

December 9th 2011
PTA - Passenger Terminal Amsterdam
#osc2011



Maximize Value from Cloud, Mobile and Social strategies with Open Source

Red Hat Enterprise Virtualization 3.0 – What, Why and How-to
Koen C. van Bakel, Solution Architect Virtualization, Red Hat



December 9th 2011 - PTA - Passenger Terminal Amsterdam

RED HAT ENTERPRISE VIRTUALIZATION

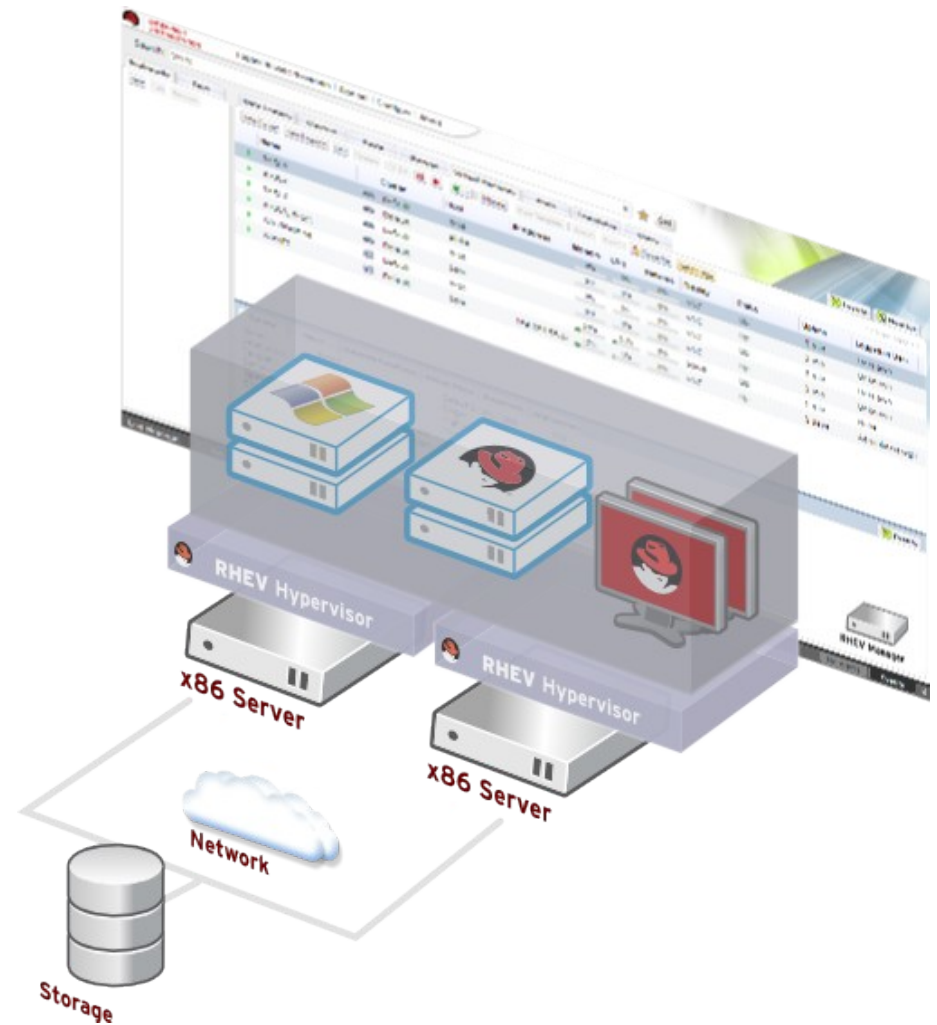
RHEV

Enterprise grade, centralized management and hypervisor for server and desktop virtualization

Industry leading performance, scalability and security infrastructure

Ecosystem of thousands of hardware and software vendors

50–70% lower cost compared to other solutions



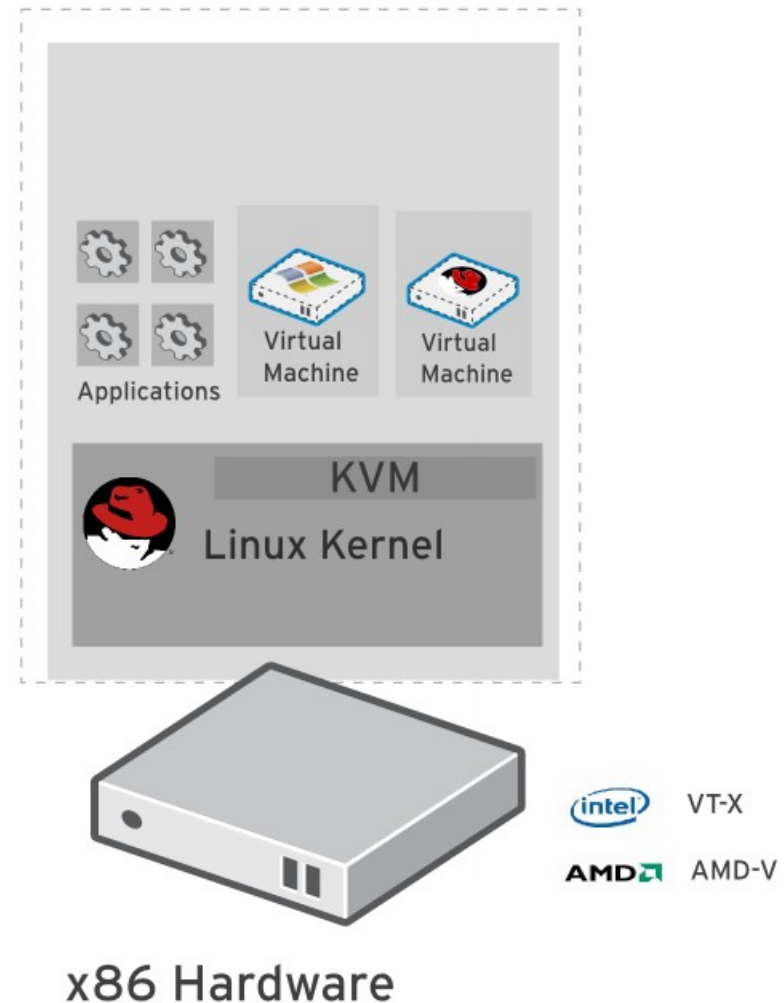
RED HAT ENTERPRISE VIRTUALIZATION PRODUCT RELEASES

- **Qumranet Solid ICE**
Released in May 2008
- **Red Hat Enterprise Virtualization 2.1**
Released in November 2009
 - Enterprise grade server management system
- **Red Hat Enterprise Virtualization 2.2**
Released in June 2010
 - Added Virtual Desktop Infrastructure with SPICE
 - OVF Import/Export
 - V2V converter for VMware and Xen
 - Improved performance and scalability
- **Red Hat Enterprise Virtualization 3.0**
 - RHEV-M/Linux backend, RHEL 6.x KVM, Usability, integration & customization features, SPICE



