oVirt Node

Jan 23, 2013

Mike Burns
Software Engineer
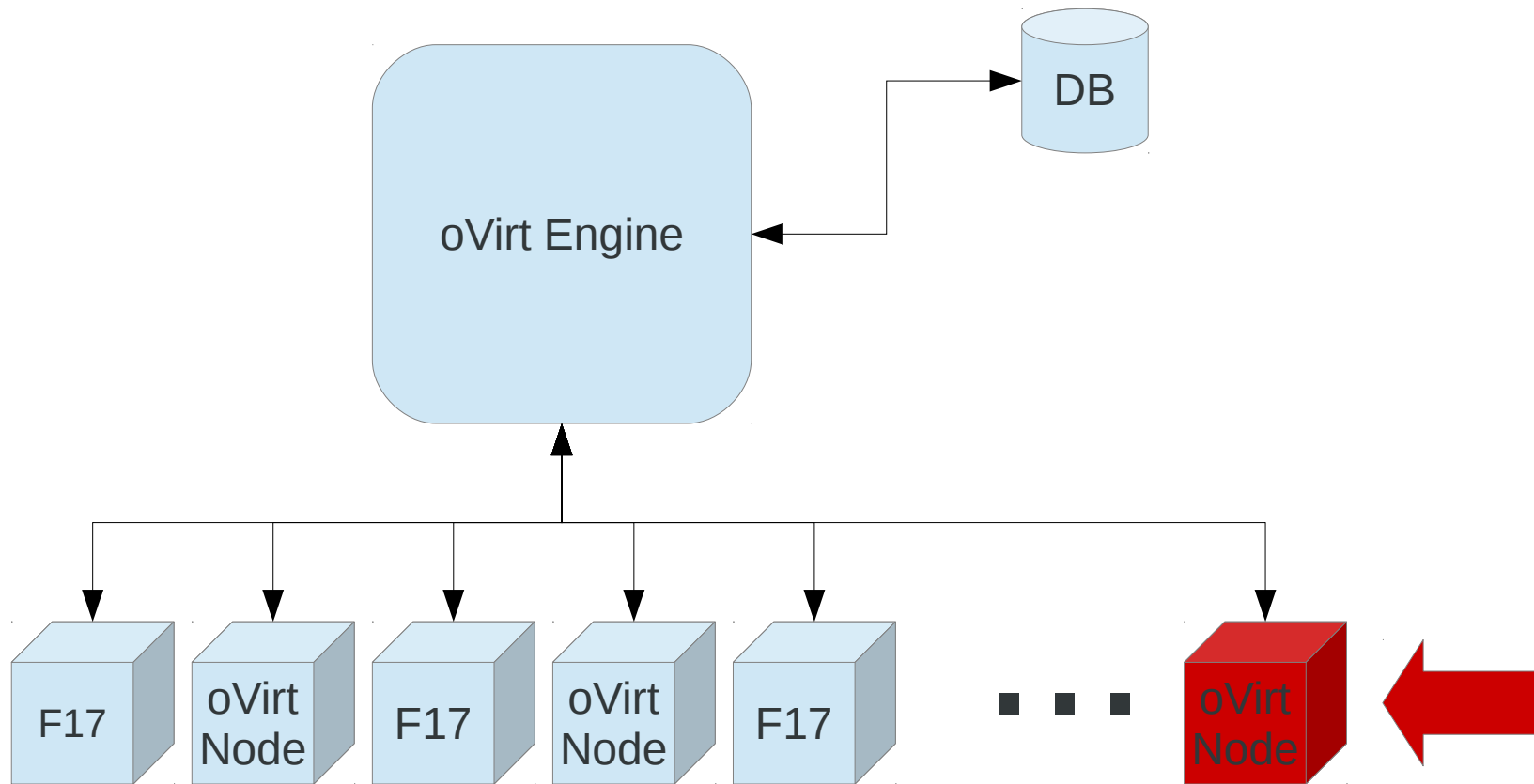Tech Lead for oVirt Node
Red Hat, Inc

