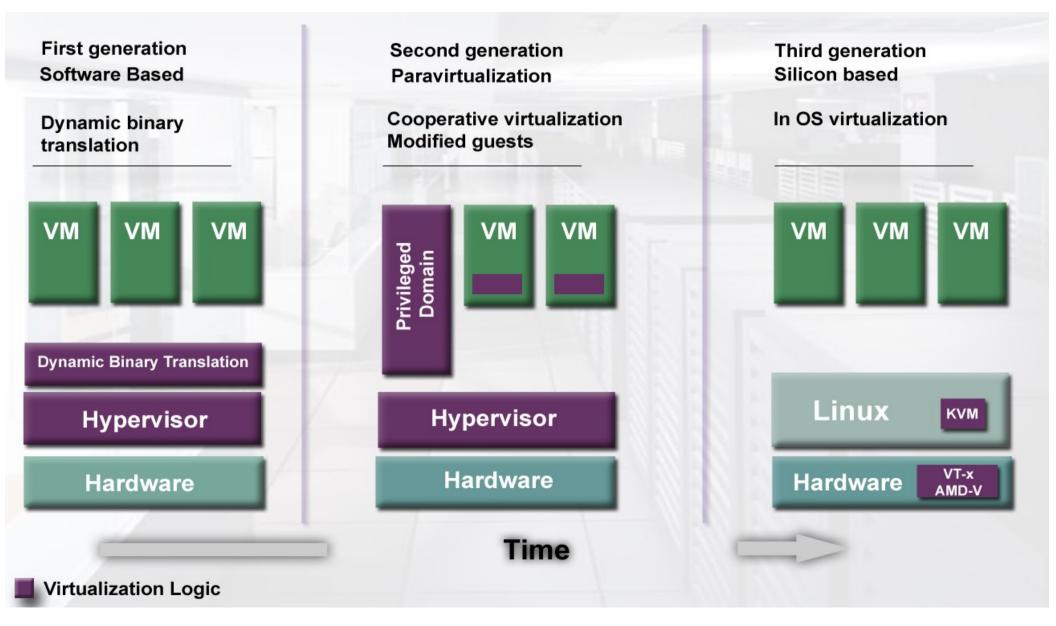


RHEL 5.4 Virtualization

- Support for advanced hardware features for both Xen and KVM
 - VT-d/IOMMU for secure PCI Pass-through
 - SR-IOV for PCI device sharing
 - Hardware assisted virtualization
- Performance and scalability out-of-the-box
- Management compatibility via libvirt
- Virt-tools allow transparent transition
- Tools to transition from Xen to KVM (para or HVM)



Evolution of x86 Virtualization





The Linux Kernel – Scalability, Security, Performance



Virtualization with the Linux Kernel

- All certifications immediately apply
- Performance tuning done as normal kernel process
- Offload work to hardware
- NUMA, huge pages, Kernel Shared Memory, CPU scheduling, power management, SELinux, etc.
- 256 cores, 1TB RAM
- Xen makes sense for some workloads (hardware without virtualization extensions)
- Xen always needs specialized knowledge to code to
- KVM is just another process



Real Life Use Cases



Typical Use Cases

- Training
- Support
- Development/testing/demos
- Leverage new technologies (FCoE, 10G)
- Kiosks
- VDI
- Compatibility
- High Availability for non-cluster-aware Applications
- Cloud Computing



Customer Deployments

- Amazon EC2
- Electronic Arts
- Dreamworks
- Chicago Tribune (RHCS/GFS)
- US Courts (dom0 mount offline LVM for backup)
- Booze-Allen-Hamilton (Innovation Winner 2008)
- What are YOU doing?



Best Practices



Best Practices

- For performance, use pre-allocated disks
- LVM snapshots to quickly clone
- Shared storage (NFS/iSCSI/Fibre) with GFS for ease of management and live migration
- Use symlinks to common config files
- Red Hat Cluster Suite for resilience and fencing
- Use Satellite 5.3 with cobbler/koan for provisioning
- Script live migrations based on utilization
- Use para-virt drivers for best performance on HVM guests



Managing Your Virtualization Infrastructure



libvirt: Stable and Open API

- Management of Hypervisor(s) using standard APIs
- Hypervisor / Platform agnostic
- Stable API for ISV and application developers
 - Isolation from Xen HV instability
 - Isolation from XenD protocol changes
 - Formalized error reporting/handling
- XML definitions for VMs
- Contribution of partners (Fujitsu, SUN, IBM, Scalent, Platform, Enomaly, etc..)
- Core API in C, Python/Perl bindings for scripting
- CLI access via virsh
- Remote management and storage APIs in development
- Addition of CIM capabilities (IBM contribution)





RHEL5 Virt Tools

- Addressing short/mid-term holes in tool suite
 - Focus on "low hanging fruit" tools/capabilities to address common issue
 - Can be CLI or GUI
 - Longer term focus on GUI interface and Virtual Center-like capabilities
 - Tools developed so far
 - "RHEL5 for Dummies" Guide
 - Red Hat Magazine articles
 - Virtualization tools for RHEL5
 - virt-top, top like performance monitoring utility
 - virt-p2v, convert physical instance to virtual machine
 - nagios-virt, integration of virtual machine monitiring into NAGIOS
 - virt-image in progress (to convert VMware images to RHEL5)