RED HAT ENTERPRISE VIRTUALIZATION KERNEL-BASED VIRTUAL MACHINE (KVM)

- Included in Linux kernel since 2006
- Runs Linux, Windows and other operating system guests
- Advanced features
 - Live migration
 - Memory page sharing
 - Thin provisioning
 - PCI Pass-through
- KVM architecture provides high “feature-velocity” – leverages the power of Linux



RED HAT ENTERPRISE VIRTUALIZATION LINUX AS A HYPERVISOR?

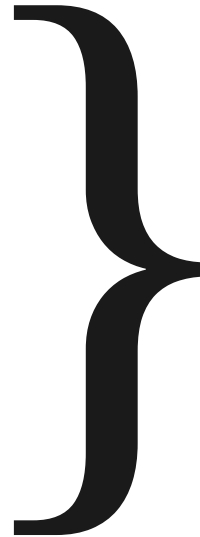
- What makes up a hypervisor ?
 - Hardware management
 - Device drivers
 - I/O Stack
 - Resource Management
 - Scheduling
 - Access Control
 - Power Management
 - Memory Manager
 - Device Model (emulation)
 - Virtual Machine Monitor



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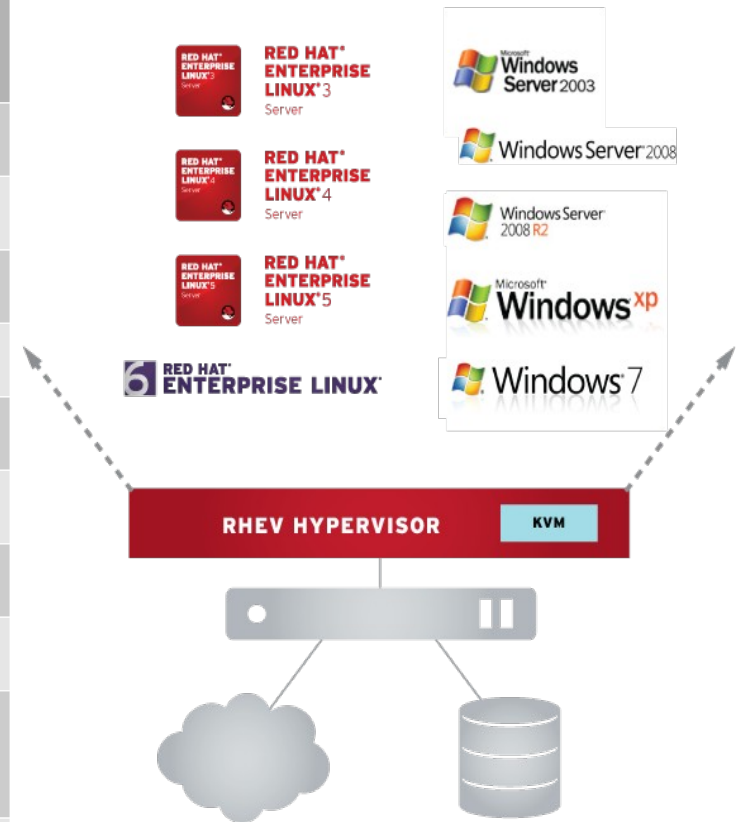


Operating System Kernel



RED HAT ENTERPRISE VIRTUALIZATION

	RHEV 2.2	RHEV 3.0 Support limit	RHEV 3.0 Theoretic al Limit
Host			
CPU's	96	160	4096
Memory	1TB	2TB	64TB
Guest			
CPU	16	64	64
Memory	256GB	256GB	64TB
RHEV Manager			
Max Hosts	100	200	> 400



RED HAT ENTERPRISE VIRTUALIZATION SECURITY

RHEV inherits the security features of Linux and RHEL

SELinux security policy infrastructure

Provides protection and isolation for virtual machines and host

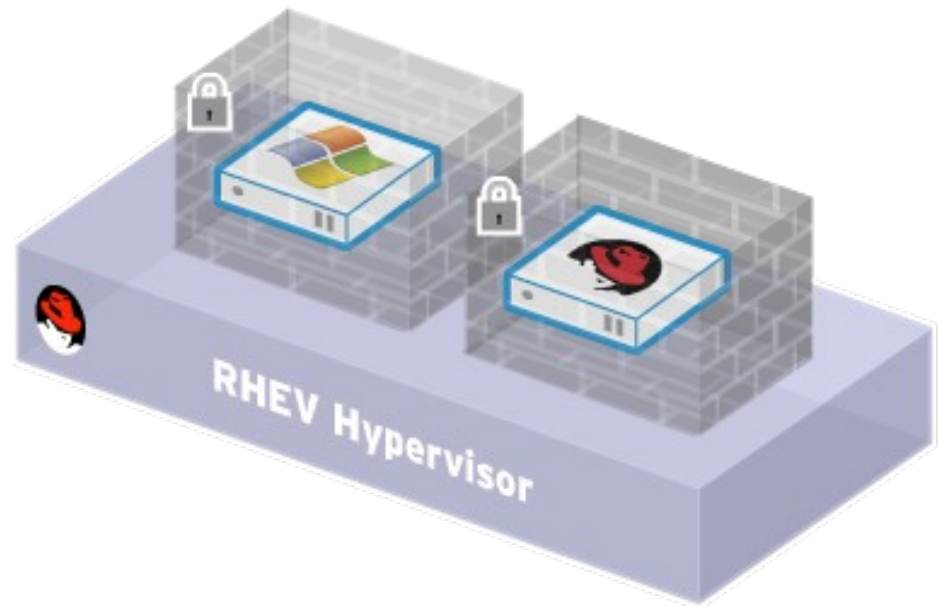
Compromised virtual machine cannot access other VMs or host

