CHINA OpenStack Days

CHINA OpenStack Days | IT大咖说 知识分享平台

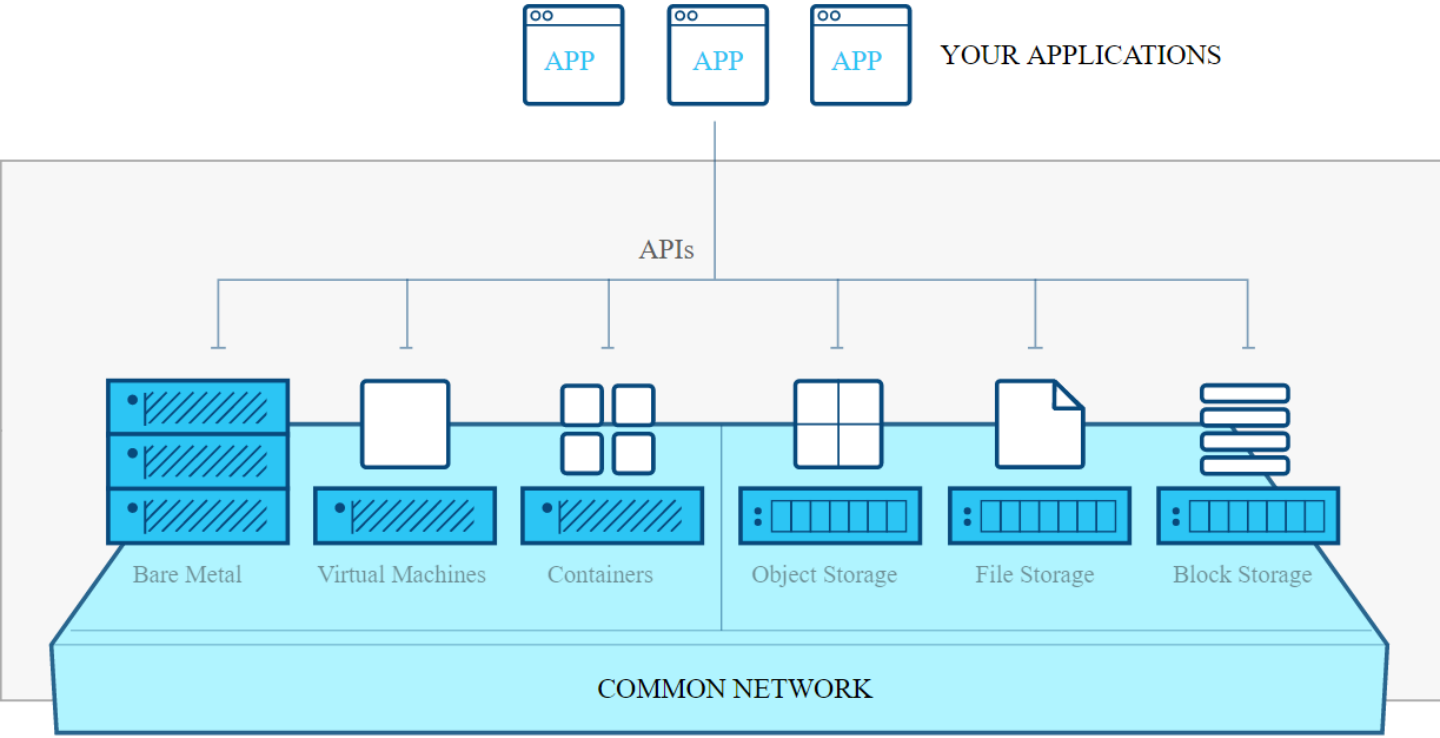
OpenStack 多容器组合应用的分析比较与容器胶囊的概念设计

赵 帅 Kevin(kevinz)

Software Engineer, ARM holdings.

Self Introduction

- IRC: kevinz
- Software Engineer at ARM since May 2015
- OpenStack Zun project Core reviewer
- Email: kevin.zhao@arm.com
- Wechat: 18818270915


APP
APP
APP
YOUR APPLICATIONS
APIs
Bare Metal
Virtual Machines
Containers
Object Storage
File Storage
Block Storage
COMMON NETWORK

