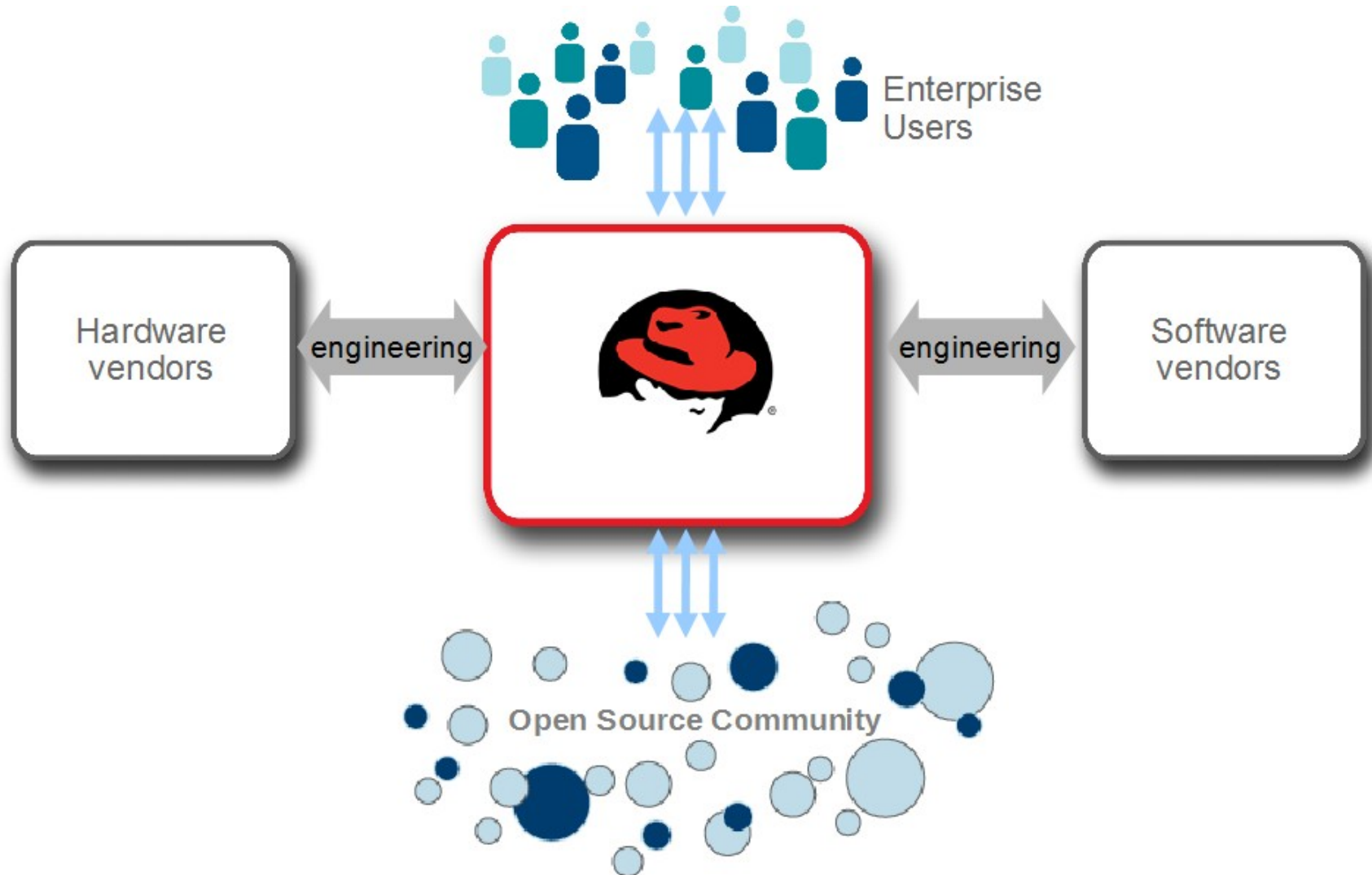




# **RED HAT ENTERPRISE VIRTUALIZATION AND CLOUD STRATEGY**

**Aram Kananov**  
**EMEA Product Marketing Manager**  
**Platform and Cloud Business Units**  
**Red Hat**

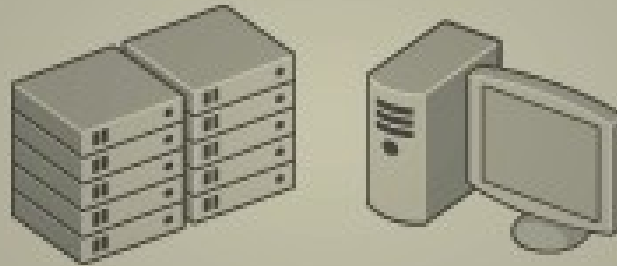
# RED HAT BRINGS COMMUNITY, VENDORS, USERS TOGETHER



# RED HAT ENTERPRISE VIRTUALIZATION

## RED HAT® ENTERPRISE VIRTUALIZATION 2.2

One platform for virtual servers and desktops



# 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.
- Ease of management – use same tools for managing physical servers and hypervisors

