Steven Ellis <sellis@redhat.com>
Senior Solution Architect
Red Hat NZ

IS THAT A CLOUD IN YOUR POCKET?

Steven Ellis <sellis@redhat.com>
Senior Solution Architect
Red Hat NZ

AGENDA

- Nested Virtualisation
- Thin LVM
- Snapshots
- RHEL-OSP vs RDO vs DevStack
- Atomic + cloud-init

AGENDA

- Along the way
  - Choosing the right Base OS image(s)
  - Gotchas
  - Power Tips

AGENDA

- What Next?
  - UEFI
  - ARM64?


WHO?

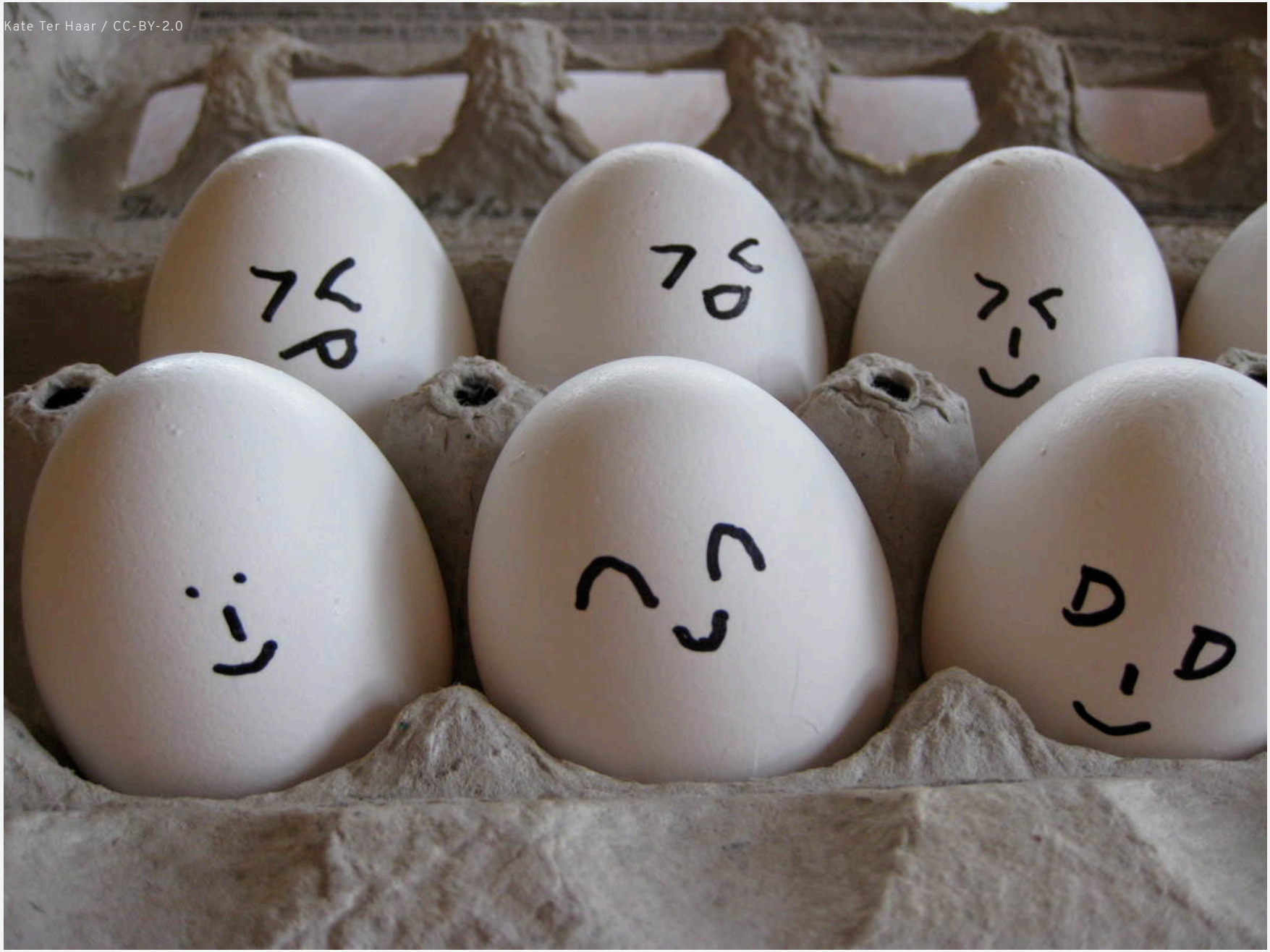

WHERE?


WHY?

