

Player observability metric definition pack

Twelve metrics every production player must emit · CMCD field per metric where one exists.

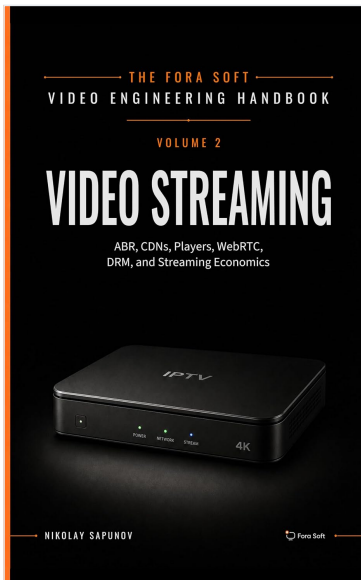
Group / metric	Unit	Formula	Player event	CMCD
STARTUP Video startup time (VST)	ms	$\text{first_frame_ms} - \text{play_intent_ms}$	request → playing	—
STARTUP Exits before video start (EBVS)	% of play attempts	$\text{exits_before_first_frame} / \text{play_attempts}$	request → view_end (no playing)	—
STARTUP Video start failures (VSF)	% of play attempts	$\text{errored_before_first_frame} / \text{play_attempts}$	request → error (no playing)	v2: error_code
PLAYBACK QUALITY Rebuffer ratio	% of intended watch	$\Sigma \text{stall_seconds} / (\Sigma \text{playing} + \Sigma \text{stall})$	rebuffer_start → rebuffer_end	bs (v1) · state (v2)
PLAYBACK QUALITY Rebuffer frequency	events per minute	$\text{count}(\text{rebuffer_start}) / \text{minutes_played}$	rebuffer_start (per event)	bs (v1) · state (v2)
PLAYBACK QUALITY Average video bitrate	kbps · play-time weighted	$\Sigma (\text{br} \times \text{playing_s}) / \Sigma \text{playing_s}$	bitrate_switch + tick	br
PLAYBACK QUALITY Upscale / downscale %	% of playing time	$\Sigma (\text{render_h} < \text{display_h}) / \Sigma \text{playing_s}$	tick + display_metrics	—
ERRORS Playback failure rate (VPF)	% of started plays	$\text{errored_after_first_frame} / \text{started_plays}$	error after playing	v2: error_code
ERRORS Error code distribution	histogram of stable codes	count by (code, dimension)	error (per event)	v2: error_code
NETWORK Measured throughput	kbps · round to 100 kbps	ABR's current bandwidth estimate	tick (per segment)	mtp
NETWORK Buffer level	seconds · round to 100 ms	duration of media in source buffer	tick (per segment)	bl
SESSION Session ID	UUID (RFC 4122)	GUID generated at player_ready	attached to every event	sid

Sources of truth

CTA-5004 (Sep 2020) and CTA-5004-A / CMCD v2 (Feb 2026) — the on-wire spec. Mux Data and Conviva metric catalogues — vendor naming conventions. Dobrian et al. SIGCOMM 2011 — empirical rebuffer-to-engagement basis.

Use this pack as your dashboard schema

Emit every event from every session — sample on the backend, never on the device. Where CMCD has a key for the metric, use it; the CDN's edge log becomes the system of record automatically. The hybrid pattern of CMCD v2 on modern devices plus a vendor SDK on legacy is the most common 2026 production shape.



GO DEEPER · VOLUME 3 OF 7

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This pack defines twelve player metrics with units, formulas, player events and CMCD fields. Volume 3 goes deeper into what those numbers describe: players and recovery from stalls, ABR rung selection, CDN delivery, QoE monitoring and the economics that a rebuffer ratio feeds into.

WHAT YOU WILL FIND INSIDE

- QoE monitoring: startup, stalls, failures
- Player recovery after a stall
- ABR rung choice and buffer behaviour
- CDN logs as a source of truth

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Want player metrics your dashboards and CDN logs agree on?

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