The oVirt Way
General Product Overview

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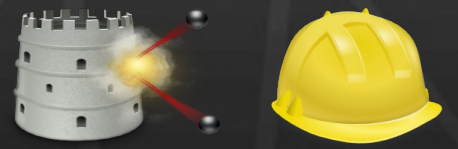
The oVirt

- Open source
- What is oVirt
- Utilizing Virt and KVM features
- Architecture
- Road-map
- Ovirt 4.0 and beyond



Open Source:

- It's not just for Linux
- It may or may not have support
- You don't have to be an expert to use it
- You have full access to the source code
- You're probably already using it

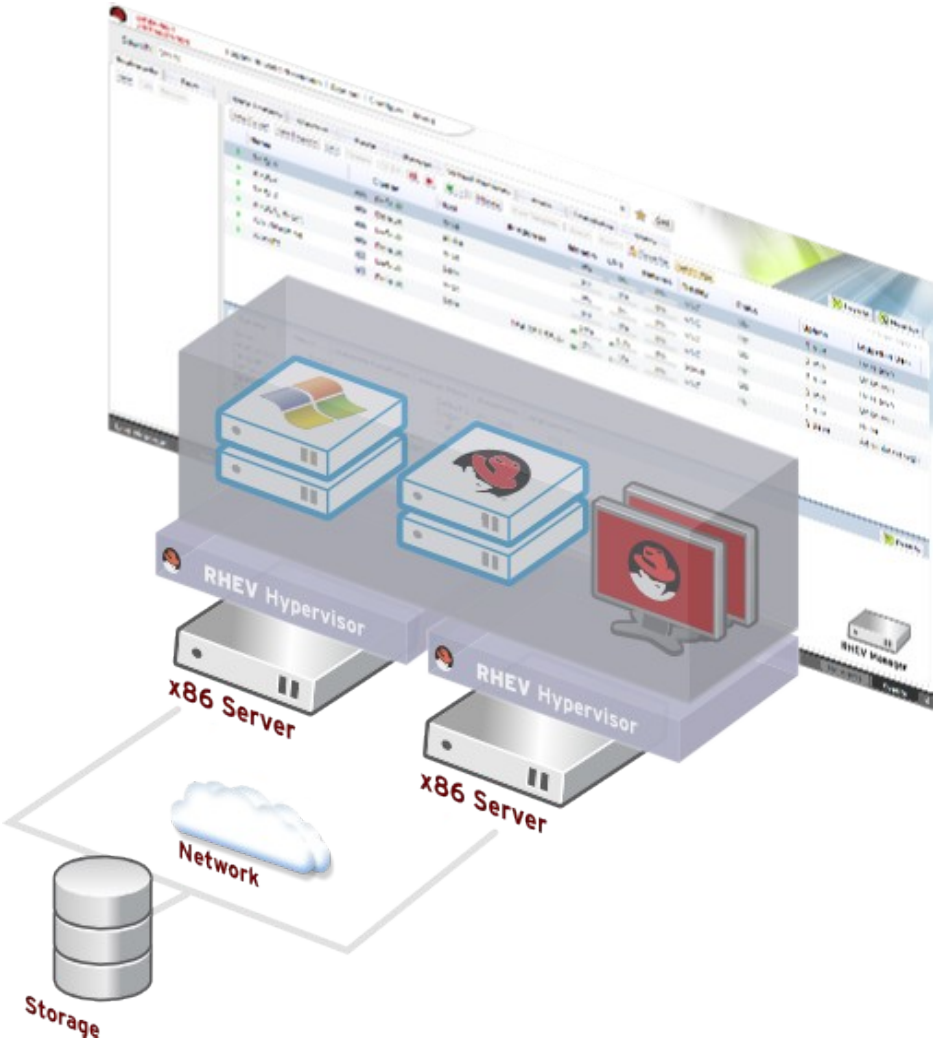
What is oVirt?

Provide an open source alternative to vCenter/vSphere/Xen

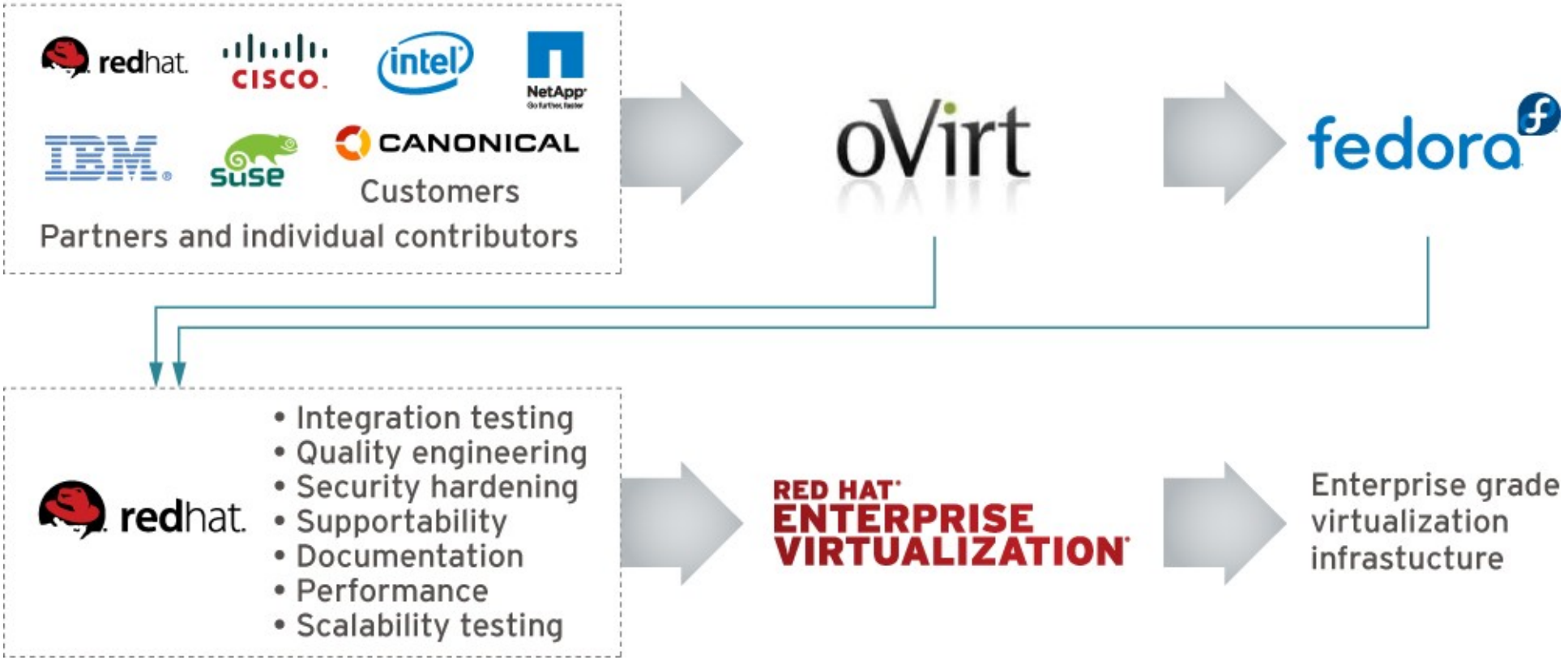
Large scale, centralized management for server and desktop virtualization

Based on leading performance, scalability and security infrastructure technologies

Focus on ease of use/deployment



Who is behind it



oVirt stack

Core

- oVirt-Engine
- VDSM
- Host deploy
- oVirt-Node
- oVirt-Engine-SDK
  - ruby\java\python
- oVirt-Engine-CLI
- oVirt-Guest-Agent
- oVirt-Image-Uploader
- oVirt-iso-Uploader
- oVirt-Log-Collector
- oVirt-DWH
- oVirt-live
- Ovirt-Reports
- Otopi
- Hosted-Engine
- **KVM**

Python Infra

- cpopen
- pthreading
- Ioprocess
- safelease

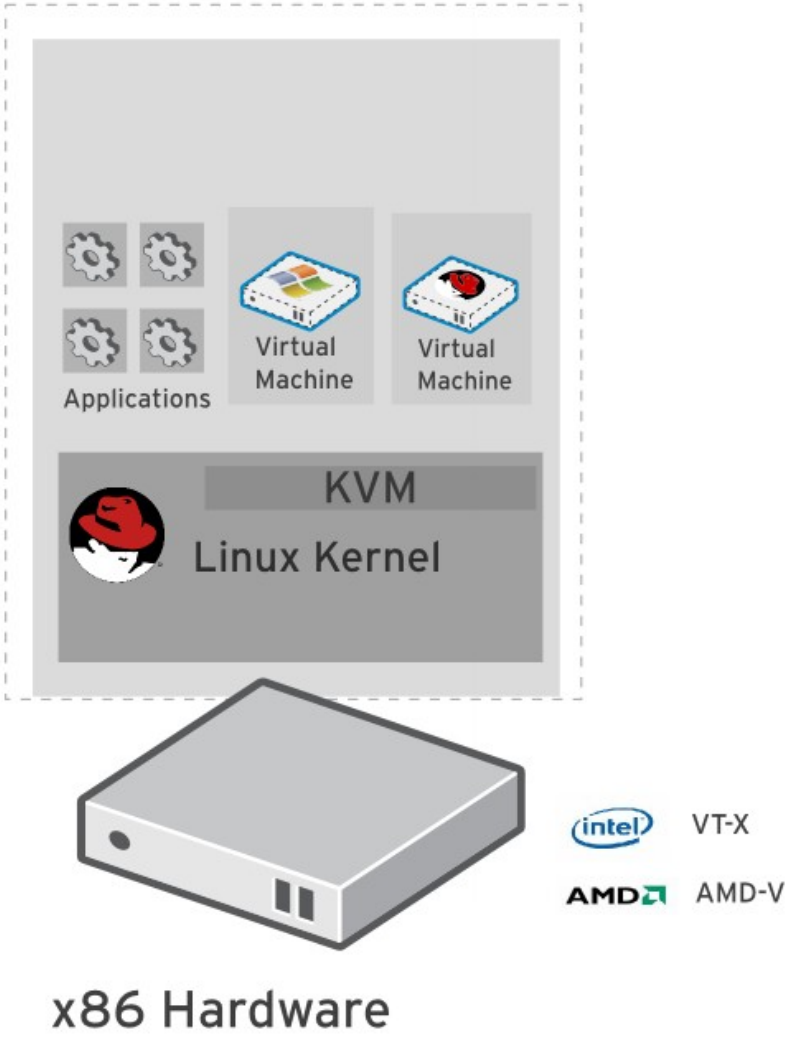
Tests Projects

- Ovirt-vdsmfake
- testenv

And much more...

Kenrel-based Virtual Machine

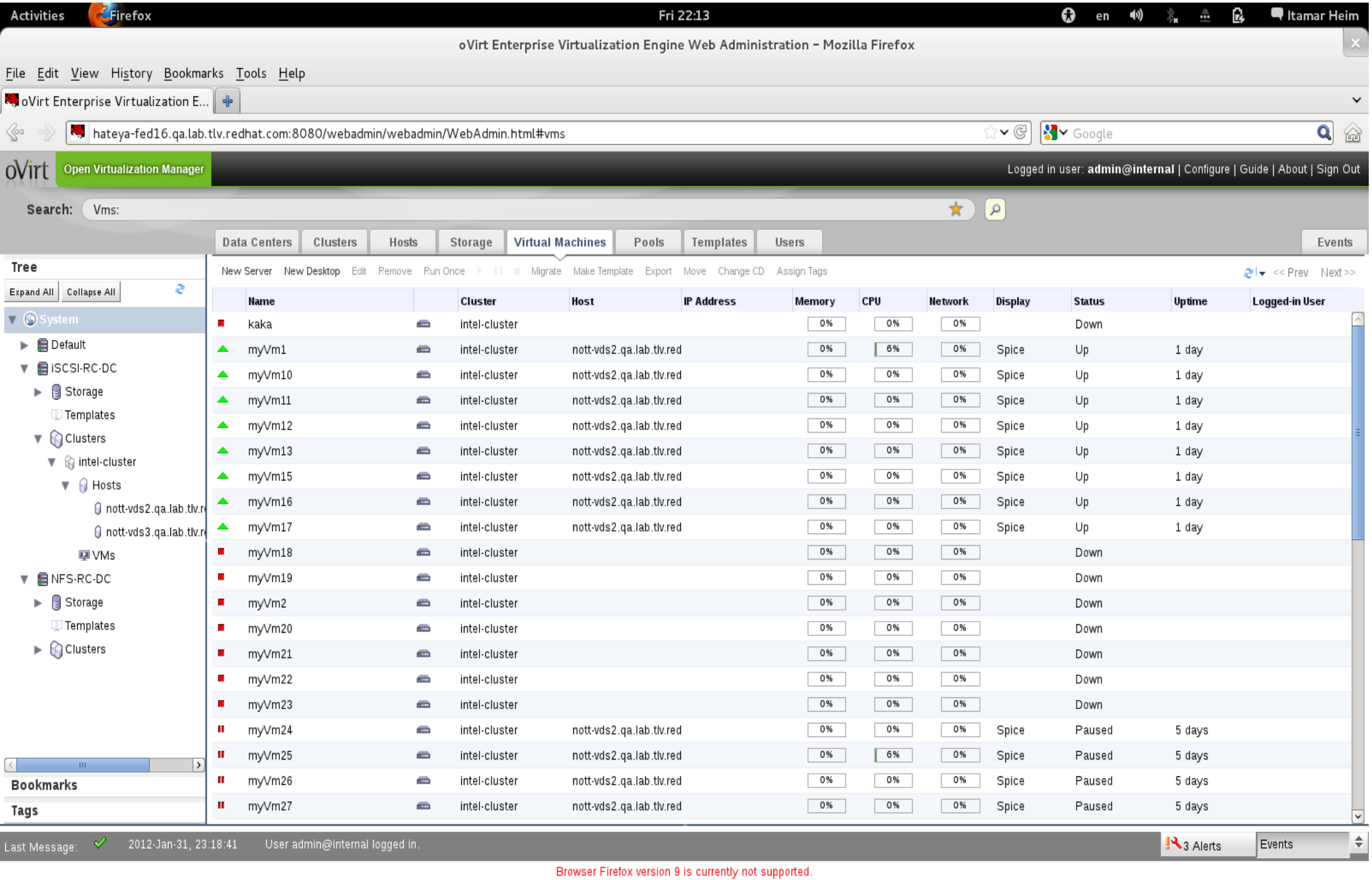
- Included in Linux kernel since 2006
- Runs Linux, Windows and other operating system guests
- Advanced features
  - Live migration
  - Memory page sharing
  - Thin provisioning
  - PCI Pass-through
- KVM architecture provides high “feature-velocity” – leverages the power of Linux



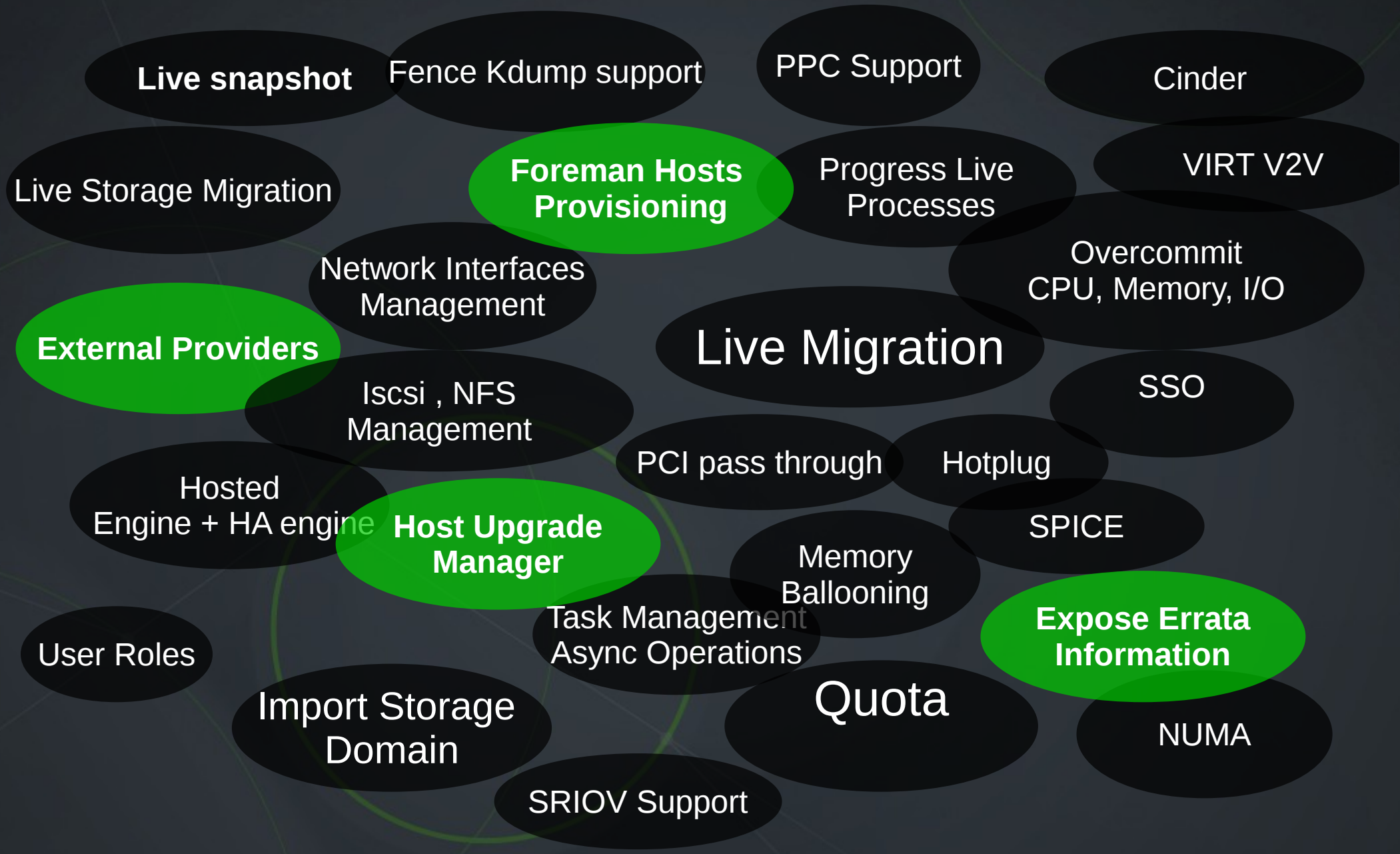
Using KVM

/usr/libexec/qemu-kvm -name vm-f16-buildmachine -S -M rhel6.4.0 -cpu Westmere -enable-kvm -m 2048 -smp 2,sockets=2,cores=1,threads=1 -uuid a8ccdb60-8a42-44f5-9669-d74c3b2eff43 -smbios type=1,manufacturer=Red Hat,product=RHEV Hypervisor,version=6Server-6.4.0.4.el6,serial=30353036-3837-4247-3831-30394635324C_78:e7:d1:22:46:d8,uuid=a8ccdb60-8a42-44f5-9669-d74c3b2eff43 -nodefconfig -nodefaults -chardev socket,id=charmonitor,path=/var/lib/libvirt/qemu/vm-f16-buildmachine.monitor,server,nowait -mon chardev=charmonitor,id=monitor,mode=control -rtc base=2013-10-08T12:16:16,driftfix=slew -no-shutdown -device piix3-usb-uhci,id=usb,bus=pci.0,addr=0x1.0x2 -device virtio-serial-pci,id=virtio-serial0,bus=pci.0,addr=0x4 -drive if=none,media=cdrom,id=drive-ide0-1-0,readonly=on,format=raw,serial= -device ide-drive,bus=ide.1,unit=0,drive=drive-ide0-1-0,id=ide0-1-0 -drive file=/rhev/data-center/f79b0b28-c82f-11e0-8739-78e7d1e48c4c/5bab6470-8825-4e3a-b408-ebcde93678b6/images/4c213cd2-c4d5-441b-a1ac-dfb1a6868699/11b3e132-50a5-481b-b48b-e3b1f2879e69,if=none,id=drive-virtio-disk0,format=qcow2,serial=4c213cd2-c4d5-441b-a1ac-dfb1a6868699,cache=none,werror=stop,rerror=stop,aio=native -device virtio-blk-pci,scsi=off,bus=pci.0,addr=0x5,drive=drive-virtio-disk0,id=virtio-disk0,bootindex=1 -drive file=/rhev/data-center/f79b0b28-c82f-11e0-8739-78e7d1e48c4c/5bab6470-8825-4e3a-b408-ebcde93678b6/images/02330fa2-d1ff-48e0-a843-842c2376756f/5a283126-4d27-4eef-86dd-fb538d8d08e4,if=none,id=drive-virtio-disk1,format=qcow2,serial=02330fa2-d1ff-48e0-a843-842c2376756f,cache=none,werror=stop,rerror=stop,aio=native -device virtio-blk-pci,scsi=off,bus=pci.0,addr=0x6,drive=drive-virtio-disk1,id=virtio-disk1 -netdev tap,fd=31,id=hostnet0,vhost=on,vhostfd=32 -device virtio-net-pci,netdev=hostnet0,id=net0,mac=00:1a:4a:23:12:13,bus=pci.0,addr=0x3,bootindex=2 -chardev socket,id=charchannel0,path=/var/lib/libvirt/qemu/channels/vm-f16-buildmachine.com.redhat.rhevm.vdsm,server,nowait -device virtserialport,bus=virtio-serial0.0,nr=1,chardev=charchannel0,id=channel0,name=com.redhat.rhevm.vdsm -chardev socket,id=charchannel1,path=/var/lib/libvirt/qemu/channels/vm-f16-buildmachine.org.qemu.guest_agent.0,server,nowait -device virtserialport,bus=virtio-serial0.0,nr=2,chardev=charchannel1,id=channel1,name=org.qemu.guest_agent.0 -chardev spicevmc,id=charchannel2,name=vdagent -device virtserialport,bus=virtio-serial0.0,nr=3,chardev=charchannel2,id=channel2,name=com.redhat.spice.0 -spice port=5904,tls-port=5905,addr=10.35.16.4,x509-dir=/etc/pki/vdsm/libvirt-spice,tls-channel=main,tls-channel=display,tls-channel=inputs,tls-channel=cursor,tls-channel=playback,tls-channel=record,tls-channel=smartcard,tls-channel=usbredir,seamless-migration=on -k en-us -vga qxl -global qxl-vga.ram_size=67108864 -global qxl-vga.vram_size=67108864

How Does It Look?



oVirt


Live snapshot
Fence Kdump support
PPC Support
Cinder
Live Storage Migration
Foreman Hosts Provisioning
Progress Live Processes
VIRT V2V
Network Interfaces Management
Overcommit CPU, Memory, I/O
External Providers
Live Migration
Iscsi , NFS Management
SSO
PCI pass through
Hotplug
Hosted Engine + HA engine
Host Upgrade Manager
SPICE
Memory Ballooning
Task Management Async Operations
Expose Errata Information
User Roles
Import Storage Domain
Quota
NUMA
SRIOV Support

The oVirt's Entities

Data Centers

Storage

Linux Hypervisors

Network

Virtual Clusters

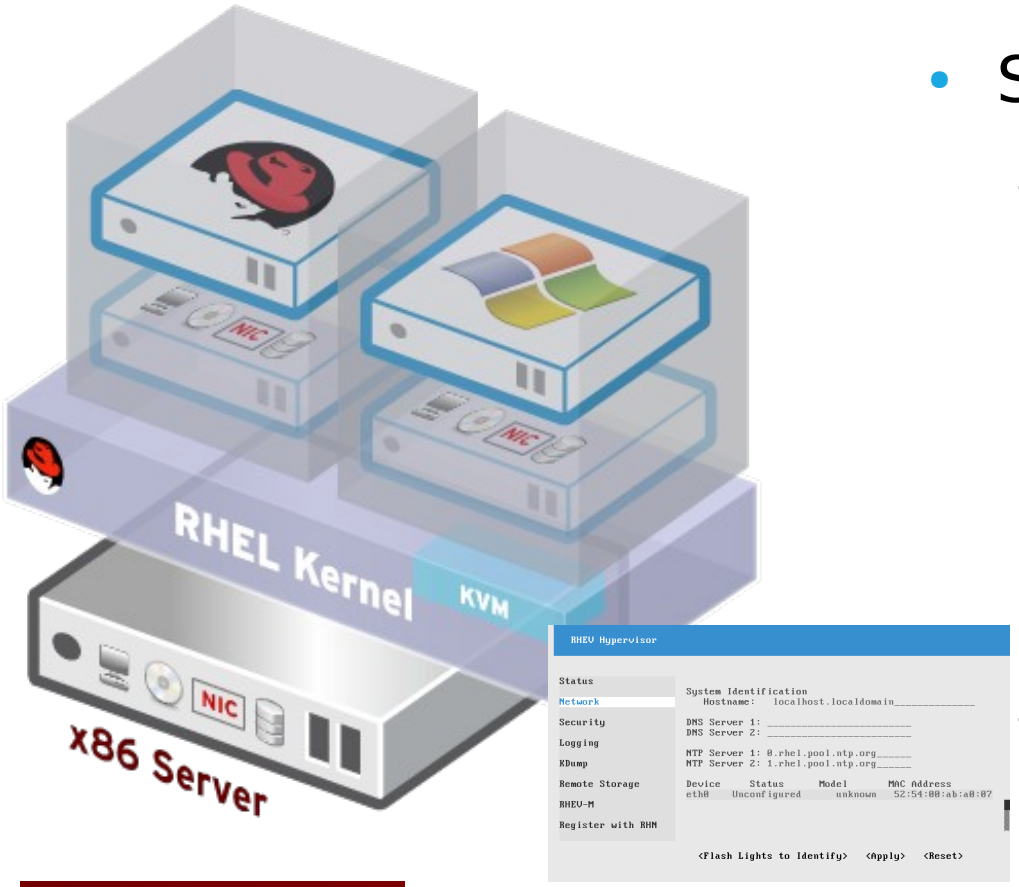
Guest\VM

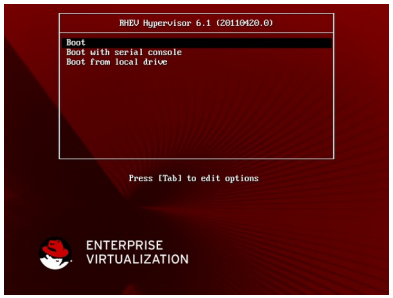
Guest\VM

Linux as a Hypervisor?

