RED HAT ENTERPRISE VIRTUALIZATION

Mario Cavaldesi

RED HAT ENTERPRISE VIRTUALIZATION

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

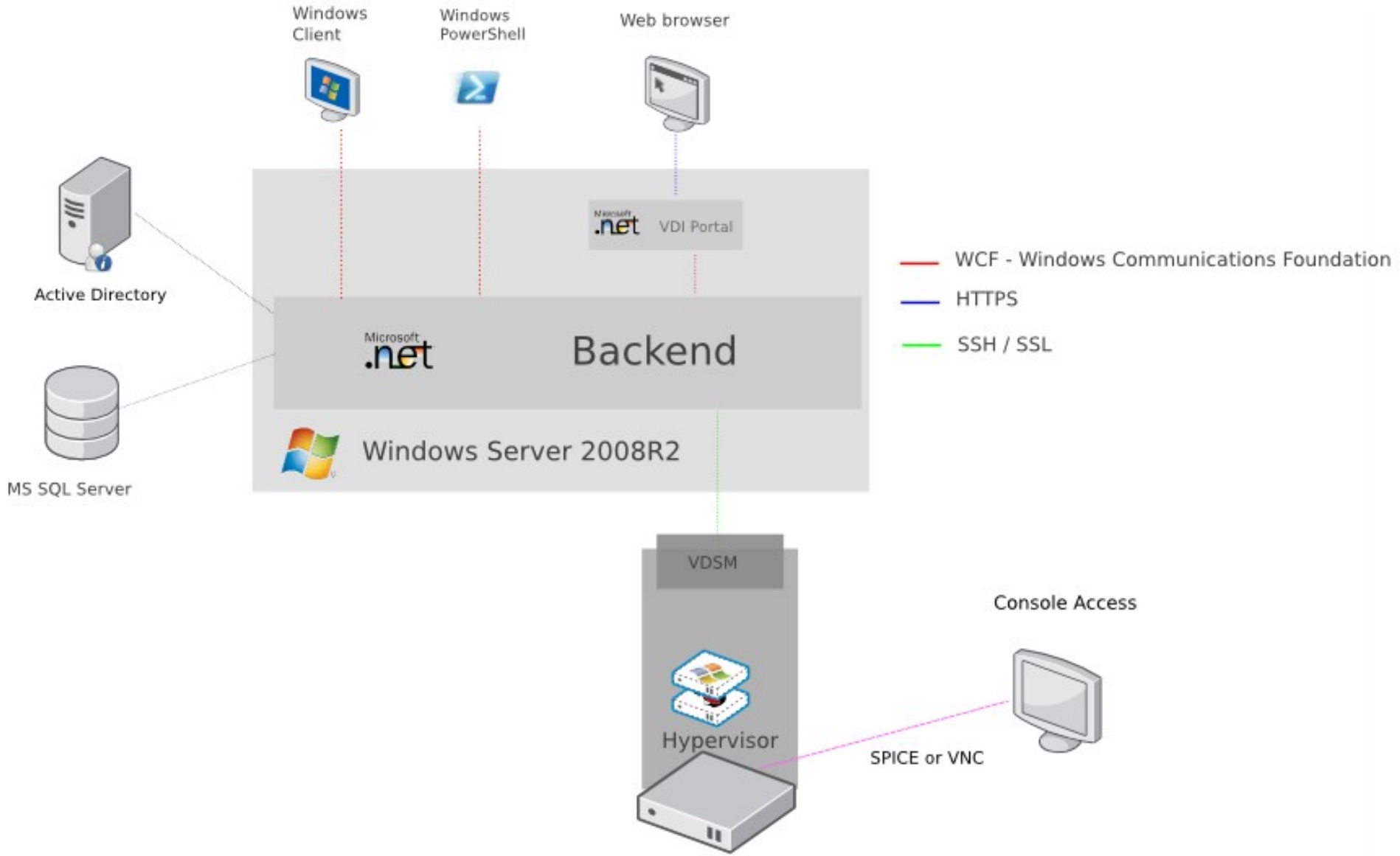
TREMENDOUS MOMENTIUM AROUND RED HAT ENTERPRISE VIRTUALIZATION

MORE AND MORE CUSTOMERS USE RED HAT ENTERPRISE VIRTUALIZATION ...

IBM	IBM Smart Business Test and Dev public cloud powered by RHEV
NTT Communications	New cloud computing service, BizHosting Basic runs on RHEV
	Swedish ISP runs video on demand service on RHEV
OXILION	Dutch ISP runs public “data center as a service” cloud on RHEV
Euronet Worldwide	Business critical card management system runs on RHEV
etisalat	RHEV powers telecom service provider's critical IT infrastructure
QUALCOMM	Wireless leader runs RHEV as a strategic virtualization platform
GANART TECHNOLOGIES	American financial services firm runs secure transaction cloud on RHEV
POLICLINICO SAN MARCO S.p.A.	Italian private hospital runs mission critical medical systems on RHEV
Growing Opportunity	Indian micro finance firm runs portfolio management system on RHEV

RED HAT ENTERPRISE VIRTUALIZATION

RED HAT ENTERPRISE VIRTUALIZATION
RHEV 2.2 ARCHITECTURE



RED HAT ENTERPRISE VIRTUALIZATION 2.2: SERVER AND DESKTOP VIRTUALIZATION

SERVER VIRTUALIZATION

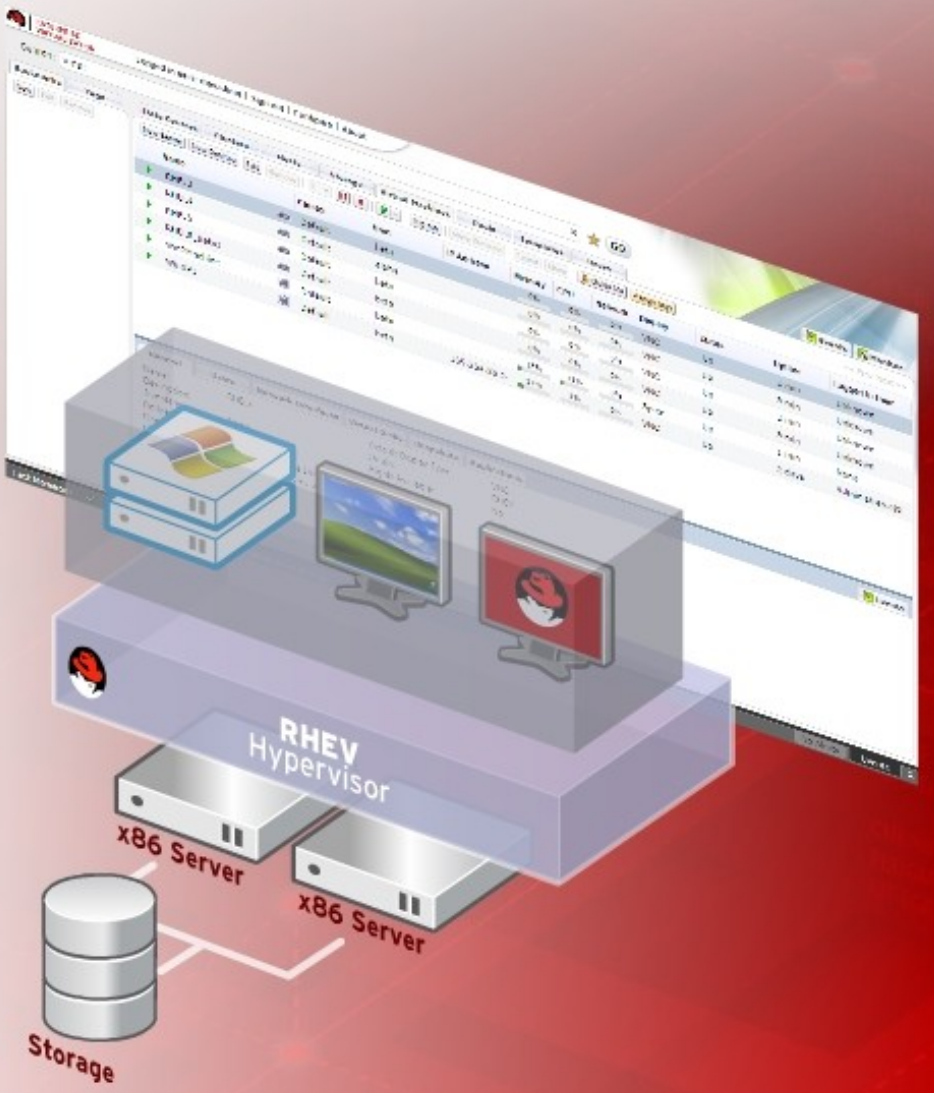
- High Availability
- Live Migration
- System Scheduler
- Power Saver
- Image management/ provisioning
- OVF Import/Export — NEW
- VMware and RHEL/Xen VM image converter — NEW
- Enhanced scalability (16 vCPU, 256 GB RAM Guest operating systems) — NEW

