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June 11-14, 2013  
Boston, MA

RED HAT  
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# Integration of Storage, OpenStack & Virtualization

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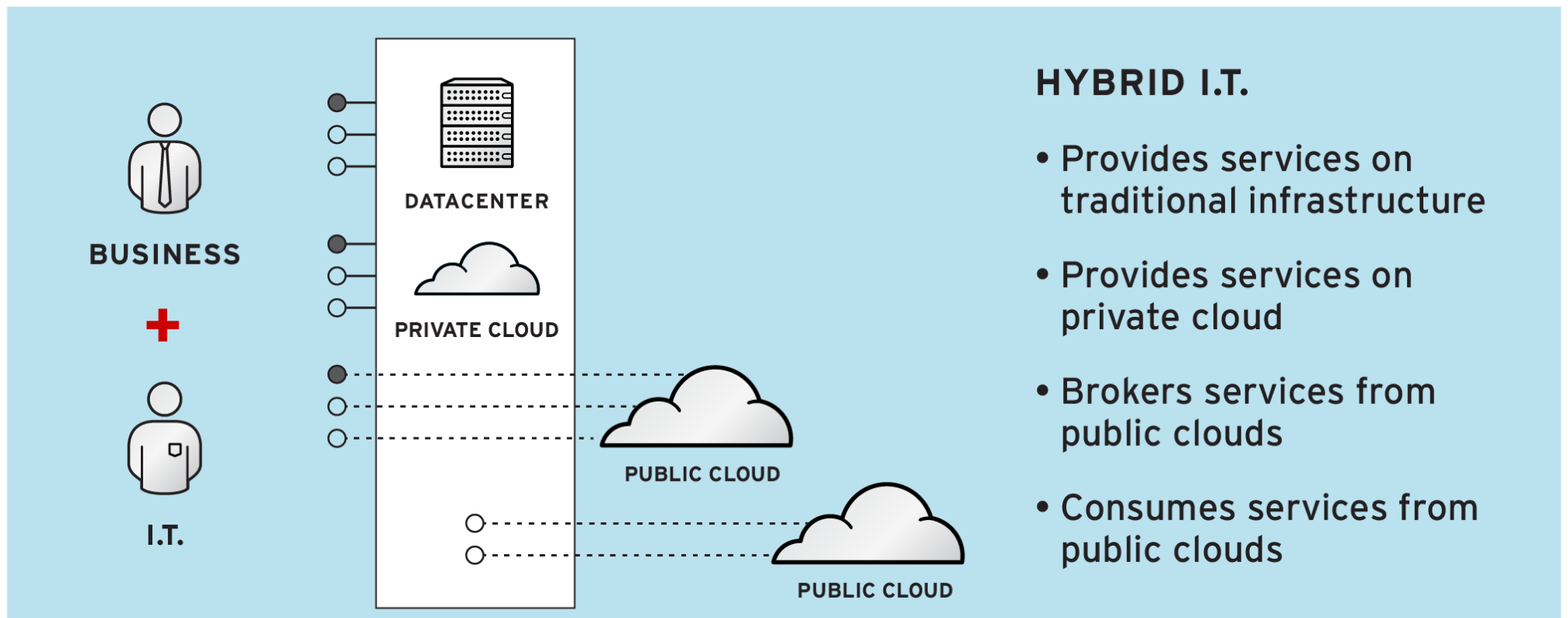
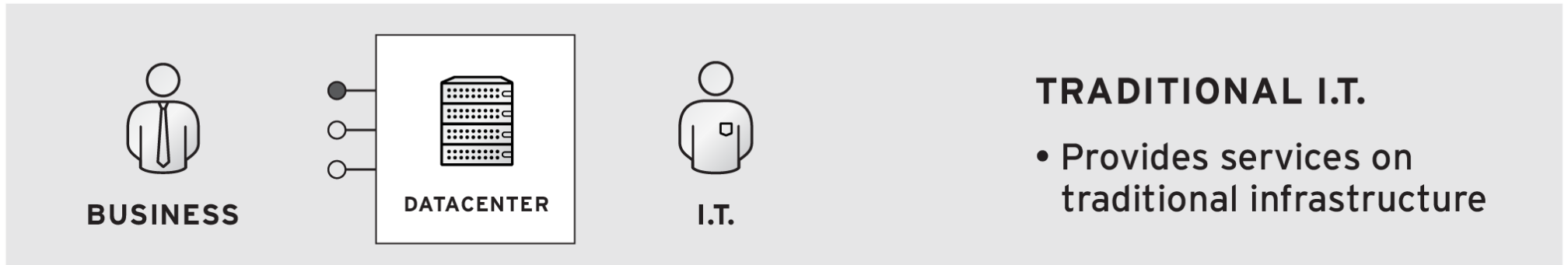
Senior Product Manager – Virtualization and Cloud

# Agenda

- IT Industry Transformation
- IT environments are diverging
  - Virtualization, Private Clouds and Public Clouds
- Convergence
  - Red Hat Storage (RHS)
  - Red Hat Enterprise Virtualization (RHEV)
  - Red Hat OpenStack (RHOS)
- Use Cases
- Summary
- Q&A

