

Hybrid Edge-Cloud Split Planner

Draw the edge-cloud line for your own fleet. Keep detection and recording local; send the cloud only events and clips. Match each job to the tier built for it.

A. Split the work (which tier owns which job)

- List every analytic and recording job; tag each: time-critical, bandwidth-heavy, private, heavy, fleet-wide, or occasional.
- Time-critical / bandwidth-heavy / private jobs run at the EDGE (camera or local box).
- Heavy / fleet-wide / occasional jobs run in the CLOUD (search, cross-camera, large models).
- Continuous recording stays LOCAL on a recorder - the uplink cannot carry it.

B. Keep the pipe thin

- Across the wire: metadata + short event clips + occasional hard frames - never full video.
- Target well under 100 kbps per camera of uplink (edge-analytic cameras reach ~20 kbps).
- Measure sustained upload: tens of Mbps continuous = you are streaming full video (fake hybrid).
- 50 cameras: ~100 Mbps full-video vs ~5 Mbps hybrid telemetry - about a 95% cut.

C. The two seams: cascade + store-and-forward

- Cascade: a light edge detector filters; only ~5% (events / low-confidence) reach the cloud model.
- The filter cuts BOTH bandwidth and cloud compute - the cloud never sees empty frames.
- Store-and-forward: queue cloud events locally during an outage; forward in order on reconnect.
- Size the ring buffer for the WORST outage (24-72h+); on cellular sites, local storage is primary.

D. The legal gate (confirm before video leaves)

- Data minimisation (GDPR Art. 5(1)(c)): send only what is necessary - metadata, not full faces.
- Cross-border (GDPR Chapter V): keeping video in-region means only metadata crosses a border.
- Biometric (EU AI Act; Illinois BIPA): keep face / plate processing on hardware you control.
- Default: recognizable video stays in-building; the cloud gets the distilled output only.

Remember: the hybrid pattern wins because it sends each job to the tier that bills it kindly - heavy and continuous work to the cheap local network, light and occasional work to the elastic cloud. A 'hybrid' that streams full video up is just a cloud system paying the cloud's full bill. Engineering guidance, not legal advice. Figures are representative and scene-dependent. Sources: ONVIF Profile M; GDPR Reg. (EU) 2016/679 Art. 5 and Ch. V; EU AI Act Reg. (EU) 2024/1689; Illinois BIPA 740 ILCS 14; AWS IoT Greengrass docs; Eagle Eye Networks / Verkada.