

CNTT RI-2 - Kubernetes Bare-Metal Test Bed Activity in OPNFV Lab

This activity was initiated from a [contribution proposal](#) by Intel to setup a test-bed to install and characterize a Kubernetes bare-metal deployment based on a [published Intel Kubernetes reference architecture](#). The linked document is from work done by Intel to help address Telco Cloud Native networking requirements using bare-metal Kubernetes. This is intended as a hands-on and iterative activity for CNTT participants to learn and collaborate with CNF Test-bed and relevant upstream communities (CNCF, etc.). This work is now rolled up as part of a new OPNFV project called [kuberef](#) (formally approved by TSC 6/30/2020).

PAGE STATUS - Developing content, feel free to provide your ideas and suggestions to [Trevor Cooper](#) or comment on this page to help get this activity started.

Objectives

Install, configure and test a bare-metal Kubernetes environment with components and features aligned with RA-2 to help identify gaps and requirements to accelerate and improve CNTT Cloud Native specifications. Through this activity we expect to learn about RI-2 requirements for installation, configuration and testing to inform ...

- Lab requirements for deploying and testing RI-2
- Installer requirements for provisioning nodes, installing Kubernetes with required features and their configuration
- Test methods, tools and test-cases to validate RI-2 (adopt and adapt from RI-1/RC-1 and upstream communities wherever possible)
- Test methods, tools and test-cases that delineate commercially significant conformance criteria for evaluating vendor infrastructure solutions i.e. requirements for RC-2
- Selection of hardware skus/platforms that can fulfill Reference Model defined hardware profiles (to demonstrate commercial feasibility of hardware profiles and metric definitions)

Activity Artifacts

Lab requirements and setup instructions

Document learnings may impact ...

- RM - Hardware profiles / metrics impacting Cloud Native
- RM - software profiles and configurations for Cloud Native deployments
- RA-2 gaps and requirements feeding RI-2 including installer requirements
- Gaps in test-coverage
- etc.

Activities / Milestones

1. Lab specification and setup [Lab Specification and Setup](#)
 - a. Evaluate lab requirements from RA-2 (if possible ... may need to read between the lines but this will at least help to give feedback to RA-2 or RI-2)
 - b. Compare with current OPNFV lab spec. (aka [Pharos spec.](#)) and highlight any gaps / issues.
 - c. Develop / document draft of a CNTT RI-2 lab spec that can be used to deploy and test all Cloud Infrastructure capabilities specified in RA-2. This will be an input to RC for requirements of a CNTT "approved lab" as part of LFN OVP 2.0 (conformance program)
 - i. What would be a reasonable number of compute nodes + spec and network topology?
 - ii. What are differences to CNCF test-bed?
2. Install and configuration of BMRA [Kubernetes Bare-Metal Install and Configuration](#)
 - a. Document configurations / learning (configuration of hardware / firmware / software)
 - b. Cookbook to follow install with configuration steps
 - c. Document issues run into since its a different environment (compare to the CNCF test-bed)
3. Map BMRA features against RA-2 requirements [Kubernetes Bare-metal Features](#)
 - a. Features of BMRA that map to RA-2 requirements
 - b. Features of BMRA that point to requirements missing from RA-2
 - c. RA-2 requirements not met by BMRA
4. Testing RI-2 (Kubernetes bare-metal) [Kubernetes Bare-metal Testing](#)
 - a. WIP

Lab Test Environment

References

- Discussion on Lab requirements re. RI-1 <https://wiki.opnfv.org/display/INF/CNTT+RI+Lab+Infrastructure+Discussion>
- [RI2] Lab requirements #1241 <https://github.com/cntt-n/CNTT/issues/1241>

Lab Requirements should be traceable to RM / RA-2 (i.e. whatever impacts hardware provisioning and configuration)

- Specify baseline for installer starting to provision (predeploy validation check?)
- Features (e.g. SR-IOV) and what needs to be provisioned to enable

- What is done by the installer and what is outside (e.g. BIOS and bootloader config.)
- ...

CNCF Test activities related to RA-2 / RI-2

Requirements from CNCF RA2 https://docs.google.com/spreadsheets/d/12EWZVvlumktXoywvmlYPR_DrU34e7Gk_rSED3VyCG4o/edit?pli=1#gid=0

CNCF conformance <https://github.com/cnfc/cnf-conformance>

Contributors

- [Trevor Cooper](#)
- [Michael Pedersen](#)

References:

- Bare-Metal Reference Architecture (BMRA) User guide: <https://builders.intel.com/docs/networkbuilders/container-bare-metal-for-2nd-generation-intel-xeon-scalable-processor.pdf>
- BMRA source and releases: <https://github.com/intel/container-experience-kits>

About Intel Kubernetes [networking reference](#)

- 1: <https://networkbuilders.intel.com/container-bare-metal-reference-architecture-overview-part-1-training-video>
- 2: <https://networkbuilders.intel.com/container-bare-metal-reference-architecture-technology-part-2-training-video>
- 3: <https://networkbuilders.intel.com/container-bare-metal-reference-architecture-installation-part-3-training-video>
- 4: <https://networkbuilders.intel.com/container-bare-metal-reference-architecture-verification-part-4-training-video>

About the Intel OPNFV Community Lab

Currently the [Intel OPNFV lab](#) environments are configured as standard OPNFV "PODs" (not to be confused with a Kubernetes POD). Two environments (12 servers) have been reserved for this activity, lab resource allocation can be seen here <https://wiki.opnfv.org/display/pharos/Intel+Lab>. For access VPN credentials can be obtained by following the standard OPNFV lab support process found here <https://wiki.opnfv.org/display/INF/Infra+Lab+Support>. Access for individual access can be approved by either [Tom Kivlinor](#) [Trevor Cooper](#).