DESKTOP VIRTUALIZATION

- SPICE remote rendering — NEW
  - HD quality video
  - bi-directional audio/video
  - USB support
  - Multiple monitors
- Connection Broker — NEW
- Desktop pools — NEW

ADVANCED, CENTRALIZED, ENTERPRISE GRADE VIRTUALIZATION MANAGEMENT

- Integrated server and desktop virtualization management
- Scalability to hundreds of hosts and thousands of virtual machines
- Modern, search driven user interface, bookmarks, tags
- Robust API for scripting



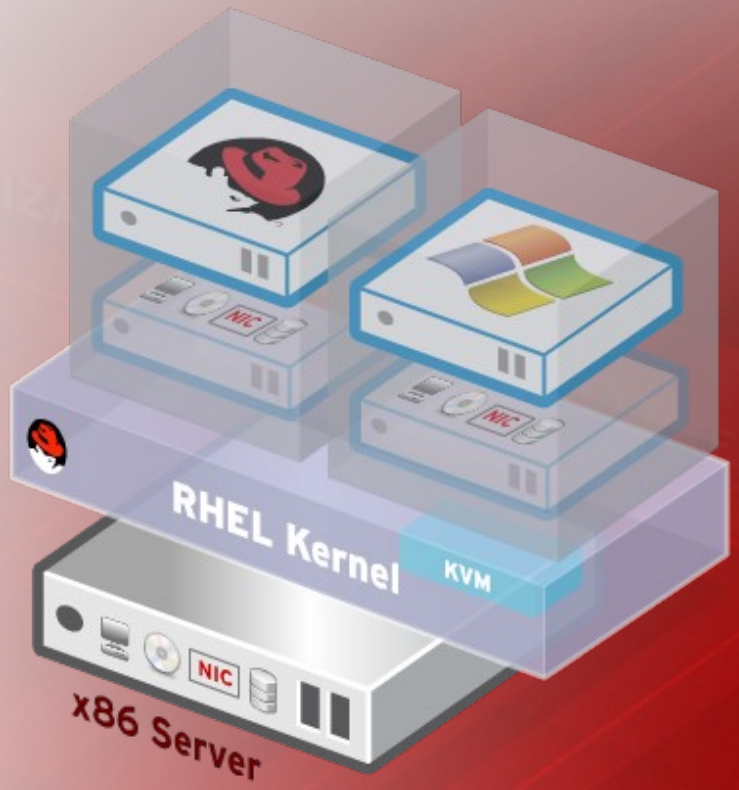
ADVANCED HYPERVISOR TECHNOLOGY

Leverages KVM (Kernel-based Virtual Machine) technology – integrated with the Linux kernel

Host scalability: 96 cores, 2 TB RAM. Guest scalability:
16 vCPU, 256 GB RAM

Advanced capabilities: memory page sharing, SR-IOV, VT-D, SE-Linux based security policy

Performance: Commonly 85%-95% of bare metal



BENEFITS OF LINUX KVM MODEL

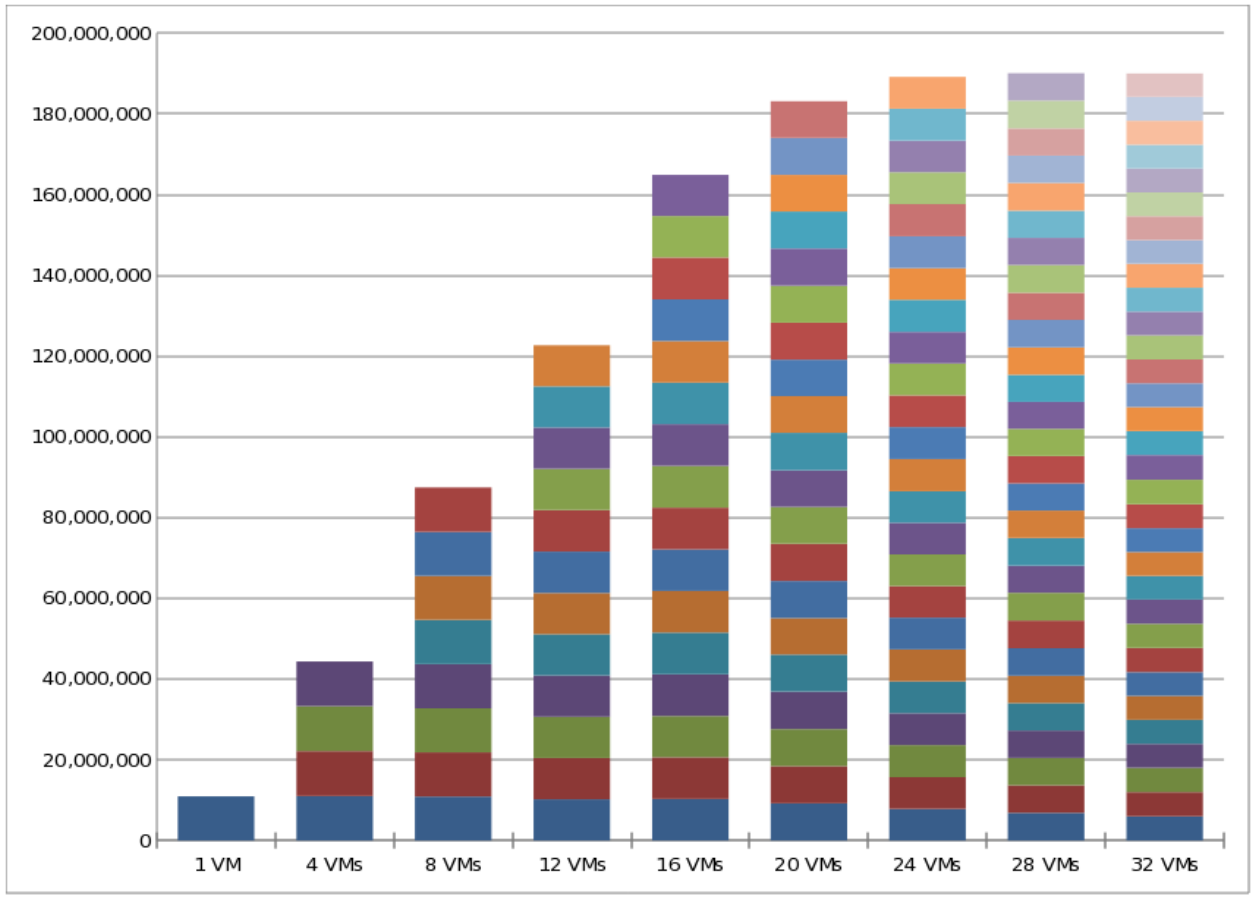
Leverages Linux – no need to re-invent the wheel
Built on trusted, stable enterprise grade platform
Scheduler, memory management, hardware support etc.
Use same tools for managing physical servers and hypervisors
Advanced features
NUMA support, power management, hot-plug etc. from Linux – others have to develop from scratch
SELinux security, advanced scheduler, RAS support etc.
Hybrid-mode operation
Run regular Linux applications side-by-side with Virtual Machines on the same server – much higher degree of hardware efficiency