Advanced features

- Inherit scalability, 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



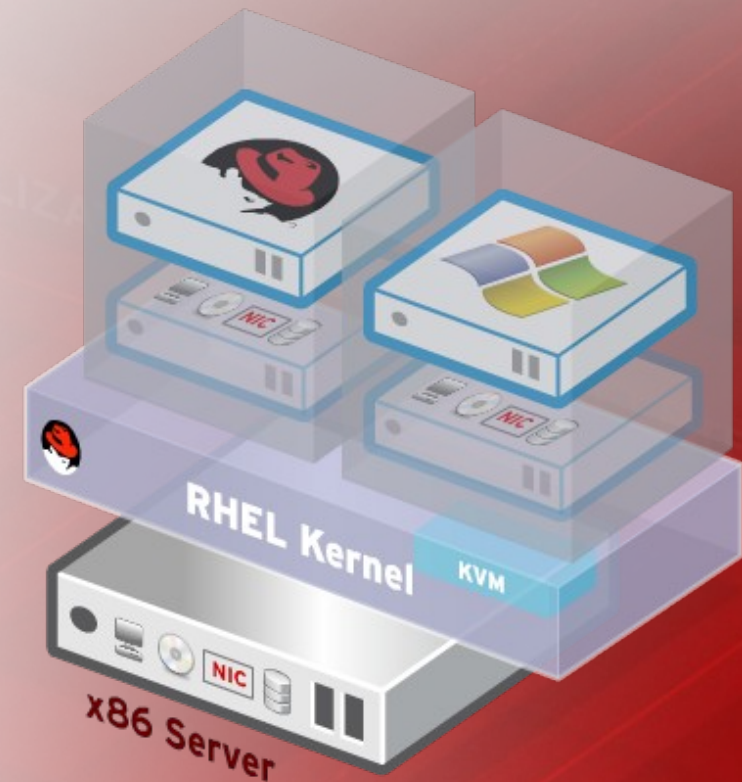
# ADVANCED HYPERVISOR TECHNOLOGY

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



# ADVANCED, CENTRALIZED, ENTERPRISE GRADE VIRTUALIZATION MANAGEMENT

Integrated server and desktop virtualization management

Scalability to hundreds of hosts and thousands of virtual machines

Industry leading performance, scalability and security infrastructure

Ecosystem of thousands of hardware and software vendors

50–70% lower cost compared to other solutions



# 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



# 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

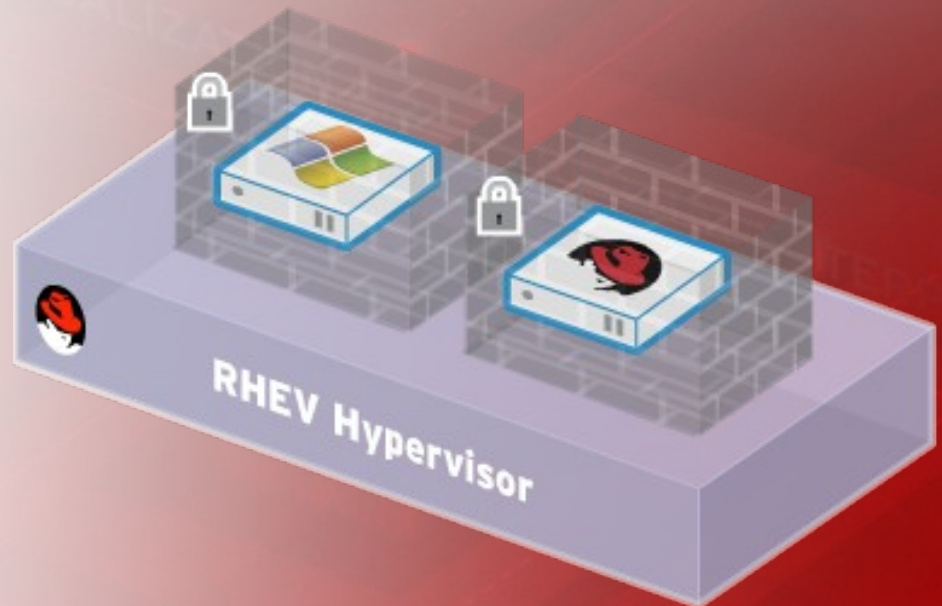
sVirt Project

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



# FULLY INTEGRATED DESKTOP VIRTUALIZATION SYSTEM

Centralized management,  
security and policy enforcement

Virtual desktops with user  
experience of a physical PC