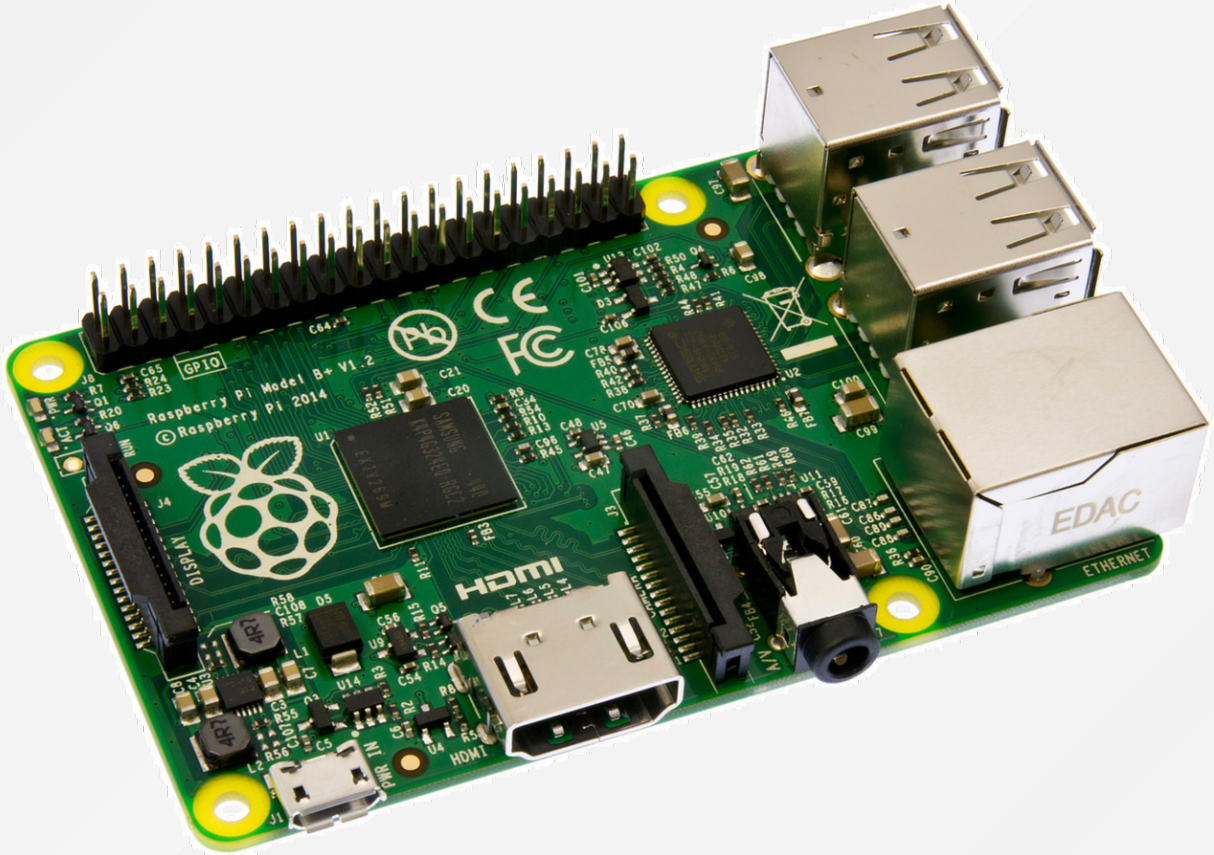

I HAVE AN ITCH


I HAVE AN SCRATCH


I HAVE AN SCRATCH
I NEED TO ITCH


Kate Ter Haar / CC-BY-2.0

redhat


GPIO
Raspberry Pi Model B+ V1.2
©Raspberry Pi 2014
DISPLAY
HDMI
HDMI
PWR IN
EDAC
ETHERNET

redhat

redhat

redhat

redhat.


HARDWARE

redhat

RED HAT®
ENTERPRISE LINUX®

fedora 23

T440s

128 GB SSD

RED HAT®
ENTERPRISE LINUX®

CentOS

redhat


DRAGONS

redhat

NESTED VIRTUALISATION

Huge performance boost over qemu software emulation

NESTED VIRTUALISATION

Huge performance boost over qemu software emulation

/etc/modprobe.d/kvm-intel.conf

```
options kvm-intel nested=1
options kvm-intel enable_shadow_vmcs=1
options kvm-intel enable_apicv=1
options kvm-intel ept=1
```

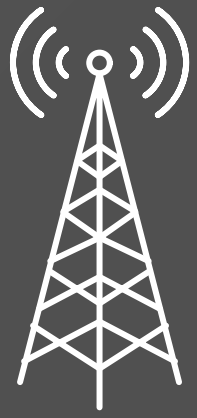
OR

/etc/modprobe.d/kvm-amd.conf

```
options kvm-amd nested=1
```

and reboot - or reload the module

POWER TIP



Always use SSD Storage

Confirm your SSD Storage performance

```
hdparm -t /dev/sdX
```

```
/dev/sda:
  Timing buffered disk reads: 1074 MB in  3.01 seconds = 356.93 MB/sec
```

redhat.

NESTED VIRTUALISATION

Create a dummy VM Centos7_BASE / RHEL7_BASE

- eg via virtual-manager

Edit Virtual Machine CPU type

virtsh edit Centos7_BASE

```
<cpu mode='custom' match='exact'>
  <model fallback='allow'>Nehalem</model>
  <vendor>Intel</vendor>
  <feature policy='require' name='vmx'/>
</cpu>
```

NESTING GOTCHA

Clashing default networks on 192.168.122.x

```
/etc/libvirt/qemu/networks/default.xml
<network>
  <name>default</name>
  <uuid>cf7022ad-7c12-4349-a15d-2bbcd3eba6ea</uuid>
  <bridge name="virbr0" />
  <mac address='52:54:00:95:F9:9F'/>
  <forward/>
  <ip address="192.168.122.1" netmask="255.255.255.0">
    <dhcp>
      <range start='192.168.122.128' end='192.168.122.254' />
    </dhcp>
  </ip>
</network>
```

redhat.

redhat.

THIN LVM ON SSD

Creating a thin pool on VG fedora_t440s

```
[root@t440s ~]# lvcreate  -T -L 80G fedora_t440s/lv_thin
  Logical volume "lv_thin" created.

# RHEL 7 Base Image
[root@t440s ~]# lvcreate  -V40G -T fedora_t440s/lv_thin -n RH7x
  Logical volume "RH7x" created.


# Centos Base Image
[root@t440s ~]# lvcreate  -V40G -T fedora_t440s/lv_thin -n Centos7_BASE
  Logical volume "Centos7_BASE" created.
```

LVM GOTCHAS

THIN ON LVM

```
/etc/lvm/lvm.conf
        issue_discards = 1
```

THIN ON LVM ON LUKS

http://blog.christophersmart.com/2013/06/05/trim-on-lvm-on-luks-on-ssd

/etc/crypttab

```
luks-blah-blah-blah UUID=blah-blah-blah none luks,discard
```

```
dracut --force
```


ALL ABOUT THAT BASE
redhat.