Agenda

- Introduction

- Architecture and Packaging

- Configuration Persistence

- Installation and Configuration

- Plugins

- Stateless

- Future Features

- Discussion
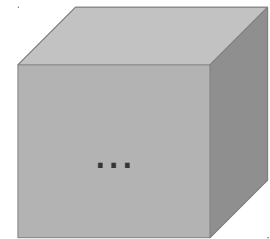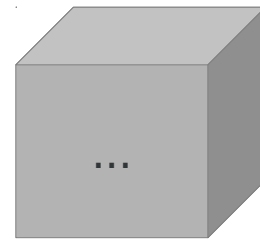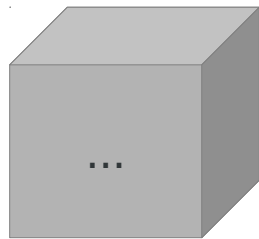
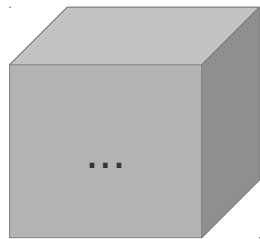Introduction

oVirt Architecture

oVirt

DB

oVirt Engine

F17   oVirt Node   F17   oVirt Node   F17   · · ·   oVirt Node

Virtual Machine Hosts
oVirt Node
Fedora

Is your datacenter this diverse?

F17	F17	Ubuntu	Ubuntu	Debian
RHEL	RHEL	Suse	Suse	Debian
...	...	...	...	...
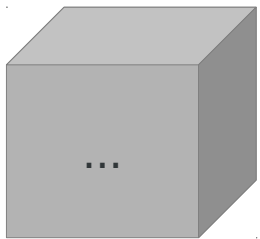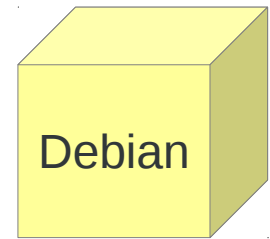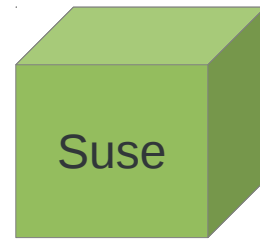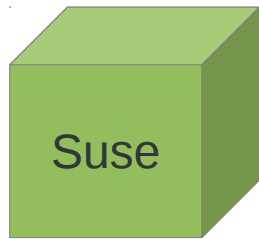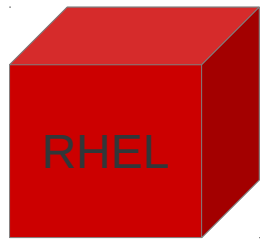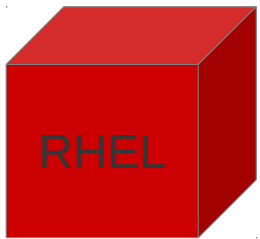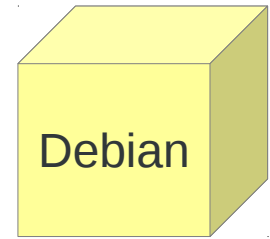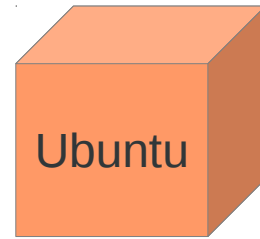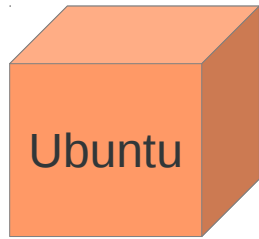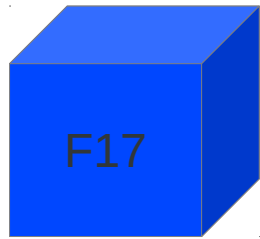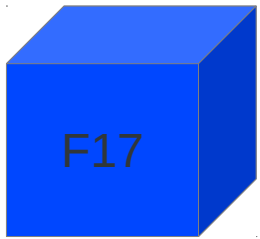
What if it could look like this?