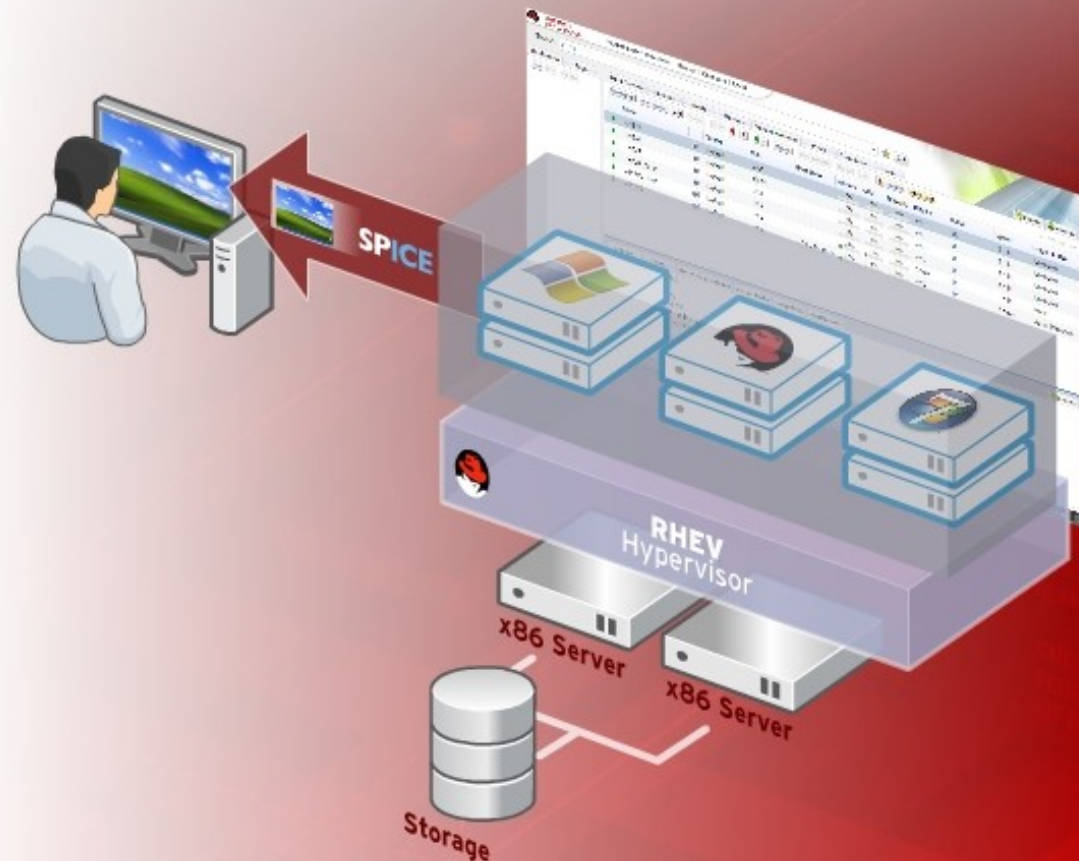
Multiple monitors

HD quality video

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

USB support

Industry leading density of virtual  
desktops/server



# LARGE ECOSYSTEM OF HARDWARE VENDORS AND ENTERPRISE ISVs

ABI Commitment

No need to re-create app problems on physical hardware

3,500+ applications

ISVs certified on Red Hat Enterprise Linux are also certified to run on Red Hat Enterprise Linux deployed on Red Hat Enterprise Virtualization.



If it's certified for Red Hat Enterprise Linux 5, it's certified for Red Hat Enterprise Virtualization \*Servers require Intel VT or AMD-V

1,000+ hardware platforms



# AND WE DO WINDOWS TOO...

**INTEROPERABILITY DELIVERED**

RED HAT AND MICROSOFT COMPLETE  
VIRTUALIZATION PLATFORM CERTIFICATIONS



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)



# 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

The subscription model .... a winning formula, one that more vendors should consider adopting.....

