IETF #104 - BMWG
Methodology for VNF Benchmarking Automation

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“If VNFs deployments can be fully automated, VNF benchmarking should be automated as well!”

Concept: Design and specify a generic workflow to automatically execute arbitrary pre-defined VNF benchmarking experiments.
The draft and its recent update

- Re-structured draft -03
- **End-to-end** definition of automated VNF benchmarking method
  - We define **how to automate** the benchmarking process, **not how to benchmark** → highly depends on the SUT
- Benchmarking experiment description using “VNF benchmarking descriptors (VNF-BD)”
- **Two** open-source reference implementations
  - Gym [1][2]
  - 5GTANGO benchmarker “tng-bench” [3][4]
Work in progress and future plans

- **YANG-based data models** [5] for VNF-BDs, VNF-PPs, etc.
- **YANG-based interface definitions** for probes, monitors, etc.
- Run **experiments** and produce **example results** [6] using the two reference implementations
Open issues and further discussion

• **Generic representation** for VNF performance **profiles** (VNF-PPs)?
  • **MUST:** **Machine readable** to be **used by orchestration** solutions etc.
  • Suggestions?

• **Alignment / collaboration with other drafts of the BMWG**
  • RFC8172: Considerations for Benchmarking Virtual Network Functions and Their Infrastructure (done, see Sec. 6.4)
  • Considerations for Benchmarking Network Performance in Containerized Infrastructures
  • Considerations for Benchmarking Network Virtualization Platforms
  • A YANG Data Model for Network Interconnect Tester Management
  • RFC 8204: Benchmarking Virtual Switches in the Open Platform for NFV (OPNFV)
  • … others?
Thank you!
References

Backups: Example Results

- **SUT**: Suricata IDS VNF deployed in a Docker container
- **Parameters**
  - Different IDS rulesets
  - Different number of vCPU cores
  - Different amounts of CPU bandwidth (CPU time)
  - Different memory limits
- **Stimulation**
  - Traffic traces with small and big flows
- **Experiments executed without human interaction using benchmarking descriptors**
- **Everything open**:
  [https://github.com/raphaelvrosa/vnf-bench-model](https://github.com/raphaelvrosa/vnf-bench-model)
Proc. Packets vs. CPU cores and flow sizes

(2048, 'big_ruleset', 'bigFlows.pcap')

(2048, 'big_ruleset', 'smallFlows.pcap')
Proc. Packets vs. CPU time

('small_ruleset', 'bigFlows.pcap')

metric_vnf0_suricata_packets

param_vnf0_cpubw

('small_ruleset', 'smallFlows.pcap')

metric_vnf0_suricata_packets

param_vnf0_cpubw
Dropped Packets vs. CPU time

('small_ruleset', 'bigFlows.pcap')

('small_ruleset', 'smallFlows.pcap')
Beckups: Figures etc.
Figure 1: Generic VNF Benchmarking Setup
Figure 2: VNF benchmarking process inputs and outputs