Search by Event / Forensic Search - One-Page Reference

How to turn months of footage into a searchable database: the pipeline, the rule that governs it, the five search rungs, the ONVIF boundary, and the privacy line. Speed is real; recall is capped by upstream detection. Search is triage, never 100%.

A. What it is - query the index, not the pixels

- Search by event (forensic search) turns recorded video into a database you query. As video records, analytics describe each scene as METADATA - object class, attributes, color, direction, event, timestamp - and the VMS writes it to a searchable index. A query (object + attribute + time + camera) is a database lookup, so results come back in seconds as ranked clips with timestamps and confidence.
- It reads the metadata index, NOT the raw pixels - the catalogue, not the books. Metadata is tiny vs video, so the index is cheap to keep and fast to query even when the footage is tiered to cold storage.

B. The rule that governs everything

- You can ONLY find what was indexed at record time. If the analytic did not detect and tag it while recording, there is no index entry and no query will find it. Decide your detection coverage BEFORE you record.
- The only fix for a gap is search-time REPROCESSING: run a fresh analytic over the original video after the fact. It finds what was missed but is slow, compute-heavy, and only works while the raw footage is still retained. Delete the video and the chance is gone.

C. The five rungs of search power

- 0 time+camera; 1 motion-in-a-region (smart search); 2 event/object (class, line, zone); 3 attribute (color, type, direction, speed, dwell); 4 appearance/similarity (find this person/vehicle across cameras = re-identification); 5 natural language (a typed sentence via a vision-language model - the 2025-2026 frontier).
- Each rung up needs richer upstream metadata, more compute, and carries more privacy weight. Most real systems live on rungs 2-4. Rungs 4-5 return RANKED candidates with confidence, not exact matches - an investigator confirms.

D. The ONVIF boundary + where it runs

- ONVIF's Recording Search Service standardizes the search interface over recorded metadata: FindEvents (mandatory), FindMetadata (optional, gated by the MetadataSearch capability) with an XPath filter, exposed via Profile G; the metadata itself is produced over Profile M. Appearance, similarity, and natural-language search are NOT standardized - they are the VMS/vendor layer. Standardized plumbing, vendor-defined richness.
- Indexing runs where the analytics run (camera/server/cloud); search runs against the index in the VMS (on-prem server or cloud). Keep the index hot and close to the operator; let the video age into cheaper tiers behind it.

E. The privacy line - search amplifies retention

- Searching identifiable people is PERSONAL DATA under GDPR (Art. 4(1)) - lawful basis, notice, DPIA for systematic public monitoring (Art. 35; EDPB Guidelines 3/2019). Cross-camera 'find this person' search is re-identification that can amount to PROFILING (Art. 4(4)); matching on a FACE template is biometric data (Art. 9; Illinois BIPA 740 ILCS 14).
- A searchable archive is far more powerful - and sensitive - than raw recordings: any operator can reconstruct one person's whole day in seconds. Match the power with PURPOSE LIMITATION, AUDIT LOGGING of who searched for what, and RETENTION LIMITS. Let search cue an investigator; gate face and cross-camera search behind the biometric rules.

This is engineering guidance, not legal advice; confirm specifics with qualified counsel. Speed claims (days to seconds; up to ~70% review-time cut) and product features (Avigilon Appearance Search; Milestone XProtect Rapid REVIEW / BriefCam VIDEO SYNOPSIS; Conntour natural-language search, $7M seed Mar 2026) are vendor/press claims as of 2026-06-09, not measured constants. The worked example (64 cams x 24h x 30d ~ 46,000 cam-hours; ~11,500 review-hours at 4x) is illustrative arithmetic. The re-ID and VLM MODELS are engineered in the AI for Video Engineering section; this is the surveillance APPLICATION - the index, the rungs, the standard, and the law. Sources: ONVIF Recording Search Service Specification Ver. 22.06 + Profiles G/M; GDPR Reg. (EU) 2016/679 Art. 4(1)/4(4)/9/35; EDPB Guidelines 3/2019; Illinois BIPA 740 ILCS 14.