*Editor, CNET News  
October 20, 2009*



# 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

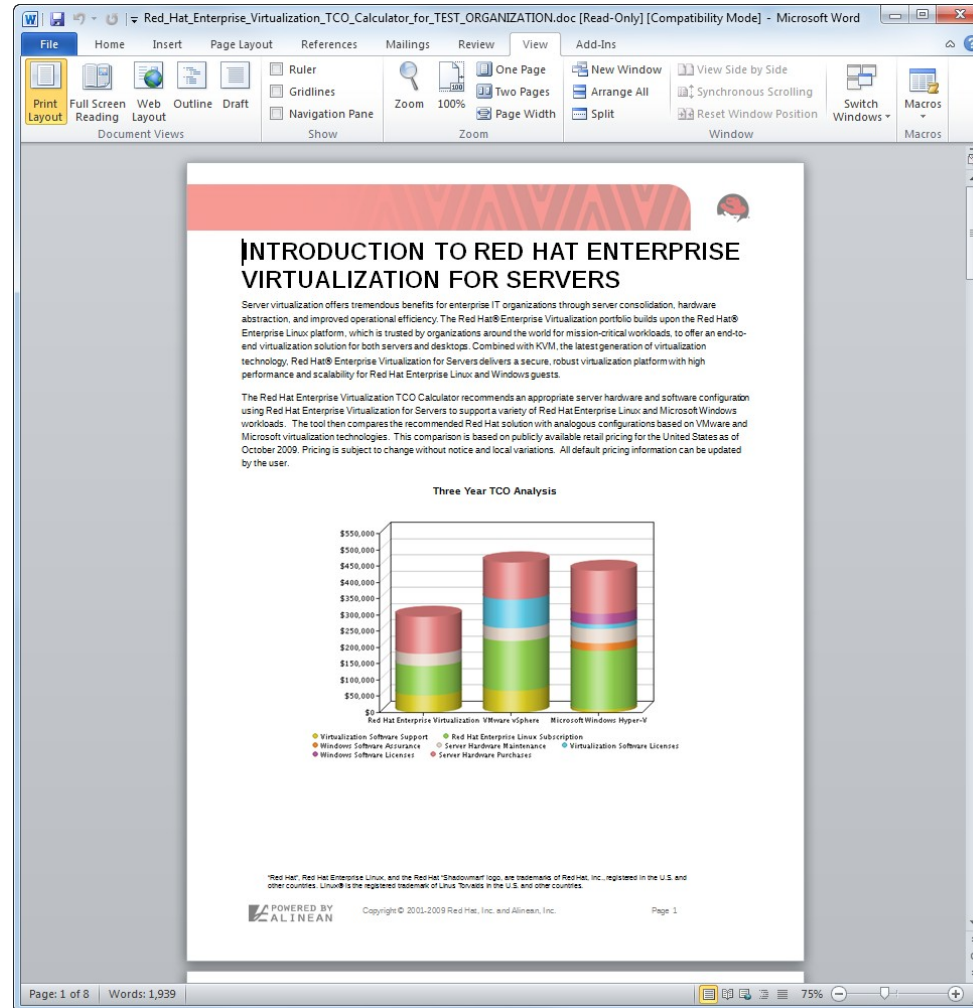
## DESKTOP VIRTUALIZATION

- Add-on to RHEV infrastructure
- SPICE, connection broker, desktop pools, etc.



# SERVER TCO REPORT

OpenOffice Writer and Microsoft Word compatible





# A Unique Approach to Cloud

# RED HAT'S APPROACH TO THE CLOUD IS BETTER

## Build better clouds with Red Hat

1. The most comprehensive solutions for clouds – both private and public.
2. Consistent enterprise-class environments bridge the physical and virtual world, inside the data center and public clouds.
3. Strategic flexibility without lock-in.
4. Better infrastructure, designed specifically for multi-tenant clouds.
5. Industry-leading ecosystem makes cloud usable, accessible, and safe.



# **A CONSISTENT, COMPREHENSIVE ENVIRONMENT: INSIDE THE DATACENTER AND IN THE CLOUD**

**Only Red Hat  
provides consistent  
environments  
between the  
datacenter and in  
the cloud**

## **Consistent environments**

Run enterprise-class applications in the data center or in the cloud

## **Both Enterprise-Class environments and Light Frameworks**

Red Hat Enterprise Linux and JBoss make the cloud usable for enterprise-class applications. Fast application development in LAMP, Ruby and Spring.

