Introduction to oVirt

James Rankin
What is oVirt?

Large scale, centralized management for server and desktop virtualization

Based on leading performance, scalability and security infrastructure technologies

Provide an open source alternative to vCenter/vSphere

Two key components

- Hypervisor -> oVirt Node
- Management Server -> oVirt Engine
### Virtualization Management the oVirt way

#### System Overview

<table>
<thead>
<tr>
<th>Name</th>
<th>Host</th>
<th>Cluster</th>
<th>Data Center</th>
<th>Memory</th>
<th>CPU</th>
<th>Network</th>
<th>Display</th>
<th>Status</th>
<th>Uptime</th>
<th>Logged-in User</th>
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</thead>
<tbody>
<tr>
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<td>zeus82</td>
<td>cluster-32</td>
<td>demo-dc-32</td>
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<td>dc-30-with-variables-cl</td>
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<td>0%</td>
<td>0%</td>
<td>Down</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### General Details

- **Name:** demo-vm
- **Description:**
- **Template:** Blank
- **Operating System:** Red Hat Enterprise Linux 6.x 64
- **Default Display Type:** Spice
- **Defined Memory:** 1024 MB
- **Physical Memory Guaranteed:** 256 MB
- **Number of CPU Cores:** 1 (1 Socket(s), 1 Core(s) per Socket)
- **Number of Monitors:** 1
- **USB Policy:** Disabled

#### System Configuration

- **Origin:** oVirt
- **Run On:** Any Host in Cluster
- **Custom Properties:** Not Configured
- **Cluster Compatibility Version:** 3.2
Goals of the oVirt project

- Build a community around all levels of the virtualization stack – hypervisor, manager, GUI, API, etc.
- To deliver both a cohesive complete stack and discretely reusable components for open virtualization management
- Provide a release of the project on a well defined schedule
- Focus on management of the KVM hypervisor, with exceptional guest support beyond Linux
- Provide a venue for user and developer communication and coordination
Governance

- Merit based, open governance model
- Built using the best concepts taken from Apache and Eclipse Foundations
- Governance split between board and projects
  - oVirt Board
  - Multiple projects under the oVirt brand
Virtualization Management the oVirt way

**oVirt Node**

- Standalone hypervisor
  - Small footprint ~ 170MB
  - 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
oVirt Node
- Small footprint
- Pre-configured, no Linux skills needed.

Full Host
- Flexible
- Add monitoring agents, scripts etc. Leverage existing Fedora infrastructure.
- Hybrid mode capable
## Management Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High Availability</td>
<td>Restart guest VMs from failed hosts automatically on other hosts</td>
<td></td>
</tr>
<tr>
<td>Live Migration</td>
<td>Move running VM between hosts with zero downtime</td>
<td></td>
</tr>
<tr>
<td>System Scheduler</td>
<td>Continuously load balance VMs based on resource usage/policies</td>
<td></td>
</tr>
<tr>
<td>Power Saver</td>
<td>Concentrate virtual machines on fewer servers during off-peak hours</td>
<td></td>
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<tr>
<td>Maintenance Manager</td>
<td>No downtime for virtual machines during planned maintenance windows. Hypervisor patching</td>
<td></td>
</tr>
<tr>
<td>Image Management</td>
<td>Template based provisioning, thin provisioning and snapshots</td>
<td></td>
</tr>
<tr>
<td>Monitoring &amp; Reporting</td>
<td>For all objects in system – VM guests, hosts, networking, storage etc.</td>
<td></td>
</tr>
<tr>
<td>OVF Import/Export</td>
<td>Import and export VMs and templates using OVF files</td>
<td></td>
</tr>
<tr>
<td>V2V &amp; P2V</td>
<td>Convert Physical servers or VMs from Vmware and Xen</td>
<td></td>
</tr>
<tr>
<td>VDI</td>
<td>Virtual Desktop Infrastructure for Windows and Linux</td>
<td></td>
</tr>
<tr>
<td>Power User Portal</td>
<td>Self Service Portal</td>
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</tbody>
</table>

**Virtualization Management the oVirt way**
How to Start?

- Build from source..
- Or, just install
  - `yum install ovirt-engine`
  - `./ovirt-setup`
  - Add managed hosts
- Or, New: All-in-one live usb
### oVirt Administration Console

#### Virtualization Management

![Admin Console Screenshot](image.png)

