Calibration of Measured Time Values between Network Elements

draft-contreras-bmwg-calibration-00

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Motivation

- Timestamps in packets can be used for calculating the measured delay between origin and destination
  - It can be used for traffic engineering purposes by composing the back-to-back delay in a path
- Network devices are incorporating capabilities for time stamping packets
  - Relevant for other work in IETF, such as Flex Algo algorithms [RFC9502] [RFC9351] for latency, or services sensitive to latency, as the deterministic ones [RFC8557], or PCE [RFC5440]
- The aim of this document is to propose a methodology for calibrating the measurements from different network element implementations
  - Common measurement scenario.

Measurement scenario

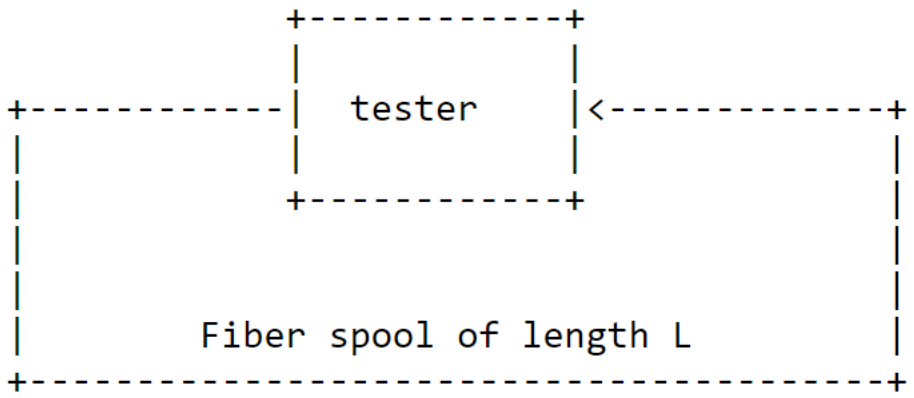

Figure 1: Baseline measurement scenario

Baseline = *T_baseline*

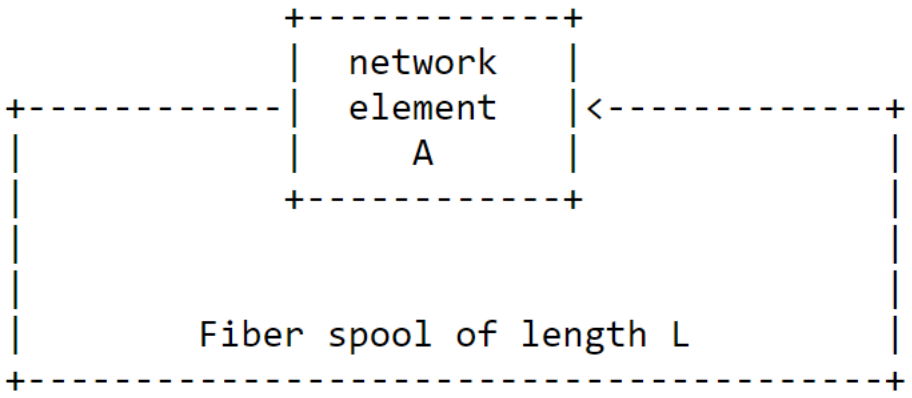

Figure 2: Single network element test

Bias = comparison between *T_baseline* and *T_ne*

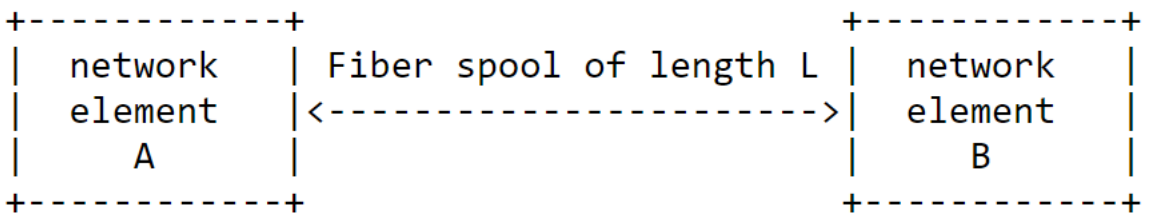

Figure 3: Paired network elements test

Bias = comparison between *T_baseline* and *T_ne_ab* (or *T_ne_ba*)

Measurement conditions

- Network device model, hardware and software description.
- Length of the fiber spool used as reference for the measurement.
- Description of the ports / line card where the fiber spool is connected. Protocol used in the measurement (e.g., TWAMP-light, STAMP, ...)
- Duration of the test for statistical consistency (e.g., period for average, min, max calculations)
- Network tester used for generating the baseline values.

Points to be addressed in -01

- Assess the differences of distinct line card / port behavior
- Scalability aspects (e.g., multiple sessions are running in parallel from the network element to its neighbours)
- Load aspects (e.g., background traffic in addition to measurements)
- Resolution of the obtained measurement
- Possibility of considering asymmetric scenarios (e.g. different path / fiber length)
- Extension of this approach to any network element, e.g. switches

Next steps

- Collect feedback and interest from the WG
- Complete the draft with the open points already identified
  - Address additional points raised during presentation or from comments received
- Prepare new version for IETF 122