



IETF #105 - BMWG

Methodology for VNF Benchmarking Automation **-04**

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Why the draft was updated?

- Need of clear considerations regarding Benchmarking Procedures (Sec. 4.2)
- Need of comparison factors (i.e., VNF-BD was not yet fully functional)
 - ◆ VNF-BD Yang model reflecting such changes
- Comments on open source reference implementation (Gym) not available

Which issues was it trying to address?

- Refine the Terminology - focus on the draft only (not NFV generic)
- Generic benchmarking procedures reflecting the overall methodology
- When running Tests with Open Source reference implementations
 - ◆ VNF-BD reflecting ongoing experiments (vice-versa)
 - ◆ Divergences in prober(s)/listener(s) parameters
- Have comparison Tests with reference implementations

Which are the major technical changes?

- Filtered only important concepts in Terminology
- Considerations on Benchmarking Procedures
 - ◆ Generic Phases (I to IV): Deployment, Configuration, Execution, Report
- **Refined VNF Benchmarking Descriptor (VNF-BD) structure (Sec. 6.1)**
 - ◆ Description Headers: VNF-BD versioning, authorship, description, etc
 - ◆ Target Information: VNF (SUT) descriptor (version, image, etc)
 - ◆ Experiments: Defines overall VNF-BD parameters: repetition of Trials, Tests, Method
 - ◆ Environment: Settings referring to components (e.g., orchestrator) to deploy scenario
 - ◆ Scenario: Topology for Tests
 - ◆ Proceedings: Agent(s)/Monitor(s) settings for (prober(s)/listener(s)) Test parameters
- VNF-BD Yang model updated
- Gym updated reference to open source repository

Which issues are unresolved? Which issues needs further discussion.

- Refine VNF Performance Profile structure
 - ◆ Generic representation
 - ◆ Useful for orchestration solutions and analytics platforms
- Have well documented comparison Tests with open source reference implementations
 - ◆ Fully demonstrating the importance of the draft
 - ◆ Showcasing utility/validity of Yang models
- Synergies (alignment/collaboration) with BMWG related work
 - ◆ 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!



Backup

- ❖ Why?
 - “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.**
- ❖ We define **how to automate** the benchmarking process, **not how to benchmark** → highly depends on the SUT
- ❖ **Two open-source reference implementations**
 - Gym [1][2]
 - 5GTANGO benchmarker “tng-bench” [3][4]