KVM HYPERVISOR – ADVANCED FEATURES

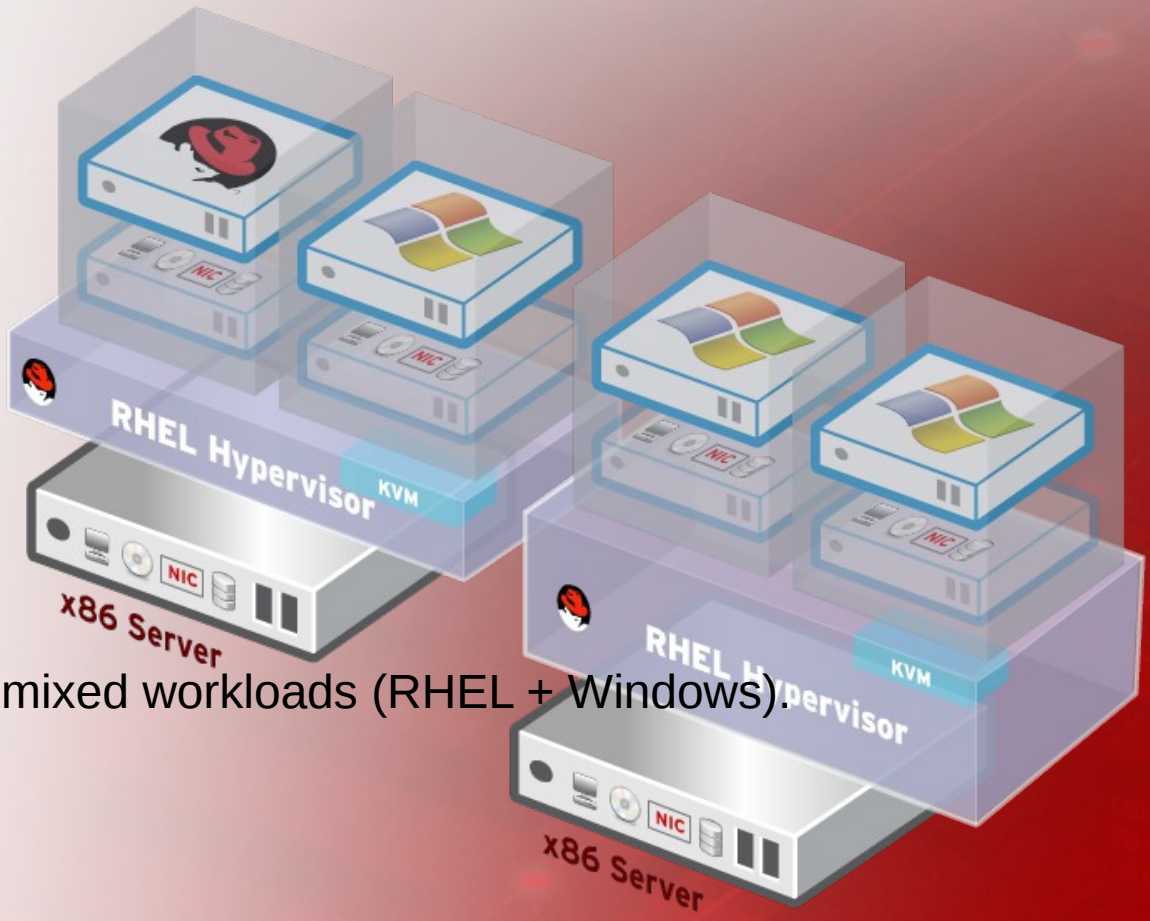
Kernel Same-Page Merging (KSM)

Enterprise Java workload benchmark - Intel Xeon Processor X5550 with 24GB RAM

- Running multiple 3GB Windows 2003 VMs - Scaling up to 200% over-commit



TWO PACKAGING MODELS FOR THE HYPERVISOR

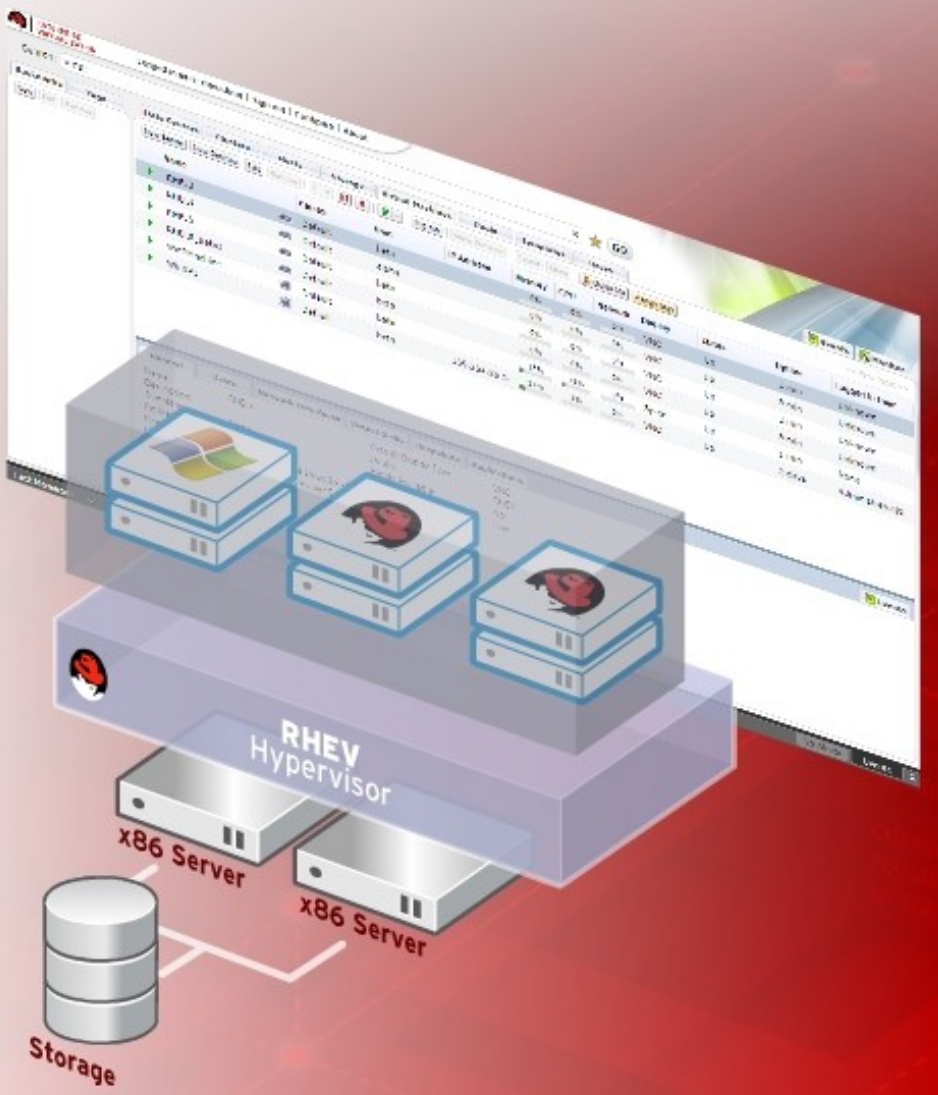


RHEV-HYPERVISOR:
Less than 100 MB
Economically ideal for Windows guests, or mixed workloads (RHEL + Windows).
Pre-configured, no Linux skills needed.

