draft-mkonstan-nf-service-density-01 (expired)

IETF-109 Online BMWG Meeting

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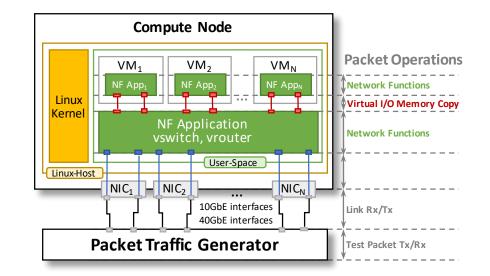
Draft Status

- No changes since -02 (expired January 9, 2020).

- Discussion at IETF-107 about progressing this work as part of a wider NFV service chains benchmarking standardization effort.
  - But no conclusions / concrete steps. (Apologies in case we missed them.)
  - BMWG position about this problem space?
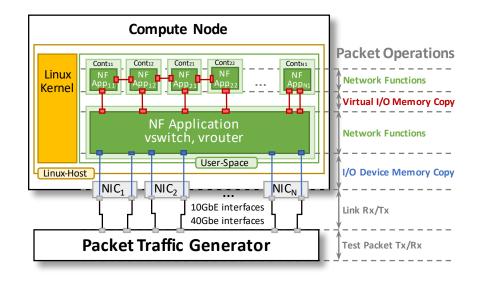
- Views and comments welcome.

No Changes After IETF-105 and -01, Why?

- Target problem space:
  - Benchmarking network function service topologies (a.k.a. chains) realized in a virtualized compute infrastructure including compute "clouds".
- The target space is dynamic and continuously evolving:
  - New virtualization and optimization approaches proliferating.
  - Variations of virtual network infrastructure involved in connecting the service topologies: vSwitch, SRIOV / SIOV, SmartNICs, virtual (memory) interfaces.
  - Hard to define a systematic and universal approach to benchmarking clusters of services often mapped to shared physical resources.
- Number of parallel industry standard efforts going after the same space:
  - ETSI, LFN OPNFV, CNTT, CNCF TUG.

Benchmarking Many NF Services on a COTS Server

- **Challenges**
  - Measuring performance of a Network Function applications (NF) running solo on a server is fairly straightforward
  - Benchmarking gets much more complex with many NFs sharing server resources in multi-instance, multi-tenant scenarios a.k.a. the "noisy neighbour" problem
  - Using virtual topologies within the server to facilitate NF "service chains" further exacerbates the problem

- **Proposal**
  - Define NFV service benchmarking methodology that yields repeatable and portable benchmarking results and use it to aid in deriving deterministic operating range of NFV designs with many NFs/NFV services running on a server
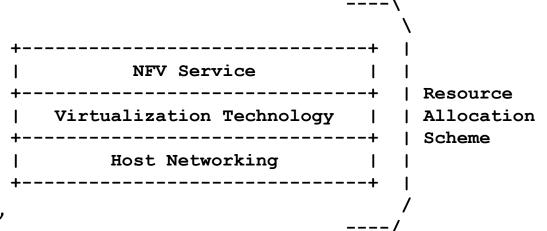
Proposed solution

- Separate out three aspects of NFV design
  - NFV service packet processing
  - Shared virtualization infrastructure
  - Shared host networking infrastructure

- Resource allocation scheme to address "noisy neighbour" aspects
  - Use common practice to start with
    - Processor core pinning
    - Observe NUMA affinity
  - Evolve from there e.g. manage LLC resources

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                                                  \
   +------------------------------+   |
   |          NFV Service         |   |
   +------------------------------+   | Resource
   |    Virtualization Technology |   | Allocation
   +------------------------------+   | Scheme
   |        Host Networking       |   |
   +------------------------------+   |
                                                  /
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But, is this the right approach ?

THANK YOU !

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