



**Broadband Forum Liaison To:**

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**From:**

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**Liaison Communicated By:**

David Sinicrope <david.sinicrope@ericsson.com>

**Date:** March 21, 2019

**Subject:** For Information: Quality Experience Delivered (Broadband QED) project and Reply to Liaison

The Broadband Forum wishes to thank SG12 for informing us of your work on harmonizing testing methodology across the industry. We look forward to cooperating with SG12 on this endeavor.

To this end we would like to inform SG12 of three areas of testing related work that the Broadband Forum currently has under way:

Quality Experience Delivered (Broadband QED) project -The QED project is developing a new, Quality Attenuation ( $\Delta Q$ ) method to capture packet network performance that may be applied to analysis of both deployed networks and in laboratory testing.

Quality Attenuation ( $\Delta Q$ ) is an approach to systems performance analysis that has applicability to broadband networks. It uses statistical distributions as a proxy for quality of experience and application outcomes.  $\Delta Q$  can decompose a round trip time into separate constituent components, corresponding to various sources of performance degradation (packet loss/delay), be they structural (architecture/design), network dimensioning (link speeds etc.) or network load/scheduling related. The component elements of  $\Delta Q$  are composable i.e. they are both additive within an individual link to give its resultant performance and can be accumulated along the end-to-end digital delivery chain (e.g. between user device or CPE and application server in the cloud data center). It is this mathematical tractability that makes the technique so powerful for reasoning about systems (network) performance and facilitates "performance by design".

This project will develop a comprehensive overview of Quality Attenuation and its applicability to broadband networks. It will cover the theory, measurement technique, use-cases and benefits of the approach.

The Broadband Forum is also progressing work on Application-Layer Testing (ALT), which allows the evaluation of network and application performance in laboratory testing under conditions which emulate the time-domain traffic characteristics resulting from the behavior of multiple applications and subscribers using a system under test. The project is defining an architecture and requirements for ALT systems and data models to support specification of unambiguous, reproducible tests that support these complex behaviors. It is also identifying metrics and measurements where appropriate that directly characterize application performance, as opposed to network performance. In addition to application-specific metrics, ALT incorporates network QoS metrics and measurements such as those currently specified for packet delay, delay variation and loss. It will also support the metrics and measurements associated with  $\Delta Q$  when these are specified.

The Broadband Forum is also progressing work on performance measurement from the IP edge to customer equipment using STAMP. This allows the measurement of access and packet transport network performance.

We will keep you apprised of this work as it progresses.

Sincerely,

Lincoln Lavoie,  
Broadband Forum Technical Committee Chair

**CC:**

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**In Response To Incoming Liaison:** BBF LIAISE-264/ITU-T SG12 LS 70

**The next Broadband Forum Meeting will be June 17-20, 2019 in Seoul, South Korea.**

A list of upcoming meetings can be found at <https://www.broadband-forum.org/what-s-happening/meetings-events-webinars/upcoming-bbf-meetings>

**Attachments:**

none