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

FULLY INTEGRATED SERVER VIRTUALIZATION SYSTEM

- Multi-level High Availability
- Live Migration
- Systems Scheduler
- Power Saver
- Image management and provisioning (templates, snapshots, thin-provisioning)
- Storage, network and configuration management



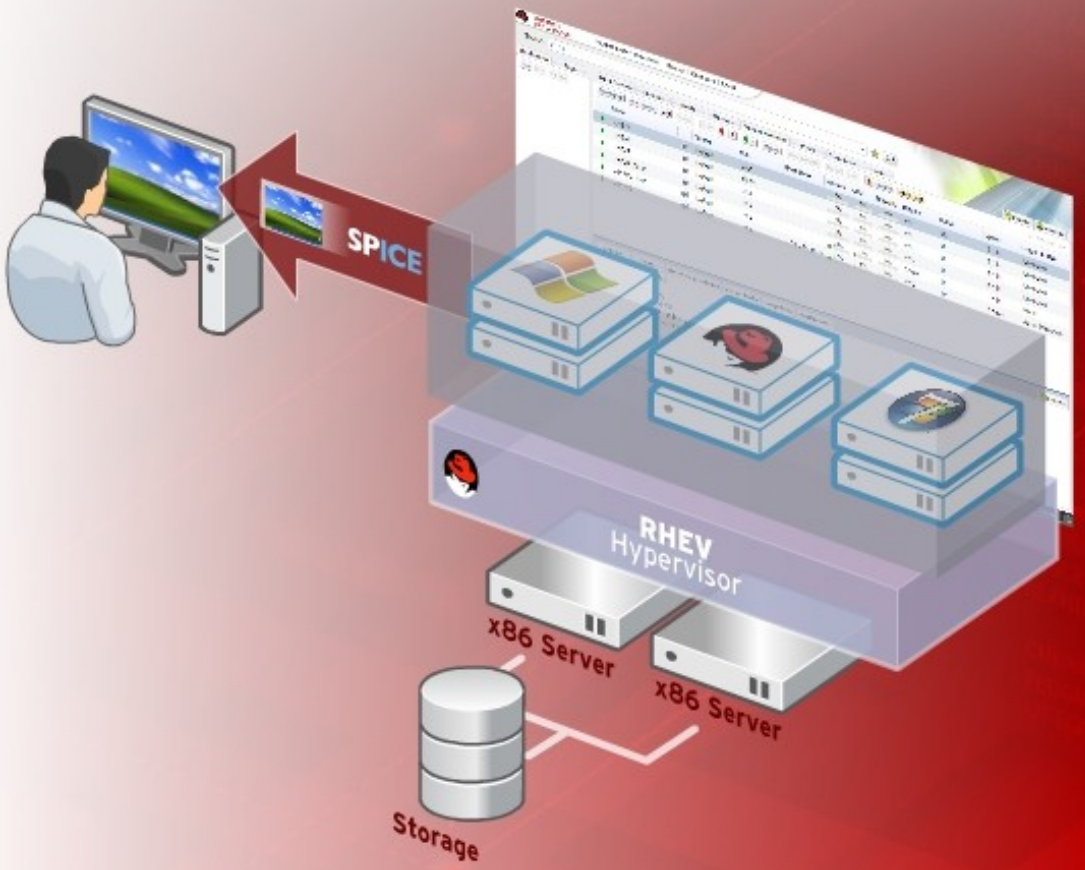
FULLY INTEGRATED DESKTOP VIRTUALIZATION SYSTEM

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



ADVANCED SECURITY INFRASTRUCTURE FOR SERVERS AND DESKTOPS

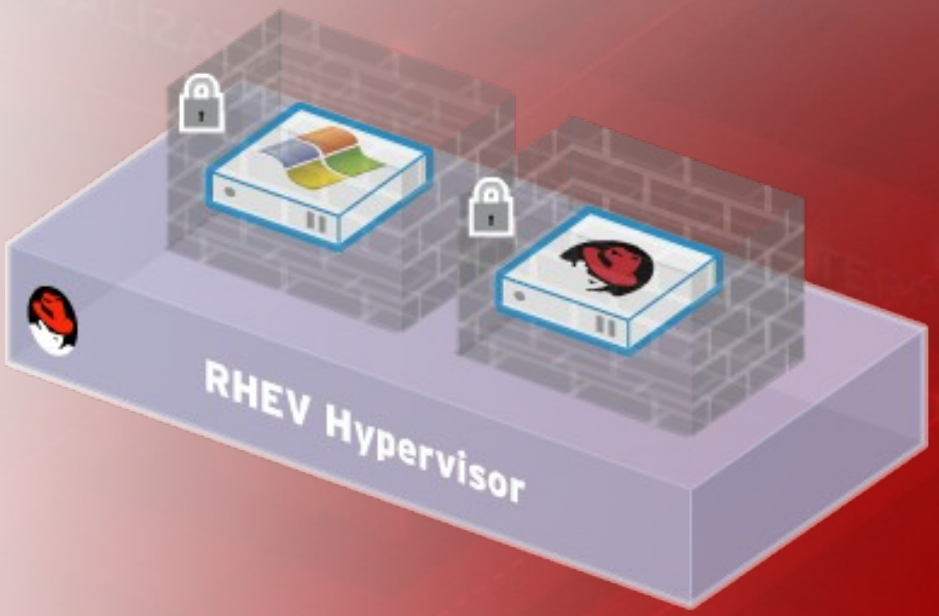
RHEV inherits the security features of Linux and RHEL

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
- Will be included in RHEL 6



SPICE: DESIGNED FROM THE GROUND UP FOR VIRTUAL DESKTOPS

SPICE includes 3 components

> SPICE driver in the guest

> SPICE virtual graphics adapter in the host

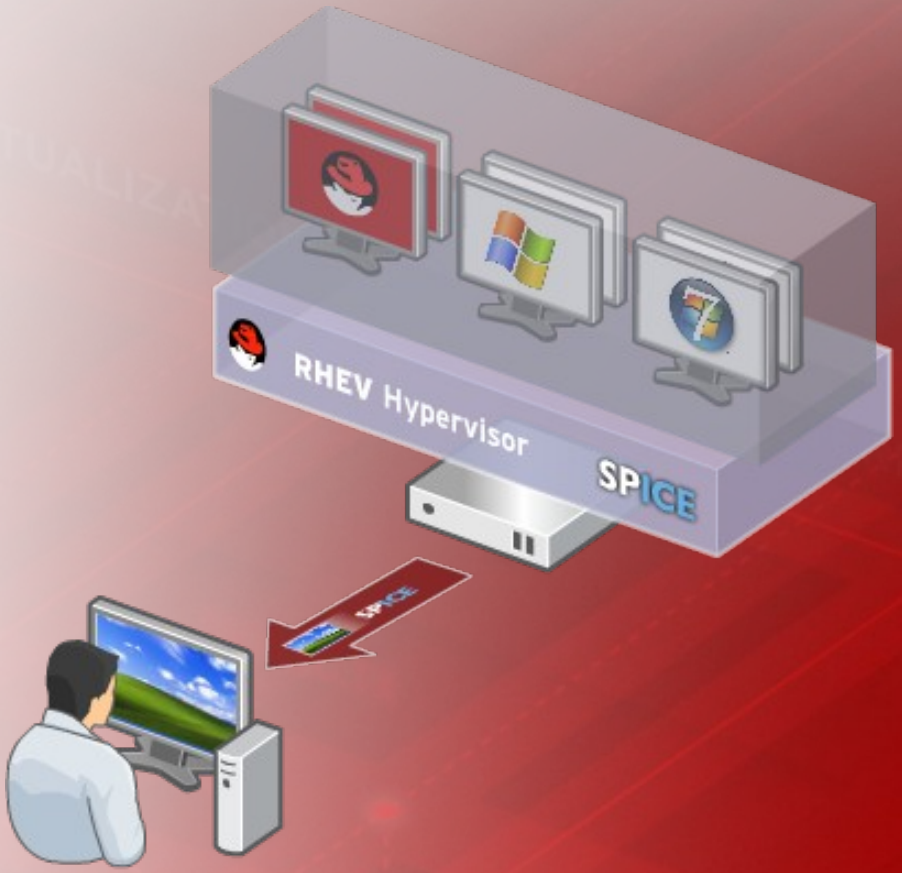
> SPICE client on the thin client

Adaptive protocol – chooses optimal point to process graphics

> In the host, or

> On the client

Highest density, optimal user-experience



AND WE DO WINDOWS TOO…

Microsoft and Red Hat reciprocal agreements for cross-certification of server operating systems

RHEL 5.2+ guests on Hyper-V (Red Hat Certified)