RHEL5/Virt Tools (http://et.redhat.com/~jmh/virt-tools/)

- All tools available in Fedora and via EPEL for RHEL
- virt-top
 - Performance monitoring using a 'top' like tool
- virt-p2v
 - Convert physical to virtual instances
- libguestfs / guestfish
 - Library and tools to modify guest images offline
- virt-inspector
 - Generate XML configuration file from existing guest image
- virt-what
 - Determine guest type and hosted Hypervisor
- virt-df
 - 'df' for virtual machines, examine file system usage from Hypervisor
- virt-mem / virt-ps / virt-dmesg / virt-uname etc
 - Tools to inspect running guest from Hypervisor
- Cobbler/Koan (integrated into Satellite 5.3)



virsh

- Exposes libvirt functionality
- Command line administration tool
- Interactive administrator shell (# virsh)
- Scriptable batch operations
- Stable and dependable interface to HV administration
- Distributed with libvirt in Fedora and RHEL5
- Should be used for all interactive/remote/shell/script management tasks
 - Can be used for all management tasks supported by xm(8)
 - Support for remote management via ssh or TLS



virt-manager

- Desktop application for VM management
- Summary view for
 - Running domains
 - Performance & Resource statistics
- Support for domain management
 - Guest Creation, deletion, suspend/resume/start/stop/save/restore
 - Configuration of domain resources
 - vCPUs, Memory, Storage, Network, Bridging
- Live resource utilization graphs
 - CPU, Memory and Networking
- Available in Fedora and RHEL5
- Graphical guest OS console
- Secure console access
- Support for remote management via SSH or TLS





virt-manager

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- Initial Overview window
 - Non-root connections open a read-only connection
 - Connection to localhost and/or multiple remote hosts in parallel
- Host Summary Window
 - List of all running Virtual Machines and resource usage
 - Dynamic hiding/showing of fields
 - Detailed domain information via 'Details' tab
 - Domain console via 'Open' or click onto domain entry
 - Create new virtual machine using the 'New' tab
- Virtual Machine Graphical Console
 - Graphical/serial interface for guest console via VNC for PV and FV
 - Supports authentication Red Hat Summit 2009 | Vinny Valdez





virt-manager

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- Virtual Machine Performance Details
 - Live graphs of various machine and HyperVisor resources
 - Network, CPU, Memory, Disk usage
 - Current view is from the HyperVisor, will include guest OS view
 - Allows CPU time to be broken down to user,system,idle,iowait and nice categories
 - UUID is a globally unique identifier
 - Persistent across migrations
- Virtual Machine Configuration
 - Allows changes to various resources
 - Memory, Virtual CPU count
 - Dynamic tunables for immediate changes
 - Static tunables will be saved and applied during next reboot of virtual machine
 - Network and Storage management (adding/removire)
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virt-manager / Connection & Host Overview

<u>ا</u>	l Open connection						
Hypervisor:	Xen	\$					
Connection:	Remote SSL/TLS with x509 certificate	¢					
Hostname:	foobar						
	Cancel Co <u>n</u> ne	ct					

		He	st Detail	S		
р						
w Virtual Ne	etworks					
details						
onnection: xe	en+tls://t	ouzz/				
lostname: bu	JZZ					
ypervisor: xe	en					
Memory: 8.	00 GB					
ical CPUs: 8						
hitecture: x8	36_64					
rmance						
CPU usage:						0 %
mory usage:						7.75 GB of 8.00 GB
	details onnection: xe lostname: bu ypervisor: xe Memory: 8. ical CPUs: 8 chitecture: x8 rmance	Virtual Networks details onnection: xen+tls://l lostname: buzz ypervisor: xen Memory: 8.00 GB ical CPUs: 8 thitecture: x86_64 rmance CPU usage:	p Virtual Networks details onnection: xen+tls://buzz/ lostname: buzz ypervisor: xen Memory: 8.00 GB ical CPUs: 8 chitecture: x86_64 rmance CPU usage:	p Virtual Networks details onnection: xen+tls://buzz/ lostname: buzz ypervisor: xen Memory: 8.00 GB ical CPUs: 8 chitecture: x86_64 rmance CPU usage:	p Virtual Networks details onnection: xen+tls://buzz/ lostname: buzz ypervisor: xen Memory: 8.00 GB ical CPUs: 8 chitecture: x86_64 rmance CPU usage:	p Virtual Networks details onnection: xen+tls://buzz/ lostname: buzz ypervisor: xen Memory: 8.00 GB ical CPUs: 8 chitecture: x86_64 rmance CPU usage:



virt-manager / VM Overview

81	Virtual M	achine Manage	er (Xen: wood	lie)	
<u>F</u> ile	<u>E</u> dit <u>V</u> iew <u>H</u> elp				
			<u>V</u> iew:	All virtual	mad
ID	Name	▼ Status	CPU usage	VCPUs	Me
-	CaneRHEL	🕢 Shutoff	0.00 %	16	2.0
0	Domain-0	🕢 Running	6.09 %	. 4	2.0
-	FreeBSD	👩 Shutoff	0.00 %	1	500
-	HastaVista	👩 Shutoff	0.00 %	1	102
-	HastaVista64	👩 Shutoff	0.00 %	1	102
-	NetBoot	👩 Shutoff	0.00 %	1	102
-	OEL5x86_64	👩 Shutoff	0.00 %	1	2.0
-	OpenSOLfv	👩 Shutoff	0.00 %	1	102
-	OracleVM-Manager	👩 Shutoff	0.00 %	1	102
46	OracleVM-Server	🕢 Running	0.09 %	1	2.0
-	TulsaRHEL	👩 Shutoff	0.00 %	4	2.0
-	VMwareVC	🕢 Shutoff	0.00 %	1	2.0
2	WinXP	🕢 Running	0.02 %	1	519
-	WinXPpv	🕢 Shutoff	0.00 %	1	512
•					
		Pele	ete 🚺 🚱 <u>N</u> ew	D C D	e <u>t</u> ails

