

Robust solutions to monitor QoS & QoE

Quality Measurements for ISPs and OTTs

Surfmeter Lab

- Measures any video or web service directly from the browser
- **Active Measurements:** Triggered directly by the user or an automatic schedule
- **Passive Measurements:** User behavior is monitored from the background
- Automated test environments under ideal conditions



Suitable for: Service-Technicians, Automated Probes, Research, Vehicular Measurements

Surfmeter Lab Mobile

- Streams and measures any video from a mobile device
- Compatible with the ExoPlayer API, DASH and HLS streams
- Measures detailed network data (5G-ready)
- Considers movements and location of the user
- Integration into own applications via library possible



Suitable for: Service-Technicians, Research, "Measurements on the go", Drive-Tests, Vehicular Measurements

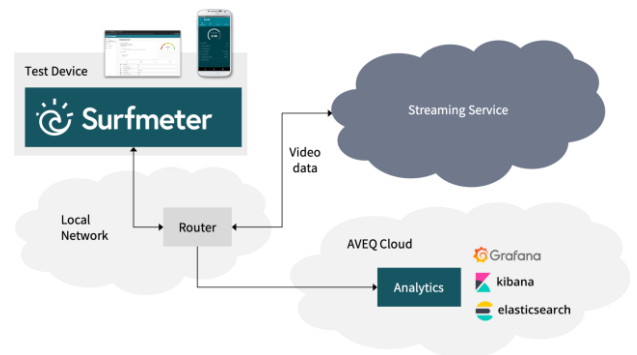
Surfmeter Crowd

- Specific adaption of Surfmeter Lab for measurements **in the crowd**
- Obtains large-scale overview on user behavior and user reactions
- Direct **interaction and communication with the end-user** possible
- Combinable with business and market research data








Suitable for: End-Customer Measurements, Market Research

Architecture



Surfmeter Measurement Data can be imported to existing BigData evaluation tools. We recommend the usage of AVEQ Analytics, an online platform to analyze and export all incoming data.

-  **You stream it – we measure it**
For ISPs, MSOs, OTTs, Content Providers etc. – all companies providing video streams
-  **Perform in-depth QoE analysis**
Gain insight into how your customers experience the quality of your video content
-  **Understand your users' pain points**
Discover issues resulting from network bottlenecks or inefficient service configuration

-  **Troubleshoot your customers' issues**
Technicians can measure with our service app – in the field and in the lab
-  **Improve your services**
Optimize your services to keep customers happy, churn low, and revenue high

Want to know more?



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Common KPIs & KQIs

Video Streaming KPIs

Audio Bitrate
Audio Codec
Video Bitrate
Video Codec
Quality Changes
Video Resolutions (Over Time)
Dropped Frames
Playout Duration
Initial Loading Delay
Stalling Count
Stalling Duration
User Engagement

Bandwidth

Download speed
Ping time
Upload speed
Connection Type¹
Signal Strength¹
Cell-ID¹

Device Data

Browser Type³
Browser Version³
CPU Model¹
CPU Vendor¹
Clock Skew
Device Type
Device Model
Device Vendor
Display Resolution
HD Playout Capability
Operating System Details
RAM Size
Window Resolution

QoE / User Experience

Audio Quality
Possible Abort Reasons²
Reaction-On-Abort²
Session Abort Timestamp²
Session Finish Timestamp
Stalling Quality
Subjective Loading Delay
Subjective Stalling Time
User Playout Duration²
Mean Opinion Score
Video Quality

Location Data

Address Location (City, Country, ...)
GPS latitude + longitude
GPS-Speed and Acceleration¹
IP-based location

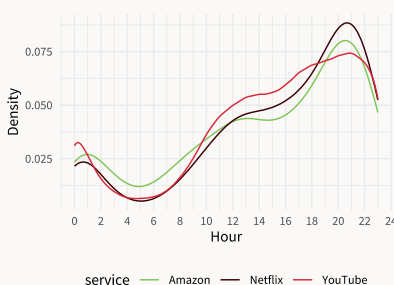
Web Performance^{2,3}

DNS Resolution Time
Multi-Request-Durations
Page Load Time
Page Classes
Request Classes
Scroll Events²
Mean Opinion Score (via QoE model)

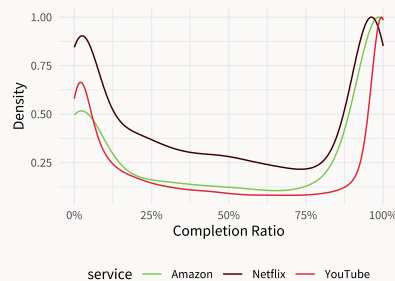
Video & Web Metadata

Ad Timestamps
Account Subscription Type
Video Popularity (Likes/Dislikes)
Video Service
Video Title
Web Domain

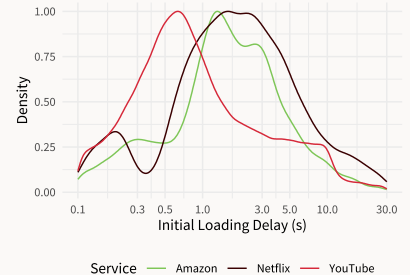
Example: Insights from the Crowd



Typical video usage times measured by Surfmeter show a difference in behavior between popular OTT services.



Video completion measures the user engagement directly from actual streaming sessions. Videos are often aborted early or watched almost completely.



Video loading performance differs significantly across the video providers. With Surfmeter, you can measure many other relevant video Key Performance Indicators.

¹Only available in mobile measurement contexts

²Only available in crowd contexts

³Only available in PC or laptop environments