- What makes up a Hypervisor?
  - OS Fedora\Red Hat Enterprise Linux\CentOs\Ubuntu
  - VDSM
    - Hardware Management
    - Memory Manager
    - Storage Manipulations
    - Resource Management
    - Scheduling
    - Access Control
    - Power Management
    - Memory Manager
    - Device Model (emulation)
    - Virtual Machine Monitor

oVirt Node





- Standalone hypervisor
  - Small footprint < 100MB
    - Customized 'spin' of Fedora + KVM
    - 'Just enough' Fedora to run virtual machines
    - Runs on all RHEL hardware with Intel VT/AMD-V CPUs
  - Easy to install, configure and upgrade
    - PXE boot, USB boot, CD or Hard drive
- Node 4.0 new generation

Cluster Of Hypervisors

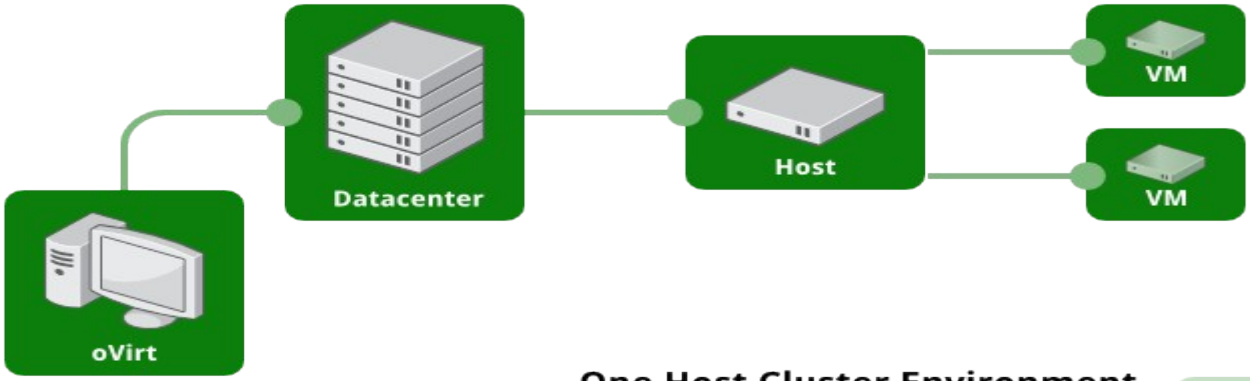
- What makes up a cluster?
  - Group – Migration domain
  - Share Specification
  - Share Storage Array
  - Network Cluster
    - Provides Migration Abilities

Guest \ Virtual Machine

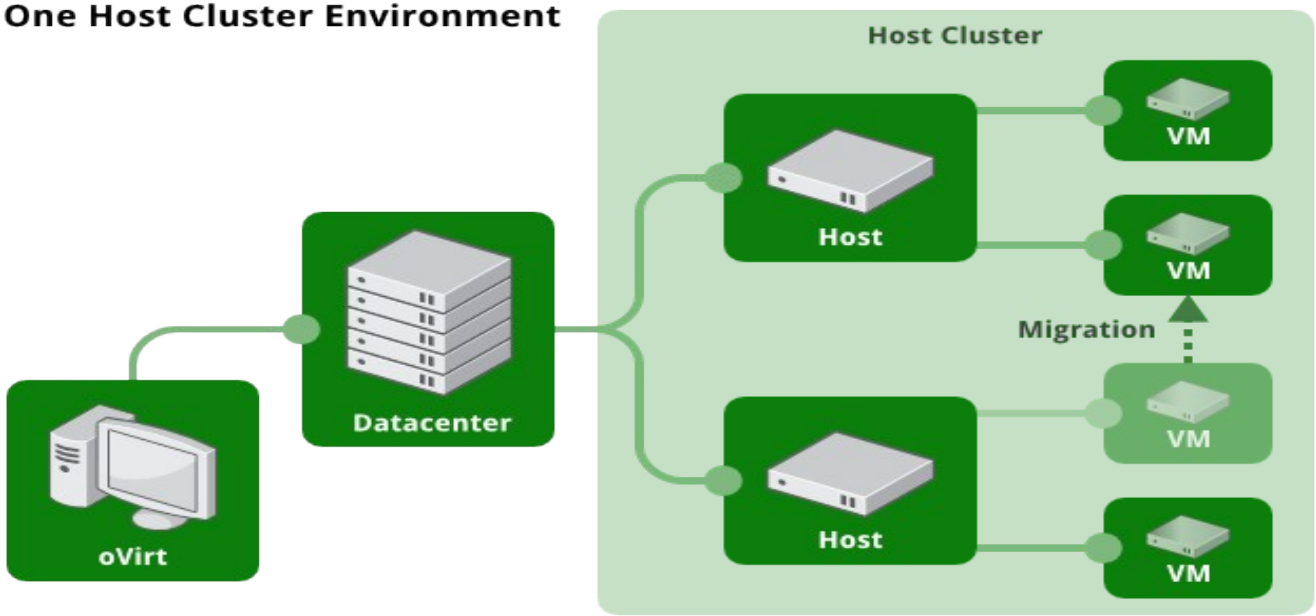
- What is a VM
  - User level process
  - Controls part of the hypervisor hardware
  - Attached to storage disk
  - Exposes VDI access control

The Environment – Why clusters?

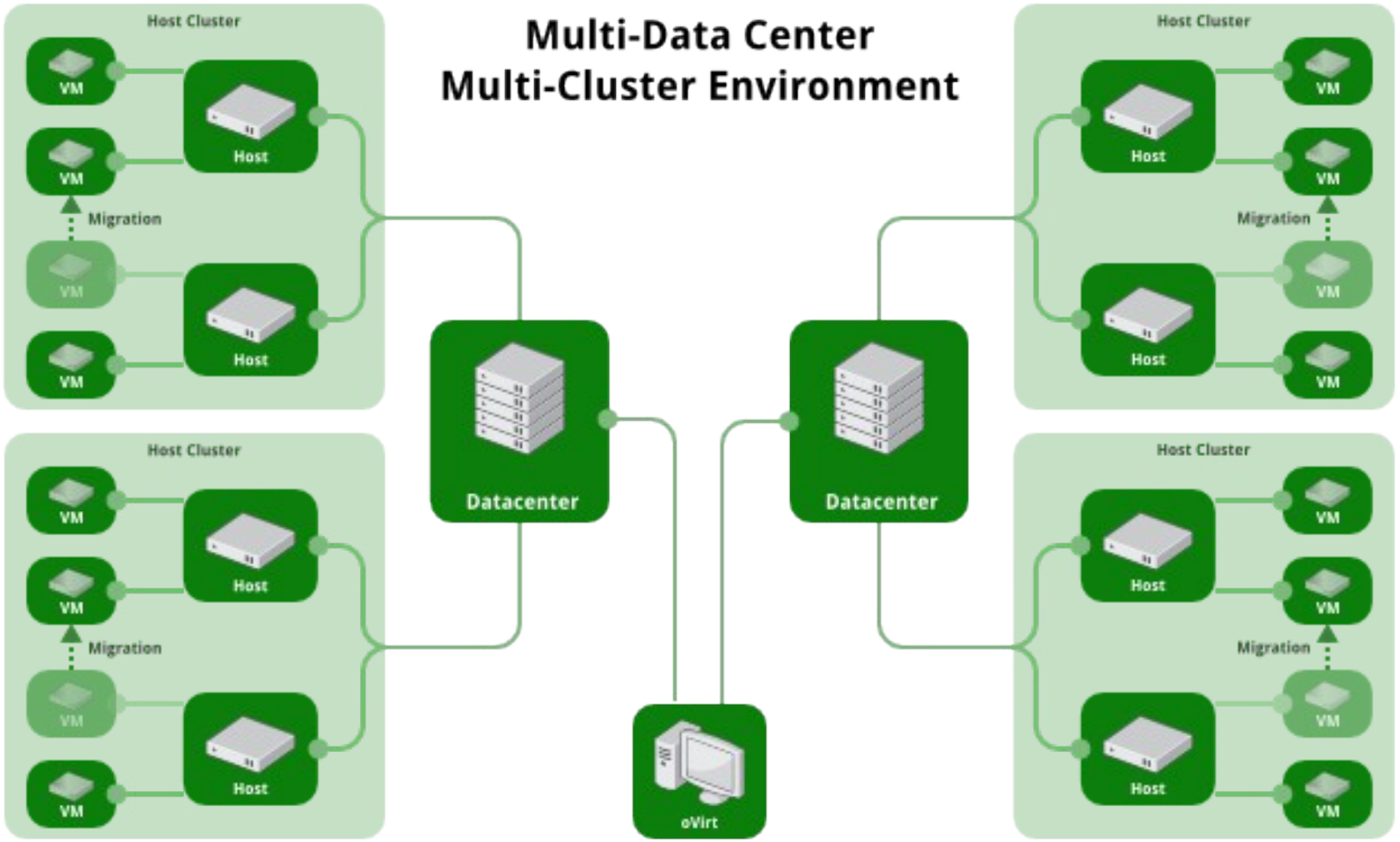
Basic One Host Environment



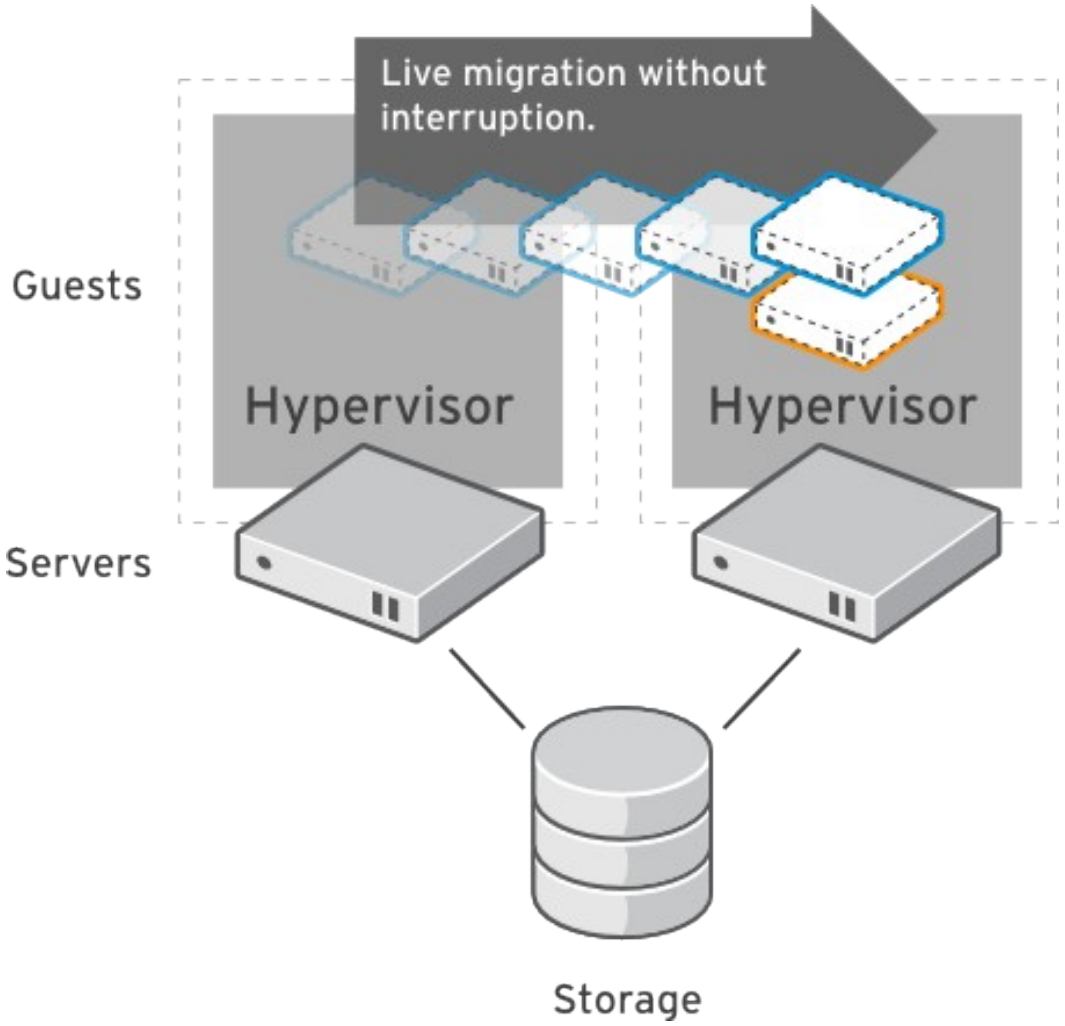
One Host Cluster Environment



Multi-Datacenter/Multi-Host

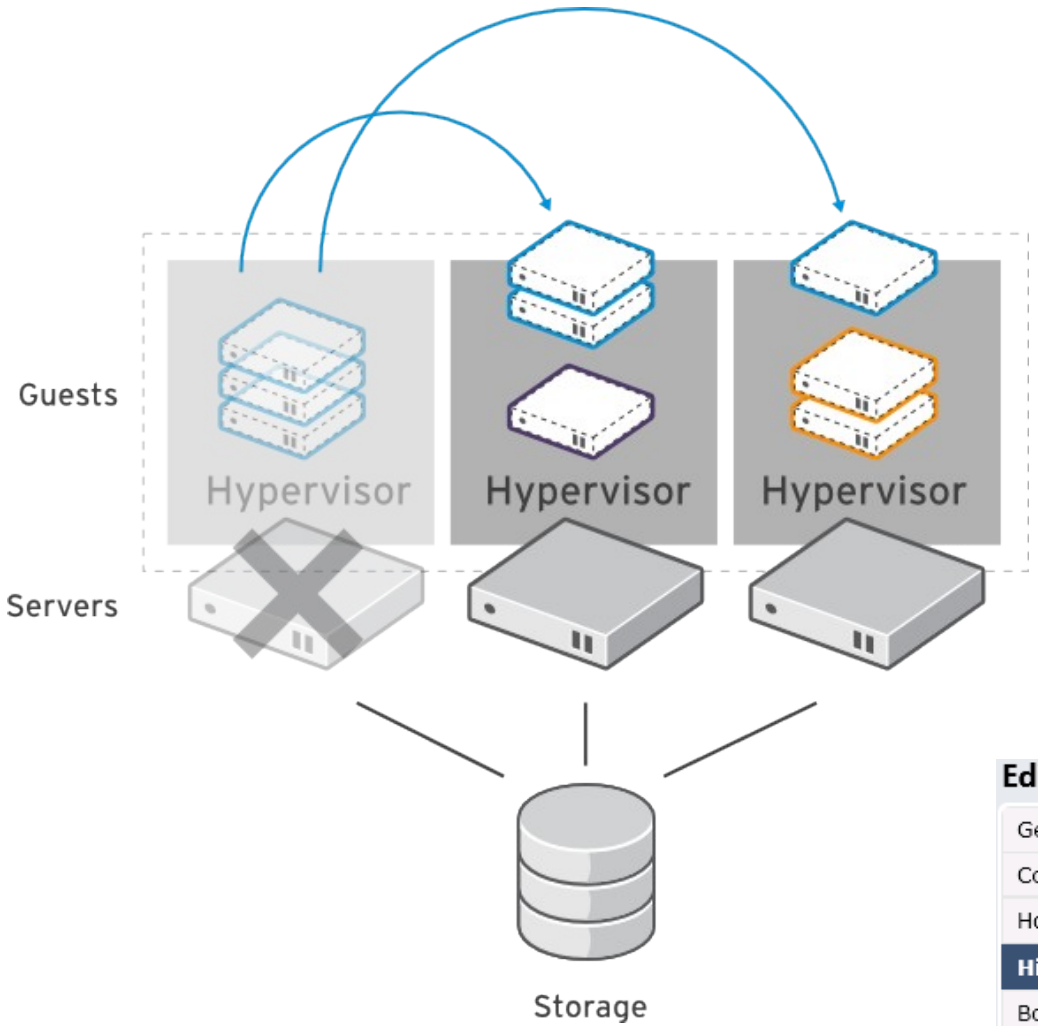


Live Migration

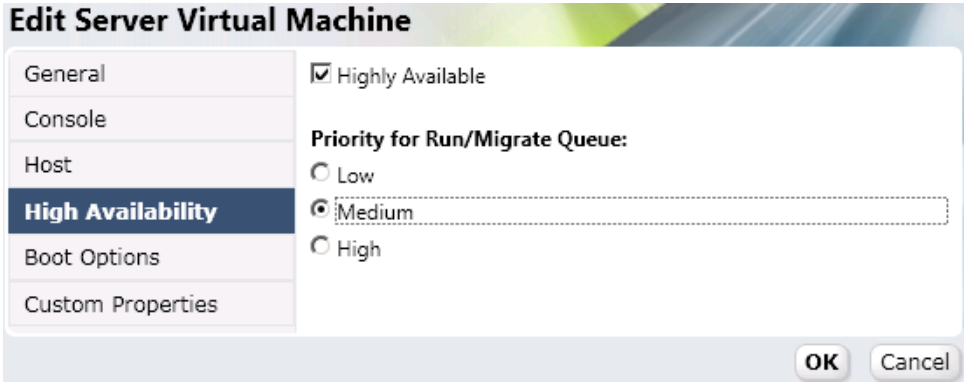


- Dynamically move virtual machines between hosts
  - No service interruption
  - Applications continue to run
- Migrate even I/O intensive workloads such as databases
- Perform hardware maintenance without application downtime
- Dynamically balance workloads between host systems

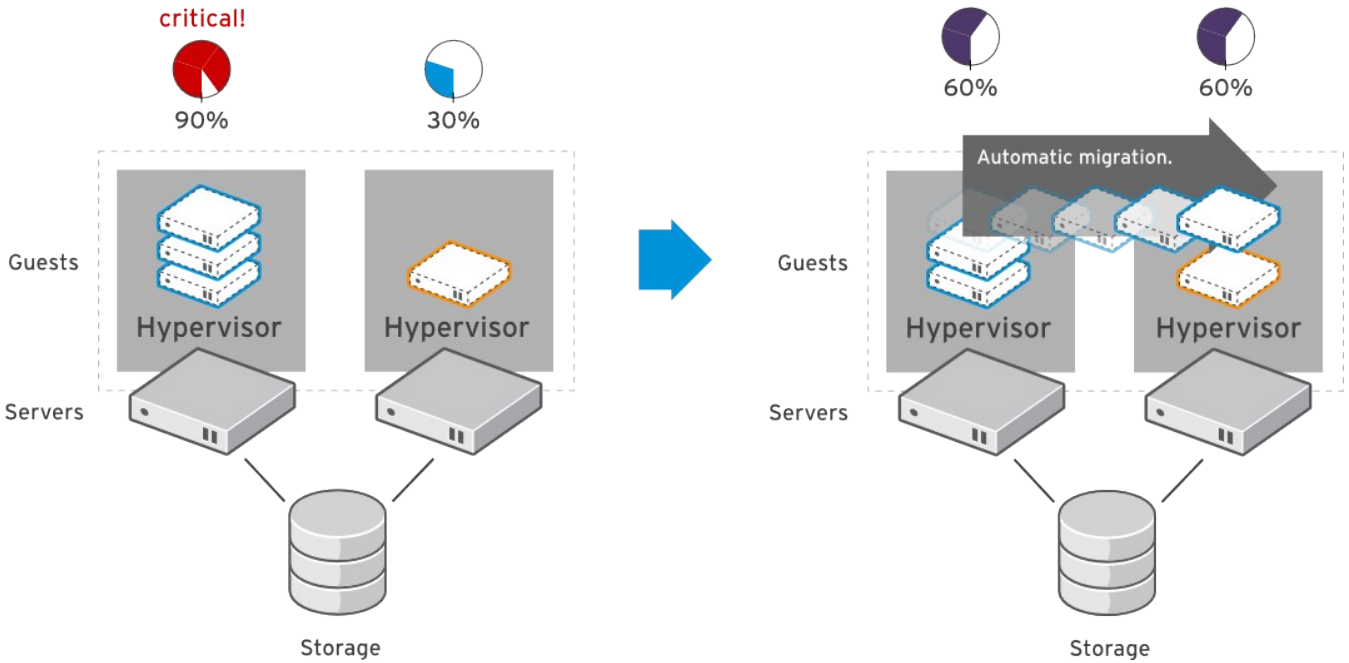
High Availability



- Build a highly available enterprise infrastructure
- Continually monitor host systems and virtual machines
- Automatically restart virtual machines in case of host failure
  - Restart virtual machine on another node in the cluster
- Use live migration to “fail-back” a VM to it's original host when the server is restored