Agenda

Nested Container

Nested Container With Kuryr

Zun Capsule Demo

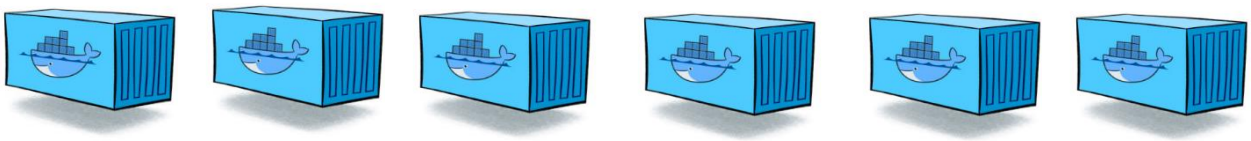
01 Nested Container

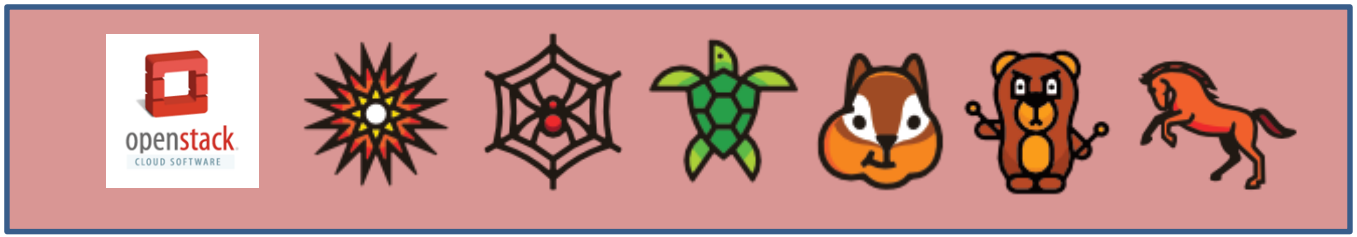
Nested Container

Deploy and run

MAGNUM

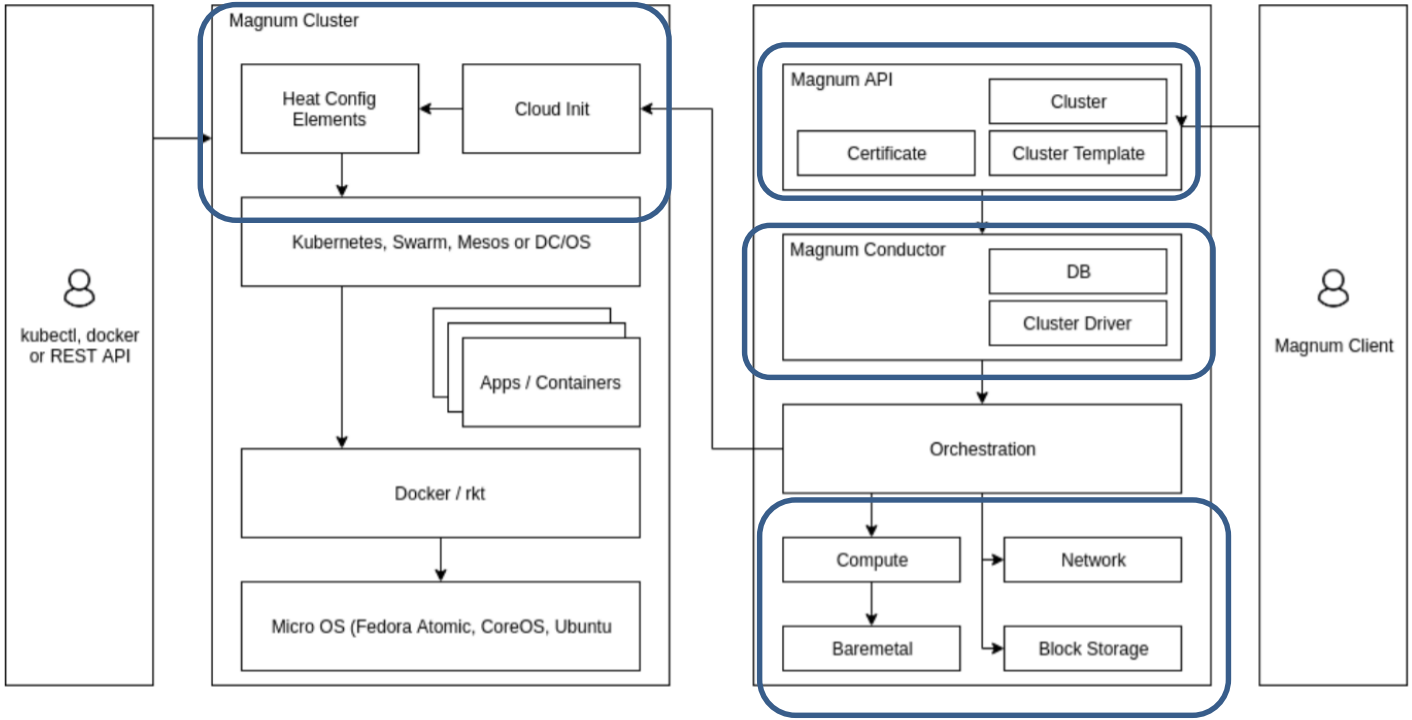
Nested Container - Architecture



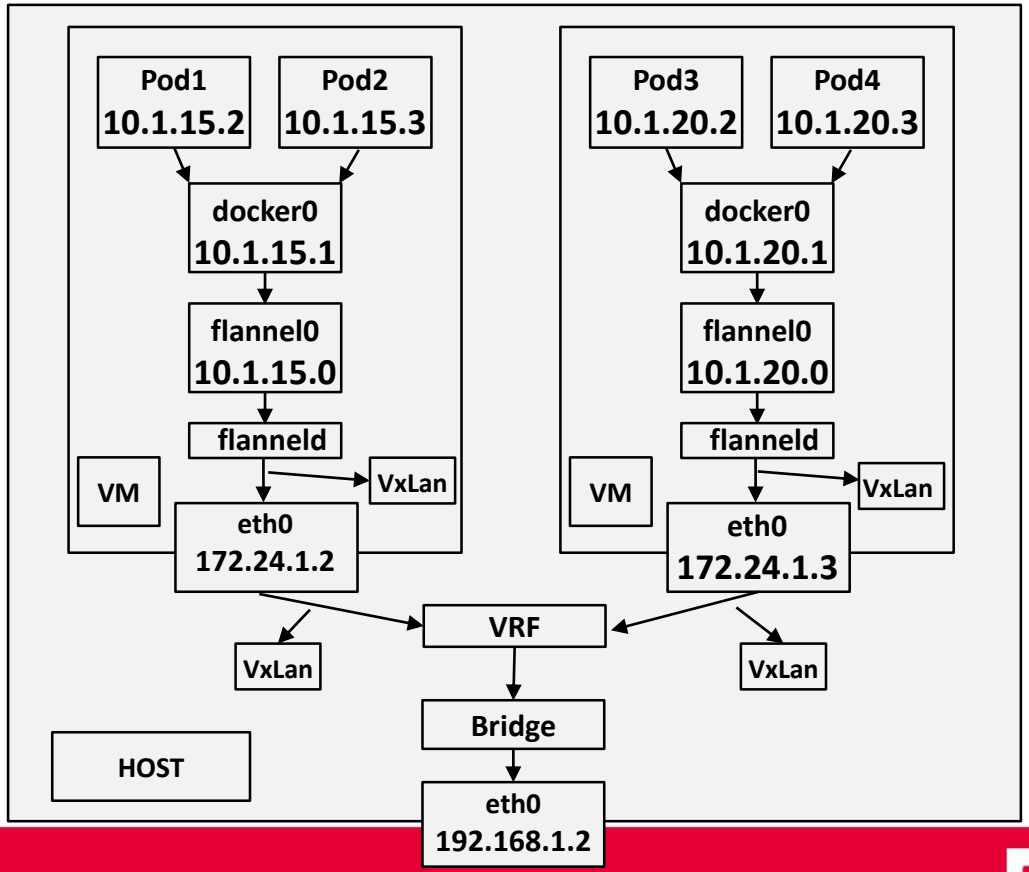


02