BASE OS IMAGE

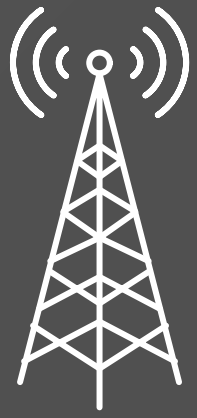
Doesn't have to be a minimal install

Have one for RHEL /Centos 6.x and 7.x (and Fedora / Ubuntu?)

Update your base regularly

How will you build your base image?

POWER TIP



ALWAYS USE A KICKSTART

redhat.

BASE OS IMAGE

Doesn't have to be a minimal install

- What are your main use cases?
  - mine was OpenStack
- Don't skimp on disk
  - 40GB base HD
- Have some re-usable kickstart functions/snippets

PARTITIONS

```
# Rename VG2 as cinder-volumes in our post
# Kickstart doesn't like cinder-volumes as a VG name
#
# Only two partitions on disk as we're BIOS booting
part /boot --fstype=ext4 --size=300
part pv.253002 --size=30760
part pv.253003 --grow --size=1
volgroup vg_vm1 --pesize=4096 pv.253002
volgroup VG2 --pesize=4096 pv.253003
logvol / --fstype=ext4 --name=lv_root --vgname=vg_vm1 \
--grow --size=1024 --maxsize=51200
logvol swap --name=lv_swap --vgname=vg_vm1 --grow \
--size=2016 --maxsize=4032
```

MINIMAL(ISH) PACKAGES

```
%packages
@core
@server-policy
ntp
@Virtualization-Platform
--firstboot
--NetworkManager
--NetworkManager-glib
mysql
```

SSH KEYS

```
# Install SSH keys.
install_ssh_keys()
{
  mkdir -p /root/.ssh
  chmod 700 /root/.ssh
  cat >> /root/.ssh/authorized_keys << KEYS
ssh-rsa owkwdwdwmyreallysimpelepublickey steve@myh
ost
KEYS
  chmod go-r /root/.ssh/authorized_keys
}
```

FIX VG AND YUM CACHE

```
keep_yumcache()
{
    sed -i 's/keepcache=0/keepcache=1/g' /etc/yum.conf
}

fix_vg_name()
{
    vgrename VG2 cinder-volumes
}


install_ssh_keys
fix_vg_name
keep_yumcache
```

redhat.

ADD A RHEL SUBSCRIPTION

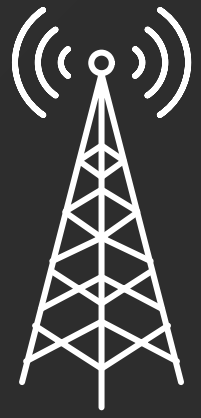
```
subscription-manager register

subscription-manager attach --pool=<POOL_ID>

subscription-manager repos --disable=*

subscription-manager repos --enable=rhel-7-server-rpms
subscription-manager repos --enable=rhel-7-server-rh-common-rpms
```

redhat

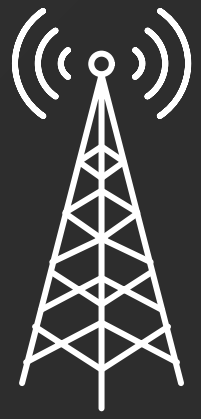
POWER TIP

Keep a Content Cache

- rsync
  - nice and simple



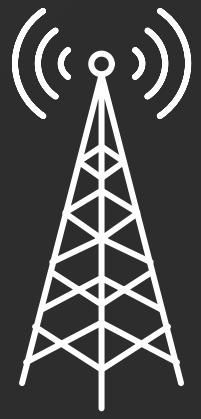
POWER TIP



Keep a Content Cache

- rsync
  - nice and simple
- createrepo
  - More elegant

POWER TIP



Keep a Content Cache

- rsync
  - nice and simple
- createrepo
  - More elegant
- RH Satellite 6.x / Katello + The Foreman
  - Double brownie points
  - Needs more storage

PATCH THE RHEL VM

```
# from my host environment

rsync -av \
7Server/rhel-7-server-rpms \
7Server/rhel-7-server-rh-common-rpms  \
openstack:/var/cache/yum/x86_64/7Server/

# From my VM

yum -y upgrade

# Pull changes back to my cache

rsync -av \

openstack:/var/cache/yum/x86_64/7Server/ 7Server/
```

PATCH THE CENTOS VM

```
# from my host environment

rsync -av  7/ centos7:/var/cache/yum/x86_64/7/


# From my VM

yum -y upgrade


# Pull changes back to my cache

rsync -av centos7:/var/cache/yum/x86_64/7/ 7/
```

