



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>
- 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 `vmlinuz0/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
 - Autoinstallation via kernel command line arguments
- Booting from CD or Flash memory will bring you to a Boot Menu

Boot Menu



```
oVirt Node Hypervisor 2.2.3 (1.1.fc16)

Start Ovirt Node
Troubleshooting >

Press Tab for full configuration options on menu items.

Starting Ovirt Node in 25 seconds. Press any key to interrupt.
```

```
Troubleshooting

Install or Upgrade with serial console
Reinstall
Reinstall with serial console
Uninstall
Start Ovirt Node in basic graphics mode.

Boot from local drive

Return to main menu. <
Press Tab for full configuration options on menu items.
```

Note: linux rescue can be passed to the boot: parameter to boot in rescue mode

TUI Installation



This screen will warn if Hardware Virtualization is not enabled on the host (see bottom on screen shot above)

TUI Installation – Disk Selection



oVirt Node Hypervisor 2.2.3-1.1.fc16

Please select the disk to use for booting oVirt Node Hypervisor

Location	Device Name	Size
Local / FibreChannel	vda	10 GB
Local / FibreChannel	vdb	10 GB
Local / FibreChannel	vdc	10 GB
Other Device		

Disk Details

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

<Quit> <Back> <Continue>

oVirt Node Hypervisor 2.2.3-1.1.fc16

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

<->	Location	Device Name	Size
<input checked="" type="checkbox"/>	Local / FibreChannel	vda	10 GB
<input type="checkbox"/>	Local / FibreChannel	vdb	10 GB
<input type="checkbox"/>	Local / FibreChannel	vdc	10 GB
<input type="checkbox"/>	Other Device		

