RED HAT SUMMIT

LEARN. NETWORK. EXPERIENCE OPEN SOURCE.

June 11-14, 2013
Boston, MA

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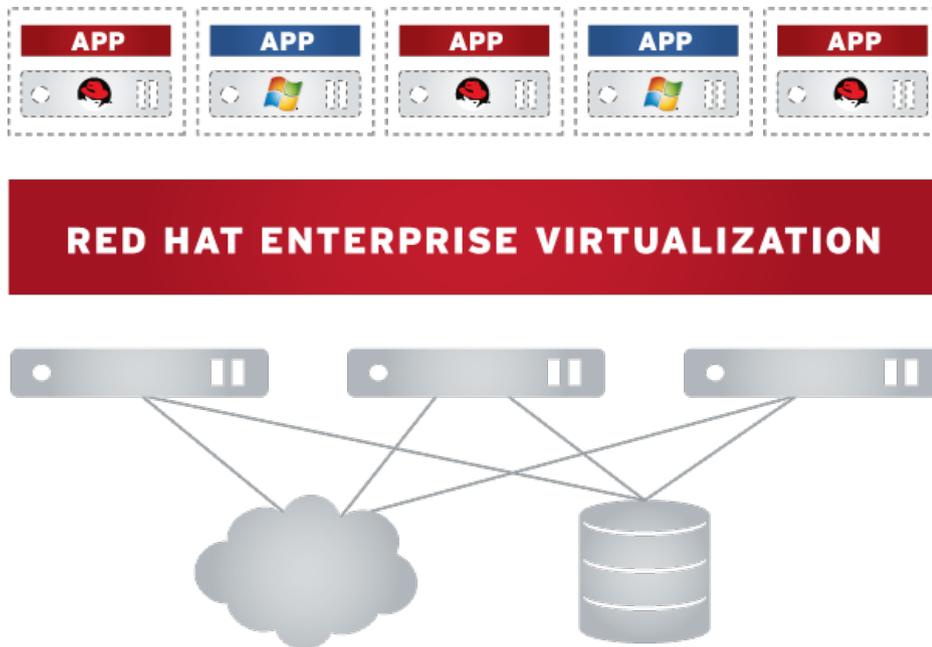# RED HAT ENTERPRISE VIRTUALIZATION ROADMAP DEEP DIVE

Andrew Cathrow
Red Hat, Inc.
Thursday, June 13th, 2013

DATACENTER VIRTUALIZATION

COMPLETE DATACENTER VIRTUALIZATION SOLUTION

- **Leading performance:** Top virtualization benchmarks for performance and scalability

- **Affordable:** Lower TCO and higher ROI than competitive platforms

- **Enterprise-ready:** Powerful mix of enterprise features and a rich set of partners

- **Open:** Offers choice and interoperability with no proprietary lock-in

- **Cross-platform:** Optimized for Microsoft Windows and Linux guests

DATACENTER VIRTUALIZATION

- Centralized Management

- High Availability

- Live Migration

- Storage Live migration

- Load Balancing

- Power Management

- Templates, thin provisioning, snapshots

- V2V & P2V Migration tools

- Self Service User Portal

- Reporting Engine

BUT SHOULDN'T I BE RUNNING OPENSTACK ?

SERVICE MODELS / WORKLOADS

TRADITIONAL WORKLOADS

- Stateful VMs: Application defined in VM

- Application SLA = SLA of VM

- SLA requires enterprise virtualization features to keep VMs highly available

- VMs scale up: add vCPU, vRAM, etc.

- Lifecycle may be measured in years

- Applications not designed to tolerate failure of VMs

CLOUD WORKLOADS

- Stateless VMs : Application distributed

- Application SLA not dependent on any one VM

- SLA requires ability to create and destroy VMs when needed

- Applications scale out: add more Vms

- Lifecycle measured in hours to months

- Applications designed to tolerate failure of VMs

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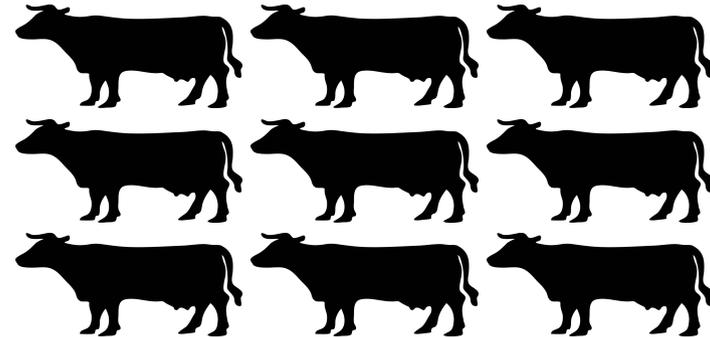# SERVICE MODELS / WORKLOADS