Windows 2003/2008 on RHEV (Microsoft SVVP certified)

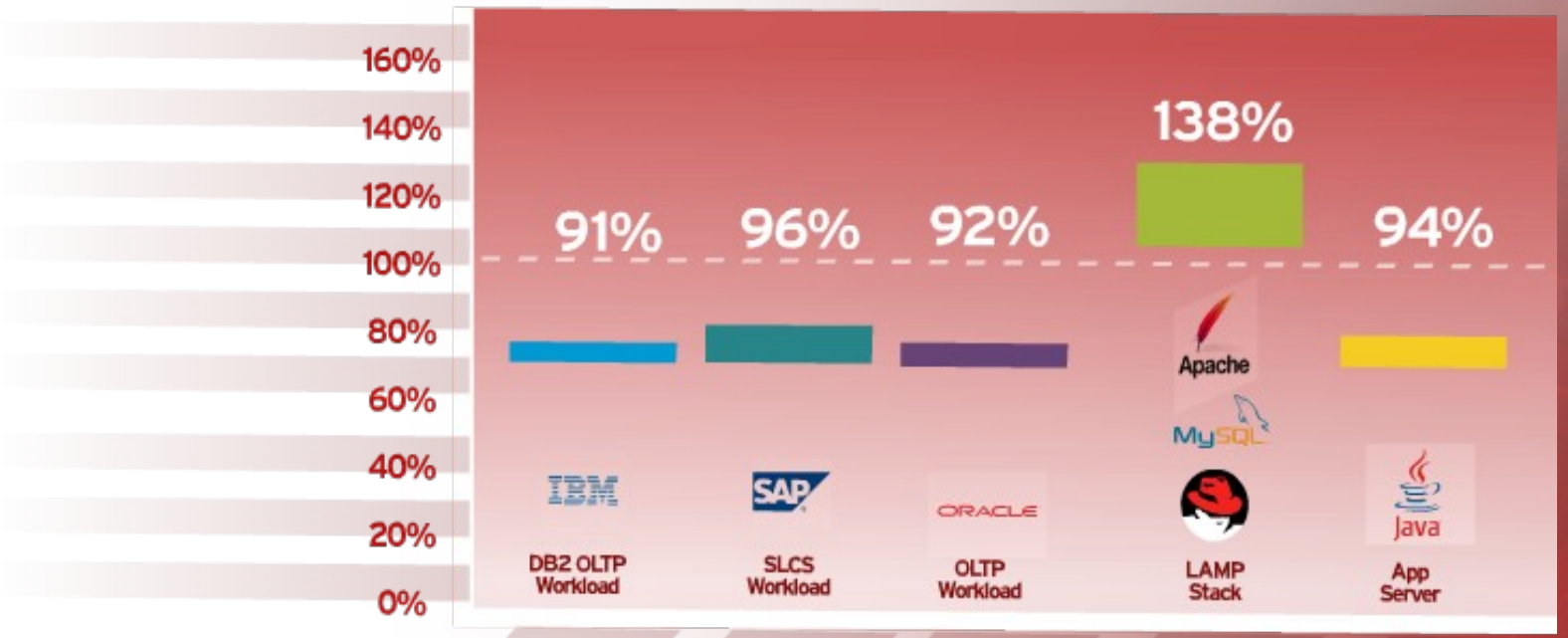
Desktop operating systems supported on RHEV for Desktops (including WHQL drivers delivered by RHEV Tools or Windows Update)

Windows XP (32 bit)

Windows 7 (32 bit and 64 bit)

LEADING PERFORMANCE FOR REAL ENTERPRISE APPLICATIONS

PERFORMANCE & SCALABILITY* OF REAL ENTERPRISE WORKLOADS ON RED HAT ENTERPRISE VIRTUALIZATION



Performance measure on a 16 core Intel Xeon 5500 in various configurations of VMs

RED HAT SUBSCRIPTION MODEL

Provides continuous value and support for your virtualization infrastructure now and in the future

Product Access

Updates

Patches

Support options

Certification

SIMPLE, SUBSCRIPTION PRICING MODEL FOR SERVER AND DESKTOP VIRTUALIZATION

SERVER VIRTUALIZATION

Complete management feature set (high availability, live migration, system scheduler, power saver etc.)