Fedora & oVirt Engine

oVirt Node

oVirt Node

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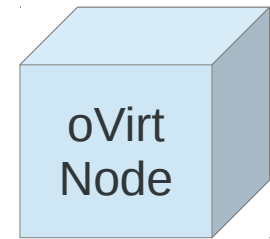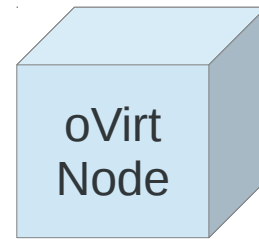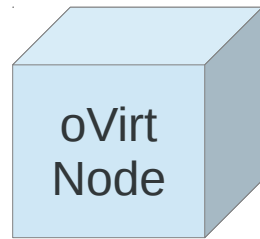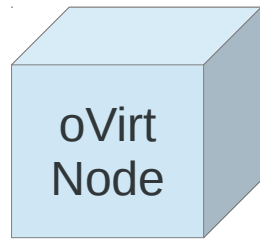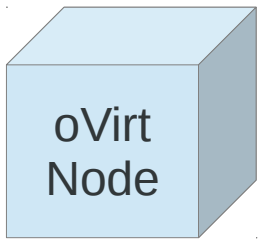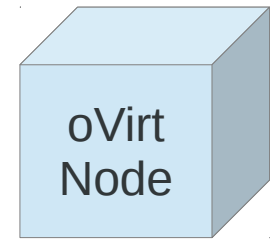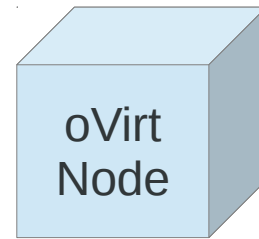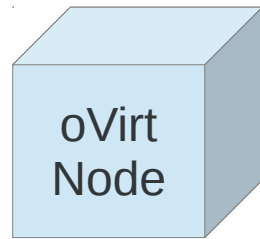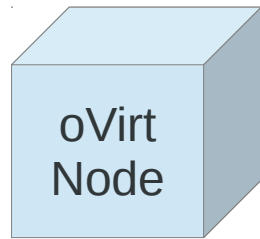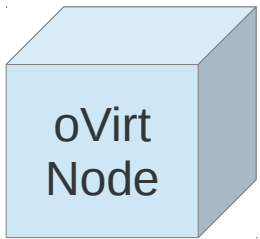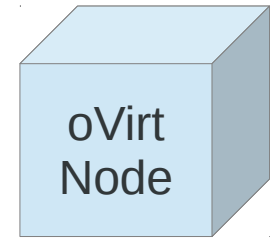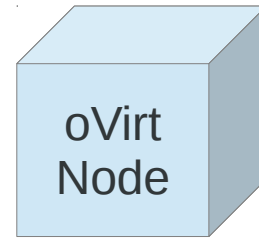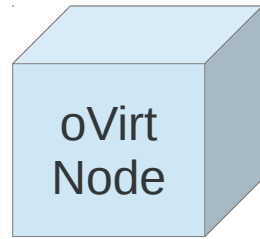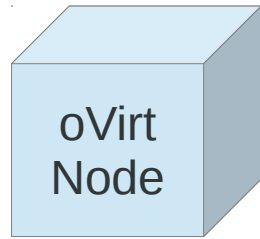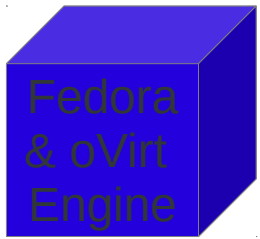
oVirt Node

What is oVirt Node?

- Dedicated hypervisor

- JEOS

- livecd

- Built on Fedora

- Firmware

    - Install and forget about it

    - Similar to ESXi or OpenWRT

- Small Footprint (< 200MB)

