

QoE KPI Definition Pack

Six core QoE metrics for any video-streaming dashboard: CTA-2066 definitions, 2026 targets, CMCD v2 field map, traps.

<p>1. VSF <i>Video Start Failure (fatal pre-frame).</i></p> <p>Definition: % of plays terminated with a fatal player error before first frame.</p> <p>CTA-2066: Stream Initialisation Failure.</p> <p>Target: $\leq 0.5\%$ web/Android, $\leq 0.3\%$ iOS, $\leq 1.0\%$ CTV.</p> <p>Common cause: 404 on manifest, DRM licence timeout, codec unsupported.</p> <p>Alert: rate per device family + region; segmented threshold.</p>	<p>2. EBVS <i>Exit Before Video Start (non-fatal).</i></p> <p>Definition: % of plays ended before first frame without fatal error.</p> <p>Mux 2024 rule: < 1 s exits get no QoE score.</p> <p>Split: EBVS-Wait (QoE) vs EBVS-Bounce (UX).</p> <p>Target: $\leq 1.5\%$ web, $\leq 2.5\%$ CTV, $\leq 3.0\%$ live.</p> <p>Trap: bounces count as failures and paint the dashboard red.</p>	<p>3. VST <i>Video Startup Time (click \rightarrow first frame).</i></p> <p>Definition: seconds from play intent to first frame rendered (content, not ad).</p> <p>Krishnan-Sitaraman 2012: $+1$ s = -5.8% retention.</p> <p>Target p50/p95: 2.0/4.0 web, 1.5/3.0 iOS, 2.5/5.0 CTV.</p> <p>Always show p50, p90, p95 — never mean alone.</p> <p>Budget split: DNS + TLS + manifest + key + segment + decode.</p>	<p>4. Rebuffer <i>Rebuffering ratio (stall over play).</i></p> <p>Definition: stall seconds / total play seconds, viewer-weighted.</p> <p>Target VOD $\leq 0.4\%$; live $\leq 0.8\%$.</p> <p>$+1$ pp rebuffer ratio ≈ -5 pp completion rate.</p> <p>Track frequency separately — many short stalls hurt most.</p> <p>Exclude ad spans from content-rebuffer ratio.</p>	<p>5. VPF <i>Video Playback Failure (fatal post-frame).</i></p> <p>Definition: % of sessions that died with a fatal error after first frame.</p> <p>Target: $\leq 0.5\%$ web, $\leq 0.3\%$ mobile, $\leq 1.0\%$ CTV.</p> <p>Common cause: DRM renewal, Wi-Fi\rightarrowLTE handoff, corrupt segment.</p> <p>Always segment by DRM system: Widevine, PlayReady, FairPlay.</p> <p>Alert: per-DRM spikes points at a licence-server outage.</p>	<p>6. Picture Quality <i>Perceptual quality score.</i></p> <p>Definition: VMAF p50 against source; SSIM/PSNR as diagnostic.</p> <p>Target ≥ 90 (excellent); 85–95 good; below 70 noticeably degraded.</p> <p>Live proxy: % session-minutes at top rung; share at $\geq 720p$ / $\geq 2160p$.</p> <p>Source: Netflix 2016 VMAF release + LIVE / UT-Austin papers. Use VMAF to redesign the ABR ladder — not bitrate alone.</p>
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CMCD v2 (CTA-5004-A) — fields a dashboard needs 2026 reference targets (p95 latencies, viewer-weighted ratios)

Key	Meaning	Feeds	Metric	Web	iOS	Android	CTV	Live
br	Encoded bitrate (kbps)	Picture Quality, ABR	VSF	$\leq 0.5\%$	$\leq 0.3\%$	$\leq 0.5\%$	$\leq 1.0\%$	$\leq 0.8\%$
bl	Buffer length (ms)	VST, Rebuffer	EBVS-Wait	$\leq 1.5\%$	$\leq 1.0\%$	$\leq 1.5\%$	$\leq 2.5\%$	$\leq 3.0\%$
mtp	Measured throughput (kbps)	ABR, debug	VST p50	≤ 2.0 s	≤ 1.5 s	≤ 2.0 s	≤ 2.5 s	$+0.5-1$ s
rtp	Requested top bitrate	ABR strategy	VST p95	≤ 4.0 s	≤ 3.0 s	≤ 4.0 s	≤ 5.0 s	$+1.0$ s
ps	Playback state (start/buffer/seek/pause/end)	VST, Rebuffer, VPF	Rebuffer	$\leq 0.4\%$	$\leq 0.3\%$	$\leq 0.4\%$	$\leq 0.6\%$	$\leq 0.8\%$
			VPF	$\leq 0.5\%$	$\leq 0.3\%$	$\leq 0.5\%$	$\leq 1.0\%$	$\leq 0.8\%$
ec	Error code (standardised, v2)	VSF, VPF	VMAF p50	≥ 90	≥ 92	≥ 90	≥ 88	≥ 80
sid	Session ID	All — session join	Composite	≥ 85	≥ 88	≥ 85	≥ 80	≥ 75
cid	Content ID	All — per-title						

Seven aggregation traps — the dashboard looks green while the product is bleeding

Trap	Mitigation
Mean instead of percentile	VST mean hides p95; tail abandonment lives in p90/p95. Show three percentiles together.
Equal-weight sessions	5-second and 5-hour sessions count the same. Weight by play time for viewer-impact metrics.
Non-stationary aggregation	New app version \neq yesterday's population. Cut by app version; hold one-week reference line.
EBVS as engagement	Bounce inflates failure rate after every carousel redesign. Split EBVS-Wait vs EBVS-Bounce; drop <1 s exits.
Ad rebuffer as content	SSAI ads inserted into the timeline inflate content-rebuffer. Honour CTA-2066 ad/content state split.
Global thresholds	Indonesia 4G \neq US fibre. Alerts must be segmented by device + region + network type.
Composite-only alerts	SPI hides which metric moved. Alert on six underlying metrics; show composite on executive screen.