# THE ROLE OF I.T. IS CHANGING

From service provider to strategic partner



# ENTERPRISE IS DIVERGING

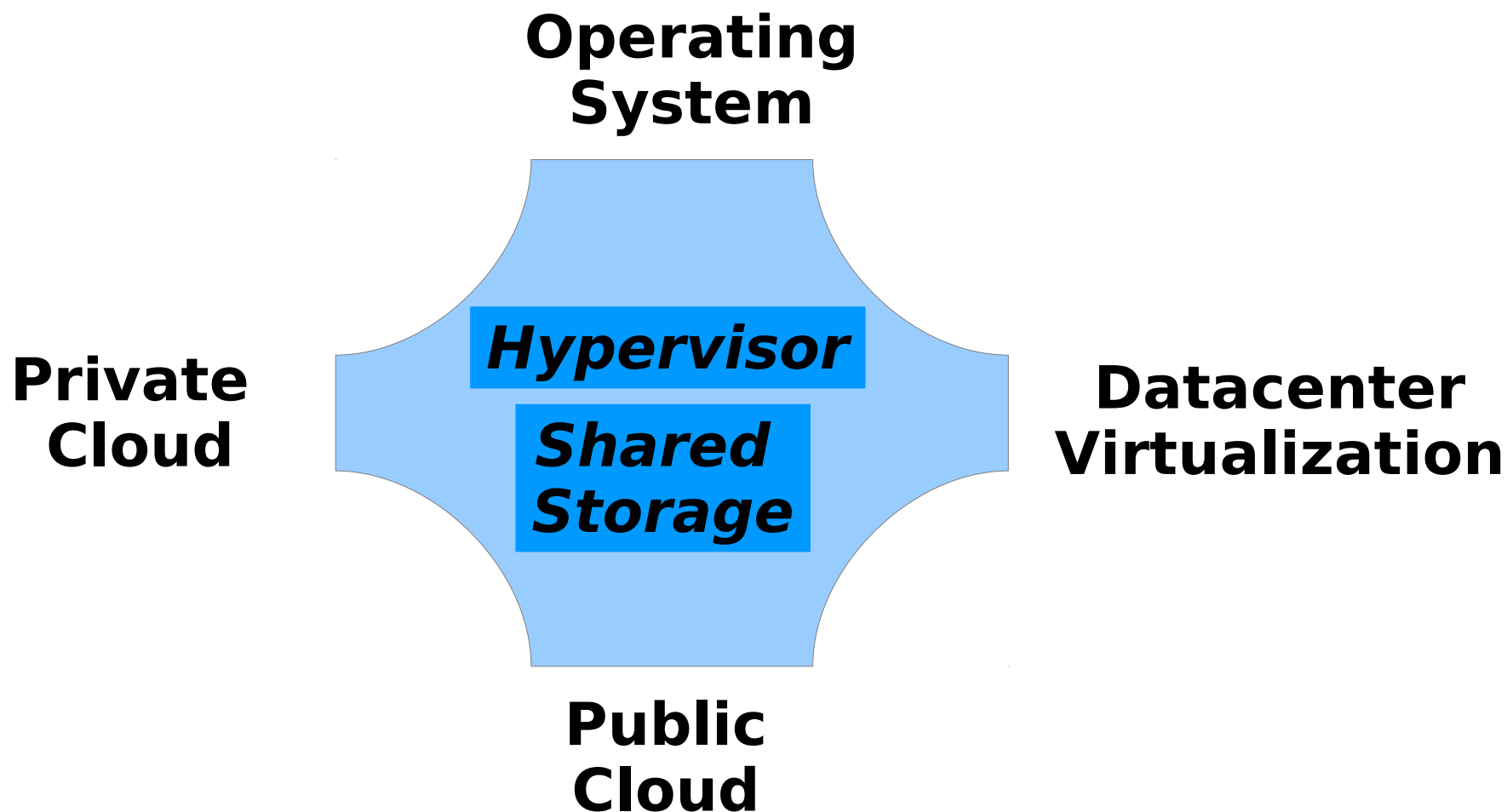
Virtualization

Private Cloud

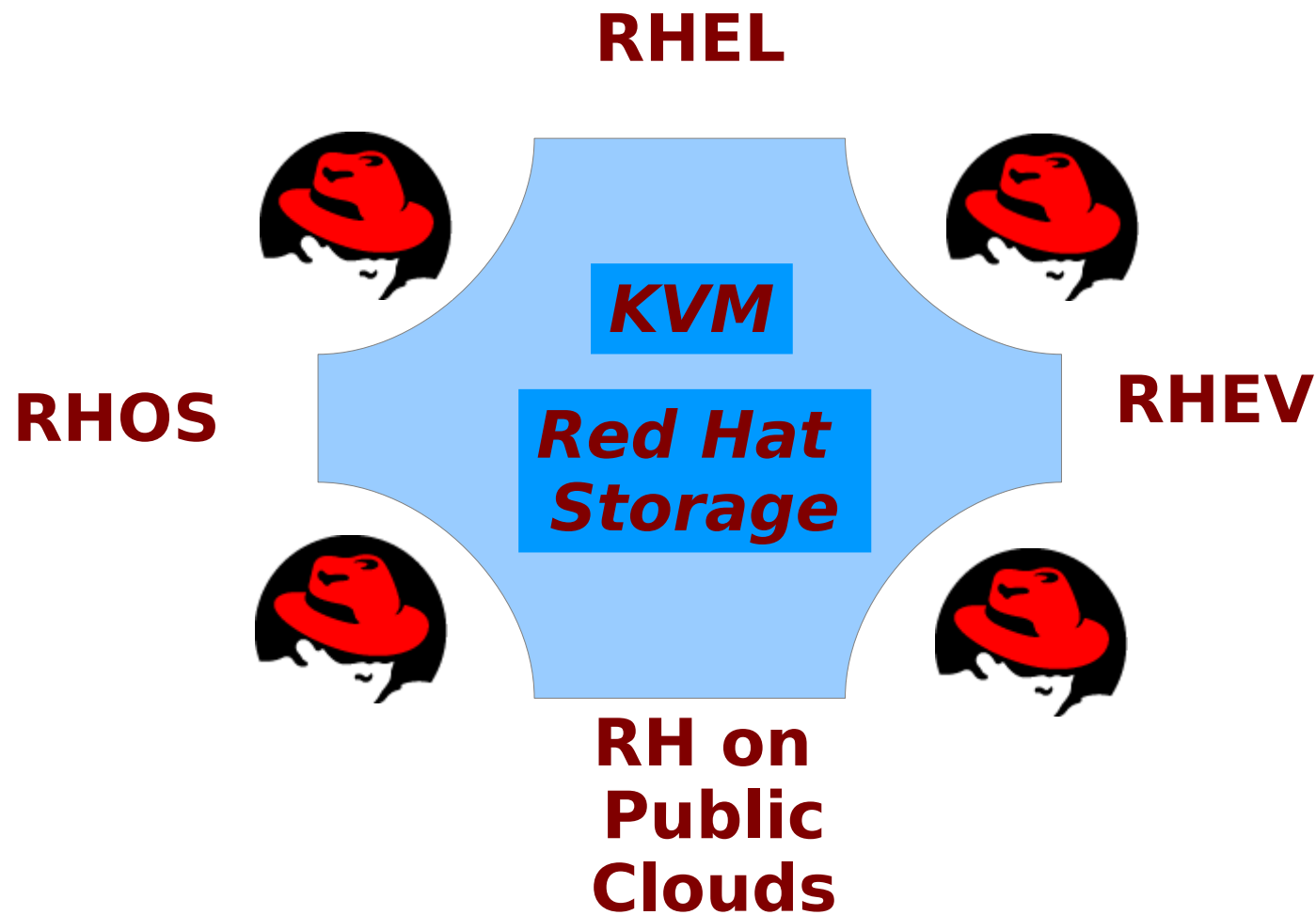


Public Cloud

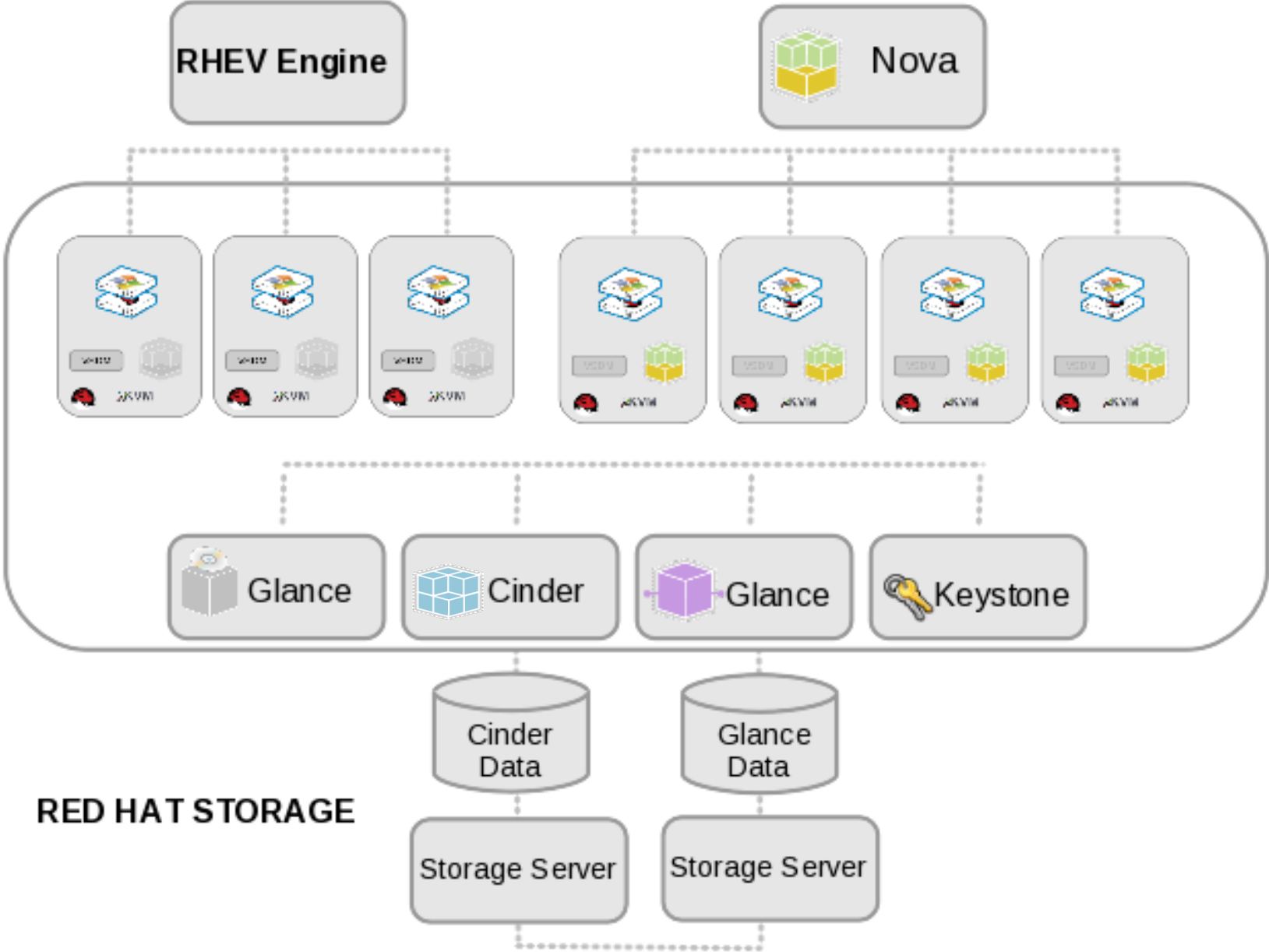
# A COMMON HYPERVISOR AND SHARED STORAGE FOR THE BRIDGE



# Red Hat Technology Integration with KVM and Red Hat Storage (RHS)



# RHOS, RHEV, AND RHS INTEGRATION

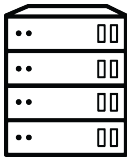




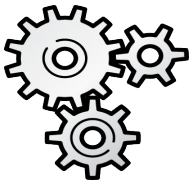
# STORAGE REQUIREMENTS



No Vendor Lock-in



Commodity hardware-based

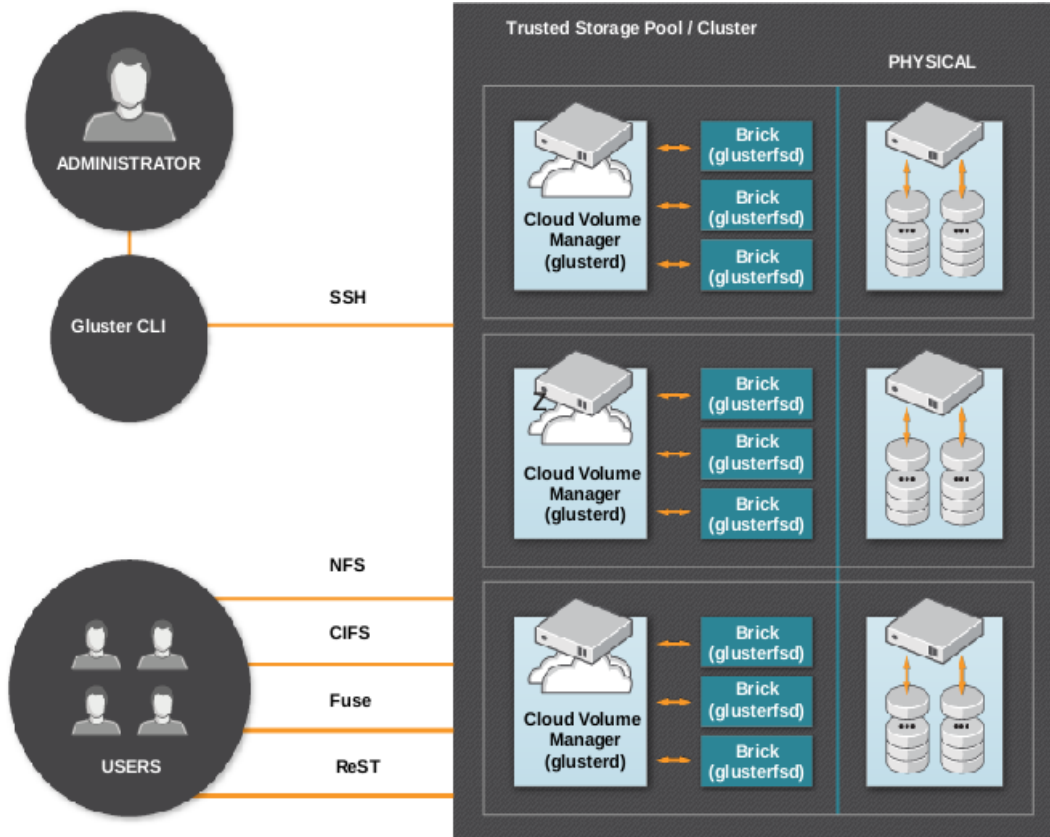


File and Object access to data and unified management



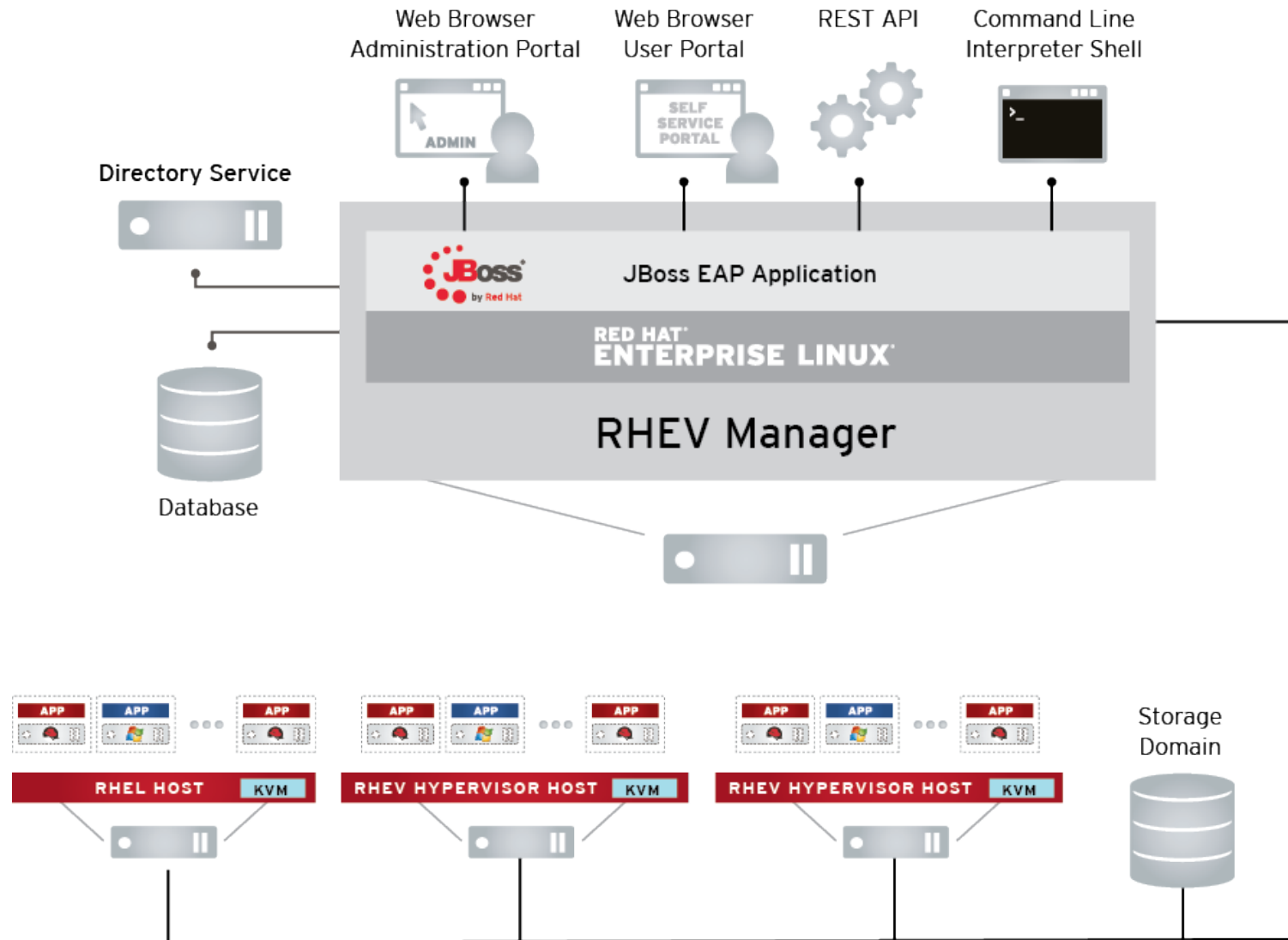
Scale-out and highly available architecture