TRADITIONAL WORKLOADS
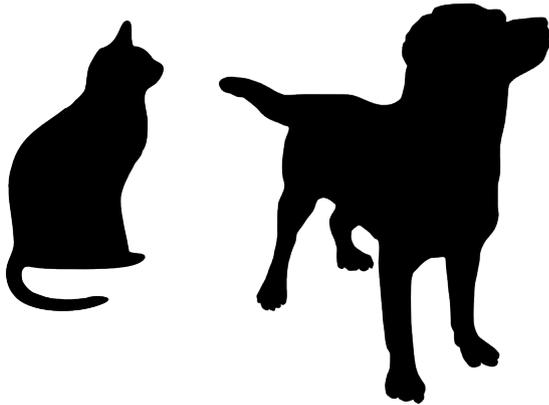
CLOUD WORKLOADS

- Pets are unique, lovingly hand raised and cared for

- They are given names
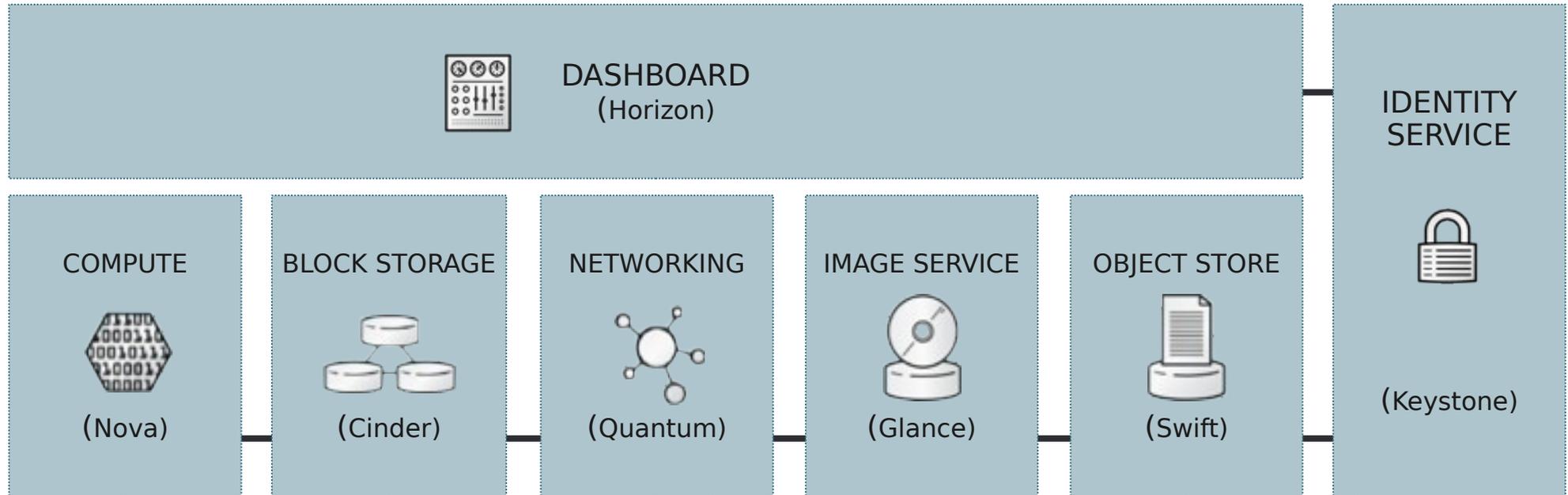
- When they get ill you nurse them back to health

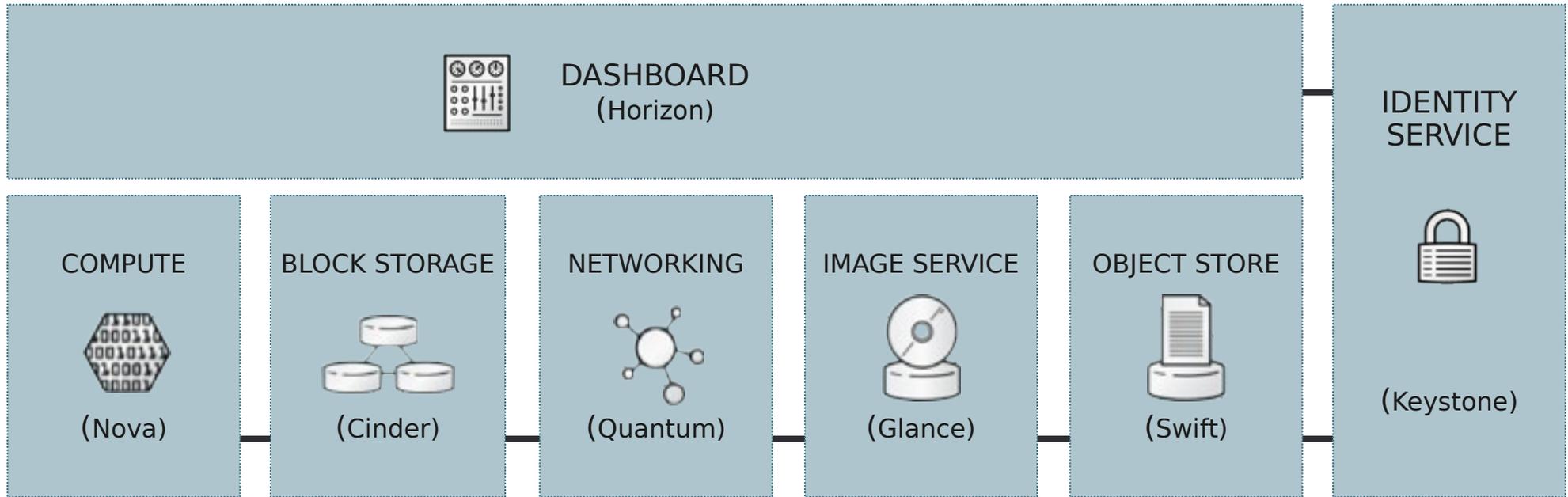- Cattle are almost identical to each other

- They are given numbers

- When they get ill you get another one

PRIVATE CLOUD

RED HAT OPENSTACK

DASHBOARD (Horizon)					IDENTITY SERVICE
COMPUTE (Nova)	BLOCK STORAGE (Cinder)	NETWORKING (Quantum)	IMAGE SERVICE (Glance)	OBJECT STORE (Swift)	(Keystone)

- Building blocks for creating a cloud

- Set of modular services with well defined APIs

- Designed for massive scale

  - Scale out to thousands of nodes

- Designed for 'cloud workloads'

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OPENSTACK ARCHITECTURE

					IDENTITY SERVICE
DASHBOARD (Horizon)					
COMPUTE (Nova)	BLOCK STORAGE (Cinder)	NETWORKING (Quantum)	IMAGE SERVICE (Glance)	OBJECT STORE (Swift)	(Keystone)

- Building blocks for creating a cloud

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OPENSTACK SERVICES

IMAGE SERVICE

(Glance)

- Stores disk images
  - ISOs, Templates, etc
- Simple API to upload, download and query images

NETWORKING

(Quantum)

- Provides framework for Software Defined Network
- Plugin Architecture
  - Allows integration of 3rd party hardware and software based network infrastructure

BLOCK STORAGE

(Cinder)

- Block Storage for virtual machines
- Plugin Architecture for vendor extensions

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COMMON SERVICES LAYER

GOALS

- Break down silos between cloud & datacenter

- Prevent duplication of infrastructure

  - Different storage, network and management platforms

- Simplify architecture

- Facilitate the transition from traditional to cloud/elastic workloads

- Optimize development / community resources

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COMMON SERVICES LAYER

- Integrating OpenStack services with oVirt / RHEV

- Deploy common set of shared services

  - KVM Based Hypervisor

  - OpenStack Image Store (Glance)

  - OpenStack Network Service (Quantum)

  - OpenStack Volume Service (Cinder)