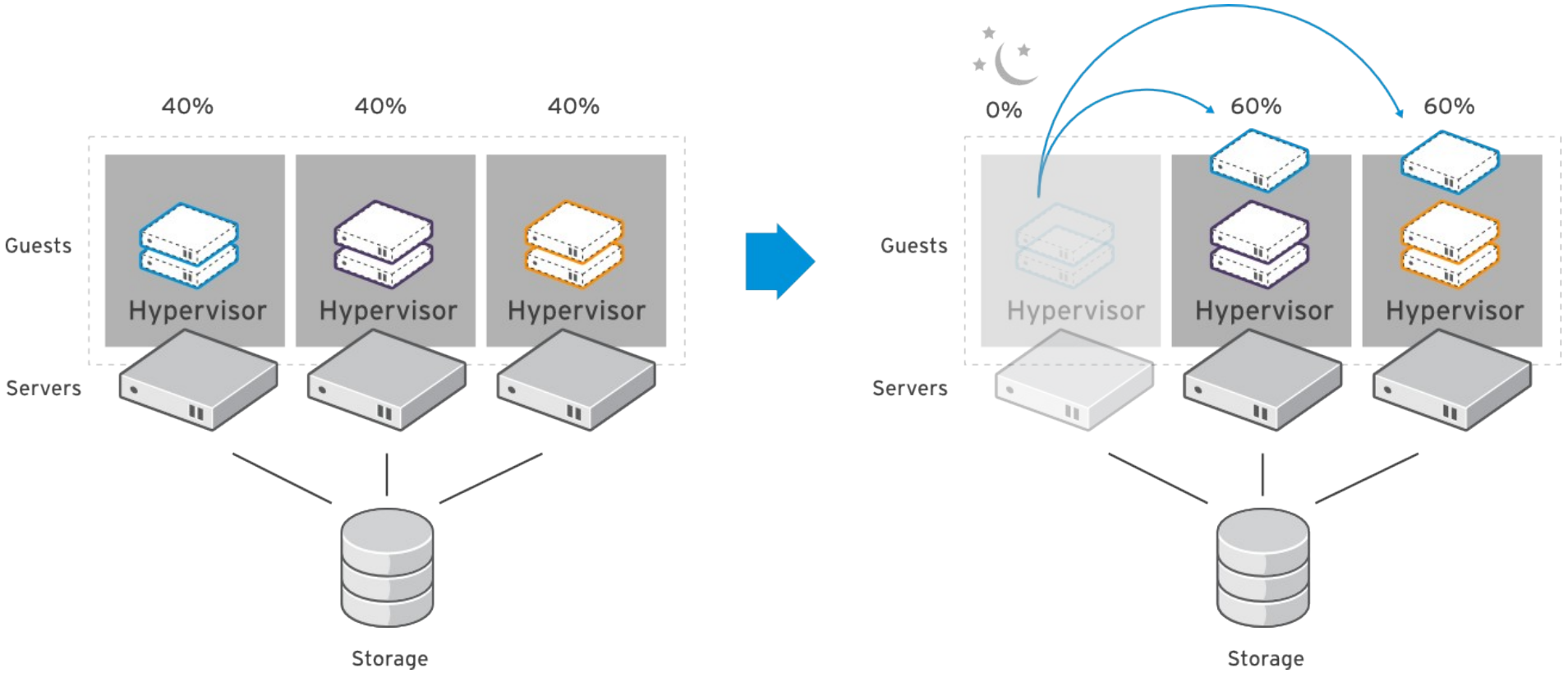
System Scheduler



- Dynamically balance workloads in the data center.
- Automatically live migrate virtual machines based on resources
- Define custom policies for distribution of virtual machines

Maintain consistent resource usage across the enterprise data center

Power Saver

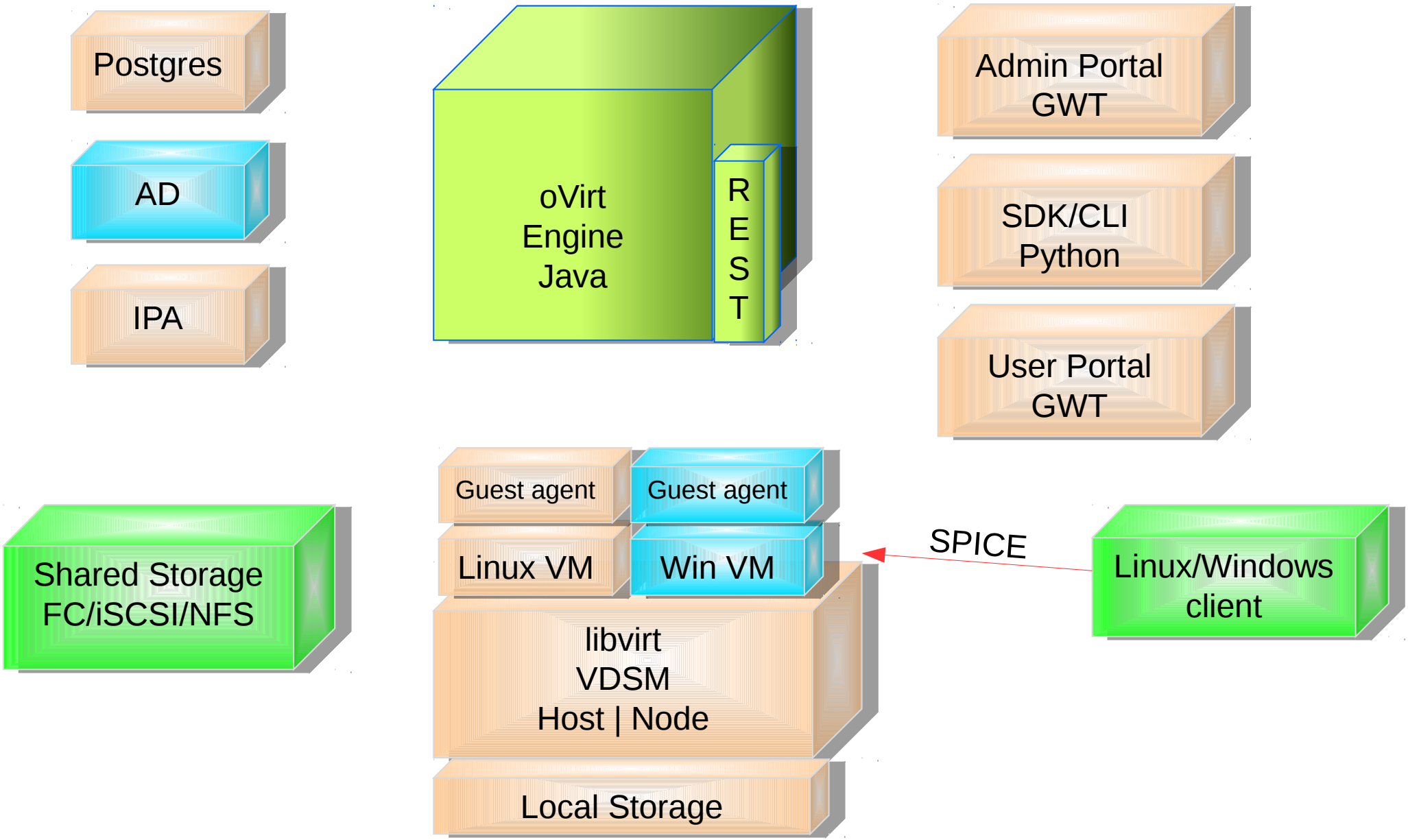


Define policies to optimize workload on a fewer number of servers during “off-peak” hours

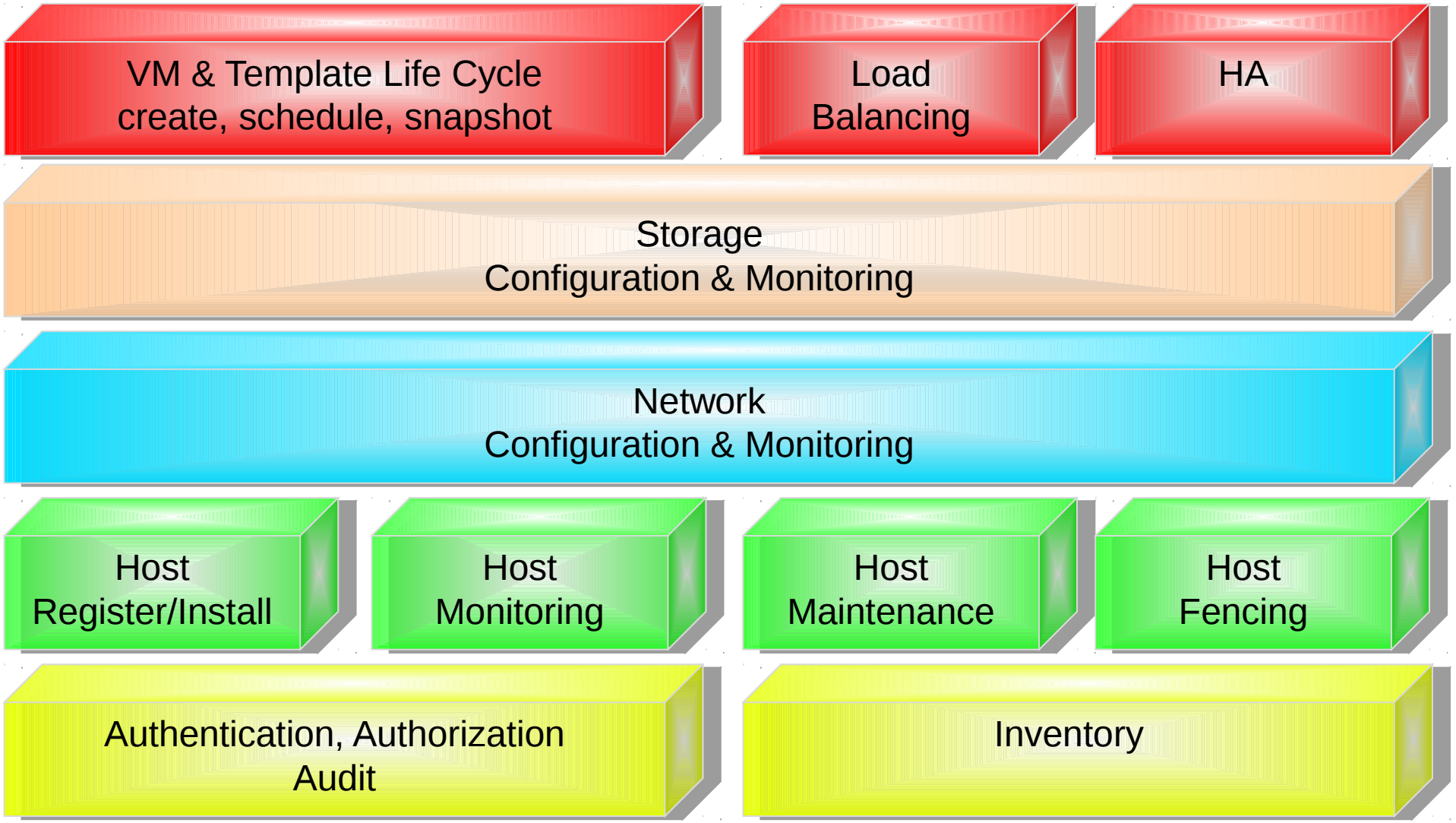
Turn off servers – Saving money

Architecture

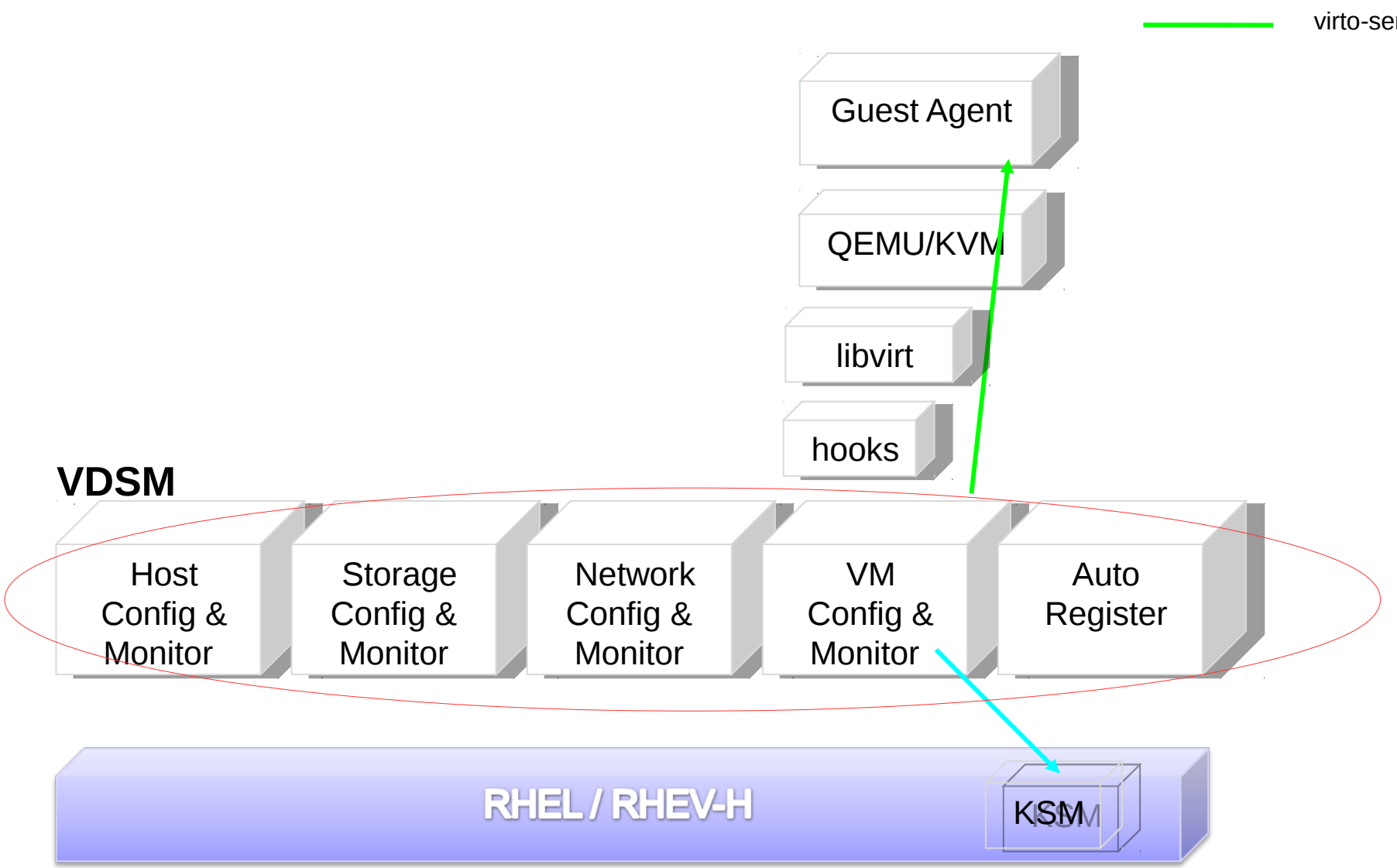
oVirt High Level Architecture



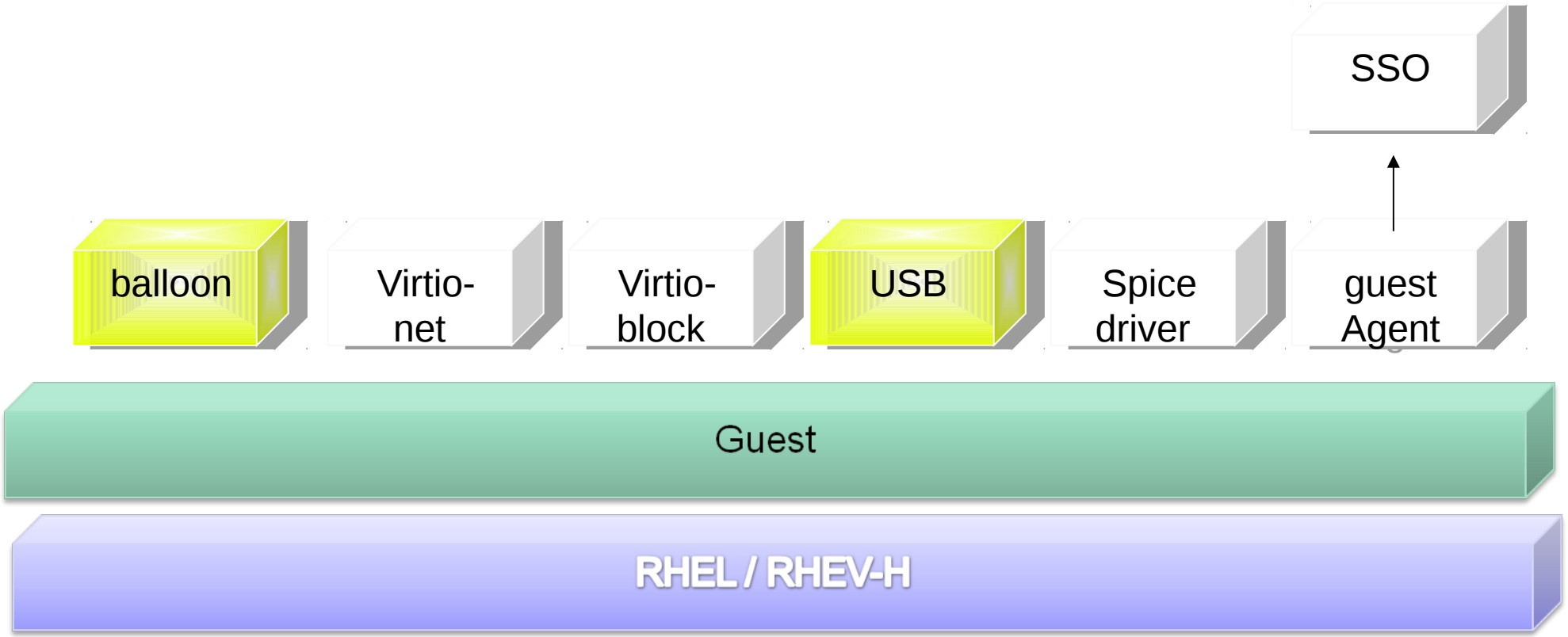
Engine Core (Backend)

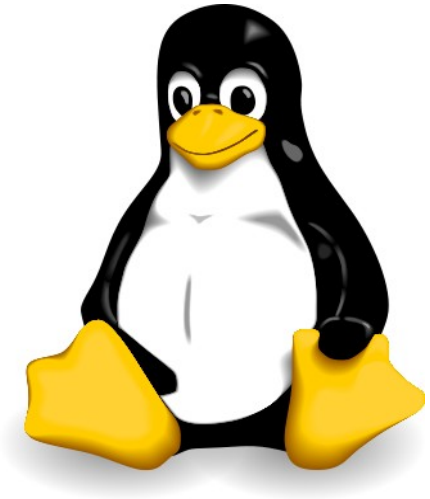


Zoom In To The Hypervisor's Components



Zoom In To The VM Components





oVirt Users
How to use?

Three Pillars of Management

- **Simplicity**
- **Stability**
- **Functionality**

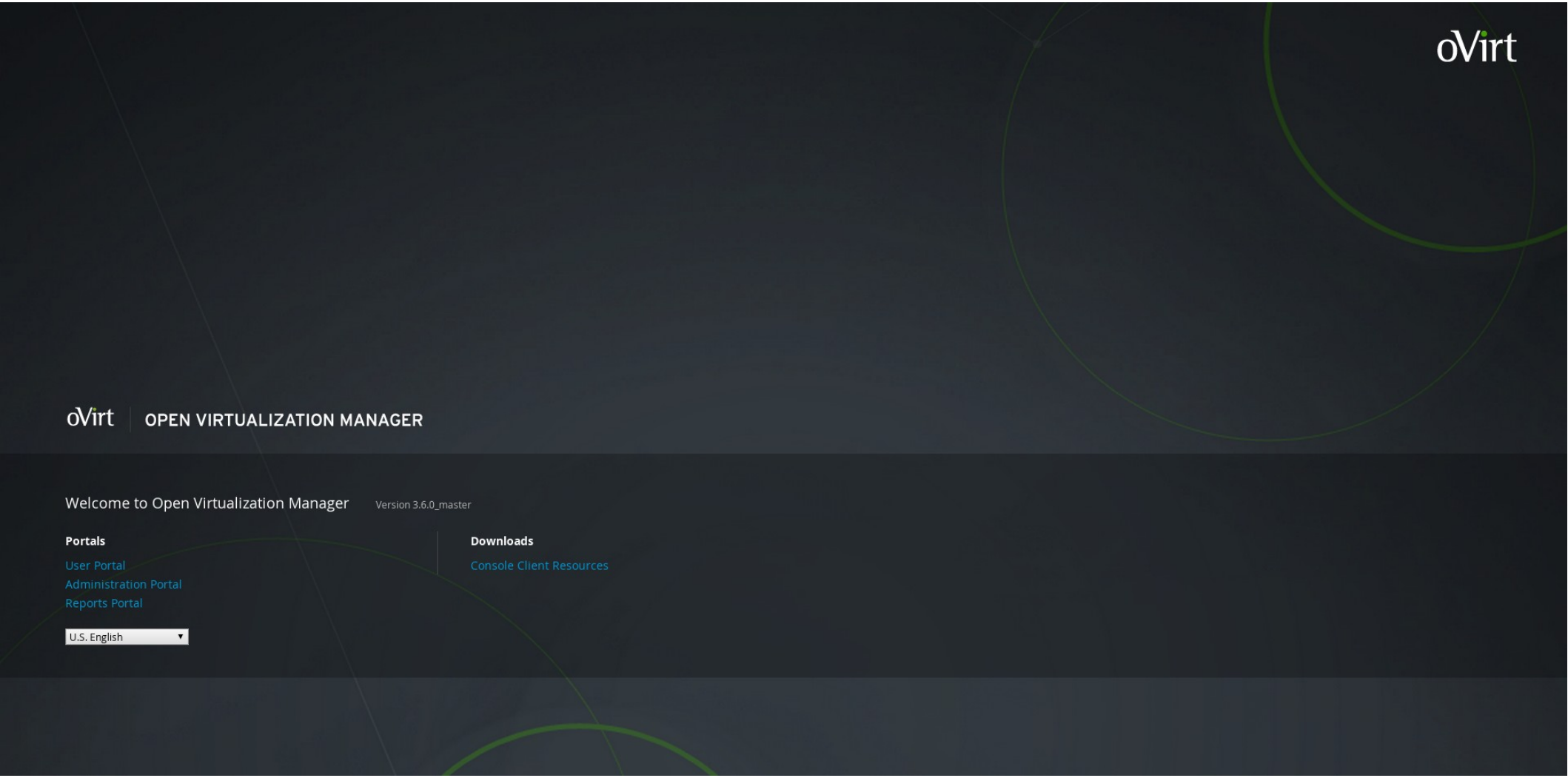
Simplicity

- Installation
  - yum install -y ovirt-engine; engine-setup
    - http://www.ovirt.org/Build_and_Install_Engine_RPM
    - http://www.ovirt.org/OVirt_Engine_Development_Environment
- oVirt-Host-Deploy process
- oVirt Node
- Varied user interaction mechanisms
  - Python CLI, Python/Java SDK
- Configuration - One place, single utility

