oVirt Introduction

Shanghai 2013

Doron Fediuck
Red Hat
What is oVirt?

- Large scale, centralized management for server and desktop virtualization
- Based on leading performance, scalability and security infrastructure technologies
- Provides an open source alternative to vCenter/vSphere
OPEN VIRTUALIZATION MANAGEMENT

Customers

Partners and individual contributors

- Integration testing
- Quality engineering
- Security hardening
- Supportability
- Documentation
- Performance
- Scalability testing

Enterprise grade virtualization infrastructure

Virtualization Management the oVirt way
Virtualization Management the oVirt way

- JBoss-based Java application
- Communicates with hypervisor nodes
- Manages VM lifecycle
- Controlled with:
  - Admin Portal
  - User Portal
  - REST API
  - Python SDK
  - Command Line Shell
Virtualization Management the oVirt way

Overview: architecture

- Postgres
- AD
- LDAP
- oVirt
  - Engine
    - Java
  - REST
- Admin Portal
  - gwt
- SDK/CLI
  - python
- User Portal
  - gwt
- Guest agent
- Linux VM
- Win VM
- MoM
  - VDSM
  - libvirt
  - Host | Node
- Local Storage
- Shared Storage
  - FC/iSCSI/NFS
- Linux/Windows client

Virtualization Management the oVirt way
## Administration Console

### oVirt Enterprise Virtualization Engine Web Administration - Mozilla Firefox

**Virtualization Management the oVirt way**

**Search:** Vms:

---

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>kaka</td>
<td>intel-cluster</td>
<td></td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm1</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm10</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm11</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm12</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm13</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm15</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm16</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm17</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Up</td>
<td>1 day</td>
<td></td>
</tr>
<tr>
<td>myVm18</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm19</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm2</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm20</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm21</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm22</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm23</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
<td>Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>myVm24</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Passed</td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>myVm25</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Passed</td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>myVm26</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Passed</td>
<td>5 days</td>
<td></td>
</tr>
<tr>
<td>myVm27</td>
<td>intel-cluster</td>
<td>nttvs2.qa.lab.tiv</td>
<td></td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>Spice</td>
<td>Passed</td>
<td>5 days</td>
<td></td>
</tr>
</tbody>
</table>

---

**Last Message:** 2012-Jan-31, 23:19:41  User admin@internal logged in.
Virtualization Management the oVirt way
Self Provisioning Portal

Virtualization Management the oVirt way
<api>
  <link rel="capabilities" href="/rhevm-api/capabilities"/>
  <link rel="clusters" href="/rhevm-api/clusters"/>
  <link rel="clusters/search" href="/rhevm-api/clusters?search={query}"/>
  <link rel="datacenters" href="/rhevm-api/datacenters"/>
  <link rel="datacenters/search" href="/rhevm-api/datacenters?search={query}"/>
  <link rel="events" href="/rhevm-api/events"/>
  <link rel="events/search" href="/rhevm-api/events?search={query}"/>
  <link rel="hosts" href="/rhevm-api/hosts"/>
  <link rel="hosts/search" href="/rhevm-api/hosts?search={query}"/>
  <link rel="networks" href="/rhevm-api/networks"/>
  <link rel="roles" href="/rhevm-api/roles"/>
  <link rel="storagedomains" href="/rhevm-api/storagedomains"/>
  <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="vmpools" href="/rhevm-api/vmpools"/>
  <link rel="vmpools/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>

<system_version 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
Setup Networks: Edit Bond

- Click the pencil icon to edit bond configuration
Add Servers or Desktops
Even Windows via Sysprep
Console Details (SPICE or VNC)
High Availability
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

Boot Sequence:
- First Device: Hard Disk
- Second Device: [None]

Host:
- Attach CD: □

High Availability:

Resource Allocation:

Boot Options:
- kernel path
- initrd path
- kernel parameters

Linux Boot Options:

Custom Properties:
- Not-Configured

Cluster Compatibility Version: 3.2
Advanced Options via Custom Properties

New Server Virtual Machine

Custom Properties
Setup Networks: Dialog

- **Interfaces**
  - bond0
    - eth1
    - eth2
  - bond1
    - eth3
    - eth4
  - eth0

- **Assigned Logical Networks**
  - NOVM_VLAN_MTU_5 (VLAN 500)
  - VLAN_MTU_5000 (VLAN 222)
  - VLAN_MTU_5000_2 (VLAN 52)
  - ovirtmgmt

- **Unassigned Logical Networks**
  - NGN_VM_MTU_9000
  - NOVM_VLAN_MTU_9 (VLAN 9)
  - VLAN_MTU_9000 (VLAN 9)
  - VLAN_MTU_9000_2 (VLAN 92)

- **Verification Options**
  - Verify connectivity between Host and Engine
  - Save network configuration
Controlling resources: Quota

Virtual CPUs

- Student-quota: 25%
- Gold-quota: 0%
- Staff-quota: 0%

Storage

- Total Size: 1GB
- Number of Snapshots: 2
- Total Size of Snapshots: <1GB

Virtual Machines' Disks & Snapshots

- vm1
  - Disks: 0
  - Virtual Size: 0GB
  - Actual Size: 0GB
  - Snapshots: 0

- vm2
  - Disks: 1
  - Virtual Size: 1GB
  - Actual Size: 0GB
  - Snapshots: 2

Quota

- Total usage: 50% (2GB)
- Used by You: 25% (512MB)
- Used by Others: 25% (512MB)
- Free: 50% (1024MB)
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
Full Host
- Flexible
- Add monitoring agents, scripts etc.
  Leverage existing infrastructure.
- Hybrid mode capable
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
Example 1: One Host Environment

