
Network Working Group

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**Updates for the Back-to-back Frame Benchmark in [RFC 2544](#)
draft-morton-bmwg-b2b-frame-05**

Abstract

Fundamental Benchmarking Methodologies for Network Interconnect Devices of interest to the IETF are defined in [RFC 2544](#). This memo updates the procedures of the test to measure the Back-to-back frames Benchmark of [RFC 2544](#), based on further experience.

This memo updates [Section 26.4 of RFC 2544](#).

[VSPERF-b2b] provides the details of the calculation to estimate the actual buffer storage available in the DUT, using results from the Throughput tests for each frame size, and the maximum theoretical frame rate for the DUT links (which constrain the minimum frame spacing). We present some of these details here.

The simplified model used in these calculations for the DUT includes a packet header processing function with limited rate of operation, as shown below:

```

                                |----- DUT -----|
Generator -> Ingress -> Buffer -> HeaderProc -> Egress -> Receiver
```

So, in the back2back frame testing:

1. The Ingress burst arrives at Max Theoretical Frame Rate, and initially the frames are buffered
2. The packet header processing function (HeaderProc) operates at approximately the "Measured Throughput", removing frames from the buffer
3. Frames that have been processed are clearly not in the buffer, so the Corrected DUT buffer time equation (Section 5.4) estimates and removes the frames that the DUT forwarded on Egress during the burst.

Implied DUT Buffer Time =

$$\text{Average num of Back-to-back Frames} / \text{Max Theoretical Frame Rate}$$

The formula above is simply expressing the Burst of Frames in units of time.

The next step is to apply a correction factor that accounts for the DUT's frame forwarding operation during the test (assuming a simple model of the DUT composed of a buffer and a forwarding function).

Corrected DUT Buffer Time =

$$= \text{Implied DUT Buffer Time} * \frac{\text{Measured Throughput}}{\text{Max Theoretical Frame Rate}}$$

where:

1. The "Measured Throughput" is the RFC2544 Throughput Benchmark for the frame size tested, and MUST be expressed in Frames per second in this equation.
2. The "Max Theoretical Frame Rate" is a calculated value for the interface speed and link layer technology used, and MUST be expressed in Frames per second in this equation.