1	Virt	ual Machine Man	ager				JX
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>H</u> elp							
			<u>V</u> iew	: All vir	tual machine	5	\$
Name 🔻	ID	Status	CPU usage	VCPUs	Memory usa	ge	A
▼ buzz	xen	Active	0.33 %	8	7.75 GB	96 %	
Domain-0	0	🕢 Running	4.50 %	8	14.75 GB	92 %	
rhel4u4fvpv	-	🔬 Shutoff	0.00 %	4	4.00 GB	0 %	
rhel4u5x86_64PV	-	🔬 Shutoff	0.00 %	4	4.00 GB	0 %	
rhel52pv	-	🔬 Shutoff	0.00 %	2	512.00 MB	0 %	
vBlade5	-	🔬 Shutoff	0.00 %	1	512.00 MB	0 %	Н
localhost	xen	Disconnected	0.00 %	0	0.00 MB	0 %	
▽ woodie	xen	Active	4.54 %	8	15.76 GB	98 %	
CaneRHEL	-	👩 Shutoff	0.00 %	16	2.00 GB	0 %	
Domain-0	0	🕢 Running	3.46 %	8	14.75 GB	92 %	
HastaVista	-	👩 Shutoff	0.00 %	1	1024.00 MB	0 %	
HastaVista64	-	👩 Shutoff	0.00 %	1	1024.00 MB	0 %	
NetBoot	-	👩 Shutoff	0.00 %	1	1024.00 MB	0 %	
OEL5x86_64	-	👩 Shutoff	0.00 %	1	2.00 GB	0 %	
OracleVM-Manager	-	👩 Shutoff	0.00 %	1	1024.00 MB	0 %	
OracleVM-Server	-	🔬 Shutoff	0.00 %	1	2.00 GB	0 %	
TulsaRHEL	-	👩 Shutoff	0.00 %	4	2.00 GB	0 %	
VMwareVC	-	🔬 Shutoff	0.00 %	1	2.00 GB	0 %	
WinXP	-	👩 Shutoff	0.00 %	1	512.00 MB	0 %	
WinXP64bit	-	🔬 Shutoff	0.00 %	1	1024.00 MB	0 %	
WinXPpv	-	🔬 Shutoff	0.00 %	1	512.00 MB	0 %	•
		9	elete 🚱 Ne	w 🧳	Details	<u>()</u> ре	n

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virt-manager / Host Details

Host Details	
<u>File</u> <u>H</u> elp	
Overview Virtual Networks	Host Details
Basic details Hostname: woodie Hypervisor: Xen Memory: 16.00 GB Logical CPUs: 8 Architecture: x86_64 Performance	File Help Overview Virtual Networks dummy12 Basic details dummy11 Image: 000000000000000000000000000000000000
CPU usage:	dummy5 State: Active dummy5 Autostart: On boot dummy6 IPv4 configuration Network: 10.1.12.0/24
Memory usage: 7.02 GB of 16.00 GB	dummy15 DHCP start: 10.1.12.128 dummy2 DHCP end: 10.1.12.254 Forwarding: NAT to physical device peth0
	♣ Add Pelete Start Start



virt-manager / Resource Management PV Guest

rhel51pvOVM Virtual Machine Details		
Virtual <u>M</u> achine <u>V</u> iew <u>H</u> elp		
Run Pause Shutdown		
Overview Hardware	rhel51pvOVM Virtual Machine Details	
Processor CPUs How many virtual CPUs should this machine be allocated? Current allocation: 4 Change allocation: 4	Virtual Machine View Help II III Run Pause Shutdown Overview Hardware	
Disk xvdd Maximum allocation: 4 Total CPUs on host machine: 8	Processor Memory How much memory should this machine be allocated? Current allocation: 499 MB	
Disk xvda Disk xvda i CPUs should be less than (or equal to) the number of physical CPUs on the host system.	Memory Change allocation: 499 MB Maximum allocation: 2048 MB	
Disk xvdb	Disk xvdd Total memory on host machine: 16382 MB	
NIC eth0	Disk xvdb	
NIC eth1	NIC eth0	
♣ <u>A</u> dd	NIC eth1	
		✓ <u>А</u> рріу



virt-manager / Hardware Management

Guest hardware resources

rhel51pvOVM Virtual Machine Details		
Virtual <u>M</u> achine <u>V</u> iew <u>H</u> elp		
Run Pause Shutdown		
Overview Hardware	Virtual <u>M</u> achine <u>V</u> iew <u>H</u> elp	
Memory Virtual Network Interface Source type: bridge	II Image: Constraint of the second	
Disk xvdd Source device: xenbr0 Target device: eth1	Overview Hardware	
Disk xvda MAC address: 00:16:3e:76:a9:02 ① Tip: 'source' refers to information seen from the home	Dick world	
Disk xvdb	Disk xvdd Target type: disk Target device: xvdd	
NIC eth0	Image: Source of the second	
NIC eth1	NIC eth0	
NIC eth2	NIC eth1	
<u>♣ A</u> dd	NIC eth2	
	<u>♣ A</u> dd ■ <u>R</u> er	nove



