

# 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 CNTT RA2 [https://docs.google.com/spreadsheets/d/12EWZVvlumktXoywvmlYPR\\_DrU34e7Gk\\_rSED3VyCG4o/edit?pli=1#gid=0](https://docs.google.com/spreadsheets/d/12EWZVvlumktXoywvmlYPR_DrU34e7Gk_rSED3VyCG4o/edit?pli=1#gid=0)

CNF 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 Kivlin](#) or [Trevor Cooper](#).