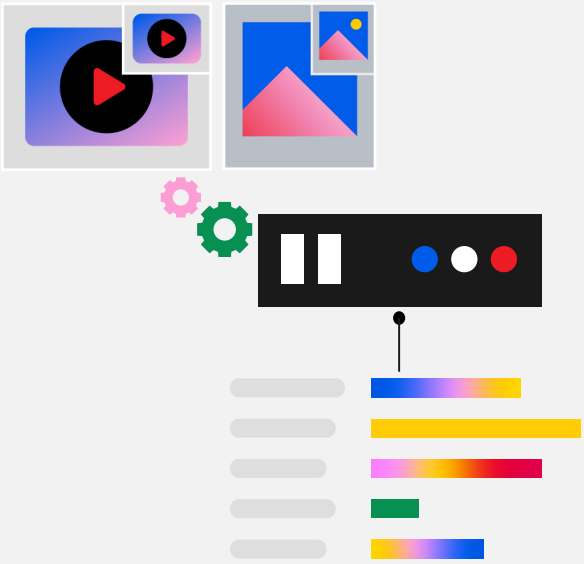
PANZURA



SOLUTION BRIEF

Metadata Harvesting

Cost efficiency and intelligence in operational technologies.

Introduction

The use of cameras in operational technologies (OT) has expanded significantly in manufacturing, law enforcement, and critical infrastructure inspections. However, storage and retrieval of vast amounts of video data present both financial and logistical challenges.

This paper explores the use of metadata tagging by extracting metadata from XML sidecar files to streamline storage, enhance searchability, and improve decision-making across industries such as manufacturing, police, defense, and utilities.

The Role of Cameras in Operational Technologies

Manufacturing
In manufacturing, high-resolution cameras monitor production lines, ensuring quality control and detecting defects. These cameras generate massive amounts of video data. For example, a single high-speed camera operating at 1000 frames per second (fps) and capturing 1080p footage can generate approximately 1 TB of data per hour (Source: National Institute of Standards and Technology, 2023). This necessitates advanced metadata indexing to facilitate defect tracking and predictive maintenance.

Law Enforcement and Police Body Cameras
Police body cameras provide accountability and evidence collection. According to the U.S. Department of Justice, a single officer wearing a body camera can generate 8-10 GB of video per shift, translating to 2.5-3 TB per officer annually in high-resolution storage requirements. Large police departments managing thousands of officers face exponential data growth, underscoring the necessity of metadata-driven archival strategies (Source: Bureau of Justice Statistics, 2022).

Drones in Power Utilities
Power companies utilize drones for inspecting power lines, substations, and other infrastructure. A single drone flight, capturing 4K video at 30 fps, produces 100-150 GB per hour of footage. Utility companies conducting daily inspections of extensive transmission networks may accumulate hundreds of terabytes per year (Source: Electric Power Research Institute, 2023). Metadata tagging enables efficient anomaly detection and retrieval of relevant footage while deep archiving non-critical data for regulatory compliance.

The Importance of Metadata

Metadata can play a crucial role in reducing storage costs and improving video intelligence. By extracting the metadata from XML sidecar files, organizations can achieve the following:

1. Efficient Storage Management
Instead of retaining large volumes of video indefinitely, metadata can be extracted from the XML files and made available in a catalog, supporting rapid queries and minimizing direct access of video. The original video files (digital artifacts) can be placed in deep archive storage, reducing expensive active storage utilization.

2. Enhanced Searchability
Metadata tagging allows for granular searching based on event types, timestamps, locations, object recognition, or alerts. Law enforcement agencies can quickly retrieve videos by incident number or suspect description without reviewing hours of footage. Leveraging third-party facial recognition software from hyperscalers, such as AWS Rekognition, to scan video footage before deep archiving allows for metadata tagging of known criminals and other relevant data. This approach enhances crime prevention efforts while optimizing IT costs for law enforcement agencies by reducing active storage requirements and streamlining data retrieval.

3. Data Integrity and Audit Trails
Metadata can include digital signatures, hash values, and tamper-evident logs. These can ensure admissibility in legal proceedings and compliance with regulatory standards.

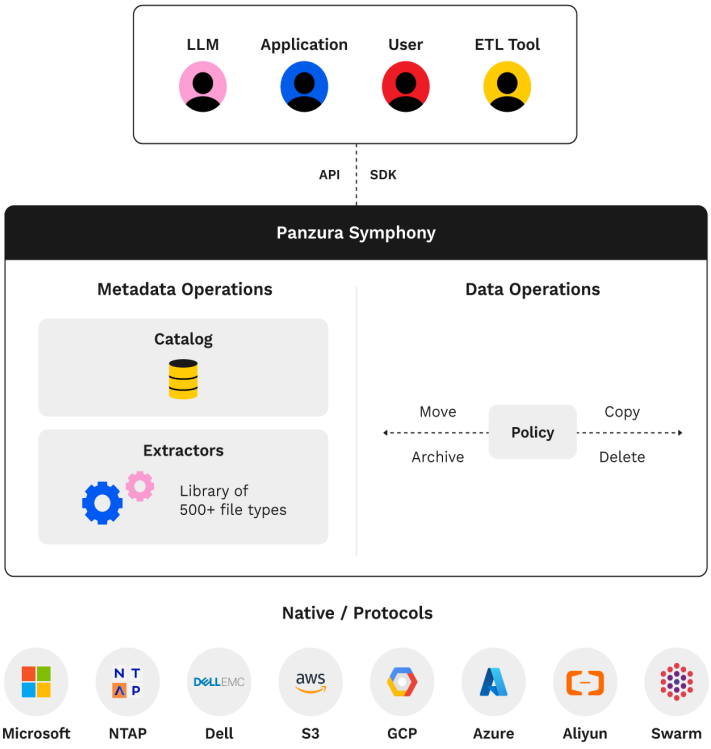
4. Automation and AI Integration
AI-powered analytics can extract meaningful insights from metadata, enabling predictive maintenance in manufacturing and automated threat detection in law enforcement. Power companies can use metadata to track infrastructure degradation over time, enabling proactive repairs.