- Deploy "Pets and Cattle" on common infrastructure without compromising on SLAs, features or scalability
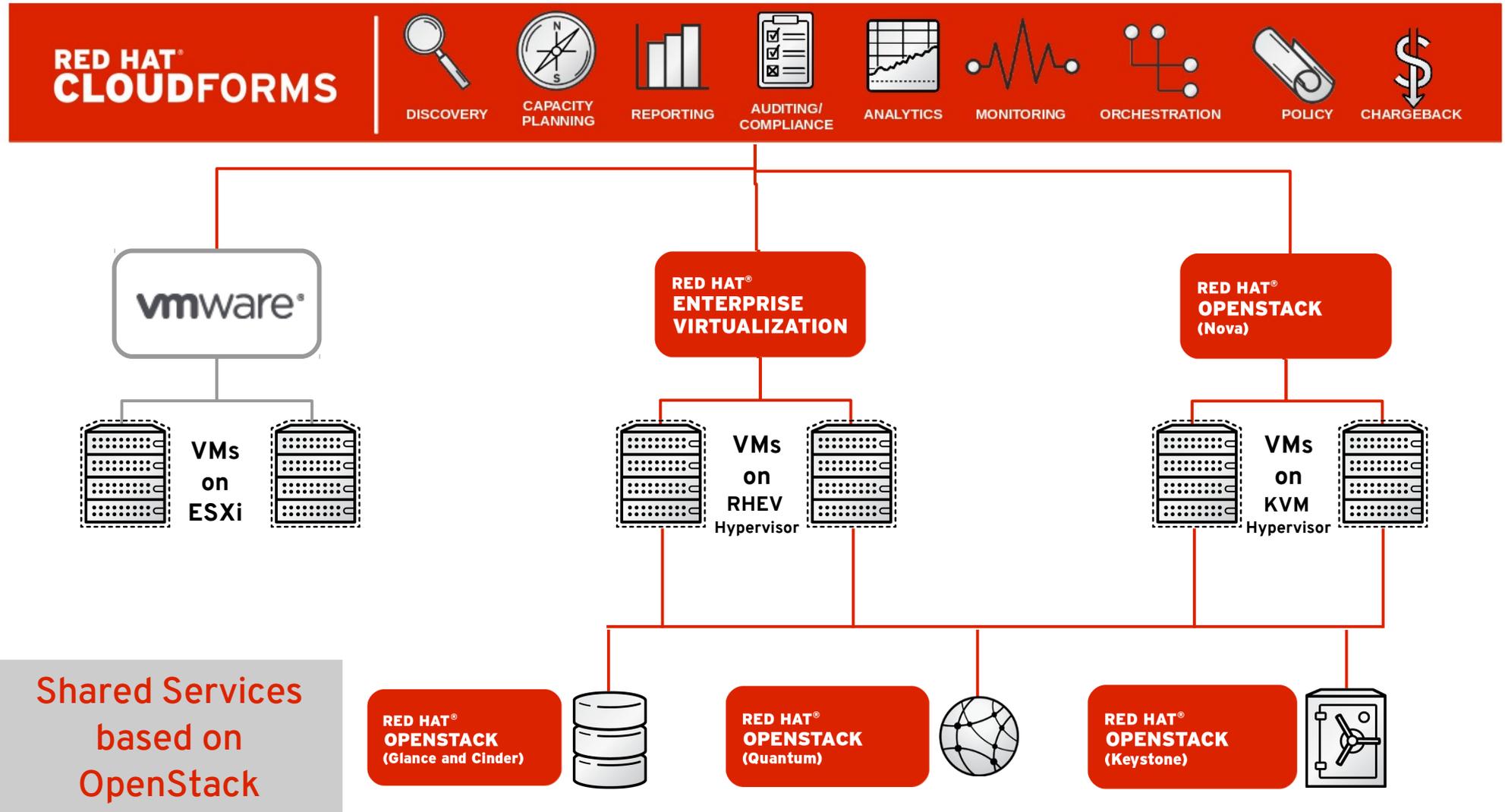
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COMMON SERVICES LAYER