virt-manager / Hardware Management

Guest hardware resources

Add new virtual hardware	
Adding new virtual hardware	
This assistant will guide you through adding a new piece of virtual hardware. First select what type of hardware you wish to add:	Add new virtual hardware
Hardware type: Storage device	Please indicate how you'd like to assign space on this physical host system for your new virtual storage device.
Network card	Partition: Browse Example: /dev/hdc2
	Simple File:
	File Location: Browse
	File <u>S</u> ize: 0 MB
X Cancel ABack	✓ Allocate entire virtual disk now? ▲ Warning: If you do not allocate the entire disk at VM creation, space will be allocated as needed while the guest is running. If sufficient free space is not available on the host, this may result in data corruption on the guest.
	Second Se



virt-manager / Hardware Management

Guest hardware resources

Add new virtual hardware			
Connect to host network			
Please indicate how you'd like to connect your new virtual network device to the host network.			
O <u>V</u> irtual network	Connect t	o host network	
Network: dummy12 \$ Image: Choose this option if your host is disconnected, connected	virtual network de	w you'd like to connect your new vice to the host network.	
 via wireless, or dynamically configured with NetworkManager. Shared physical device 	 Virtual network 		
Device: xenbr0	<u>N</u> etwork: Tip: Chyvia wire	dummy12 dummy11	
Tip: Choose this option if your host is statically connected to wired ethernet, to gain the ability to migrate the virtual system.	○ <u>S</u> hared physi	dummy5 dummy6	
	<u>D</u> evice:	dummy15	
	🤤 Tip: Ch wired e	dummy2	
		dummy16	
★ <u>C</u> ancel ★ <u>B</u> ack ★ <u>F</u> orward		dummy9	
		dummy8	
		dummy3	
		dummv10	ird



virt-manager / Resource Management HVM Guest

1		rhel3u9x86pvtest Virtual Machine Details						
Virtual <u>M</u> ac	hine <u>V</u> iev	w <u>H</u> elp						
►	11	•						
Run	Pause	Shutdown						
Overview	Hardware							
Basic de	tails			1		rheli	3u9x86pvtest Virtual Machine Details	_ 🗆 🗙
Name:	rhel3u9x8	брvtest		Virtual <u>M</u> ac	hine <u>V</u> iev	v <u>H</u> elp		
UUID:	39082041	-950e-9f88-8cb5-5ae1c0782482		•	п	Ø		
Status:	Running			Run	Pause	Shutdow	vn	
Perform	ance			Overview	Hardware			
CPU	usage:		0 %	Processor Memory Disk hda Disk xvdb			CPUs How many virtual CPUs should this machine be allocated? Current allocation: 2 Change allocation: 2 Maximum allocation: 2 Total CPUs on host machine: 8 Tip: For best performance, the number of virtual	
				NIC eth0			CPUs should be less than (or equal to) the number of physical CPUs on the host system.	
					♣ <u>A</u> dd		✓ A	7bblà

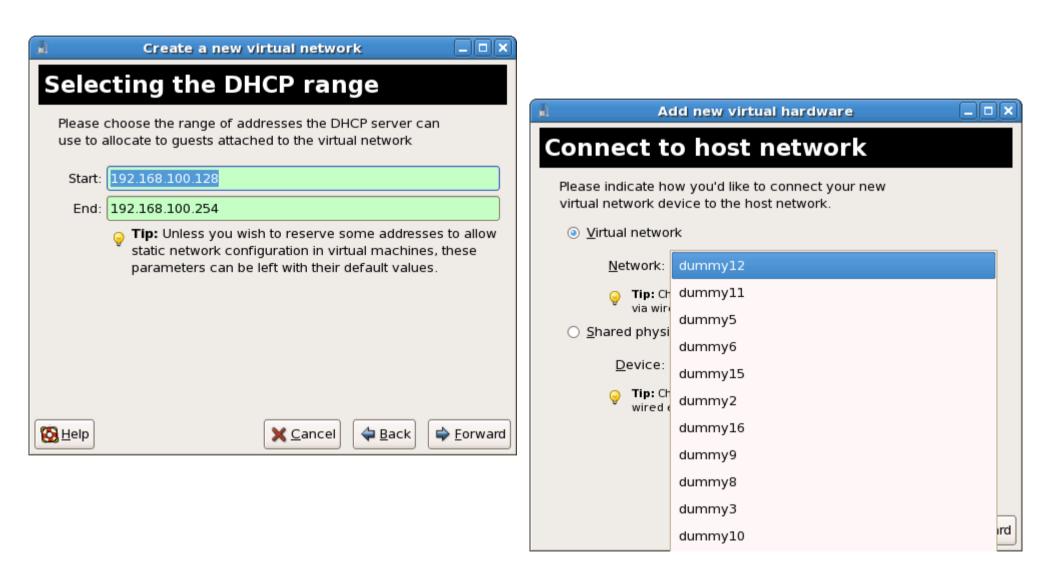


virt-manager / Virtual Network Management HyperVisor

Create a new virtual network	Create a new virtual network
Creating a new virtual network	Naming your virtual network
 This assistant will guide you through creating a new virtual network. You will be asked for some information about the virtual network you'd like to create, such as: A name for your new virtual network The IPv4 address and netmask to assign The address range from which the DHCP server will allocate addresses for virtual machines Whether to forward traffic to the physical network 	Please choose a name for your virtual network: Network <u>N</u> ame: AMDvnet1 Example: network1
Melp ★ Cancel Sack Forward	Image: Back Image: Back Image: Back Image: Back