sVirt Project

Sub-project of NSA's SELinux community. Provides “hardened” hypervisors

Multilevel security. Isolate guests

Contain any hypervisor breaches



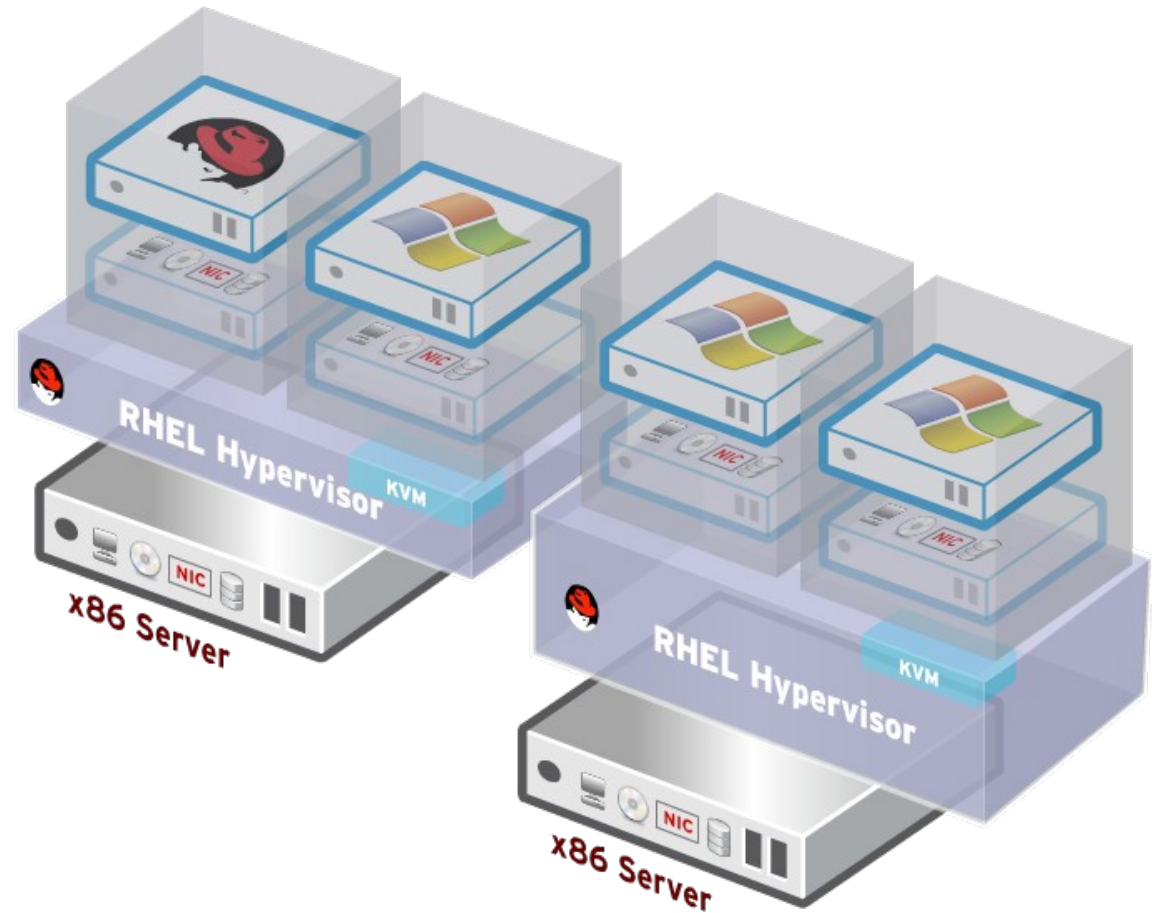
RED HAT ENTERPRISE VIRTUALIZATION HYPERVISOR & RED HAT ENTERPRISE LINUX

RHEV-HYPERVISOR:

- Less than 100 MB
- Economically ideal for Windows guests, or mixed workloads (RHEL + Windows).
- Pre-configured, no Linux skills needed.

RHEL AS A HYPERVISOR:

- Flexible
- Security hardened, corporate standard RHEL image as a virtualization host.
- Add monitoring agents, scripts etc. Leverage existing RHEL infrastructure.
- Economically ideal for RHEL guests.
- Hybrid mode capable



RED HAT ENTERPRISE VIRTUALIZATION FEATURES

Feature	Description
High Availability	Restart guest VMs from failed hosts automatically on other hosts
Live Migration	Move running VM between hosts with zero downtime
System Scheduler	Continuously load balance VMs based on resource usage/policies
Power Saver	Concentrate virtual machines on fewer servers during off-peak hours
Maintenance Manager	No downtime for virtual machines during planned maintenance windows. Hypervisor patching
Image Management	Template based provisioning, thin provisioning and snapshots
Monitoring & Reporting	For all objects in system – VM guests, hosts, networking, storage etc.
OVF Import/Export	Import and export VMs and templates using OVF files
V2V	Convert VMs from VMware and RHEL/Xen to RHEV



RHEV 3.0 - RHEV MANAGER

ENTERPRISE VIRTUALIZATION

Logged in user: rhevadmin | Sign out | Configure | About | Guide

Search: Host:

Expand All Collapse All

Tree

- System
 - Default
 - Storage
 - ISO
 - Data
 - Clusters
 - Default
 - Hosts
 - alpha
 - beta
 - gamma

Bookmarks

Tags

Data Centers Clusters **Hosts** Storage Virtual Machines Pools Templates Users Even Monitor

New Edit Remove Activate Maintenance Approve Configure Local Storage Power Management Assign tags << Prev Next >>

Name	Host/IP	Cluster	Status	Load	Memory	CPU	Network	Spm Status
alpha	alpha.rhev.lab.e	Default	Up	1 VMs	13%	0%	0%	SPM
beta	beta.rhev.lab.er	Default	Up	1 VMs	12%	0%	0%	None
gamma	gamma.rhev.lab	Default	Up	0 VMs	3%	0%	0%	None