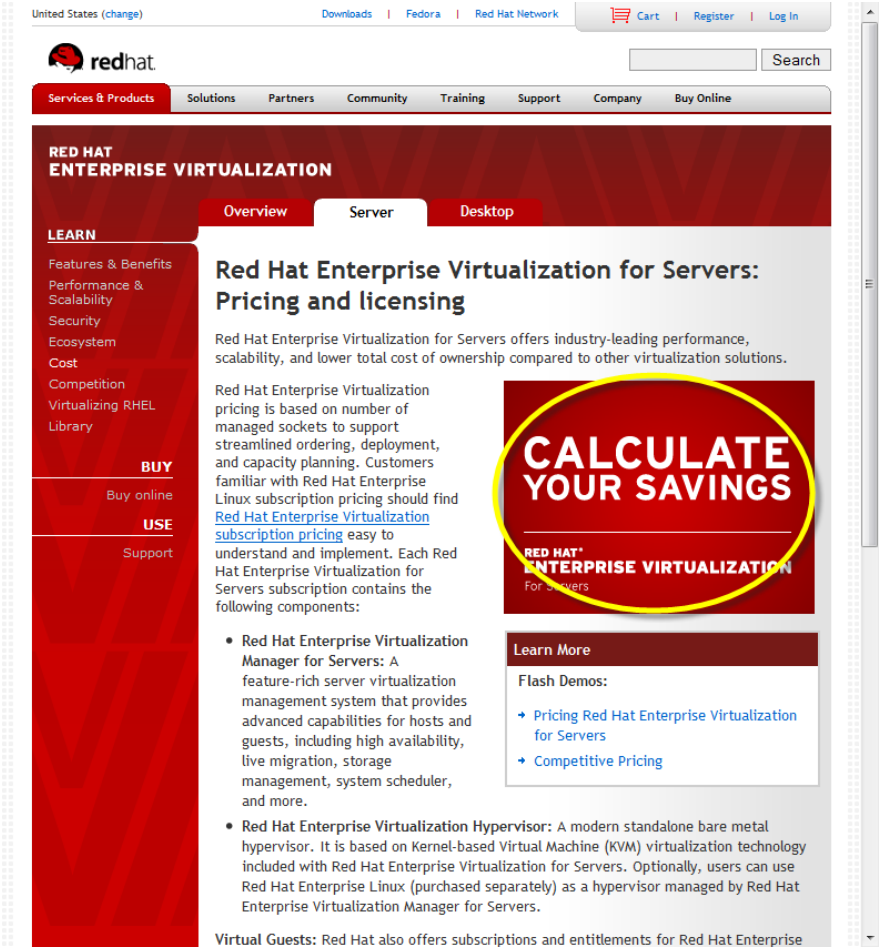
High performance hypervisor

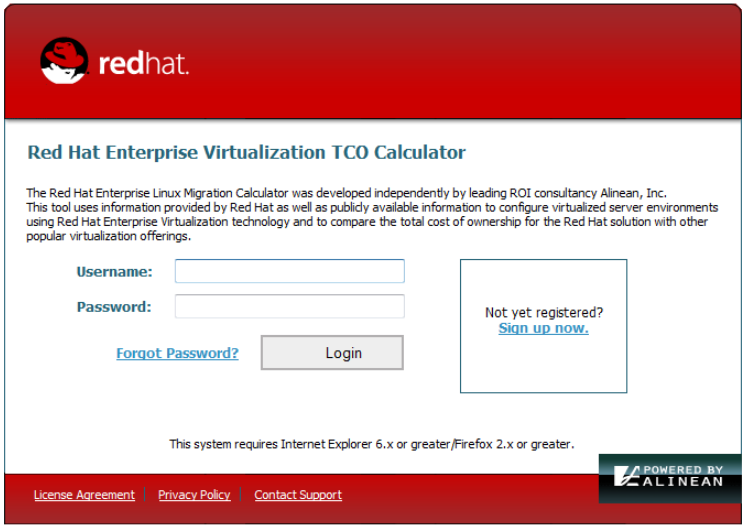
DESKTOP VIRTUALIZATION

Add-on to RHEV infrastructure

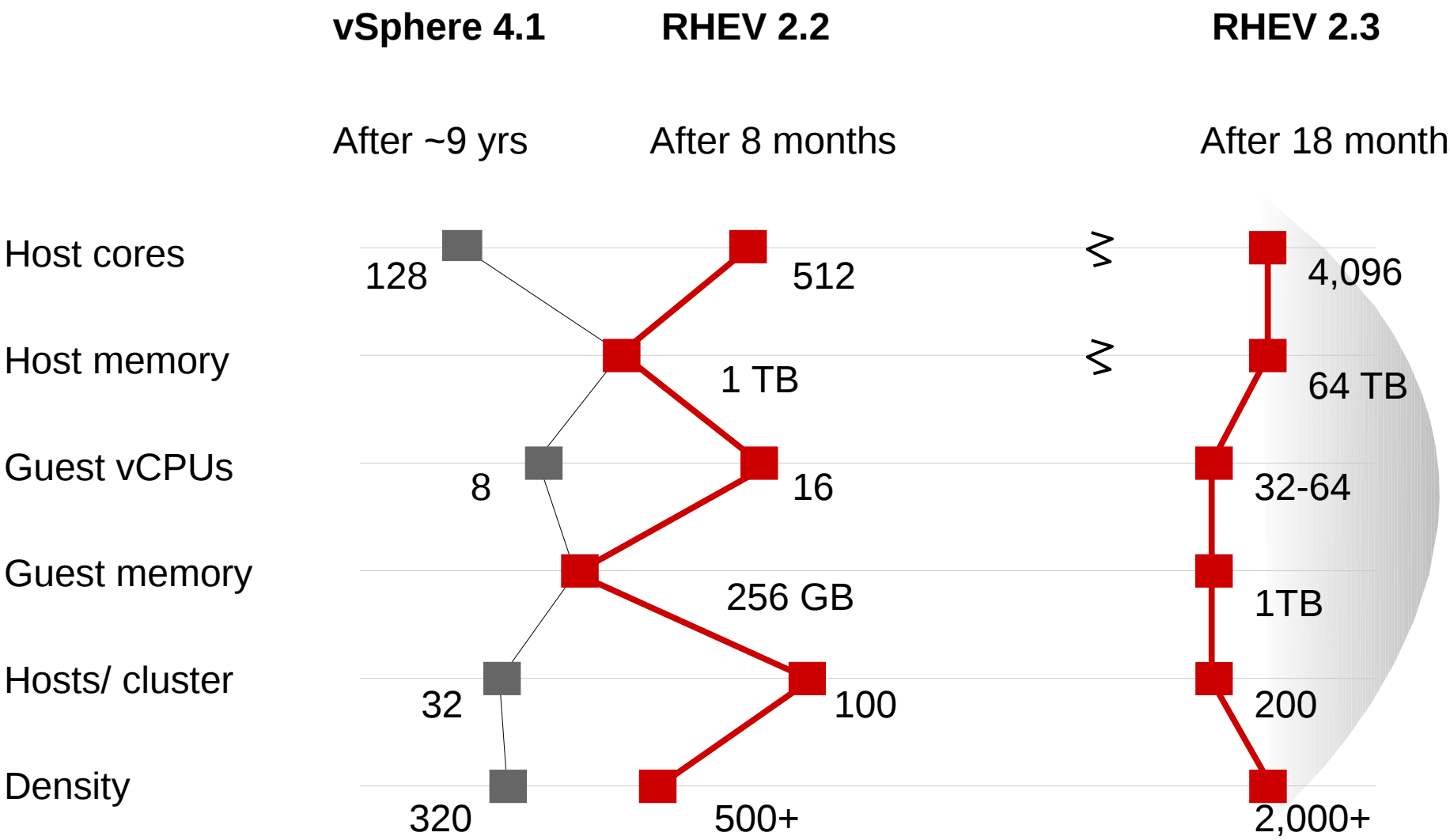
SPICE, connection broker, desktop pools, etc.

RED HAT ENTERPRISE VIRTUALIZATION TCO/ROI CALCULATORS





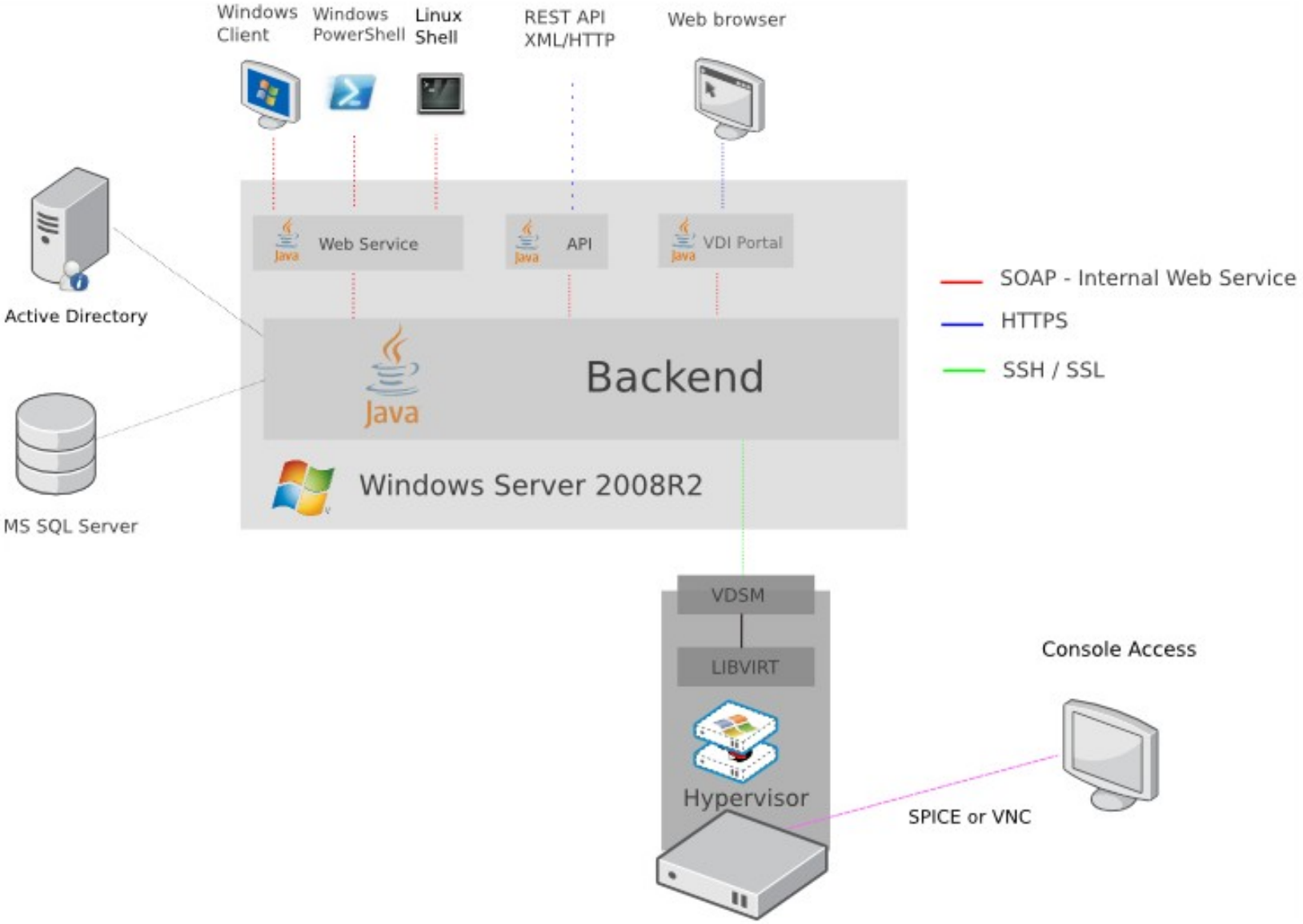
RED HAT ENTERPRISE VIRTUALIZATION EXTENDS THE SCALABILITY FRONTIER ...