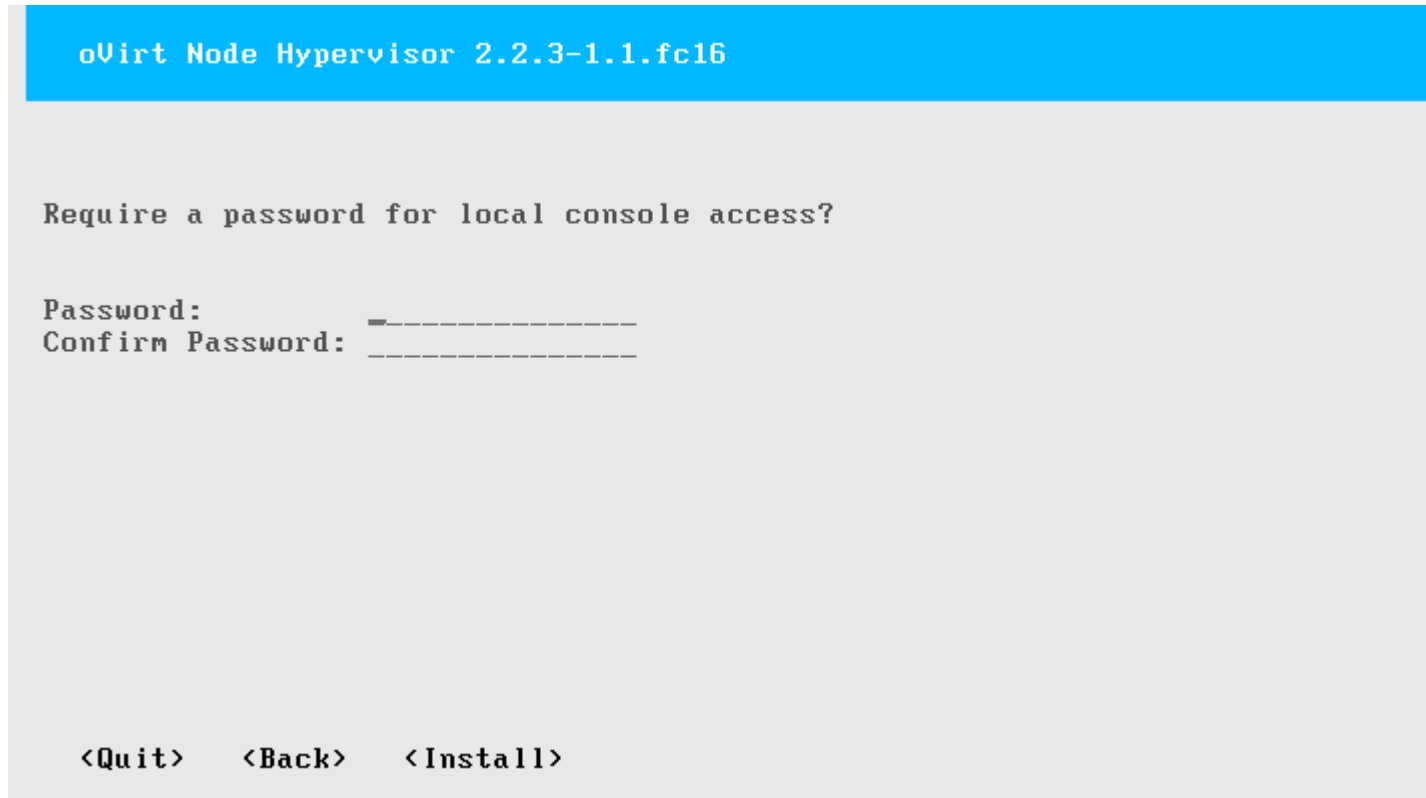
Disk Details

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

<Quit> <Back> <Continue>

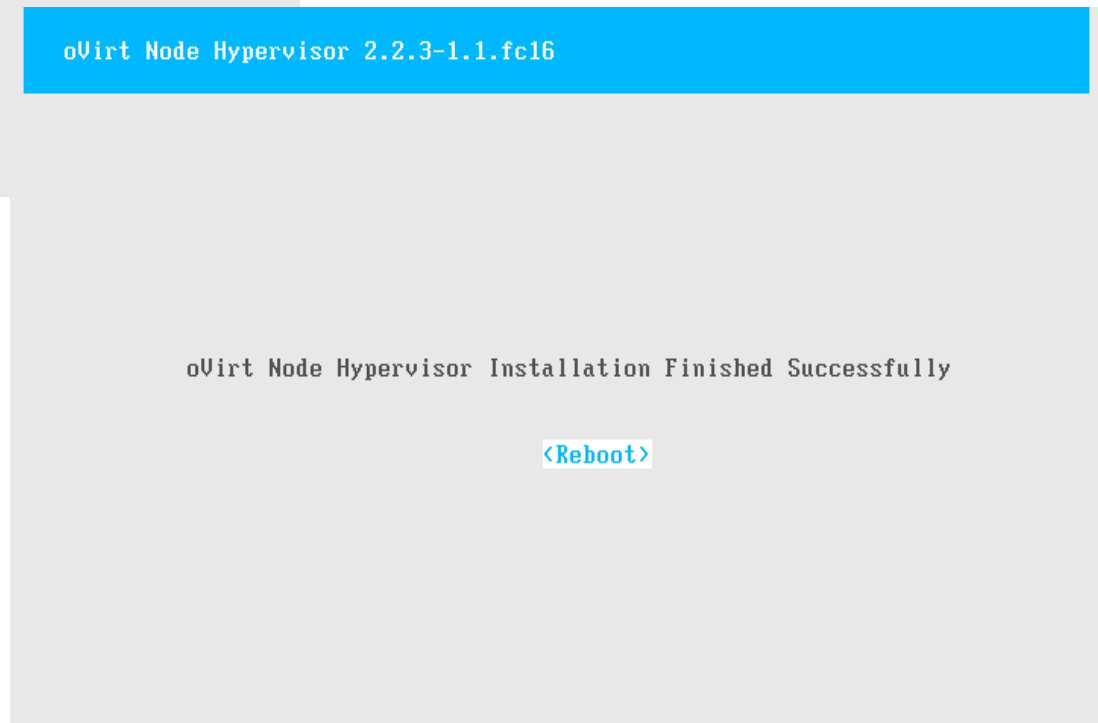
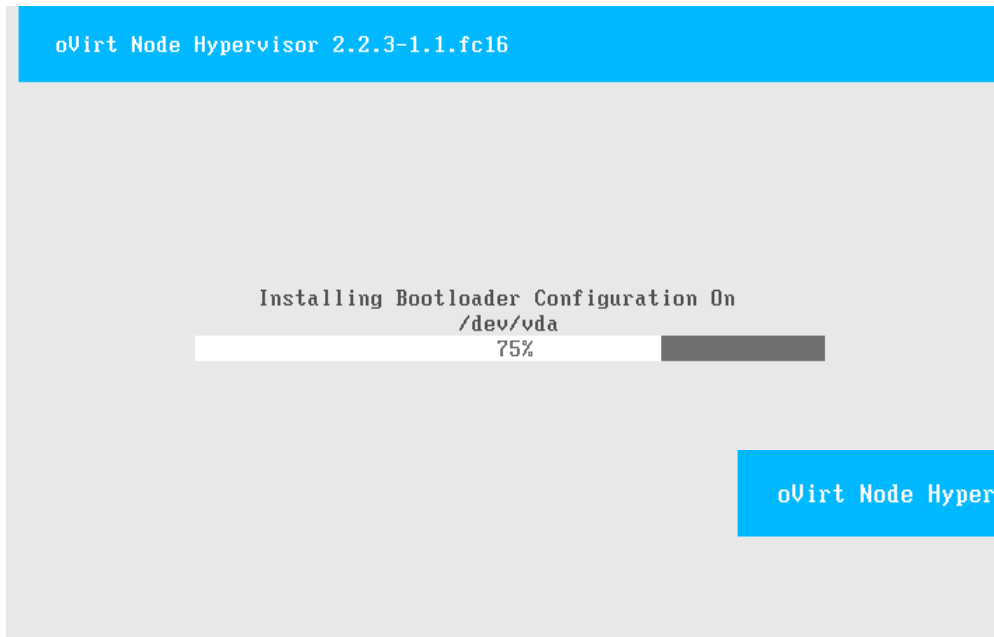
- Select a device to boot from (left screen)
- Select 1 or more disks for storing configuration data and swap (right screen)