# RED HAT STORAGE (RHS) OVERVIEW

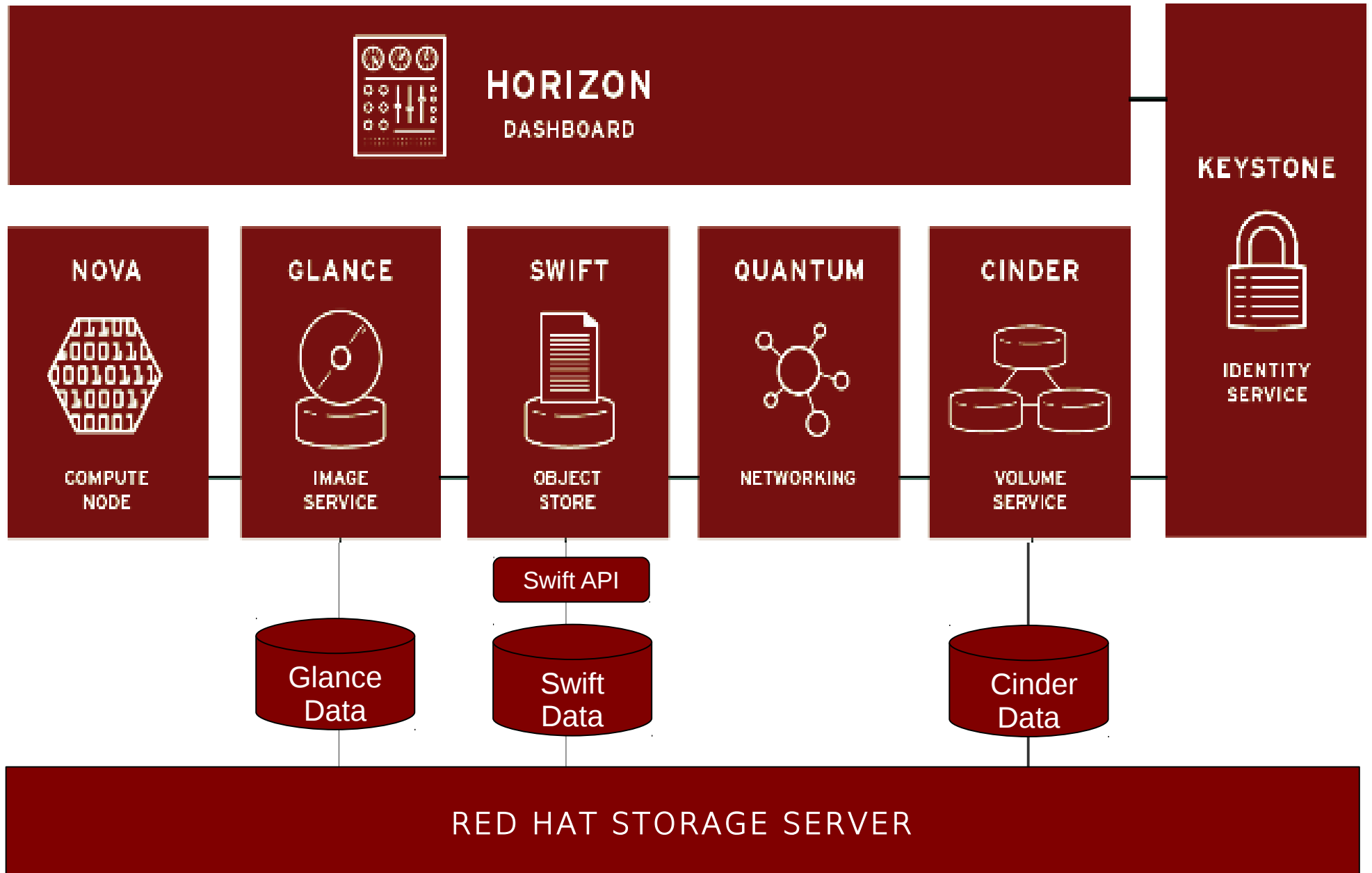


- Started as Gluster, Inc
- Acquired by Red Hat in 2011
- Distributed architecture
- File and Object access
- Deployed at scale
  - Intuit, Pandora, Pattern Energy, BrightCove, Cornell

