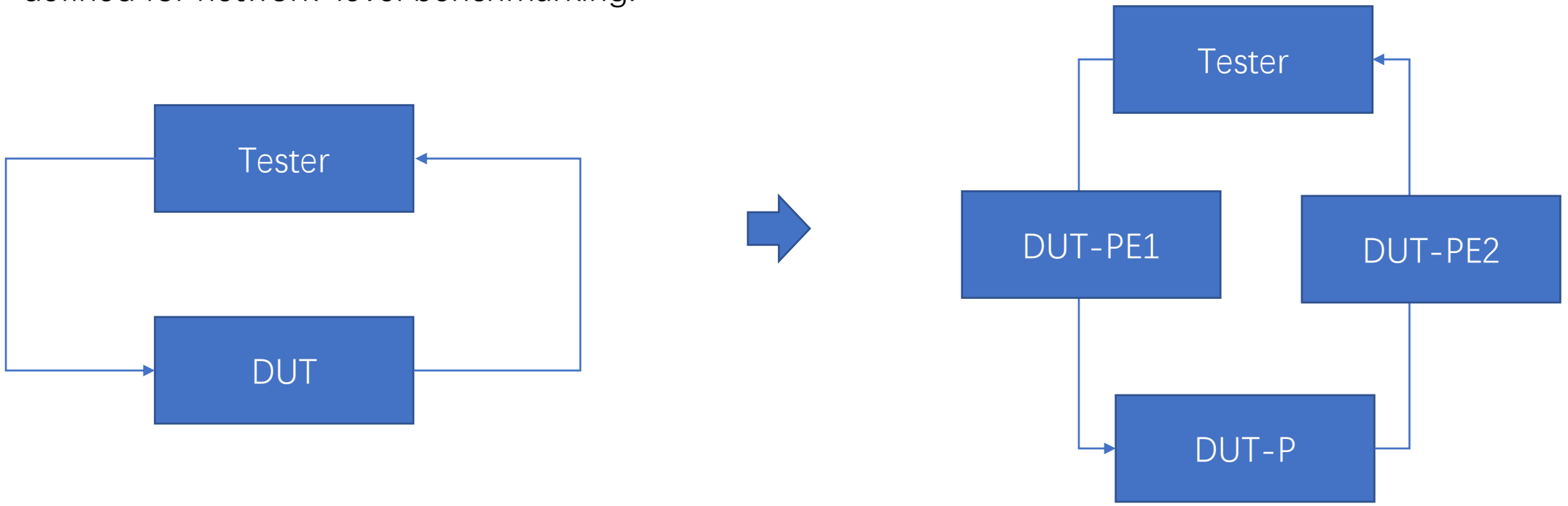
SRv6 Service Benchmarking Guideline

draft-geng-bmwg-srv6-service-guideline

BMWG, IETF 121, Dublin

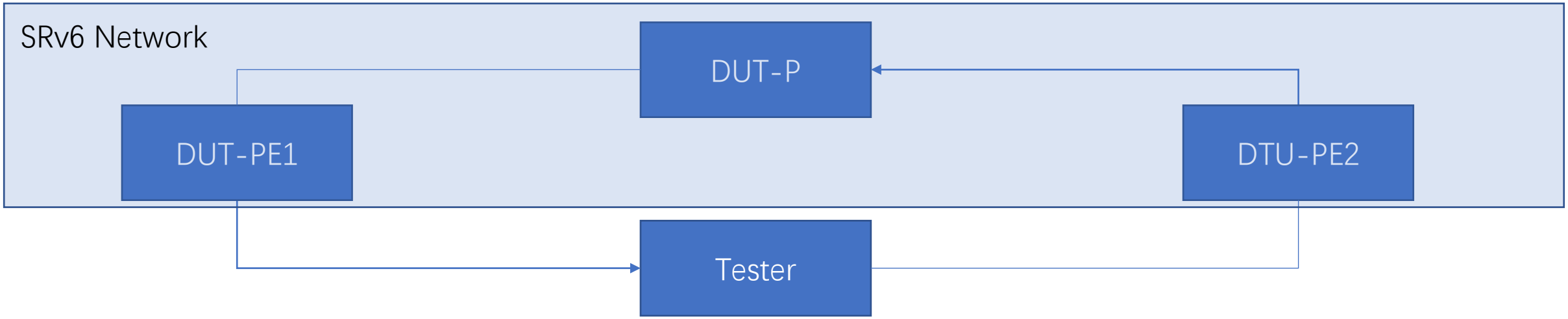
More than RFC2544?

