

Last-Mile Tuning Cheat Sheet

Ladder, buffer, partial-segment, and ABR parameters per detected last-mile type — 2026 baseline.

Per-network defaults

Network	Throughput	Latency	Top rung target	Bottom rung	Buffer / part-target	Tuning lever
Mobile 5G mid-band	150–700 Mbps	20–35 ms	1080p · 4–6 Mbps	270p · 300 kbps	4 s buffer · 2 s part	Carrier-throttle clamp
Mobile 5G low-band	50–150 Mbps	30–50 ms	720p · 2.5 Mbps	270p · 300 kbps	4 s buffer · 2 s part	ABR reacts < 2 s
Mobile 5G mmWave	1–3 Gbps	1–10 ms	4K · 12–20 Mbps	720p · 1.5 Mbps	3 s buffer · 1 s part	Niche; ride the ceiling
Starlink (LEO)	117–129 Mbps	45 ms	1080p · 6 Mbps	480p · 600 kbps	8 s buffer · 2 s part	Detect & extend buffer
Fibre / Cable	500–2000 Mbps	5–15 ms	4K HDR · 15–25 Mbps	480p · 600 kbps	3 s buffer · 1 s part	Push for LL-HLS / MoQ
Fixed wireless	100–250 Mbps	30–60 ms	1080p · 5 Mbps	360p · 500 kbps	5 s buffer · 2 s part	Peak-hour cap detection
Wi-Fi 7 (MLO, 6 GHz)	200–500 Mbps	3–10 ms	4K HDR · 15–25 Mbps	480p · 600 kbps	3 s buffer · 1 s part	Let it run
Wi-Fi 6 (5 GHz)	30–150 Mbps	5–15 ms	1080p · 5 Mbps	360p · 500 kbps	4 s buffer · 2 s part	Standard config
Wi-Fi 5 (apartment)	5–20 Mbps p10	10–40 ms	720p · 2.5 Mbps	270p · 300 kbps	5 s buffer · 2 s part	Bottom-rung lever

Six pipeline changes that typically halve rebuffer ratio

- **1. Ladder depth.** 5 rungs minimum; 6–7 if mobile-throttled markets in the audience.
- **3. ABR reaction time.** Under 2 s end-to-end to catch a Starlink handover or 5G cell change.
- **5. Detected-network buffer.** 6–8 s on Starlink-detected sessions; 4 s elsewhere.
- **2. Bottom rung.** 250–400 kbps at 270p. Recovers Wi-Fi-5 / low-band-5G viewers.
- **4. Partial-segment sizing.** 2 s part-target survives Starlink / 5G; 1 s costs the cohort.
- **6. Carrier-throttle clamp.** Hold-the-rung if top rung persists 30 s on a variable network.

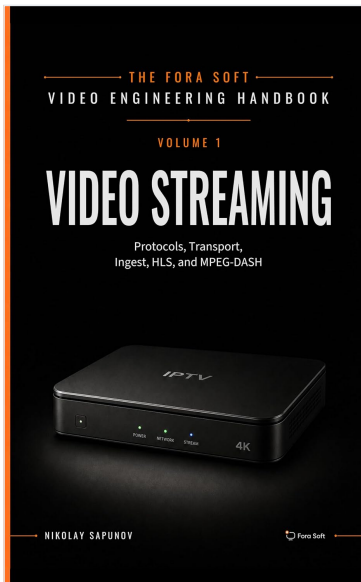
Pitfalls

Office Wi-Fi ≠ audience network. Test on a tethered phone, a Wi-Fi 5 apartment router, a real Starlink dish.

Starlink ≠ GEO satellite. 45 ms vs 600 ms. Over-buffering Starlink costs engagement; under-buffering costs rebuffer.

Home Wi-Fi is the last leg. Half of rebuffer events originate here. Document the router recommendation in the help centre.

1-second LL-HLS costs the Starlink cohort. Pick 2–3 s parts unless the product genuinely needs sub-second.



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This sheet gives ladder, buffer and part-target defaults per last-mile type, from 5G to Starlink and Wi-Fi 5. Volume 2 explains the network behaviour behind those numbers: what the access network does to a stream, TCP versus UDP and congestion control, QUIC and HTTP/3, and how HLS, DASH and CMAF segments travel the last mile.

WHAT YOU WILL FIND INSIDE

- What 5G, satellite and Wi-Fi do to a stream
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- QUIC and HTTP/3 for segment delivery
- Partial segments and CMAF chunking

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