# RED HAT ENTERPRISE VIRTUALIZATION (RHEV) OVERVIEW

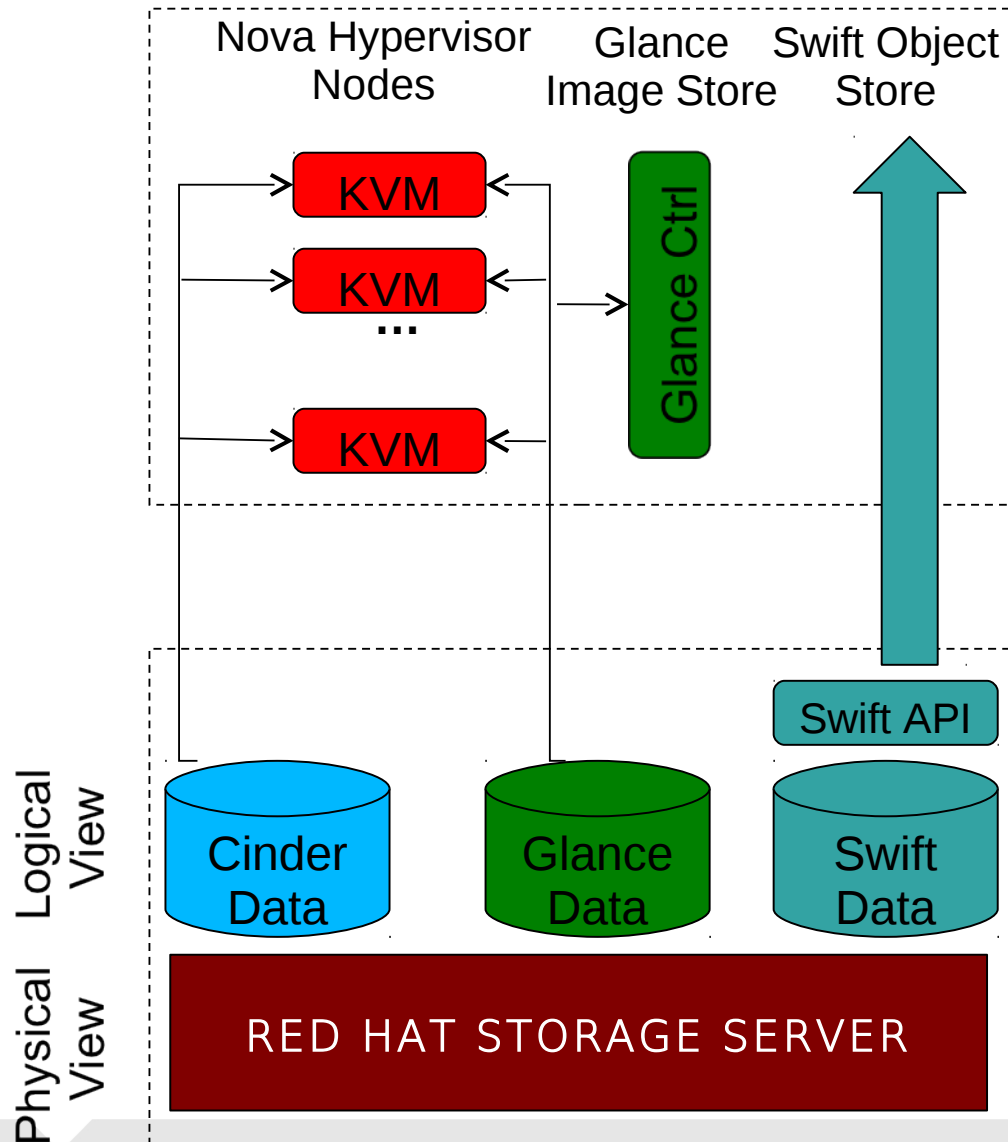


# RED HAT OPENSTACK OVERVIEW



# PRIVATE CLOUD WITH RED HAT OPENSTACK AND RED HAT STORAGE

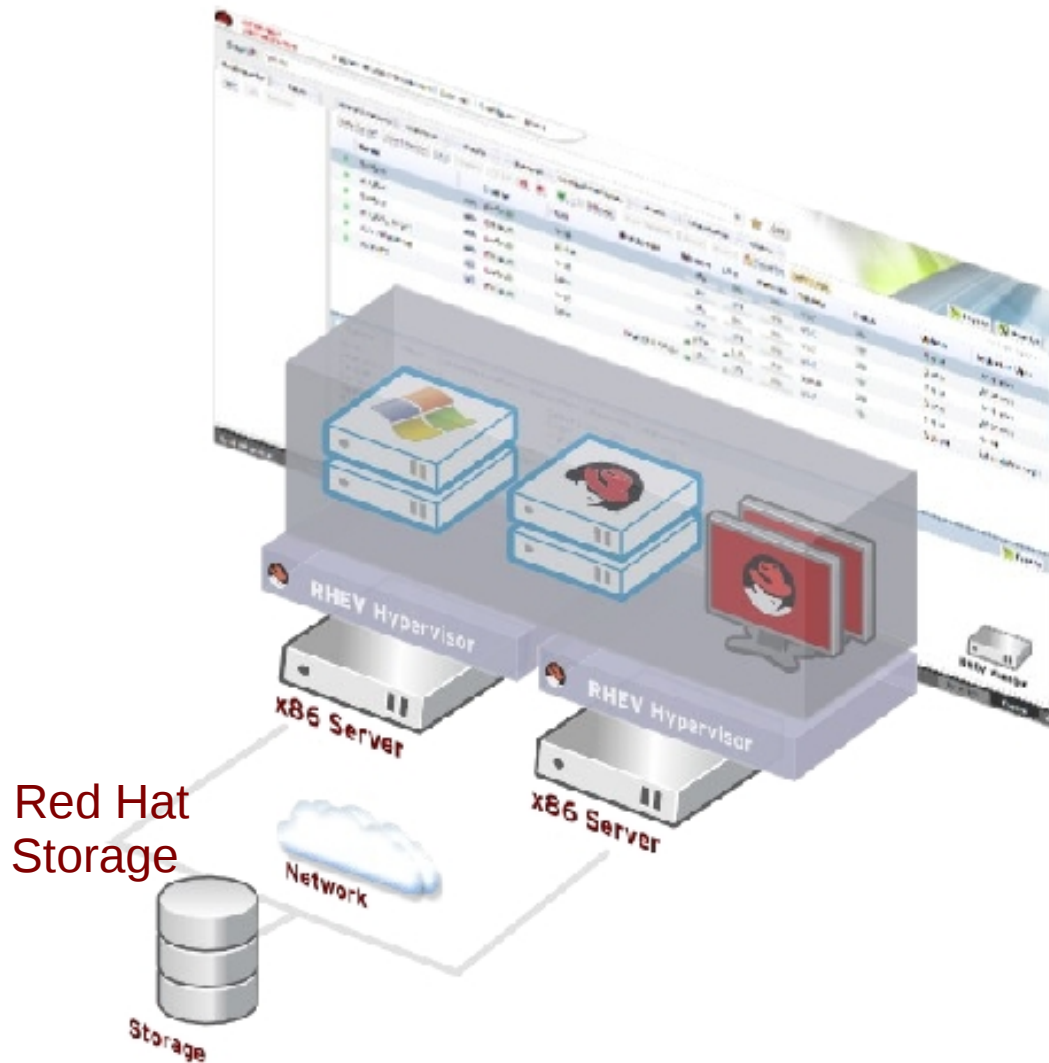
RHOS



**RHS provides:**

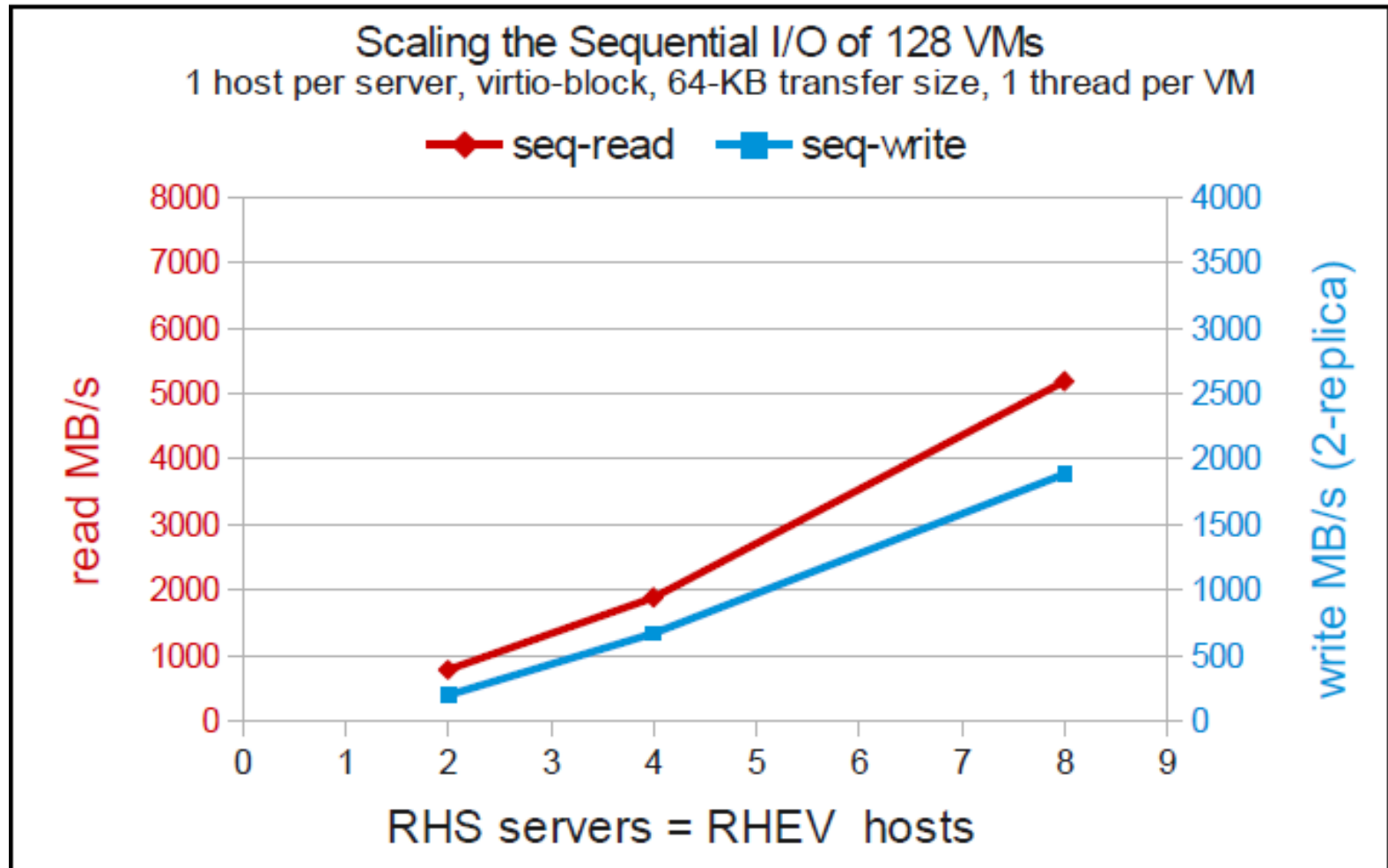
- Cinder Block Service
- Glance Image Service
- Swift Object Service

# CONVERGED VIRTUALIZATION AND STORAGE WITH RED HAT



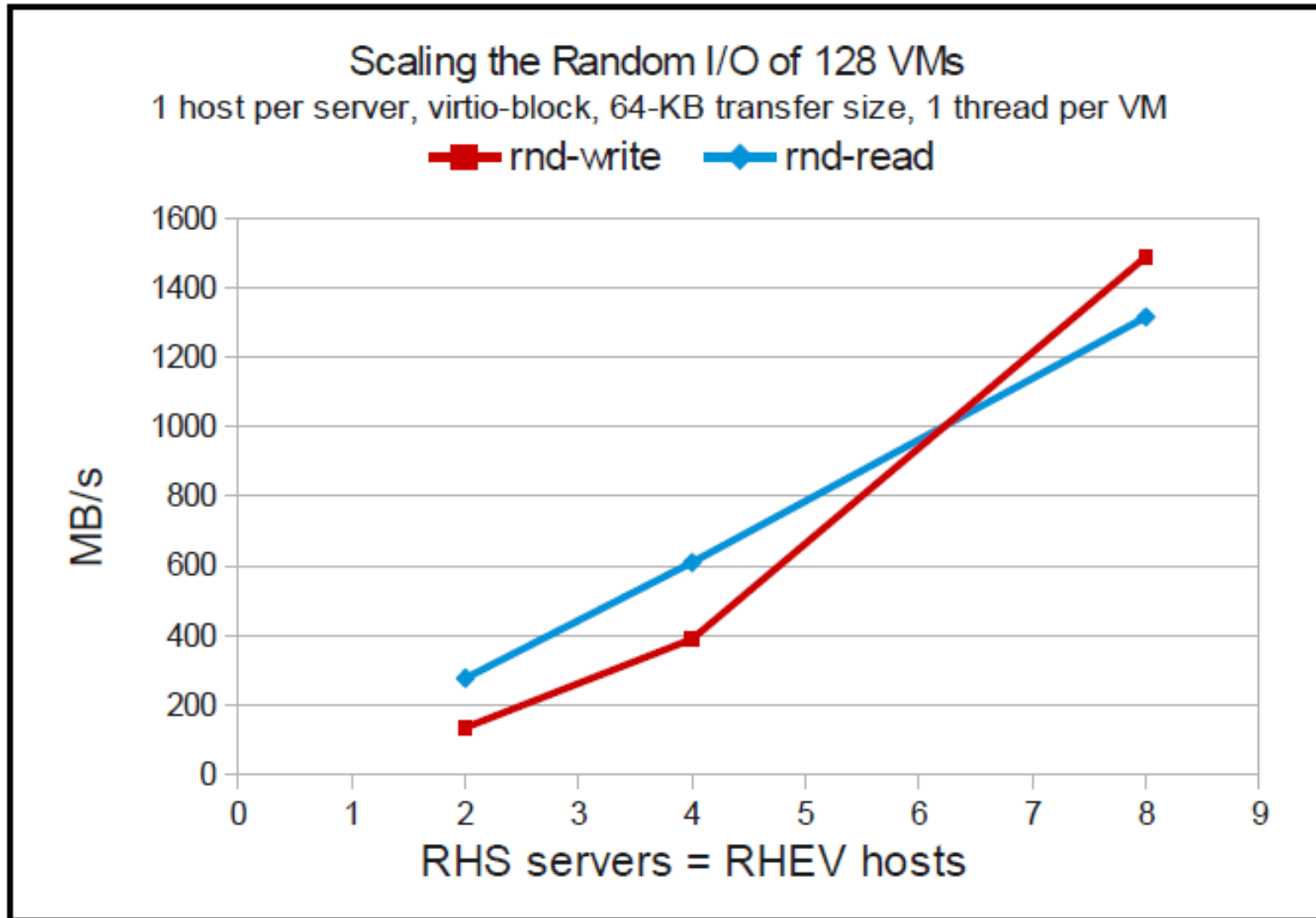
- Store live VM images
- Live Migration of VM
- High Availability
- Common Management

# KVM SCALES WITH RHS



(for sequential IO and ..... )

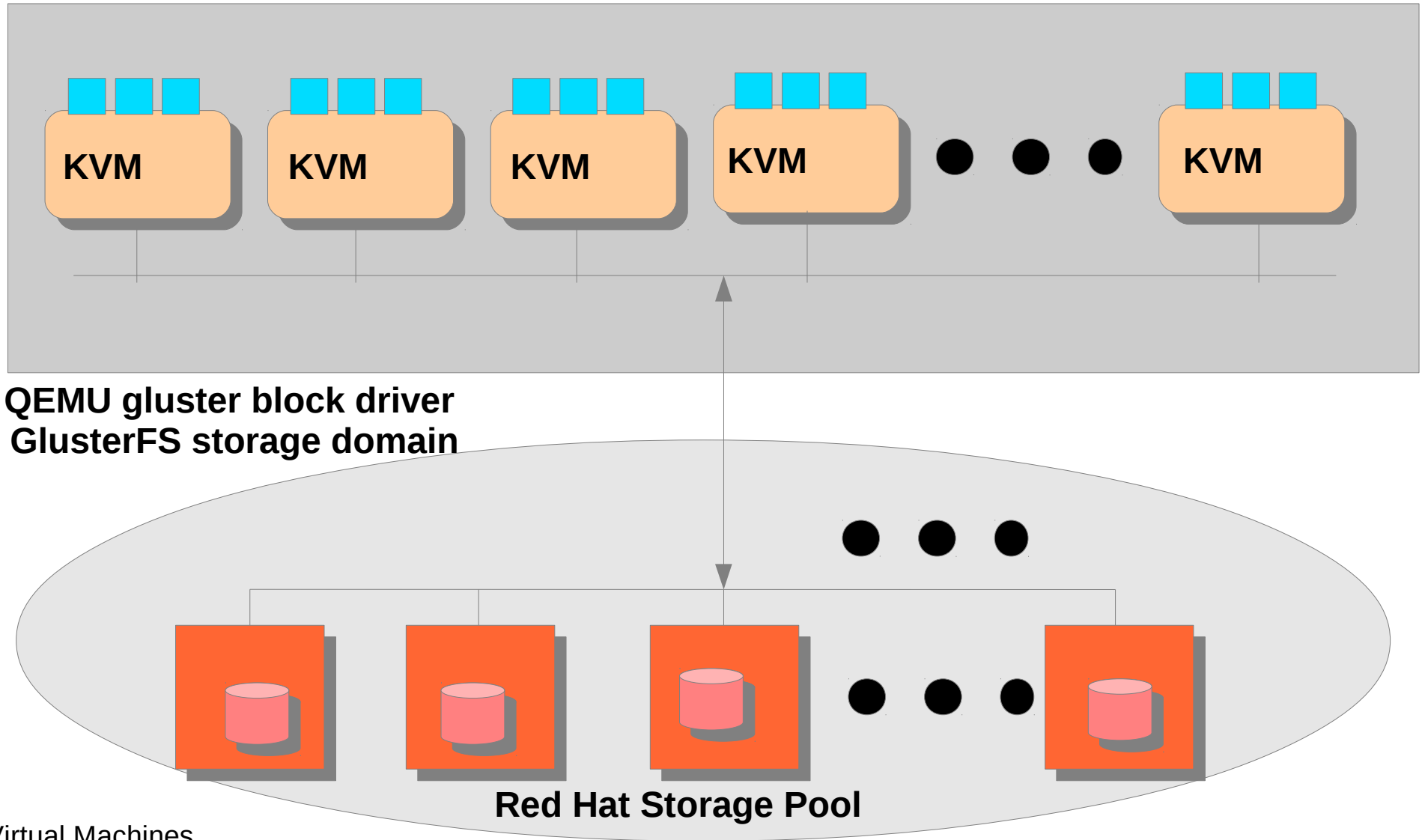
# KVM SCALES WITH RHS



(..... Random IO)