Advantages and Disadvantages

oVirt

- Advantages

  - Single image

  - Easy Upgrades

  - No managing individual package updates

  - Upgrade directly from management

- Disadvantages

  - Lack of Customization

  - No easy shell access

  - More difficult to debug problems

Architecture and Packaging

Architecture

- ISO Image

- Created using standard packages in Fedora

- Generated based on layered kickstarts

- %post scripts handle default configuration and setup

- TUI provided for installation and configuration post install

- Source Repositories

  - ovirt-node

  - ovirt-node-iso

oVirt Node

ISO
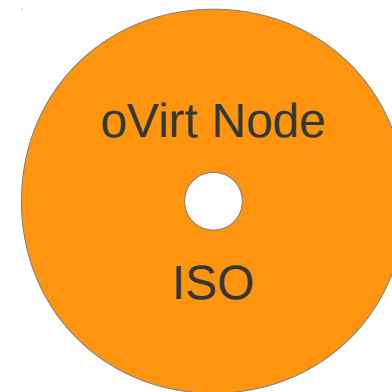
Packaging

- Packaged into 4 distinct RPMs
    - ovirt-node – configuring the ISO
    - ovirt-node-tools – working with ISO
    - ovirt-node-recipe – building the ISO
    - ovirt-node-iso – wraps the ISO
- Additional RPMs to be added in the future
    - ovirt-node-plugin-* - customizations for the ISO

Key Technologies

- qemu-kvm - http://www.linux-kvm.org/

- libvirt - http://libvirt.org/

- spice - http://spice-space.org/

- device-mapper-multipath

  - http://christophe.varoqui.free.fr/

- newt/snack

  - http://en.wikipedia.org/wiki/Newt_(programming_library)

- Livecd-tools

  - http://fedoraproject.org/wiki/FedoraLiveCD

Configuration Persistence

Configuration Persistence

- Root FS is non-persistent by default
  - On reboot, the original filesystem is loaded
- Root FS is mounted readonly
- Some things do need to be persisted across reboots
  - persist and unpersist commands added
- Persistent changes are stored in /config
  - Limited space available by default (8 MB)
  - bind-mounted automatically at boot time
- Some packages will handle this automatically
  - vdsm and ovirt-node

oVirt

Installation and Configuration

Deployment Modes

- oVirt Node can be installed using a variety of methods

  - CD/DVD-Rom (including virtual CD)

  - Flash Memory (USB or SD Card)

  - Network (PXE)

- Limited stateless support

- Install to disk

  - Can be either HDD or Flash disk (USB or SD Card)

- Installation Methods

  - Automatic

  - Manual

Automatic Installation

- Triggered using kernel command line parameters

  - Requires storage_init and BOOTIF

  - Should include additional options or adminpw if you want to configure things later

- All configurations done on the TUI can be done through kernel command line options