Basic One Host Environment

- Datacenter
- Host
- VM
- oVirt
Example 2: Multiple hosts
Example 3: Multi-Datacenter/Multi-Host
## Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scalability</td>
<td>Extend your virtualization environment by adding more host nodes</td>
</tr>
<tr>
<td>High Availability</td>
<td>Restart guest VMs from failed hosts automatically on other hosts</td>
</tr>
<tr>
<td>Host Live Migration</td>
<td>Move running VM between hosts with zero downtime</td>
</tr>
<tr>
<td>Storage Live Migration</td>
<td>Move running VM between storage domains with zero downtime</td>
</tr>
<tr>
<td>Network Filtering</td>
<td>Control network traffic in your virtualization environment</td>
</tr>
<tr>
<td>Port Mirroring</td>
<td>Mirror network traffic to a specific VM</td>
</tr>
<tr>
<td>Image Management</td>
<td>Template based provisioning, thin provisioning and snapshots</td>
</tr>
<tr>
<td>Live Snapshots</td>
<td>Take snapshot of a running virtual machine</td>
</tr>
<tr>
<td>Direct LUNs</td>
<td>Being able to attach block devices as volumes directly to virtual machines</td>
</tr>
<tr>
<td>Shared/Floating Disks</td>
<td>Share and hotplug disks between virtual machines</td>
</tr>
</tbody>
</table>
## Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Scheduler</td>
<td>Continuously load balance VMs based on resource usage/policies</td>
</tr>
<tr>
<td>Power Saver</td>
<td>Concentrate virtual machines on fewer servers during off-peak hours</td>
</tr>
<tr>
<td>Maintenance Manager</td>
<td>No downtime for virtual machines during planned maintenance windows. Hypervisor patching</td>
</tr>
<tr>
<td>Monitoring Tools</td>
<td>For all objects in system – VM guests, hosts, networking, storage etc.</td>
</tr>
<tr>
<td>SLA-MOM</td>
<td>A policy engine to help with memory management</td>
</tr>
<tr>
<td>Reports</td>
<td>Customized JasperReports and JasperServer reporting tools</td>
</tr>
<tr>
<td>OVF Import/Export</td>
<td>Import and export VMs and templates using OVF files</td>
</tr>
<tr>
<td>V2V &amp; P2V</td>
<td>Convert Physical servers or VMs from Vmware and Xen</td>
</tr>
<tr>
<td>Remote Access</td>
<td>SPICE and VNC protocols for accessing your virtual machines</td>
</tr>
<tr>
<td>USB and Smartcards</td>
<td>Passthrough USB and Smartcards to VMs</td>
</tr>
</tbody>
</table>
## Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gluster Support</td>
<td>Manage your Gluster volumes and bricks, and integrate them with oVirt</td>
</tr>
<tr>
<td>REST API</td>
<td>RESTful web service using HTTP methods to control oVirt objects</td>
</tr>
<tr>
<td>Development Tools</td>
<td>Python SDK and CLI Shell</td>
</tr>
</tbody>
</table>
New in 3.2

Infrastructure
The administration portal supports custom user interface (UI) plugins written in JavaScript.
Live Snapshots of a virtual machine can now be created without first having to stop it.
Support has been added for the Windows 8, Windows 8 x64, and Windows 2012.

Storage
Supporting storage live migration. Enables migration of disks between storage without downtime.
Supporting storage domain live upgrade. Enables upgrade from the old to the new V3 domain, online.

Performance
Memory Overcommit Manager (MOM) is enabled by default for hosts. It provides the ability to manage memory ballooning and Kernel Same-page Merging (KSM) of the Linux kernel

Virtualization
Virtual machines can now utilize the host's CPU flags, enables better performance in VM.
Clusters can now be configured to treat host CPU threads as cores for the purposes of virtual machine resource allocation and migration.

User Interface
A new "Network" tab has been added to the main resource tabs
oVirt Engine now retrieves and displays host BIOS information when a host is added to the engine

35+ additional new features listed at: http://www.ovirt.org/OVirt_3.2_release_notes
### UI-Plugin: Foreman main tab

#### Generated at 20 Dec 13:41

<table>
<thead>
<tr>
<th>Description</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosts that had performed modifications without error</td>
<td>0</td>
</tr>
<tr>
<td>Hosts in Error State</td>
<td>0</td>
</tr>
<tr>
<td>Good Host Reports in the last 35 minutes</td>
<td>0 / 4 hosts (0%)</td>
</tr>
<tr>
<td>Hosts that had pending changes</td>
<td>0</td>
</tr>
<tr>
<td>Out Of Sync Hosts</td>
<td>0</td>
</tr>
<tr>
<td>Hosts With No Reports</td>
<td>4</td>
</tr>
<tr>
<td>Hosts With Alerts Disabled</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Puppet Clients Activity Overview

![Puppet Clients Activity Overview](image)

#### Run Distribution in the last 30 Minutes

![Run Distribution in the last 30 Minutes](image)
UI-Plugin: oVirt Monitoring sub-tab

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

- Obtain from oVirt website
- Build from source
- Fedora repositories
  - yum install ovirt-engine
  - engine-setup
  - Add managed hosts
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://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