

ABR Tuning Checklist

Audit your adaptive bitrate stack across ladder, algorithm, start-up, and observability.

1. Bitrate ladder

- ☐ Ladder has 6–9 rungs for 1080p content; 4–6 for 720p-max.
- ☐ Adjacent rungs spaced roughly 1.5× apart in bitrate.
- ☐ Two or three rungs share the top resolution; lower resolution at the floor.
- ☐ Lowest rung < 500 kbps for mobile fallback on 2G/3G.
- ☐ Highest rung sustained by > 5% of viewers (else retire it).
- ☐ Audio rendered as separate variant tracks (128–192 kbps).
- ☐ Per-title or per-shot encoding evaluated for top three rungs.

2. Algorithm choice

- ☐ Algorithm family documented in player config (throughput / buffer / hybrid).
- ☐ Safety factor on throughput estimator set to 1.2–1.5.
- ☐ Buffer-based thresholds T_{low} and T_{high} tuned for content type.
- ☐ Hybrid utility weights $w1/w2/w3$ reviewed quarterly.
- ☐ Live and VoD use different algorithm settings (smaller buffer, more conservative for live).
- ☐ Neural ABR considered for tier-1 traffic; not the default in 2026.

3. Start-up rung

- ☐ Initial rung target documented and matched to most-recent throughput.
- ☐ First-segment bandwidth estimator uses last-session value, not zero.
- ☐ Start-up time below 1.5 s on tier-1 markets; below 3 s elsewhere.
- ☐ Manifest cached at the player on warm start.
- ☐ Start-up A/B tested for at least one product cycle.

4. Observability

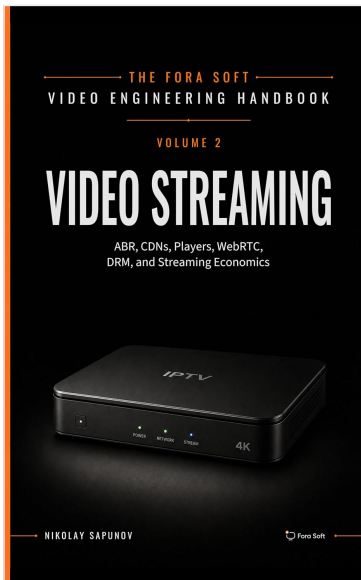
- ☐ Start-up time, rebuffer ratio, average bitrate, switches/min, QAB tracked per session.
- ☐ Dashboard segmented by region, device class, ISP, and CDN.
- ☐ Rebuffer ratio target: < 0.5% tier-1, < 1.5% global.
- ☐ Switches per minute target: < 0.5 (one switch per two minutes).
- ☐ Alerting on regression for any metric > 20% week-over-week.
- ☐ Player logs sampled at 1% or higher for forensic debugging.

5. Common mistakes to avoid

- ☐ Vanity top rung: drop it if sustained by < 5% of viewers.
- ☐ Too few rungs: 3-rung ladders produce visible jumps and oscillation.
- ☐ Always-low start: pixelation in the first three seconds drives drop-off.
- ☐ Trusting estimator on segment 1: use a sane default.
- ☐ Tracking only average bitrate: switches per minute is a first-class metric.
- ☐ Re-using VoD config for live: smaller buffer needed.

6. Standards anchor

- ☐ RFC 8216 reviewed for HLS multi-variant playlists (§4.3.4.2).
- ☐ Apple HLS Authoring Specification revision checked against current Apple bump (1–3 / year).
- ☐ ISO/IEC 23009-1:2022 reviewed for DASH MPD shape; DASH-IF guidelines for implementation profile.
- ☐ ISO/IEC 23000-19 reviewed for CMAF chunked transfer when live and low-latency.



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This checklist helps you audit an ABR stack across ladder, algorithm, start-up and observability. Volume 3 explains the machinery behind every item: building bitrate ladders, buffer-based, throughput-based and hybrid rung selection, player recovery after stalls, and QoE monitoring that shows whether your tuning worked.

WHAT YOU WILL FIND INSIDE

- Designing bitrate ladders per title and per device
- Buffer-based, throughput-based and hybrid ABR
- Player start-up and stall recovery
- QoE metrics and monitoring dashboards

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