# BMWG – Considerations for Benchmarking Network Performance in Containerized Infrastructures

IETF 110
March 1-5, 2021
Online

# Hackathon Plan

- The main goal is to figure out container networking performance impacts by various resource options.
  - Related Draft:
    Considerations for Benchmarking Network Performance in Containerized Infrastructures
    https://tools.ietf.org/html/draft-dcn-bmwg-containerized-infra
  - Two main features
    - Implementing containerized infrastructure with various network models
    - Verifying performance impacts depending on configuration settings

# What got done

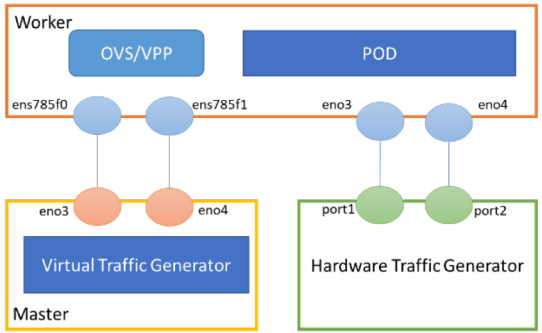
- Discussion – Current states of benchmarking for containerized infrastructure
  - Our previous works:
    - 106 / 109 Hackathon
  - Other works
    - VSPERF-Container Networking Benchmarking and Testing (https://wiki.opnfv.org/display/vsperf/VSPERF-Container+Networking+Benchmarking+and+Testing)
    - Benchmarking by industry
      - VPP Performance test (https://docs.fd.io/csit/rls1904/report/vpp_performance_tests/)
      - DPDK performance report (https://doc.dpdk.org/guides/howto/virtio_user_for_container_networking.html)
  - Generalizing test architecture

| Networking Model | | Test-Scenario | | |
|---|---|---|---|---|
| | | pod-to-external | pod-to-pod | Multiple-pods |
| Kernel space network model | Linux Bridge | [2, 4] | [2] | - |
| | OVS | [2] | [2] | - |
| User space network acceleration | OVS/DPDK | [1, 7] | [3] | - |
| | VPP-memif | [1] | [1] | [6] |
| | SRIOV | [1, 2] | [2] | - |


[1] VSPERF-Container Networking Benchmarking and Testing (https://wiki.opnfv.org/display/vsperf/VSPERF-Container+Networking+Benchmarking+and+Testing)
[2] J. Anderson et al., "Performance considerations of network functions virtualization using containers," ICNC2016.
[3] U. Abbasi et al., "A Performance Comparison of Container Networking Alternatives," IEEE Network, 2019.
[4] J. Struye et al., "Assessing the value of containers for NFVs: A detailed network performance study," CNSM 2017.
[5] Y. Park et al., "Performance Analysis of CNI (Container Networking Interface) based Container Network," ICTC 2018.
[6] VPP Performance test (https://docs.fd.io/csit/rls1904/report/vpp_performance_tests/)
[7] DPDK Performance report (https://doc.dpdk.org/guides/howto/virtio_user_for_container_networking.html)

# What got done

- Validating other benchmarking works
  - OVS-DPDK / VPP-memif / SR-IOV
    - Throughput  (as defined in RFC 1242)
    - Latency (as defined in RFC 1242)
    - Frameloss count and percentage
    - Packet drops
  - Multi-pods test scenario
    - VPP-memif (multiple pods-to-pods / Chaining)
    - Other technologies : OVS-DPDK, …
  - These works are still on process, and we get results soon




Validating Example: Single-pod testing scenario with OVS/VPP

# What we learned

- Need to updating our related draft
  - Re-arrange chapters, figures, words, ..
  - Adding other benchmarking activities
  - Up-to-date technologies
- Find remaining areas for benchmarking (Next hackathon)
  - Multi-pods in a single host - different acceleration techniques
    - Multiple Pods-to-Pods, Chaining Scenarios
  - Pod with multi-interfaces

# Wrap Up

Team members:

Younghan Kim (IISTRC)
Nguyen Quang Huy (IISTRC)
Kyoungjae Sun (IISTRC)
Jangwon Lee (IISTRC)

Jaehoon Paul Jeong (SKKU)
Hyunsik Yang (KT)

First timers @ IETF/Hackathon:
Tran Minh Ngoc (IISTRC)