#### Table of Virtual Machines

<table>
<thead>
<tr>
<th>Name</th>
<th>Cluster</th>
<th>Host</th>
<th>IP Address</th>
<th>Memory</th>
<th>CPU</th>
<th>Network</th>
<th>Display</th>
<th>Status</th>
<th>Uptime</th>
<th>Logged-in User</th>
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<td>0%</td>
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<td>Spice</td>
<td>Down</td>
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<td>1 day</td>
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<td>1 day</td>
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</tbody>
</table>
Virtualization Management the oVirt way

ovirt Enterprise Virtualization Engine Web Administration – Mozilla Firefox

Logged in user: admin@internal | Configure | Guide | About | Sign Out

Search:

Tree

Default

ISCSI Rds

Storage

Storage

Templates

Clusters

VMs

NFS-RC DC

Network Interfaces

Virtual Disks

Snapshots

Applications

Permissions

Installed Applications

Browser Firefox version 9 is currently not supported.
Add Host As Simple As
Power Management

Virtualization Management the oVirt way

Power Management

New Host

General

Enable Power Management

Power Management

Address

User Name

Password

Type: bladecenter

Port

Slot

Options

Please use a comma-separated list of key=value or key

Secure

Test

OK Cancel
Setup Networks: Dialog

- Drag to make changes

**Assigned Logical Networks**
- NOVM_VLAN_MTU_5 (VLAN 500)
- VLAN_MTU_5000 (VLAN 222)
- VLAN_MTU_5000_2 (VLAN 92)

**Unassigned Logical Networks**
- NOVM_VLAN_MTU_9000
- NOVM_VLAN_MTU_9 (VLAN 900)
- VLAN_MTU_9000 (VLAN 9)
- VLAN_MTU_9000_2 (VLAN 92)

- Verify connectivity between Host and Engine
- Save network configuration

Virtualization Management the oVirt way
Setup Networks: Create Bond

- Drag an interface on top of another interface to bond the interfaces or to extend an existing bond.
Drag an interface on top of another interface to bond the interfaces or to extend an existing bond.
Setup Networks: Edit Bond

- Click the pencil icon to edit bond configuration
Setup Networks: Attach Network

- Drag a network from the unassigned networks list to the interface/bond to be attached
Configure Storage Once for Entire Cluster

Edit Domain

Name: hateya-ovirt-rc-1

Domain Function / Storage Type: Data / SCSI

Use Host: ntt-edts2.qa.lab.tiv.redhat.com

Targets:
- 1hataya-ovirt-rc11 75GB 0 IET VIRTUAL-C SIETVIRTUAL-DISK
- 1hataya-ovirt-rc31 75GB 1 IET VIRTUAL-C SIETVIRTUAL-DISK
- 1hataya-ovirt-rc41 75GB 1 IET VIRTUAL-C SIETVIRTUAL-DISK

OK | Cancel
Extend with More LUNs as Needed
Add Servers or Desktops

New Server Virtual Machine

General
- Data Center: demo/dc-32
- Host Cluster: cluster-32

Name:
Description:
Based on Template: Blank
Boot Options:
Memory Size: 512 MB
Total Virtual CPUs: 1
Operating System: Unassigned

Advanced Parameters

OK | Cancel
Even Windows via Sysprep
Console Details (SPICE or VNC)
High Availability

New Server Virtual Machine

High Availability

Priority for Run/Migration queue:
- Low
- Medium
- High

OK Cancel
Control Allocated Resources (Disk, Memory)
Virtualization Management the oVirt way

Boot Devices

New Server Virtual Machine

General
- Name: nwfilter-vm-
- Description:
- Template: Blank
- Operating System: Red Hat Ent
- Default Display Type: Spice
- Priority: Low

Initial Run
- First Device
- Second Device

Host
- Attach CD

High Availability

Resource Allocation

Boot Options
- kernel path
- initrd path
- kernel parameters

Linux Boot Options:
- [None]

Boot Sequence:
- Hard Disk

OK Cancel
Advanced Options via Custom Properties

New Server Virtual Machine

General
- name: nwlfilter-vm-
- description: description
- template: blank
- operating system: Red Hat Ent
- default display type: spice
- priority: low

Initial Run
- sasluf: dropdown
- true: dropdown

Console
- sap_agent: dropdown
- host: dropdown

High Availability
- Please select a key...

