

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 1.5x 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.