Backup

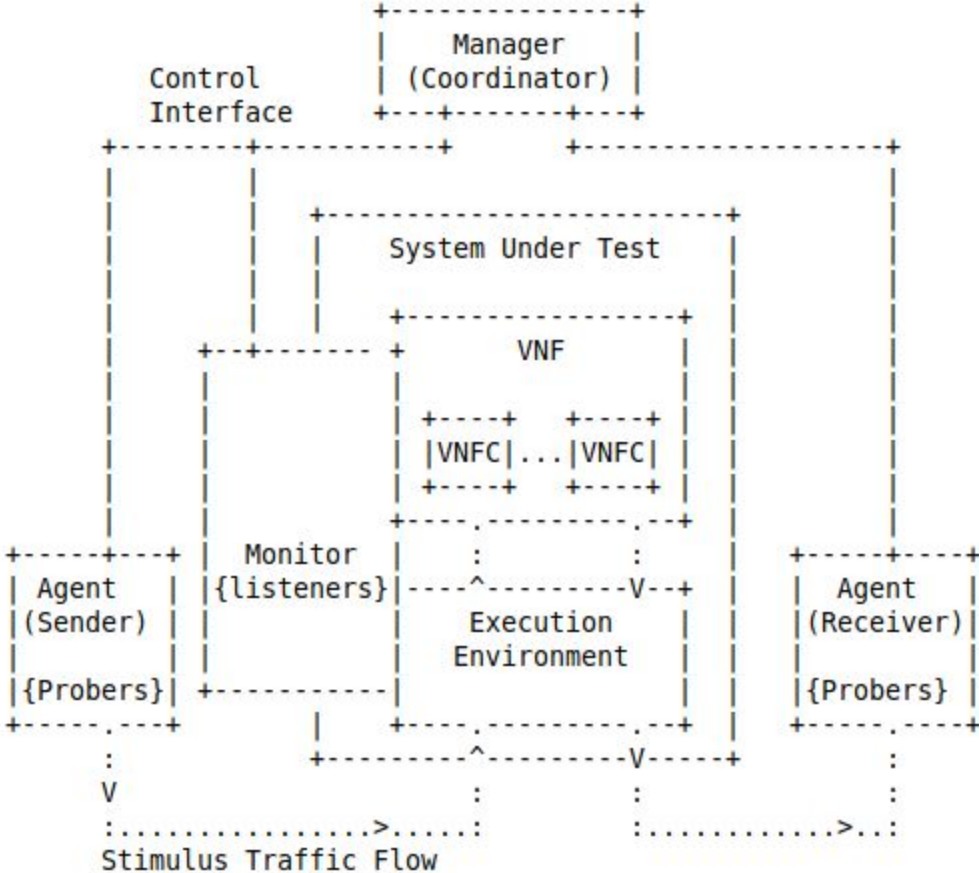


Figure 1: Generic VNF Benchmarking Setup

Backup

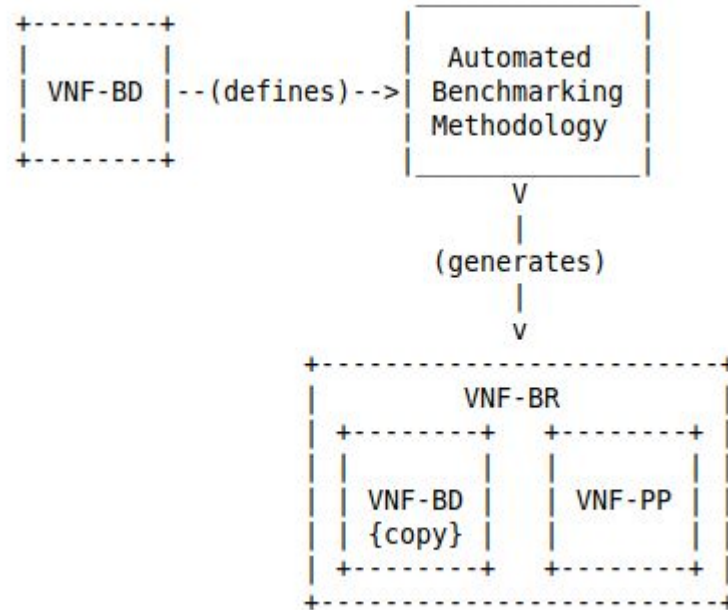


Figure 2: VNF benchmarking process inputs and outputs

Backup: 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>

References

- [1] R. Rosa, C. Bertoldo, C. Rothenberg, "Take your VNF to the Gym: A Testing Framework for Automated NFV Performance Benchmarking", IEEE Communications Magazine Testing Series , Sept 2017, <<http://ieeexplore.ieee.org/document/8030496>>.
- [2] "Gym Home Page", <<https://github.com/intrig-unicamp/gym>>.
- [3] M. Peuster, H. Karl, "Profile Your Chains, Not Functions: Automated Network Service Profiling in DevOps Environments", IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN) , 2017, <<http://ieeexplore.ieee.org/document/8169826/>>.
- [4] "5GTANGO VNF/NS Benchmarking Framework", <<https://github.com/sonata-nfv/tng-sdk-benchmark>>.
- [5] YANG Models: <https://github.com/raphaelvrosa/vnf-bench-model/tree/master/vnf-br/yang>
- [6] Example Results: <https://github.com/raphaelvrosa/vnf-bench-model/tree/master/experiments>