



eBook

Visualizing Quality of Experience

Improve Subscribers' Viewing Experience by Understanding and Monitoring QoE

Artifacts

Independent research conducted with different video service providers found that some of the top issues reported by subscribers are related to the quality of experience (QoE) artifacts. In the context of video and audio programming, QoE means assuring that service providers deliver pictures and sound that will meet subscribers' quality and experience expectations.

Probing technologies created for monitoring Quality of Service (QoS) for traditional IP delivery, transport streams, or ABR streaming do not directly detect or alarm on many of the common QoE artifacts and their root causes.

This document describes some of the most frequent types of QoE errors and how to prevent them during video service delivery to meet the best possible viewing experience for your subscribers. Some of these artifacts include: macroblocking, slice and bit errors, frozen video, video blackouts and audio loudness.



Macroblocking



Blocky - Partial Screen / Occasionally

What is it? The Video frame looks clean or normal with stationary or slow movement, but very blocky with fast action or scene changes. Some of the video frames show 8x8 pixel blocks in low resolution. The fine details of the blocks appear several frames later.

What causes it? Long GOP setting. Video element bandwidth set too low. Video prefiltering not enabled.

How to fix it? Change GOP to Dynamic. Increase bandwidth. Prefilter video.



Blocky - Full Screen / Continuously

What is it? Every frame appears to be blocky. Fine picture details are missing.

What causes it? Video element bandwidth set too low.

How to fix it? Increase bandwidth.



Slice and Bit Errors



Network Slice Error

- What is it?** One or more of the 16-pixel high rows is shifted to the left.
- What causes it?** IP Packet lost, or large amount of data from RF transmission lost. Buffer overflows and syntax errors can cause this too.
- How to fix it?** Reduce IP switch/router capacity. Increase RF Signal to Noise ratio.



Network Bit Error - After Several Frames

- What is it?** A single bit error, or in this case four bit errors in a signal frame, linger and move about the picture due to Motion Vector adjustments. The artifact will disappear once a new GOP arrives (about every 500 ms).
- What causes it?** Bit error inserted during transmission.
- How to fix it?** Increase RF Signal to Noise ratio.

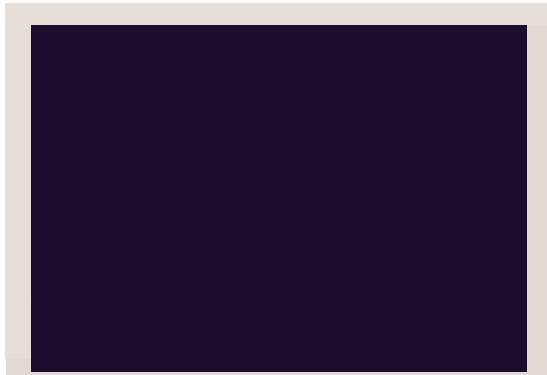
Frozen Video



Frozen Video

- What is it?** The same video frame repeats for many seconds or minutes.
- What causes it?** Live video input to encoder/mux/remux is lost, or the link to the Receiver/Decoder has been lost. Buffer underflows can cause this too.
- How to fix it?** Maintain live video at encoder/mux/remux. Ensure that the RF/IP link to the Receiver/Decoder is maintained.

Black Video



Black Video

What is it? The same black video frame repeats for many seconds or minutes.

What causes it? Live video input to encoder/mux/remux is lost, or the link to the Receiver/Decoder has been lost.

How to fix it? Maintain live video at encoder/mux/remux. Ensure that the RF/IP link to the Receiver/Decoder is maintained.

Audio Loudness: Network Errors



Audio Too Loud / Quiet

What is it? Average audio levels should stay within a few dB of the DialNorm reference. Levels between programs and commercials should not change dramatically, but occasionally do. This example shows a program averaging about -25 LKFS (first half), followed by content about 2 dB above and then below the average.