Resource Allocation

Boot Options

Custom Properties

OK Cancel
Virtualization Management the oVirt way

Edit Pool

General

Data Center: Default
Host Cluster: Default

Name: vm-template-test
Description:

Increase number of VMs in pool by 0 VMs

Based on Template: test-vm-pool
Memory Size: 512 MB
Total Virtual CPUs: 1

Operating System: Unassigned

Advanced Parameters

Resides on Storage Domain: data3-default

Origin: oVirt
Is Stateless: false
Run On: Any Host in Cluster
Assign Permissions to Objects by Roles
Define Your Own Roles
Virtualization Management the oVirt way
Create Volume – Add Bricks

Virtualization Management the oVirt way
Virtualization Management the oVirt way

User Portal
Virtualization Management the oVirt way

- **Active Virtual Machines by OS (BR18)**
  - /organizations/ovirtreports/Reports/Executive/active_vms_by_os_br18
  - The report contains comparative measurements of the number of running virtual machines and OS usage in a selected cluster and a selected virtual machine's type within the requested period.
  - Report
  - October 18

- **Cluster Capacity Vs Usage (BR19)**
  - /organizations/ovirtreports/Reports/Executive/cluster_capacity_vs_usage_br19
  - This report contains charts displaying host's resources usage measurements (CPU core, physical Memory) and charts displaying virtual machine's resources usage measurements (virtual machine's total vCPU, Virtual Memory size) for a selected cluster.
  - Report
  - October 18

- **Host OS Break Down (BR22)**
  - /organizations/ovirtreports/Reports/Executive/host_os_break_down_br22
  - The report contains a table and a chart displaying the number of hosts for each OS version for a selected cluster within a requested period.
  - Report
  - October 18

- **Summary of Host Usage Resources (BR17)**
  - /organizations/ovirtreports/Reports/Executive/summary_of_host_usage_resources_br17
  - The report contains a scattered chart of CPU and memory usage data within a requested period and for a selected cluster.
  - Report
  - October 18
Active Virtual Machines by OS in Clusters of Data Center Default

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

- RHEL vs Other Linux OS
- Distribution of Windows Versions
- RHEL vs Windows OS
- Virtual Machines With Known OS vs Unknown OS

Input Controls:
- Show Deleted Entities?: Yes
- Data Center: RHEV-M-3
- Cluster: RHEV-M-3
- VM Type: Server
- Period Range: Monthly
- Select Month: August 2011
- Start Date: 2011-08-01
- End Date: 2011-08-31
RESTful Web Service

- Stands for Representational State Transfer
- Modeling entity actions around HTTP verbs
  - GET
  - PUT
  - POST
  - DELETE
- Still uses 'actions' for some state changes
- Self describes – entity navigation and actions
<api>
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  <link rel="clusters" href="/rhevm-api/clusters"/>
  <link rel="clusters/search" href="/rhevm-api/clusters?search={query}"/>
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  <link rel="storagedomains/search" href="/rhevm-api/storagedomains?search={query}"/>
  <link rel="tags" href="/rhevm-api/tags"/>
  <link rel="templates" href="/rhevm-api/templates"/>
  <link rel="templates/search" href="/rhevm-api/templates?search={query}"/>
  <link rel="users" href="/rhevm-api/users"/>
  <link rel="groups" href="/rhevm-api/groups"/>
  <link rel="domains" href="/rhevm-api/domains"/>
  <link rel="vm pools" href="/rhevm-api/vmpools"/>
  <link rel="vm pools/search" href="/rhevm-api/vmpools?search={query}"/>
  <link rel="vms" href="/rhevm-api/vms"/>
  <link rel="vms/search" href="/rhevm-api/vms?search={query}"/>
</api>

<summary revision="428" build="0" minor="6" major="4"/>

<vms>
  <total>22</total>
  <active>5</active>
</vms>

<hosts>
  <total>6</total>
  <active>5</active>
</hosts>

<users>
  <total>2</total>
</users>

Virtualization Management the oVirt way
<hosts>
  <host id="15896dce-ed00-415c-a524-c9b02f278895" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895">
    <name>nari11</name>
    <actions>
      <link rel="install" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/install"/>
      <link rel="activate" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/activate"/>
      <link rel="fence" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/fence"/>
      <link rel="deactivate" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/deactivate"/>
      <link rel="approve" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/approve"/>
      <link rel="iscsiLogin" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/iscsilogin"/>
      <link rel="iscsidiscover" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/iscsidiscover"/>
      <link rel="commitnetconfig" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/commitnetconfig"/>
    </actions>
    <link rel="storage" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/storage"/>
    <link rel="nics" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/nics"/>
    <link rel="tags" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/tags"/>
    <link rel="permissions" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/permissions"/>
    <link rel="statistics" href="/rhevm-api/hosts/15896dce-ed00-415c-a524-c9b02f278895/statistics"/>
    <address>nari11.eng.lab.tv.redhat.com</address>
    <status>UP</status>
    <cluster id="4a5bafe-7c6d-4d75-9aba-d60f3a188d0b" href="/rhevm-api/clusters/4a5bafe-7c6d-4d75-9aba-d60f3a188d0b"/>
    <port>54321</port>
    <storage_manager>false</storage_manager>
    <power_management/>
      <enabled>false</enabled>
      <options/>
    </power_management>
    <ksm/>
      <enabled>false</enabled>
    </ksm>
    <transparent_hugepages/>
      <enabled>true</enabled>
    </transparent_hugepages>
    <iscsi/>
      <initiator>iqn.1994-05.com.redhat:a7afc41a35b0</initiator>
      <iscsid/>
      <target>/iscsi_storages/2560560500000000000000000000000000000000</target>
      <iscsi_lun>1</iscsi_lun>
      <iscsi_lun>/dev/sg2/iscsi/sg2_0_1</iscsi_lun>
    </iscsi>
  </host>
</hosts>
Host networks collection