virt-manager / Virtual Network Management HyperVisor



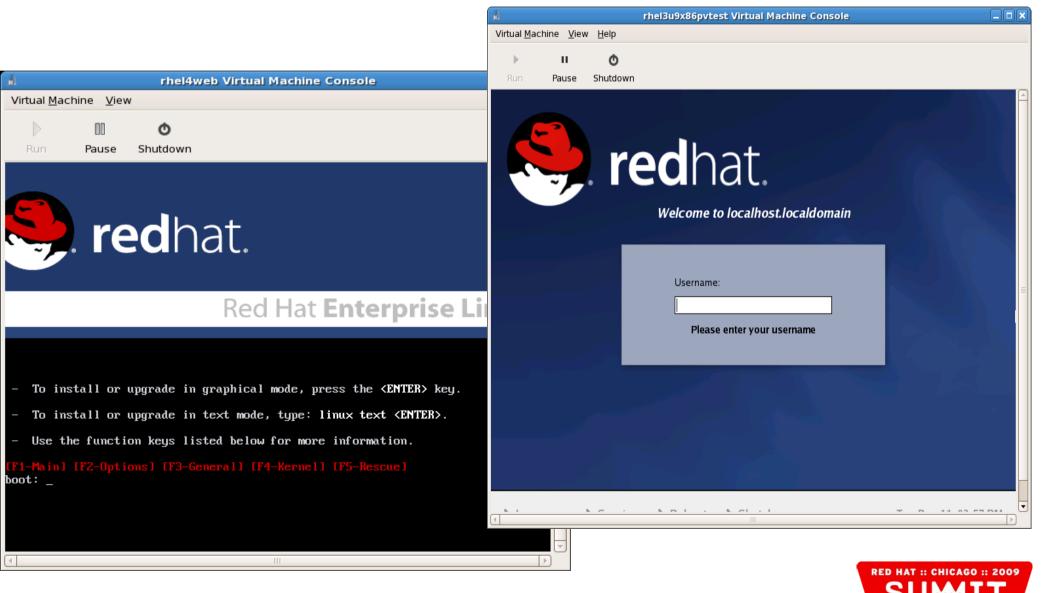


virt-manager / Virtual Network Management HyperVisor

i Cr	eate a new virtual network	
Connecti	ng to physical network	
	whether this virtual network ected to the phyiscal network.	Create a new virtual network
 Isolated virt Forwarding 	ual network to physical network	Ready to create network
Desination:	NAT to any physical device	Summary
	NAT to physical device peth0	Network name: AMDvnet1
	NAT to physical device eth1	IPv4 network
		Network: 192.168.100.0/24
		Gateway: 192.168.100.1
		Netmask: 255.255.255.0
		DHCP
		Start address: 192.168.100.128
		End address: 192.168.100.254
🙆 <u>H</u> elp	X Cancel ♀ Back ♀ Forward	Forwarding
		Connectivity: NAT to any physical device
		🔯 Help 🛛 🗶 Cancel 🗇 Back 🔯 Einish

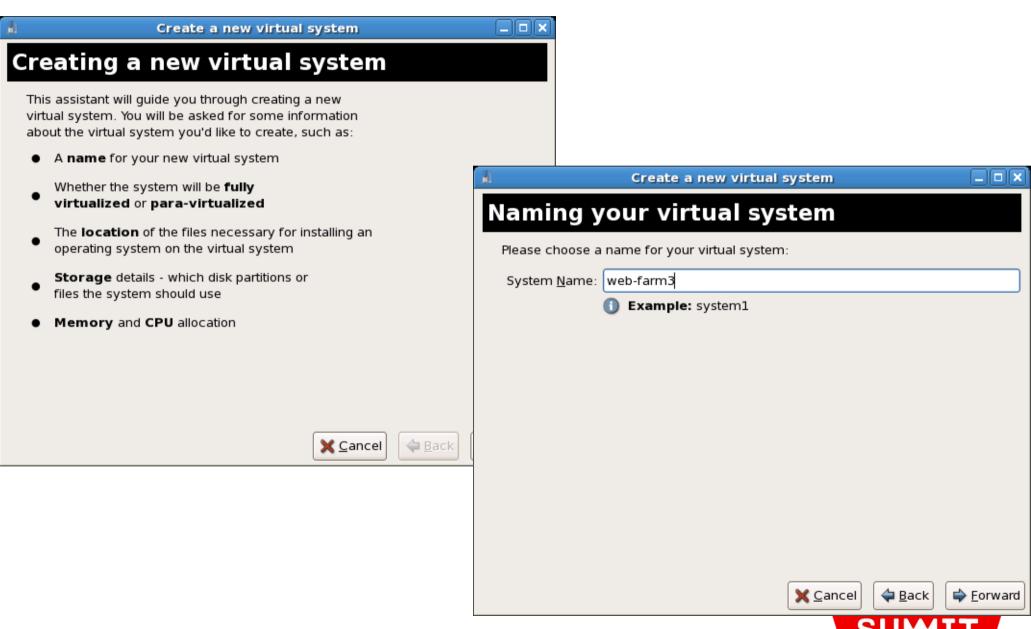


virt-manager / Console Window Guest



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virt-manager / VM Creation Wizzard

