

Red Hat Enterprise Virtualization for Servers:

The Power of KVM with Enterprise-Grade Management

– Customer Case KMI



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“The VMWare solution also turned out to be much more expensive and the leading benchmark results achieved with Red Hat's Kernel-based Virtual Machine (KVM) hypervisor technology illustrates the excellent efficiency of Red Hat Enterprise Virtualization solution.”

-- Emmanuel Strobbe, system engineer in the KMI's IT department.

Presentation Outline

- What is KVM?
- What is RHEV?
- Who is KMI?
 - Background
 - Environment
- Why?
 - Why virtualization?
 - Why RHEV?

What is KVM?

- Kernel-based Virtual Machine
- A virtualization infrastructure for the Linux Kernel.
- Supports native virtualization (VMX/SVM).
- Runs on a wide variety of processors.
- A wide variety of guest Operating Systems are supported.
- Paravirtualization support. (VirtIO)
- License: (L)GPL(v2)
- Development started by Qumranet.

RHEV Manager

ENTERPRISE VIRTUALIZATION | Logged in user: rhvadmin | Sign out | Configure | About

Search: Vms: [x] [★] [GO]

Bookmarks | Tags | Data Centers | Clusters | Hosts | Storage | Virtual Machines | Pools | Templates | Users | Events | Monitor

New Server | New Desktop | Edit | Remove | [▶] | [⏸] | [⏹] | Migrate | Make Template | Export | Move | Guide Me | Assign tags | << Prev Next >>

Name	Cluster	Host	IP Address	Memory	CPU	Network	Display	Status
▶ MailServer	Default	alpha		10%	2%	0%	VNC	Up
▶ RHEL5	Default	beta		0%	7%	0%	VNC	Up
▶ RHEL5_Desktop	Default	beta		0%	4%	0%	Spice	Up
▶ rhel6	Default	alpha	10.16.53.245	10%	2%	0%	VNC	Up
▶ RHEL6_WebServer	Default	beta	10.16.53.226	10%	4%	0%	VNC	Up
▶ SAP	Default	beta	10.16.53.247	10%	5%	0%	VNC	Up
▶ Win2k8R2	Default	gamma	10.16.53.157	9%	1%	0%	VNC	Up
■ Win7	Default			0%	0%	0%		Down
▶ WinXP	Default	alpha	10.16.53.159	18%	1%	0%	Spice	Up

General | Network Interfaces | Virtual Disks | Snapshots | Applications | Permissions | Events

Name: SAP | Default Display Type: VNC
 Description: | Origin: RHEV
 Template: RHEL6-x86_64 | Highly Available: No
 Defined Memory: 4096 MB | Priority: Low
 Operating System: Red Hat Enterprise Linux 6.x x64
 CPU Cores: 4 (2 Sockets, 2 Cores per Socket)

Last Message: ✓ Dec 08, 20:41 VM Win2k8R2 started on Host gamma | 1 Alerts | Events

What is RHEV?

- Red Hat Enterprise Virtualization
- KVM-based Virtualization with a management layer.
- Features:
 - Import and Export (In OVF format)
 - Reporting Engine
 - Live migration
 - Prioritized High Availability
 - Maintenance Manager
 - Image Manager
 - System scheduler
 - Power Saver
 - Search driven User Interface with tagging

Who is KMI?

- Royal Meteorological Institute of Belgium
- Industry: Meteorological service

Who is KMI?

- Background:
- Aim: To provide information services (standard or customized) to a wide variety of clients.
- These services include:
 - Hydro meteorological and geophysical forecasting
 - Extreme or exceptional weather warnings
 - Making KMI's technical knowledge in hydrometeorology, climatology and geophysics available.
- All of these services are subject to strict standards.
- Accuracy, regularity, constant availability and excellent responsiveness are all challenges that need to be met.