No other vendor gives you both.

**Opens the Cloud to More Applications**



# RED HAT MAKES CLOUD AN EVOLUTION, NOT A REVOLUTION

**Red Hat's unique  
business and  
technology model  
unlocks the most  
strategic flexibility  
for IT**

Red Hat makes moving to the cloud a simple, gradual approach

Avoid getting locked in to one vendor's monolithic stack

Manage your diverse IT assets as one cloud

- Microsoft Windows or Red Hat Enterprise Linux
- LAMP, Java, or .Net
- Red Hat Enterprise Virtualization, VMWare ESX, or Microsoft Hyper-V
- IaaS or PaaS
- On-premise or public clouds

Committed to openness and interoperability at all levels of both the current and future cloud computing stacks



# RED HAT DELIVERS BETTER CLOUD INFRASTRUCTURE

**Red Hat's unique approach to technology unlocks the value of the cloud for enterprises and governments worldwide**

Only x86 virtualization designed for multi-tenancy with advanced security features

Red Hat Enterprise Virtualization is the right virtualization architecture built directly into the Linux kernel

The best development model using open source

Guarantee minimum resources for better Quality of Service

Centralized management of all virtual machines



# TRUST THE CLOUD WITH RED HAT'S INDUSTRY-LEADING CERTIFIED CLOUD ECOSYSTEM

Red Hat's ecosystem of thousands of certified hardware vendors, ISVs, and cloud providers means reliable and safe deployment

Confidently run your certified application  
On any type of certified server capacity

- physical
- virtual
- or in a certified public cloud

At any time, based on the needs of your business

With the confidence that it has been tested, certified, and is supported for enterprise-class production use.



# RED HAT'S CLOUD ARCHITECTURE

The image features a monochromatic blue color scheme. The background is a deep, dark blue gradient. In the foreground and middle ground, there is a dense, textured layer of white and light blue clouds, resembling a thick blanket of soft, billowy clouds. The clouds are more prominent in the lower half of the frame, creating a sense of depth and volume. The overall aesthetic is clean, modern, and evocative of a vast, open sky.

# WHAT DOES A CLOUD PROVIDE?

**A Cloud provides an abstraction layer to manage scale and complexity**

- Self service
- Abstracted, elastic resources
- Location-independent storage & services
- Users, Groups
- Accounting
- API's, Drivers, Tools
- Federation



**Cloud:**

**Resource abstraction,**  
Second Abstraction  
maps cloud to virtual  
resources



**Virtualization:**

**Hardware abstraction,**  
First Abstraction maps  
virtual to physical  
resources



**Bare metal:**

**Full access,**  
No Abstraction



**PHASE 1:  
CONSOLIDATE**

# VIRTUALIZE YOUR SERVERS

Virtualize your physical hardware to achieve higher utilization, consolidation, and flexibility.

Virtualization increases the utilization of physical servers and provides a foundation for cloud computing.



**PHASE 2: AUTOMATE**

# BUILD A PRIVATE CLOUD

As you expand your use of virtualization, build a private cloud to manage the scale and complexity.

A private cloud abstracts multiple instances of virtual resources into elastic pools of computation with self-provisioning and scalable services.

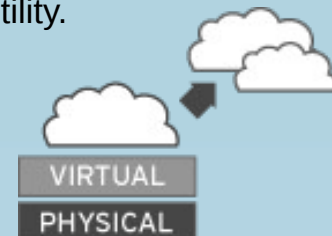


**PHASE 3: UTILITY**

# ADD A PUBLIC CLOUD

As you expand your use of cloud computing, add public cloud providers delivered as a utility to increase capacity and lower costs.

Red Hat's cloud architecture lets you manage and integrate various virtualization systems and public cloud providers together. This allows you to leverage public cloud computing as a utility.



# EVERYTHING NEEDED TO PLAN, BUILD, AND MANAGE A CLOUD. TODAY.

Comprehensive product family  
Detailed reference architecture  
and cookbook implementation  
guides

Expert services to plan, build  
and manage.

Training classes for knowledge  
transfer and development

**June, 2010: Cloud  
Foundations, Edition One:  
Private Infrastructure-as-a-  
Service Cloud.**

INTRODUCING  
RED HAT CLOUD FOUNDATIONS,  
EDITION ONE

Real Clouds. Today.

