oVirt Node

Mar 21, 2012

Mike Burns
Agenda

- Introduction
- Architecture Overview
- Deployment Modes
- Installation and Configuration
- Upgrading
- Configuration Persistence
- Future Features
- Discussion
Introduction to oVirt Node

- Dedicated Hypervisor
  - Minimum OS needed to run and manage VMs
  - Well defined management interfaces and APIs
- Small Footprint
  - Less than 150MB image size
  - ~850MB disk space required for installation
  - 512MB runtime RAM footprint
- Built from Fedora components
  - Supports same hardware as Fedora
- Utilizes KVM
- Includes VDSM for VM Management
Architecture – RPMs

- ovirt-node
  - A TUI interface for installation and configuration
  - Automatic installation and configuration
  - Modifications to sysinit scripts
- ovirt-node-tools
  - A set of kickstart files
  - Minimal package list
  - Blacklisting for image minimization
  - Used to create an image
Architecture - Image

- Built using kickstarts from ovirt-node-tools package
- Provided in ISO format
- Installs to local hard drive, flash drive, SD card
- Minimal state information persisted to a config partition
- Multiple upgrade paths
  - Booting a new image
  - In place upgrade
livecd-tools

- Utility for create an ISO image containing a LiveOS
  - [http://fedoraproject.org/wiki/FedoraLiveCD](http://fedoraproject.org/wiki/FedoraLiveCD)
- Uses the following as input
  - Kickstart file to automate OS installation
    - package list (RPMs)
    - custom %post script for configuration
    - scripts for minimizing image size using file blacklisting and forced package removal
  - Yum Repositories for OS packages
  - Output is an ISO image
Key Packages

- qemu-kvm – provides KVM virtualization platform
- qemu-kvm-tools – kvmtrace and kvm_stat for debugging utilities
- vdsm – daemon for managing the node from oVirt Engine
- vdsm-cli – command line interface to VDSM daemon
- libvirt – virtualization API and VM control daemon
- spice-server – Provides guest remote connections
Manifest Files

- The produced image file contains manifest files in the top-level isolinux folder
- Manifests document the content of the final image after minimization (blacklisting)
  - manifest-deps.txt.bz2 – dependency (stderr of “rpm -e --test” result)
  - manifest-dir.txt.bz2 – directories in the image
  - manifest-file.txt.bz2 – files in the image
  - manifest-license.txt – licenses for all installed RPMs
  - manifest-owns.txt.bz2 – file ownership by RPM
  - manifest-rpm.txt – installed RPMs
  - manifest-srpm.txt – source RPMs for installed RPMs
Deployment Modes

- **CD-ROM**
  - Burn ISO image to writable CD with standard tools
  - Boot server from CD and install to local hard disk
- **Flash Memory (USB stick or SD card)**
  - Use livecd-iso-to-disk to copy image to USB or SD card
  - Boot from USB/SD and install to local hard disk
- **Network (PXE) Boot**
  - Use livecd-iso-to-pxeboot on the iso
  - Deploy generated vmliuz0/initrd0 files to PXE/tftp server
  - Boot server from PXE
Installation

- The oVirt Node image currently needs to be installed to a hard disk or flash drive to run
- After installation, boot method should be changed to hard disk
- There are two modes of installation
  - Booting to installation TUI
  - Autostart via kernel command line arguments
- Booting from CD or Flash memory will bring you to a Boot Menu
Boot Menu

Note: *linux rescue can be passed to the boot: parameter to boot in rescue mode*
This screen will warn if Hardware Virtualization is not enabled on the host (see bottom on screen shot above)
TUI Installation – Disk Selection

Please select the disk to use for booting oVirt Node Hypervisor

<table>
<thead>
<tr>
<th>Location</th>
<th>Device Name</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local / FibreChannel</td>
<td>vda</td>
<td>10 GB</td>
</tr>
<tr>
<td>Local / FibreChannel</td>
<td>vdb</td>
<td>10 GB</td>
</tr>
<tr>
<td>Local / FibreChannel</td>
<td>vdc</td>
<td>10 GB</td>
</tr>
<tr>
<td>Other Device</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Disk Details

- Device: /dev/vda
- Model: None
- Bus Type: Local / FibreChannel
- Serial: None
- Size: 10GB
- Description: virtio disk

Please select the disk(s) to use for installation of oVirt Node Hypervisor

<table>
<thead>
<tr>
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</tr>
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<td>vda</td>
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<td>10 GB</td>
</tr>
<tr>
<td>[ ] Other Device</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Disk Details

- Device: /dev/vda
- Model: None
- Bus Type: Local / FibreChannel
- Serial: None
- Size: 10GB
- Description: virtio disk

- Select a device to boot from (left screen)
- Select 1 or more disks for storing configuration data and swap (right screen)
TUI Installation – Admin Password

- Set a password for the admin user
- Proceeding from this screen starts the installation
TUI Installation -- Finishing