The KMI Environment

- Internal
 - Internal services (Mail, ...)
 - Internal meteorological services
- External
 - Very Critical: FTP server responsible for handling large transfers of meteorological data between weather bureaus worldwide via the RMDCN Network. (Regional Meteorological Data Communications Network).

The KMI Environment

- External
 - Numerous applications which have to be available at all times in order to provide recipients with the information they need in a timely manner.
 - SLA's have been signed
 - Sometimes a delay of even half an hour begins to create serious problems.
 - Clients that focus on wind forecasts are particularly demanding in terms of response times.

Why Virtualization?

- The problem?
 - With time, the number of servers grew to such an extent that managing them efficiently became extremely difficult.
 - The principle was to dedicate a server to each application. This to make management easier and to avoid problems with one server interfering with other applications.
 - The negative effects:
 - Significant occupation of floor space
 - Excessive cabling
 - All sorts of waste from under-utilized systems

Why Virtualization?

- The challenge?
 - Optimize the use of IT resources
 - Lower the costs
 - Minimize service downtime
 - Facilitate:
 - System administration
 - Development testing
 - Migration
 - Introduction of new applications

Why RHEV?

- The solution:
 - A number of solutions were examined:
 - Xen
 - VMWare
 - Red Hat

Why RHEV?

“We use a lot of open source technology, especially provided by Red Hat, for the Production side. Red Hat Enterprise Linux, with its reputation for quality and reliability, had gradually been introduced since 2005 for all our needs and also for those solutions that don't require HP-UX.”

-- Emmanuel Strobbe

Why RHEV?

“We were focused more on x86 servers in a Linux environment, which were far less expensive solutions than PA-RISC or Itanium. Our positive experience with Red Hat and the power of its open source software were the determining factors in our decision to virtualize using Red Hat Enterprise Virtualization.

The VMWare solution also turned out to be much more expensive and the leading benchmark results achieved with Red Hat's Kernel-based Virtual Machine hypervisor technology illustrate the excellent efficiency of the Red Hat Enterprise Virtualization solution.”

-- Emmanuel Strobbe

The benefits of RHEV

The KMI's IT department uses the Red Hat Enterprise Virtualization Manager for:

- The creation and migration of virtual machines
- Console access
- The overall supervision of resource consumption

The benefits of RHEV

The KMI's IT department about the Red Hat Enterprise Virtualization Manager:

- A Graphical User Interface that is very intuitive and easy to use
- The System Administrators can easily:
 - Monitor the RHEV Clusters
 - Configure High Availability
 - Configure workload balancing policies
 - Perform server updates without impacting the application workloads. (Maintenance Manager)

This results in minimization of the administration necessary to support the virtualization cluster and increase the productivity of the system administration staff.

The benefits of RHEV

- Significantly rationalize the number of servers
- The High Availability feature of RHEV
(Provides multilevel priority intelligent fail-over)

This was a key functionality in helping KMI meet the strict service availability requirements.

- Greater flexibility and speed for:
 - Adaptations to the infrastructure
 - Test operations
 - Quickly create a machine

The benefits of RHEV

“Virtualization enables us to save two or three months on a project”

-- Emmanuel Strobbe

The benefits of RHEV

- Test operations:
 - Five virtual machines are dedicated to the development of tests, enabling KMI to test and update applications more easily.
 - Example:
 - Centralized management of the IT hardware via Puppet.

The benefits of RHEV

- Performance of the KMI UNIX (HP-UX) cluster that hosts production applications dedicated to weather forecasting services was significantly improved:
 - The following were moved of the cluster to virtual servers:
 - Critical data transfers between national services
 - Data format conversions

The benefits of RHEV

“Previously we had to halt the applications, unmount SAN disks, mount them in another machine and restart the applications. Virtualization allows us to perform the migration in the same environment. A successful switch was difficult to achieve since we had to conduct switching tests that can take over an hour. With virtualization, we can do the test in five minutes.”