This XML file does not appear to have any style information associated with it. The document tree is shown below.

```xml
<host_nics>
  <host_nic id="dbb39d06-3aef-468c-83e6-88eae0a3f346" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/dbb39d06-3aef-468c-83e6-88eae0a3f346">  
    <name>eth0</name>
  </host_nic>
  <actions>
    <link rel="attach" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/dbb39d06-3aef-468c-83e6-88eae0a3f346/attach"/>
    <link rel="detach" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/dbb39d06-3aef-468c-83e6-88eae0a3f346/detach"/>
  </actions>
  <link rel="statistics" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/dbb39d06-3aef-468c-83e6-88eae0a3f346/statistics"/>
  <host id="15896dce-edd0-415c-a524-c9b02f278895" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895"/>
  <network>
    <name>rhevm</name>
  </network>
  <ip netmask="255.255.252.0" address="10.35.16.151"/>
</host_nic>
  <host_nic id="0d98b08c-9b42-45a4-a226-b7dd3f0854cf" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/0d98b08c-9b42-45a4-a226-b7dd3f0854cf">  
    <name>eth1</name>
  </host_nic>
  <actions>
    <link rel="attach" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/0d98b08c-9b42-45a4-a226-b7dd3f0854cf/attach"/>
    <link rel="detach" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/0d98b08c-9b42-45a4-a226-b7dd3f0854cf/detach"/>
  </actions>
  <link rel="statistics" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895/nics/0d98b08c-9b42-45a4-a226-b7dd3f0854cf/statistics"/>
  <host id="15896dce-edd0-415c-a524-c9b02f278895" href="/rhevm-api hôsts/15896dce-edd0-415c-a524-c9b02f278895"/>
  <mac address="78:E7:D1:E4:8E:92"/>
  <ip netmask="255.255.252.0" address="10.35.16.151"/>
</host_nic>
</host_nics>

Virtualization Management the oVirt way
Python SDK

- Creating the proxy
  ```python
api = API(url='http://localhost:8080', username='user@domain', password='password')
```
- Listing all collections
  ```python
  api
  ```
  ```python
  api.vms
  ```
  ```python
  __init__(url, username, password, key_file, cert_file, port, ssl)
  ```
- Listing collection's methods.
  ```python
  api.vms]
  ```
  ```python
  add(vm)
  ```
  ```python
  get(name)
  ```
  ```python
  list(query)
  ```
- Querying collection with oVirt search engine.
- Querying collection by custom constraint.
- Querying collection for specific resource.
- Accessing resource methods and properties.

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

```python
vms = api.vms.list(memory=1073741824)
```

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

```python
vm.start()
```
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 first form, no arguments are provided, and the connection details are read 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 be in the user@domain format.
* password  - The password to use.
### CLI - Smart Auto Completion

```bash
[oVirt shell (connected)]#
EOF connect create disconnect exit list shell status
action console delete echo help ping show update
[oVirt shell (connected)]#
[oVirt shell (connected)]#
[oVirt shell (connected)]# create
cdrom datacenter group network permission role storagedomain template vm
cluster disk host nic permit snapshot tag user vmpool

[oVirt shell (connected)]#
[oVirt shell (connected)]#
[oVirt shell (connected)]# create vm
cluster-id
cluster-name
cpu-topology-cores
cpu-topology-sockets
custom_properties-custom_property--LIST
description
display-monitors
display-type
domain-name