- After installation completes, machine will reboot automatically
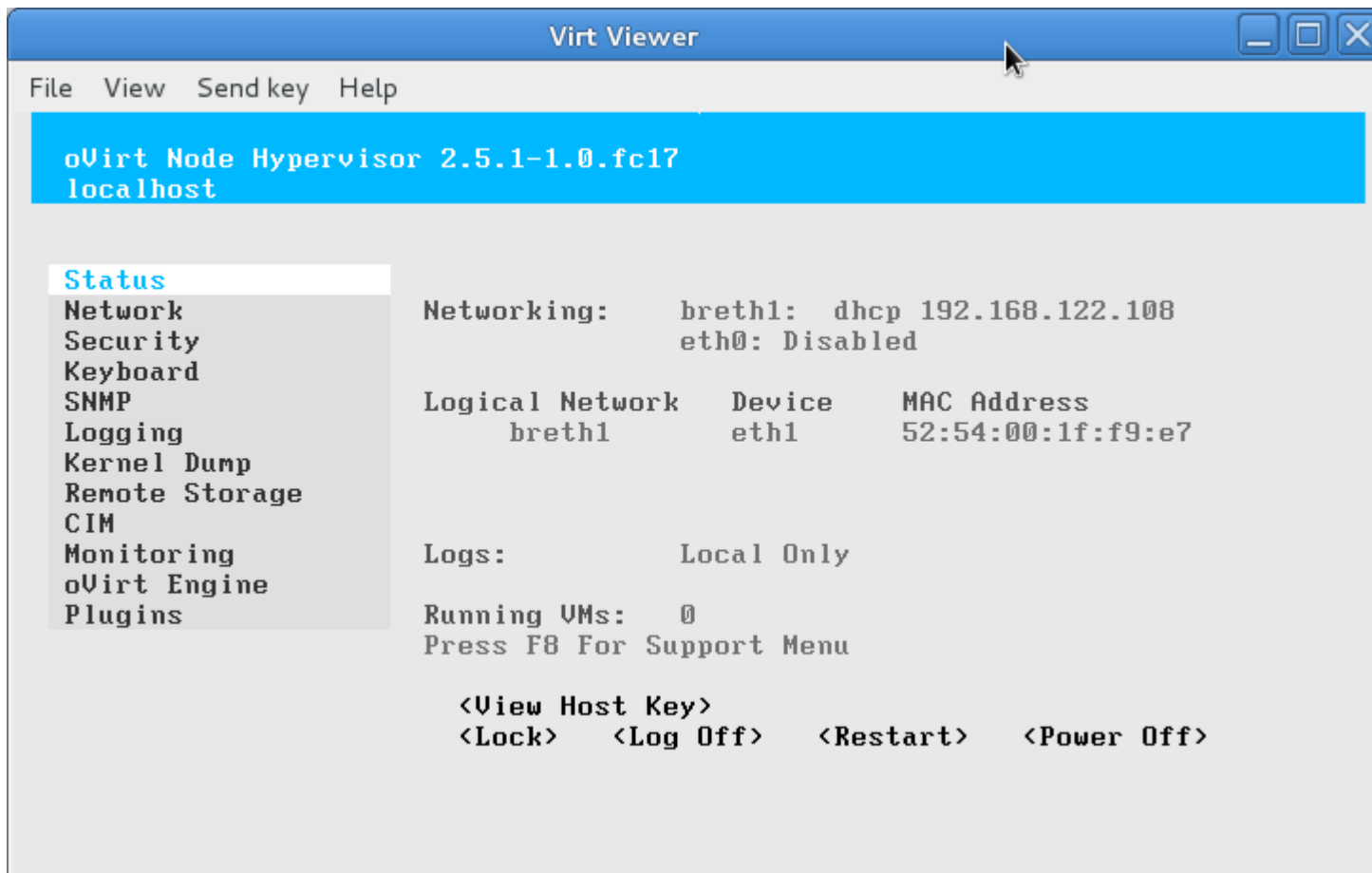