General Virtual Machines Network Interfaces Host Hooks Permissions Events

OS Version:	RHEL - 6Server - 6.1.0.1.el6	Active VMs:	1	Physical Memory:	26041 MB
Kernel Version:	2.6.32 - 128.el6.x86_64	Memory Page Sharing:	Active	Physical Memory - Free:	22921 MB
KVM Version:	0.12.1.2 - 2.153.el6	Automatic Large Pages:	Off	Swap Size:	24095 MB
VDSM Version:	2.3.0.57	Number of CPUs:	16	Swap Size - Free:	24095 MB
SPICE Version:	0.8.0 - 1.el6	CPU Name:	Intel Nehalem Family	Shared Memory:	0%
iSCSI Initiator Name:	iqn.1994-05.com.redhat:c66	CPU Type:	Intel(R) Xeon(R) CPU		

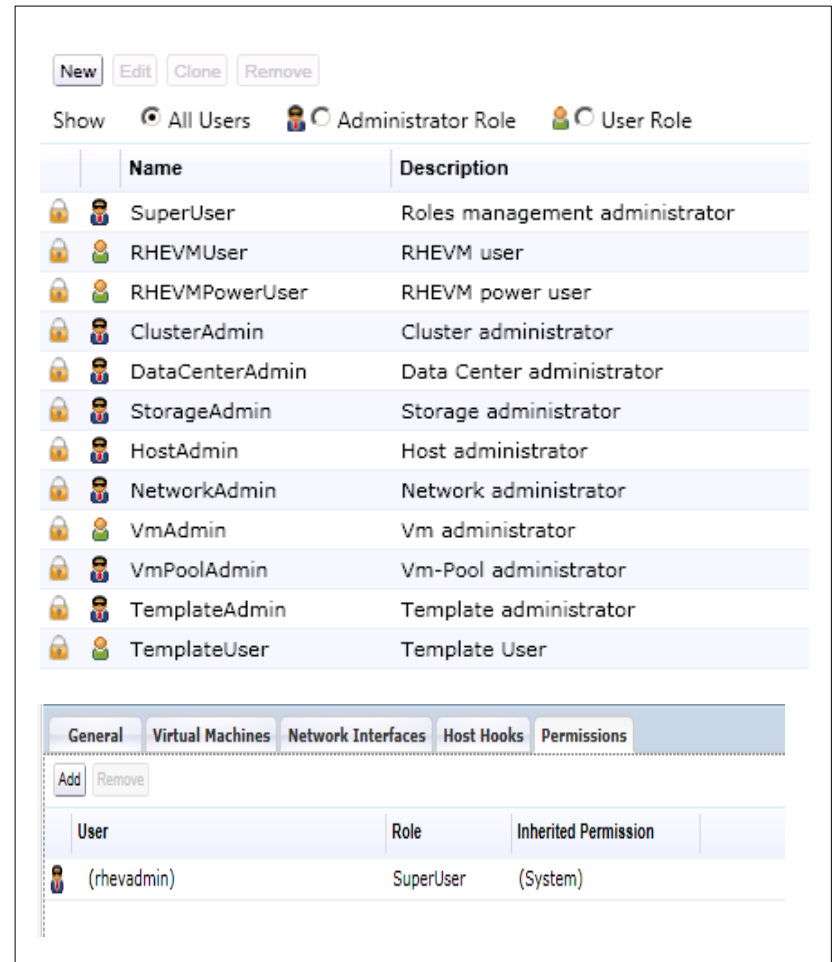
Last Message: 2011-Apr-15, 06:07 Interface nic1 (Red Hat VirtIO) was added to VM RHEL5. (User: rhevadmin)



RED HAT ENTERPRISE VIRTUALIZATION

RHEV 3.0 - MULTI LEVEL ADMINISTRATION

- Administrators are able to grant users as much or as little control over the environment as required.
- User is granted permission over both the selected object and its children.
- For simplicity, permissions are grouped together in roles
- Roles can be assigned to specified objects such as Clusters, Templates and Virtual Machines
- Allows for more fine grained permissions such as access to virtual machine console.



The screenshot shows the RHEV 3.0 administration interface. At the top, there are buttons for 'New', 'Edit', 'Clone', and 'Remove'. Below these are radio buttons for 'All Users', 'Administrator Role', and 'User Role'. The main content is a table listing users and their descriptions:

Name	Description
SuperUser	Roles management administrator
RHEVMUser	RHEVM user
RHEVMPowerUser	RHEVM power user
ClusterAdmin	Cluster administrator
DataCenterAdmin	Data Center administrator
StorageAdmin	Storage administrator
HostAdmin	Host administrator
NetworkAdmin	Network administrator
VmAdmin	Vm administrator
VmPoolAdmin	Vm-Pool administrator
TemplateAdmin	Template administrator
TemplateUser	Template User

Below the table, there are tabs for 'General', 'Virtual Machines', 'Network Interfaces', 'Host Hooks', and 'Permissions'. The 'Permissions' tab is selected, showing a table with columns for 'User', 'Role', and 'Inherited Permission':

User	Role	Inherited Permission
(rheadmin)	SuperUser	(System)