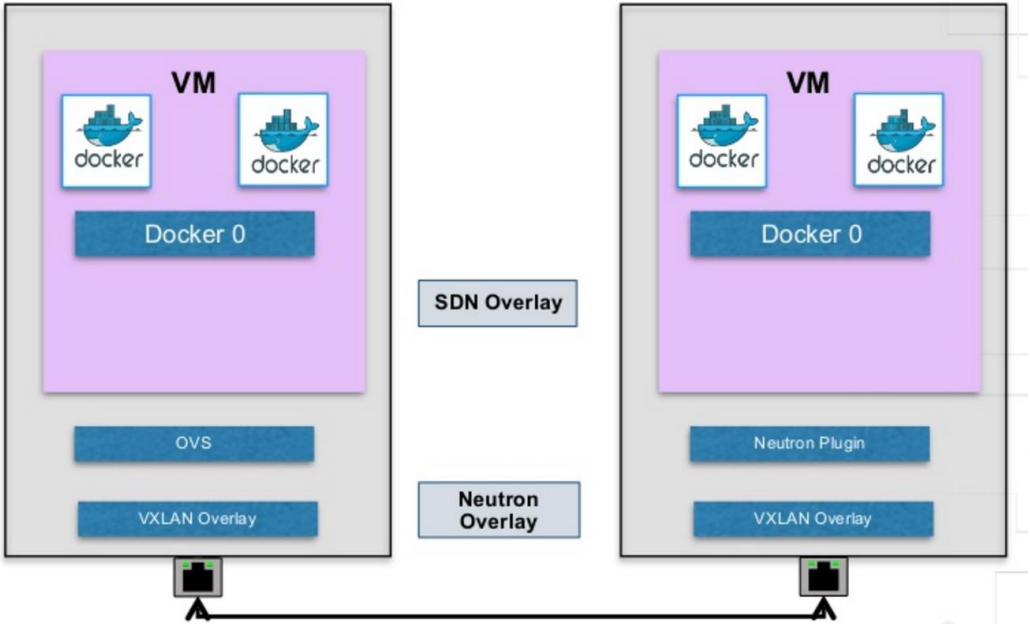
Nested Container – Magnum



Nested Container – Magnum



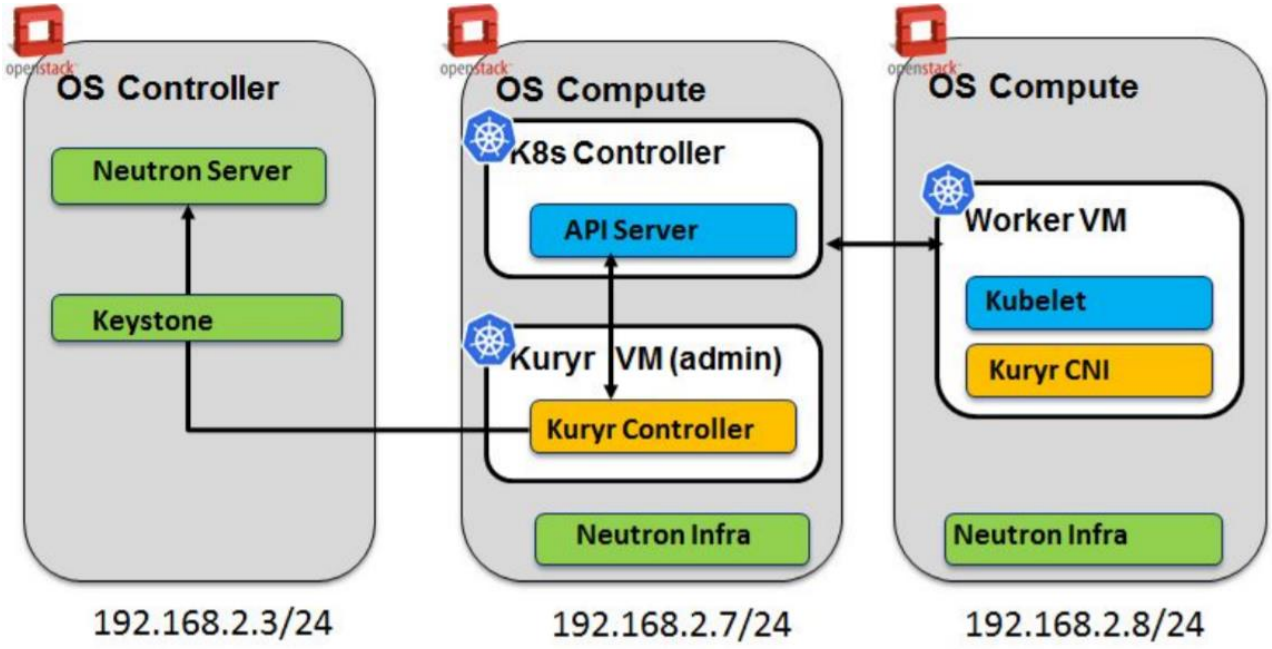
Nested Container - Magnum



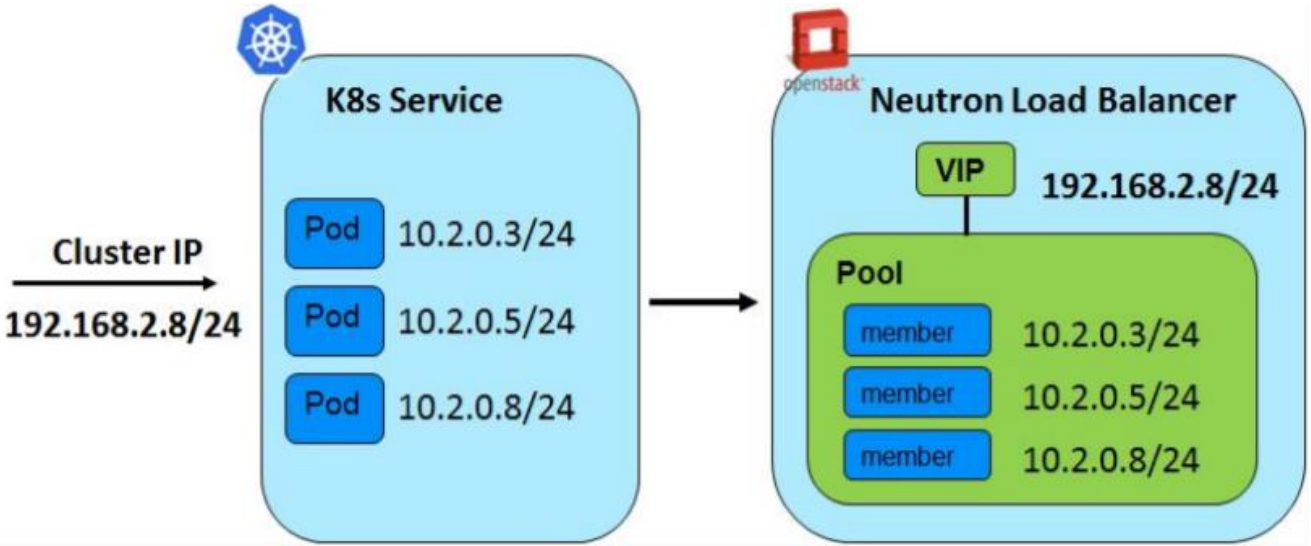
- Two Separate networking infrastructures，
- Performance and unneeded overhead

02 Nested Container With Kuryr

02 Nested Container - Kuryr