RED HAT CLOUD INFRASTRUCTURE

- Single subscription that provides an open cloud solution

- Bridges traditional and cloud/elastic workloads

- Provides both virtualization and cloud services

- Policy-based cloud management

- Available with or without RHEL guests

- General availability July 2013

OPEN INNOVATION
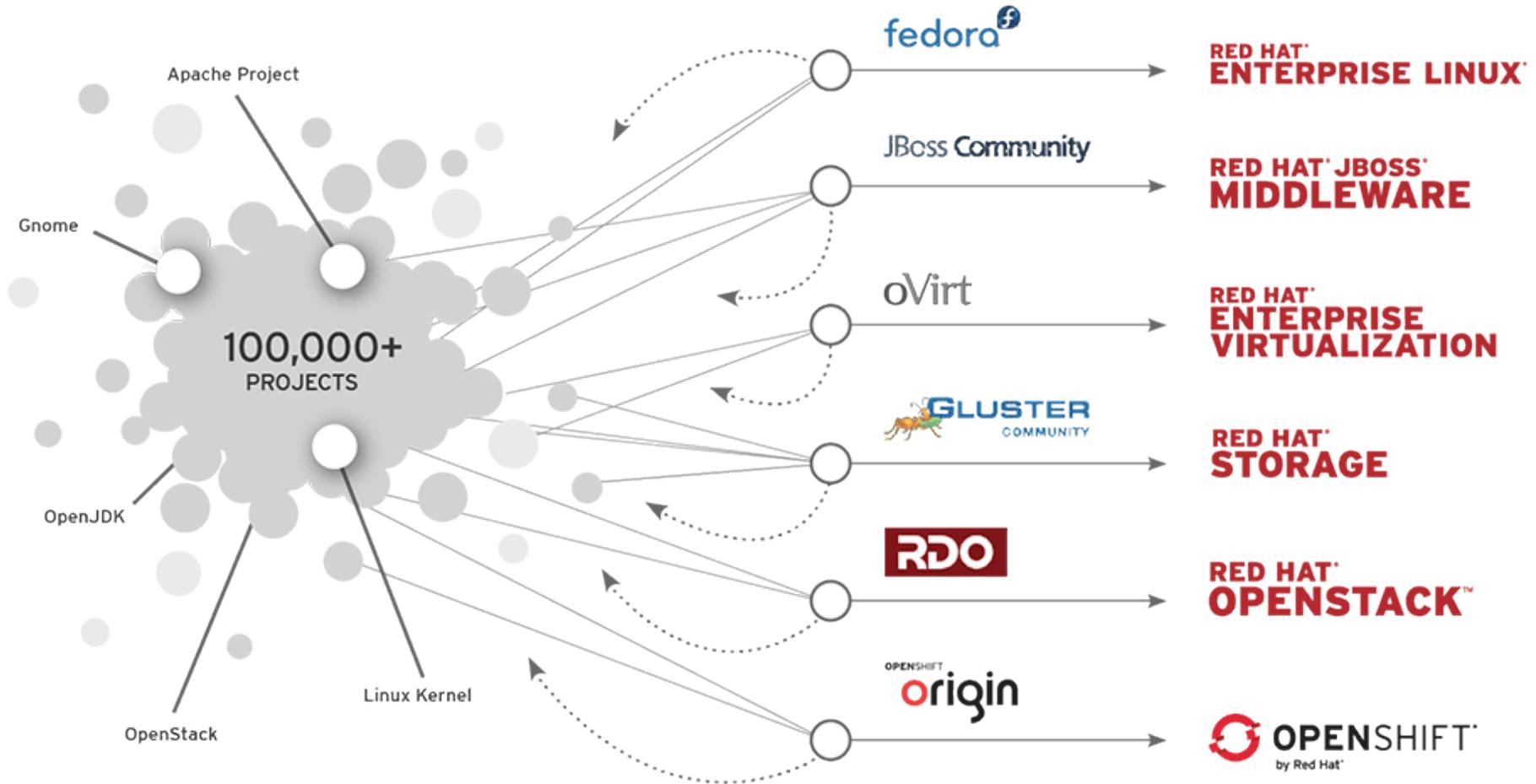
OPEN INNOVATION
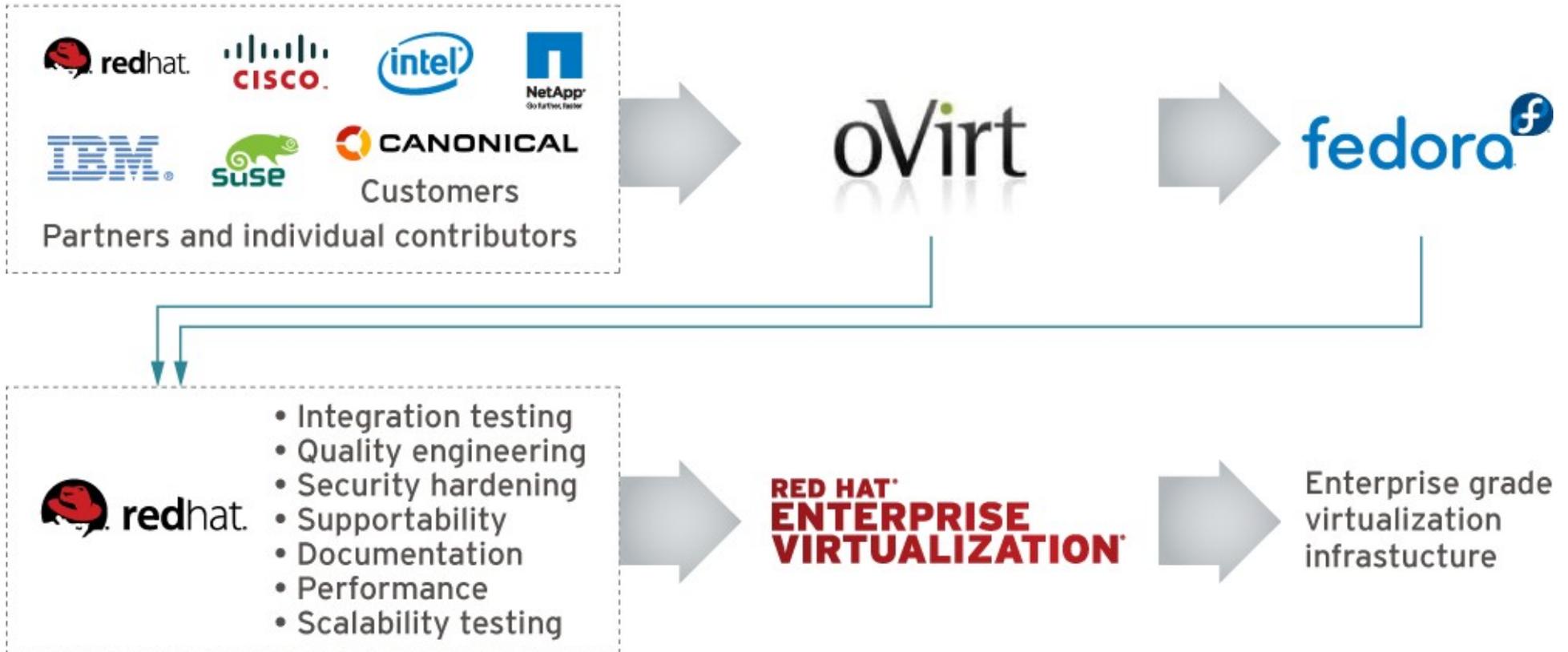
Partners and individual contributors:
- redhat.
- CISCO.
- (intel)
- NetApp
- IBM
- SUSE
- CANONICAL
- Customers

→ oVirt → fedora

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- Integration testing
- Quality engineering
- Security hardening
- Supportability
- Documentation
- Performance
- Scalability testing

→ RED HAT ENTERPRISE VIRTUALIZATION → Enterprise grade virtualization infrastucture

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TIMELINES

December 2012	Red Hat Enterprise Virtualization 3.1
February 2013	Red Hat Enterprise Linux 6.4
April 2013	CloudForms 2.0
June 2013	Red Hat Enterprise Virtualization 3.2
July 2013	**Red Hat Cloud Infrastructure (RHCI)**
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RED HAT ENTERPRISE VIRTUALIZATION
RHEV 3.1 - HIGHLIGHTS

RHEV 3.1 – December 2012	
Web Admin	- Full HTML based Web Admin
Improved Scalability	- 160 Virtual CPUs per VM - 2 TB Virtual RAM per VM
P2V	- Quickly migrate physical machines to virtual machines
Quotas	- Quotas for storage, CPU and memory
Live Snapshots	- Live snapshots of Virtual Machine (configuration and disk)
Storage Migration	- Live migration of virtual machine disk between storage domains Tech Preview
Hotplug Disk	- Hot plug/unplug virtual machine disk image
Disk Management	- New UI for managing internal and external (direct lun) disks
Hot plug NIC	- Hot plug/unplug virtual machine's network interface
Gluster Integration	- Manage Red Hat Storage from within RHEV Manager

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User Interface

Internationalization

- Localization of Web admin portal, user portal, documentation and landing page [New]
- Automatically detected from browser preferences
- Supports manual selection to override browser default

- Localization
    - English (US)
    - French
    - German
    - Japanese
    - Portuguese
    - Simplified Chinese
    - Spanish
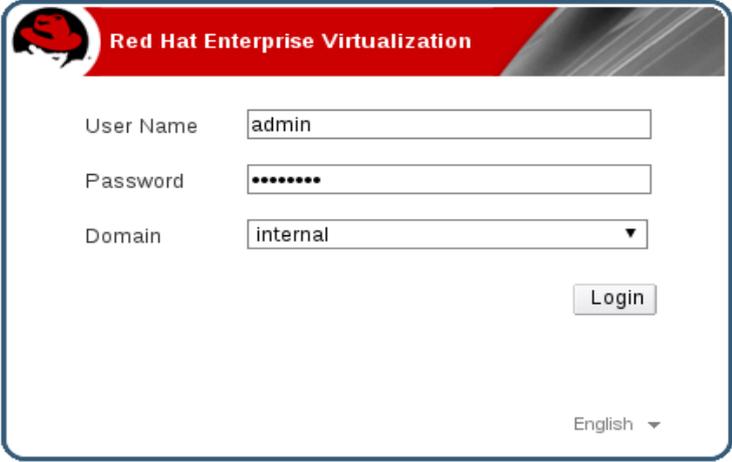
RED HAT ENTERPRISE VIRTUALIZATION 3.2

