Player QoE Instrumentation Checklist — One-Page Reference

You cannot improve a viewing experience you cannot see. Settle these before you ship. Engineering guidance; spec/vendor behaviour (CMCD v2, SDK metric names) changes — confirm against current docs.

1 · THE FIVE NUMBERS (capture in the player)

- [ ] **Startup time** — press-play to first frame; measure content-startup apart from ad load.
- [ ] **Rebuffering ratio** — frozen time / watch time; the metric most tied to lost engagement.
- [ ] **Delivered bitrate** — time-weighted active rendition, not the simple midpoint.
- [ ] **Errors** — split startup-failure vs playback-failure, and fatal vs recoverable.
- [ ] **Dropped frames** — getVideoPlaybackQuality; catches juddery video that never stalls.

2 · THE EVENT MODEL (how the player captures)

- [ ] **Startup** — stopwatch from play request to the first playing / first-frame signal.
- [ ] **Rebuffer** — sum each waiting→playing span / watch time (W3C HTML media events).
- [ ] **Exclude seeks** — a waiting after a seek is viewer-caused; never count it as a stall.
- [ ] **Bitrate** — log every quality switch with a timestamp; average across the session.
- [ ] **Errors** — read the error event + MediaError code; classify before first frame vs during.

3 · BEACONS + TRANSPORT (off the device)

- [ ] **Flush on hidden** — sendBeacon on visibilitychange→hidden; survives backgrounding.
- [ ] **Never unload + XHR** — browsers cancel it; the worst sessions go missing and bias data.
- [ ] **Batch + sample** — bundle events; sample detail at huge scale so beacons don't cost a fortune.
- [ ] **Keep beacons small** — Beacon API caps the queued payload at 64 KiB; send summaries.
- [ ] **CMCD to the CDN** — bl, br, mtp, bs per request (CTA-5004); correlate client with edge.

4 · STANDARDS, BUILD-VS-BUY, PITFALLS

- [ ] **One definition** — align metrics to CTA-2066 so 'rebuffering' matches across every client.
- [ ] **Track CMCD v2** — CTA-5004-A (Feb 2026) adds event-mode reporting; check player/CDN support.
- [ ] **Buy the SDK, usually** — Mux / Conviva / Datazoom give cross-platform capture + dashboards.
- [ ] **Don't inflate plays** — autoplay and ad-start can hide the real content-startup number.
- [ ] **Dashboards = Block 9** — capture here, aggregate and alert there; keep the split clean.

THE TEST — INSTRUMENTATION YOU CAN TRUST

Quality of experience is what the viewer feels: how fast it started, how often it froze, how sharp it looked, and whether it failed. Only the player can measure those honestly, because only the player knows when its own buffer emptied or its own quality switched — the CDN sees bytes leaving a cache, not the freeze at second 47. So instrument in the player: time startup from the play request to the first frame; bracket every rebuffer between a waiting and the next playing event and divide by watch time, excluding seeks; track delivered bitrate across switches; classify each error as startup or playback, fatal or recoverable; and poll dropped frames for smoothness. Then get the data off the device reliably — flush the closing summary with sendBeacon on visibilitychange to hidden, never a cancellable request on unload, or the worst sessions vanish and your dashboards lie. Send a slice of the same truth to your CDN with CMCD (CTA-5004) so edge delivery and client experience line up. Align every metric to a shared definition (CTA-2066) so the number from your web player, iOS app, and smart-TV app mean the same thing. Most teams buy a QoE SDK (Mux, Conviva, Datazoom) for cross-platform consistency and the dashboards; the capture, beacon, and standardization rules above are the contract that SDK must meet. The test of finished instrumentation: every session that ended badly is on the dashboard, not missing from it.



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