Nested Container - Kuryr



02

Nested Container - Summarize

Network

- VM network and container network is independent.
- Kuryr can connect it COE to Neutron network

Interopt

- COE and VM can not interopt
- COE for containers
- OpenStack for VM and BM.

Storage

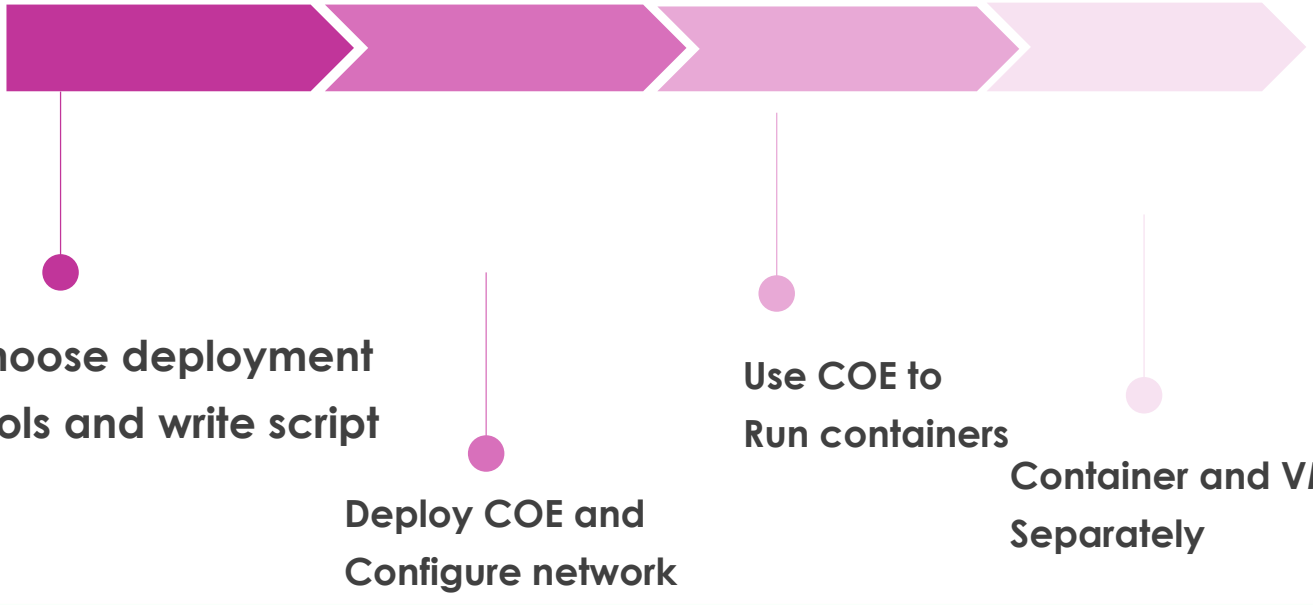
- Cinder will be used as integrate block storage.

