

Infrared

and the Fantabulous Emancipation of One OSP Lab

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November 2019



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@dark_axl



/rootzilopochtli



www.rootzilopochtli.com



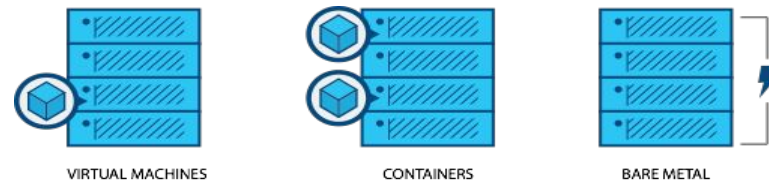
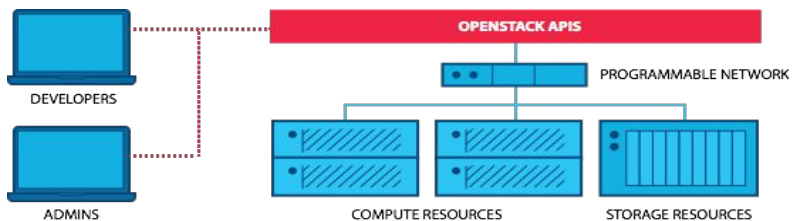
Geek by nature, Linux by choice, Fedora of course!

DISCLAIMER

- Esta presentación es realizada con fines **estrictamente** educativos
- El método presentado se encuentra en constante desarrollo
- La infraestructura de laboratorio generada **no está soportada**, incluyendo la que contempla el uso de suscripciones
- Bajo ninguna condición se recomienda el uso en ambientes diferentes al de laboratorio de pruebas
- El presentador se deslinda de cualquier responsabilidad sobre las decisiones tomadas como resultado de esta presentación



What is OpenStack?



Infraestructura programable que presenta un conjunto común de API's, además de recursos de cómputo, redes y almacenamiento para proporcionar una infraestructura como servicio en la nube (IaaS)

Una plataforma para máquinas virtuales, contenedores y baremetal

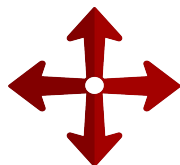
What is OpenStack used for?



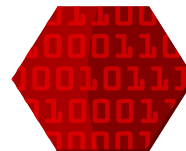
NETWORK
FUNCTION
VIRTUALIZATION



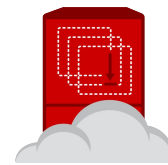
DEVELOPER
CLOUD



EDGE
COMPUTING



AI/ML/HPC



SERVICE
PROVIDER

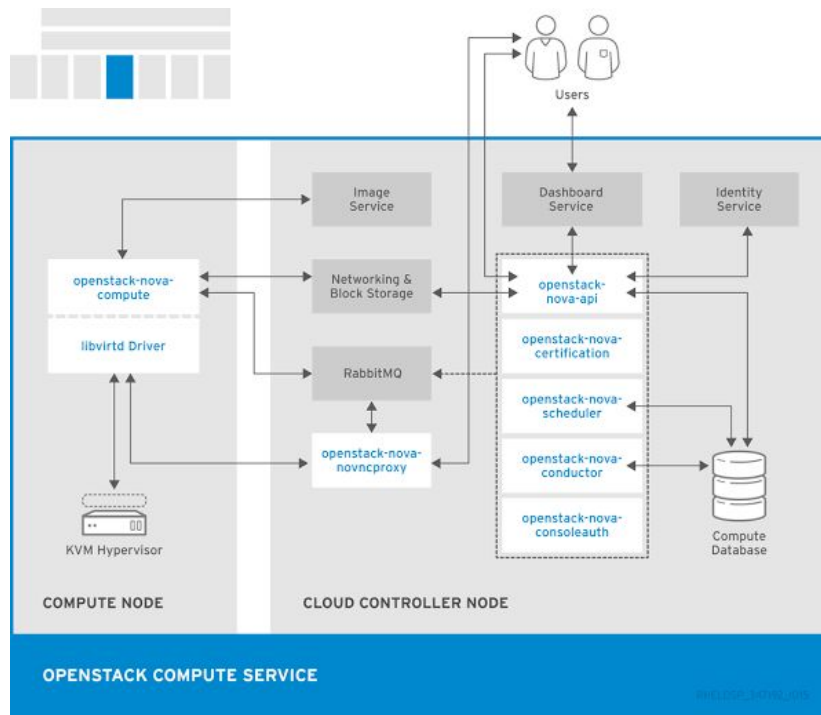
En serio, ¿qué es OpenStack?