-- Emmanuel Strobbe

The Future for KMI

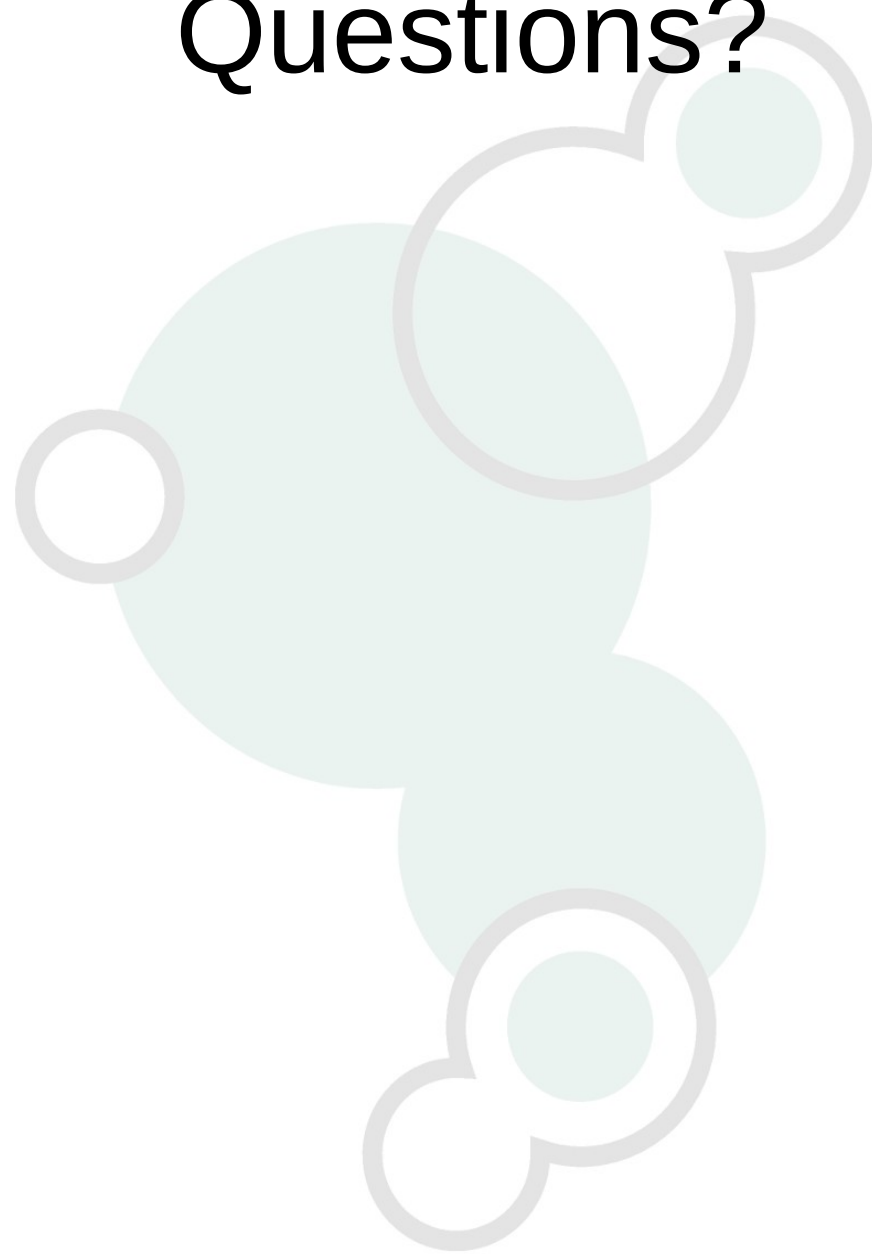
- KMI's virtualization project will continue in the future
- They also intend to migrate the intranet to a virtual machine
- The public website could also go down the same road
- The roadmap for RHEV looks promising
- KMI is looking forward to continue leveraging the functionality of RHEV

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Questions?

Q/A



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