

Benchmarking Methodology WG (BMWG)  
Wednesday march 27, 2019 | 11:20-13:20 (UTC+1)  
Morning Session II - Room Athens/Barcelona OPS

Remote Participation:  
<https://www.ietf.org/how/meetings/104/remote>

Note taker: Warren Kumari  
Jabber Scribe: Sarah Banks  
Key: Q (Question) A (Answer) FQ (Follow up Question) C (Comment)

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P L E A S E   R E A D   T H E   D R A F T ! ! !  
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0. Agenda Bashing

1. WG Status (Chairs)

(Brief Status below)

- There are many proposals for new work
- Plan: Look for synergies in drafts
- **Action Item:** Update Milestones (Chairs)
- **Suggestion from Chairs:** Remember to use the “Standard Paragraph” when authoring your drafts – it saves time in review and removes objections

1a. Benchmarking Methodology for EVPN and PBB-EVPN

Presenter: No presentation, just an update

Related Draft:

- Chairs update: going to put the draft through a second last call, as the first last call received no responses on list

2. Charter and Milestones (Chairs)

3. Benchmarking Methodology for Network Security Device Performance

\*\*\* with validation test results \*\*\*

Presenter: Carsten Rossenhoevel

Related RFC: <https://tools.ietf.org/html/rfc3511>

Related Draft:

<https://tools.ietf.org/html/draft-ietf-bmwg-ngfw-performance-00>

Related Web page:

<https://www.netsecopen.org/>

<https://www.netsecopen.org/about>

Presentation:

- Been previously presented.
- Weekly calls happening in NetSec open group.
- No discussions happening on BMWG mailer, but in separate mailer NetSecOPEN(?)
- Goal: having repeatable results for any ngFW testing, improving test procedures.
- Overview of updates since IETF103 -- see slides.
- Comparison with RFC3511 -- see slides.
- Definitions for different sizes / classes of firewalls (Small, Medium, Large, ...)

Q: Jacob Rapp (JR): Can we classify these differently? Things evolve over time, etc.

A: Couldn't really figure out how to put in dynamic stuff.

FQ: Sarah Banks: seems like you need guidelines. Should have people list how many rules, etc. for each iteration.

C: Jacob Rapp: Recommendation -- instead of S,M,L,suggest class A, B, C and a way to define your own.

A: This also adds TCP stack info, it is important

C: Al Morton: Things like RTT, etc. affect things. I think you should include some delay generators, etc. to tickle those. This reflects real world.

C: Tim Winters: Is there some place where we can borrow text form?

C: Al Morton: Depends if you want window to exhaust, so.. no.

Q: Jacob Rapp: I don't think we should be recommending what implementors should implement.

A: Well, what can be turned off and still be a firewall?

Q: Jacob Rapp: I think we should just list all features, and not recommend what is required / optional.

A: Don't want the vendors to game it. Vendors don't really provide details, and so we want them to not apply it with features off and claim compliance.

Q: Sarah Banks: Suggest having 2 types, one with everything on, and another with a list of what features on vs off?

A: Don't want them to publish without the feature list, some will only list a number with everything turned off.

Q: Jacob Rapp: Should include more of the terminology stuff from other documents.

Pres: Send text!

- Did PoC testing.
- We want to create a program to we can compare results across labs / testers / etc.
- Results: See slides.
- next steps - draft fairly stable, but want to continue reviews and feedback gathering. Aiming at setting up an open certification program. Drive open-source test tools implementations. Looking for open-source groups interested in participating in POC testing.
- Call of Open Source people / etc. to participate.

**Q:** Tim Chown: Good work! This looks like designed for ebncmard commercial. In university, see elephant flows too. Would be nice to see testing for that too. We see firewalls squash elephants - not designed for this. Is the scope to allow traffic mix to include some high throughput flows?

**Pres:** Document is modular. We discussed this, we should be able to add e.g: mobile, and academic profile, etc. Please send info / contribution.

**Q:** Maciek Konstantynowicz: Thanks! OpenSource benchmark, called out trex. We use it extensively. Will follow up. Are you only focusing on closed systems, or also virtualized space?

**A:** Done it with 3 virtualized. Similar to black-box. All should look like a black box. Perhaps in e.g cloud the profile will be different.

**Q:** Maciek Konstantynowicz: Excellent. We are looking at cloud / container networks - to what degree does the methodology change? Function is distributed...