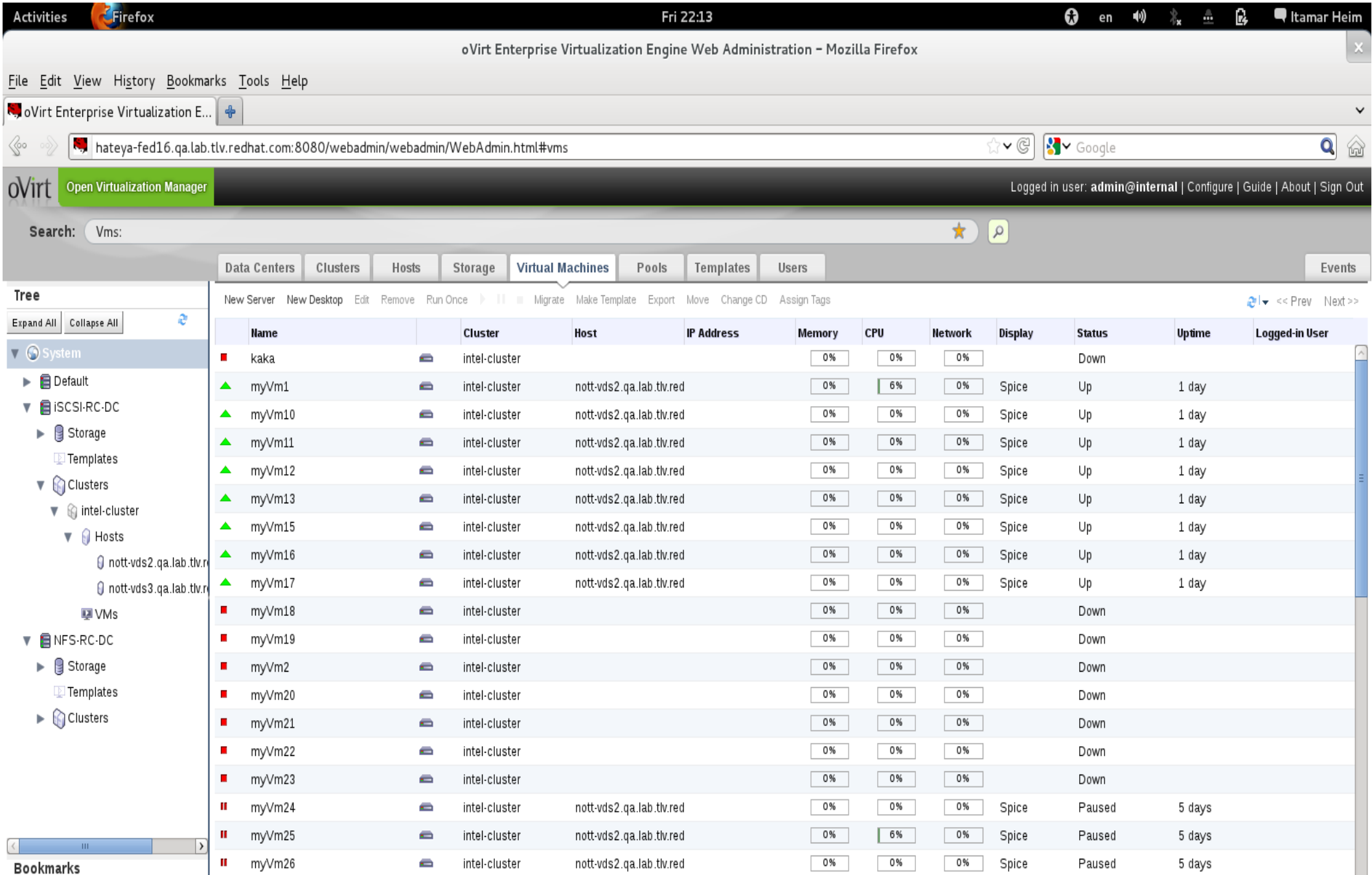
Stability

- Involvement of big companies
  - RHEV is based on oVirt
  - IBM, Netapp, Cisco etc.
- Release schedule
  - Feature freeze
  - Stabilization periods
  - Test days
- Continues Integration
  - Jenkins jobs – Available upstream
- Active users community

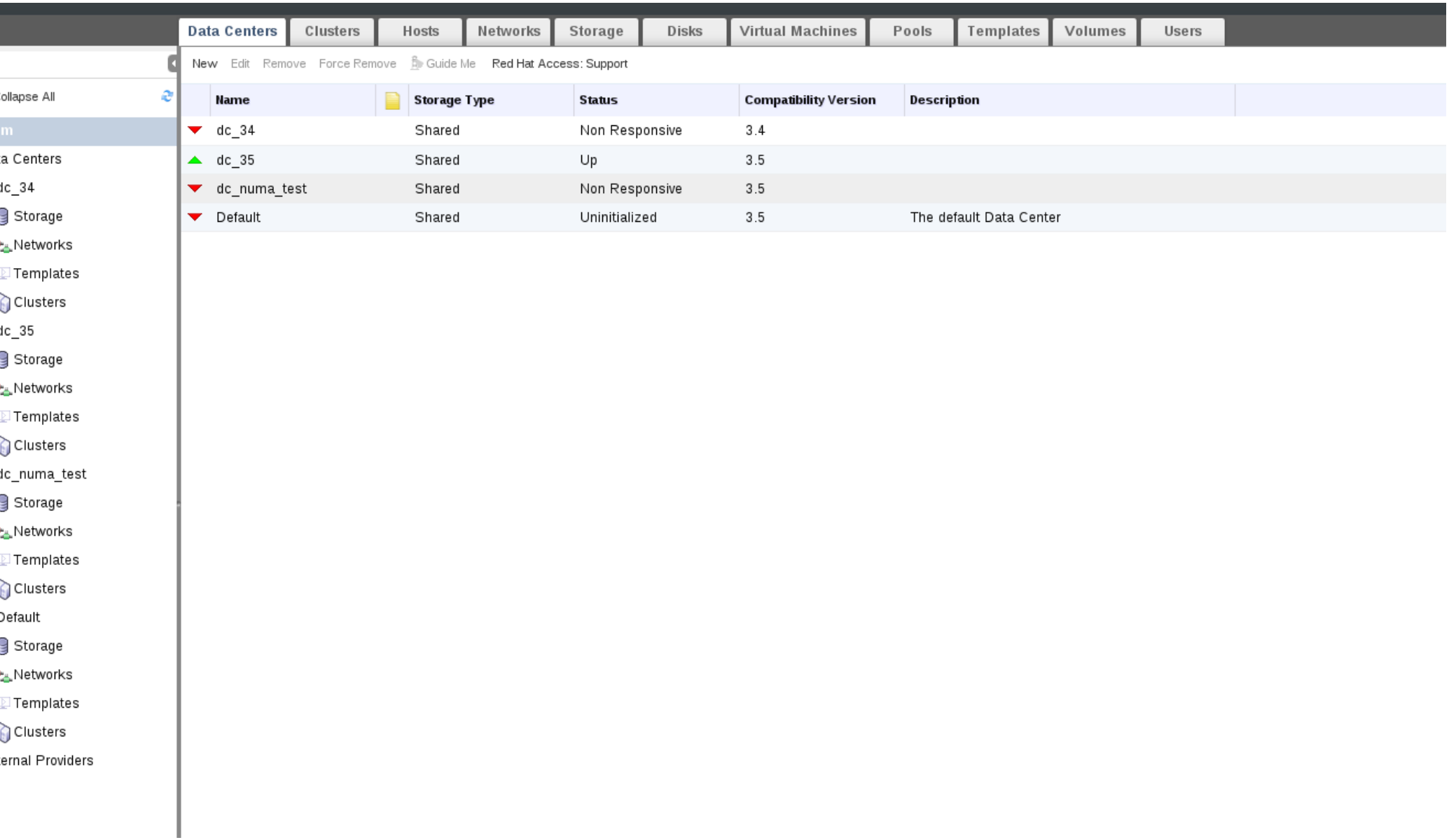
Functionality – Login



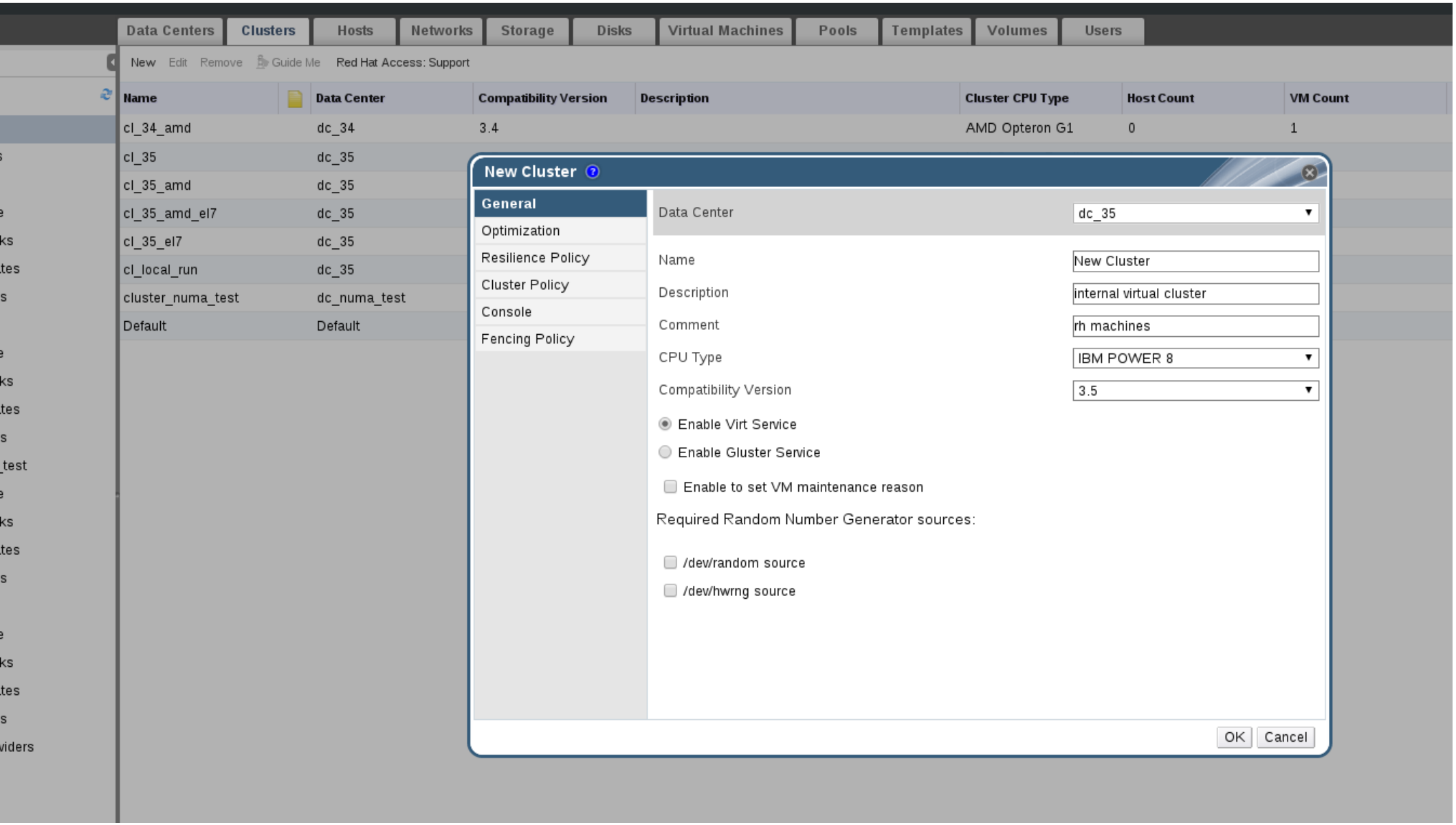
oVirt Functionality – Admin Console



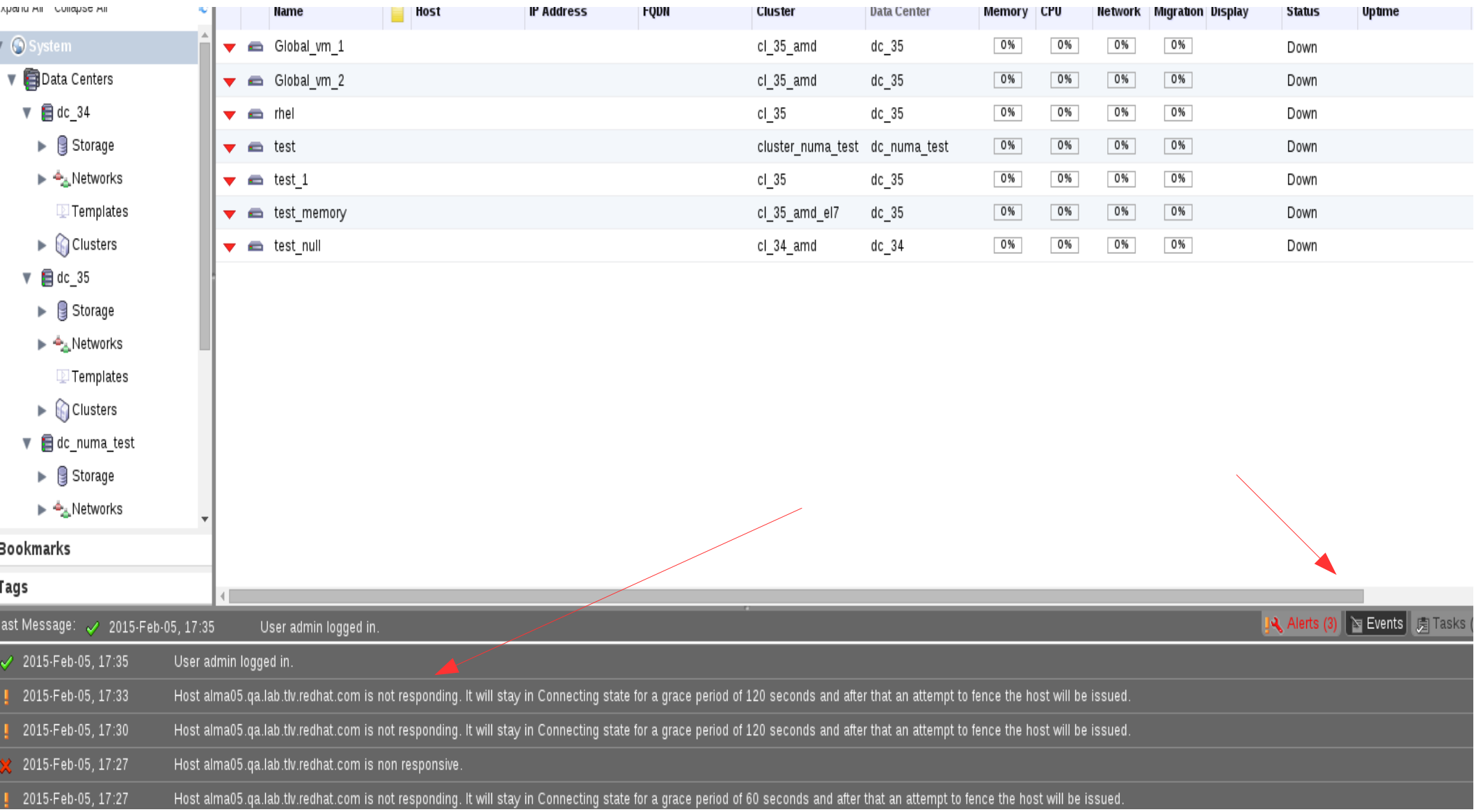
oVirt Functionality –Declare DC and Cluster



