

Bitrate Ladder — Quick-Reference Card

The five rules, codec multipliers, content classes, and recommended rung counts.

1. Geometric spacing

Adjacent rungs spaced 1.4×–1.7× in bitrate. Tighter wastes encoder time; looser jolts the viewer.

2. Resolution moves with bitrate

Cluster 2 rungs at the top resolution; drop resolution at the bottom. A 400 kbps stream at 1080p loses to 400 kbps at 360p.

3. Codec efficiency is multiplicative

Apply the codec factor to the whole H.264 base ladder. Ship H.264 as the universal fallback.

4. Content complexity scales the ladder

Multiply the H.264 base by the content class. Per-title encoding (Netflix 2015) saved 20%; you can do half that with a class shortcut.

5. fps and HDR each carry a premium

60 fps adds ~1.4× per rung. HDR10 adds ~1.15× on the top two rungs; Dolby Vision adds ~1.20×.

Audience reshapes the ladder

Mobile-dominant: cap at 1080p, lift bottom rungs +10%. Broadband-only: drop the bottom 2 rungs. OTT: top-heavy.

Codec efficiency multipliers (vs H.264, matched VMAF, 2026)

Codec	Mult.	Reach	Production notes
H.264 (AVC)	1.00×	universal	Universal fallback. Every device made since 2008. Ship always.
VP9	0.65×	Chrome/FF	Legacy alternative. Largely replaced by AV1 in 2026.
HEVC (H.265)	0.55×	Apple TV+	Apple ecosystem default for 4K HDR. Royalty-bearing.
AV1	0.42×	modern	Royalty-free. ~68% device support globally (Q1 2026). Use top rungs first.

Content complexity multipliers

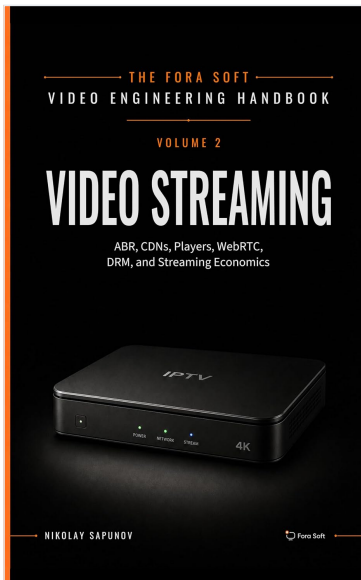
Class	Mult.	What goes here
Easy	0.70×	Animation, slideshow lectures, talking-head, low-motion screencasts.
Standard	1.00×	Drama, news, documentary, mid-motion VOD.
Hard	1.25×	Sports, action, esports, music with strobe lighting.
Extreme	1.45×	4K HDR sports, dense particle motion, premium concert film.

Recommended rung counts by workflow

Workflow	Rungs	Notes
VOD (multi-pass per-title)	6–9	Maximises catalogue savings. Ship H.264 + one modern codec.
Live, low-latency (LL-HLS / LL-DASH)	4–6	Single-pass; cap encoder cost; 3 s end-to-end target.
Real-time (WebRTC / WHEP)	3–4	Simulcast layers; <1 s latency; encoder runs in the SFU pipeline.
UGC short-form social	3–4	Tight encoder budget; content typically <3 minutes.

Egress arithmetic, one viewing hour at the top rung

$\text{bytes_per_hour} = \text{bitrate_kbps} \times 1000 \div 8 \times 3600$ $\text{GB_per_hour} = \text{bytes_per_hour} \div 2^{30}$ $\text{cost} = \text{GB_per_hour} \times \$/\text{GB}$
Example: 5,000 kbps → 2.15 GB/hr → \$0.017/hr at \$0.008/GB.



GO DEEPER · VOLUME 3 OF 7

Video Streaming: A Complete Guide to Video Delivery

From ABR and CDNs to Players, WebRTC, DRM, and the Economics of Streaming

By Nikolay Sapunov, CEO at Fora Soft · 1,182 pages · Kindle & paperback on Amazon

[Read it on Amazon →](#)
amazon.com/dp/B0HH76ZYWC

This card gives the five ladder rules, codec and content multipliers and rung counts per workflow. Volume 3 follows the ladder into delivery: ABR and bitrate ladders, buffer- and throughput-based rung selection, CDN caching, WebRTC simulcast and the economics of streaming.

WHAT YOU WILL FIND INSIDE

- Bitrate ladders and ABR design
- WebRTC and real-time delivery
- Rung selection: buffer, throughput, hybrid
- Delivery economics and CDN egress

THE FULL HANDBOOK · 7 VOLUMES · 9,000+ PAGES · ALL ON AMAZON

Vol. 1 · Video Encoding — pixels and color to H.264, HEVC, AV1, quality metrics and AI

Vol. 2 · Video Streaming I — network transport, contribution and ingest, HLS, MPEG-DASH, CMAF

Vol. 3 · Video Streaming II — ABR, CDNs, players, WebRTC, DRM and the economics of delivery

Vol. 4 · Audio for Video I — PCM, codecs, loudness, accessibility, real-time voice processing

Vol. 5 · Audio for Video II — jitter buffers, lip sync, Atmos, quality metrics, neural codecs

Vol. 6 · AI for Video I — models and inference, computer vision, speech, search, generative video

Vol. 7 · AI for Video II — real-time pipelines, agents, serving, cost, compliance, verticals

Sizing a ladder for a new catalogue, codec or live workflow?

We will turn your content mix, audience and codecs into a concrete ladder with rung counts, bitrates and an egress estimate. 250+ video products shipped since 2005.

[Book a 30-min call →](#)
[WhatsApp →](#)
[Email us →](#)