Installing Bootloader Configuration On
/dev/vda
75%

ovirt Node Hypervisor 2.2.3-1.1.fc16

ovirt Node Hypervisor Installation Finished Successfully

<Reboot>
### Configuration - Status

**oVirt Node Hypervisor 2.2.3-1.1.fc16 localhost**

<table>
<thead>
<tr>
<th>Status</th>
<th>Networking: breth0: dhcp 192.168.122.244</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>Logical Network: breth0: eth0</td>
</tr>
<tr>
<td>Security</td>
<td>Device: MAC Address 52:54:00:7e:95:8e</td>
</tr>
<tr>
<td>Logging</td>
<td>Logs: Local Only</td>
</tr>
<tr>
<td>Kernel Dump</td>
<td>(Virtualization hardware was not detected)</td>
</tr>
<tr>
<td>Remote Storage</td>
<td>Press F8 For Support Menu</td>
</tr>
<tr>
<td>Monitoring</td>
<td>&lt;Lock&gt; &lt;Log Off&gt; &lt;Restart&gt; &lt;Power Off&gt;</td>
</tr>
<tr>
<td>oVirt Engine</td>
<td></td>
</tr>
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</table>

Use arrow keys to choose option, then press Enter to select it

- Get overall status of the system
- See number of VMs running (not available in the screen shot, because we're installing the hypervisor in a kvm guest)
- Support menu
## Configuration – Networking

**Choose device to setup for management bridge**

**Supports vlans**
## Configuration - Security

**Remote Access**

[*] Enable ssh password authentication

**Local Access**

Password: 
Confirm Password: 

<table>
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<tr>
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<tr>
<td>Network</td>
<td></td>
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<tr>
<td>Security</td>
<td>Remote Access</td>
</tr>
<tr>
<td></td>
<td>[*] Enable ssh password authentication</td>
</tr>
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<td>Local Access</td>
</tr>
<tr>
<td>Kernel Dump</td>
<td>Password:</td>
</tr>
<tr>
<td>Remote Storage</td>
<td>Confirm Password:</td>
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- Enable password based ssh authentication
- Reset admin password
Configuration - Logging

- Logrotate
- Remote logging server
- Netconsole
## Configuration - kdump

<table>
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<td><strong>Status</strong></td>
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<tr>
<td><strong>Logging</strong></td>
</tr>
<tr>
<td><strong>Kernel Dump</strong></td>
</tr>
<tr>
<td>[ ] NFS [ ] SSH [ ] Restore (Local)</td>
</tr>
<tr>
<td>NFS Location (example.redhat.com:/var/crash):</td>
</tr>
<tr>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>SSH Location (<a href="mailto:root@example.redhat.com">root@example.redhat.com</a>)</td>
</tr>
</tbody>
</table>

- Configure kdump server
Configuration – Remote Storage

- Setup an iSCSI Initiator Name
- One is randomly generated during installation
Configuration – Monitoring

- Connect with a remote collectd server
## Configuration – oVirt Engine

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**oVirt Engine Configuration**
- Management Server: 
- Management Server Port: 8443

**[>] Connect to oVirt Engine and Validate Certificate**

Set oVirt Engine Admin Password
- Password: 
- Confirm Password: 

**<Apply>  <Reset>**

- Register to the oVirt Engine management server
Automatic Installation and Configuration

- All configuration in the TUI can be automated with kernel command line parameters
- Ideal for PXE boot environments
- Requires storage_init and BOOTIF parameters
- adminpw parameter recommended for management after installation
Upgrading

- oVirt Node image is a dedicated appliance
  - no yum/rpm upgrading in the live image
  - Rootfs is non-persistent so upgrades are lost
    - Warning: Runtime rootfs (/) is in-memory overlay. Writing excessive amounts of data to it can cause out of space issues
    - It is mounted read-only by default to avoid this issue
- Three upgrade paths supported
  - Update the PXE server and set host to network boot
  - Boot from new media (CD, USB, SD)
  - In-place upgrade
- ISO/USB/PXE upgrades must specify `upgrade` on the kernel command line to trigger upgrade logic
Configuration Persistence

- Root FS is mounted read-only
  - even if remounted RW, changes are not persisted
- Current Persistence uses rc.sysinit stateless support
- Important files are persisted automatically by oVirt and VDSM as needed
- To manually persist a file, use the persist command:
  - # persist /etc/hosts
- The /config partition is only a few MB by default, so use sparingly.
Roadmap – Stateless

• Feature
  • [http://ovirt.org/wiki/Node_Stateless](http://ovirt.org/wiki/Node_Stateless)
  • Be able to boot from media/PXE and run completely stateless
  • Kernel Commandline Parameters used for configuration

• Status
  • Booting stateless and all oVirt Node functionality should work currently
  • oVirt Engine does not support Stateless nodes currently
    • Nodes can register fine, but a reboot (reinstall) will require re-registration
Roadmap – Plugins

• Feature
  • [http://ovirt.org/wiki/Node_plugins](http://ovirt.org/wiki/Node_plugins)
  • Ability to add custom packages and functionality
  • Added offline to the ISO image

• Status
  • Work in progress
  • First patches are posted, but work is still ongoing
More information

- Mailing Lists:
  - node-devel@ovirt.org
  - users@ovirt.org
- IRC: #ovirt on OFTC
- Web Site: [http://www.ovirt.org](http://www.ovirt.org)
- Git Repository: [git://gerrit.ovirt.org/ovirt-node.git](git://gerrit.ovirt.org/ovirt-node.git)
- Documents: [http://www.ovirt.org/wiki/Special:AllPages](http://www.ovirt.org/wiki/Special:AllPages)
- Bugzilla: [https://bugzilla.redhat.com](https://bugzilla.redhat.com) (Community->oVirt)
THANK YOU!

http://www.ovirt.org