Network Cloud Family Blueprints Installation Overview

PLEASE REFER TO R1 NETWORK CLOUD RELEASE DOCUMENTATION

NC Family Documentation - Release 1

THIS DOCUMENTATION WILL BE ARCHIVED

Contents

Prerequisites

1. Internal and external network connectivity on all target hardware.

Steps

1. Ensure all High Level Requirements are met.
2. Clone and download repositories and packages for the appropriate Akraino release. (Linux Foundation credentials required.)
   a. Akraino Gerrit: From the list of projects, clone all relevant repositories.
   b. Akraino Nexus 3: Download all relevant packages.
3. Install the Regional Controller Node:
   a. Bootstrap the bare metal regional server node from the central node.
   b. Run installation scripts to launch the Portal, Camunda Workflow, and Database components.
4. Login to the Akraino Portal UI.
5. Install the Edge Node via the Portal UI:
   a. Complete the appropriate YAML template according to site requirements:
      i. Site name
      ii. Username and ssh key(s) for node access
      iii. Server names and hardware details
      iv. PXE, Storage, Public, and IPMI/iDrac network details
      v. SR-IOV interface details, including the number of virtual functions and BDF6 addresses
      vi. Ceph storage configuration
   b. Choose the site to build, choose the required Blueprint, and select Build.
   c. Upon successful build, select Deploy. The following scripts will be run, with status conveyed to the UI:
      i. 1promgen.sh
      ii. 2genesis.sh (invokes genesis.sh)
      iii. 3deploy.sh

Deployment Components

The following components are deployed in automated sequential fashion:

- Genesis Host
  - This is the first control node. Genesis serves as the seed node for the control cluster deployed on Edge sites.
  - Genesis contains a standalone Kubernetes instance with undercloud components (e.g., Airship) deployed via Armada.
  - Once the Undercloud is deployed, Ceph is deployed via Armada.
  - Remaining cluster control nodes are deployed next from bare metal, using MaaS. This requires an available PXE network. The Genesis host will provide a MaaS controller.
- Control Hosts
- Compute Hosts
- Airship
- Apache Traffic Server (VNF)
- Ceph
- Calico
- ONAP
- OpenStack
- SR-IOV

High Level Requirements

Review requirements in the following order:

Compute Node Details

Herewith are three methods to locate sufficient hardware details:

```
$ sudo dmidecode -s system-manufacturer
HP
$ sudo dmidecode -s system-version
Not Specified
$ sudo dmidecode -s system-product-name
ProLiant DL380 Gen9

$ sudo dmidecode | grep -A3 '^System Information'
System Information
        Manufacturer: HP
        Product Name: ProLiant DL380 Gen9
        Version: Not Specified

$ sudo apt-get install -y inxi
[ ... ]
$ sudo inxi -Fx
System:    Host: mtxnjrsv124 Kernel: 4.4.0-101-generic x86_64 (64 bit gcc: 5.4.0) Console: tty 10
           Distro: Ubuntu 16.04 xenial
Machine:   Mobo: HP model: ProLiant DL380 Gen9 serial: MXQ604036H Bios: HP v: P89 date: 07/18/2016
CPU(s):    2 Multi core Intel Xeon E5-2680 v3s (-HT-MCP-SMP-) cache: 61440 KB
           flags: (lm nx sse sse2 sse3 sse4_1 sse4_2 ssse3 vmx) bmips: 119857
           clock speeds: [ ... ]
Graphics:  Card: Failed to Detect Video Card!
           Display Server: X.org 1.18.4 drivers: fbdev (unloaded: vesa)
           tty size: 103x37 Advanced Data: N/A for root out of X
Network:   Card-1: Broadcom NetXtreme BCM5719 Gigabit Ethernet PCIe
           driver: tg3 v: 3.137 bus-ID: 02:00.0
           IF: eno1 state: down mac: 14:02:ec:36:52:c4
           [ ... ]
Drives:    HDD Total Size: 1320.2GB (16.2% used)
           ID-1: /dev/sda model: LOGICAL_VOLUME size: 120.0GB temp: 0C
           ID-2: /dev/sdb model: LOGICAL_VOLUME size: 1200.2GB temp: 0C
Partition: ID-1: / size: 28G used: 17G (66%) fs: ext4 dev: /dev/dm-0
           ID-2: /boot size: 472M used: 155M (35%) fs: ext2 dev: /dev/sda1
           ID-3: /home size: 80G used: 21G (28%) fs: ext4 dev: /dev/dm-2
RAID:      No RAID devices: /proc/mdstat, md_mod kernel module present
Sensors:   System Temperatures: cpu: 48.0C mobo: N/A
           Fan Speeds (in rpm): cpu: N/A
Info:      Processes: 397 Uptime: 39 days Memory: 41943.1/257903.7MB
           Init: systemd runlevel: 5 Gcc sys: 5.4.0 Client: Shell (sudo) inxi: 2.2.35
```

SR-IOV

Configure and determine the SR-IOV NIC as follows:

```
$ # update /etc/default/grub with this line
$ export GRUB_CMDLINE_LINUX_DEFAULT="intel_iommu=on iommu=pt"
$ sudo -E update-grub
$ sudo reboot now
$ cat /proc/cmdline
$ sudo echo '32' > /sys/class/net/ens3f0/device/sriov_numvfs
$ sudo ip link show ens3f0 # to verify it worked
$ # add line to /etc/rc.local so it does this on reboot
$ sudo echo '32' > /sys/class/net/ens3f0/device/sriov_numvfs
```

BDF6 Addresses

Intel provides a script to locate BDF6 addresses from their NICs. Learn more about Bus:Device:Function (BDF) Notation.

Network

This Network Cloud blueprint requires:

1. A network that can be PXE booted with appropriate network topology and bonding settings (e.g., a dedicated PXE interface on an untagged /native VLAN)
2. A segmented VLAN with all nodes bearing routes to the following network types:
    a. Management: Kubernetes (K8s) control channel
    b. Calico
    c. Storage
    d. Overlay
    e. Public

Storage

This Network Cloud blueprint requires:

1. Control plane server disks:
    a. Two disk RAID-1 mirror for the operating system.
    b. Configure remaining disks as JBOD for Ceph, with Ceph journals preferentially deployed to SSDs where available.
2. Data plane server disks:
    a. Two disk RAID-1 mirror for the operating system.
    b. Configure remaining disks per the host profile target for each server (e.g., RAID-6; no Ceph).

Redfish

This Network Cloud blueprint requires:

1. Configuring BIOS with HTTP boot as a primary device.
2. Adding MAC address of the card to Switch and DHCP server for traffic to flow.
3. Creating the configuration file for pre-seed on DHCP server.
4. Rebooting the server to boot on HTTP device.
5. Getting IP and the related package of OS to install Operating System.