RED HAT ENTERPRISE VIRTUALIZATION VIRTUAL DESKTOP INFRASTRUCTURE

Centralized management,
security and policy enforcement

Virtual desktops with user
experience of a physical PC

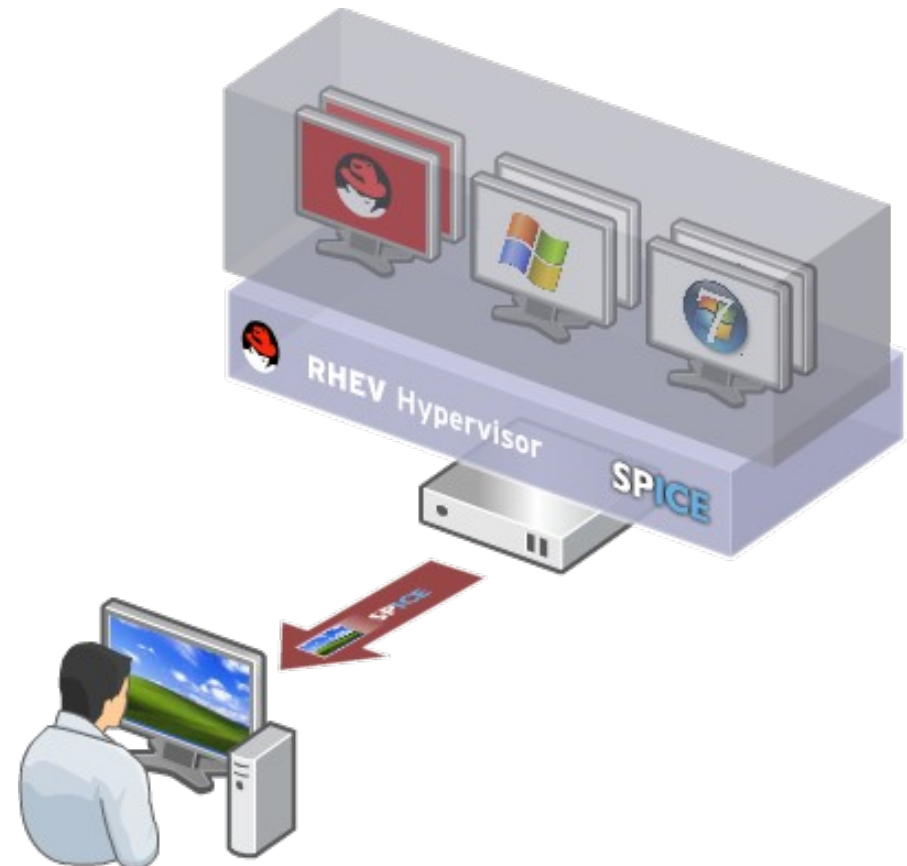
Multiple monitors

HD quality video

Bi-directional audio/video for
VoIP or video-conferencing

USB support

Industry leading density of virtual
desktops/server



RED HAT ENTERPRISE VIRTUALIZATION

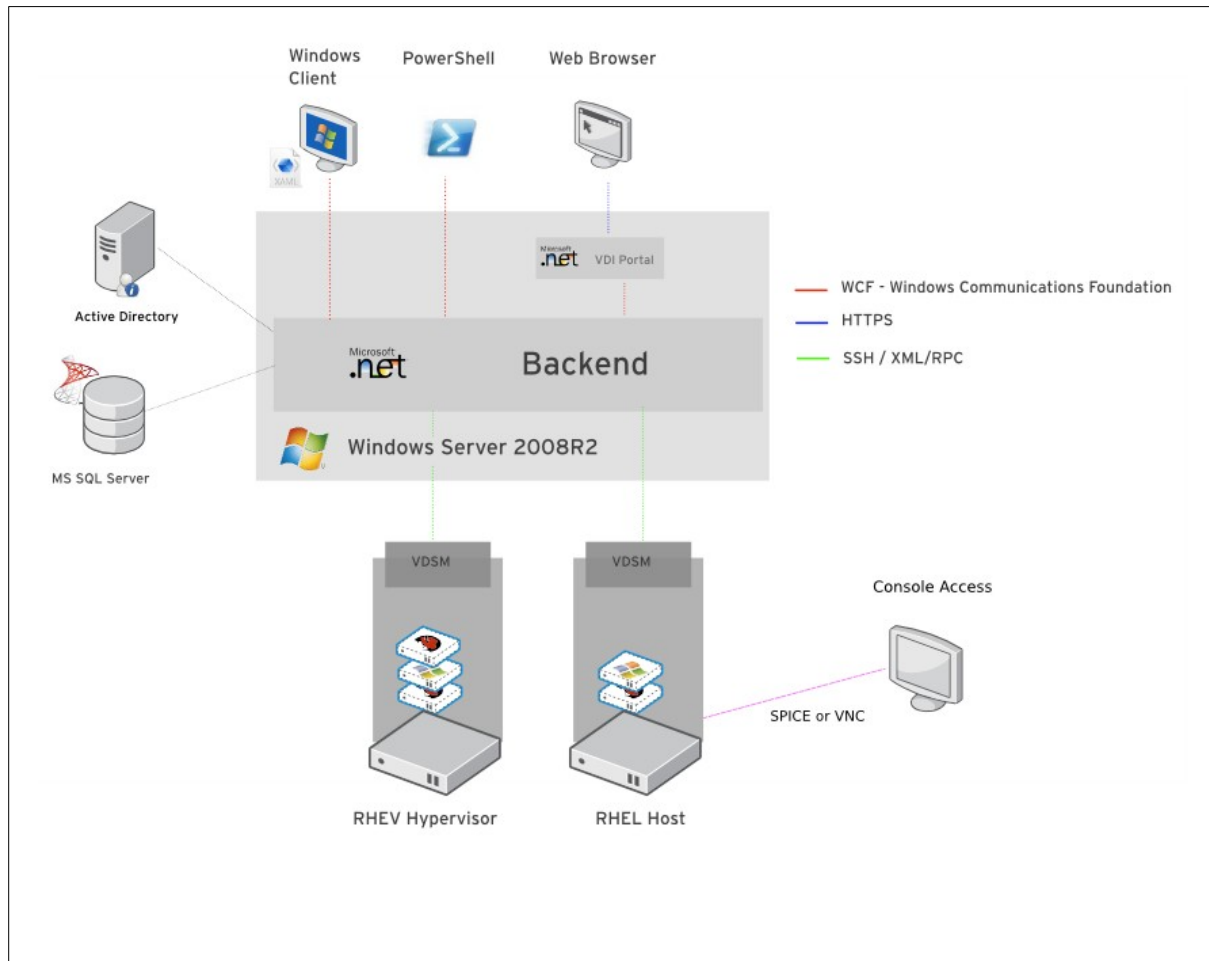
RHEV 3.0 KEY INITIATIVES

- Move from proprietary to open technologies
- Remove dependency on Windows
 - But maintain interoperability with Windows
- Build Open Source community project around open virtualization
- Deliver new features and releases in parallel