En serio, ¿qué es OpenStack?

Tipos de nodos:

- ▶ Controller¹
 - DB's y API's
- ▶ Compute¹
 - Hypervisor
- ▶ Storage²



[1] Infraestructura mínima soportada: 3 controllers, 2 computes

[2] Opcional

Test Deployments



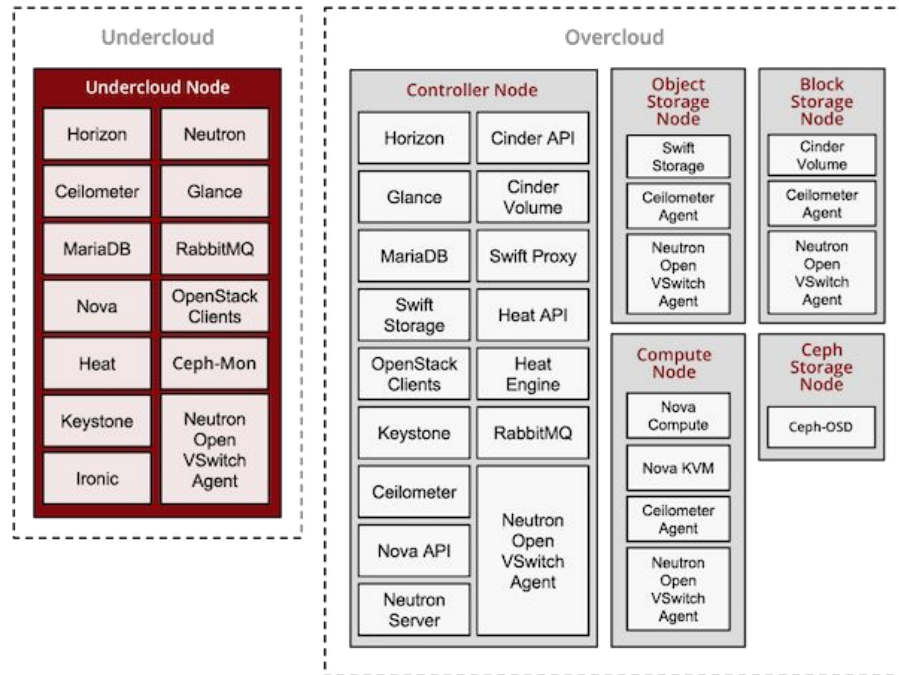
Create a proof of concept cloud

Deploy a production Cloud

TripleO

TripleO se refiere a “OpenStack On OpenStack”

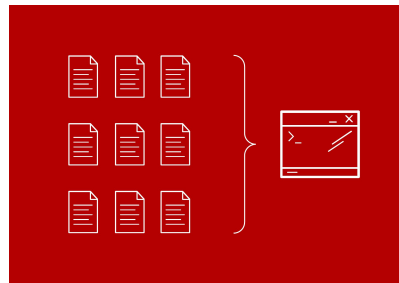
- ▶ Objetivo oficial del proyecto OpenStack
 - Capacidad para desplegar y administrar la nube de producción en bare-metal hardware utilizando un subconjunto de componentes de OpenStack



Infrared

InfraRed is a plugin based system that aims to provide an easy-to-use CLI for Ansible based projects. It aims to leverage the power of Ansible in managing / deploying systems, while providing an alternative, fully customized, CLI experience that can be used by anyone, without prior Ansible knowledge.

The project originated from Red Hat OpenStack infrastructure team that looked for a solution to provide an “easier” method for installing OpenStack from CLI but has since grown and can be used for *any* Ansible based projects.