Manual Installation

- Done using a TUI interface
- Keyboard driven
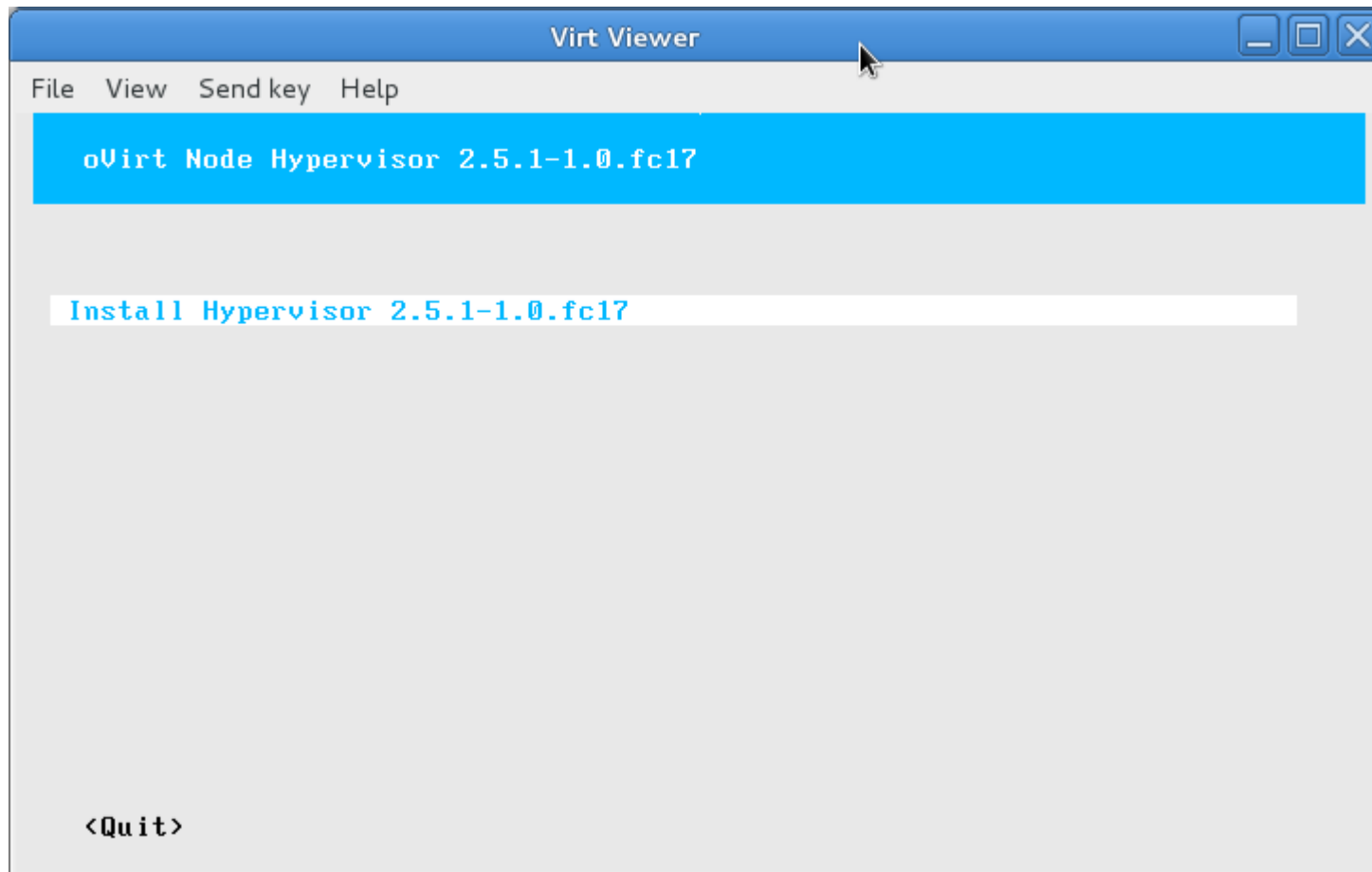
Configuration