Multi-tenant

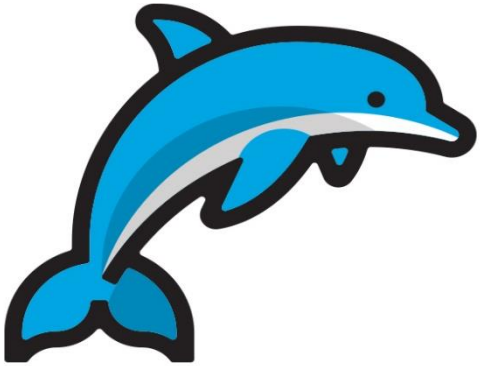
- COE and VM will be tenant isolated.
- But tenant for containers is impossible

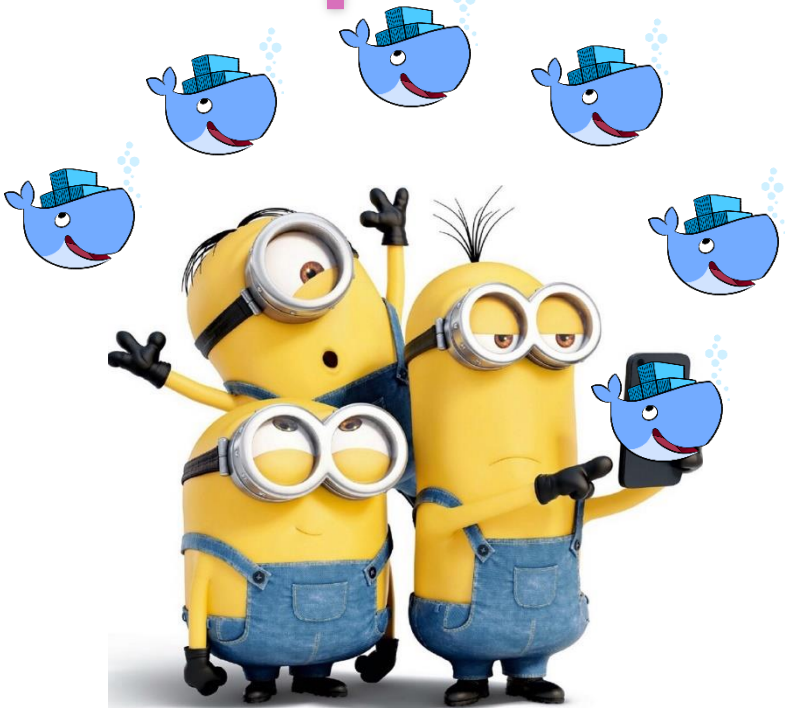
02 Nested Container

Pain point: What should I do if I want to run multiple containers compositions in OpenStack???