User Interface

UI Plugins

- Framework for 3rd party UI plugins for RHEV Manager
- Allows end users and vendors to extend management platform

- Commercial Vendors shipping ~ RHEV 3.2
  HP, NetApp & Symantec

- Community Plugins
  Foreman, Nagios, Shellbox and others.

oVirt http://www.ovirt.org/Features/UIPlugins

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User Interface

UI Plugins

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RED HAT ENTERPRISE VIRTUALIZATION 3.2

User Interface

UI Plugins

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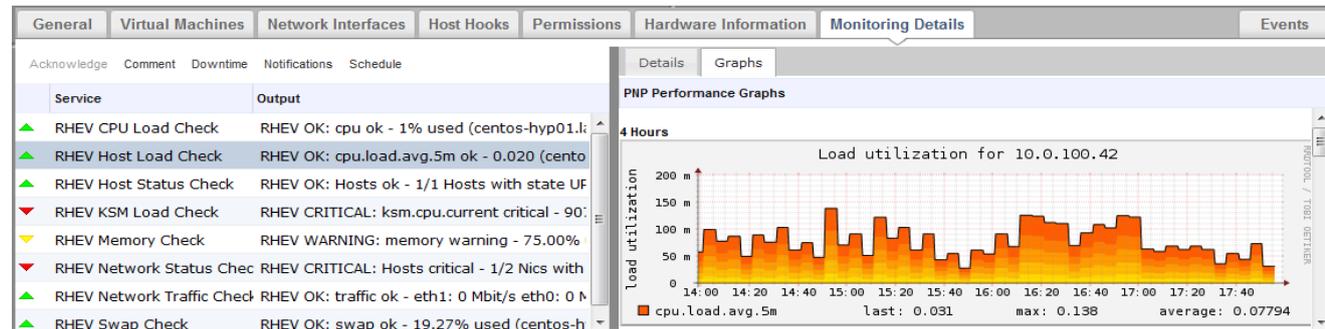- Allows end users and vendors to extend management platform

RED HAT ENTERPRISE VIRTUALIZATION 3.2

User Interface

UI Plugins

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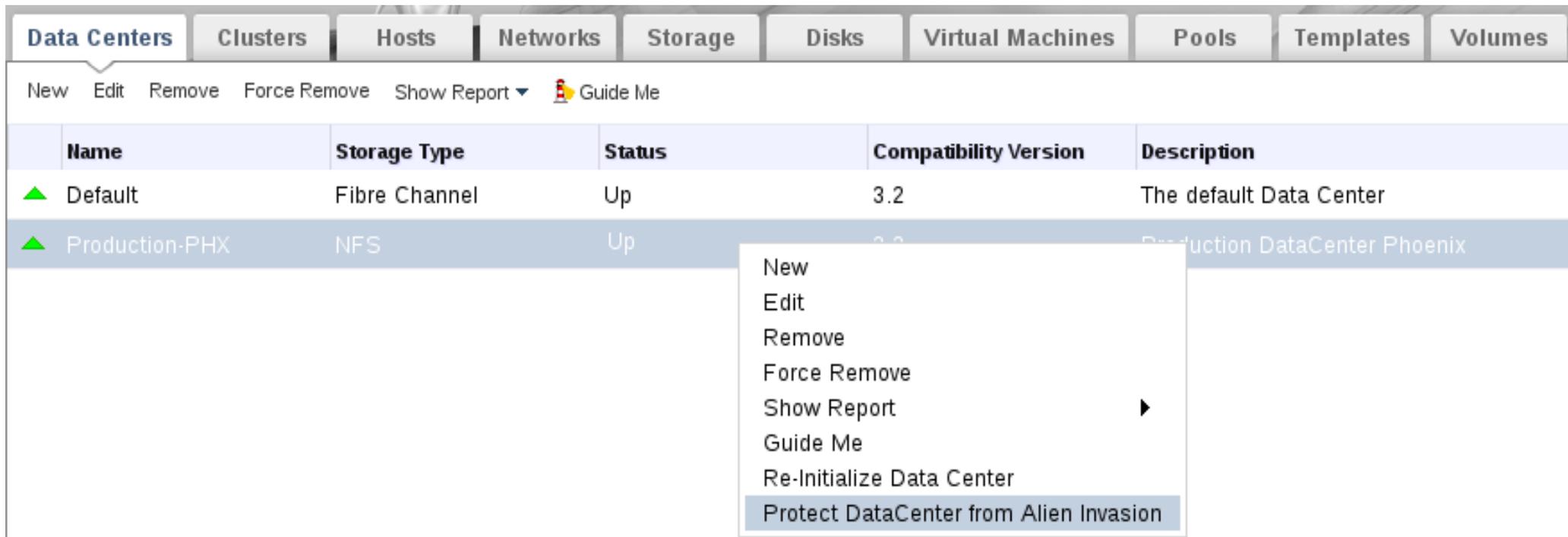- Allows end users and vendors to extend management platform

RED HAT ENTERPRISE VIRTUALIZATION 3.2

User Interface

UI Plugins

- Framework for 3rd party UI plugins for RHEV Manager
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| Data Centers | Clusters | Hosts | Networks | Storage | Disks | Virtual Machines | Pools | Templates | Volumes |

New   Edit   Remove   Force Remove   Show Report ▼   🚥 Guide Me

Name	Storage Type	Status	Compatibility Version	Description
▲ Default	Fibre Channel	Up	3.2	The default Data Center
▲ Production-PHX	NFS	Up	3.2	Production DataCenter Phoenix

New
Edit
Remove
Force Remove
Show Report   ▶
Guide Me
Re-Initialize Data Center
Protect DataCenter from Alien Invasion

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RED HAT ENTERPRISE VIRTUALIZATION 3.2

User Interface

UI Plugins

- Framework for 3rd party UI plugins for RHEV Manager
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Data Centers	Clusters	Hosts	Networks	Storage	Disks		Templates	Volumes

New   Edit   Remove   Force Remove   Show Report ▼   🚥 Guide Me

Name	Storage Type	Status	Co	
▲ Default	Fibre Channel	Up	3.2	ta Center
▲ Production-PHX	NFS	Up		taCenter Phoenix

