Experience OPNFV on Arm

Deploy OPNFV on Arm with Compass4NFV

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19-Mar-2018
Agenda

• OPNFV overview
• Deploy OPNFV on Arm – experience sharing
• Compass4NFV architecture
  • Bare-metal provisioning
  • Virtual provisioning
• OPNFV CI/CD and testing
• Compass4NFV on Arm – status and plan
About us

- Arm CE-OSS (Central Engineering – Open Source Software)
- Cross team project among Workloads, Networking, Container
  - Develop container network acceleration solutions
  - Develop containerized VNF solutions
  - Run OPNFV on Arm platform
  - Follow community best practice
OPNFV overview

Leverage upstream OSS to construct a reference NFV platform.

Major components:
• Integration
• Deployment
• Testing

https://www.opnfv.org/software/technical-overview
Deploy OPNFV on Arm – A frustrating experience

**Fuel installer**
- Great experience, if it works.
- Debugging is hard.
- Redeployment is very time consuming.

**Kubernetes on OpenStack**
- Unofficial, cannot integrate with OPNFV community.
- What if I only need Kubernetes, not OpenStack?

**Joid installer**
- Only supports Ubuntu.
- Juju doesn’t support Kubernetes on Arm.
Compass4NFV advantages

• Official OPNFV installer.
• Lightweight, easy for debugging.
• Doesn’t support Arm, but welcomes contributions.
• Supports both OpenStack and Kubernetes.
• Containerized deployment, easy to maintain.
• Distro neutral, Ansible based, flexible configuration.

One line of code for a quick start:

curl https://raw.githubusercontent.com/opnfv/compass4nfv/master/quickstart_k8s.sh | bash
Compass4NFV architecture

• OS deployment
  • Install OS by Cobbler
  • Supports Ubuntu, CentOS
  • Supports Arm, x86
  • Install through PXE

• K8s deployment
  • Deploy K8s by Kubespray
  • Supports Ubuntu, CentOS
  • Supports Arm, x86
  • Networking:
    – Management network
    – External network
Compass4NFV deployment

sd Install

User

Deploy Job

Compass

Cobbler

Ansible

Nodes

deploy_start()
init_compass()
init_cobbler()
init_ansible()

hw_discover()
reset_baremetal()
pxe_req()

os_provisioning()

start_deploy()

deploy()

deploy_finish()

(from Actors)

Jump host

Compass-cobbler

Linux distro ISO

cobbler

Compass-tasks-k8s

Host network

tftp, PXE

Arm

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Deploy on bare-metal

Host configuration

```yaml
TYPE: baremetal
FLAVOR: cluster
POWER_TOOL: ipmitool
ipmiVer: '2.0'
hosts:
  - name: host1
    mac: '14:30:04:F2:24:CB'
    ipmiUser: uuuuuuuu
    ipmiPass: xxxxxxxx
    ipmiIp: 172.16.130.81
    interfaces:
      - eth0: '14:30:04:F2:24:CC'
    roles:
      - kube_master
      - etcd
      - ha
  - name: host2
    mac: '14:30:04:F2:24:3B'
    ipmiIp: 172.16.130.82
    ipmiUser: uuuuuuuu
    ipmiPass: xxxxxxxx
    interfaces:
      - eth1: '14:30:04:F2:24:3C'
    roles:
      - kube_node
```

Network configuration

```yaml
sys_intf_mappings:
  - name: mgmt
    interface: eth0
    type: normal
    vlan_tag: None
    role:
      - controller
      - compute
  - name: external
    interface: eth1
    type: normal
    vlan_tag: None
    role:
      - controller
      - compute

ip_settings:
  - name: mgmt
    ip_ranges:
      - "10.1.0.50"
      - "10.1.0.100"
    dhcp_ranges:
      - "10.1.0.2"
      - "10.1.0.49"
    cidr: "10.1.0.0/24"
    gw: "10.1.0.1"
```

![Deployment diagram](image)
Deploy on VM

Host configuration

TYPE: virtual
FLAVOR: cluster

hosts:
  - name: host1
    roles:
      - kube_master
      - etcd
      - ha
  - name: host2
    roles:
      - kube_master
      - etcd
      - ha
  - name: host3
    roles:
      - kube_master
      - etcd
      - ha
  - name: host4
    roles:
      - kube_node
  - name: host5
    roles:
      - kube_node

Network configuration

sys_intf_mappings:
- name: mgmt
  interface: eth0
  type: normal
  vlan_tag: None
  role:
    - controller
    - compute
- name: external
  interface: eth1
  type: normal
  vlan_tag: None
  role:
    - controller
    - compute

ip_settings:
- name: mgmt
  ip_ranges:
    - "10.1.0.59"
    - "10.1.0.190"
  dhcp_ranges:
    - "10.1.0.2"
    - "10.1.0.49"
  cidr: "10.1.0.0/24"
  gw: "10.1.0.1"
OPNFV CI/CD

- **Jenkins** based
  - How to add slaves
- Maintained by **Releng**
- Jobs
  - Patch validation
  - Daily jobs
- Testing
  - Yardstick
  - Functest

[Diagram of Jenkins, Compass4nfv code, and Arm pod connections]

OPNFV community

**Jenkins slave**
Jump host

Release Engineering (Releng)

Jenkins master

Jobs

OPNFV community

Compass4nfv code

Arm pod

YAML

YAML

JJB scripts
Compass4NFV on Arm

• Status
  • Supported features
    – Run Compass core containers on Arm jump host
    – Bare-metal OS deployment (CentOS AArch64)
    – Kubernetes deployment (v1.7 AArch64)
  • 2 Arm daily CI/CD jobs ready in OPNFV community
  • 20+ patches merged to support Compass4NFV on Arm

• Plan
  • Support Kubernetes v1.9
  • Support deploying Ubuntu to nodes
  • Build Compass containers in OPNFV community
  • Refine CI/CD tasks
  • ...
Thank You
Danke
Merci
谢谢
ありがとう
Gracias
Kiitos
감사합니다
धन्यवाद
תודה