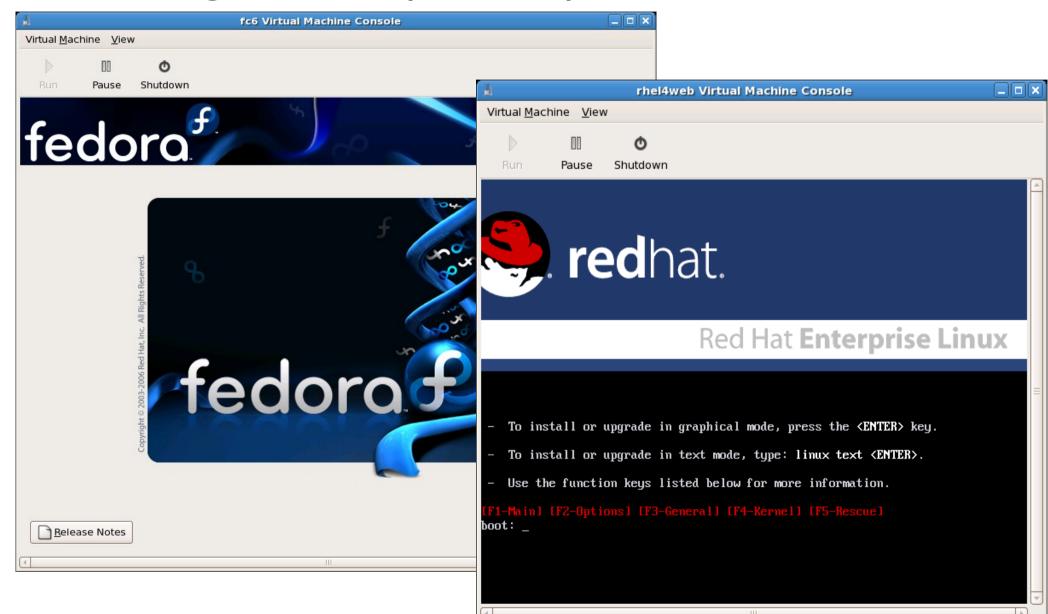


virt-manager Install Wizard (Resources)

Create a new v	virtual system		c	Create a new virtual system	
Assigning storage s	pace	A	llocate m	emory and CPU	
Please indicate how you'd like to assig host system for your new virtual syste used to install the virtual system's ope Normal Disk <u>P</u> artition: P <u>a</u> rtition: () Example: /dev/hdc2	em. This space will be erating system. Browse		specify the maxim able to use, and o Total memory on VM	nemory configuration for this VM. You can num amount of memory the VM should be ptionally a lower amount to grab on startup. host machine: 2046 GB 1 <u>M</u> ax Memory: 500	
 Simple File: File Location: /xen/web-farm3.img File Size: 3200 MB Note: File size param Tip: You may add additional storage, in mounted storage, to your virtual system created using the same tools you would be same tools you woul	Connect to host Please indicate how you'd like new virtual system to the host © Virtual network Network: private © Tip: Choose this optio via wireless, or dynam O Shared physical device Device: © Tip: Choose this optio	new virtual system network to connect your	should start up wi	number of virtual CPUs this VM ith. ical host CPUs: 2 <u>V</u> CPUs: 6 erformance, the number of virtual CPUs should be le o) the number of logical CPUs on the host system. (* Back	
40	Bed Hat Su	× ⊆ancel (RED HAT :: CHI	ICAGO :: 2009



virt-manager Install (console)





KVM virt-manager (Hardware Selection)

🖬 Create a new virtual system						
Choosing a virtualization method						
You will need to choose a virtualization method for your new system:		Create a new virtual system 📃 🗆 🗙				
O <u>P</u> aravirtualized:		ocating installation media				
Lightweight method of virtualizing machines. Limits operating system choices because the OS must be specially modified to support paravirtualization. Better performance than fully virtualized systems. Fully Virtualized: Involves hardware simulation, allowing for a greater range of operating systems (does not require OS modification). Slower than paravirtualized systems. CPU architecture: i686 \$ Enable kernel / hardware acceleration 		Please indicate where installation media is available for the operating system you would like to install on this fully virtualized virtual system: ISO Image Location: ISO Location: Browse O CD-ROM or DVD: Path to install media: WXHOEM_EN \$				
		Please choose the type of guest operating system you will be installing:				
		OS Type: Microsoft Windows				
Sancel 👰 Back	<u>E</u> orward	OS ⊻ariant: Windows XP 🔹				
		Sancel Back Forward				