**A:** Contributions welcome!

**C:** Sarah Banks: Bob - we are planning on doing profiles / resource utilizations.

**Q (to Chairs, from Presenter):** Next steps?

**A:** Al Morton: You have been adopted, now we rough you up and try get it ready for WGLC.

**A:** Sarah Banks: (relay from Brian Monkman on jabber): Reminder that netsec open runs under RFC8179.

#### 4. Updates for Back-to-Back Frame Benchmark & OPNFV Plugfest/VSPERF Testing

**Presenter:** Al Morton

**Related Draft:** <https://tools.ietf.org/html/draft-morton-bmwg-b2b-frame-05>

**Background Slides with test results:**

<https://wiki.opnfv.org/download/attachments/10293193/VSPERF-Dataplane-Perf-Cap-Bench.pptx?api=v2>

<https://wiki.opnfv.org/display/vsperf/Traffic+Generator+Testing>

- Call for WG Adoption resulted in many exchanges on-list with Yoshiaki Ito, resolved in ver 04 and 05
- Work in virtualized space impetus for this.
- Added background in reference into this doc.
- Overview of test, back to back stream. Buffer catches and tries to forward. If the buffer & header processing can keep up, then we haven't characterized buffer. Aim to overflow.
- Hard to tell because of header processing. Added text on correction factor.
- Buffers absorb transients

**Action item** – Sarah Banks to call consensus on draft, on the list

**Q:** Maciek Konstantynowicz: Goals look useful. Concern: In NFV - abstracting software dataplane on many devices isn't really correct. Not showstopper, looks useful.

**A:** Al Morton: A test to determine that simple model failed, then go to other test...

Q: Maciek Konstantynowicz: How do we apply this to more complex topologies?

Guessing it is for future work.

A: Al Morton: Yup.

Q: Sarah Banks: Are you planning on expanding scope, etc.?

A: Al Morton: Not really. Clear from document what scope is.

C: Maciek Konstantynowicz: Agree.

## 5. Methodology for VNF Benchmarking Automation

Presenter: Manuel Peuster

Related Draft: <https://tools.ietf.org/html/draft-rosa-bmwg-vnfbench-03>

Related Publication: (IEEE Comm Mag)

<https://www.dropbox.com/s/n9niziuhi648scj/2017-rosa-taking.pdf?dl=0>

- Premise: If VNF is automated, benchmarking should be too!
- This is a framework to run benchmarks, not a benchmark itself.
- 2 opensource implementations - Gym, 5GTANGO (tng-bench)
- See slides.
- Lots of good overlap with other documents, etc.
- Want to contact other authors / etc. to align.

Q: Carsten: How far is the draft?

A: Still needs some work, but fairly close

Q: CB: Seems very abstract, not clear to me how to use it. Guide on how to test in general - seems too generic.

A: Biggest point - we want the modes, so you can give the model to someone with tools, and can run it without needing to do manual setup, human interaction, etc.

Q: CB: VNF testing is domain specific. This doesn't really seem to cover domain specific. Not sure if successful.

A: Left it intentionally open, and you can use your benchmark and have it automated. It is a much higher level.

Q: CB: Q on opensource - couldn't download Gym, couldn't find it.

A: Heard pres. is being updated. tng-bench is under development. It is usable: <https://github.com/sonata-nfv/tng-sdk-benchmark>

**Action item** – Presenter to update link for Gym.

## 6. Considerations for Benchmarking Network Virtualization Platforms

\*\*\* with test results \*\*\*

Presenter: Samuel Kommu & Jacob Rapp

Related Draft: <https://tools.ietf.org/html/draft-skommu-bmwg-nvp-03>

- Terminology draft. Split into co-located / single.
- Trying to capture universe where e.g smart NICs, hypervisor not on cam CPUs, etc.

- Description of updates: See slides.
- Off-loads make things faster :-P
- Test results were presented - see slides for details.

C from presenter: looking for more feedback.

C: Maciek and Sarah volunteered to read and comment on the draft.

C from Presenter: interested in feedback on the firewall parts.

## 7. Benchmarks and Methods for Multihomed EVPN

Presenter: Al Morton

Related Drafts: <https://tools.ietf.org/html/draft-morton-bmwg-multihome-evpn-01>  
<https://tools.ietf.org/html/rfc8317>

- Pres: short presentation today. Got some feedback off list but not enough. Looking to deploy it in SPs.

Q: Sarah Banks: How does it fit into adopted EVPN draft. Jim (co-author) in discussion with author of the other draft?

Q: Carsten Rosenthavel: Finding it useful, very applicable. Will provide feedback on improving the methodology.

C: Sarah Banks: looking for feedback from people actually doing the testing - asking Carsten to read the drafts EVPN (methodology this draft, terminology item 14, and EVPN multicasting draft presented later). Also looking for all EVPN benchmarking authors to meet and discuss if these multiple drafts can be consolidated

## 8. Multiple Loss Ratio Search for Packet Throughput (MLRsearch)

\*\*\* with test results from FD.io CSIT \*\*\*

Presenter: Vratko Polak, Maciek Konstantynowicz

Related Draft:

<https://tools.ietf.org/html/draft-vpolak-mkonstan-bmwg-mlrsearch-00>

- Proposal: improved binary search.
- Aims to increase speed of testing by improving search.
- We find multiple loss ratios (e.g: non-drop and partial drop ratio). Can add more.
- Maths! (See slides).
- Geometric progression with shorter tests, wider accuracy window, home in on actual.
- Running code! (lots of links, see slides).
- Results - see slides.
- 30--60% improvement.
- Asking for comments / adoption.
- Al Morton: Only a few readers. Seems within scope.
- **Action Item:** Looking for reviewers (Sarah, Carsten, Li)

