

QoE Target & Diagnosis Checklist

Fora Soft Learn

Quality of experience (QoE) is what the viewer felt, measured at the player — not what the server sent. This sheet gives the QoE quartet a plain definition, a rule-of-thumb target, the most likely causes when it degrades, and the honest-measurement traps that hide a problem until viewers have already left. Targets are 2026 operating conventions, not standards; metric terminology follows CTA-2066. The slow-start revenue math at the bottom turns a two-second delay into a budget line.

1 · THE QoE QUARTET — DEFINITION & TARGET

- ☐ **Video startup time** — press-play to first frame. Whether the session begins at all. Target: under ~2 s; best ≤ 1 s.
- ☐ **Rebuffering ratio** — frozen time $\div$ viewing time. Whether the session survives. Target: under ~1%; best $\leq 0.5\%$.
- ☐ **Bitrate delivered** — average data rate received; proxy for sharpness. Target: as high as the network sustains without freezing.
- ☐ **Playback failure rate** — attempts that errored out (VSF before first frame + VPF after). Target: toward 0%; $> \sim 0.5\%$ is urgent.

2 · WHEN IT DEGRADES — LIKELY CAUSES

- ☐ **Slow startup** — distant origin with no cache, oversized first segment, serial license round-trip, or a client-side ad before first frame.
- ☐ **High rebuffering** — buffer drains faster than it refills: weak CDN reach, a coarse encoding ladder with no low rung to step down to.
- ☐ **Low bitrate** — ABR pinned low by a poor connection, or a ladder missing high rungs; check it is not over-conservative.
- ☐ **Failures** — license-server errors, manifest/segment 404s, DRM mismatch, exhausted player resource; split VSF from VPF to locate.

THE SLOW-START REVENUE MATH — WHAT TWO SECONDS COSTS

Startup time is not an engineering footnote; it is one of the highest-leverage numbers on the platform, so walk the arithmetic out loud. A 23-million-view study (Krishnan & Sitaraman, Akamai, IMC 2012) found viewers begin abandoning after about two seconds of startup delay, with each additional second adding roughly 5.8% to the abandonment rate. Suppose your platform sees 1,000,000 play attempts a day and a configuration change — a slower origin, a heavier player, an extra ad call before the first frame — adds two seconds to startup. Extra abandonment = $2 \text{ s} \times 5.8\%/s = 11.6\%$. Plays lost per day = $1,000,000 \times 11.6\% = 116,000$. Plays lost per year = $116,000 \times 365 \approx 42,340,000$. At a conservative \$0.02 of ad revenue per play: $42,340,000 \times \$0.02 \approx \$847,000$ a year — from two seconds, before counting the long-term damage that viewers who fail to start are measurably less likely to return. To re-size for your platform, replace the two inputs: daily play attempts and revenue per play. The lever is the same one engineering controls: a nearer cache, a smaller first segment, a parallel license fetch, and the ad moved out of the first-frame path.

3 · HONEST-MEASUREMENT TRAPS

- ☐ **One average hides the failure** — a healthy 1.8 s mean can bury 8 s on smart TVs in one region. Read the 95th percentile and per-segment.
- ☐ **QoS is not QoE** — a 99.99% CDN-availability dashboard says nothing about the spinner on a congested home Wi-Fi. Measure at the player.
- ☐ **Ad calls inflate startup** — a client-side ad before first frame adds its whole load to perceived startup; measure with the ad in the path.
- ☐ **Bitrate chased at the cost of rebuffering** — pushing sharpness that empties the buffer trades tolerated softness for abandoned freezing.

4 · STANDARDIZE SO NUMBERS TRAVEL

- ☐ **Use CTA-2066 terms** — one definition of startup time and rebuffering across every player so two teams mean the same thing.
- ☐ **Send CMCD (CTA-5004)** — let the player tell the CDN its buffer level and stall risk, closing RFC 9317's session blind spot.
- ☐ **Track a perceptual score** — ITU-T P.1203 MOS (1-5) or a vendor index, but always break it back down into the quartet.
- ☐ **Segment everything** — by device, region, content, and CDN; the average is where a serious problem hides.