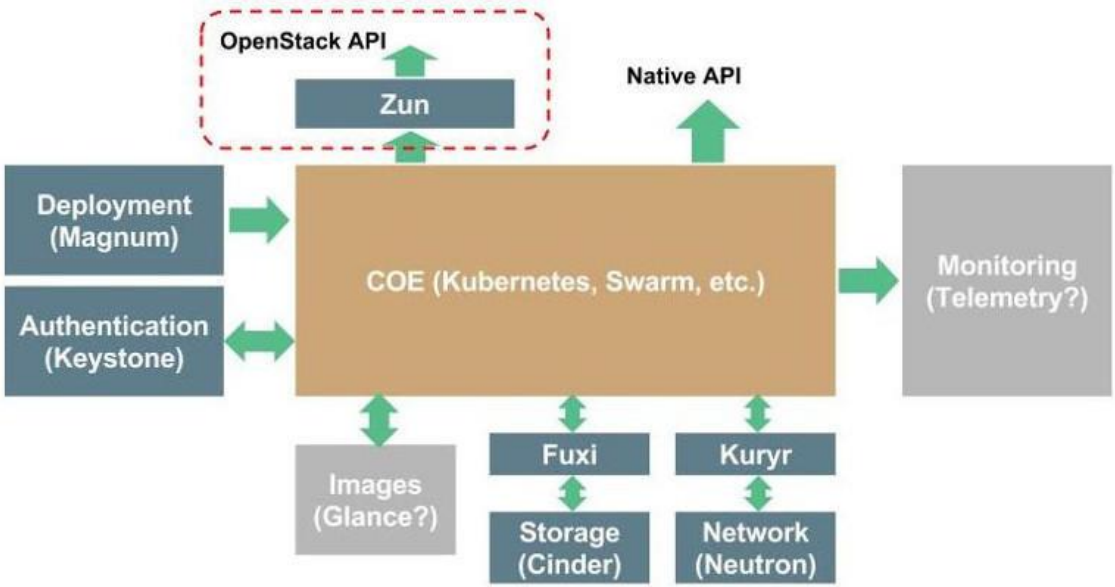


03 Zun Capsule

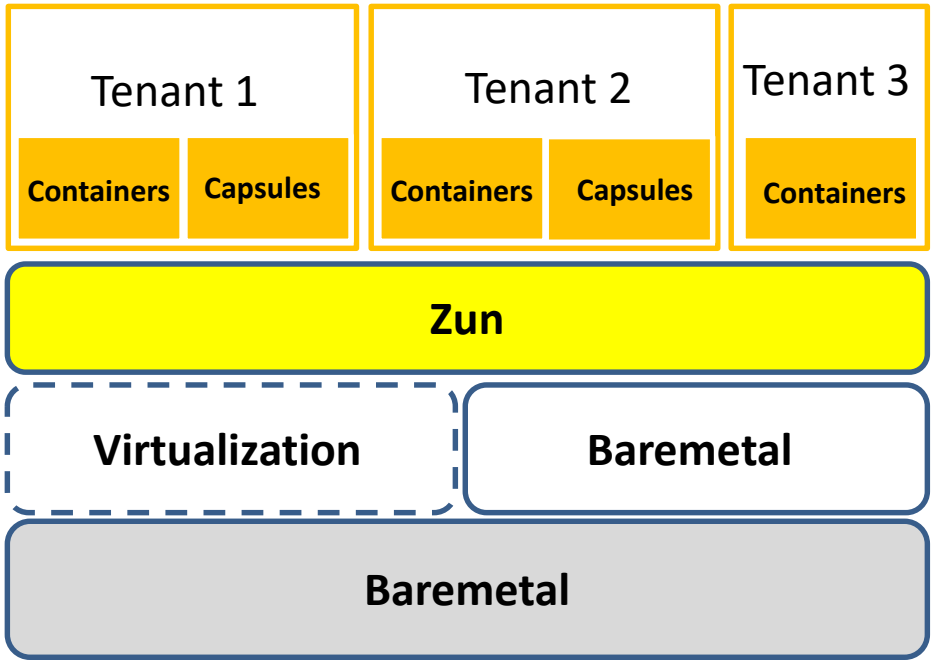




03 Zun - General



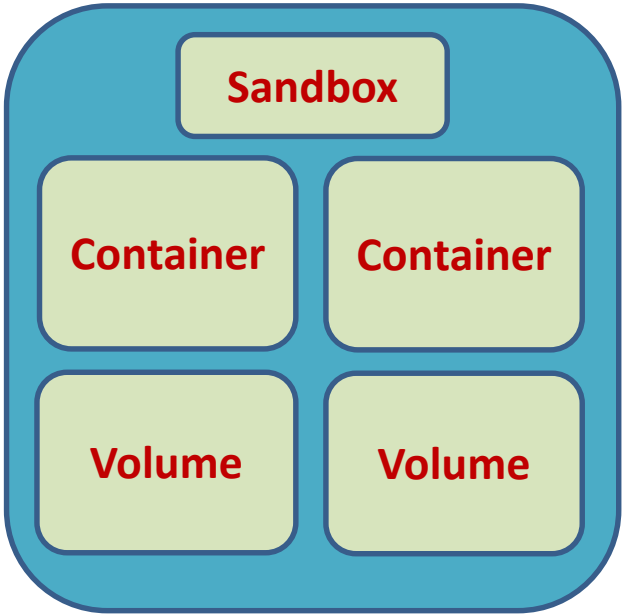
03 Zun Architecture



03 Zun Capsule

Component

- Capsule contains one sandbox container, multiple containers and volumes.



Characteristics:

- Co-located and Co-scheduled
- Share the network namespace
- Share the Volume
- Share resource limits