RED HAT ENTERPRISE VIRTUALIZATION ROADMAP

Q1 2011	H2 2011
Red Hat Enterprise Virtualization 2.3	**Red Hat Enterprise Virtualization 3.0**
• RHEL 6 based Hypervisor • New API Infrastructure for integration Adds Linux CLI and REST API • Power User GUI (self service) • Multi Level Admin (Enhanced Roles & Delegation) • sVirt • Local Storage • Hooks for customization	*Currently in planning* • RHEV Manager running on Red Hat Enterprise Linux • SLA Support (CPU, Memory, Network and Disk) • VM-PM Scheduler (Hybrid model) Physical and Virtual system scheduler • Hot Pluggable CPU, Memory, Disk and NIC • Hybrid mode scheduler • HTML based Web Admin UI • Live Snapshots

RED HAT ENTERPRISE VIRTUALIZATION
RHEV 2.3 ARCHITECTURE



RED HAT ENTERPRISE VIRTUALIZATION
RHEV 2.3 HIGHLIGHTS

- RHEL 6 based Hypervisor
- Performance and Scalability
- RHEV backend engine in Java
- Guest tools for Red Hat Enterprise Linux
- Local Storage
- New API Infrastructure – including REST and Linux CLI
- Multi-Level Admin including delegation
- Hooks for Customization

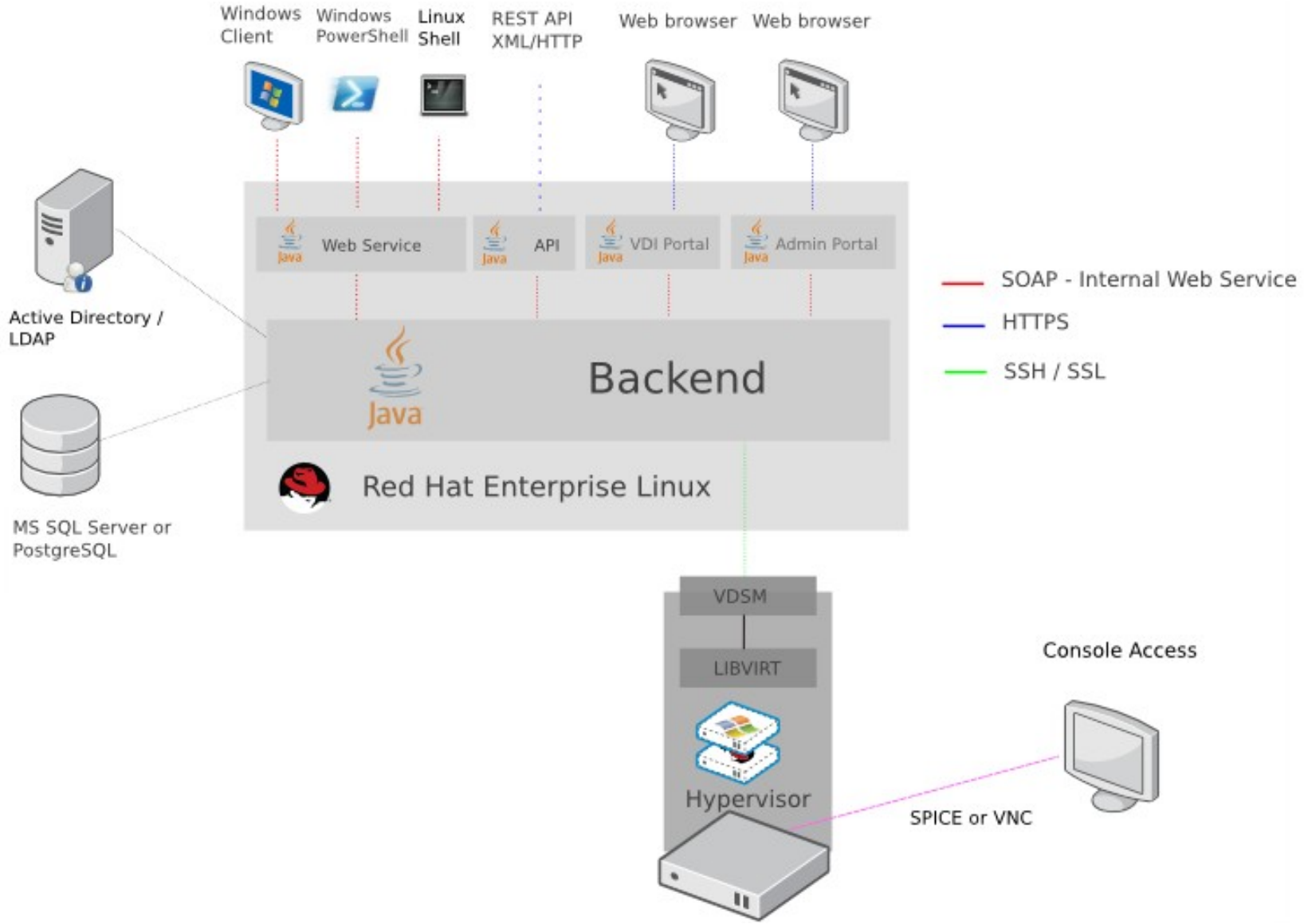
RED HAT ENTERPRISE VIRTUALIZATION
RHEV 2.3 HIGHLIGHTS – PERFORMANCE

- Performance and Scalability

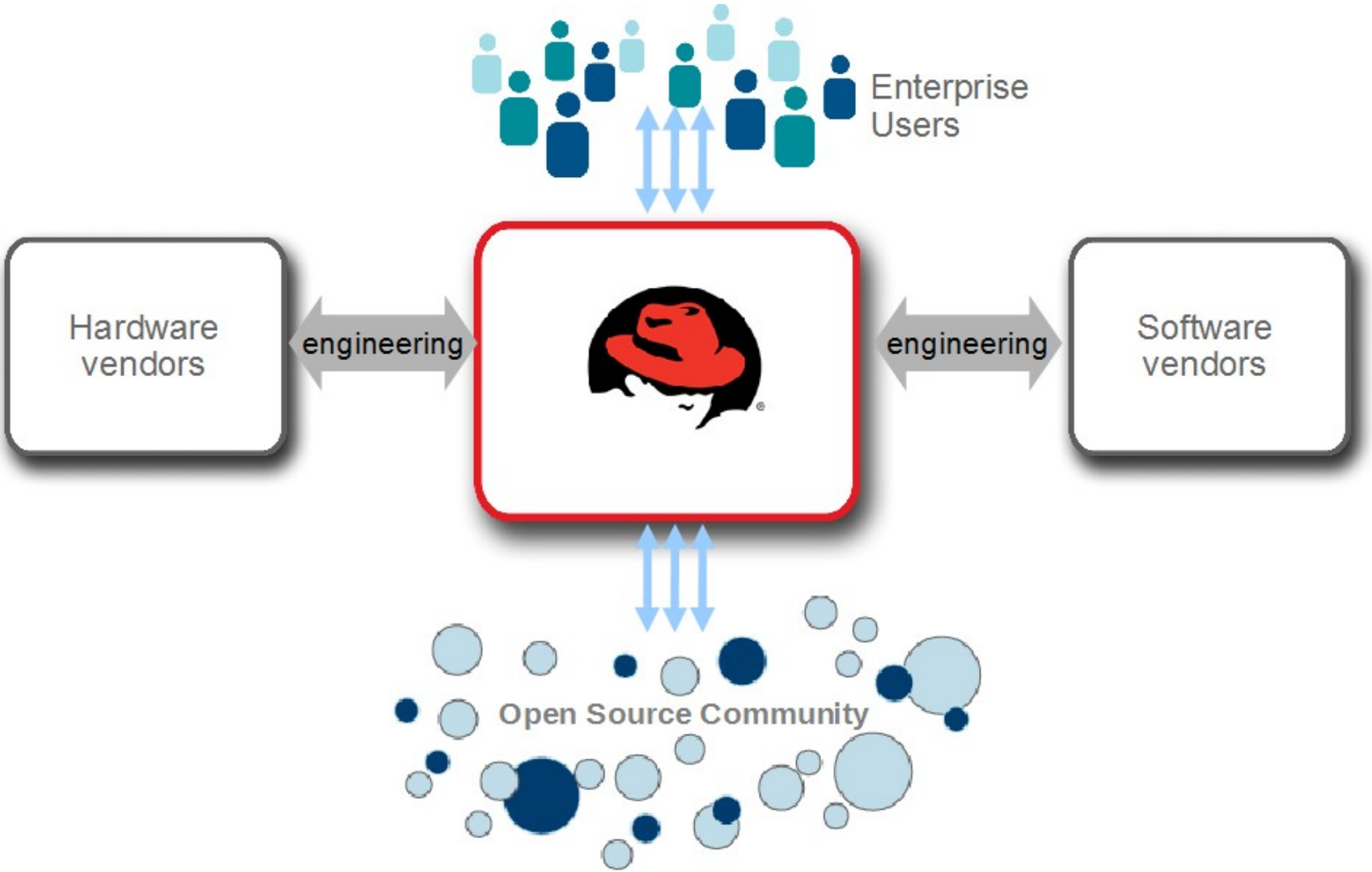
	RHEV 2.2	RHEV 2.3 Support limit	RHEV 2.3 Theoretical Limit
Host			
CPUs	96	4096	4096
Memory	1TB	8TB*	64TB
Guest			
CPU	16	32*	64
Memory	256	1 TB	64TB
RHEV M			
Max Hosts	100	200	> 400