New
Edit
Remove
Force Remov
Show Report
Guide Me
Re-Initialize
Protect Data

Datacenter under attack

00000500

Get me outta here   Call Support

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Networking

Network Main Tab

- New top level network management UI

http://wiki.ovirt.org/wiki/Feature/NetworkMainTab

RED HAT ENTERPRISE VIRTUALIZATION 3.2

Networking	
Network Main Tab	- New top level network management UI

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Networking	
Network ACLs	- Apply Permissions / ACLs on logical networks - New role "NetworkUser"
Hot Switch	- Switch virtual/logical network on running vNic

Edit Network Interface ⓘ

Name	nic1
Network	rhevm
Link State	● Up ○ Down
Type	Red Hat VirtIO
☐ Specify custom MAC address	00:1a:4a:10:35:43
	Example: 00:14:4a:23:67:55
⌄ Advanced Parameters	
Port Mirroring	☐
Card Status	● Plugged ○ Unplugged

OK Cancel

http://wiki.ovirt.org/wiki/Feature/NetworkPermissions

http://wiki.ovirt.org/wiki/Feature/NetworkLinking

oVirt
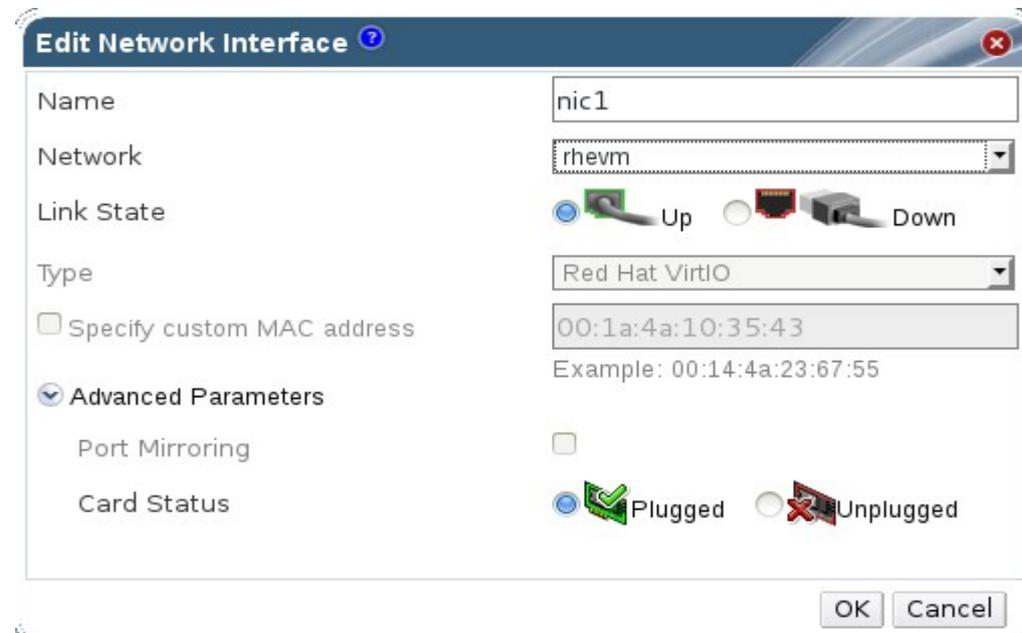
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Networking

Statistics

- Enhanced statistic and configuration collection from guest

  - Report all guest network interfaces

  - Report IPV6 addresses in addition to IPV4

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Networking
- Support E1000 nic for Windows VMs (in addition to VirtIO & RTL8139)
- VDSM Hook for hot-plug events

Windows e1000

Hotplug Hook

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Storage	
Storage Migration	- Move to full support from tech preview in 3.1
	-Support migrating multiple disks from same virtual machine
Storage domain scan	- Scan storage domain for new (orphaned) images
	- Import images into storage domain

API ONLY

oVirt http://wiki.ovirt.org/Features/Domain_Scan

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Storage	
Disks sub-tab	- View/Manager all disks on storage domain
Remove VM	- Remove VM without deleting virtual disks

Remove Virtual Machine(s) ❓

Are you sure you want to remove the following Virtual Machine(s)?

- web-prd-12   ☑ Remove Disk(s)

OK   Cancel
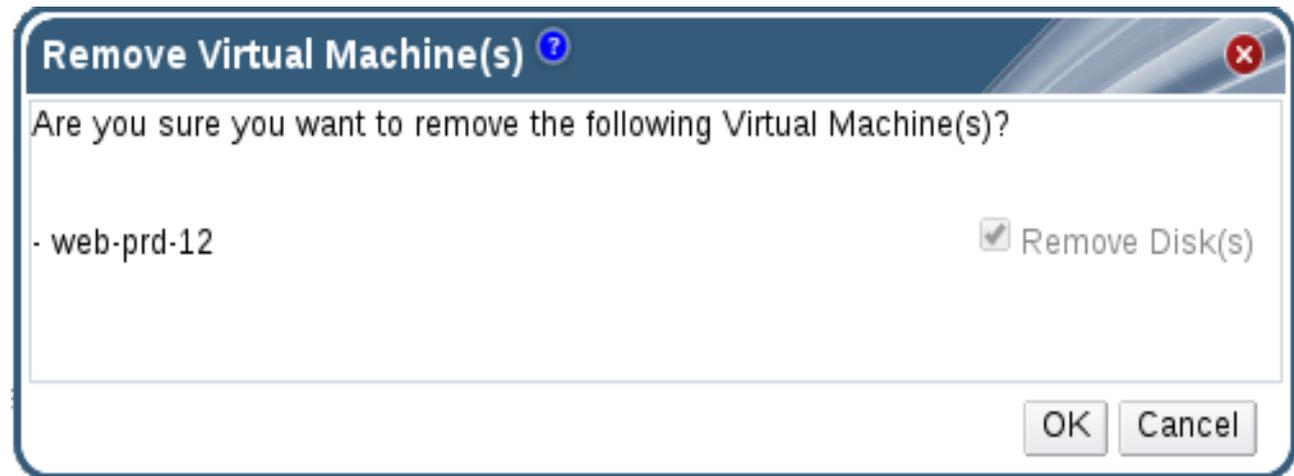
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SLA