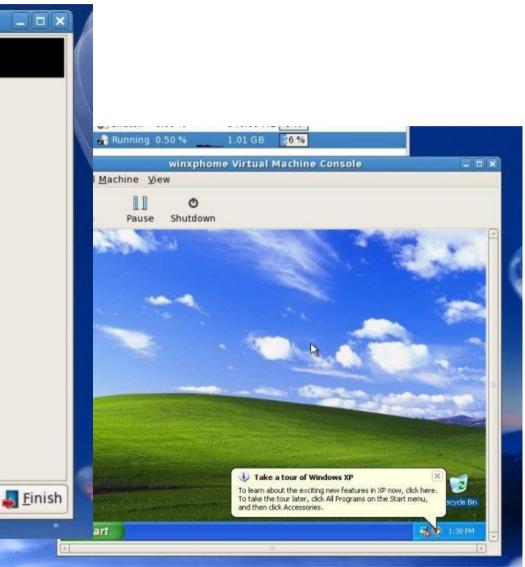
KVM virt-manager (Storage/Resource Selection)

	torage space	physical	A .	Create a new virtua	l system	
host system for your	new virtual system. This space w tual system's operating system.		Allo	cate memory and ory:	CPU	
Partition: Simple File:		Browse	Plea can sho gra will	ase enter the memory configuration specify the maximum amount of m uld be able to use, and optionally a l b on startup. Warning: setting VM m cause out-of-memory errors in your	emory the VM ower amount to emory too high host domain!	
File Size: Warning: If you do be allocated as nee is not available on ti Tip: You may add ad storage, to your virtu	<pre>/home/phoronix/winxp1 4800 → MB Allocate entire virtual disk nor not allocate the entire disk at VM creati eded while the guest is running. If suffici he host, this may result in data corruption iditional storage, including network-moutual system after it has been created use id on a physical system. </pre>	W? on, space will V ent free space on on the guest. E nted	rca /: A CPUs Ple sho	al memory on host machine: 3.83 G VM <u>M</u> ax Memory (MB): 1033 VM <u>S</u> tartup Memory (MB): 1033 : ase enter the number of virtual CPU ould start up with. Logical host CPUs: 8 <u>V</u> CPUs: 1 Tip: For best performance, the number of than (or equal to) the number of logical CPU	Js this VM	



KVM virt-manager (Summary)

Create a new virtual system _ 0 × **Ready to begin installation** Summary: Machine name: winxphome Virtualization method: Fully virtualized **Operating System:** Windows XP Installation source: /dev/scd0 **Kickstart source: Disk image:** /home/phoronix/winxp1 Disk size: 4800 MB Maximum memory: 1033 MB Initial memory: 1033 MB Virtual CPUs: 1 Press finish to create a new virtual machine with this configuration & display the virtual console.





Back

S Cancel

Management Best Practices

- As of RHEL5.2 remote management via virt-manager/virsh
 - Can implement a "virtual appliance" style management instance
 - Can trigger live migration from remote, as well as all other virsh commands
- Can consolidate all management interfaces for virtualization and clustering onto a single management "appliance"/host
- If clustering is deployed use a bonded network interface for the cluster traffic and "virtualization" (live migration) traffic
 - Currently the clustering software assumes the network associated to the hostname is used for cluster and "virtualization" traffic
- Even if no clustering is used it is recommended to use a dedicated network for migration traffic (and use at least a GbE connection)



You need a centralized UI?



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SUMIT

Red Hat Enterprise Virtualization



Red Hat Enterprise Virtualization Manager

	Logged in user: rhevadmin Sign o	ut Configure About	/						
Search: Vms:					× ★	GO			
Bookmarks Tags	Data Centers Clusters	Hosts Storage	Virtual Machines	Pools	Templates Us	sers 🖹 Events	Monitor		
New Edit Remove	New Server New Desktop Edit Remove Run Once 🕨 💷 🖳 Migrate Make Template Custom Actions 🕶 Assign tags								
	Name	Cluster	Host	IP Address	Memory CPU	Network Display	Status		
	RHEL-53	📼 Default	New		0% 0%	0%	Down		
	Window-2003	📼 Default	station: Edit	1		1% VNC	Up		
	Windows-XP	i Default	Rem	iove	0% 0%	0%	Down		
	4		Stop Migr Make Run	t down					
	General Network Interface	es Virtual Disks Snaps					History		
	Create Preview Commit Undo	es virtual Disks Shaps	Char	nge CD 🛛 🕨			- nistory		
	 June, 2009 Tir Su Mo Tu We Th Fr Sa 	me Description		Disks I	Installed Application	18			
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Red Hat Enterprise Virtualization Hypervisor

Scalability

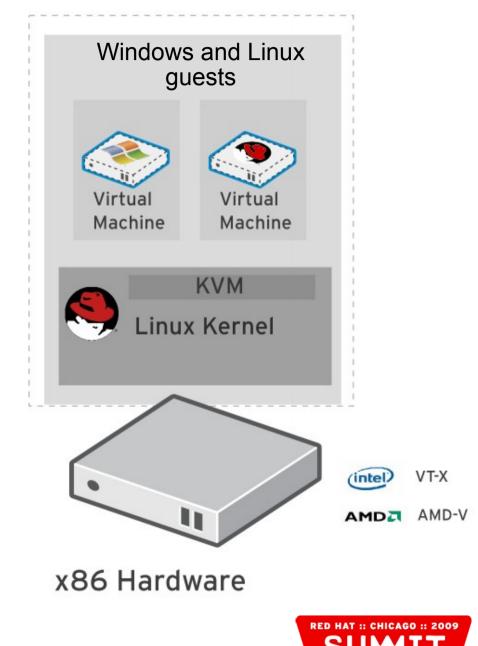
- Host: 96 cores, 1 TB RAM
- Guest: 16vCPU, 64 GB RAM