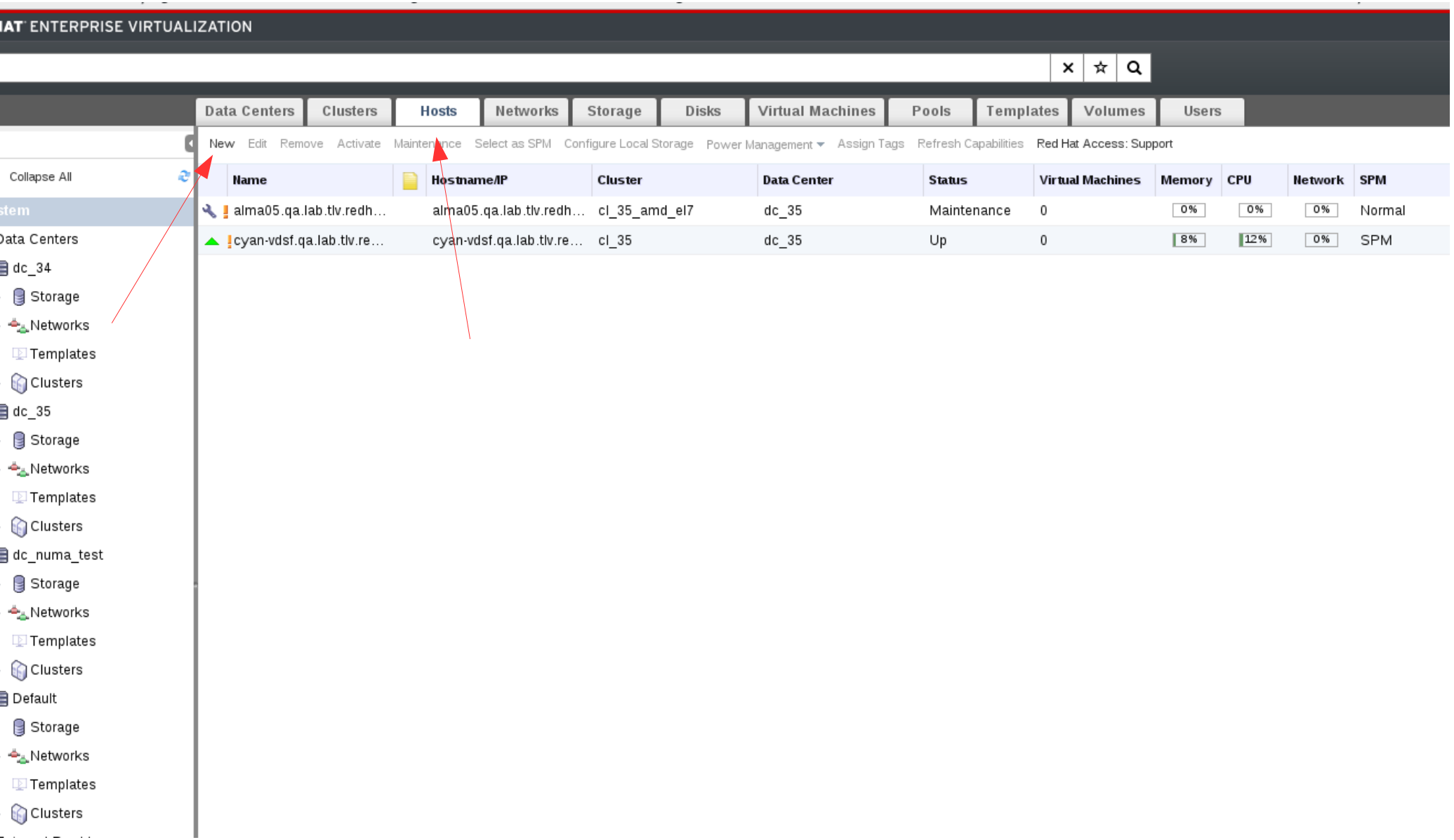
Functionality –Declare DC and Cluster



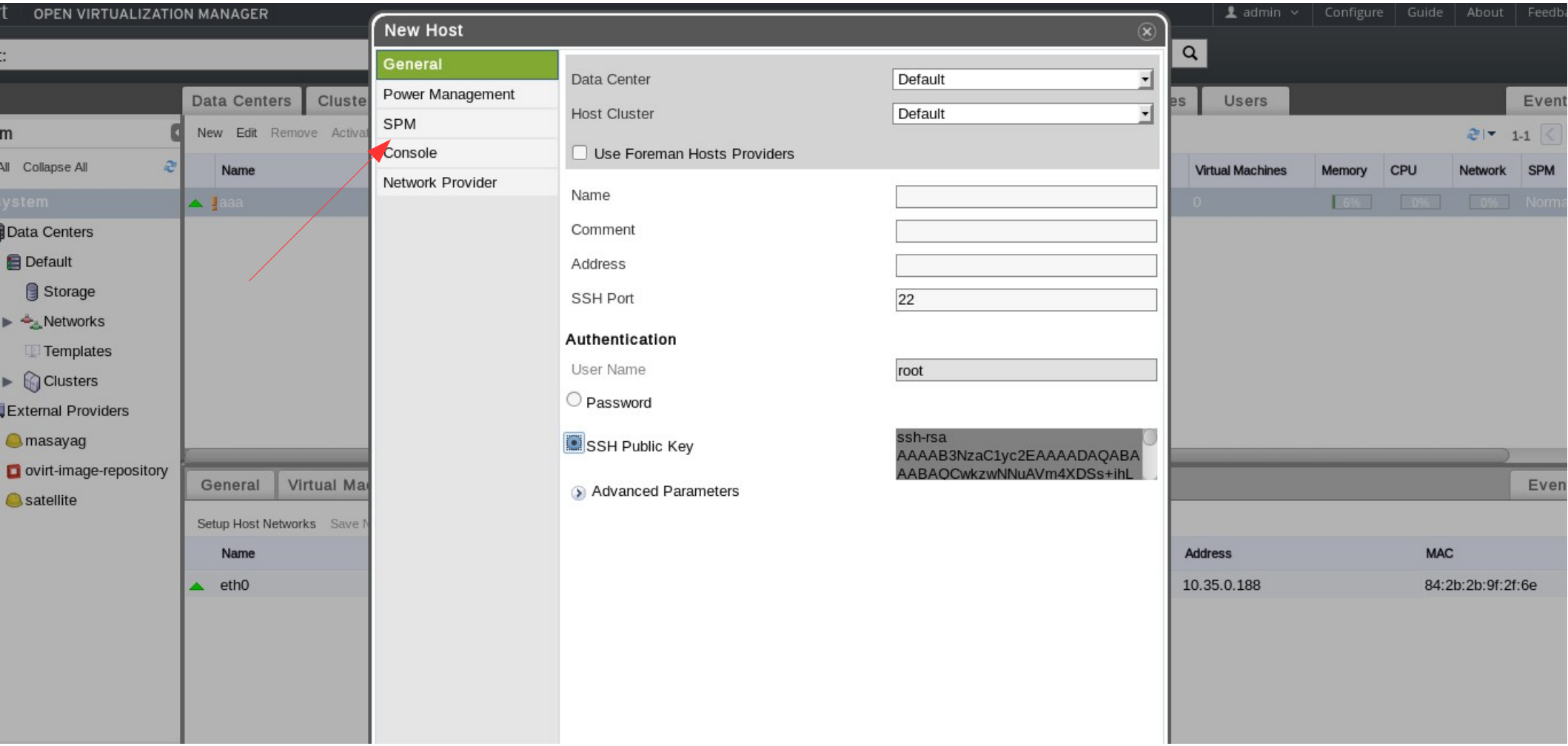
Functionality – Events



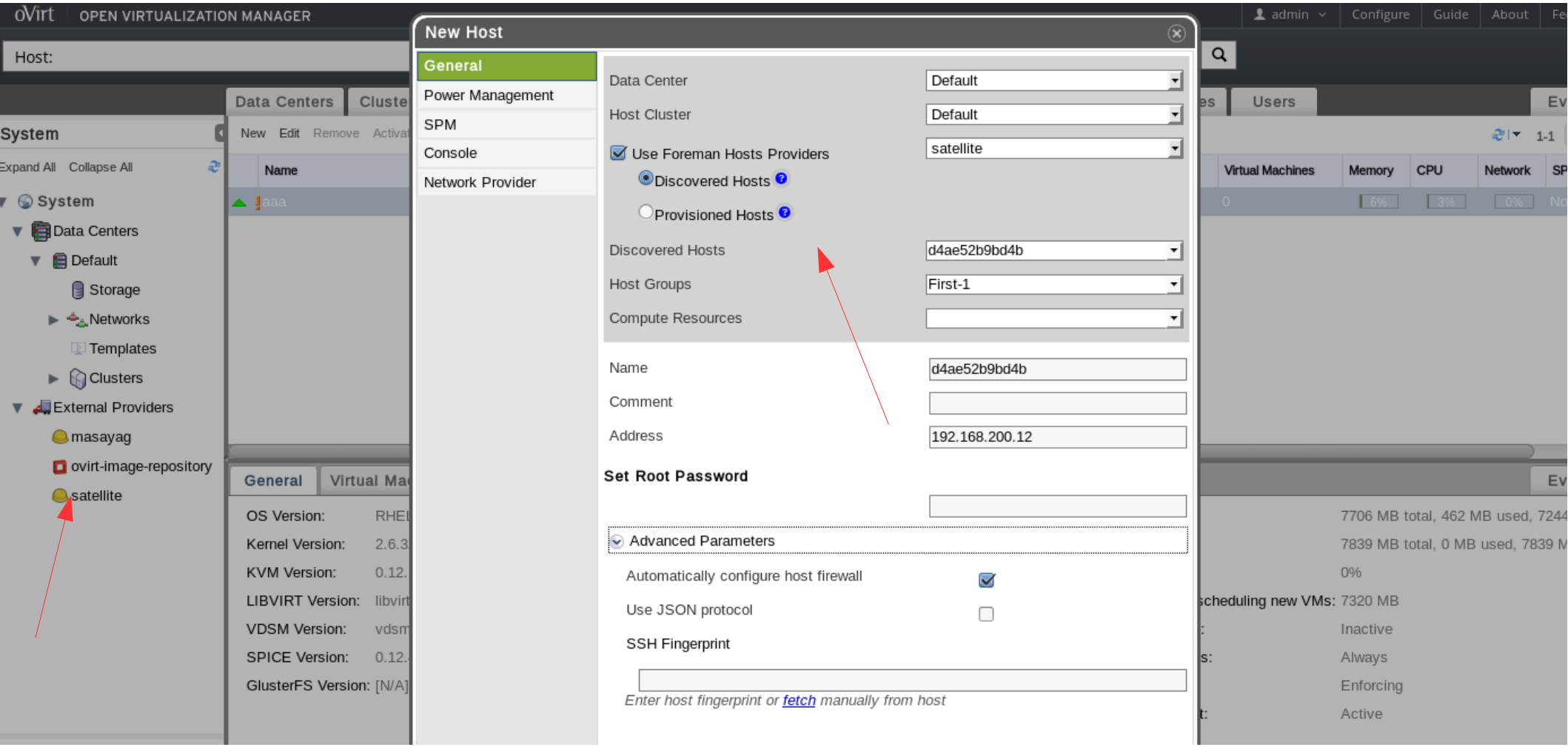
oVirt Functionality – Add Host



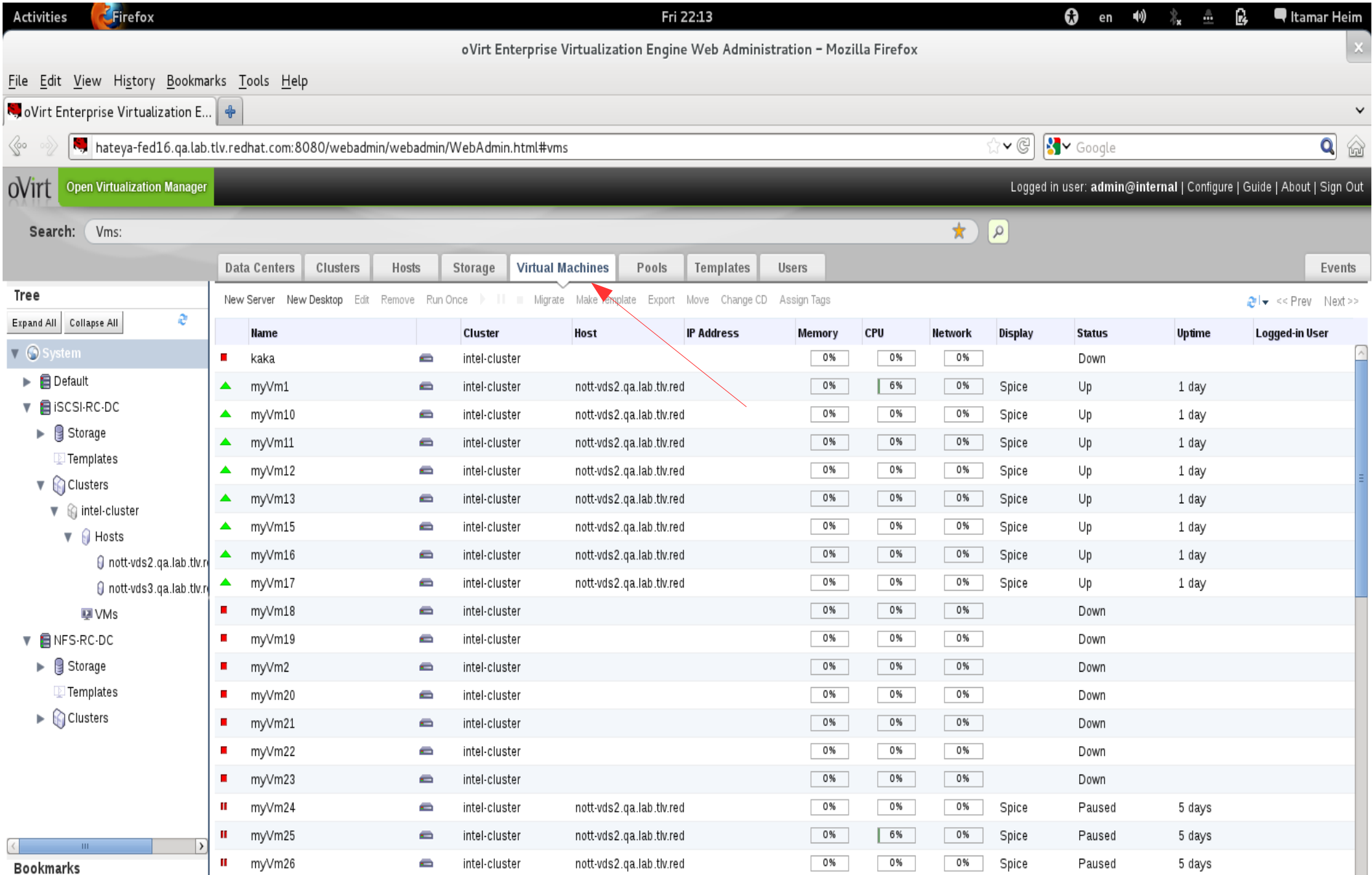
oVirt Add Host As Simple As



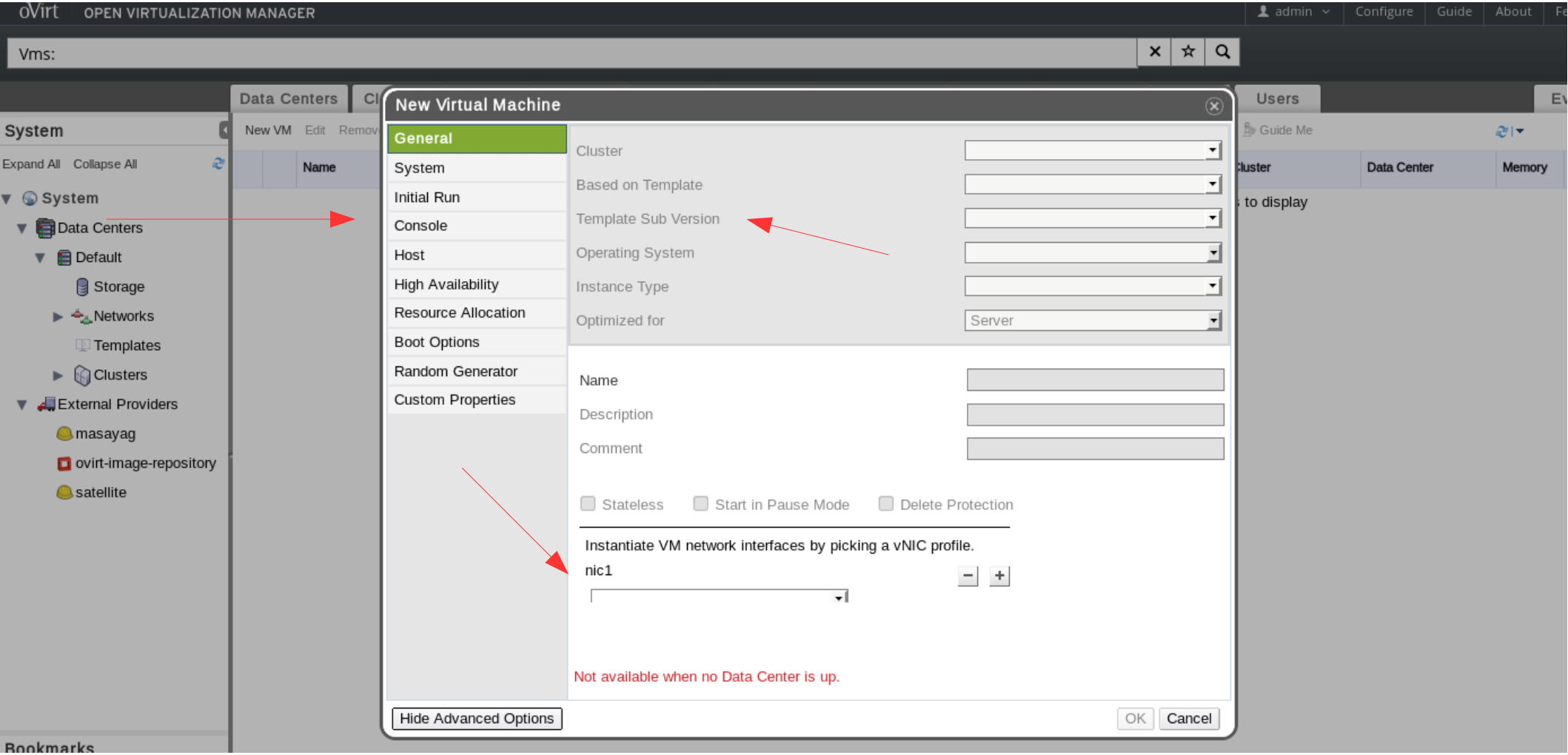
Add Host From External Management System



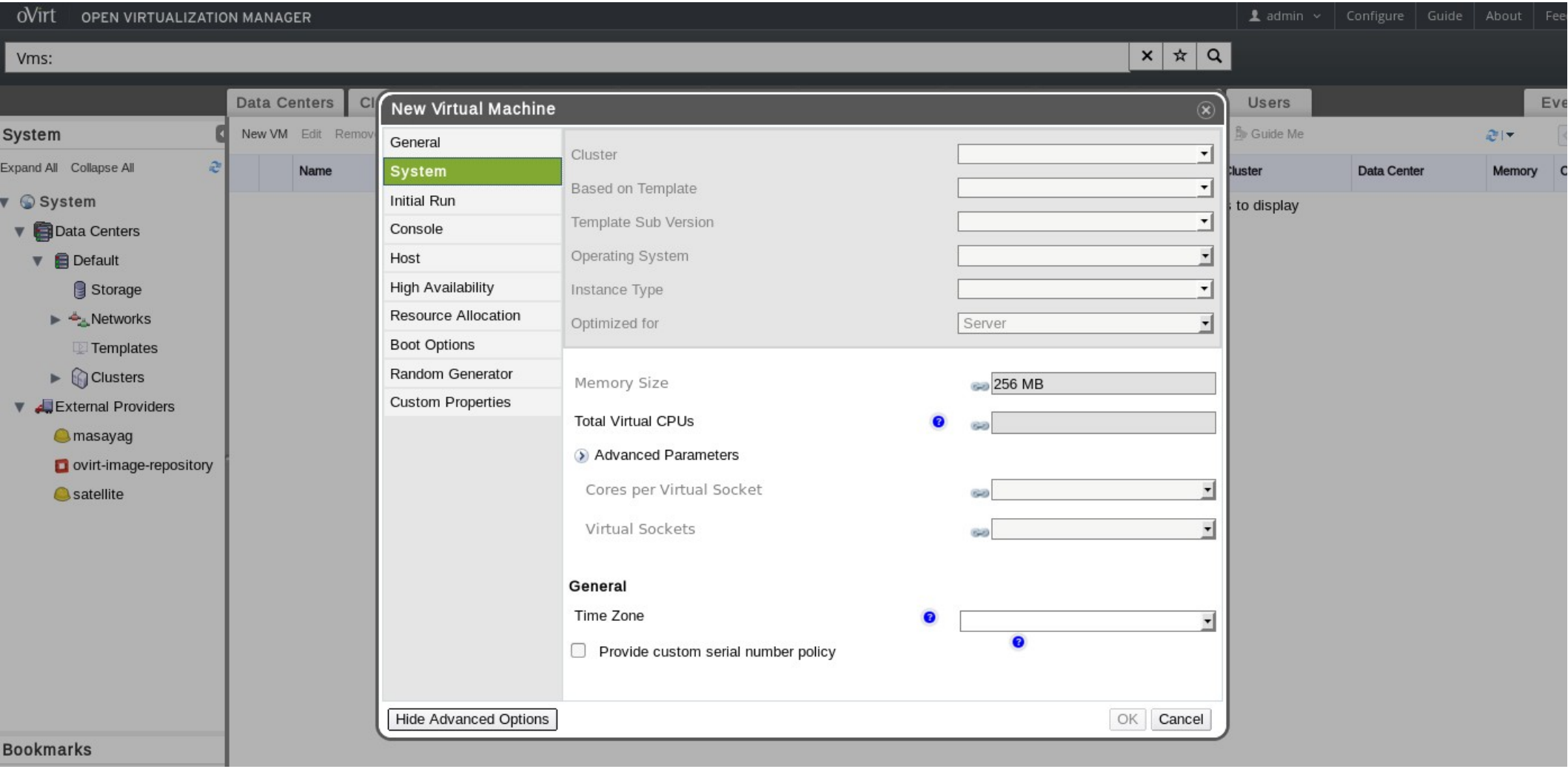
oVirt Functionality – VM Management



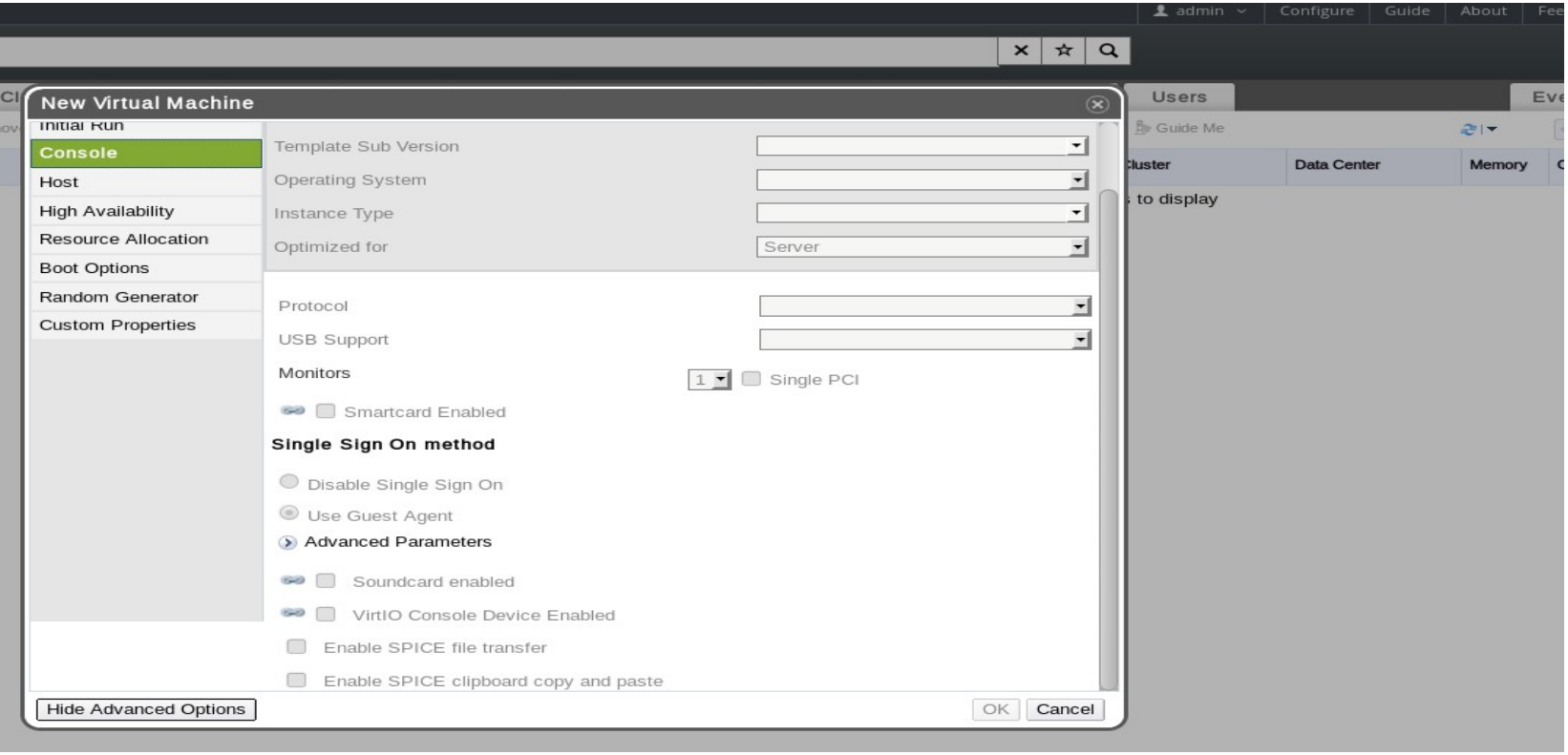
Add Servers or Desktops

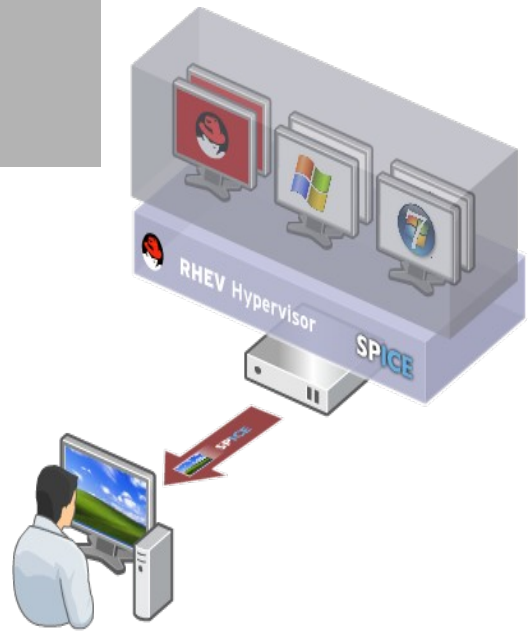


Add Servers or Desktops



Define Console - VDI





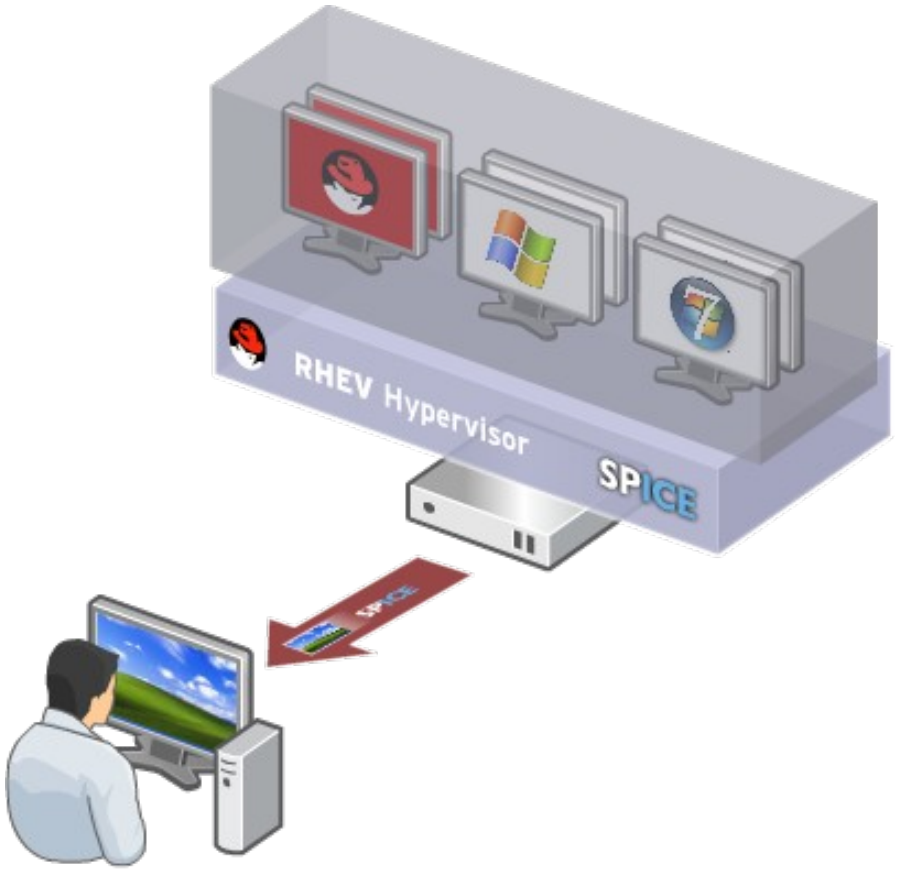
oVirt Virtual Desktop Infrastructure

Centralized management, security and policy enforcement

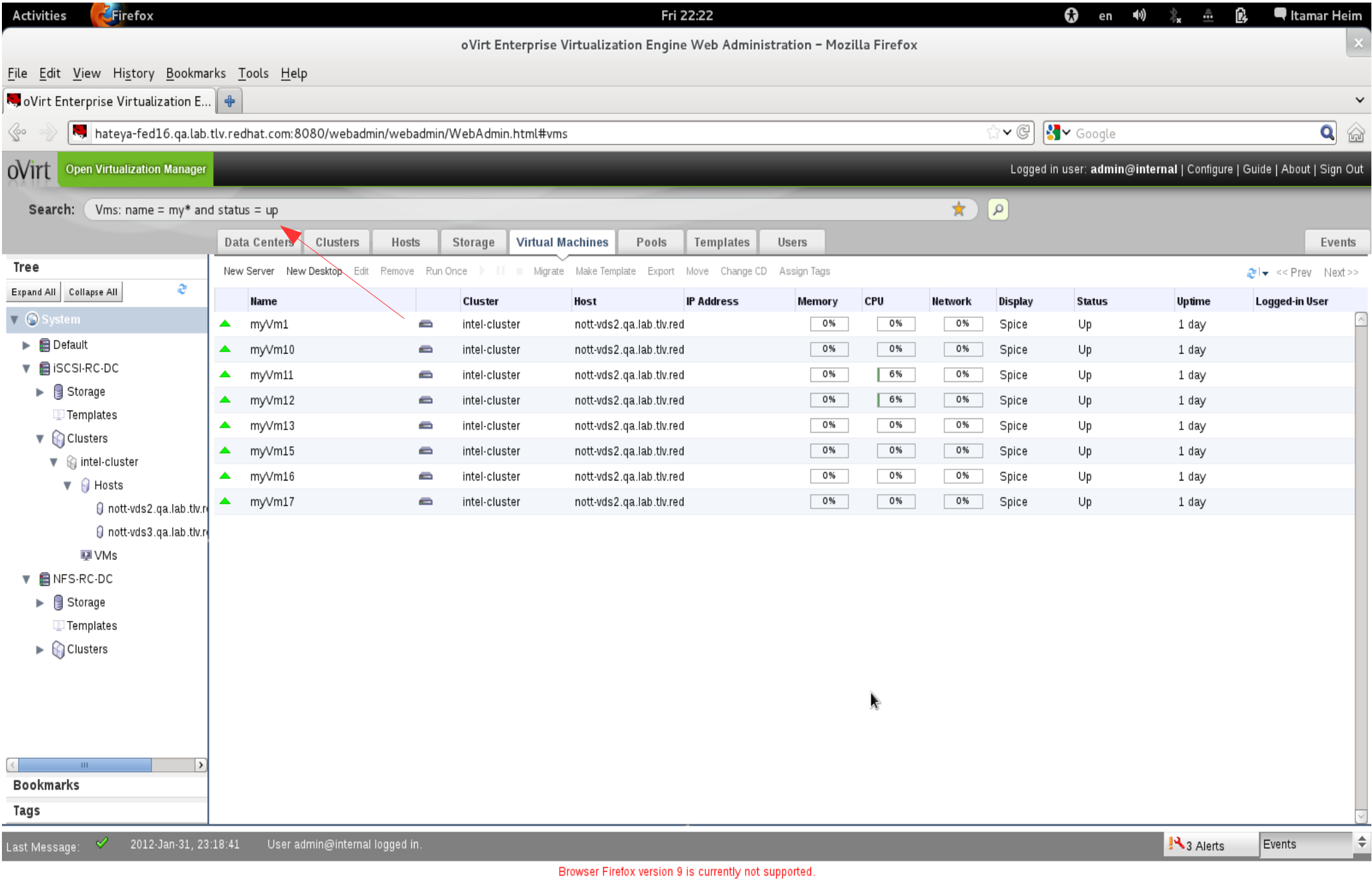
Virtual desktops with user experience of a physical PC