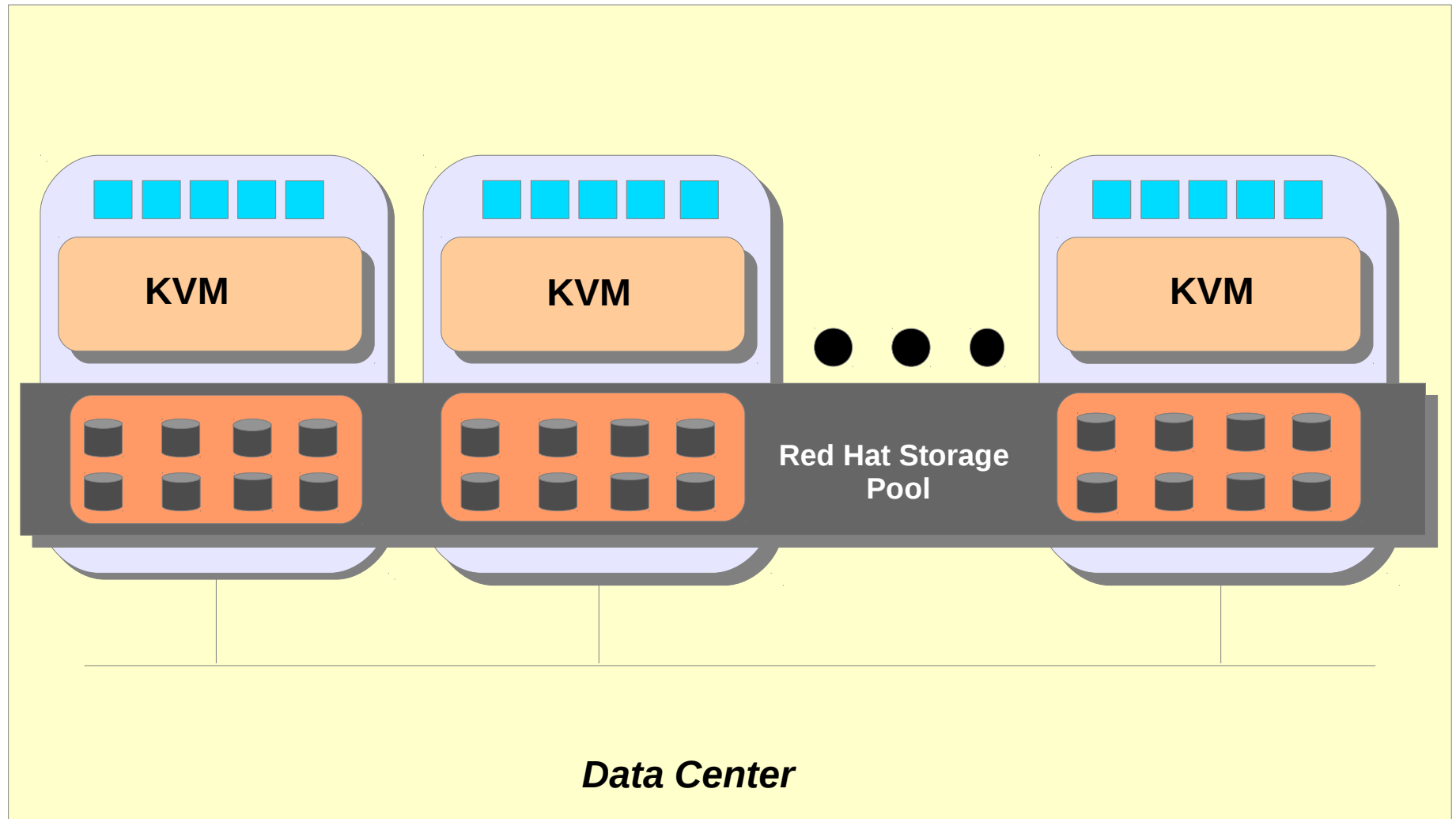


# FUTURE: QEMU Gluster Block Driver and GlusterFS storage domain



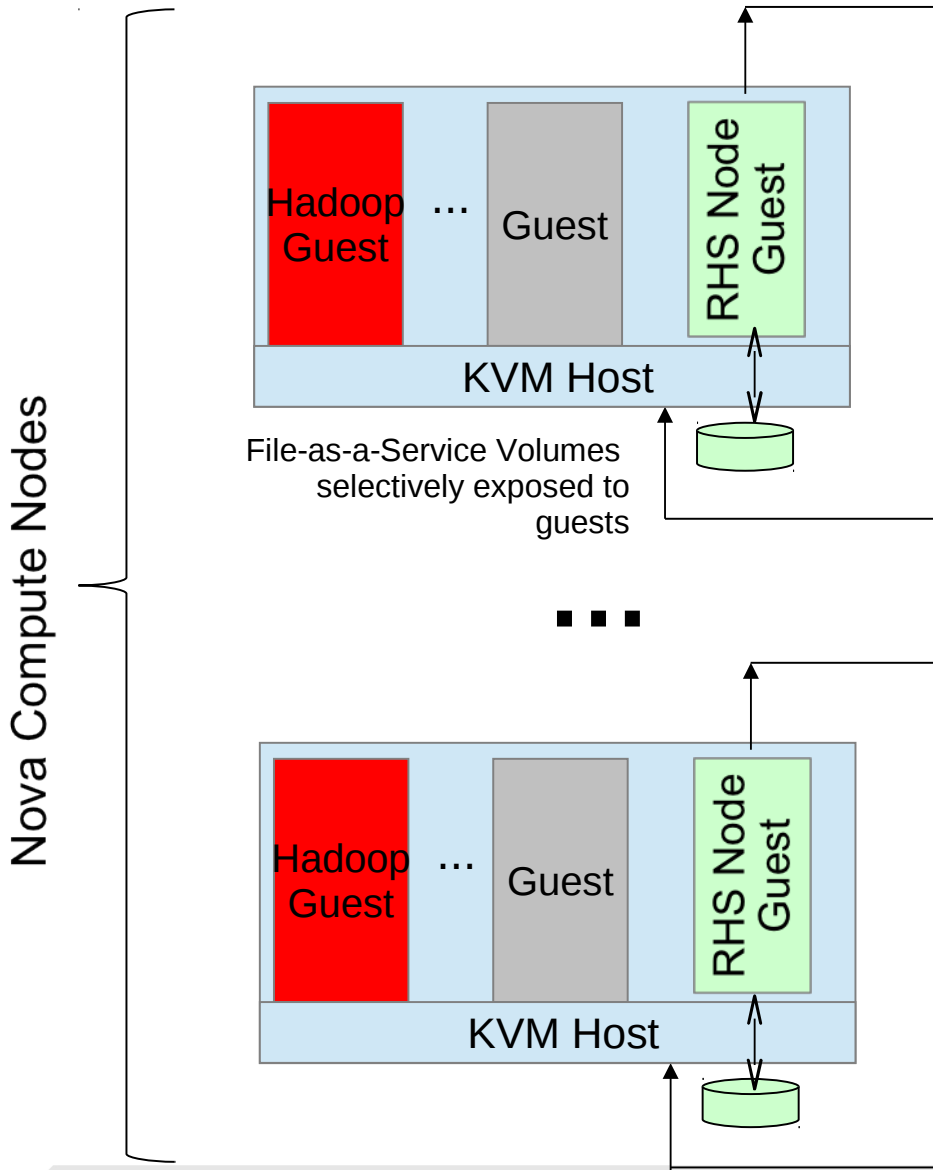
 Virtual Machines

# FUTURE: VMs and RHS are co-located



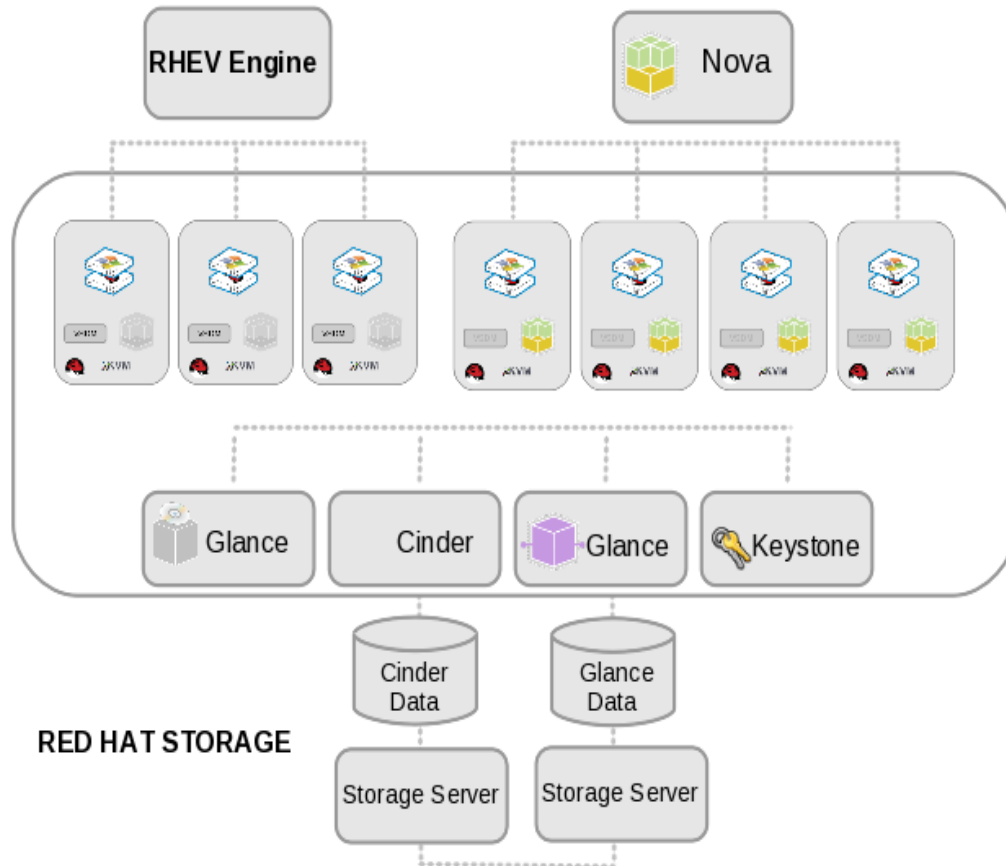
 Virtual Machines

# FUTURE: OpenStack File-as-a-Service with RHS



- File is presented directly inside the guest
  - No virtual block
  - No network roundtrip
- Tenant specific shares
- Use-cases
  - Virtual NAS
  - Hadoop on OpenStack
  - Tenant-private SMB or Swift services

# RHS, RHOS and RHEV INTEGRATION BENEFITS



- Scale-out
- Highly Available
- Enterprise-ready
- Open

# RHOS – RHEV integration

# RHOS – RHEV

## Integration Benefits

- Both provide:
  - VM Life Cycle deployment
  - VM image repository
  - VM Storage services
- OpenStack automates the largest data centers by abstracting virtual resources and the VM lifecycle, in massive scale.
- Both solve similar problems in different ways and work better together like a bass & electric guitar in a rock band...