[oVirt shell (connected)]#
[oVirt shell (connected)]#
[oVirt shell (connected)]#
[oVirt shell (connected)]# create nic
host vm
```

---

**Virtualization Management the oVirt way**
[ovirt shell (connected)]# help create host

create <type> [base identifiers] [attribute options]

DESCRIPTION

Create a new object with type host. See 'help create' for generic help on creating objects.

ATTRIBUTE OPTIONS

The following options are available for objects with type host:

* -name: string
* -address: string
* -root_password: string
* -cluster-id: string
* -port: int
* -storage_manager_priority: int
* -power_management_type: string
* -power_management_enabled: boolean
* -power_management_address: string
* -power_management_user_name: string
* -power_management_password: string
* -power_management_options_option--LIST: {name=string,value=string}

RETURN VALUES

* 002 (COMMAND_ERROR)
* 003 (INTERRUPTED)
* 011 (NOT_FOUND)
* 000 (OK)
* 010 (REMOTE_ERROR)
* 001 (SYNTAX_ERROR)
* 004 (UNKNOWN_ERROR)

[ovirt shell (connected)]# help create vm

create <type> [base identifiers] [attribute options]

DESCRIPTION

Create a new object with type vm. See 'help create' for generic help on creating objects.

ATTRIBUTE OPTIONS

The following options are available for objects with type vm:

* -name: string
* -template_id[name: string
* -cluster_id[name: string
* -timezone: string
* -os-boot-dev: string
* -os-boot-device: string
* -os-type: string
* -os-boot-enabled: boolean
* -type: string
* -os-initrd: string
* -display-monitors: int
* -display-type: string
* -os-cmdline: string
* -cpu-topology-cores: int
* -memory: long
* -high_availability_priority: int
* -high_availability_enabled: boolean
* -domain-name: string
* -description: string
* -stateless: boolean
* -cpu-topology-sockets: int
* -placement_policy-affinity: string
Virtualization Management the oVirt way

**oVirt High Level Architecture**

- **Postgres**
- **AD**
- **LDAP**

- **Shared Storage**
  - FC/iSCSI/NFS

- **Local Storage**

- **Host | Node**

- **libvirt**

- **VDSM**

- **Guest agent**

- **Linux VM**

- **Win VM**

- **oVirt Engine**
  - Java
  - REST

- **Admin Portal**
  - gwt

- **SDK/CLI**
  - python

- **User Portal**
  - gwt

- **Linux/Windows client**

- **SPICE**
Hooks

- “Hook” mechanism for customization
  - Allows administrator to define scripts to modify VM operation
    - eg. Extend or modify VM configuration
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
  - Before and After VM set ticket
  - 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
Hooks

Virtualization Management the oVirt way

New Server Virtual Machine

- General
  - Name: sndbuf
  - Initial Run: true
  - Host: host
  - High Availability
  - Resource Allocation
  - Boot Options

Custom Properties

OK  Cancel
Hooks

Hooks installed in /usr/libexec/vdsm/hooks

```
[root@host1 ~]# cd /usr/libexec/vdsm/hooks/
[root@host1 hooks]# ls -l
total 60
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vdsm_stop
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_cont
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_dehivernate
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_destroy
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_hibernate
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_migrate_destination
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_migrate_source
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_pause
drwxr-xr-x. 2 root root 4096 Apr 12 03:55 after_vm_start
```

```
[root@host1 hooks]#
```

**Event Name** | **Script Name** | **Property Name** | **Property Value**
--- | --- | --- | ---
before_vm_start | 10_qemu | md5 | 2c352c04e6cf99c
1 #!/usr/bin/python
2 import os
3 import sys
4 import hooking
5 import traceback
6 from xml.dom import minidom
7 
8 ...
9 
10 watchdog vdsb hook
11 adding to domain xml
12 <watchdog model='i6300esb' action='reset'/>
13 '"
14 
15 if os.environ.has_key('watchdog'):
16     try:
17         sys.stderr.write('watchdog: adding watchdog support\n')
18         domxml = hooking.read_domxml()
19 
20         devices = domxml.getElementsByTagName('devices')[0]
21         card = domxml.createElement('watchdog')
22         card.setAttribute('model', 'i6300esb')
23         card.setAttribute('action', 'reset')
24 
25         devices.appendChild(card)
26 
27         hooking.write_domxml(domxml)
28     except:
29         sys.stderr.write('watchdog: [unexpected error]: %s\n' % traceback.format_exc())
30         sys.exit(2)
How To Contribute or Download

- Website and Repository:
  - http://www.ovirt.org
  - http://www.ovirt.org/wiki
  - http://www.ovirt.org/project/subprojects/

- Mailing lists:
  - http://lists.ovirt.org/mailman/listinfo

- IRC:
  - #ovirt on OFTC
THANK YOU!

http://www.ovirt.org