* Pending testing

RED HAT ENTERPRISE VIRTUALIZATION
RHEV 3.0 ARCHITECTURE



RED HAT BRINGS COMMUNITY, VENDORS, USERS TOGETHER

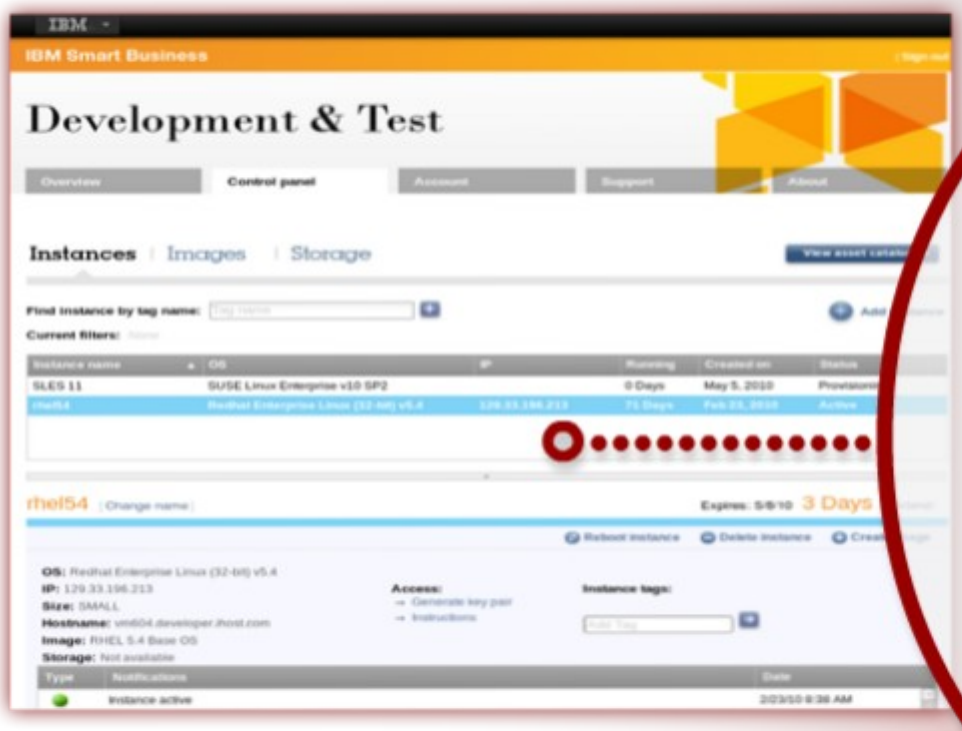


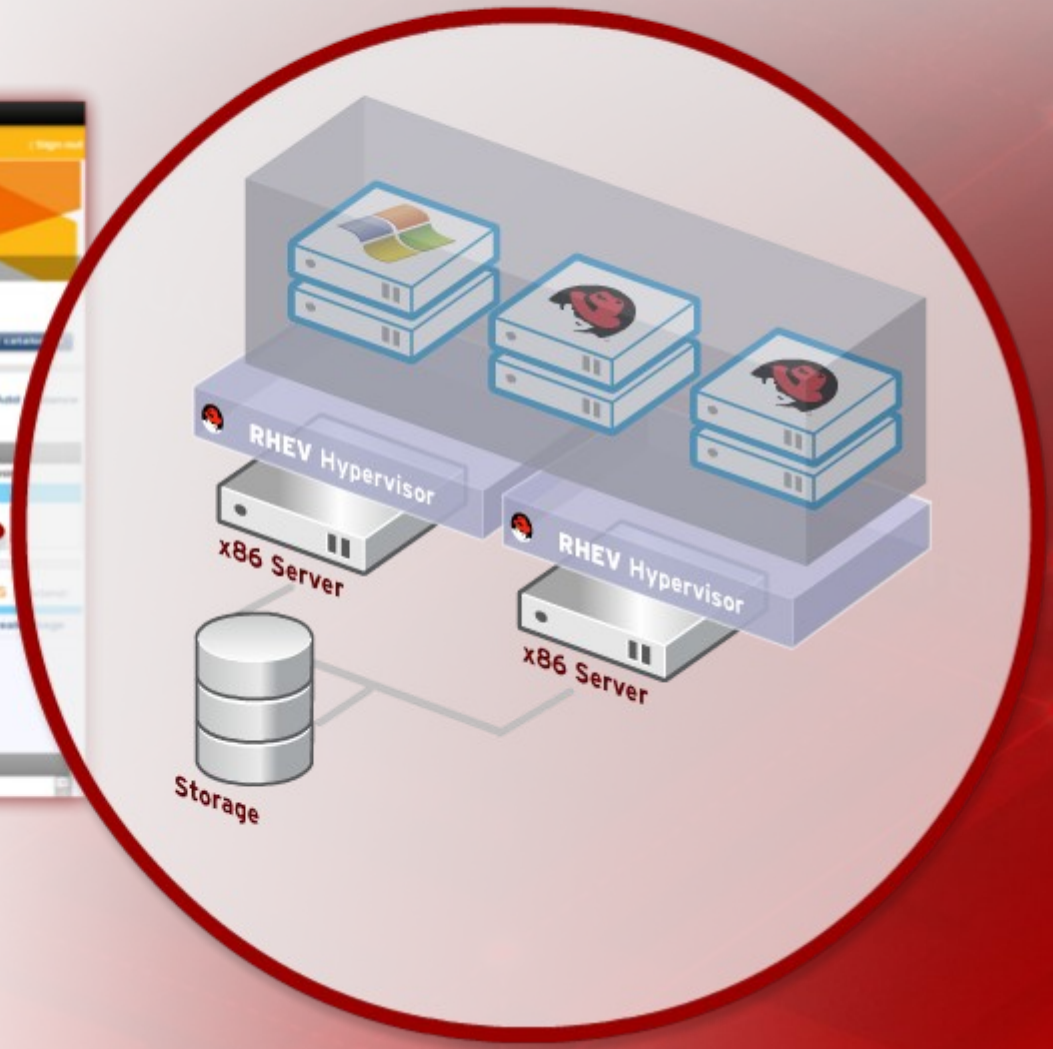
QUESTIONS?

THANK YOU!

For more information, please visit http://www.redhat.com/rhev/

IBM CLOUD USES RHEV ...





NTT CLOUD USES RHEV ...