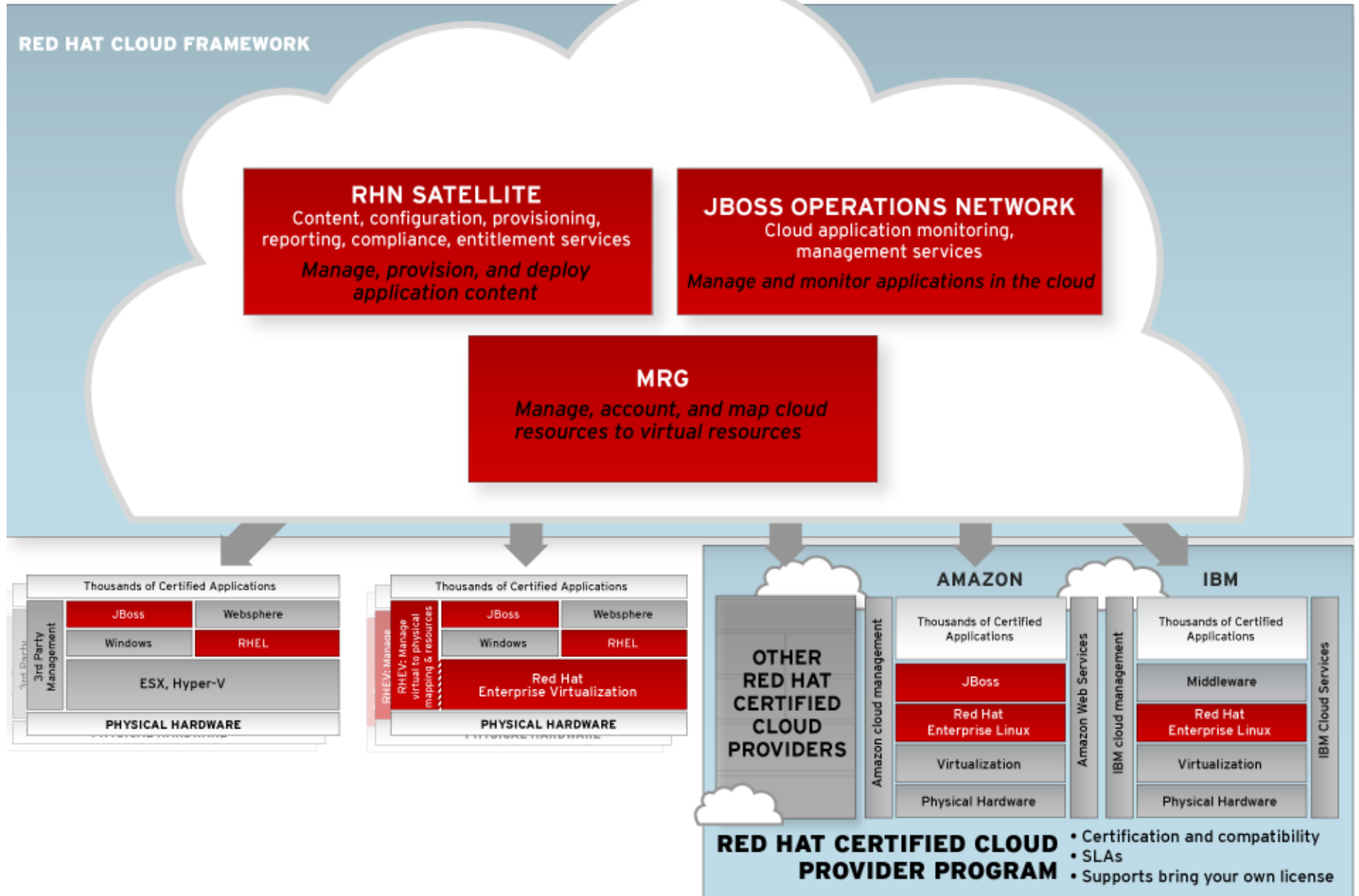
PLAN → BUILD → MANAGE

PARTNERSHIPS & PROGRAMS	PRODUCTS
CONSULTING	TRAINING
REFERENCE ARCHITECTURE & BEST PRACTICES	

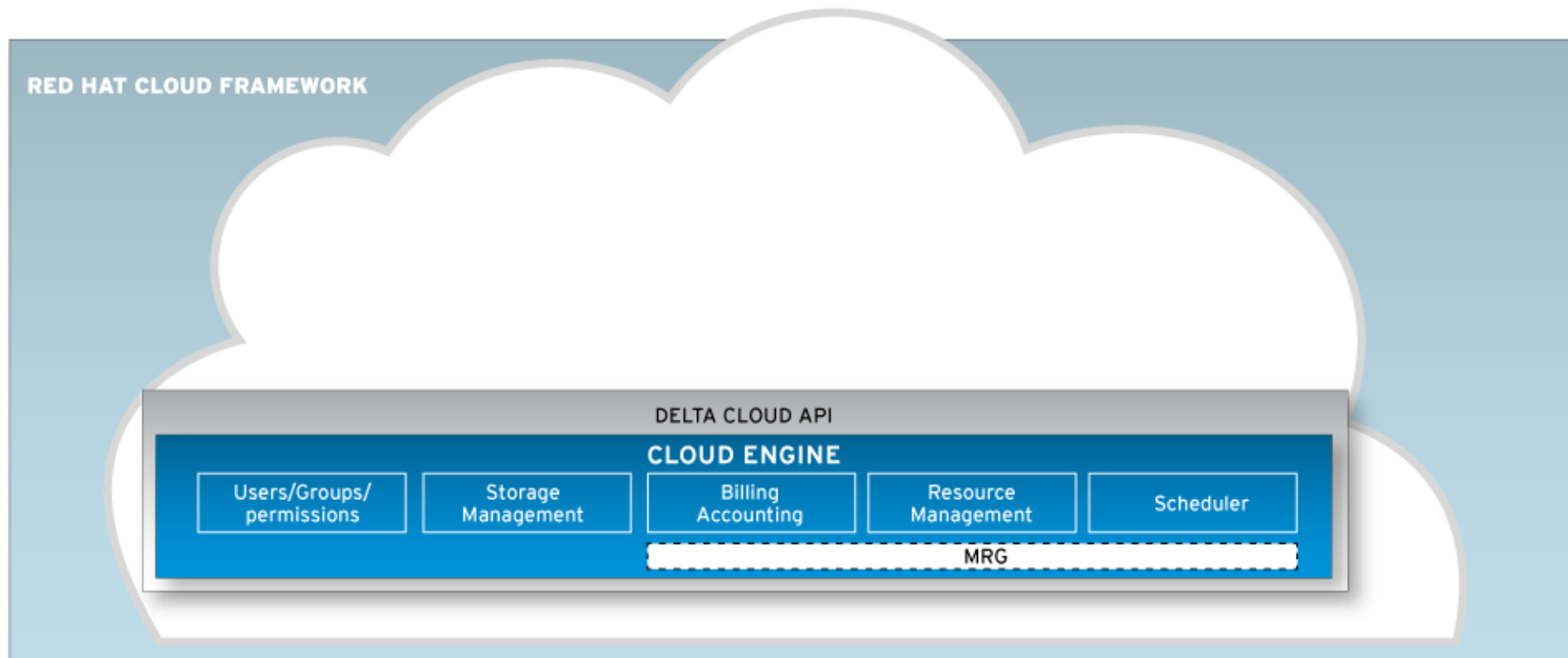
The graphic features a blue background with white text. At the top, it says 'INTRODUCING RED HAT CLOUD FOUNDATIONS, EDITION ONE' in large, bold letters. Below this, the tagline 'Real Clouds. Today.' is centered. A horizontal flow of three boxes labeled 'PLAN', 'BUILD', and 'MANAGE' with right-pointing arrows connects them. Below the flow is a grid of five boxes: 'PARTNERSHIPS & PROGRAMS' and 'PRODUCTS' in the top row; 'CONSULTING' and 'TRAINING' in the middle row; and 'REFERENCE ARCHITECTURE & BEST PRACTICES' in a single wide box at the bottom.