Source: <https://infrared.readthedocs.io/>

Infrared

Requerimientos

- ▶ Un **servidor físico** con al menos:
 - **48 GB** de RAM
 - Disco duro de **150 GB**
 - Puede sobrevivir con *70 GB* si se usa la compresión *btrfs* y *zlib* para `/var/lib/libvirt/images`
 - Virtualización de CPU habilitada en BIOS / UEFI
- ▶ Fedora Server **>25**, CentOS o RHEL **7** con:
 - `git gcc libffi-devel openssl-devel python-virtualenv libselinux-python redhat-rpm-config screen`



Dell PowerEdge R720
Intel(R) Xeon(R) CPU E5-2620 v2 @ 2.10GHz
32058 MB memory, 299 GB disk space

Source Photo: <https://twitter.com/base2wave/status/1197223104457715712>

Lab deployment

Instalar infrared:

```
git clone https://github.com/redhat-openstack/infrared.git
cd infrared
virtualenv .venv && source .venv/bin/activate
pip install --upgrade pip
pip install --upgrade setuptools
pip install --upgrade infrared
pip install .
echo ". $(pwd)/etc/bash_completion.d/infrared" >> ${VIRTUAL_ENV}/bin/activate
infrared plugin list
```

Lab deployment

Recomendaciones

- ▶ **screen** y/o **tlog**
 - <http://www.rootzilopochtli.com/2019/02/tlog-grabar-sesiones-en-la-terminal/>
- ▶ **time**
- ▶ Destruir VM's y restaurar la configuración original
 - `kill`

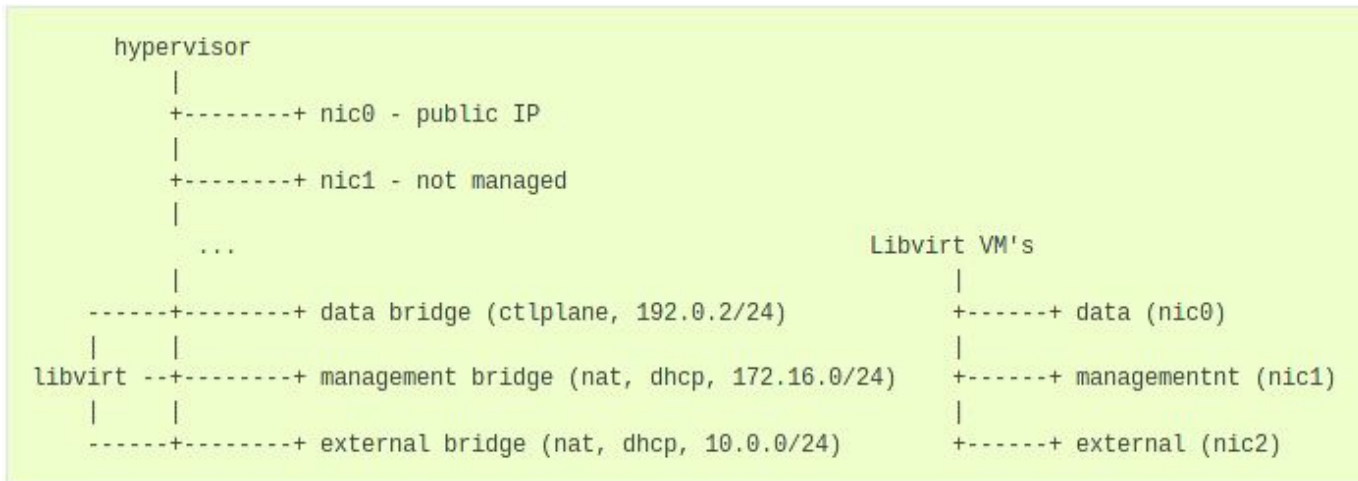
```
time infrared virsh -v -o cleanup.yml --host-address $HOST --host-key $HOST_KEY --kill yes
```

- `cleanup`

```
time infrared virsh --cleanup True --host-address $HOST --host-key $HOST_KEY
```

Lab deployment

Network layout:



Lab deployment



Infra deployment:

```
time infrared virsh -v --host-memory-overcommit True \  
--host-address $HOST --host-key $HOST_KEY --host-user root \  
--topology-nodes "undercloud:1,controller:3,compute:2" \  
-e override.controller.cpu=2 -e override.controller.memory=8192 \  
-e override.controller.disks.disk1.size=60G -e override.compute.disks.disk1.size=60G \  
-e override.compute.memory=16384 -e override.undercloud.memory=16384 \  
--image-url https://cloud.centos.org/centos/7/images/CentOS-7-x86_64-GenericCloud.qcow2
```

