



2FXS

Multimodal Performance Measurement for
Internet Access Profiling

System overview

Measuring the performance of an Internet access, whether it is fixed or mobile, is a common claim from both subscribers and network operators.

While users expect a versatile tool that is available on a wide range of platforms and accessible any time and any place, to get an easy-to-understand quantitative picture on the subscribed Internet access, operators may have various management scenarios (e.g., testing a new deployment, handling performance issues and claims, forecasting, etc.) to perform measurements ad hoc or scheduled.

The key feature of our measurement system is the integrated concept that incorporates a multimodal measurement engine concurrently supporting both web-based and dedicated HW-based clients. This design concept accommodates flexibly to the requisites of both parties. Furthermore, the implemented measurement methodology complies with and extends the related proposals of EU BEREC.

Key

Web- and hardware-based measurements within one system

Measurement range:
1 Mbps - 1+ Gbps

High precision: < 3% web-based measurement error (typically)

Measured access QoS parameters:
DL/UL bitrate (TCP throughput/goodput), packet loss (3 methods), RTT, RTT jitter, TCP retransmissions, and performance statistics

System

Wide OS support: Windows 7/8/8.1/10, Linux, OSX, Android, iOS

Wide browser support: Mozilla Firefox, Google Chrome, Microsoft Edge, Apple Safari

Web technologies: HTML5/JScript (no browser plugin is required)

Features

Low resource requirements on client-side

Portable dedicated HW clients (optional)

Scalable performance: built-in server-side load balancing

Measurement service differentiation: concurrent public (crowdsourced) and internal (technical) measurements

Meets and extends IETF and EU BEREC methodology proposals

Server hardware requirements

Minimum:

Intel x64 multicore CPU
4 GB of RAM
20 GB of disk space
10 GbE PCIe NIC

Recommended:

Intel Xeon E5 class min. 8-core CPU
16 GB of RAM
100 GB of disk space
10/40 GbE PCIe NIC

Software requirements

Client-side:

OS: Windows 7/8/8.1/10,
Linux desktop, OSX, iOS,
Android
Browser with HTML5/JS
and websocket support:
Firefox, Chrome, Edge,
Safari

Server-side:

Linux operating system
Kernel version 4.x
MySQL or SQLite
Webserver (Apache, Lighttpd, etc.)

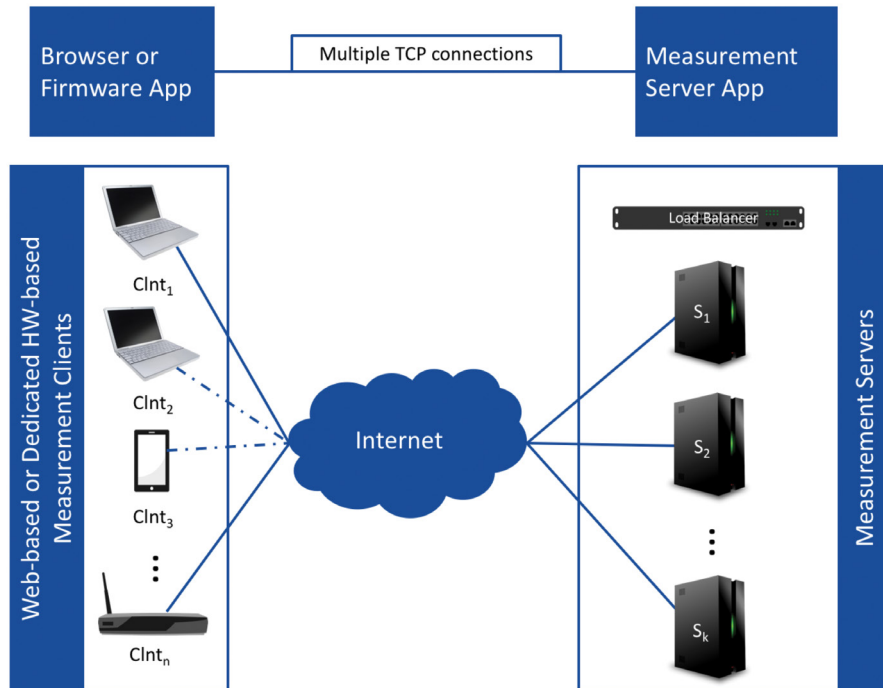
Real-time visualization

Download and upload measurements are visualized on the web-based frontend in real-time. Since the system is based on the HTML5/JavaScript web technologies, it supports a wide range of web browsers.

Customizable layout, style and color



System architecture



Application fields

- Crowdsourcing-based measurements available for fixed and mobile subscribers
- Technical assistance for Internet access deployments and handling network performance issues
- SLA verification
- Permanent outplacement of measurement HW boxes (remote and scheduled measurements)
- Generating Internet access quality maps



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