Set-Top Box simulator with QoS analysis

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ACRONYM	net+ qSimBox
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NO	B15T06
TYPE	Bachelor Project
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The net+ FR company, active in the canton of Fribourg, is a network service provider for business and individuals of various access technologies such as optical fiber, DSL or cable TV.

To optimize its distribution network, it seeks to perform load testing on its equipment and to measure the quality perceived by its TV customers.

Project objectives

- Analyze software solutions for measuring real-time network traffic

- Define methods for calculating the quality of TV streams

- Specify an extensible and scalable software architecture

- Develop a tool to measure the quality on Live and Replay TV streams
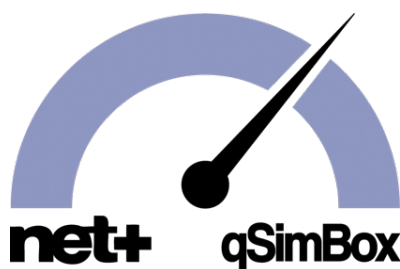
Context

The calculator is placed behind the modem of a subscriber. It simulates TV boxes by subscribing to multiple TV streams according to individual customer profiles and then measures the quality of receiving data.

It also allows for generation of reports in graphical form to quickly assess impact on user experience.

Broadcast server

Distribution network (net+)

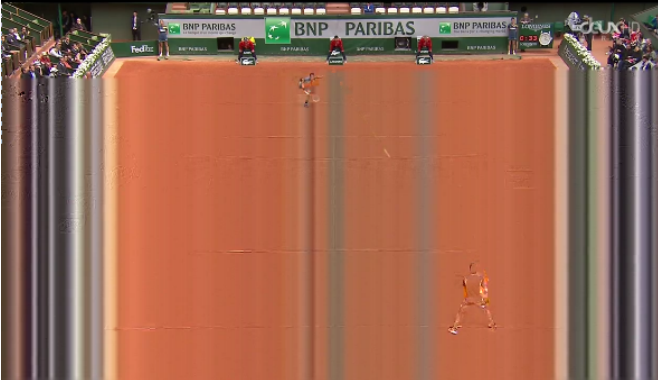Customer's modem

Calculator net+ qSimBox
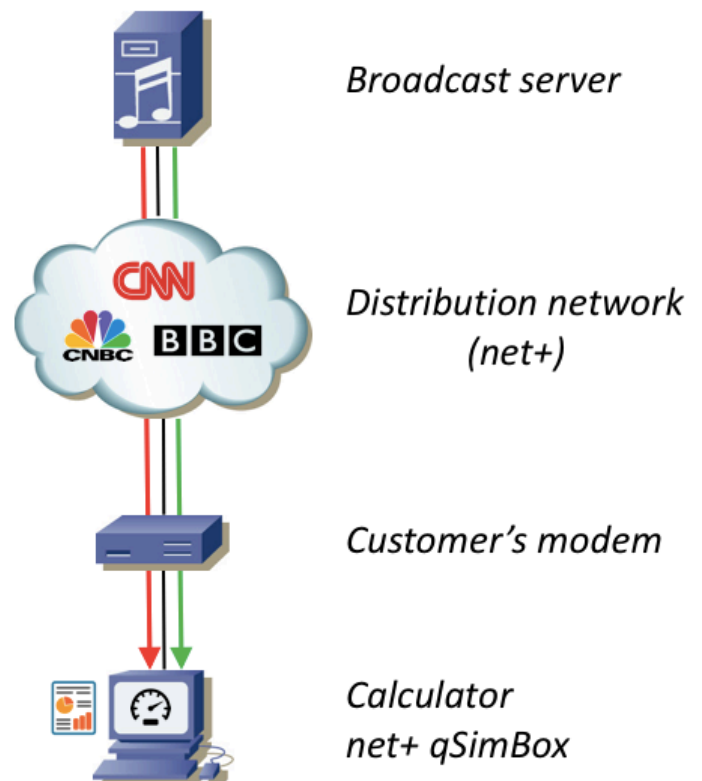
Quality measurement

The quality measurement involves calculating three key values, which directly influence the subscriber's experience:

- Bandwidth used by the TV stream
- Variation of the transmission delay
- Data loss rate
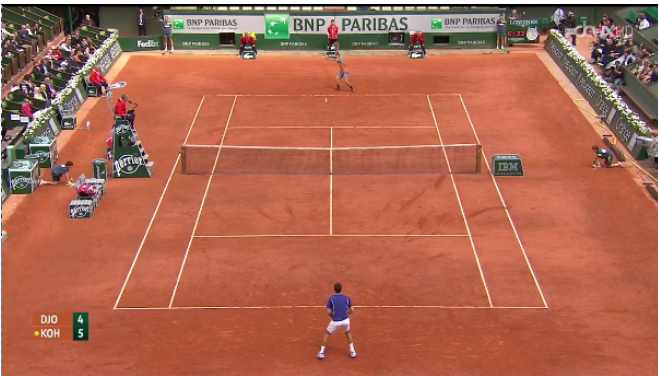
No loss of transmitted data
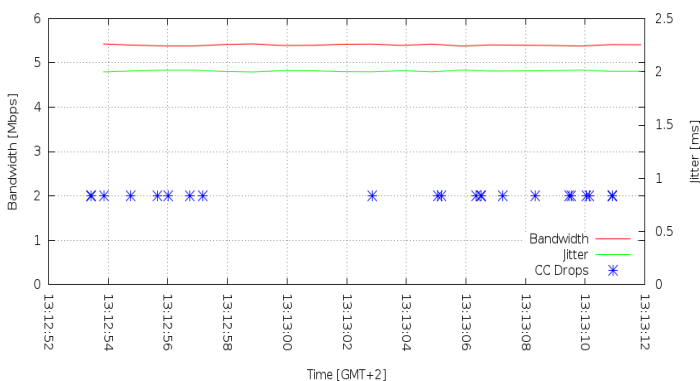

0.5% loss of transmitted data

Chart generated by net+ qSimBox

Types of simulations

The tool is able to subscribe to Live TV channels and Replay programs simulating typical customers:

- Define the number of TV Box
- Zapping between various channels
- Random selection of TV shows
- Online and Offline quality analysis

Embedded system

At the end of the project, the tool has been installed on an embedded system. Recommendations and a proof of concept have been formulated to facilitate its migration into a future project.

Future outlook

The goal is in term to use the software remotely as a probe. Installed at customers that report TV problems, it could be controlled by a command server from the net+ headquarter, and also automatically upload all measurement results.

Hes·so
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