Lab deployment



Instalar undercloud (director):

```
time infrared tripleo-undercloud --version queens --images-task build --ssl no
```

Si el tamaño del lab es menor a 64 Gb de RAM, se recomienda reducir los *workers* a 1. Se puede utilizar el script:

```
curl -L -O https://raw.githubusercontent.com/mrVectorz/snips/master/osp/low_memory_uc.sh
```


Lab deployment



Instalar overcloud (controllers y computes):

```
time infrared tripleo-overcloud --version queens --deployment-files virt \  
--introspect yes --tagging yes --deploy yes \  
--containers yes --registry-mirror docker.io --registry-namespace tripleoqueens \  
--registry-tag current-tripleo-rdo --registry-prefix='centos-binary-' \  
--registry-skip-puddle yes
```

Toma 2:

```
--overcloud-templates sahara,disable-telemetry,docker-queens_image
```

Lab deployment



Infra deployment:

```
--image-url http://hakke.rootzilopochtli.com/rhel-guest-image-7-6-210-x86-64-qcow2
```

Instalar undercloud (director):

```
time infrared tripleo-undercloud --build GA --version 10 --images-task rpm --ssl true --cdn cdn_creds.yml
```

Lab deployment



cdn_creds.yml:

```
username: rhn_user
password: *****
pool_ids: 8a85f99a6d1c4218016e3c1611ab0a32
```

Instalar overcloud (controllers y computes):

```
time infrared tripleo-overcloud --deployment-files virt --version 10 \  
--introspect yes --tagging yes --postreboot yes --deploy yes \  
--network-backend vxlan --overcloud-ssl true
```

Deployment test

- ▶ create a few networks
- ▶ create respective subnets
- ▶ create routers
- ▶ add router ports to the router
- ▶ ¹download cirros guest image
 - http://download.cirros-cloud.net/0.4.0/cirros-0.4.0-x86_64-disk.img
- ▶ download centos guest image
 - https://cloud.centos.org/centos/7/images/CentOS-7-x86_64-GenericCloud.qcow2
- ▶ create images and flavors
- ▶ create security groups
- ▶ create instances
- ▶ boot a couple instances

[1] OpenStack Images: <https://docs.openstack.org/image-guide/obtain-images.html>

Lab customization

Personalizar infra domain:

```
plugins/tripleo-undercloud/hypervisor.yml:  {{ item }}.redhat.local {{ item }}"
plugins/tripleo-undercloud/init.yml:         name: "{{ inventory_hostname }}.redhat.local"
plugins/tripleo-undercloud/init.yml:
    line: "127.0.0.1  {{ inventory_hostname }}.redhat.local {{ inventory_hostname }}"
plugins/tripleo-undercloud/plugin.spec:      default: 'redhat.local'
plugins/tripleo-undercloud/restore.yml:     {{ groups['undercloud'][0] }}.redhat.local \
```

Horizon Dashboard

- ▶ Localizar las IP's de los nodos en undercloud:

```
[stack@undercloud-0 ~]$ openstack server list
```

ID	Name	Status	Networks	Image Name
6f7ed9fd-1a3a-46e8-940b-a0e3555f6273	controller-2	ACTIVE	ctlplane= 192.168.24.6	overcloud-full
183ce9a1-73d8-4782-8d92-79b6e52ccf6f	compute-0	ACTIVE	ctlplane= 192.168.24.12	overcloud-full
37c7df4e-2c75-424e-a41b-909bb0b623ef	controller-1	ACTIVE	ctlplane= 192.168.24.17	overcloud-full
6bf8c568-b53b-4c0f-8fd1-247857cb4529	compute-1	ACTIVE	ctlplane= 192.168.24.15	overcloud-full
7a51c36b-3feb-4f36-8d70-51ca2114e859	controller-0	ACTIVE	ctlplane= 192.168.24.16	overcloud-full

- ▶ Localizar la url del dashboard en algún controller::

```
[heat-admin@controller-0 ~]$ grep -A2 horizon /etc/haproxy/haproxy.cfg |grep bind\ 10  
bind 10.0.0.101:443 transparent ssl crt /etc/pki/tls/private/overcloud_endpoint.pem  
bind 10.0.0.101:80 transparent
```