9. Probabilistic Loss Ratio Search for Packet Throughput (PLRsearch)

\*\*\* with test results from FD.io CSIT \*\*\*

Presenter: Vratko Polak, Maciek Konstantynowicz

Related Draft: <https://tools.ietf.org/html/draft-vpolak-bmwg-plrsearch-01>

- Motivation: Users still want "Throughput "
- Search is probabilistic. Makes assumptions about SUT.
- PLRsearch similar to RFC2544
- Graphs - see slides.
- More graphs - example of why 2 fitting functions. See slides.
- Interesting "jitter" of results. Converges over time.
- Sample implementation / Running Code -> See links in slides.
- Ask: Adoption.

New Proposals:

10. Benchmarking Methodology for EVPN Multicasting

Presenter: Vikram Nagarajan (Remote)

Related Draft: <https://tools.ietf.org/html/draft-vikjac-bmwg-evpnmultest-01>

- Follow on to EVPN benchmarking.
- Focusing on IGMP snooping and optimized L2 mcast forwarding.
- Topology tested: CLOS switching fabric with mcast sourced from behind spines and distributed towards leaves.
- Measuring: learning rate, and forwarding rate
- Long list of IGMP related parameters to measure - see slides.
- Measuring with multiple VLANs, and at scale with many groups.
- Q: Al Morton: asked if anybody in BMWG with expertise on multicast EVPN
- A: no one.
- Q: Al Morton: asking author(s) to find reviewers from another WG to progress work here.
- A: okayed.

11. Considerations for Benchmarking network Performance in Containerized Infrastructures

Presenter: Kyoungjae Sun

Related Draft: <https://tools.ietf.org/html/draft-dcn-bmwg-containerized-infra-00>

- Made reference to ETSI GS NFV-TST 009
- Draft is focusing on comparing container deployments between bare metal and VM.
- Leveraging different orchestration for those environments.

- See testing environment specification slides.
- Testing scenarios: Combinations of bare metal and VM based scenarios
- Lots of test scenarios are not described in the draft yet, so moving on.
- Conclusion: want to focus on developing test methodologies for containerized environments.
- To review the draft: Luis, Al and Maciek already reviewed.

## 12. NFV Service Density Benchmarking

\*\*\* with test results from [FD.io](https://fd.io) CSIT and CNCF CNF Testbed \*\*\*

Presenter: Maciek Konstantynowicz

Related Draft: <https://tools.ietf.org/html/draft-mkonstan-nf-service-density-00>

- Goal is to define constant methodology to benchmark NF data planes running on single server, but not in isolation. e.g service chain, impact of noisy neighbor.
- Assumption: NFV are build from functions, either isolated, or in containers (or others).
- Distinguishing topologies impacts, and virtualizations / host types.
- Paying attention to noisy neighbors, etc.
- We abstract service - see topology and configuration. Also, how packets are forwarded.
- Applied methodology in 2 projects, including CNF.
- Density matrix -- see slides.
- Also have core focused matrix.
- Sample measurements -- see slides, have data.
- Cannot measure all combinations.
- More results. -- Explanation of results.
- More resources -> switch makes things better!
- Chairs ask: Adoption / feedback.
- C: Carsten R: Jacobs and these look very different. Cover same area from other sides. Perhaps they can be aligned (not merged)?
- Presenter: Good comment.
- Action item - Pres: Will talk to Jacob and will try align.
- Action item - AM: Participants should read the documents.
- Q from Presenter: Evaluating performance under load - this is under interest, yes? Couldn't find people doing this work.
- Al Morton: Closest was in work 009. This goes to network service density. I like this.

## 13. FYI - A YANG Data Model for Network Interconnect Tester Management

Author: Vladimir Vassilev

Related Draft:

<https://tools.ietf.org/html/draft-vassilev-bmwg-network-interconnect-tester-00>

14. FYI - Benchmarking Methodology for EVPN VPWS

Presenter: <not presented this time>

Related Draft:

<https://tools.ietf.org/html/draft-kishjac-bmwg-evpnpwstest-01>

and then...

13:40-15:00 Wednesday Afternoon Collaboration Session Congress Hall 3

<https://datatracker.ietf.org/meeting/104/floor-plan?room=congress-hall-3#lower-lobby>

WHO: Everyone interested in continuing discussions of drafts and test results (mostly test results)

WHAT: Grab a To-Go Lunch and return for more informal BMWG!

WHEN: ASAP after the official BMWG session closes

WHERE: Congress 3 meeting room with a projector and ideally tables to eat lunch comfortably.

END TIME: 1500

Notes: We will have to pack-up and move to Congress 3, but we have to grab lunch somewhere, anyway, and we'll have plenty of space. Our session room was already booked :( Also, this will be a face2face meeting, where presenters will use their own laptops and collect comments on their work.

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EOM