- After installation or stateless boot
    - Login as admin to access the TUI to make changes

Installation Disk Layout

Boot

Root

RootBackup

HostVG LVM

Config

Logging

Swap

Data
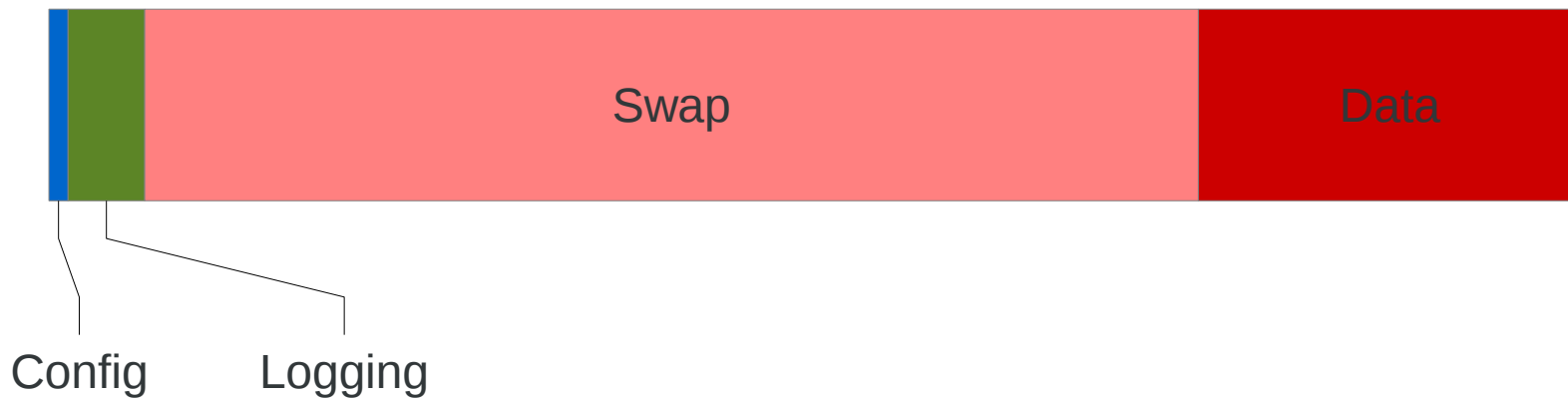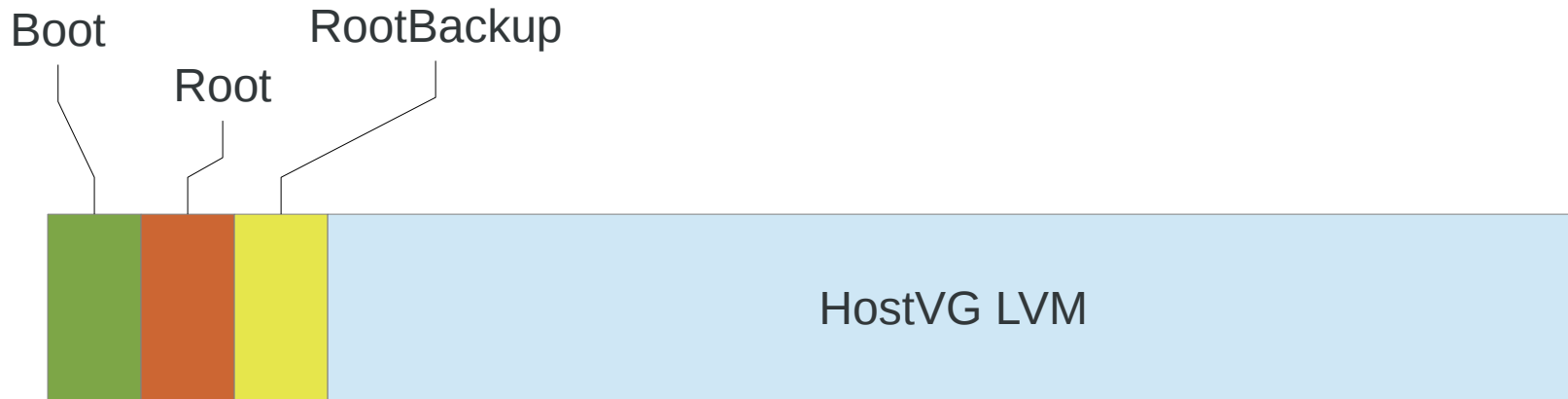
Upgrades

- Usually as simple as booting the new image

  - Update the PXE image

  - Boot new CD/USB/SD

  - In Place Upgrade

    - Upload new image to running system

    - Trigger Upgrade logic

    - Used by oVirt Engine

- Can be done automatically using the command line

- Can be done through TUI

- Clean installs can be triggered with a command line option as well

RootBackup

- Provide roll back capability in the case of a bad upgrade

- Using Grub savedefault

- Upgrade ISO gets installed into RootBackup partition

- Partitions are renamed

  - RootBackup -> RootNew

  - Root -> RootBackup

  - RootNew to Root

- If machine fails to boot, it rolls back to RootBackup

Plugins

What are Plugins?

- Preview in oVirt Node 2.5.1

- Add functionality not included in the base image

- Packaged as RPMs

- Installed offline using edit-node tool (ovirt-node-tools)

