

Bitrate Ladder Design Worksheet

Audit ladder shape, top & bottom rungs, content profile, codec mix, and encoder-cost amortisation.

1. Ladder shape

- ☐ 6–9 rungs for 1080p VOD; 4–7 for live; 3–4 for short-form video.
- ☐ Adjacent rungs spaced $\sim 1.5\times$ apart in bitrate (not equally spaced).
- ☐ Two or three rungs share the top resolution; lower resolution at the floor.
- ☐ Geometric spacing audited per codec (H.264, HEVC, AV1).
- ☐ Manifest lists every codec/resolution pair the player can use.

2. Top rung

- ☐ Top rung sustained by $> 5\%$ of viewer sessions in production telemetry.
- ☐ Top rung below the codec's visible ceiling (H.264: 10 Mbps for 1080p).
- ☐ 4K rung shipped only when audience skews TV / fast networks.
- ☐ Decorative top rung retired in last 12 months.
- ☐ Resolution-bitrate pairing audited for HDR / non-HDR variants.

3. Bottom rung

- ☐ Bottom rung < 500 kbps for global mobile audiences.
- ☐ 240p–360p fallback for the worst realistic network.
- ☐ Bottom rung tested on a real congested 4G connection.
- ☐ Audio-only fallback considered for emergency egress.
- ☐ Player config logs the rung played first at start-up.

4. Content profile

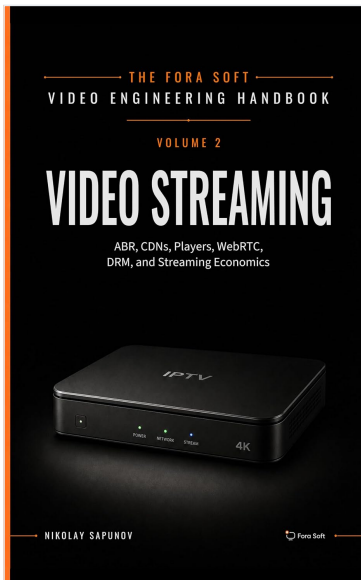
- ☐ Content classified by encoder difficulty (easy / mixed / hard).
- ☐ Per-title encoding evaluated for titles with $> 10K$ lifetime views.
- ☐ Per-shot encoding evaluated for tier-1 catalogue and live broadcast.
- ☐ Probe-based per-title (Mux Instant or equivalent) for long-tail catalogue.
- ☐ Trial-encode grid documented (resolutions, CRF/QP steps, metric).
- ☐ VMAF target documented per audience tier (95+ premium, 90+ standard).

5. Codec mix & cost

- ☐ Compatibility companion codec (H.264) always shipped.
- ☐ HEVC ladder shipped for Apple devices and Smart TVs.
- ☐ AV1 evaluated for tier-1 markets and modern devices.
- ☐ Encoder compute budget tracked per minute of source content.
- ☐ Storage cost reconciled with bandwidth savings monthly.

6. Standards anchor

- ☐ RFC 8216 §4.3.4.2 reviewed for HLS multi-variant playlist shape.
- ☐ Apple HLS Authoring Specification revision (current: 2025-09) §2.7 cross-checked.
- ☐ ISO/IEC 23009-1:2022 reviewed for DASH MPD; DASH-IF guidelines for implementation profile.
- ☐ Per-title and per-shot Netflix papers cited as the foundational sources for any internal docs.



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This worksheet audits ladder shape, top and bottom rungs, content profile and codec mix. Volume 3 picks up where the ladder meets the viewer: ABR and bitrate ladders, buffer- and throughput-based rung selection, CDN caching, player recovery from stalls, and the economics of delivery.

WHAT YOU WILL FIND INSIDE

- Bitrate ladders and per-title ABR
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- Buffer- and throughput-based rung selection
- Player stall recovery and QoE

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