TUI Installation – Admin Password



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

TUI Installation -- Finishing



Configuration - Status



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

Status
Network
Security
Logging
Kernel Dump
Remote Storage
Monitoring
oVirt Engine

Networking:   breth0:  dhcp 192.168.122.244

Logical Network  Device  MAC Address
breth0          eth0    52:54:00:7e:95:8e

Logs:         Local Only

(Virtualization hardware was not detected)
Press F8 For Support Menu
<Lock>  <Log Off>  <Restart>  <Power Off>

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



oVirt Node Hypervisor 2.2.3-1.1.fc16
localhost.localdomain

Status
Network
Security
Logging
Kernel Dump
Remote Storage
Monitoring
oVirt Engine

System Identification
Hostname: localhost.localdomain_____

DNS Server 1: _____
DNS Server 2: _____

NTP Server 1: 0.fedora.pool.ntp.org_____
NTP Server 2: 1.fedora.pool.ntp.org_____

Device	Status	Model	MAC Address
eth0	Configured	Red Hat In	52:54:00:7e:95:8e
eth1	Unconfigured	Red Hat In	52:54:00:ec:e1:96

<Flash Lights to Identify> <Apply> <Reset>

oVirt Node Hypervisor 2.2.3-1.1.fc16
localhost.localdomain

Interface: eth0 Driver: virtio_net
Protocol: Disabled Vendor: Red Hat Inc
Link Status: Inactive MAC Address: 52:54:00:7e:95:8e

IPv4 Settings
 Disabled DHCP Static
IP Address: _____ Netmask: _____
Gateway: _____

VLAN ID: _____
<Apply> <Back> <Reset>

- Choose device to setup for management bridge
- Supports vlans

Configuration - Security

A screenshot of the oVirt Node Hypervisor configuration interface. The title bar at the top is blue and contains the text "oVirt Node Hypervisor 2.2.3-1.1.fc16 localhost". On the left side, there is a vertical menu with several options: "Status", "Network", "Security" (highlighted in blue), "Logging", "Kernel Dump", "Remote Storage", "Monitoring", and "oVirt Engine". The main content area on the right is titled "Remote Access" and contains a checkbox labeled "[*] Enable ssh password authentication" which is checked. Below this, there is a section titled "Local Access" with two password fields: "Password:" and "Confirm Password:", both followed by dashed lines for input. At the bottom of the configuration area, there are two buttons: "<Apply>" and "<Reset>".