    - Start with oVirt Node ISO image

    - Run edit-node tool

    - Get a different oVirt Node ISO image

- Can install arbitrary number of plugins

Plugin Examples

- Update default passwords

- Install or update packages

- Install new kernel modules

- Add vdsm hooks

CIM Plugin

SNMP Plugin

VDSM Hook

Updated Kernel Modules

Base Ovirt Node ISO
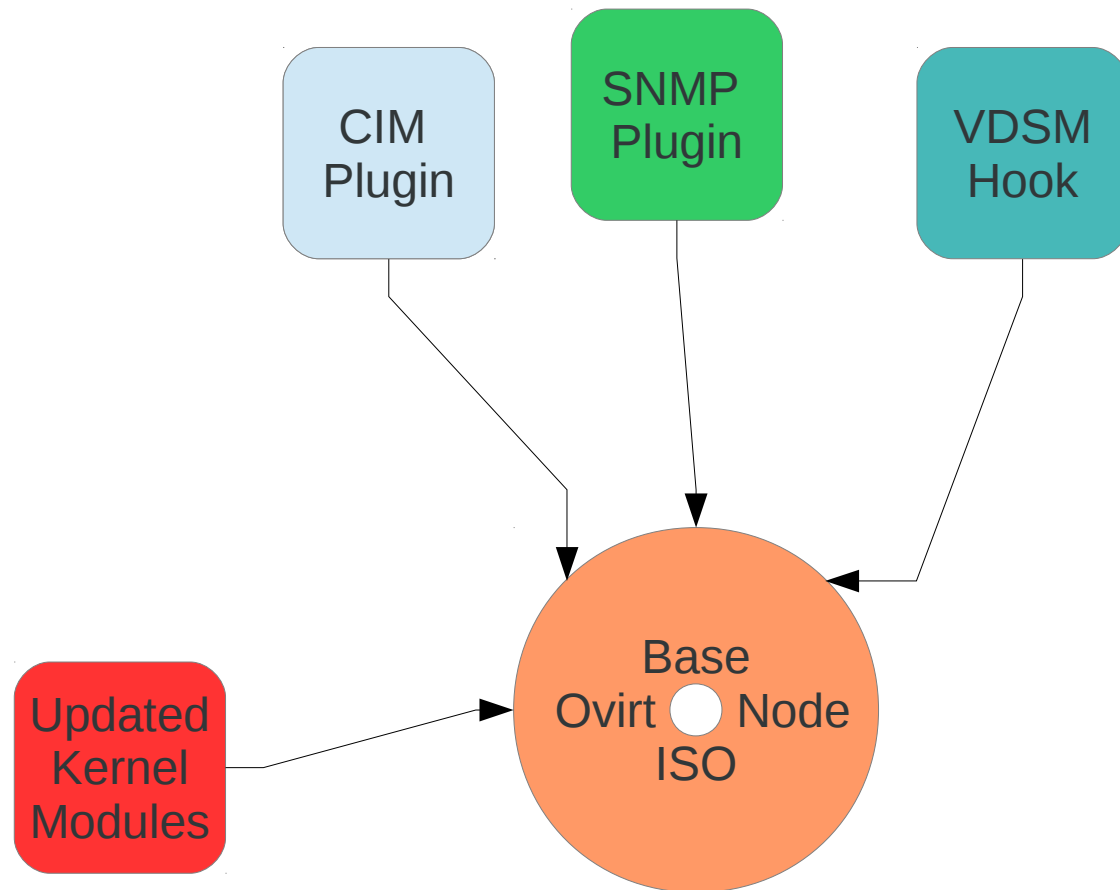
Stateless

Current Support

- Enabled by passing "stateless" on the command line

- Ignores all local storage

- persist and unpersist commands do nothing

- Configuration TUI works the same as in an installed system

- Honors all regular kernel command line options except those having to do with local storage

Current Limitations

- No support for swap

  - This means that you need to disable overcommit in oVirt Engine

- No local storage partition

  - Local Storage Domains in oVirt Engine are not supported

- oVirt Engine does not understand the concept of stateless nodes

  - Have to re-register and approve every reboot

Roadmap

Additional Use Cases

- Non-oVirt use cases

- Can be done by utilizing Plugins

- Investigating OpenStack and Gluster as possible consumers

- Steps needed

  - Remove vdsm from ovirt-node default build and make it a plugin

  - Develop plugins that would pull in appropriate packages for OpenStack and/or Gluster

- Base image is generic and not used for anything

- Admin would use edit-node to install their plugin(s)

Plugin Enhancements

- Add some net-new plugins

  - OpenStack, Gluster, etc...

- Remove some functionality from base image to minimize size

  - SNMP, CIM, etc...

- Additional supported features

  - Service enablement

  - Firewall configuration

  - Auto-installation process

  - Security Profiles

Other Future Features

- Software iSCSI Root Support

- Network Manager

  - Move away from using ifcfg scripts directly to using NM libraries

  - Depends on NetworkManager support for bridges, bonds, and vlans

- Stateless

  - Fix the limitations on swap and local storage domain

- UI Enhancements

  - Make code more re-usable to ease TUI Plugin design

    Allow different size screens (currently only 80x20)

Discussion and Questions

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