- Multiple monitors
- HD quality video
- Bi-directional audio/video for VoIP or video-conferencing
- Smartcard support
- USB support

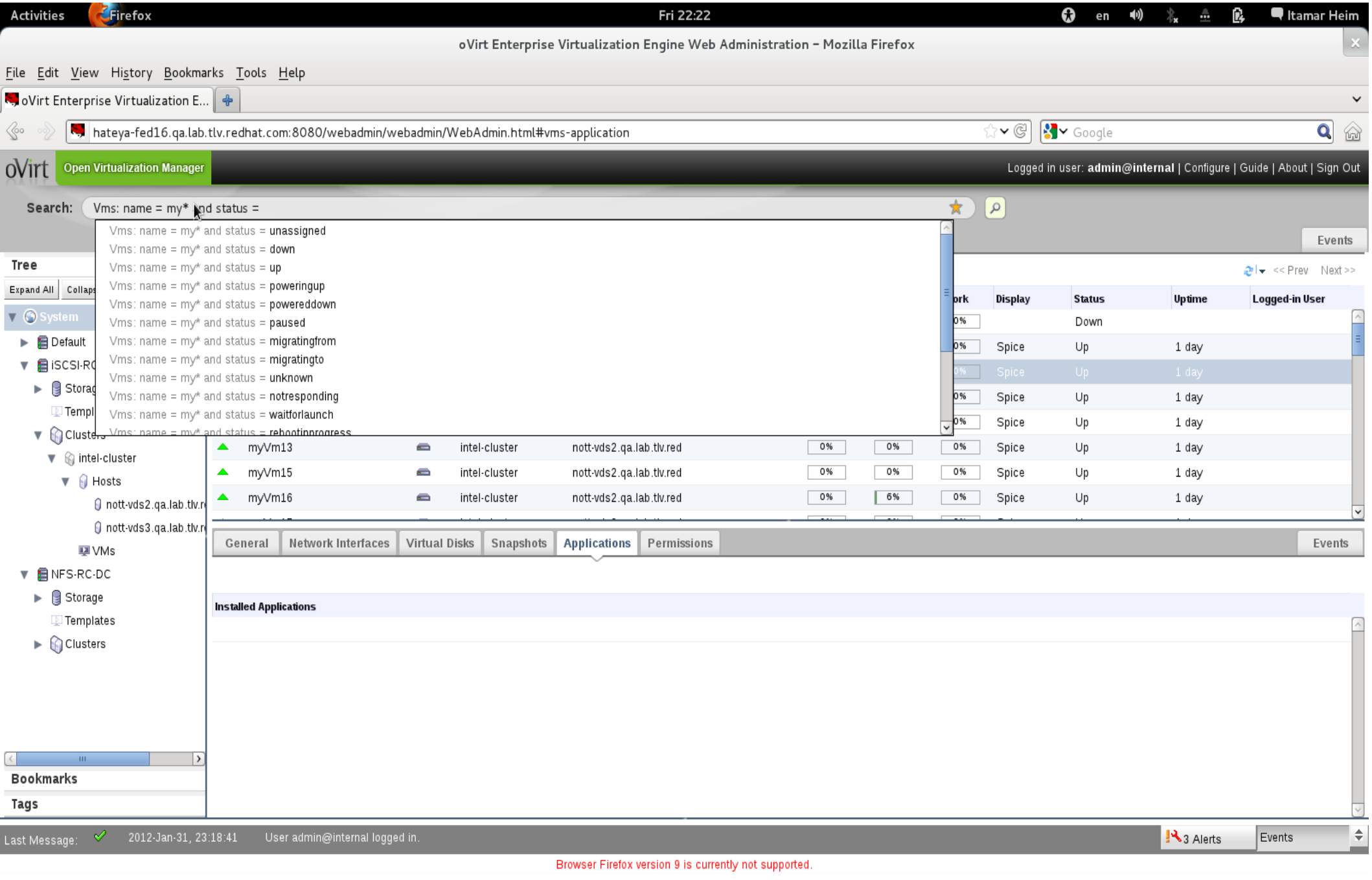
Industry leading density of virtual desktops/server