03 Capsule

OpenStack CLI

VM

BM

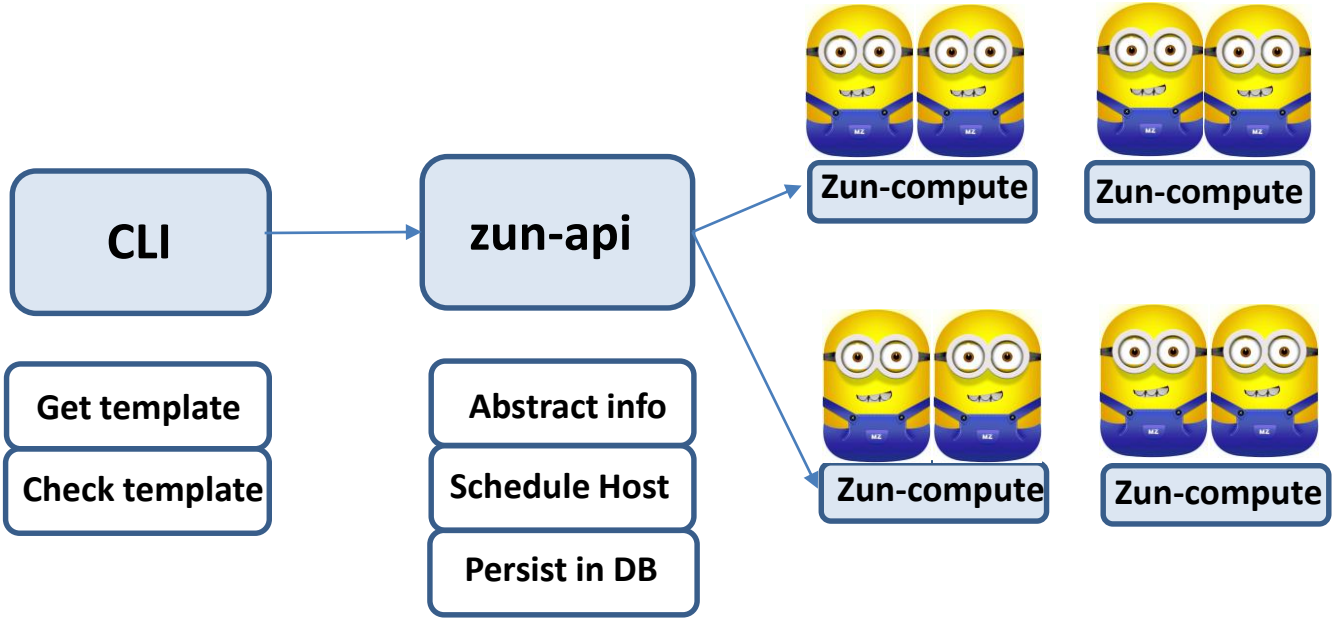
GLANCE

CINDER
FUXI

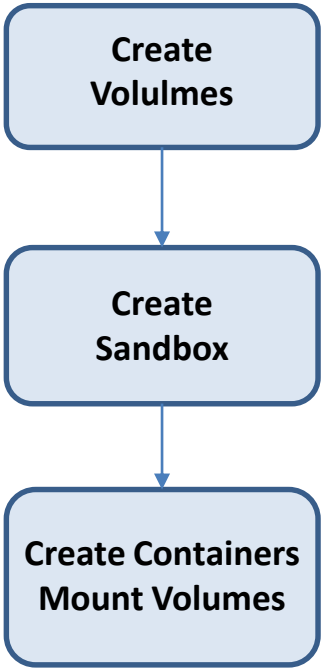
NEUTRON

KURYR

03 Capsule Provision



03 Capsule Provision



E.G :

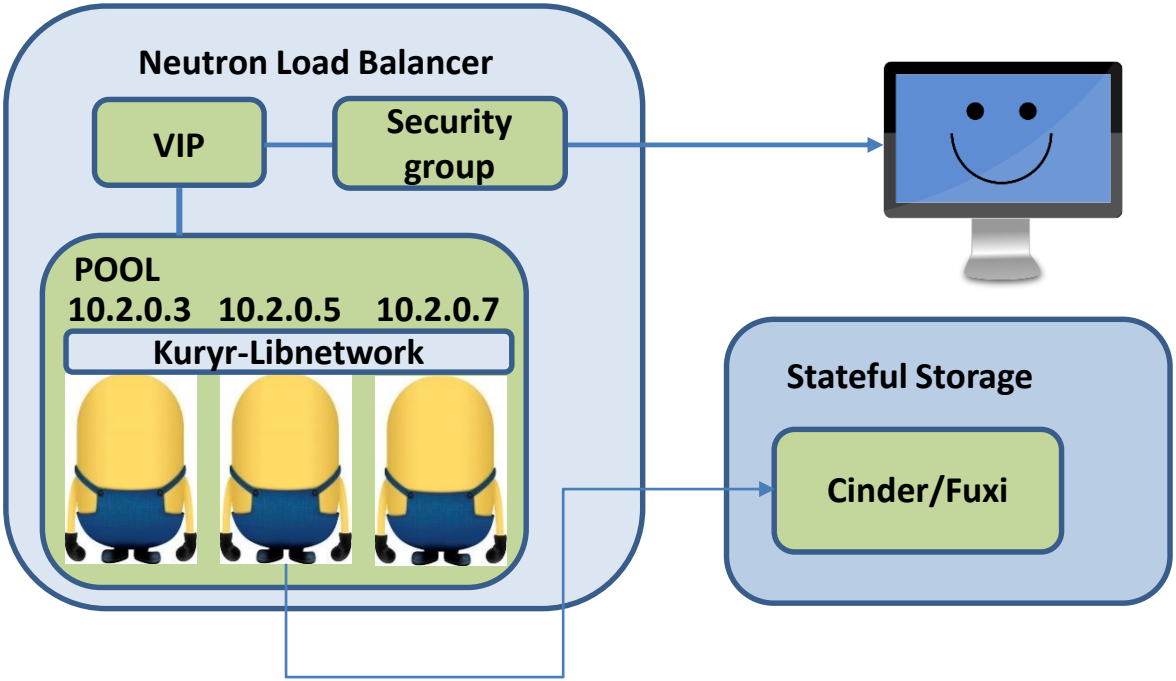
1. Create a Docker Sandbox

$ docker run --d –name sandbox pause

2. Create a container by using the sandbox

$ docker run --d
--net container: sandbox
--ipc container: sandbox
--pid container: sandbox
--volumes-from container: sandbox
……

03 Capsule


Neutron Load Balancer
VIP
Security group
POOL
10.2.0.3 10.2.0.5 10.2.0.7
Kuryr-Libnetwork
Stateful Storage
Cinder/Fuxi