ALL ABOUT THAT THIN BASE

CLEAN UP YOUR VM

```
yum clean all
```

OR

```
yum clean packages
```

MIGRATING TO THIN LVM

Power off your VM and get to know fstrim and kpartx

```
[root@t440s ~]# kpartx -a  /dev/fedora_t440s/Centos7
[root@t440s ~]# cd /mnt; mkdir volume

[root@t440s mnt]# mount /dev/mapper/fedora_t440s-Centos7_BASE1 /mnt/volume/
[root@t440s mnt]# fstrim -v volume
boot: 356.5 MiB (373850112 bytes) trimmed
[root@t440s mnt]# umount volume/

[root@t440s mnt]# mount /dev/centos7/root /mnt/volume/
[root@t440s mnt]# fstrim -v ./volume
./boot: 9.8 GiB (10481520640 bytes) trimmed
[root@t440s mnt]# umount volume

[root@t440s mnt]# vgchange -a n  centos7
  0 logical volume(s) in volume group "centos7" now active
[root@t440s mnt]# kpartx -d /dev/mapper/fedora_t440s-Centos7_BASE
```

LVTHIN GOTCHAS

virt-manager and thin

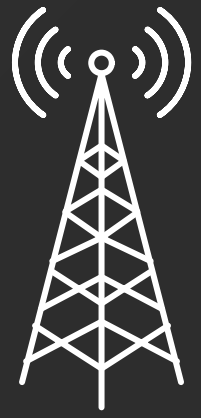
- Can't manage existing thin volumes
- You can manually add the path

LVTHIN GOTCHAS

virt-manager and thin

- Can't manage existing thin volumes
- **Don't** manually add the path
- virsh edit <VM Image>
  - manually enter the pathname

POWER TIP



Enable discard for your VM

- https://chrisirwin.ca/posts/discard-with-kvm/

1. Check your machine type > 2.1

```
<type arch='x86_64' machine='pc-i440fx-2.4'>hvm</type>
```

2. Add discard to your hard disks

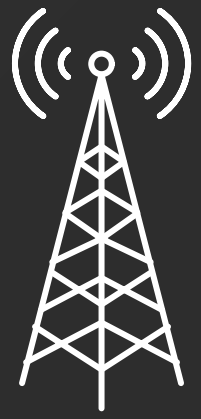
```
<driver name='qemu' type='raw' discard='unmap'/>
```

3. Add scsi controller model virtio-scsi

```
<controller type='scsi' index='0' model='virtio-scsi'>
```

redhat.

POWER TIP



Boot and test your VM

```
[root@rhel7 ~]# lsblk -o MOUNTPOINT,DISC-MAX,FSTYPE
MOUNTPOINT DISC-MAX FSTYPE
 /boot           1G xfs
[SWAP]           1G swap
/                1G xfs
```

Run fstrim in your VM

```
[root@rhel7_local ~]# fstrim -v /boot/
/boot/: 334.5 MiB (350711808 bytes) trimmed
[root@rhel7_local ~]# fstrim -v /
/: 10.4 GiB (11197124608 bytes) trimmed
```

LVM THIN SNAPSHOTS

SNAPSHOTS OF SNAPSHOTS

- Great on Thin on SSD
  - minimal performance overheard
- I can easily create latest RDO or RHEL-OSP off my base
- Make snapshots as your layer things up
- Sensible names
  - RHOSP8_v1 vs RHOSP8_neutron_test
- Keep copious notes

THIN SNAPSHOT GOTCHA

Thin no longer auto activates

redhat.

THIN SNAPSHOT GOTCHA

Thin no longer auto activates

This is good

```
[root@t440s ~]# lvcreate -s --name RH7_RHOSP8  fedora_t4
40s/RH7x
  Logical volume "RH7_RHOSP8" created.

# Enable the thin volume
[root@t440s ~]# lvchange -ay  -K fedora_t440s/RH7_RHOSP8
```

LETS BUILD A CLOUD

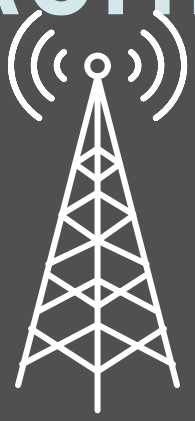
INITIAL RHEL-OSP BASE

```
# use virsh edit to re-point our VM at the new snapshot

# start VM

systemctl stop NetworkManager
yum remove NetworkManager\*
systemctl enable network

subscription-manager repos \
--enable=rhel-7-server-rpms \
--enable=rhel-7-server-rh-common-rpms \
--enable=rhel-7-server-extras-rpms \
--enable=rhel-ha-for-rhel-7-server-rpms \
--enable=rhel-7-server-openstack-8.0-rpms \
--enable=rhel-7-server-openstack-8.0-director-rpms
```

INITIAL CENTOS 7 BASE

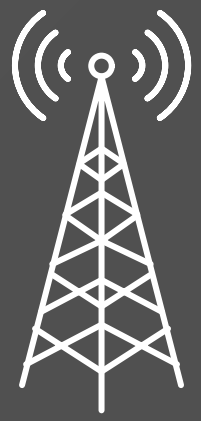
```
# use virsh edit to re-point our VM at the new snapshot

# start VM

systemctl stop NetworkManager
yum remove NetworkManager\*
systemctl enable network
```

COPY OUR CONTENT CACHE



```
# RHEL - from my host environment

rsync -av \
7Server/rhel-7-server-rpms \
7Server/rhel-7-server-rh-common-rpms  \
7Server/rhel-ha-for-rhel-7-server-rpms \
7Server/rhel-7-server-openstack-8.0-rpms \
7Server/rhel-7-server-openstack-8.0-director-rpms \
openstack:/var/cache/yum/x86_64/7Server/


# Centos - from my host environment

rsync -av 7/ \
centos:/var/cache/yum/x86_64/7/
```