# BUILD A PRIVATE CLOUD



# ROADMAP TO GREATER AGILITY



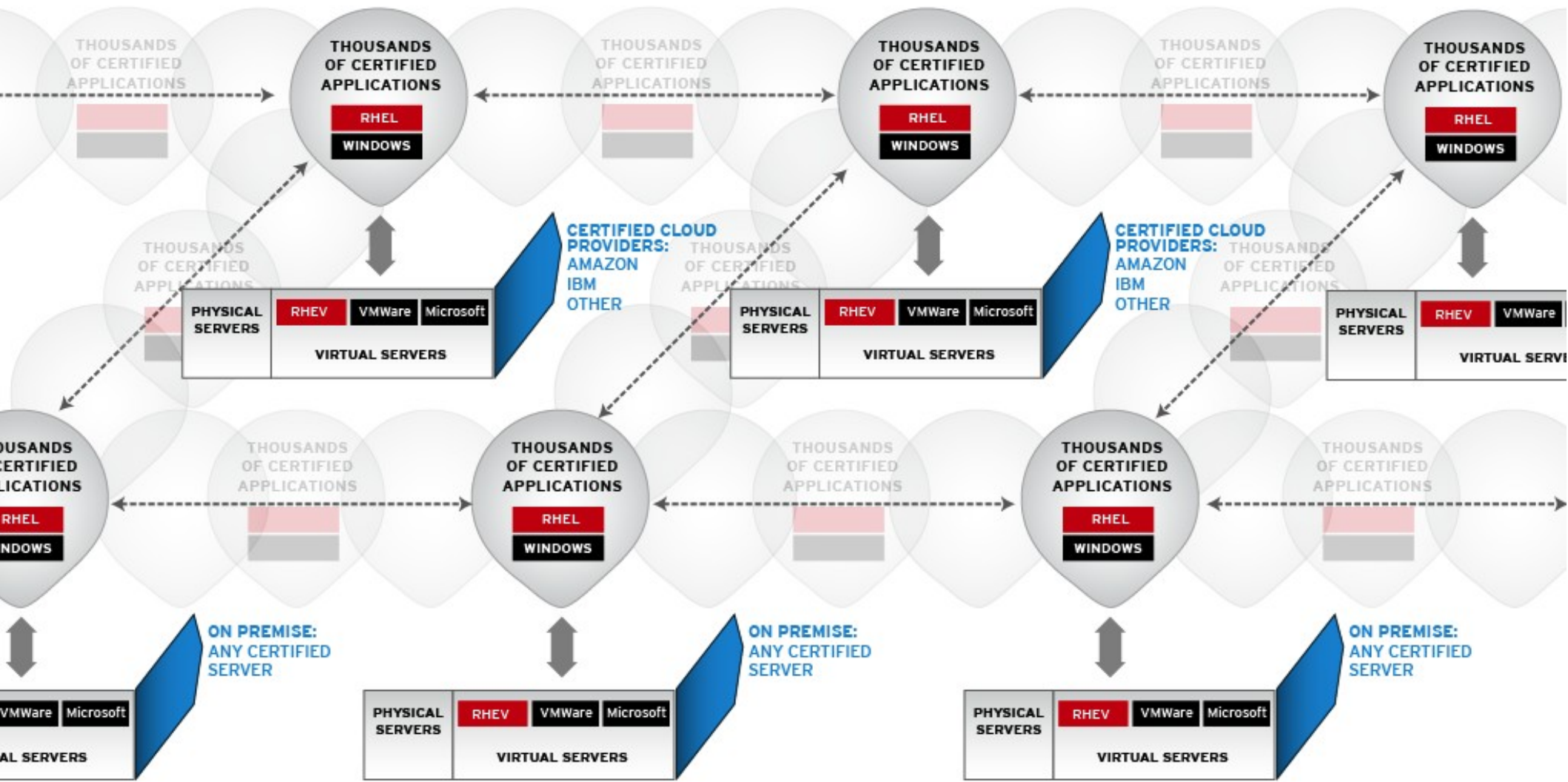
# PORTABILITY IS KEY FOR ADOPTING THE CLOUD

“In our extensive research, we've found that open APIs and interoperability are essential to customers considering the cloud. Our research shows that **80 percent of enterprises cite the lack of interoperability standards as a challenge in adopting cloud computing services. With Cloud Foundations, Red Hat is on the right track with cloud by accelerating interoperability and portability to prevent cloud lock in.**”

— Gary Chen, Research Manager, Enterprise Virtualization Software at IDC



# LEADING THE INDUSTRY WITH A UNIQUE AND EXTENSIVE CERTIFIED CLOUD ECOSYSTEM



# LEADING THE INDUSTRY WITH A UNIQUE AND EXTENSIVE CERTIFIED CLOUD ECOSYSTEM

## Red Hat Certified Cloud Provider

RHEL and JBoss certified applications are compatible with a certified Cloud.

The vendors have done extensive testing and passed rigorous certification criteria.

A support network has been established to provide reliable, seamless enterprise support across vendors.

Security and other image updates are easily available.

Buy RHEL and JBoss by the hour.

## Red Hat Premier Certified Cloud Provider

All the advantages of a Certified Cloud Provider, plus:

- Unique Cloud Access feature allows easy transfer of Red Hat subscriptions between in-house servers and public clouds.
- Confidence that the Cloud is built on the most scalable, secure virtualization infrastructure available, designed specifically for multi-tenant environments.