- RHEV 3.0 currently in beta
- General Availability – December 2011



RHEV 2.2 ARCHITECTURE

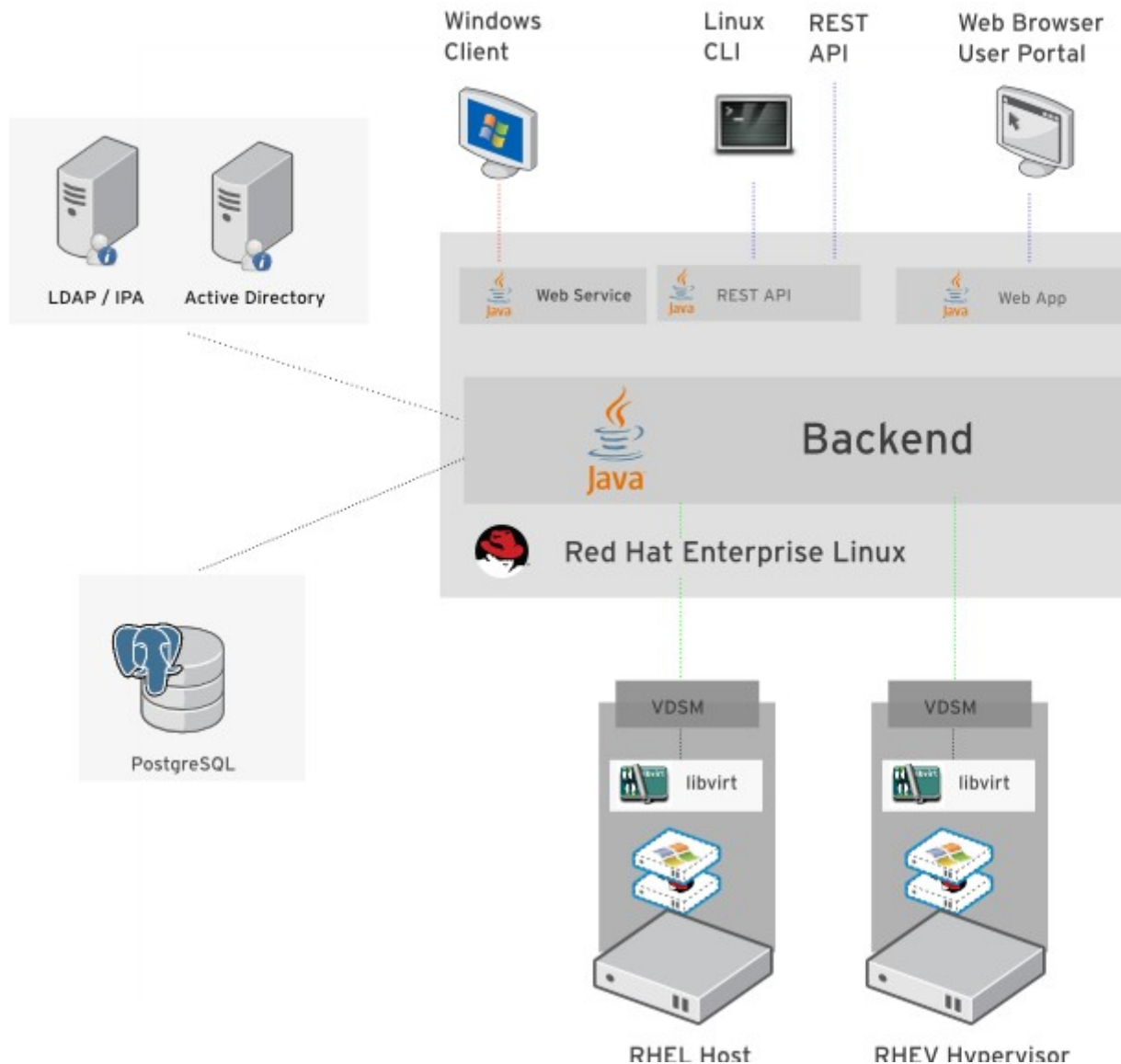


- RHEV Manager server was a .NET backend requiring a Windows2008 Server
- MS SQL Database SQL
- Authentication only through Active Directory
- Limited programmatic access to RHEV Manager functionality