- RFC2544 defines a number of tests to describe the performance characteristics of a network interconnecting device, which is widely used for **single device**.
- In addition to single-device benchmarking, **network-level benchmarking** is also critical for operators. This can provide valuable reference points for on-net testing, which is essential work.
- Similar tests and performance characteristics, **like throughput, latency, packet loss rate**, could be defined for network-level benchmarking.



Take SRv6 as An Example: from single device to service

- draft-ietf-bmwg-sr-bench-meth has defined the SRv6 behavior in data plane of **singe device**
- Segment Routing specific report parameters are defined, for example:
  - Number of Segments considered in the SID list.
  - Behavior (H.Encaps, etc.) and Flavor (PSP, USP, USD) used for SRv6 tests (according to [RFC8986]).
- Based on the existing work, we are trying to propose the benchmarking of **SRv6 service** capability, which means different types of services could be transported through **SRv6 network**.



SRv6 Service Benchmarking

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SRv6 Best Effort Service

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Internet Service
- Global IPv4 over SRv6 network
- Global IPv6 over SRv6 network

Layer 3 Service over SRv6
- IPv4 VPN over SRv6 network
- IPv6 VPN over SRv6 network

Ethernet VPN (EVPN) over SRv6
- Layer2/Layer3 VPN over SRv6
- VPWS VPN over SRv6

SRv6 Traffic Engineering Service

SRv6 Policy with Compression

Internet Service
- Global IPv4 over SRv6 network
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RFC 9252: BGP Overlay Services Based on Segment Routing over IPv6 (SRv6)

Comments and Update

- From IETF 120:
  - Add Test Topology in section 3
  - Collect Feedback from SRv6OPS
- From SRv6OPS Mailing List: will be updated very soon after the meeting

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1. The test topology in section 3 is a bit simple and cannot reflect the testing scenarios of subsequent sections. It is recommended to refine it, maybe split to different topologies according to the following scenarios.
[Xuesong] Good question! We have also mentioned this point in last IETF meeting. Considering that the previous benchmarking is for single device/system, more complex topology may make it difficult to control and repeat, so we decide to maintain the simplest topology in the existing stage. Maybe we could consider more complex topology in the future version.

2. In section 3.4.2 SRv6 SID Ping, I think the expected results do not match the procedure, the suggestion as follow:

Expected Results:

1. the SRv6 SID Ping returns the result that every node is through
[Xuesong] Thanks for pointing this out. We will update in the next version.
3. Regarding the test result descriptions in section 3.1.1 and 3.1.2, some results are summarized as "traffic is forwarded normally without packet loss," . It seems a bit too high-level. For more detailed insights, it might be helpful to break down these results further, similarly to previous single-node benchmarking work. For instance, including metrics such as Throughput, Packet Loss which could provide more granular visibility into the performance of SRv6 networks.
[Xuesong] OK, we will try to introduce more detailed metric in the result part.

I look forward to further discussions and am happy to contribute if I can.

- Add a new co-author: Gaowei

Reuse “Benchmarking Test” of RFC2544 in the Following Version

	RFC2544(Single Device)	Service Benchmarking(Multiple Device)
Throughput	**Procedure:** Send a specific number of frames at a specific rate through the DUT and then count the frames that are transmitted by the DUT. If the count of offered frames is equal to the count of received frames, the fewer frames are received than were transmitted, the rate of the offered stream is reduced and the test is rerun. The throughput is the fastest rate at which the count of test frames transmitted by the DUT is equal to the number of test frames sent to it by the test equipment.	Could be reused directly
Latency	**Procedure:** First determine the throughput for DUT at each of the listed frame sizes. Send a stream of frames at a particular frame size through the DUT at the determined throughput rate to a specific destination. The stream SHOULD be at least 120 seconds in duration. An identifying tag SHOULD be included in one frame after 60 seconds with the type of tag being implementation dependent. The time at which this frame is fully transmitted is recorded (timestamp A). The receiver logic in the test equipment MUST recognize the tag information in the frame stream and record the time at which the tagged frame was received (timestamp B).	Time Synchronization should be requested
Frame loss rate	**Procedure:** Send a specific number of frames at a specific rate through the DUT to be tested and count the frames that are transmitted by the DUT. The frame loss rate at each point is calculated using the following equation: ((input_count - output_count) * 100) / input_count	Could be reused directly

Next Steps

- Comments and collaborations are welcome.

Thanks