CPU Passthrough	- Support host CPU pass through - Delivers optimal performance at the expense of migration
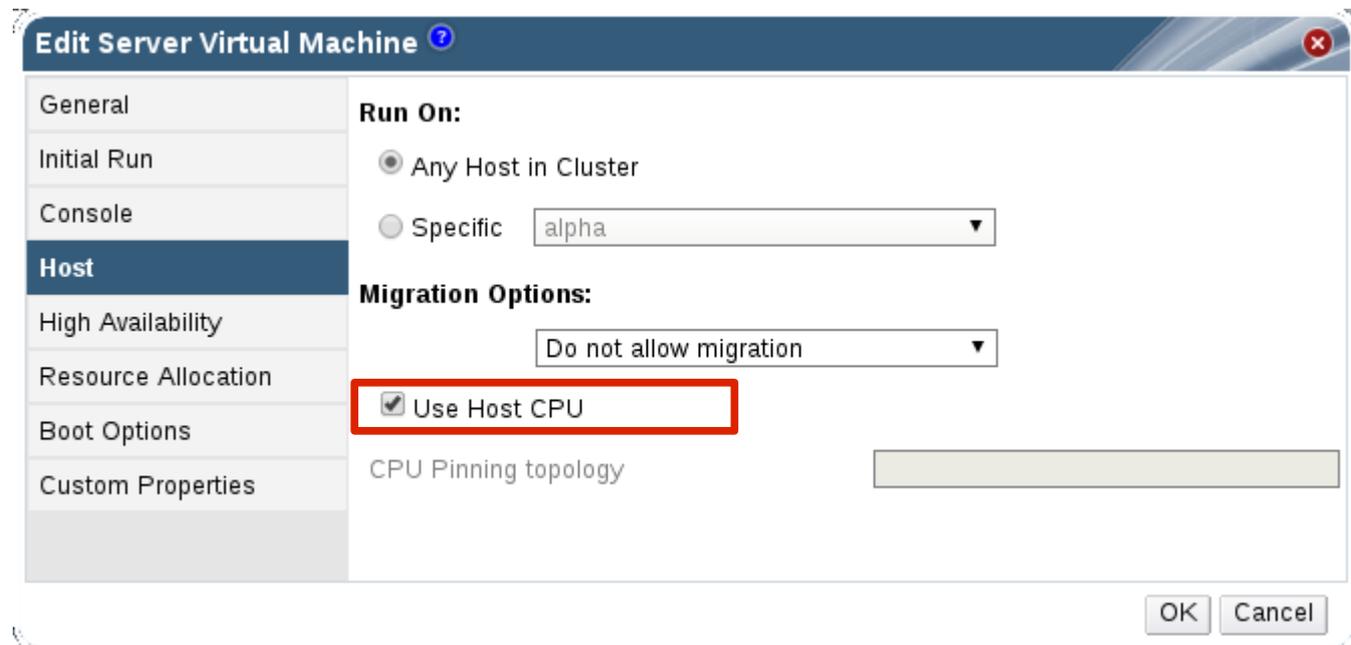
RED HAT ENTERPRISE VIRTUALIZATION 3.2
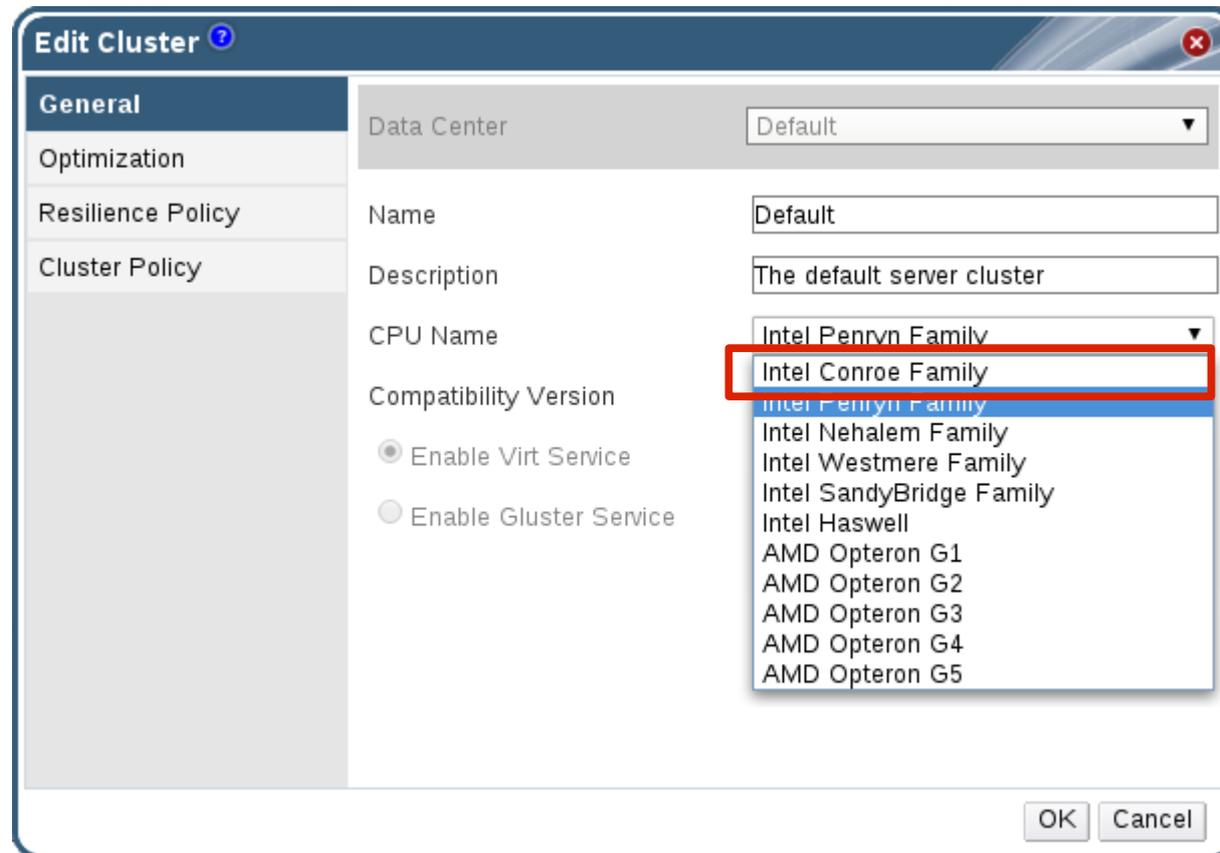
RED HAT ENTERPRISE VIRTUALIZATION 3.2