OR USE MY YUM CACHE



/etc/yum.repos.d/local.repo

```
[rhel-7-server-cached]
name = Baseline RHEL7 cached packages
baseurl = http://192.168.122.1/repo/rhel-7-server-rpms
gpgkey = file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
enabled = 1
sslcacert = /etc/rhsm/ca/redhat-uep.pem
gpgcheck = 1


[rhel-7-server-extras-cached]
name = Baseline RHEL7 extras cached packages
baseurl = http://192.168.122.1/repo/rhel-7-server-extras-rpms
gpgkey = file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
enabled = 0
sslcacert = /etc/rhsm/ca/redhat-uep.pem
gpgcheck = 1
```

RED HAT® OPENSTACK® PLATFORM

RH OSP + PACKSTACK

Simple packstack

```
packstack --allinone  --cinder-volumes-create=n
```

Uses our existing cinder-volumes as LVM backing for cinder

Rsync post packstack repo back to our host

```
rsync -av \

openstack:/var/cache/yum/x86_64/7Server/  7Server/
```

Reboot and have a play


RDO


redhat.

RDO + PACKSTACK

Simple packstack - https://www.rdoproject.org/Quickstart

```
yum -y upgrade
yum install -y \
https://www.rdoproject.org/repos/rdo-release.rpm
yum install -y openstack-packstack
packstack --allinone  --cinder-volumes-create=n
```

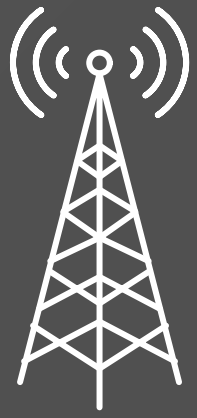
Uses our existing cinder-volumes as LVM backing for cinder

Rsync post packstack repo back to our host

```
rsync -av   centos:/var/cache/yum/x86_64/7/   7/
```

Reboot and have a play

POWER TIP



Keep **digital** notes

- Pen + Paper = a start
- vi / gedit / gnote
- Google Docs / Google Keep
- Trac / Redmine / Wiki
- Document in Mojo

redhat

Search

logged in as steve | Logout | Preferences | Help/Guide | About Trac

Wiki | Timeline | Roadmap | Browse Source | View Tickets | New Ticket | Search | Admin

← Previous Ticket | Next Ticket →

Ticket #193 (accepted task)

Modify ↓

Create Centos 7 base image for demos

Opened 5 weeks ago
Last modified 0 seconds ago

Reported by:	steve	Owned by:	steve
Priority:	minor	Milestone:	FY16Q4
Component:	Centos	Version:	
Keywords:		Cc:	

Description (last modified by steve) (diff)

Reply

Needed for my LCA 2015 session to repeat some RDO and Atomic demos

Refs

- #167 Create local lv_thin pool on T440s for Demos
- #191 RHEL7 based OpenStack demo of RHELOSP8 Liberty
- #185 RHEL7 based OpenStack demo of RDO Kilo
- ~~#159~~ RHEL7 based OpenStack demo of RHOS5
- RHEL7 based OpenStack demo of RHELOSP7 Kilo

Need to apply the following profile to the VM for nesting

```
<cpu mode='custom' match='exact'>
  <model fallback='allow'>Nehalem</model>
  <vendor>Intel</vendor>
  <feature policy='require' name='vmx'/>
```

FIREWALL GOTCHA

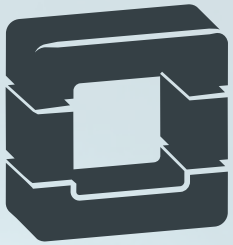
```
# Learn firewalld

firewall-cmd --permanent  --add-service=http
firewall-cmd --permanent  --add-service=https

firewall-cmd --permanent  --add-port=5000/tcp
```

RED HAT® OPENSTACK® PLATFORM

VS

RDO

redhat.



openstack™

ETSI

OPEN DAYLIGHT

RDO

OPNFV

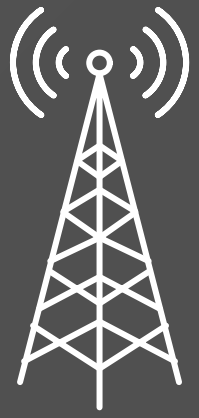
RED HAT®

OPENSTACK®

PLATFORM

redhat.

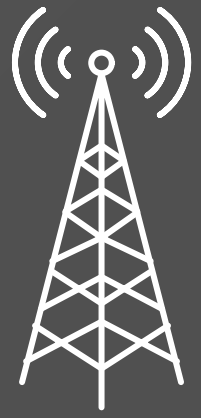
UBER POWER TIPS



Documentation and Repeatability

- I can blow away my snaps

UBER POWER TIPS

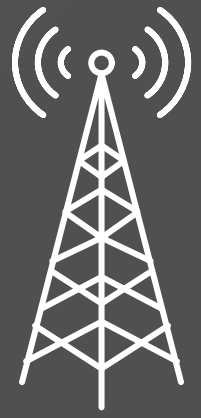


Documentation and Repeatability

- I can blow away my snaps

Regularly patch base environment (s)

UBER POWER TIPS



Documentation and Repeatability

- I can blow away my snaps

Regularly patch base environment (s)

Re-image my base very quickly

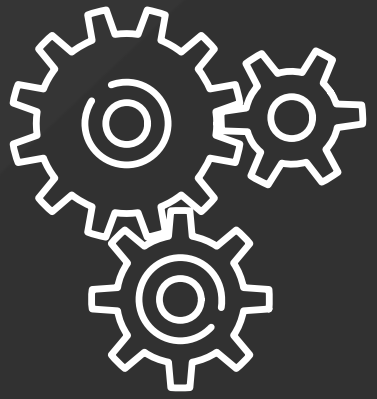
Reduce my overall Internet traffic

EXPERIMENT

Lets do some neutron hacking.

```
[root@t440s ~]# lvcreate -s --name RH7_RHOSP8_Net
\

                fedora_t440s/RH7_RHOSP8

  Logical volume "RH7_RHOSP8_Net" created.

[root@t440s ~]# lvchange  -a y -K fedora_t440s/RH7
_RHOSP8_Net
```