# RHOS – RHEV

## Zoom in

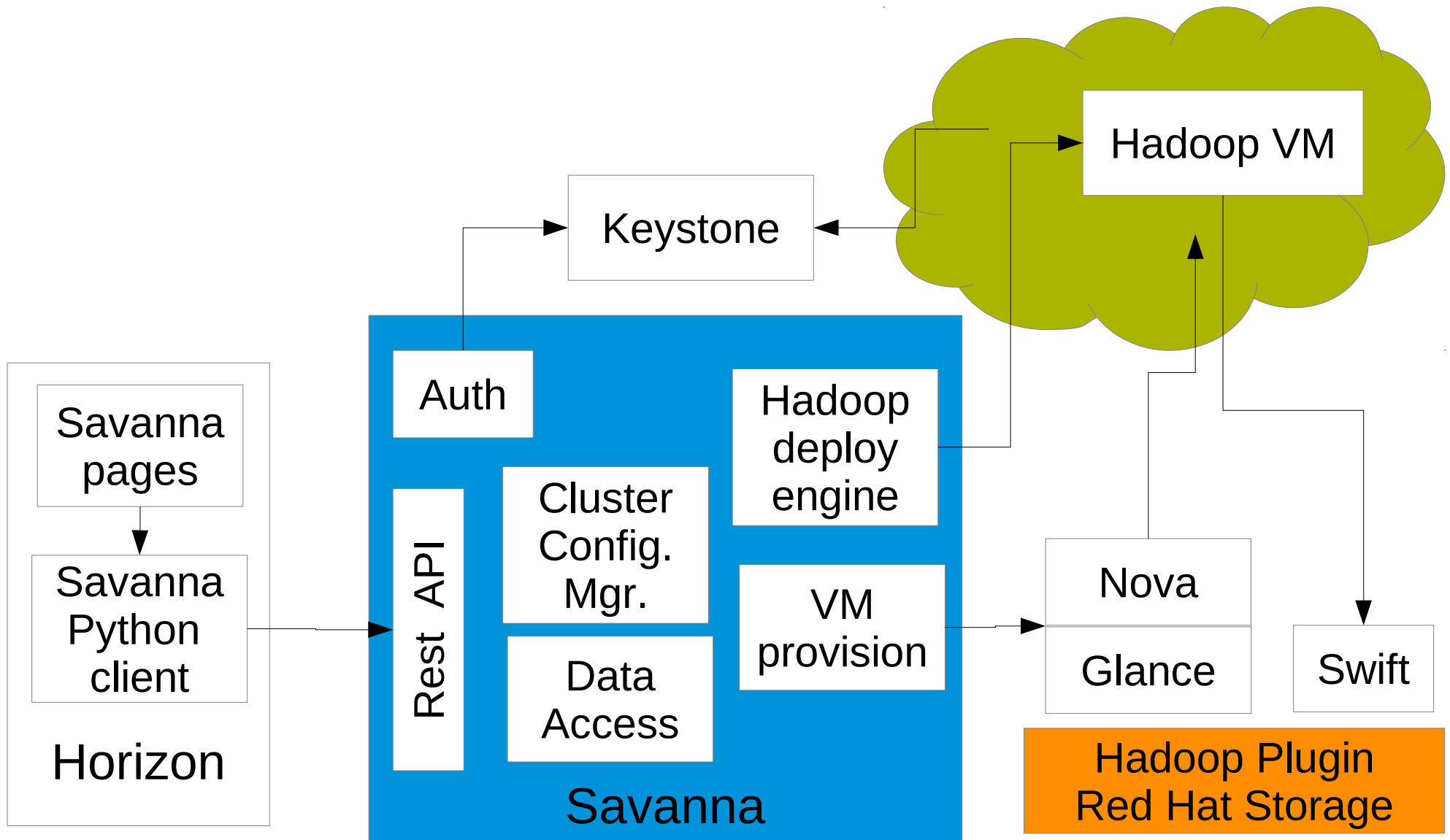


- Once you enter a more virtualized use case, is where RHEV is needed to provide a deeper and more complete treatment
- If you drill down the stack, OpenStack doesn't actually create the VM – it invokes hypervisor specific libraries for it (e.g. libvirt)
- RHEV has a full-blown rich Hypervisor that exposes all KVM features as soon as available
- RHEV can also provide advanced virtual storage services to the applications and provide transparently:
  - Live Storage Migration
  - VM Backup & Restore using Independent Software Vendors\*

# USE CASES

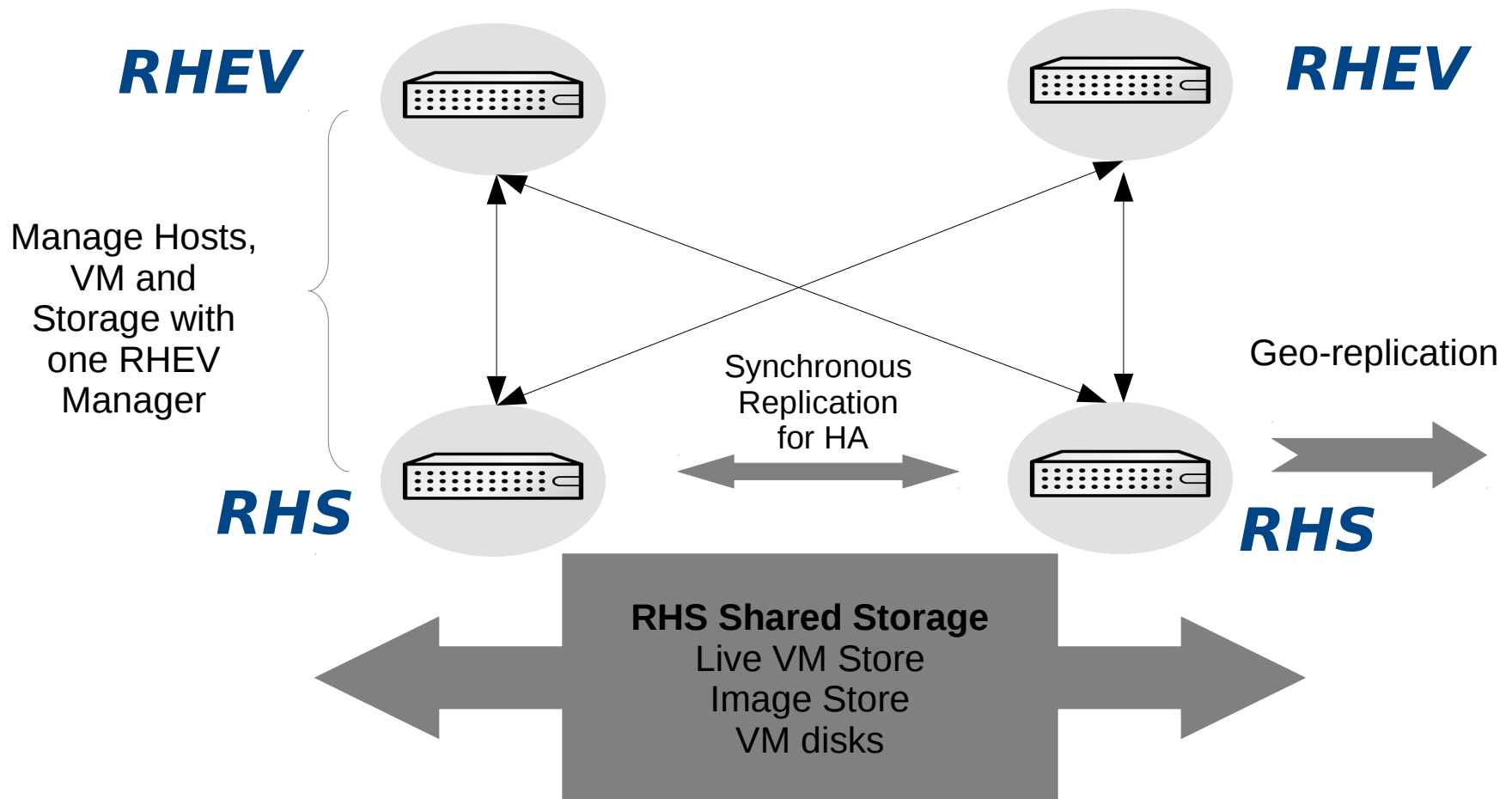


# HADOOP ON DEMAND WITH OPENSTACK AND RHS

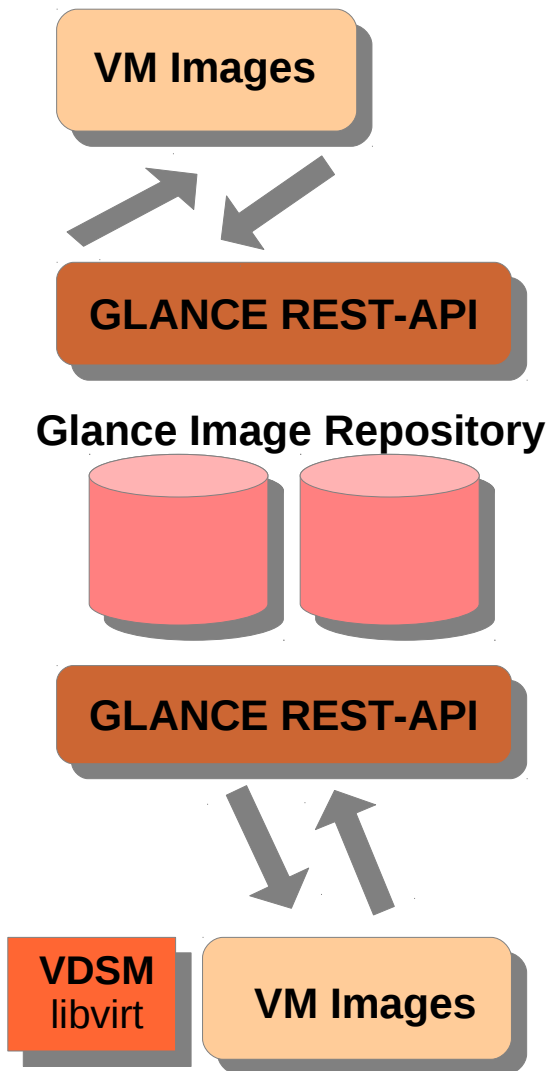


# RHS and RHEV for Branch office

High levels of data protection and resiliency through RHS self-healing, and synchronous and asynchronous replication.



# RHOS and RHEV integrated Image Repositories



- Red Hat OpenStack can immediately benefit from the availability of RHEV images to the entire Data Center via the Glance-API.
- RHEV users will be able to import Glance images directly.
- Perfect for DevOps use case, where the Dev., QA & Staging are performed on OpenStack & then rolled into Production images in RHEV.
- OpenStack can gain the benefit of more VM images to deploy, while the RHEV image repository can consume, export to and from Glance.



# Summary and Conclusions

- IT is diverging because of business and forces technological trends
- KVM and RHEV are essential to connect RHEV, RHOS and Public Clouds
- Benefits
  - Integrated and hardened for enterprises
  - Global support for entire stack
  - Innovative future that provides more choices

# Related Sessions

- **RHOS plus RHS Demo at the Red Hat Booth**
- Thursday, June 13
  - **10:40 AM:** KVM Hypervisor Roadmap & Technology Update + SELinux for Mere Mortals
  - **3:40 PM:** Hadoop on Red Hat Storage Server: A Reference Architecture
  - **3:50 PM:** **Red Hat Enterprise Virtualization & Red Hat Storage Server Integration LAB**
  - **4:50 PM:** Best Practices for Red Hat Storage Server Performance + Red Hat Enterprise Virtualization Performance
- Friday, June 14
  - **11:00 AM:** Red Hat Storage Server: Best Practices & Advanced Configurations

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# THANK YOU

CONNECT TO THE INFORMATION REVOLUTION  
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*[tkatarki@redhat.com](mailto:tkatarki@redhat.com)*  
*[scohen@redhat.com](mailto:scohen@redhat.com)*

# Backup



# RED HAT ENTERPRISE VIRTUALIZATION ROADMAP

## RHEV 3.2 – June 2013

RHEL 6.4

- Based on RHEL 6.4 Hypervisor

New CPU Support

- Intel Haswell and AMD Opteron G5 (Seoul)

New guest Support

- Windows 8 and Windows Server 2012

VDI Smart Card

- Support smart card for client authentication

VDI Spice Proxy

- Support for Network proxy for Spice traffic

Network Mgmt

- New Network Management UI including Network permissions

UI Plugins

- Framework for vendor supplied UI plugins

Reporting

- New reports including cloud provider utilization report

# RED HAT ENTERPRISE VIRTUALIZATION ROADMAP

RHS Native Support

Hosted RHEV-M

Backup API

SLA Manager

Quantum Integration

Glance Integration

VirtIO SCSI

Resize disks

UI Plugins

Self Service

## RHEV 3.3 Release

- Glusterfs as Storage Domain

- Run RHEV Manager as a managed virtual machine with HA

- Backup and Restore API for Independent Software Vendors

- SLA Manager (Quality of Service for Virtual Machines)