- Enable password based ssh authentication
- Reset admin password

Configuration - Logging



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

Status
Network
Security
Logging
Kernel Dump
Remote Storage
Monitoring
oVirt Engine

Logging

Logrotate Max Log Size (KB): 1024_

Rsyslog is an enhanced multi-threaded syslogd

Server Address: _____
Server Port:    514___

Netconsole service allows a remote syslog daemon
to record kernel printk() messages

Server Address: _____
Server Port:    6666_

<Apply>  <Reset>
```

- Logrotate
- Remote logging server
- Netconsole

Configuration - kdump



A screenshot of the oVirt Node Hypervisor configuration interface. The top bar is blue and contains the text "oVirt Node Hypervisor 2.2.3-1.1.fc16 localhost". On the left side, there is a vertical menu with several options: "Status", "Network", "Security", "Logging", "Kernel Dump" (which is highlighted in blue), "Remote Storage", "Monitoring", and "oVirt Engine". The main content area on the right is titled "Kernel Dump" and contains the following text: "[] NFS [] SSH [] Restore (Local)", "NFS Location (example.redhat.com:/var/crash):", a dashed line, "SSH Location (root@example.redhat.com)", and another dashed line. At the bottom of the main content area, there are two buttons: "<Apply>" and "<Reset>".

- Configure kdump server

Configuration – Remote Storage



A screenshot of the oVirt Node Hypervisor configuration interface. At the top, a blue header bar contains the text "oVirt Node Hypervisor 2.2.3-1.1.fc16" and "localhost" below it. On the left side, there is a vertical menu with several options: "Status", "Network", "Security", "Logging", "Kernel Dump", "Remote Storage" (which is highlighted with a white background and blue text), "Monitoring", and "oVirt Engine". The main area of the interface is titled "Remote Storage" and contains the text "iSCSI Initiator Name:" followed by a text input field containing the value "iqn.1994-05.com.redhat:d2bdae36d98a" followed by a dashed line indicating a cursor. At the bottom of the main area, there are two buttons: "<Apply>" and "<Reset>".

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

Configuration – Monitoring



A screenshot of the oVirt Node Hypervisor configuration interface. The title bar at the top is blue and contains the text "oVirt Node Hypervisor 2.2.3-1.1.fc16 localhost". On the left side, there is a vertical menu with several options: "Status", "Network", "Security", "Logging", "Kernel Dump", "Remote Storage", "Monitoring" (which is highlighted in blue), and "oVirt Engine". The main content area on the right is titled "Monitoring Configuration" and contains the following text: "Collectd" followed by a paragraph: "Collectd gathers statistics about the system can be used to find performance bottlenecks and predict future system load." Below this text are two fields: "Server Address:" followed by a dashed line, and "Server Port:" followed by the value "7634_". At the bottom of the configuration area are two buttons: "<Apply>" and "<Reset>".

- Connect with a remote collectd server

Configuration – oVirt Engine



oVirt Node Hypervisor 2.2.3-1.1.fc16
localhost

Status
Network
Security
Logging
Kernel Dump
Remote Storage
Monitoring
oVirt Engine

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
 - 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
 - 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

- <http://www.ovirt.org/get-ovirt/> (Installation guide available)
- Mailing Lists:
 - node-devel@ovirt.org
 - users@ovirt.org
- IRC: #ovirt on OFTC
- Web Site: <http://www.ovirt.org>
- Git Repository: <git://gerrit.ovirt.org/ovirt-node.git>
- Documents: <http://www.ovirt.org/wiki/Special:AllPages>
- Bugzilla: <https://bugzilla.redhat.com> (Community->oVirt)

oVirt

THANK YOU !

<http://www.ovirt.org>