Edit VM via virsh edit and restart



ANSIBLE

https://github.com/steven-ellis/ansible-packstack

```
---
- hosts: packstack
  vars:
    repo_host: 192.168.122.1
  remote_user: root
  tasks:
  - name: install the RDO Yum Respository for CentOS / RHEL
    yum: name=https://www.rdoproject.org/repos/rdo-release.rpm state=prese
nt
    when: ansible_distribution == "CentOS"

  - name: Enable the correct repositories when on RHEL 7
    command: subscription-manager repos \
             --disable=\* \
             --enable=rhel-7-server-rpms \
             --enable=rhel-7-server-rh-common-rpms \
             --enable=rhel-7-server-optional-rpms \
             --enable=rhel-7-server-extras-rpms \
             --enable=rhel-ha-for-rhel-7-server-rpms \
             --enable=rhel-7-server-openstack-7.0-rpms \
             --enable=rhel-7-server-openstack-7.0-director-rpms
    when: (ansible_distribution == "RedHat" and ansible_distribution_major
_version == "7")
```

```
---
- hosts: packstack
  vars:
    repo_host: 192.168.122.1
  remote_user: root
  tasks:
  - name: install the RDO Yum Respository for CentOS / RHEL
    yum: name=https://www.rdoproject.org/repos/rdo-release.rpm state=prese
nt
    when: ansible_distribution == "CentOS"

  - name: Enable the correct repositories when on RHEL 7
    command: subscription-manager repos \
             --disable=\* \
             --enable=rhel-7-server-rpms \
             --enable=rhel-7-server-rh-common-rpms \
             --enable=rhel-7-server-optional-rpms \
             --enable=rhel-7-server-extras-rpms \
             --enable=rhel-ha-for-rhel-7-server-rpms \
             --enable=rhel-7-server-openstack-7.0-rpms \
             --enable=rhel-7-server-openstack-7.0-director-rpms
    when: (ansible_distribution == "RedHat" and ansible_distribution_major
_version == "7")
```

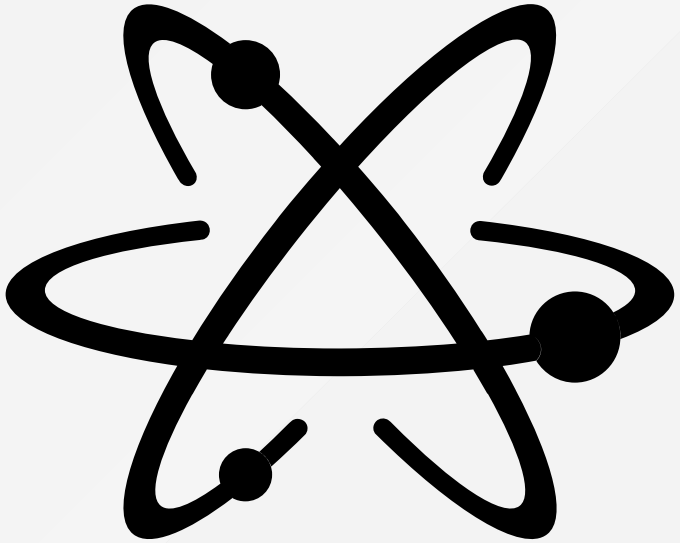
```
---
- hosts: packstack
  vars:
    repo_host: 192.168.122.1
  remote_user: root
  tasks:
  - name: install the RDO Yum Respository for CentOS / RHEL
    yum: name=https://www.rdoproject.org/repos/rdo-release.rpm state=prese
nt
    when: ansible_distribution == "CentOS"

  - name: Enable the correct repositories when on RHEL 7
    command: subscription-manager repos \
             --disable=\* \
             --enable=rhel-7-server-rpms \
             --enable=rhel-7-server-rh-common-rpms \
             --enable=rhel-7-server-optional-rpms \
             --enable=rhel-7-server-extras-rpms \
             --enable=rhel-ha-for-rhel-7-server-rpms \
             --enable=rhel-7-server-openstack-7.0-rpms \
             --enable=rhel-7-server-openstack-7.0-director-rpms
    when: (ansible_distribution == "RedHat" and ansible_distribution_major
_version == "7")
```

```
 - name: Make sure we have yum-utils
   yum: name=yum-utils state=latest

 - name: Make sure we have yum-plugin-priorities
   yum: name=yum-plugin-priorities state=latest

 - include: local_repo.yaml
 - include: local_openstack_repo.yaml

 - name: upgrade all packages
   yum: name=* state=latest

 - name: install the Packstack from Red Hat RH-OSP repository or from RDO
on Centos
   yum: name=openstack-packstack state=latest

 - name: Execute Packstack
   command: packstack --allinone --cinder-volumes-create=n
```

```
 - name: Make sure we have yum-utils
   yum: name=yum-utils state=latest

 - name: Make sure we have yum-plugin-priorities
   yum: name=yum-plugin-priorities state=latest

 - include: local_repo.yaml
 - include: local_openstack_repo.yaml

 - name: upgrade all packages
   yum: name=* state=latest

 - name: install the Packstack from Red Hat RH-OSP repository or from RDO
on Centos
   yum: name=openstack-packstack state=latest

 - name: Execute Packstack
   command: packstack --allinone --cinder-volumes-create=n
```

```
 - name: Make sure we have yum-utils
   yum: name=yum-utils state=latest

 - name: Make sure we have yum-plugin-priorities
   yum: name=yum-plugin-priorities state=latest

 - include: local_repo.yaml
 - include: local_openstack_repo.yaml

 - name: upgrade all packages
   yum: name=* state=latest

 - name: install the Packstack from Red Hat RH-OSP repository or from RDO
on Centos
   yum: name=openstack-packstack state=latest

 - name: Execute Packstack
   command: packstack --allinone --cinder-volumes-create=n
```

LVM VS QCOW



RED HAT ATOMIC

redhat.

