



10 things you need to know about monitoring Video & Audio Quality of Experience

1 Why should I worry about managing Quality of Experience (QoE)?

Independent research conducted with Video Service Providers found that some of the top customer issues reported were content related: macroblocking; video blackouts; frozen video and silence. Unlike QoE probes, traditional IP and Transport Stream (Quality of Service) probes do not directly detect or alarm on these common causes of complaint. But what is QoE? In the context of video and audio programming QoE is assuring that you deliver pictures and sound that will keep your viewers happy.

2 What is the difference between QoE and QoS?

Quality of Service (QoS) can be defined as an objective set of measurements of network and system performance against pre-defined standards. It is important to recognise that there is often no direct correlation between the adherence to QoS standards and the impact to the end viewer. To put it another way, an individual QoS problem (e.g. a long PAT repetition rate) may not result in a customer impacting QoE problem, but a QoE problem (e.g. macroblocking) may be caused by one or more QoS problems (e.g. dropped IP packets or continuity count errors).

3 QoS as a measurement technique has limitations when used on its own as a monitoring strategy

In video systems, the most common standard used to monitor transport stream QoS is TR 101 290, which was designed as an interoperability standard to ensure that compliant network elements would be guaranteed to work together. Non-compliance with TR 101 290 does not mean that a system will not operate correctly. Indeed, most video networks are not 100% compliant with TR 101 290, yet still function correctly. So taking this interoperability standard and applying it to 24 x 7 monitoring of video services leads to many alarms which may or may not be customer impacting. TR 101 290 is a valuable diagnostic aid, which is why Tektronix' Sentry's TR 101 290 measurements, are stored along with the QoE measurements in its 60-day database.

4 What issues can QoE Monitoring identify?

Monitoring probes must alert only when an event is deemed "customer impacting" - an event that would be noticed by a viewer - a QoE issue. These events could include: macroblock errors; slice errors; serious compression artefacts; frozen & black frames; low or excessive audio levels; silence; clicks; and video & audio drop-outs.

5 QoE issues can only be reliably detected by analysing the actual content, which must be decoded

Traditional QoS probes cannot reliably and deterministically measure and determine, in real-time, the severity of these customer impacting events. To identify these issues it is necessary to analyse the actual video and audio content. This in itself requires that the content be decoded.

6 Real-time content analysis is very difficult and you need to select a scalable monitoring solution

In a modern video network there may be hundreds of programs that all must be decoded and analysed in real-time. Due to both complexity and the use of entropy bit-stream encoding, H.264 content requires 7-10 times the computational resource required to decode MPEG-2, which itself is computationally complex to decode. As a result QoE monitoring solutions that analyse the video content in real-time have in the past, been limited to a few programs, making them expensive and not scalable to deploy. Sentry's unique architecture allows it to monitor the actual video and audio content of hundreds of program simultaneously and in real-time.

7 Scalable real-time content analysis technology can help solve a range of other issues

By using such an efficient, high-performance architecture, Sentry is also able monitor and alert on a broad range of customer impacting issues that are not specifically video or audio related. These include: subtitle and teletext presence; carousel cycle times & events; and splicing issues.

8 Different types of content need monitoring and managing in different ways and to different levels

Sentry's innovative program groups and alert templates, allow you to group, monitor and set alert thresholds specific to content type (HD, SD, long-tail); content provider; or content destination. This allows you to monitor to your own internal standards or those of your business partners, making Sentry an ideal tool to assist with Service Level Agreement (SLA) verification.

9 Detecting issues is one thing, but being alerted about them in the right way is just as important

Sentry's flexible alert and reporting capabilities allow you to be e-mailed with critical alerts and scheduled reports in CSV and PDF formats. Integration with NMS systems is critical and Sentry's easy to understand MIB and north bound SNMP traps, which include the alert URL, allows easy and flexible integration into a broader monitoring platform.

10 Implementing the correct QoE monitoring strategy will help save you time and money in addition to keeping your viewers happy

The benefits of QoE monitoring with Sentry can be quickly realised, with lower call centre loading, reduced MTTR, fewer truck rolls and better managed SLAs, all resulting in OPEX reductions. And happy viewers.