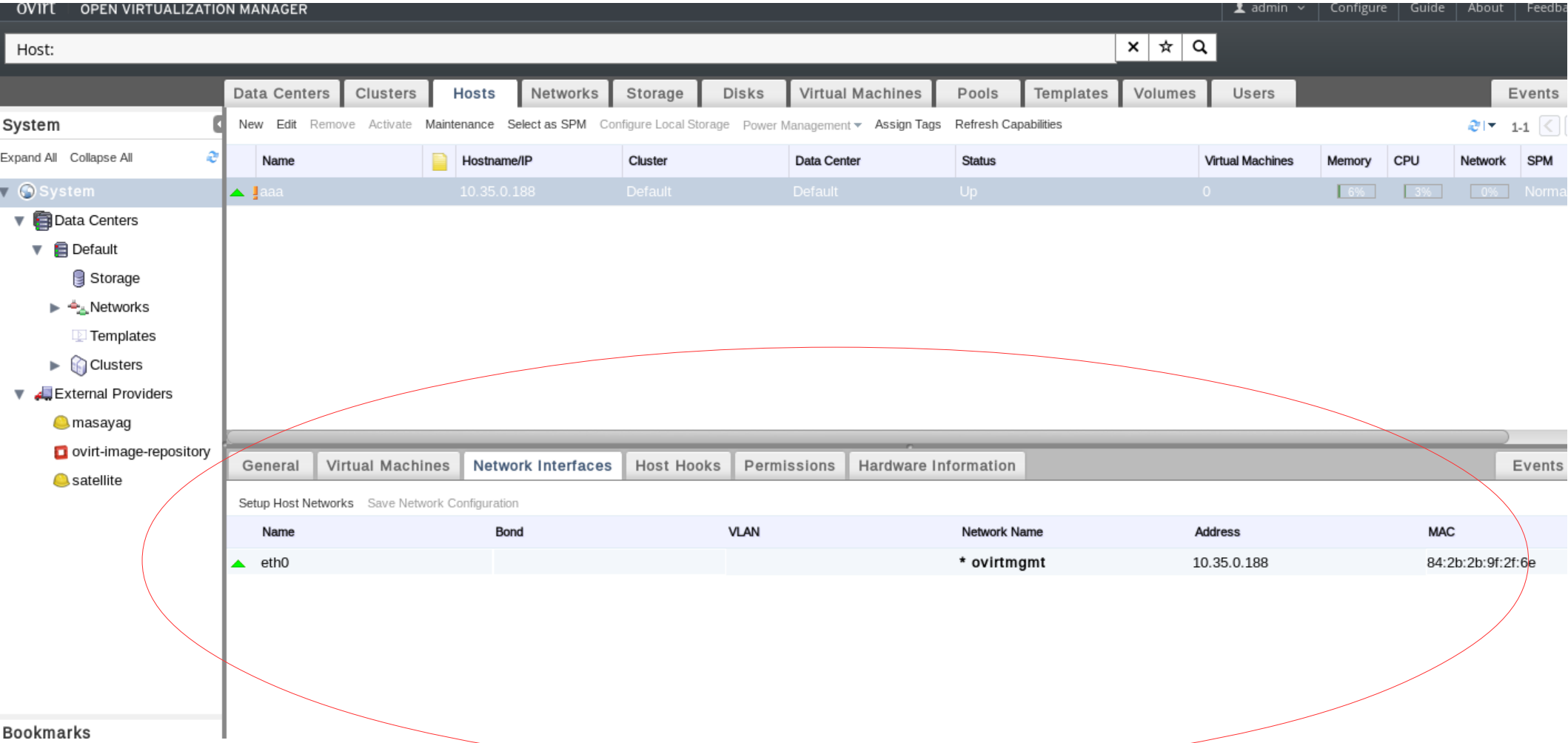
Quick Search



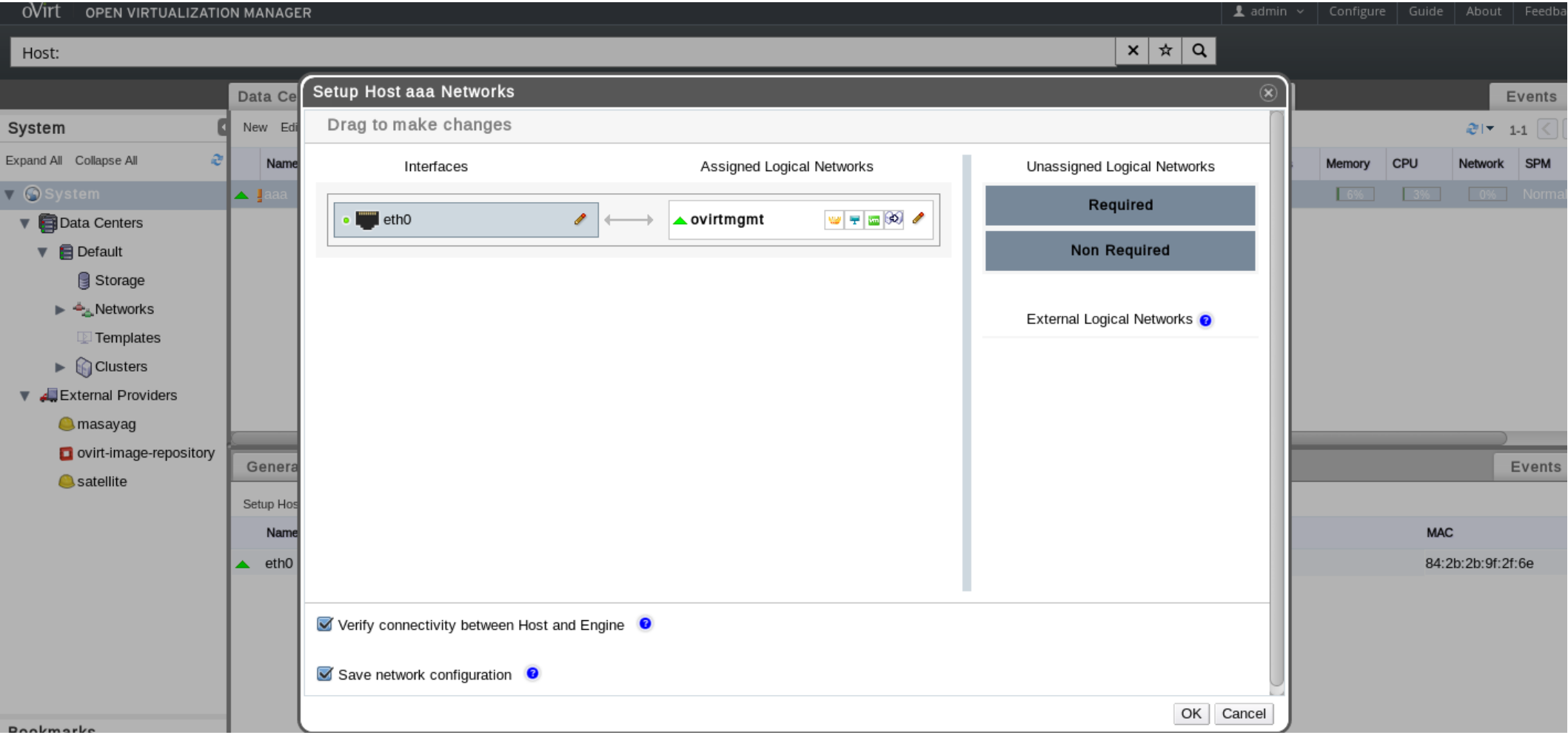
oVirt Search Auto Complete



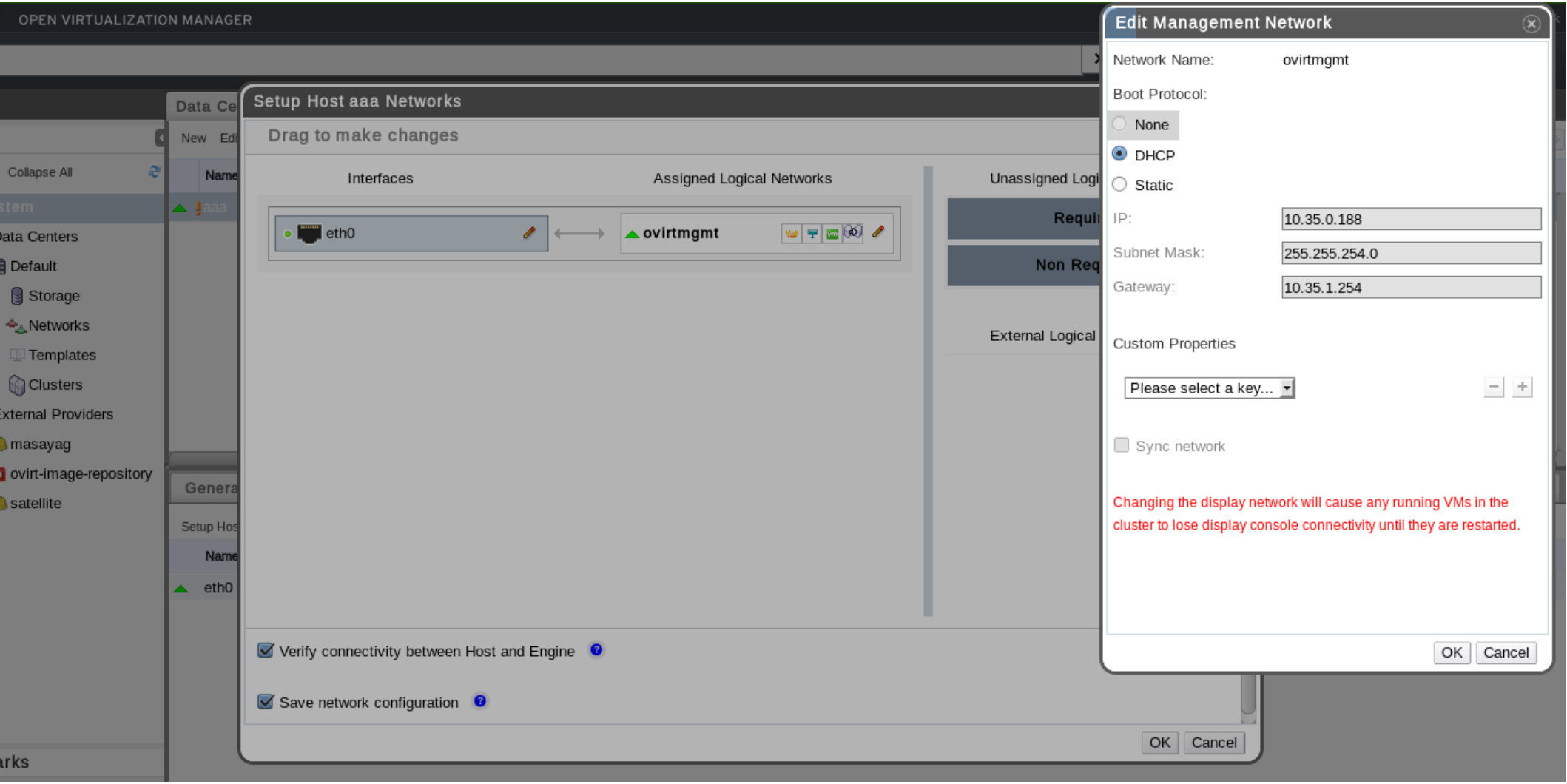
Configure Networks



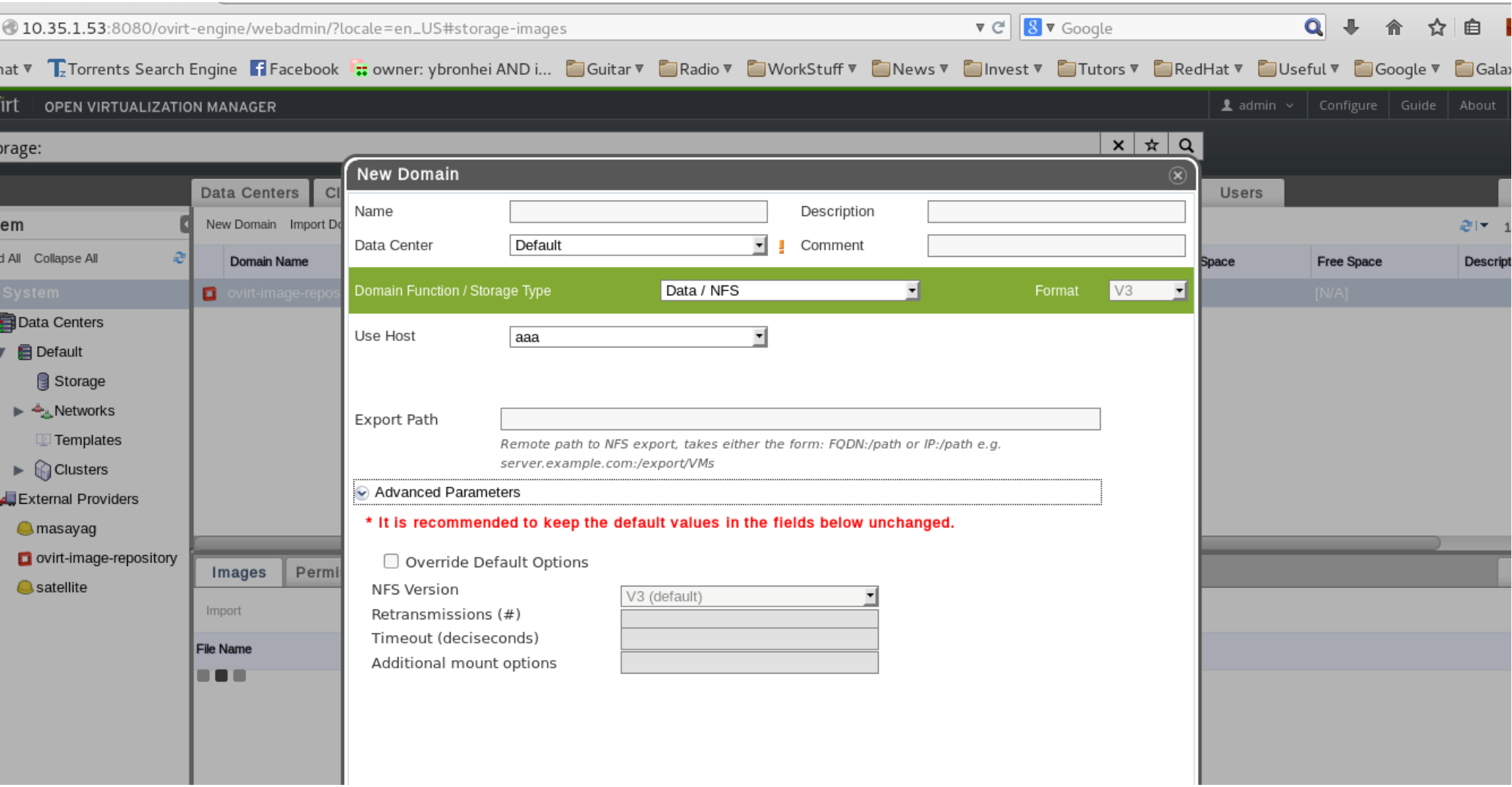
Interface Details



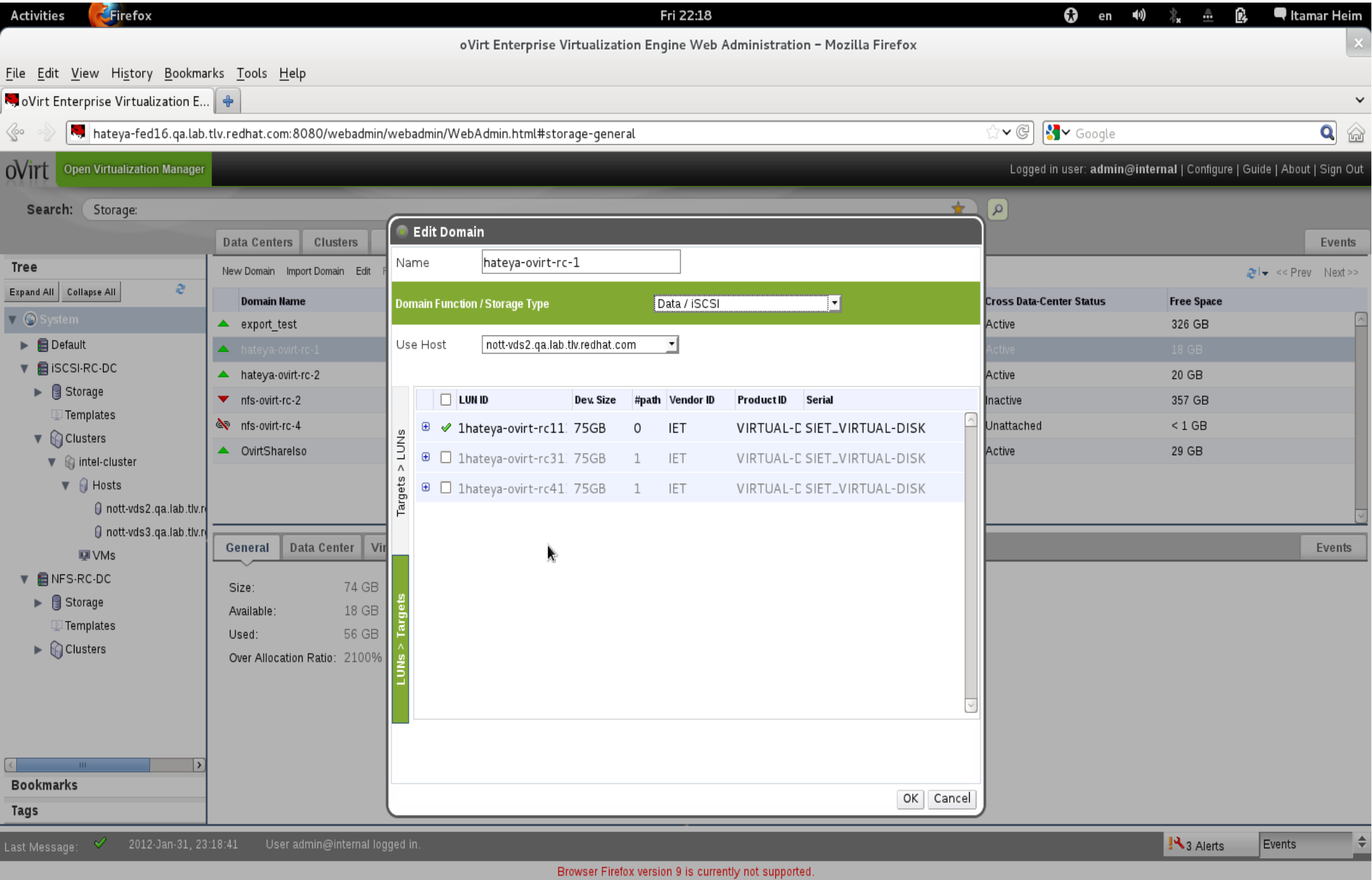
Without Scripts or Config Files



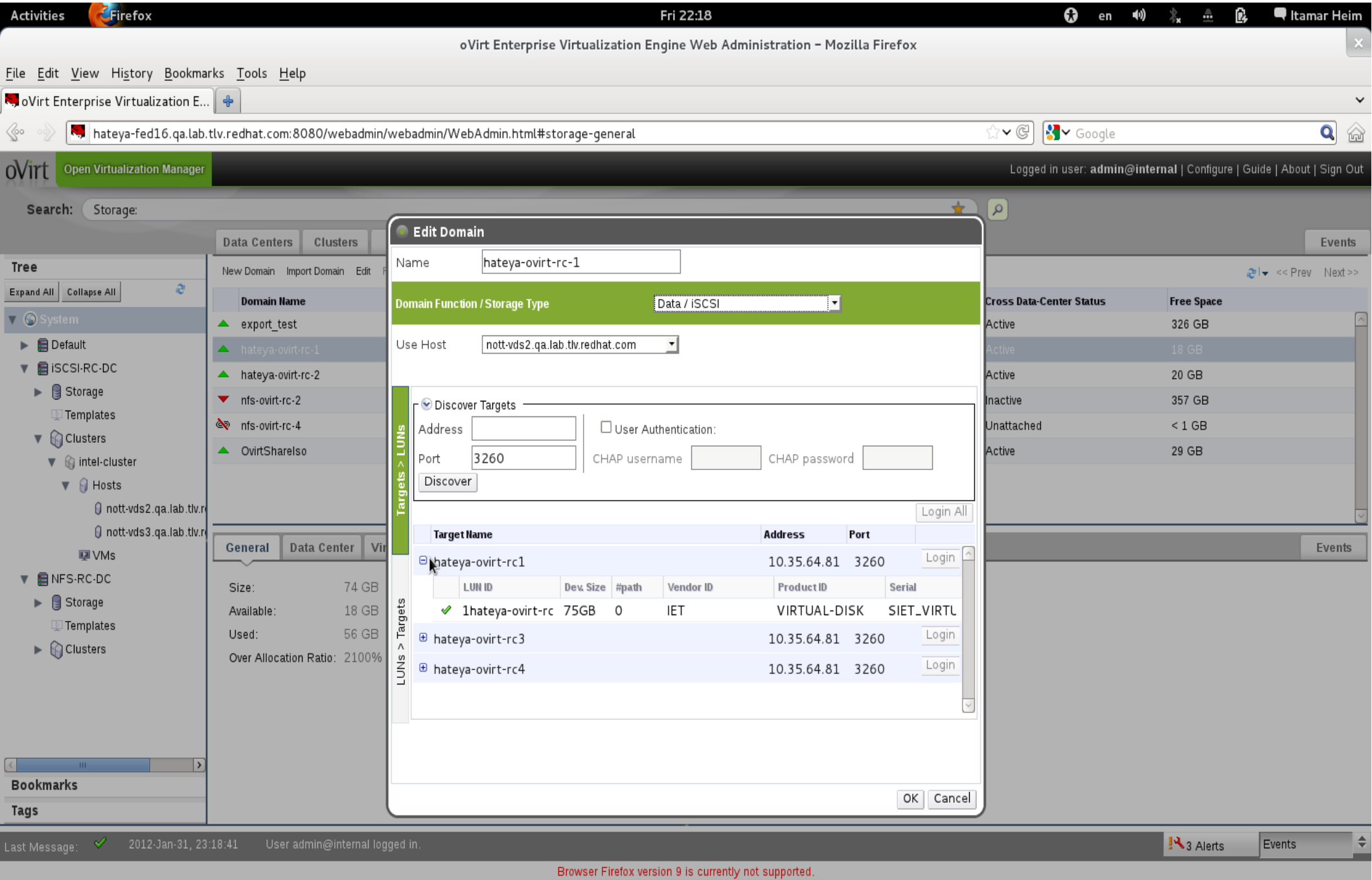
Attach Storage Domain



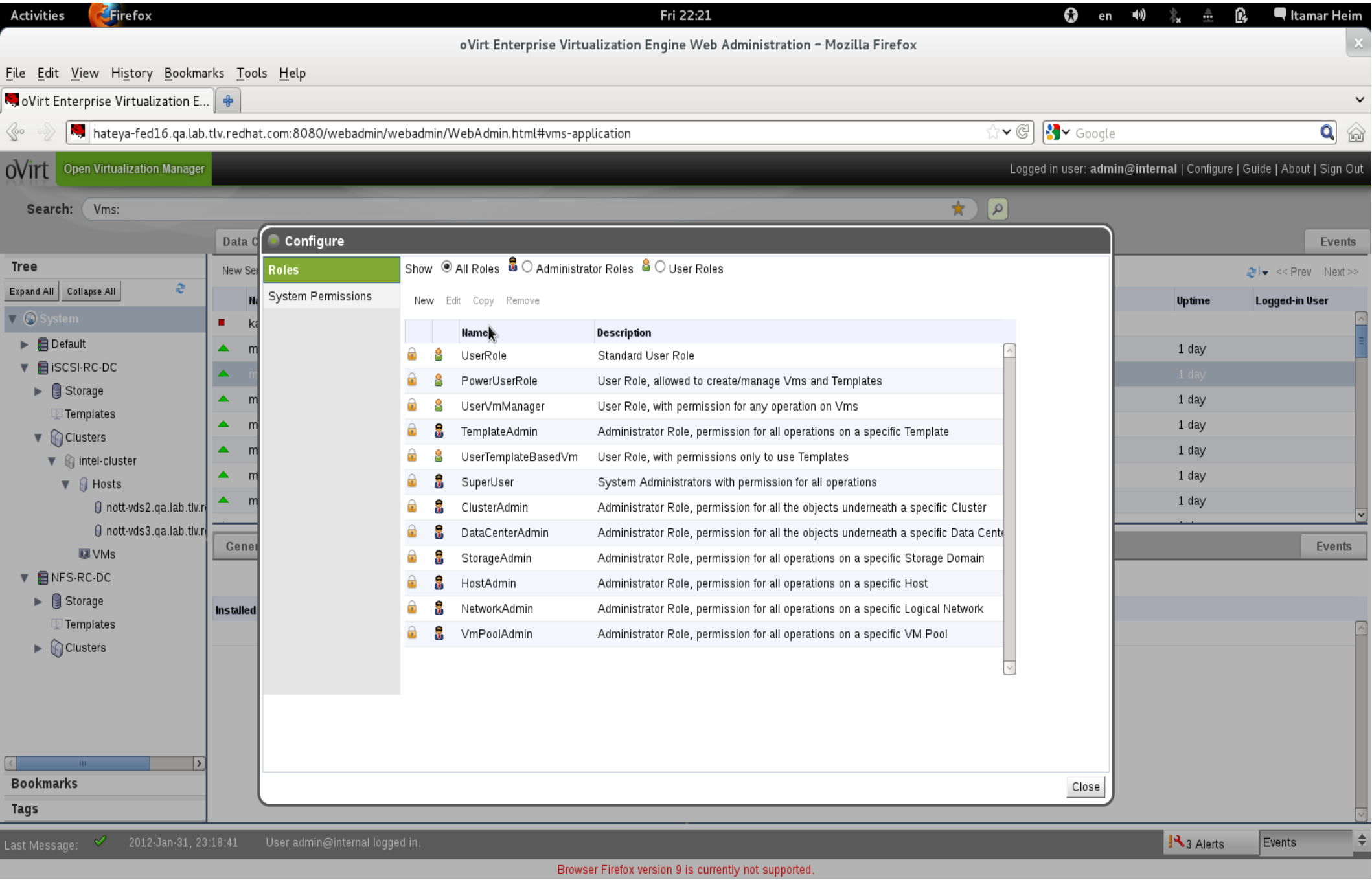
Configure Storage Once for Entire Cluster



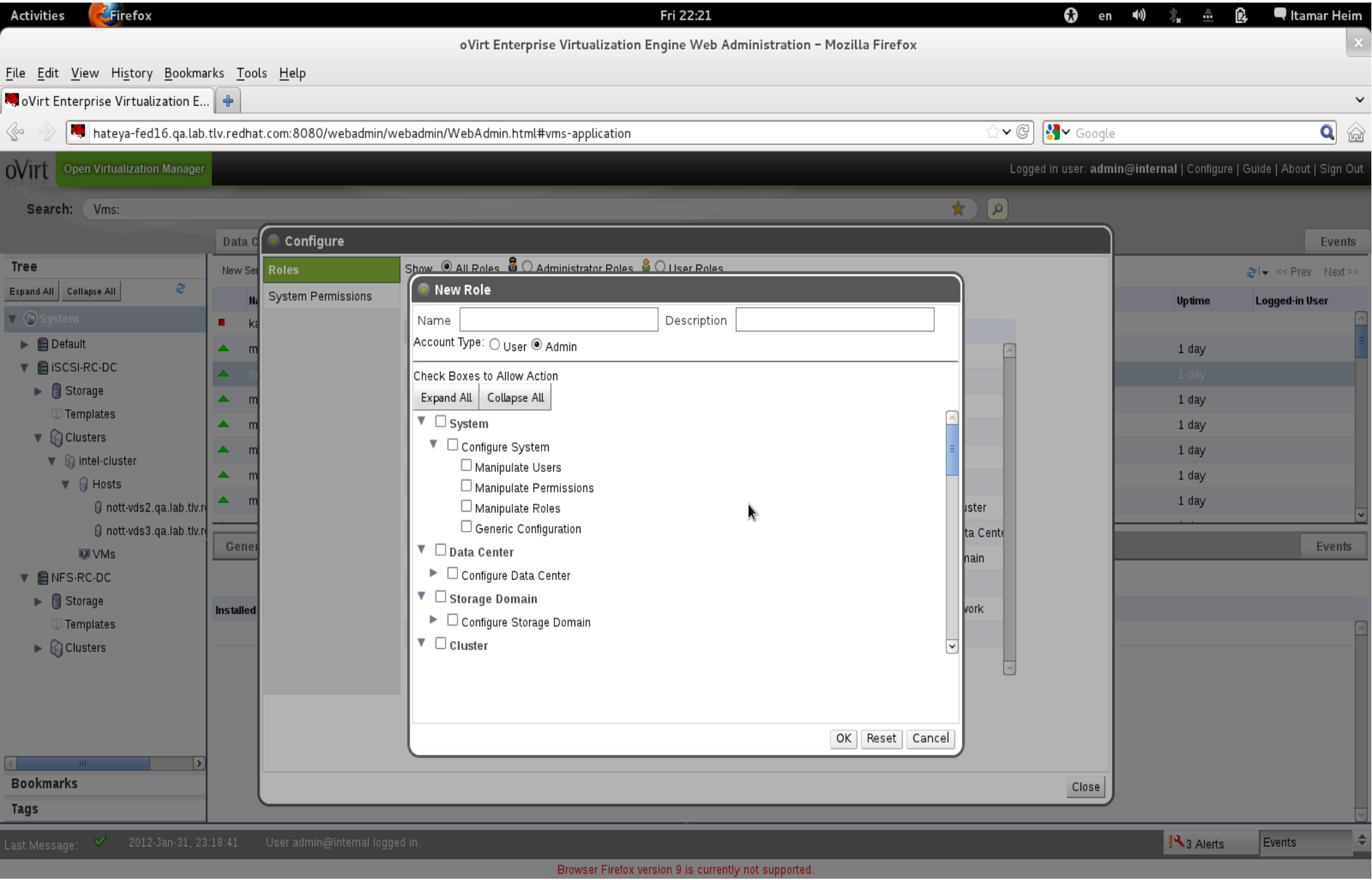
Extend with More LUNs as Needed



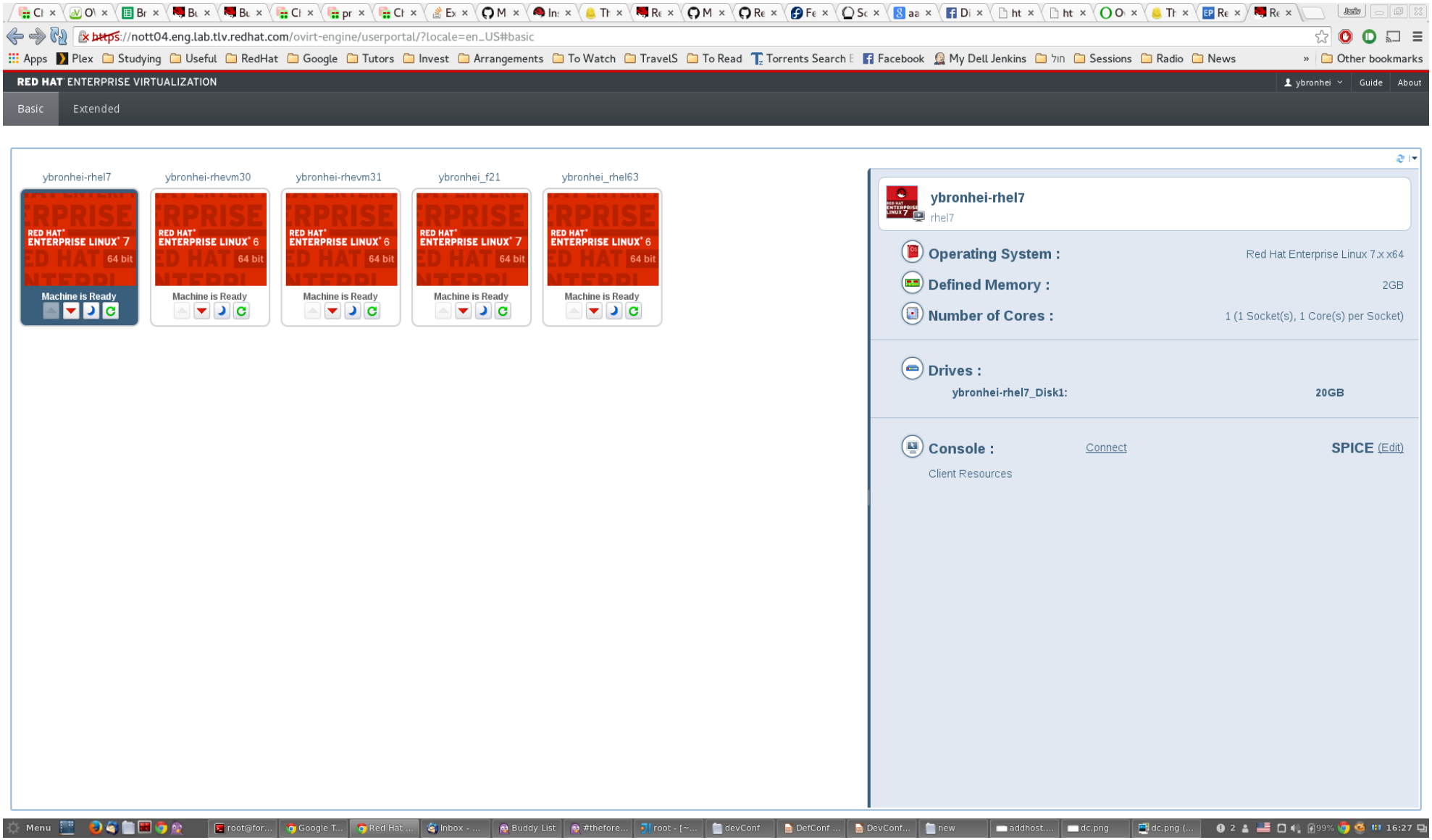
Assign Permissions to Objects by Roles



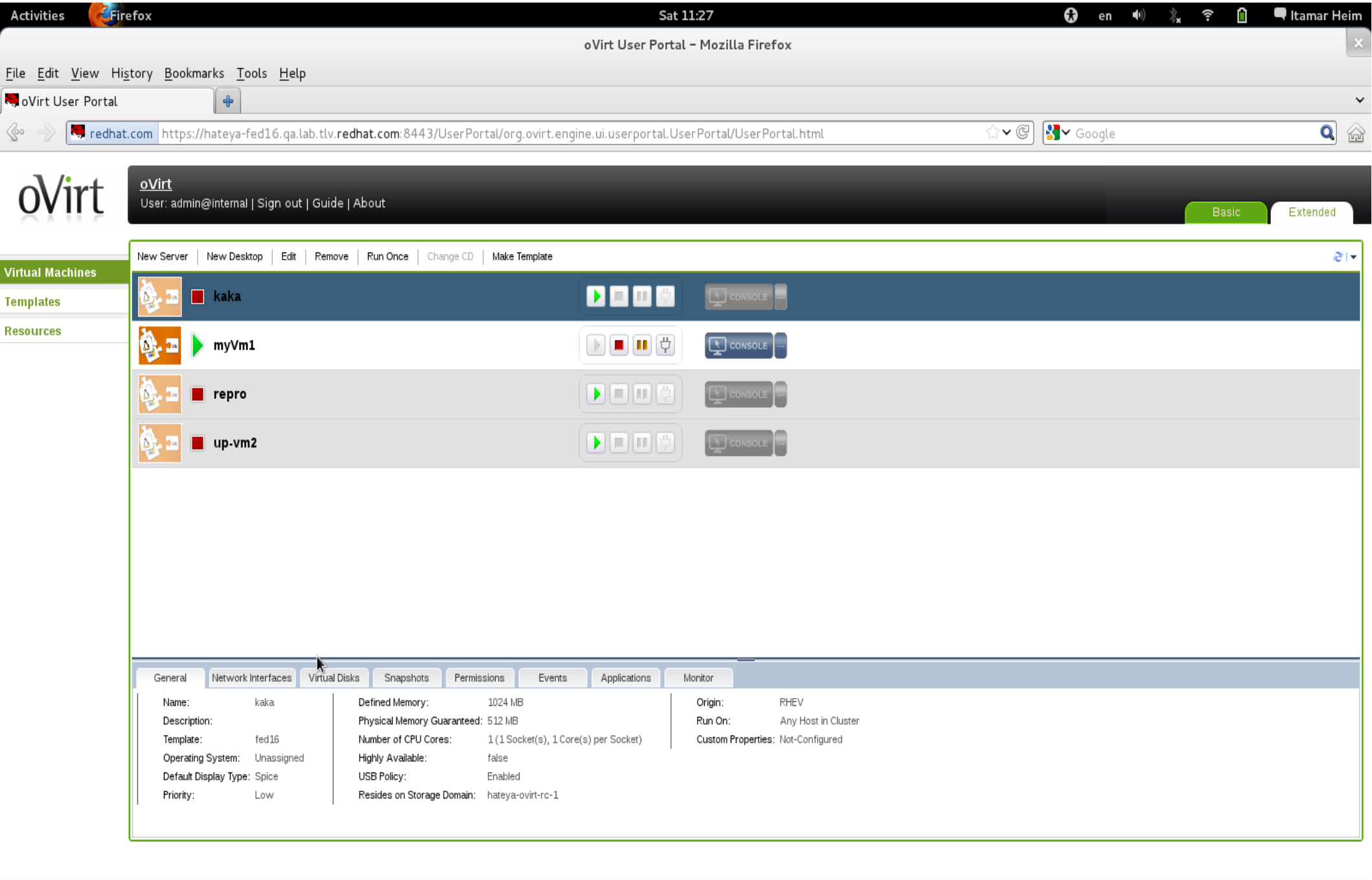
Define Your Own Roles



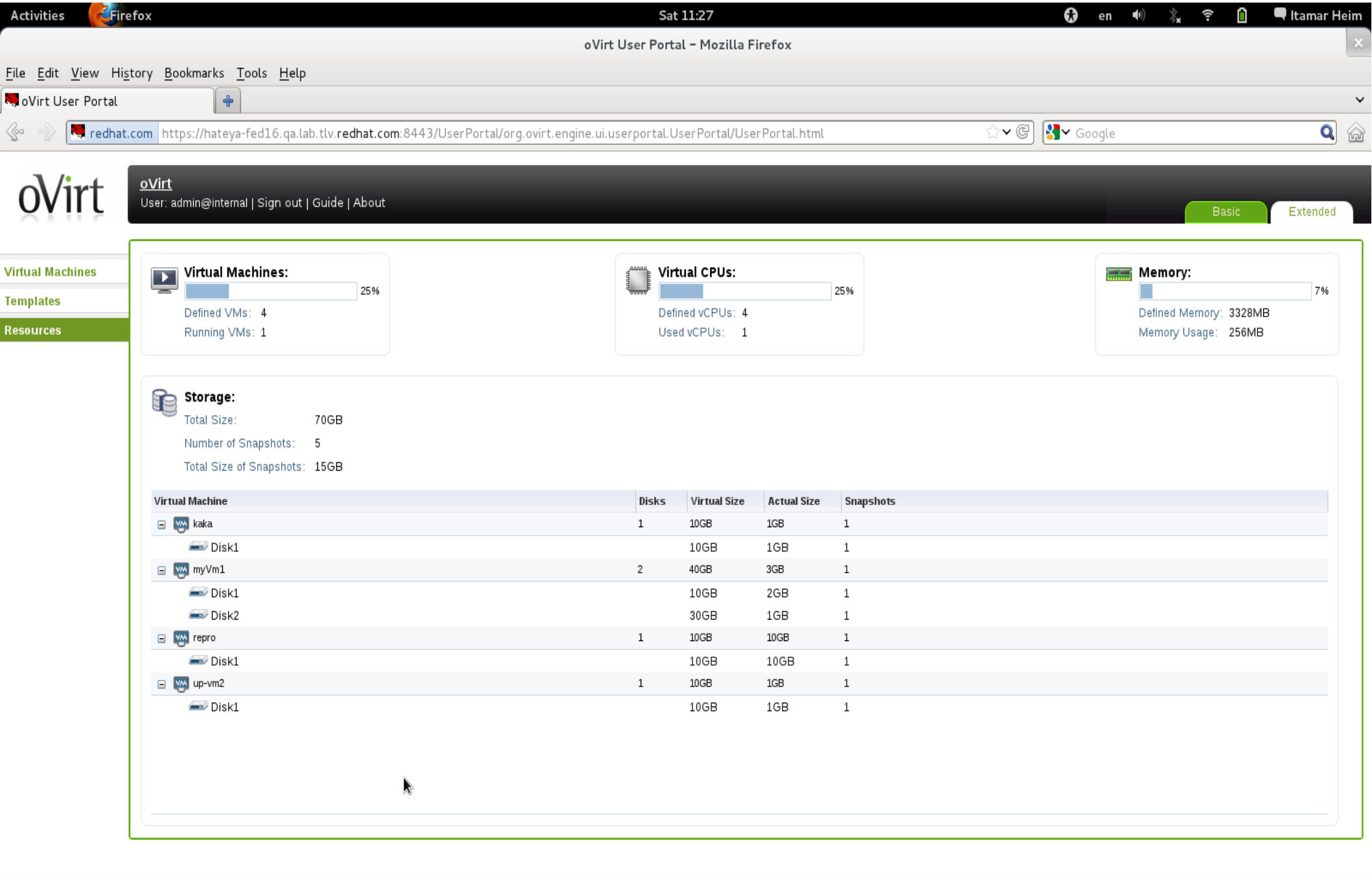
oVirt User Portal



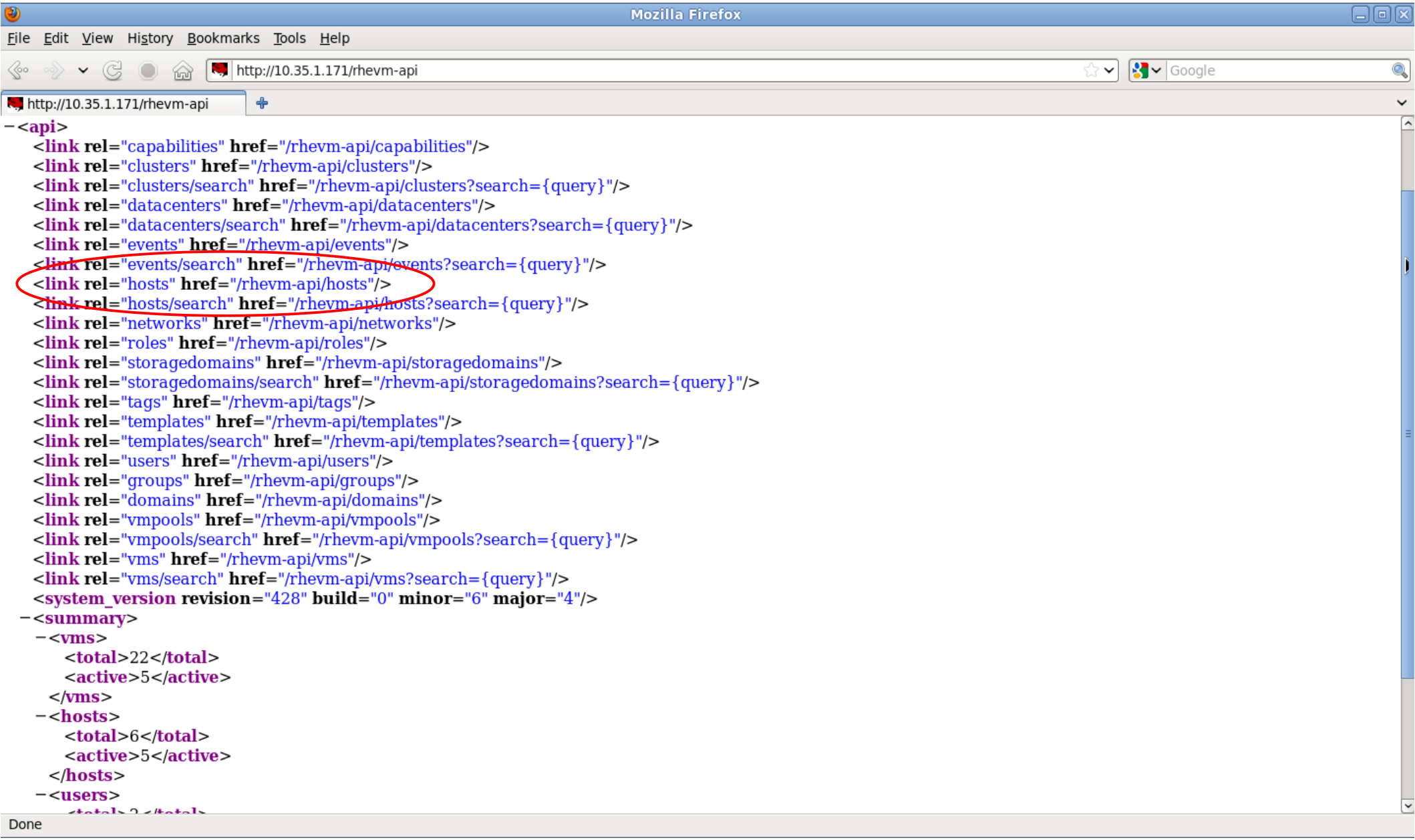
Self Provisioning Portal



oVirt User Resource View



REST API


Mozilla Firefox
File Edit View History Bookmarks Tools Help
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Google
http://10.35.1.171/rhevm-api
−<api>
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<active>5</active>
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−<hosts>
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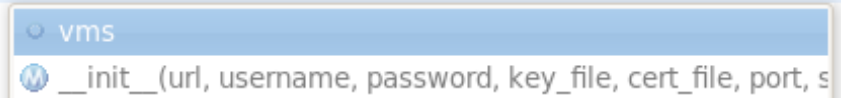
</hosts>
−<users>
Done

Python SDK

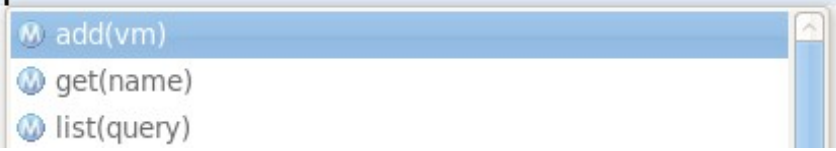
- Creating the proxy
- Listing all collections

```
#create proxy
api = API(url='http://localhost:8080', username='user@domain', password='password')

api.
```



- Listing collection's methods.

```
api.vms.
```



- Querying collection with oVirt search engine.
- Querying collection by custom constraint.