LEARN CLOUD-INIT

https://access.redhat.com/articles/rhel-atomic-cloud-init-faq

Create two data files we can inject via cloud-init

- `meta-data`
- user-data

EXAMPLE FILES

```
# cat >meta-data<<EOF

instance-id: Atomic0
local-hostname: atomic-00
EOF
```

EXAMPLE FILES

```
# cat >meta-data<<EOF

instance-id: Atomic0
local-hostname: atomic-00
EOF

# cat >user-data<<EOF
#cloud-config
password: atomic
chpasswd: {expire: False}
ssh_pwauth: True
ssh_authorized_keys:
  - ssh-rsa <my rsa pubkey> steve@host
EOF
```

CREATE ISO IMAGE

```
genisoimage -output atomic0-cidata.iso \
-volid cidata -joliet -rock user-data meta-data

I: -input-charset not specified, using utf-8 (detected in
locale settings)
Total translation table size: 0
Total rockridge attributes bytes: 331
Total directory bytes: 0
Path table size(bytes): 10
Max brk space used 0
183 extents written (0 MB)
```

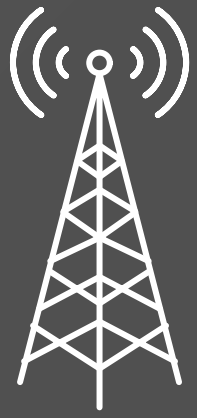
QEMU + QCOW2

```
[root@t440s images]# qemu-img create -f qcow2 \
-o backing_file=../ISO/rhel-atomic-cloud-7.1-1.x86_64.qcow2 \
atomic-instance-0.qcow2

Formatting 'atomic-instance-0.qcow2', fmt=qcow2 size=107374182
40 backing_file='../ISO/rhel-atomic-cloud-7.1-1.x86_64.qcow2'
encryption=off cluster_size=65536 lazy_refcounts=off
```

QEMU + QCOW2 + LIBVIRT

```
# Use virt-install to create our first atomic host

# Note the cloud-init ISO file

virt-install --import --name Atomic0 --ram 2048 --vcpus 2 \
--disk path=/opt/Virtual/images/atomic-instance-0.qcow2,format=qcow2
,bus=virtio \
--disk path=/opt/Virtual/images/atomic0-cidata.iso,device=cdrom \
--network bridge=virbr0 --graphics vnc


# Lets start a console

virsh console Atomic0
```

POWER TIP



You can re-init the disk without re-running virt-install

- cloud-init cdrom will still be attached
- You can also snap your snap.

QCOW2 GOTCHAS

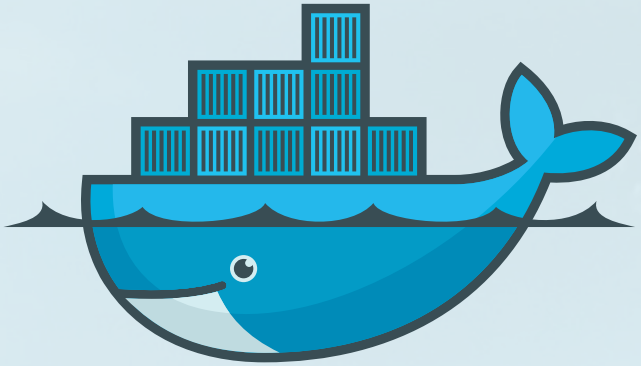
Don't snapshot a running instance

RED HAT®
ENTERPRISE LINUX®
ATOMIC HOST

fedora

CentOS

PROJECT
ATOMIC



+

redhat.

DOCKER EXAMPLES

Playing with Docker and Kubernetes on Atomic

- mydbforweb
  - https://access.redhat.com/articles/1330533
- webwithdb
  - https://access.redhat.com/articles/1328953
- Getting started with Kubernetes
  - https://access.redhat.com/articles/1198103

redhat.

redhat.

redhat

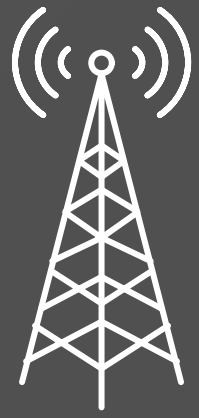
UEFI + KVM

Currently can boot a VM

Need to re-base

- VMs
- Kickstarts
- Then full Secure boot

UEFI READY USB KEY



Download RHEL 7.x 64bit ISO or Fedora

```
dd if=rhel-server-7.1-x86_64-dvd.iso \
      of=/dev/sdx
```

OR

```
livecd-iso-to-disk \

 --format --reset-mbr \
--efi rhel-server-7.1-x86_64-dvd.iso \
/dev/sdx
```

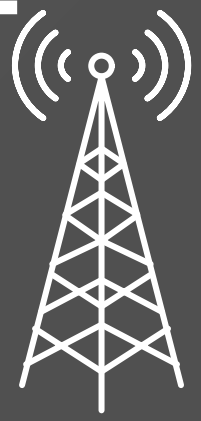
Boot USB in UEFI mode

- **force** UEFI only in BIOS

redhat

redhat.

