IETF #105 - BMWG

Methodology for VNF Benchmarking Automation -04

R. Rosa, C. Rothenberg, M. Peuster, H. Karl
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!
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
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