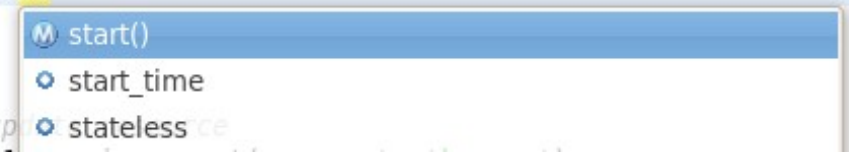
```
#list by query
vms = api.vms.list(query = 'name=python_vm')

#search vms by property constraint
vms = api.vms.list(memory=1073741824)
```

- Querying collection for specific resource.

```
#get by constraints
vm = api.vms.get(id = '02f0f4a4-9738-4731-83c4-293f3f734782')
```

- Accessing resource methods and properties.

```
vm.st
```



oVirt CLI

```
AVAILABLE COMMANDS

    * action           execute an action on an object
    * cd               change directory
    * clear            clear the screen
    * connect          connect to a RHEV manager
    * console          open a console to a VM
    * create           create a new object
    * delete           delete an object
    * disconnect       disconnect from RHEV manager
    * exit             quit this interactive terminal
    * getkey           dump private ssh key
    * help             show help
    * list             list or search objects
    * ping             test the connection
    * pwd              print working directory
    * save             save configuration variables
    * set              set a configuration variable
    * show             show one object
    * status           show status
    * update           update an object
```

```
(oVirt cli) > help connect

USAGE

  connect
  connect <url> <username> <password>

DESCRIPTION

  Connect to a RHEV manager. This command has two forms. In the firs
  form, no arguments are provided, and the connection details are rea
  from their respective configuration variables (see 'show'). In
  the second form, the connection details are provided as arguments.

  The arguments are:

   * url          - The URL to connect to.
   * username     - The user to connect as. Important: this needs to
                    in the user@domain format.
   * password     - The password to use.
```

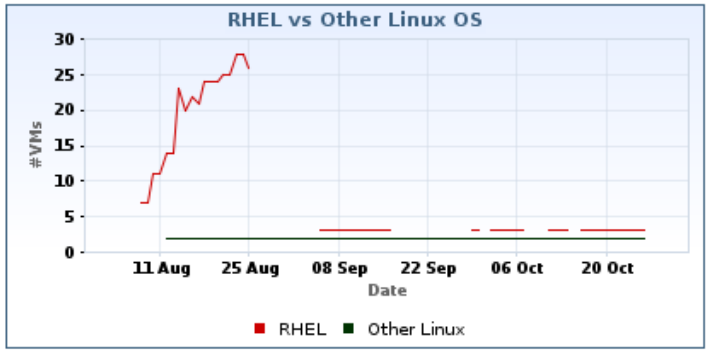
oVirt Reports

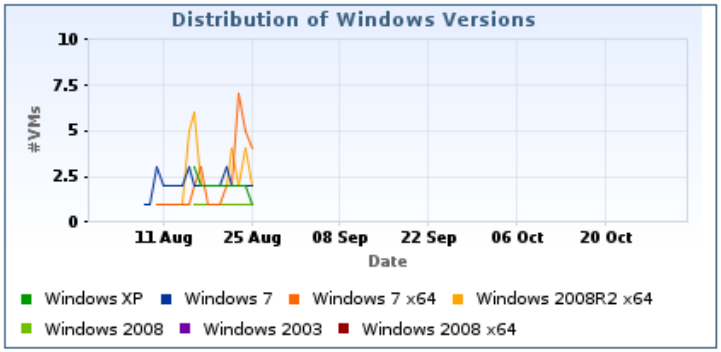
oVirt
oVirt Reports

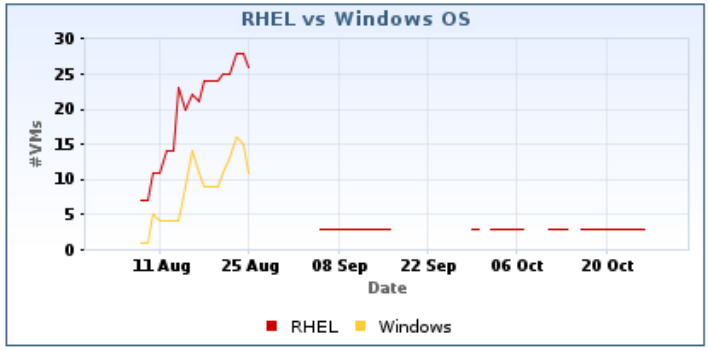
Oct 31, 2011

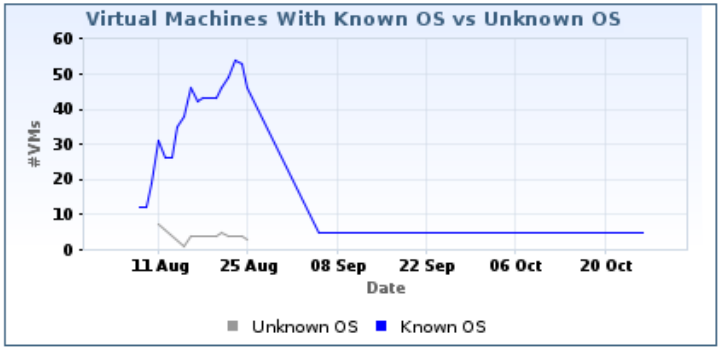
Active Virtual Machines by OS in **Clusters** of **Data Center Default**

Criteria: **Datacenter:** Default | **Date Range:** 2011-08-01 - 2011-10-31 | **VM Type:** All
Cluster: All | **Period:** Quarterly | **Show Deleted Virtual Machines:** Yes

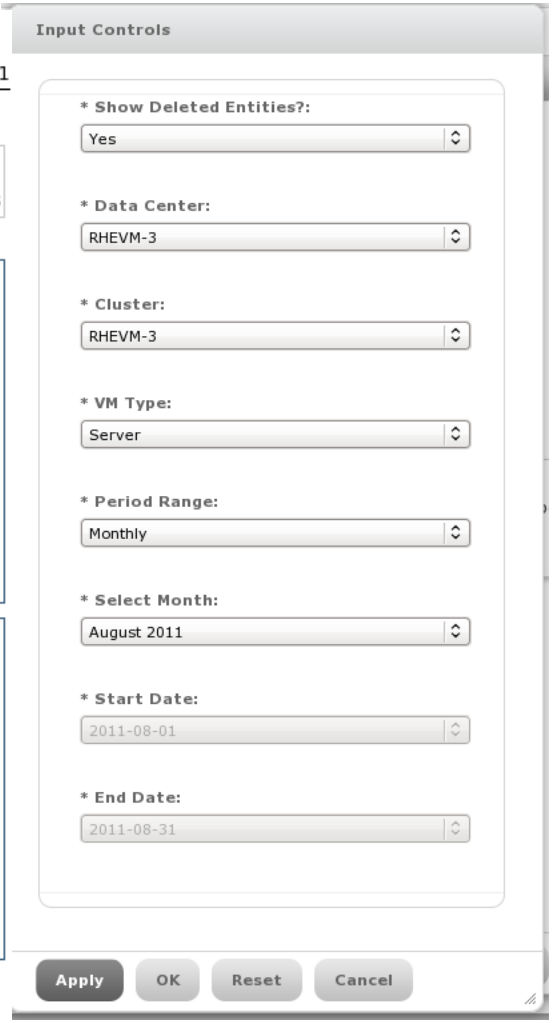






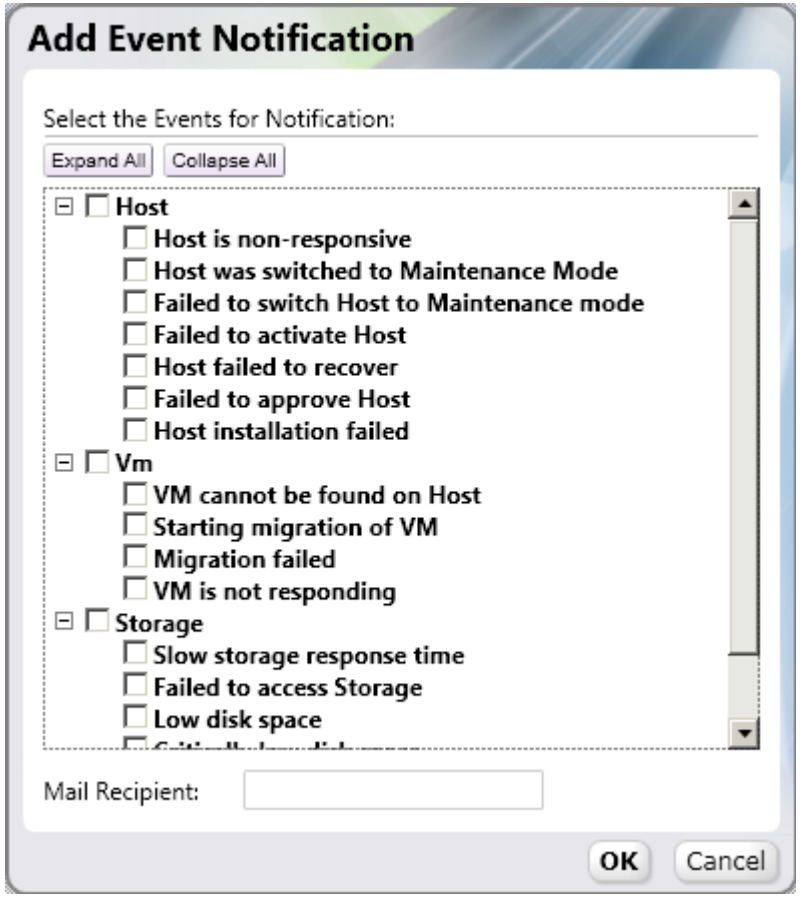


Page 1 of 1



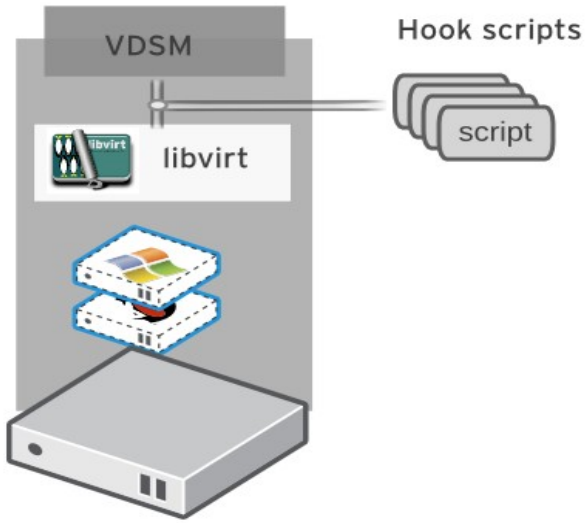
Notification Service

- oVirt allows registration to certain audit events
- The notification service sends emails per audit message to relevant users
- Also monitors engine itself



Hooks

- “Hook” mechanism for customization
  - Allows administrator to define scripts to modify VM operation
    - eg. Add extra options such as CPU pinning, watchdog device, direct LUN access, etc
  - Allows oVirt to be extended for new KVM features before full integration is done
  - An easy way to test a new kvm/libvirt/linux feature

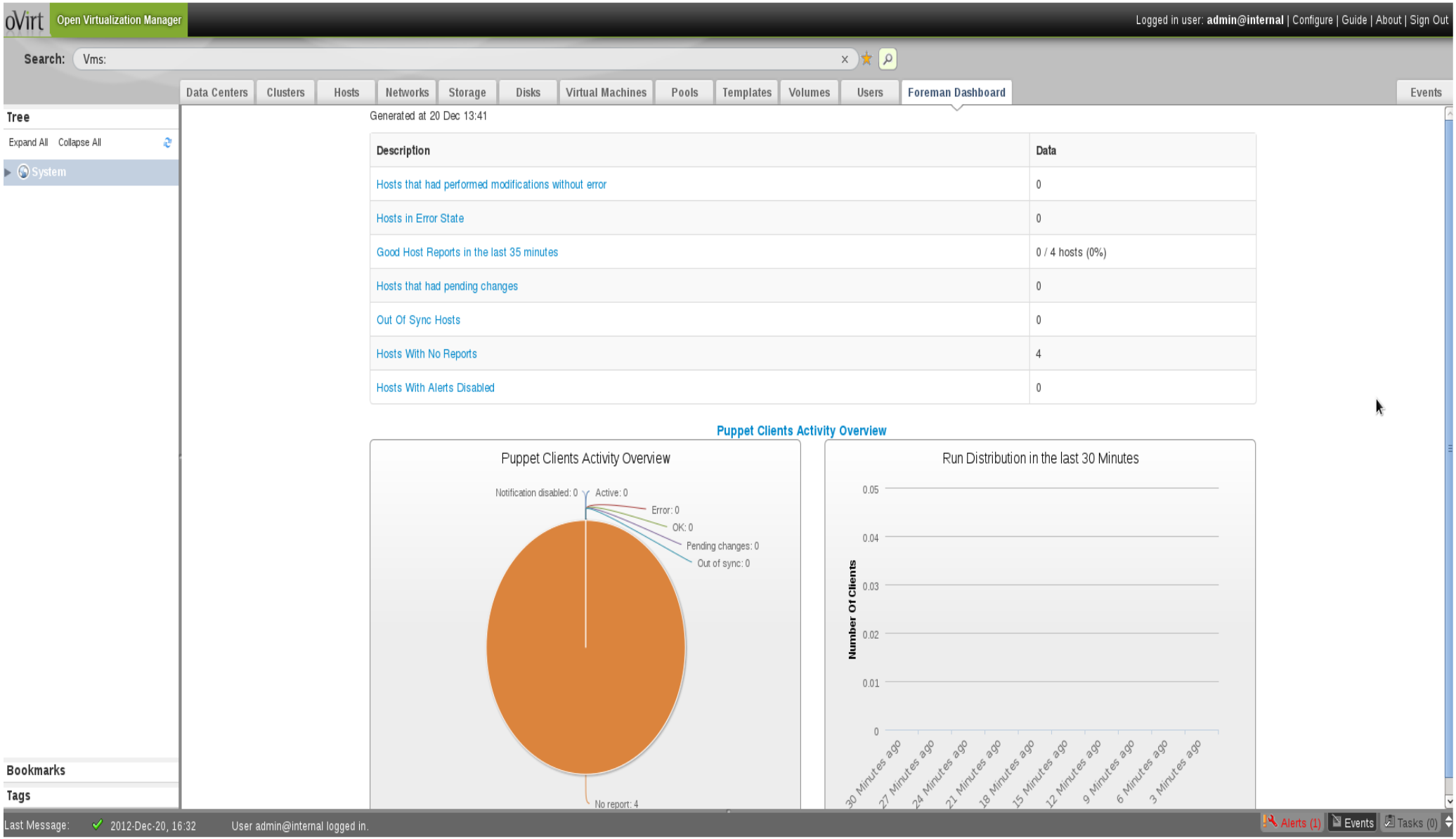


oVirt

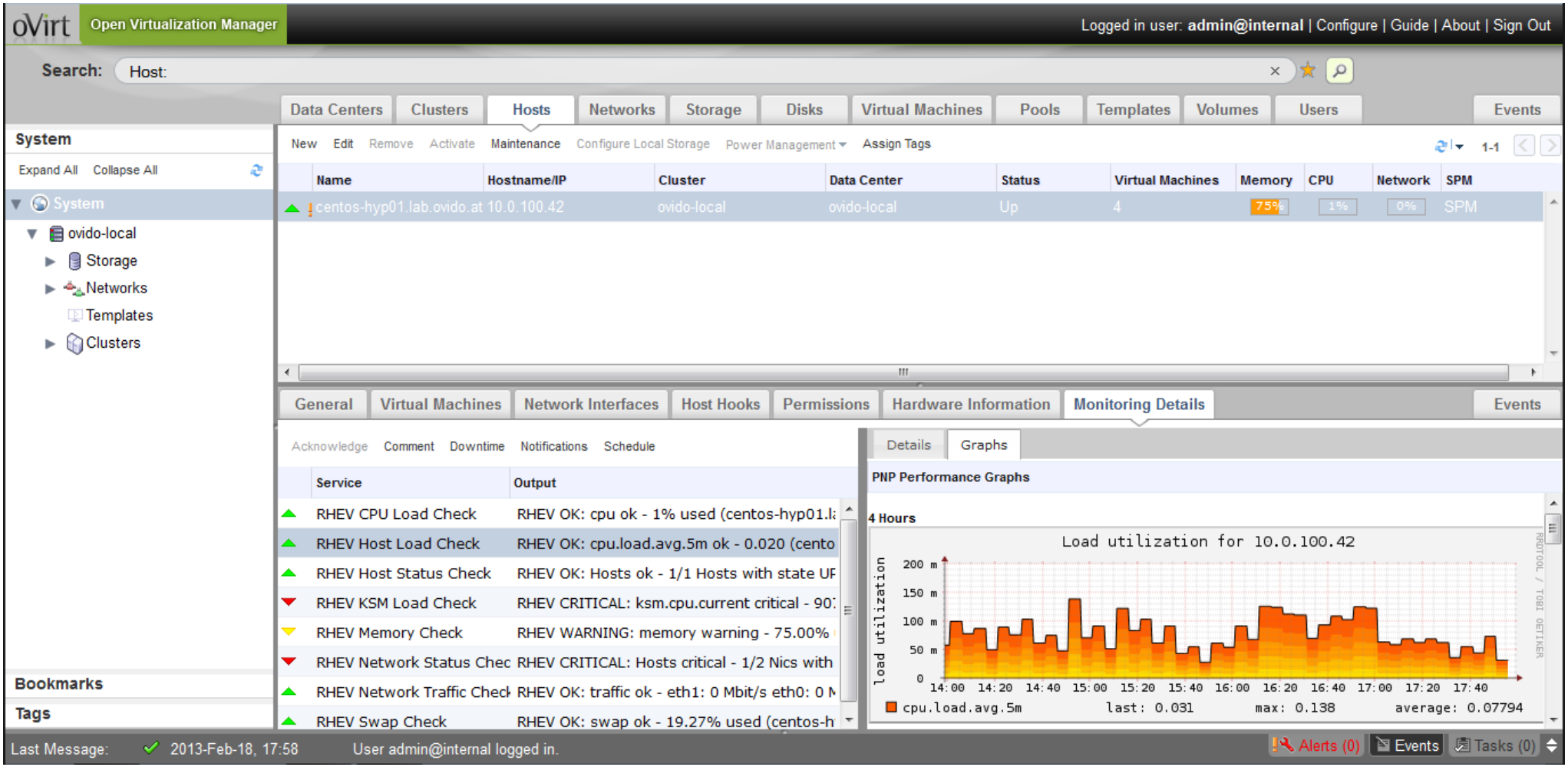
Hooks

- Hook scripts are called at specific VM lifecycle events
  - VDSM (management agent) Start
  - Before VM start
  - After VM start
  - Before VM migration in/out
  - After VM migration in/out
  - Before and After VM Pause
  - Before and After VM Continue
  - Before and After VM Hibernate
  - Before and After VM resume from hibernate
  - On VM stop
  - On VDSM Stop
- Hooks can modify a virtual machines XML definition before VM start
- Hooks can run system commands – eg. Apply firewall rule to VM

UI-Plugin: Easy Java Script



UI-Plugin: oVirt Monitoring sub-tab



More info at: https://labs.ovido.at/monitoring/wiki/ovirt-monitoring-ui-plugin

Also in oVirt but not here

- Gluster Support
- Hot plug
  - Cpu, memory, nics
- Shared disks
- PPC support
- Integration with:
  - Foreman, Glance, Neutron, Cinder ..
- Live snapshot with ram
- Numa
- Live storage Migration
- Upgrade Manager
- Events
- Network Broker

Getting oVirt

- Obtain from oVirt website -
  - http://www.ovirt.org/Download
- Fedora And oVirt repositories (resources.ovirt.org)
- Live USB - http://wiki.ovirt.org/wiki/OVirt_Live
- Build from source

How To Contribute

Join the community
- Find bugs, File Them, Correct Them.
- Translate, Write Documentation.
- Design Interfaces, Develop new features
- Share your experiences.

Everyone can make a difference.

- **Website and Repository:**
  - http://gerrit.ovirt.org/
  - http://www.ovirt.org
  - http://www.ovirt.org/wiki

- **Mailing lists:**
  - http://lists.ovirt.org/mailman/listinfo
- **IRC:**
  - #ovirt on OFTC

What's Next

- Release 3.6
- Up coming 4.0
- Test days

THANK YOU !

http://www.ovirt.org
ybronhei@redhat.com