RED HAT ENTERPRISE VIRTUALIZATION

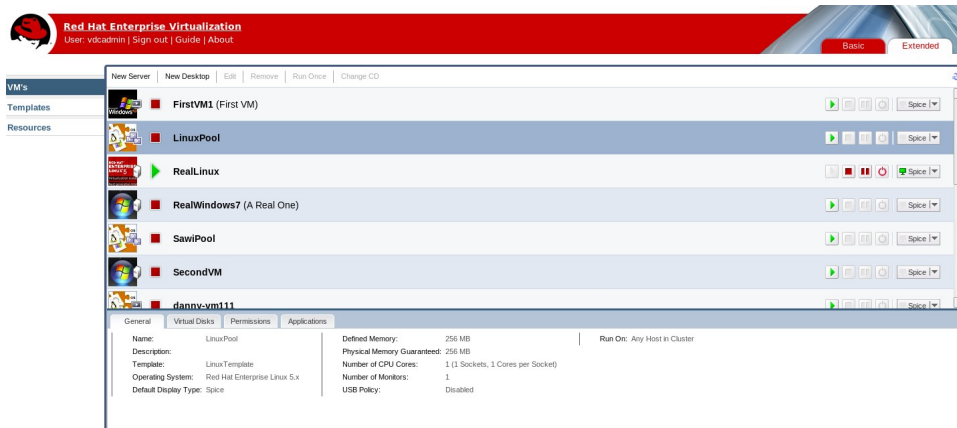
RHEV 3.0 ARCHITECTURE



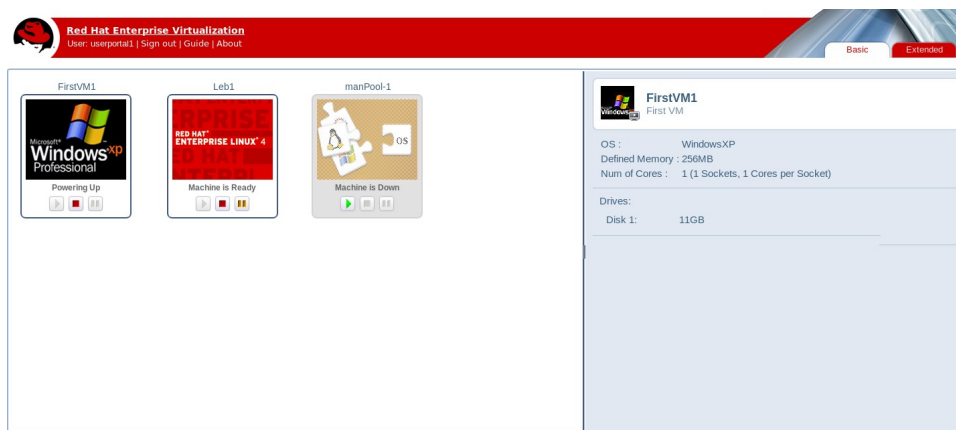
RED HAT ENTERPRISE VIRTUALIZATION

RHEV 3.0 - USER PORTAL

User Portal - Advanced view



User Portal - Basic View



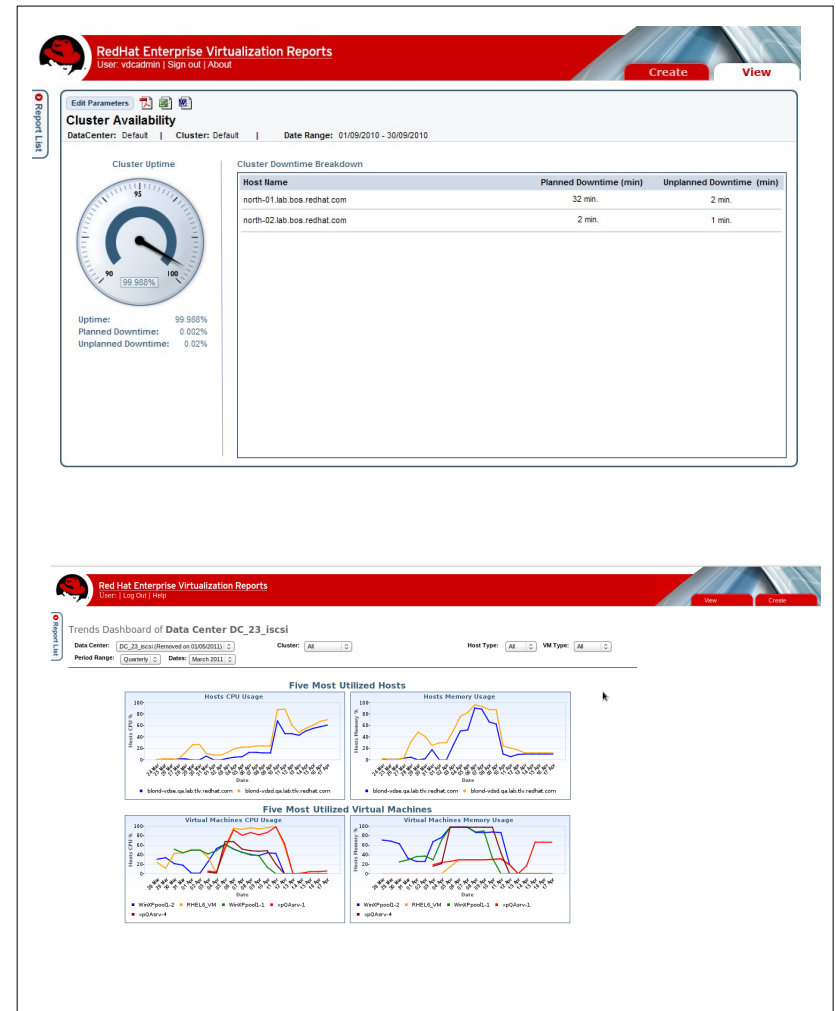
- ✓ Create, edit and remove virtual machines
- ✓ Manage virtual disks and network interfaces
- ✓ Assign user permissions to virtual machines
- ✓ Create and use templates to rapidly deploy virtual machines
- ✓ Monitor resource usage and high-severity events
- ✓ Create and use snapshots to restore virtual machines to a previous state



RED HAT ENTERPRISE VIRTUALIZATION

RHEV 3.0 REPORTING

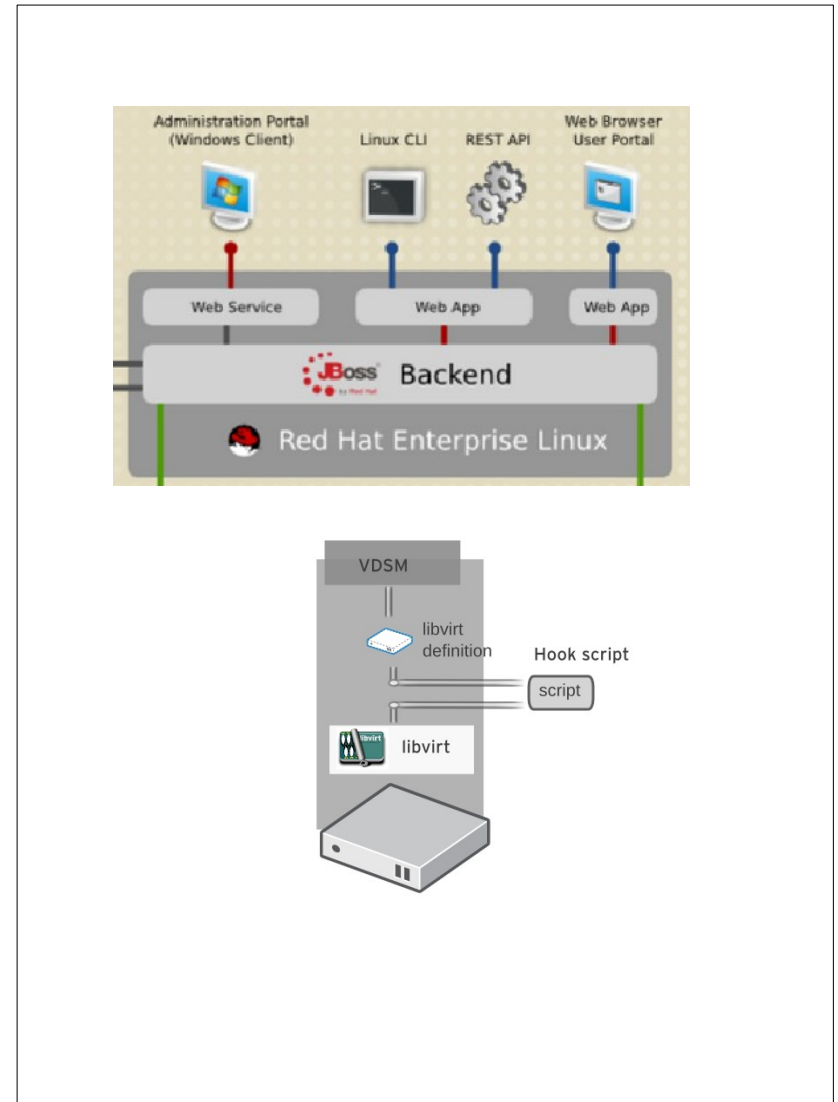
- Historical usage, trending, quality of service
- Integrated reporting engine based on Jasper reports
- Over 25 prebuilt reports and dashboards included
- Ability to create and customize reports and templates