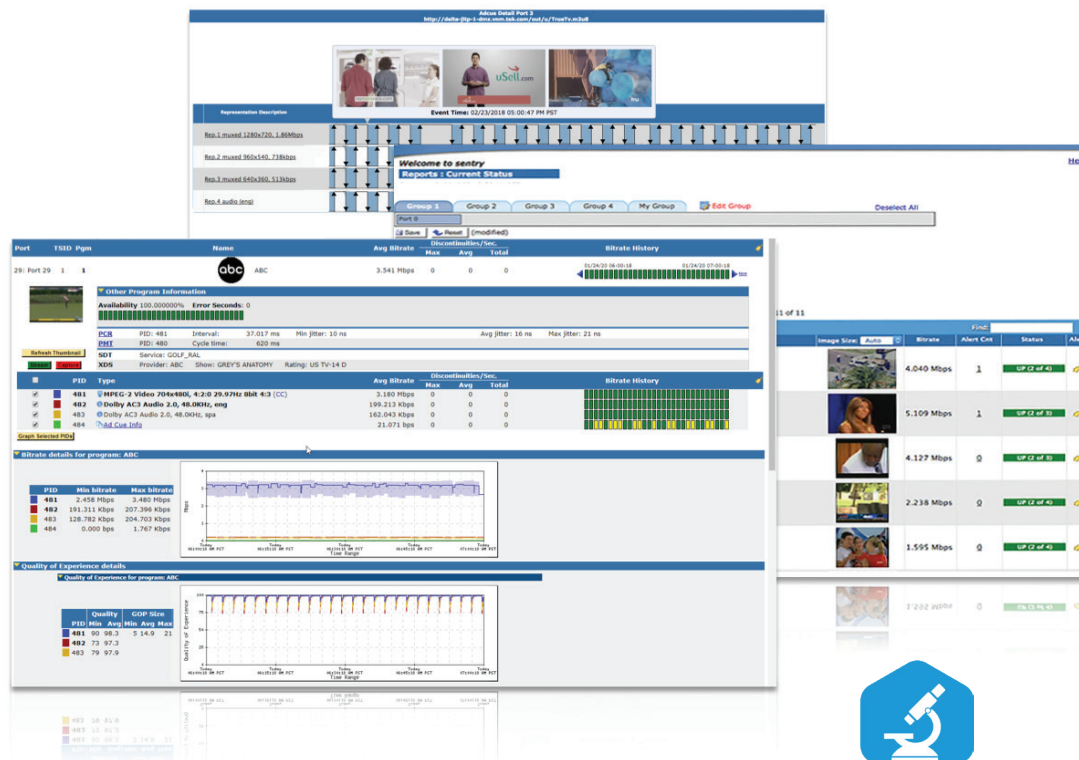
What causes it? Encoding and Multiplexing audio content without paying attention to DialNorm.

How to fix it? Adjust audio of levels to be near DialNorm before compression and transmission.

High-density Content QoE Monitoring with Sentry

Sentry is a high-density, all-purpose content monitoring solution incorporating both quality of experience (QoE) and quality of service (QoS) measurements. It is a comprehensive video and audio quality monitoring solution for advanced video networks.

By providing detailed root-cause information, Sentry allows service providers to resolve problems quickly and often before subscribers experience any quality deterioration or outage. It enables video providers to deliver services with optimum quality while reducing operational expenditures.

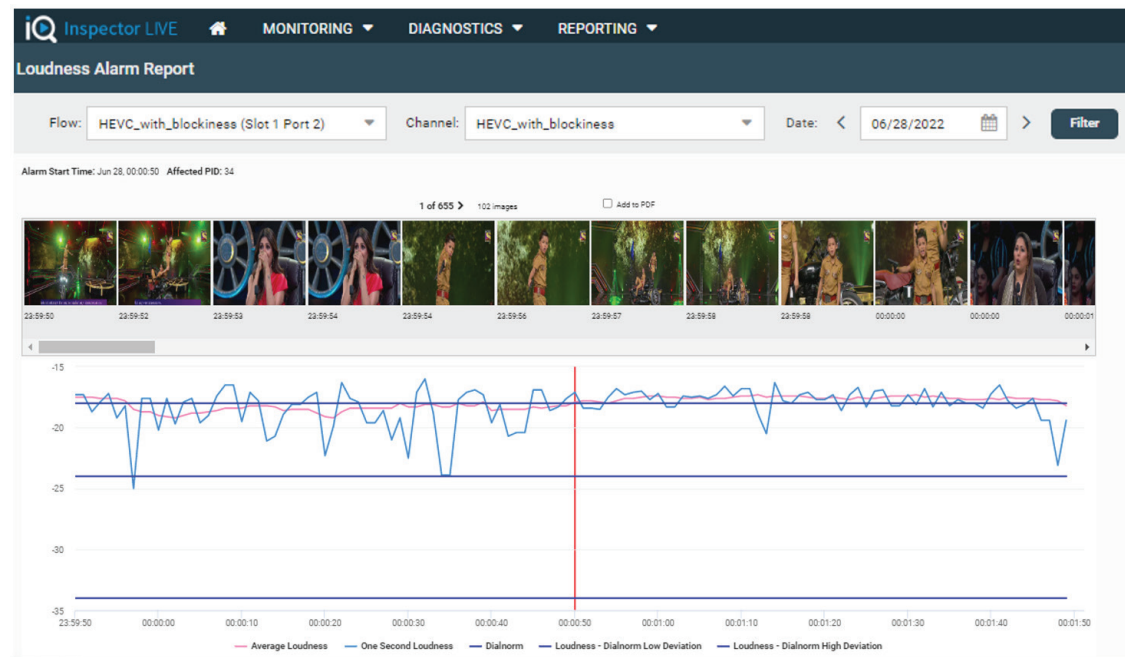


In-depth Content QoE Monitoring with Inspector Live

Inspector LIVE is a multi-purpose monitoring probe that combines both quality of experience (QoE) and quality of service (QoS) measurements.



It enables the visibility necessary to understand the status of the video delivery for broadcaster, content owners, and streaming service providers. Inspector LIVE displays thumbnails of each program being monitored and provides a customizable, concise status of the current video and audio alarm state.



Get in touch today to find out more about how Telestream can help you with your video quality monitoring needs.

To learn more about compliance monitoring visit Telestream iQ webpage [here](#).

To learn more about Sentry click [here](#).

To learn more about Inspector LIVE click [here](#).

Ready to talk to us and see it in action? [Contact us today](#).