- Integration with OpenStack Network Service Management

- Integration with OpenStack Glance for templates/images

- Paravirtualized SCSI support in guests

- Live resize of virtual disks

- Framework for vendor supplied UI plugins

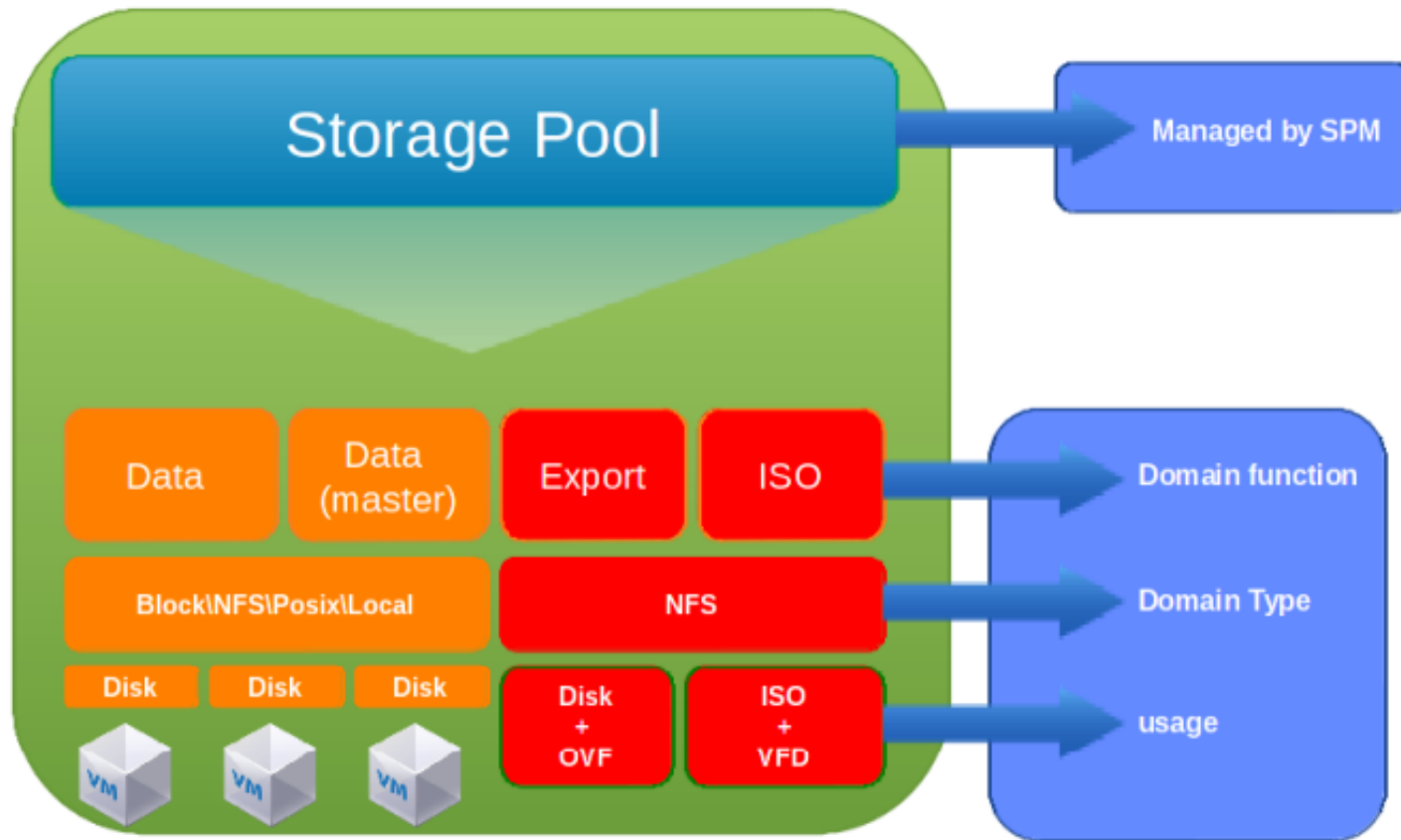
- Expanded self service options – Instance types/images/etc

# RHEV OPENSTACK QUANTOM INTEGRATION

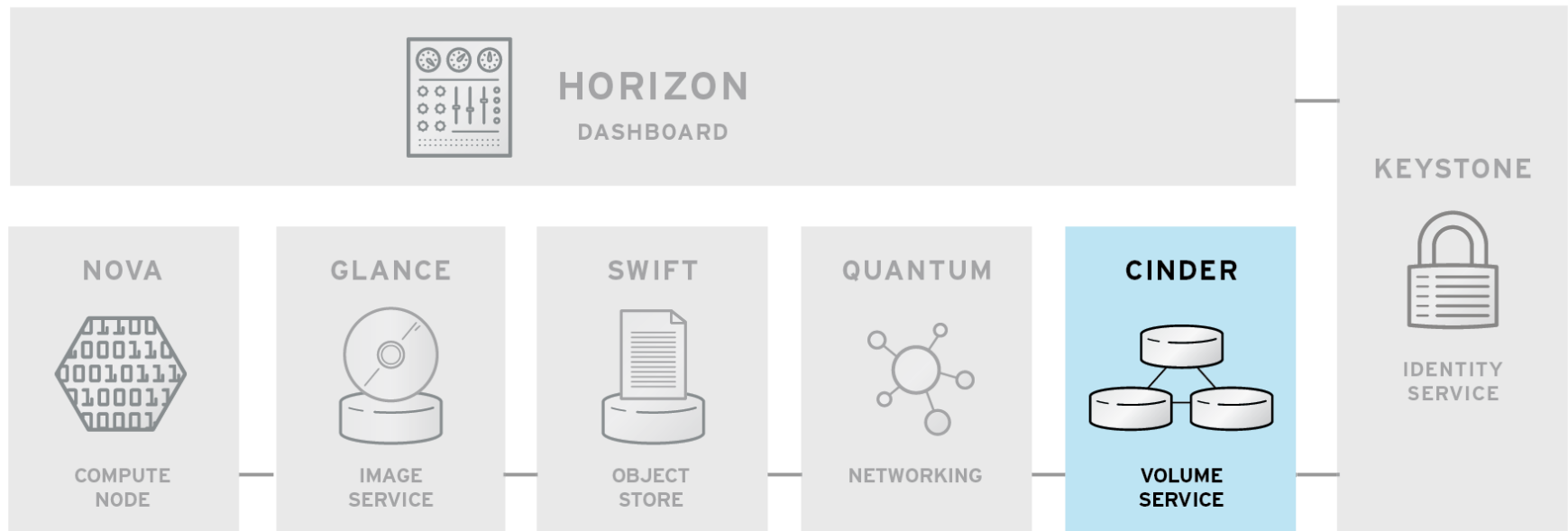
The screenshot shows the oVirt Open Virtualization Manager interface. At the top, the logo 'oVirt Open Virtualization Manager' is on the left, and the user 'admin@internal' is logged in on the right. Below the header is a search bar and a navigation menu with tabs for Data Centers, Clusters, Hosts, Networks, Storage, Disks, Virtual Machines, Pools, Templates, Volumes, Providers, and Users. The 'Providers' tab is selected. On the left sidebar, a tree view shows the system hierarchy: System, dc, Storage, Networks, Templates, Clusters, and Default. The main content area displays a table of providers. The first row is 'Quantum' with description 'Quantum external provider' and URL 'http://10.35.17.30:9696/v2.0'. Below this, there are tabs for 'General' and 'Networks'. Under the 'Networks' tab, there is a 'Discover' button highlighted with a red box, and a 'remove' link. Below the button is a table with columns 'Name' and 'External ID', containing one entry: 'external\_red' with ID 'a9cf334b-e1c6-4463-b5a8-42872f9b23ed'. At the bottom, a status bar shows a message: 'Last Message: 2013-Jan-21, 21:28 User admin@internal logged in.' and notification icons for Alerts (2), Events, and Tasks (0).

# Add RHS Roadmap

# Overview of RHEV Storage concepts



# OPENSTACK CORE PROJECTS

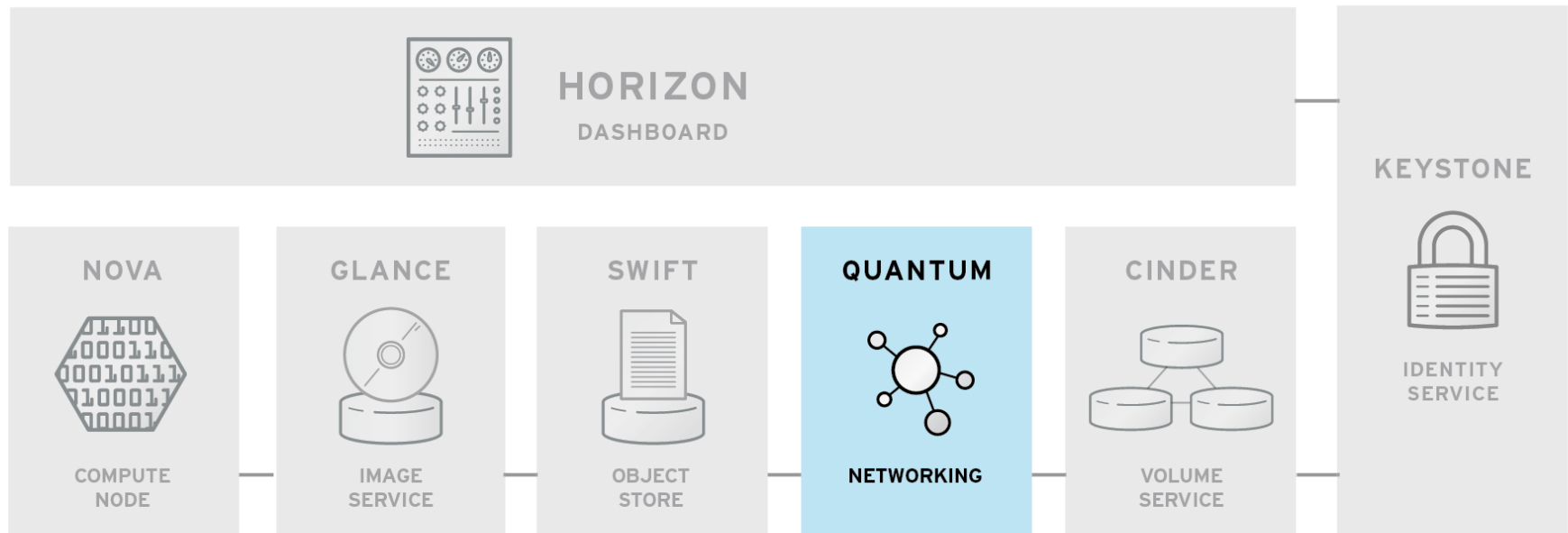


OST 0001

## OpenStack Block Storage (CINDER)

- Block Storage (Volume) Service
- Provides block storage for virtual machines (persistent disks)
- Similar to Amazon EBS service
- GlusterFS Driver for Cinder
- Plugin architecture for vendor extensions