Horizon Dashboard

- ▶ Configurar ~/.ssh/config:

```
# openstack@home infrared
Host compute-1.redhat.local
    HostName 192.168.24.15
Host compute-0.redhat.local
    HostName 192.168.24.12
Host controller-2.redhat.local
    HostName 192.168.24.6
Host controller-1.redhat.local
    HostName 192.168.24.17
Host controller-0.redhat.local
    HostName 192.168.24.16
    DynamicForward localhost:65432
```

```
Host undercloud-0.redhat.local
    User stack
    HostName undercloud-0
    ForwardAgent yes
Host *.redhat.local
    User heat-admin
    ProxyJump dell-per720-4
    IdentityFile /root/.ssh/id_rsa
```

Horizon Dashboard

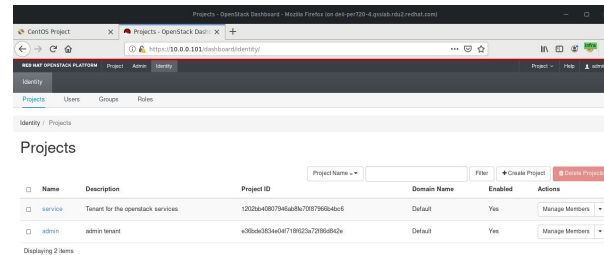
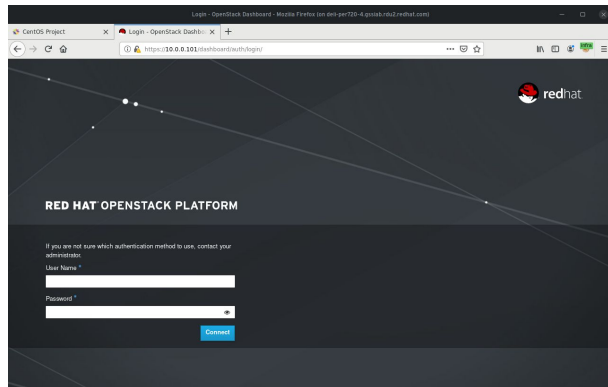
- ▶ Crear tunel ssh:

```
[root@de11-per720-4 ~]# ssh -f -N controller-0.redhat.local
```

- ▶ Configuración de Socks Proxy:

```
CURLOPT_PROXY=socks5://localhost:65432
```

```
ALL_PROXY=socks5h://localhost:65432 curl -vi 10.0.0.101:80/dashboard
```



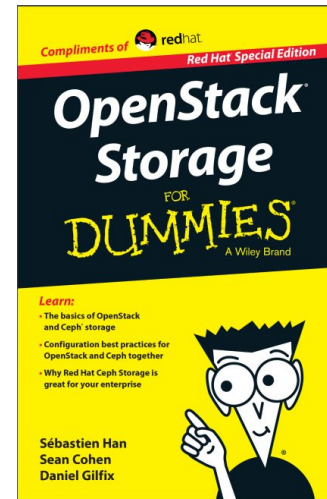
Hybrid deployment



https://infrared.readthedocs.io/en/latest/hybrid_deployment.html

Referencias

- ▶ <https://www.redhat.com/cms/managed-files/st-openstack-storage-for-dummies-9781119292531-201606-en.pdf>
- ▶ https://access.redhat.com/documentation/en/red_hat_openstack_platform
- ▶ <https://infrared.readthedocs.io/>
- ▶ <https://github.com/mrVectorz/infrared-lab>
- ▶ <https://www.vkhitrin.com/blog/clize-your-ansible-playbooks-using-infrared/>
- ▶ <https://herve.beraud.io/virtualization/linux/openstack/infrared/environment/2019/02/05/prepare-environment-to-use-red-hat-infrared.html>
- ▶ <https://herve.beraud.io/virtualization/ssh/forwarding/horizon/openstack/infrared/2019/03/06/setup-ssh-port-forwarding-to-reach-horizon-openstack-dashboard-deployed-with-infrared.html>
- ▶ <http://www.tuxfixer.com/create-tenant-in-openstack-newton-using-command-line-interface/>



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