SLA

Hyperthread Policy	- Define handling of Hyperthreads
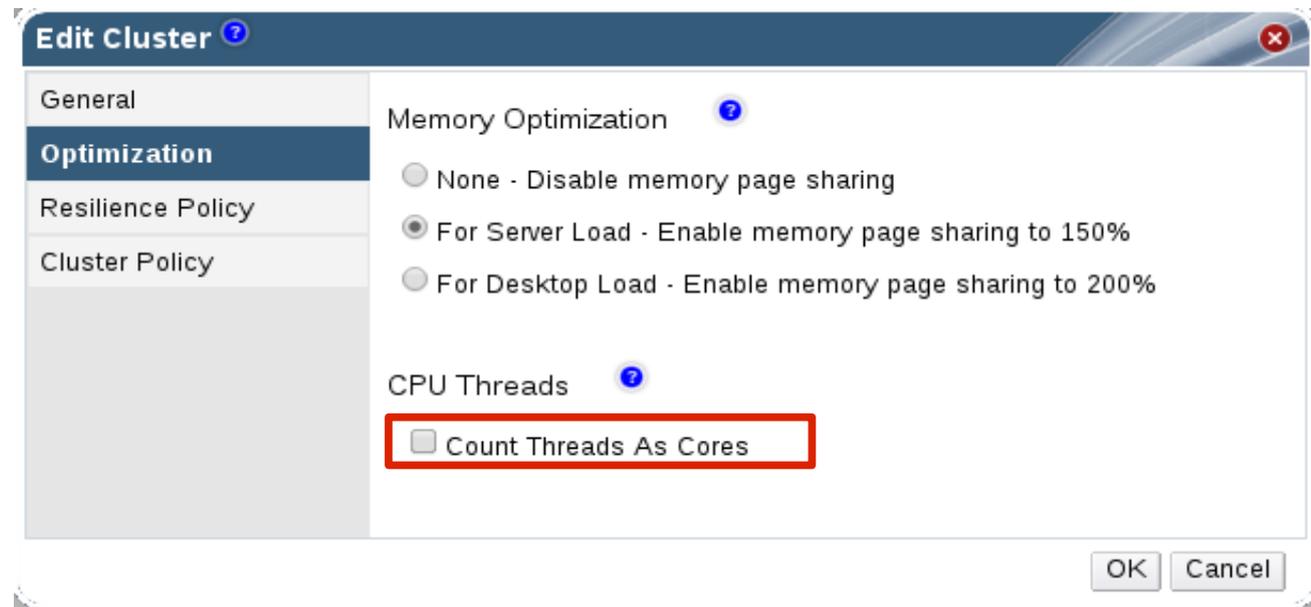
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SLA

Quota in User Portal — All user to see breakdown of quota consumption in self service portal

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Virtualization / Compute
New Guest Support — - Windows Server 2012
- Windows 8
New CPU Support — - New Intel Core i3, i5, i7, Xeon E3 (code named "Haswell")
- New AMD Opteron G5 processors (code named "Seoul")
Guest Tuning — - Automatically apply tuned guest profile on RHEL guests

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Virtualization / Compute

Delete Protection

- Allow admin to set 'do not delete' on virtual machine
  Prevents accidental deletion through UI and API

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VDI

Spice Proxy	- Configure proxy server for Spice protocol
Smartcard	- UI / API support for Smartcard (CAC & PIV)
Dynamic Resolution	- Dynamically change guest resolution by resizing client window
Console Options	- Set per-device settings for console (VNC, Spice & RDP)

Console Options ⊙

Select Console for 'win2k8'
  ● SPICE   ○ VNC   ○ Remote Desktop
Console Invocation
  ○ Auto
  ○ Native client
  ● Browser plugin
SPICE Options
  ☑ Pass Ctrl-Alt-Del to virtual machine
  ☑ Enable USB Auto-Share
  ☐ Open in Full Screen
  ☐ Enable SPICE Proxy
  ☐ Enable WAN Options

OK Cancel
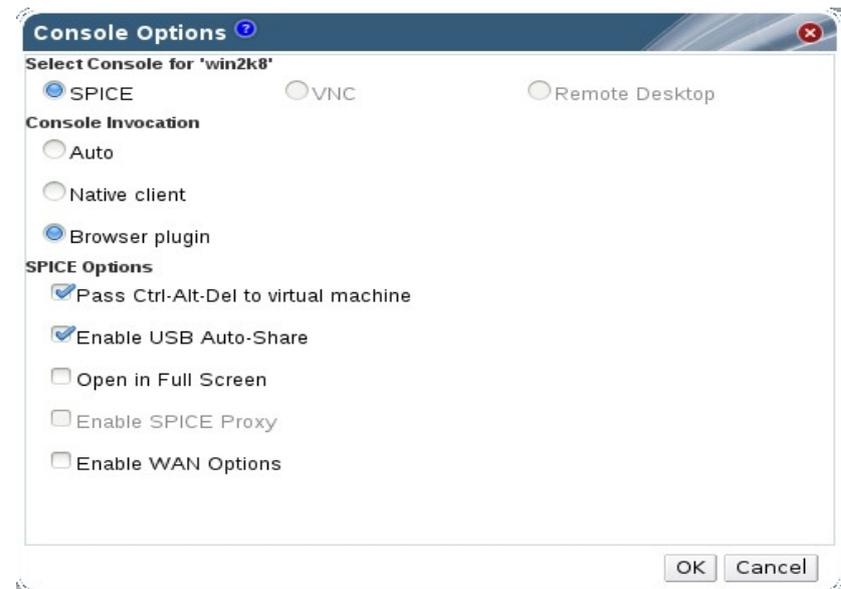
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Platform Infrastructure

New Bootstrap	- New host bootstrap infrastructure (otopi)

Reports	- New reports including storage inventory, cloud provider utilization & VDI

Power Management	- Support for multiple Power Management (fencing) agents per host - Configure proxy selection for Power Management at DC/Cluster level

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RHEV 3.3 – Q4 2013

Networking

- OpenStack Network Service (Quantum) Integration

- Define migration network

- Define gateway per logical network

- Custom Properties on vNics

Storage

- OpenStack Image Service (Glance) Integration

- VirtioSCSI (paravirtualized SCSI)

- Online resize virtual disk

- New Backup API

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RED HAT ENTERPRISE VIRTUALIZATION

RHEV 3.3 – Q4 2013

Virtualization

- Major changes to VM creation dialogs

- Support for 'Instance types'

- Integrate with 'cloud-init' for VM metadata

-Support 'mime-type' launching for VM Consoles

- Add guest memory to live snapshots

- Add support for NoVNC (HTML based VNC client)

-Specify host to run VM using "run once"

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RHEV 3.3 – Q4 2013

Infrastructure	- 'Hosted Engine' – self hosting RHEV-M as highly available VM
	- OpenLDAP support

SLA / Performance	- Service Level (QoS) Manager Define VM policies for: - CPU - Memory - Network

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THANK YOU

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DON'T MISS ....

Time	Title
9:00 AM – 11:00 AM	Lab/Hands on : Deploying OpenStack
9:45 AM - 10:45 PM	Hypervisor Technology Comparison & Migration
11:00 AM - 12:00 PM	Network Virtualization & Software-defined Networkingg

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