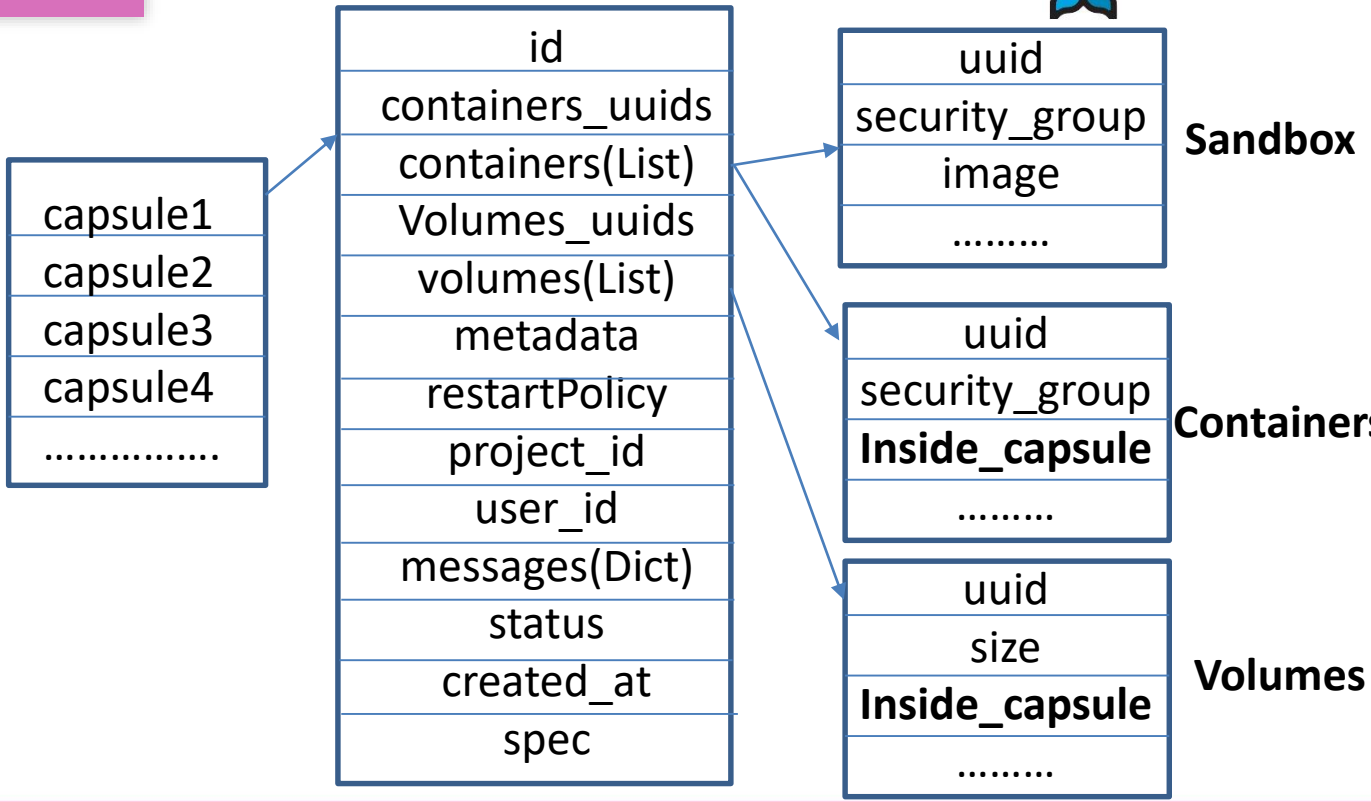
03 Capsule Template

```yaml
capsule_template_version: 2017-06-21
capsule_version: beta
kind: capsule
metadata:
  name: capsule-example
  labels:
    - app: web
    - nihao: baibai
restartPolicy: always
spec:
  volumes:
  - name: volume1
    drivers: cinder
    driverOptions: options
    size: 5GB
    volumeType: type1
    image: ubuntu-xenial
```

```yaml
containers:
- image: ubuntu
  command:
    - "echo"
  args:
    - "Hello"
    - "World"
  imagePullPolicy: always
  workDir: /root
  labels:
    app: web
  ports:
    - name: nginx-port
      containerPort: 80
      hostPort: 80
      protocol: TCP
  resources:
    allocation:
      cpu: 1
      memory: 1024
  env:
    ARGS0: /usr/local/bin
```

JSON and YAML

03 Capsule Database



03 Capsule API

Capsule API:

list <List all the capsule, add parameters about list capsules with the same labels>

create <-f yaml file><-f directory>

describe <display the details state of one or more resource>

Delete <capsule name>
<-l name=label-name>
<–all>

run <--capsule ... container-image>
If "--capsule .." is set, the container will be created inside the capsule.
Otherwise, it will be created as normal.

Container API:

* **show/list** allow all containers
* **create/delete** allow bare container only (disallow in-capsule containers)
* **attach/cp/logs/top** allow all containers
* **start/stop/restart/kill/pause/unpause** allow bare container only (disallow in-capsule containers)
* **update** for container in the capsule, need <--capsule> params.
Bare container doesn't need.

03 Capsule Future Plan

Notification to track capsule status

Capsule Service

Capsule Upgrade/Rollback

Capsule health checker

Join us:
#openstack-zun

05 Demo

Thank you!

Capsule make things easier!

#openstack-zun