Industry Standards

- Trusted RHEL kernel + KVM
- High performance VirtIO drivers
- Libvirt management interface

Advanced Features

- Memory Page sharing
- SELinux for high security and isolation
- Live migration
- Snapshots
- Thin provisioning

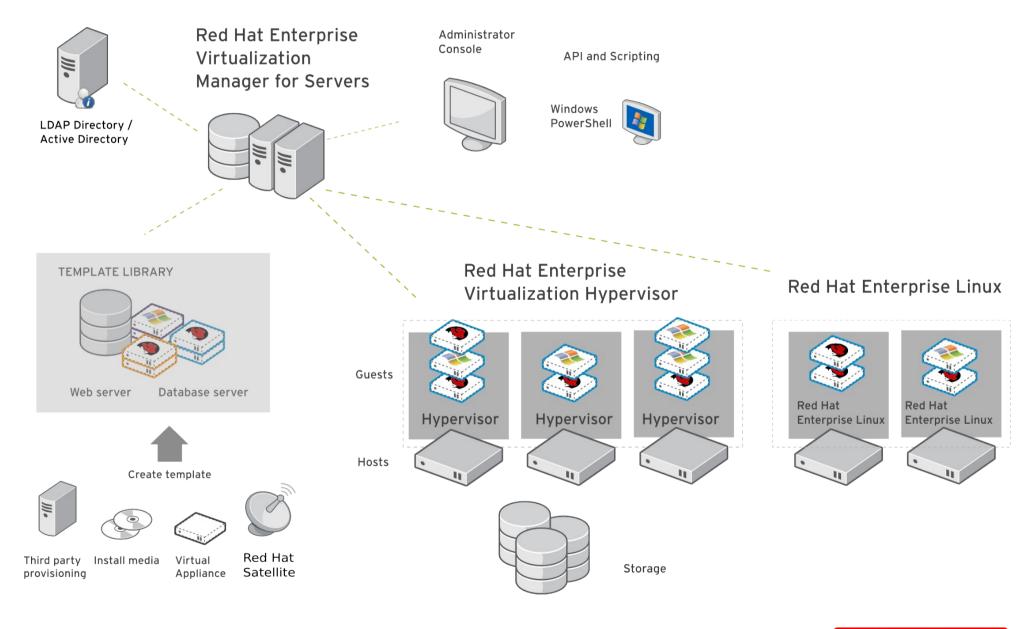


SUMIT

RHEV Server Virtualization



Red Hat Enterprise Virtualization - Servers

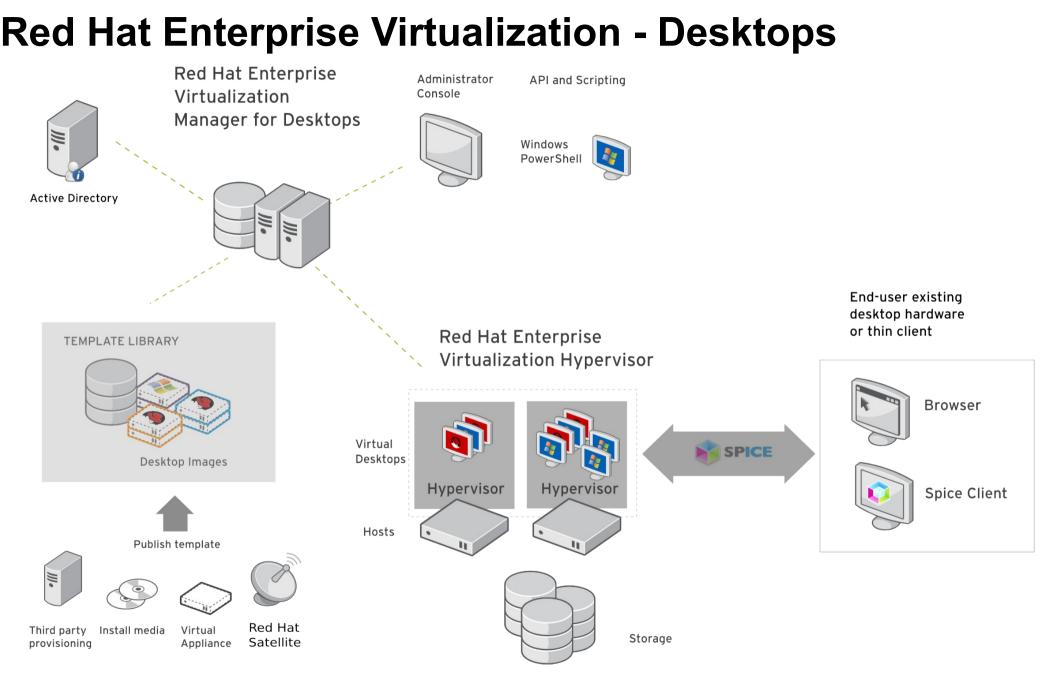




SUMIT

RHEV Desktop Virtualization







QUESTIONS?

TELL US WHAT YOU THINK: REDHAT.COM/SUMMIT-SURVEY