# OPENSTACK CORE PROJECTS

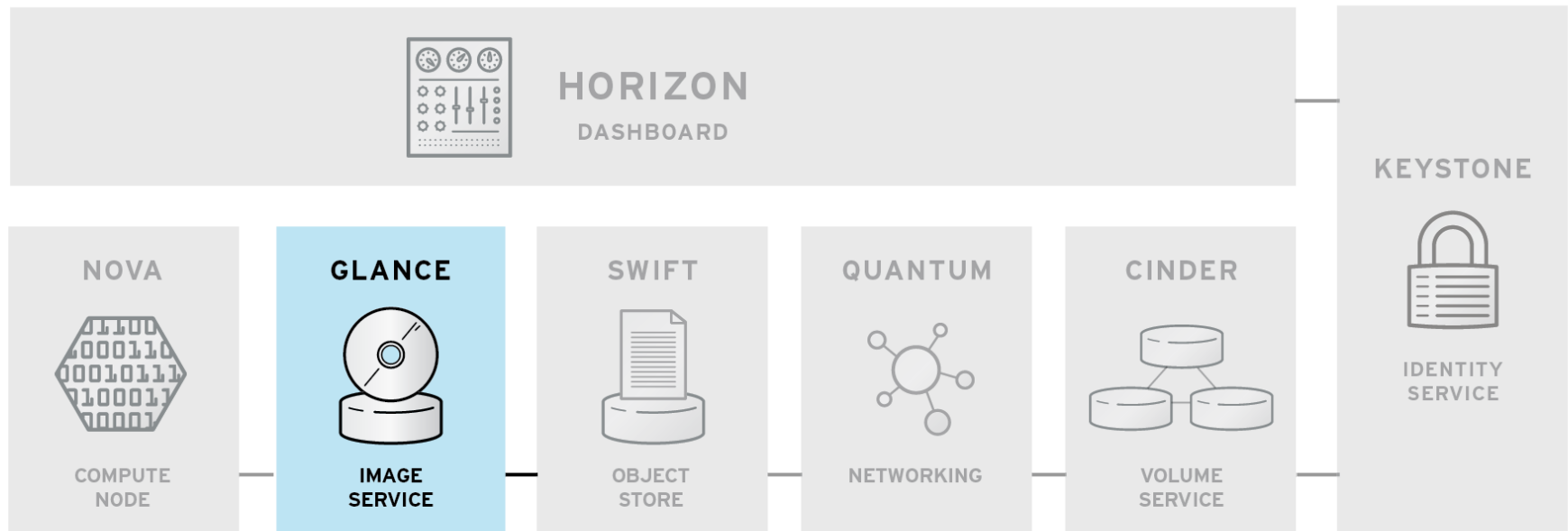


OST 0001

## OpenStack Networking (formerly QUANTUM)

- Network Service
- Provides framework for Software Defined Network (SDN)
- Plugin architecture
  - Allows integration of hardware and software based network solutions

# OPENSTACK CORE PROJECTS



## OpenStack Image Service (GLANCE)

- Image service
- Stores and retrieves disk images (virtual machine templates)
- Supports Raw, QCOW, VMDK, VHD, ISO, OVF & AMI/AKI
- Backend storage : Filesystem, Swift, Amazon S3



# Red Hat Open Stack Overview

OpenStack is software and tools for building and managing Cloud infrastructure

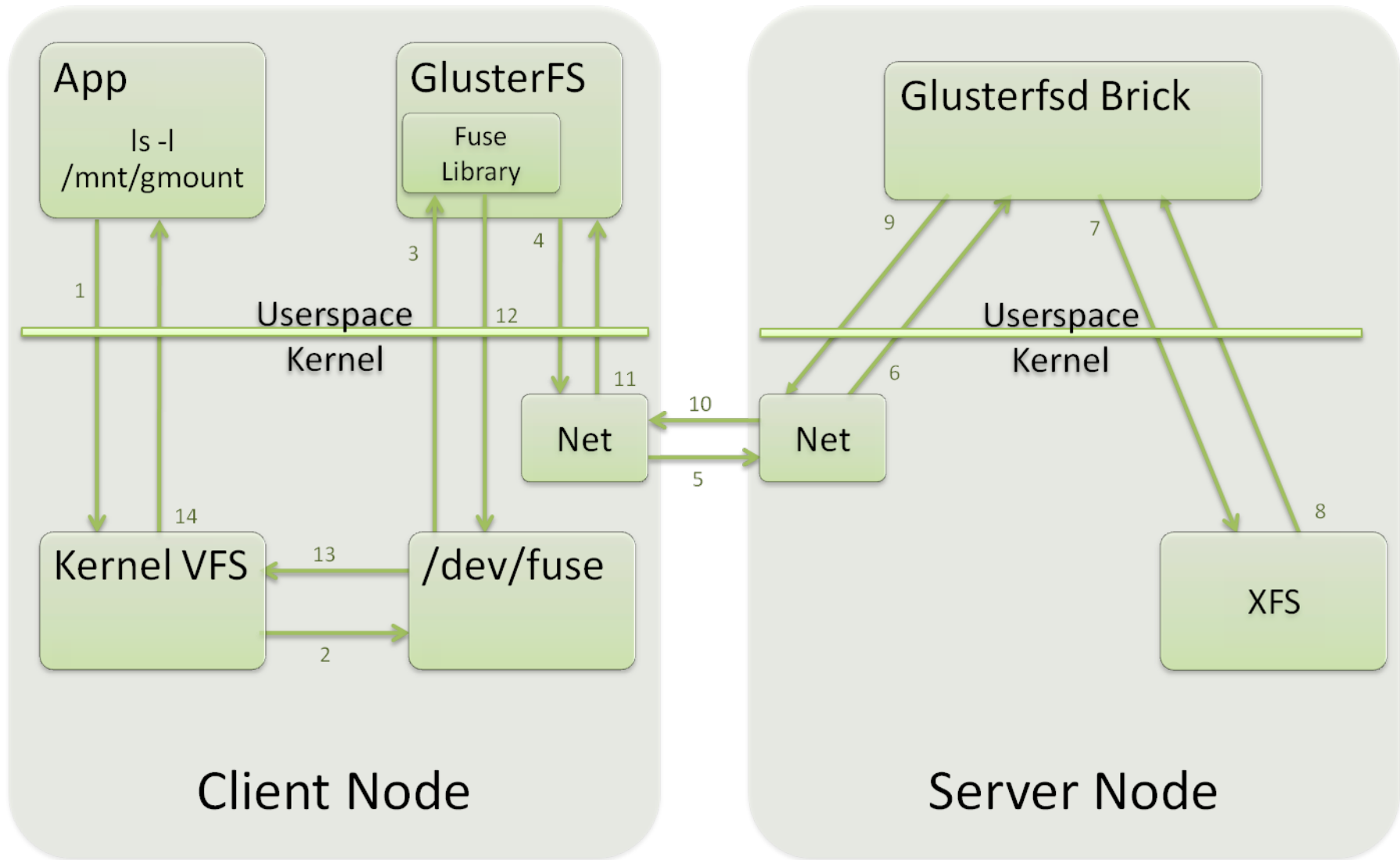
9429 users distributed across 87 countries and 100s of deployments

RDO is a community of people using and deploying OpenStack on Red Hat platforms

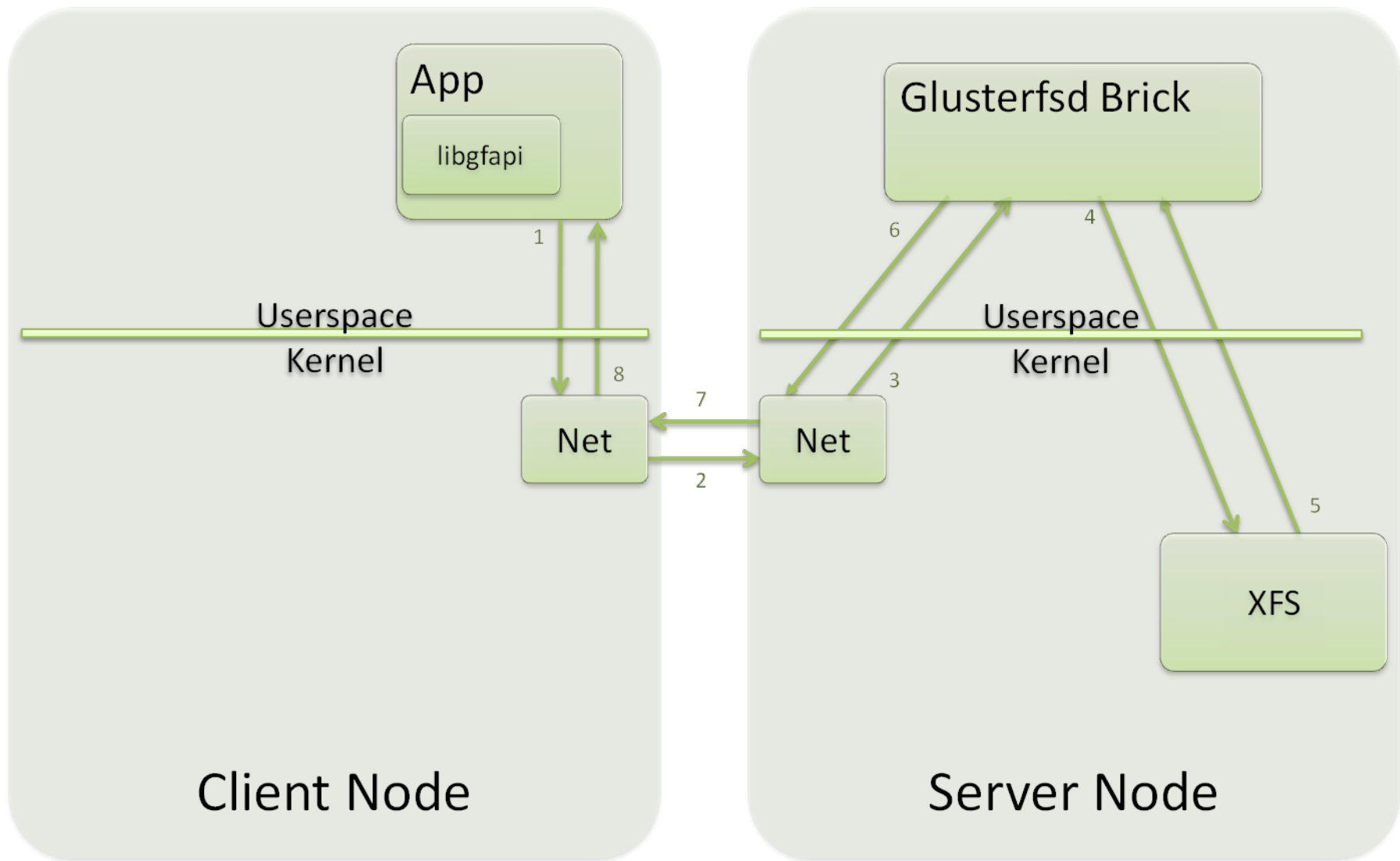
Red Hat Open Stack is the Community Invented Open Stack that has been Hardened and Supported by Red Hat

Red Hat is very actively involved and is the largest contributor to the latest release (Grizzly)

# Native Application, FUSE-based Access



# Native Application, libgfapi-based Access



# Red Hat Storage server roadmap summary

		CY 2013			CY 2014		
Releases		Anshi		Big Bend	Corbett	Denali	
		Q1	Q2	Q3	Q4	Q1	Q2
Key Features		<b>Theme: Red Hat Enterprise Virtualization images store, robustness (GA)</b> <ul style="list-style-type: none"> <li>• Red Hat Enterprise Linux 6.2 based</li> <li>• Red Hat Enterprise Virtualization image store</li> <li>• Live migration of VMs</li> <li>• Root squash support                             <ul style="list-style-type: none"> <li>• ~100 bug fixes</li> </ul> </li> </ul>		<b>Theme: High Performance Geo-Replication (RC)</b> <ul style="list-style-type: none"> <li>• Red Hat Enterprise Linux 6.4 based</li> <li>• High performance Geo-replication Quota Support</li> </ul> <b>Features</b> <ul style="list-style-type: none"> <li>• Improved swift integration with authentication support and performance enhancements</li> </ul>	<b>Theme: Console, Windows Performance (RC)</b> <ul style="list-style-type: none"> <li>• Red Hat Enterprise Linux 6.4 based</li> <li>• Storage Console full support</li> </ul> <b>Features</b> <ul style="list-style-type: none"> <li>• SMB 2.0 Support and performance updates</li> <li>• Document &amp; Support AD integration</li> <li>• NFSv3 ACL support</li> </ul>	<b>Theme: Snapshots (RC)</b> <ul style="list-style-type: none"> <li>• Red Hat Enterprise Linux 6.5 based</li> <li>• Snapshots</li> </ul> <b>Features</b> <ul style="list-style-type: none"> <li>• Better support for small files performance</li> </ul>	