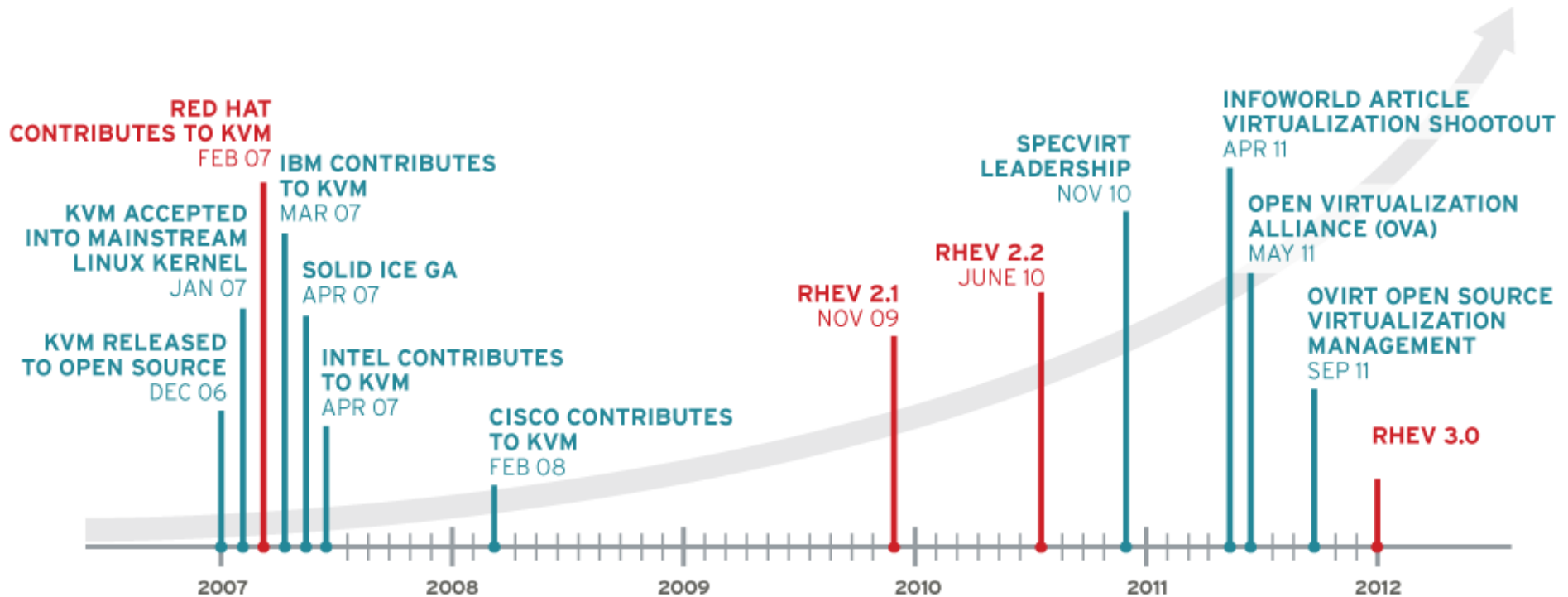
RED HAT ENTERPRISE VIRTUALIZATION

RHEV 3.0 - INTEGRATION & CUSTOMIZATION

- RESTful API for integration with RHEV Manager
- Linux Command Line Interface (CLI) for scripting actions in the RHEV environment
- Hooks mechanism allows admins to define scripts to modify VM operation



RHEV IS MATURE AND READY FOR LARGE SCALE ENTERPRISE DEPLOYMENTS...



RED HAT ENTERPRISE VIRTUALIZATION COMPETITIVE LANDSCAPE

Test Center Scorecard						
	Management	Performance	Reliability	Scalability	Installation	Overall Score
	25%	20%	20%	20%	15%	
Citrix XenServer 5.6.1	7	8	8	7	9	7.7 GOOD
	25%	20%	20%	20%	15%	
Microsoft Windows Server 2008 R2 Hyper-V	8	8	9	8	7	8.1 VERY GOOD
	25%	20%	20%	20%	15%	
Red Hat Enterprise Virtualization for Servers 2.2	8	8	8	9	9	8.4 VERY GOOD
	25%	20%	20%	20%	15%	
VMware vSphere 4.1	9	9	9	9	9	9.0 EXCELLENT

- InfoWorld “shootout” 2011
 - Independent analysis of leading virtualization platforms
 - After <18 months Red Hat has overtaken Citrix & Microsoft in performance and functionality

<http://bit.ly/virtshootout>



OPEN SOURCE VIRTUALIZATION MANAGEMENT

OVIRT - COMMUNITY PROJECT



Complete and Comprehensive Open Source Infrastructure and Management Virtualization Platform for the Data Center

... or for anyone that cares about Linux-based KVM virtualization.

The oVirt Project is an open virtualization project providing a feature-rich server virtualization management system with advanced capabilities for hosts and guests, including high availability, live migration, storage management, system scheduler, and more.

By open we mean open source & open governance, done right.

oVirt is an umbrella project for multiple sub-projects delivering a complete integrated platform on a well defined release schedule. These are components designed and tested to work together.

SEARCH SITE

@OVIRT

- #oVirt workshop 1-3 Nov in San Jose @Cisco - <http://t.co/3Wy2fq2v> & rsvp@ovirt.org. 1 day ago
- The new oVirt project webpage is now live with lots of explanation of the project (re)launch: <http://t.co/aVZXDlCb> 2 days ago

NEWS

- oVirt kick-off workshop 1 - 3 Nov 2011 September 12, 2011

#OVIRT ON TWITTER



OPEN VIRTUALIZATION ALLIANCE



- Fostering KVM adoption and interoperability
- <http://www.openvirtualizationalliance.org>





RHEV 3 BETA NOW AVAILABLE

Red Hat Enterprise Virtualization 3:
Your strategic alternative to VMware.
Choose industry leading performance
and scalability at a superior value.

[GET STARTED](#)

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THANK YOU

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