UEFI + BIOS LIVE IMAGE



Full RHEL 7.x install

Can boot on BIOS and UEFI systems

Runs off 32 GB USB3 Key

redhat.

RHEL 7.X INSTALL

In UEFI Mode + leave a little space on the USB Key

- 8MB is sufficient

Boot / test / patch

Note your EFI layout

```
[root@rhel7sd 7Server]# parted /dev/sdd unit s print
Model: TS-RDF5 SD Transcend (scsi)
Disk /dev/sdb: 30539776s
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start     End         Size        File system  Name                  Fla
gs
 1      2048s     411647s     409600s     fat16        EFI System Partition  boo
t
 2      411648s   1435647s    1024000s    xfs
 3      1435648s  28706815s   27271168s
```

BIOS ENABLE

Legacy BIOS needs a couple of tweaks

- Additional bios_grub partition

```
# parted -a optimal /dev/sdd
(parted) unit s
(parted) mkpart non-fs 28706816s 28710911s

(parted) print
Model: TS-RDF5 SD Transcend (scsi)
Disk /dev/sdd: 30539776s
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start      End        Size       File system  Name                  Flags
 1      2048s      411647s    409600s    fat16        EFI System Partition  boot, esp
 2      411648s    1435647s   1024000s   xfs                                msftdata
 3      1435648s   28706815s  27271168s                                     lvm
 4      28706816s  28710911s  4096s                   non-fs

(parted) set 4  bios_grub on
```

INSTALL GRUB2

Currently only have grub2-efi installed

```
yum install grub2
```

Power off and force BIOS to boot **Legacy** only

Then boot from your Installer in rescue mode from USB Key or DVD-ROM

BIOS GRUB2

You **must** have booted in legacy mode to enable traditional grub2

```
chroot /mnt/sysimage
```

```
grub-install --target=i386-pc /dev/sdx
```

```
grub2-mkconfig -o /boot/grub/grub.conf
```

Reboot and test - should survive kernel upgrades

Retest in UEFI mode

redhat

TO DO

Re-Work all demos as UEFI ready kickstarts

- kickstart via Ansible -> OpenStack

kickstart the creation of my BIOS/UFI live image

- Add encryption support?

Fully script Kubernetes on Atomic via cloud-init + Ansible

RED HAT® ENTERPRISE LINUX®
SERVER FOR ARM
Development Preview

redhat.

QUESTIONS?

BREAKOUT SESSIONS - Wednesday April 27th

Zaqar Messaging for Microservices and IoT	Fei Long Wang (Catalyst), Ryan Brown (Red Hat), Victoria Martinez de la Cruz (Red Hat)	9:00am – 9:40am
Service Function Chaining – Technology Analysis and Perspective	Tim Rozet(Red Hat), Bin Hu (AT&T)	9:50am – 10:30am
Debugging OpenStack failure scenarios with Ansible and Oslogmerger	Miguel Angel Ajo (Red Hat), Gorka Eguileor (Red Hat)	11:50am – 12:30pm
Is that a Cloud in your Pocket?	Steven Ellis	11:50am – 12:30pm
Tired of iptables based security groups? Here's how to gain tremendous speed with Open vSwitch instead!	Jakub Libosvar (Red Hat), Rodolfo Alonso (Intel)	1:50pm – 2:30pm
Achieving Five-Nines of VNF Reliability in Telco-Grade OpenStack Cloud	Rimma Iontel (Red Hat), Eoin Walsh (Intel)	1:50pm – 2:30pm
Designing for NFV: Lessons Learned from Deploying at Verizon	Radhesh Balakrishnan (Red Hat), Kyle Forrester (Big Switch), Chris Emmons (Dell)	3:30pm – 4:10pm
Protecting the Galaxy – Multi-Region Disaster Recovery with OpenStack and Ceph	Sean Cohen, Federico Lucifredi, Sebastien Han	4:30pm – 5:10pm

BREAKOUT SESSIONS - Thursday April 28th

Lab: Deploy Microservices Architecture on OpenStack using Kubernetes, Docker, Flannel and etcd	Al Kari	9:00am – 10:30am
Orchestrated Containerization with OpenStack	Lars Herrmann	9:00am – 9:40am
The Notorious M.T.U.	Kevin Benton (Mirantis), Sean Collins (Mirantis), Matthew Kassawara (IBM), Ihar Hrachyshka (Red Hat)	9:00am – 9:40am
CephFS in Jewel: Stable at last	Greg Farnum	11:00am – 11:40am
Using a Service VM as an IPv6 vRouter	Bin Hu (AT&T), Sridhar Gaddam (Red Hat), Prakash (Huawei)	11:00am – 11:40am
Neutron Quality of Service, new features and future roadmap.	Miguel Ángel Ajo (Red Hat), Victor Howard (Comcast), Sławek Kapłoński (OVH Group)	1:30pm – 2:10pm

THANK YOU

sellis@redhat.com

http://people.redhat.com/sellis


plus.google.com/+RedHat


facebook.com/redhatinc


linkedin.com/company/red-hat


twitter.com/RedHatNews


youtube.com/user/RedHatVideos


redhat

redhat.

THANK YOU!

sellis@redhat.com

http://people.redhat.com/sellis

linkedin.com/company/red-hat

twitter.com/RedHatNews

facebook.com/redhatinc

plus.google.com/+RedHat

youtube.com/redhat