Metadata and Storage Orchestration Solutions

GRAU Data MetadataHub
Grau Data MetadataHub provides metadata extractors for common data types, including sidecar files and creates a metadata catalog for rapid queries by users and applications.

This capability enables organizations to enhance metadata structure, making retrieval faster and more precise.

By supporting over 500 different file types and standardizing metadata extraction and classification, MetadataHub can be utilized as a single source for OT metadata, and can be queried like enterprise MDM.



Panzura Symphony as a Zero Trust Principled Data Broker
Panzura Symphony acts as a Zero Trust Principled Data Broker, efficiently tiering video data from fast and expensive storage to tape while preserving access within the file system. Symphony enables seamless data migration while adhering to SLA retrieval times, ensuring cost-efficient storage solutions for video-intensive industries. Additionally, Symphony provides:

- Compliance management, ensuring that organizations adhere to industry regulations for data retention and governance via automation of regulatory compliance requirements.
- Data orchestration, enabling automated workflows for video analysis and metadata-driven retrieval.
- Data purging, systematically removing aged-out data based on retention policies, preventing unnecessary storage costs.
- LLM training, AI tools can query the Metadata Catalog, but must be authenticated to retrieve the digitals artifacts such as videos, PII, etc. More information in LLM training using Symphony can be found here.

Use Case: Implementing Metadata Tagging and Deep Archival

Scenario 1: Manufacturing Quality Control
Implementation:
- Cameras capture defects on an assembly line.
- Metadata tags defects by type, time, and location.
- Video is archived, while metadata is indexed for easy retrieval.

Benefits:
- Engineers analyze defect trends without excessive storage overhead.
- Rapid root-cause analysis improves production efficiency.

Scenario 2: Police Body Camera Evidence Management
Implementation:
- Body cameras record police interactions.
- Metadata tags include case number, GPS coordinates, and officer ID.
- Footage is archived while metadata remains searchable.

Benefits:
- Faster retrieval for legal cases.
- Reduced storage costs by archiving non-critical footage.

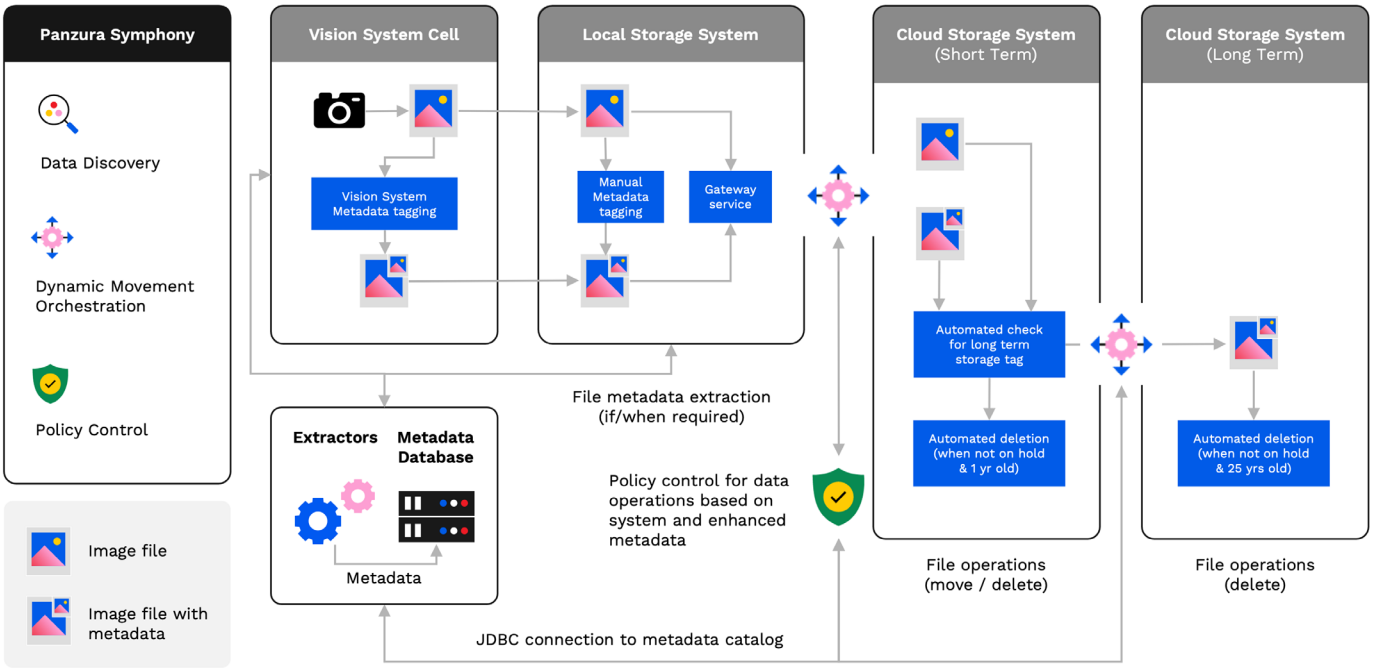
Scenario 3: Power Line Drone Inspections
Implementation:
- Drones inspect power lines for faults.
- Metadata includes GPS coordinates, fault severity, and timestamps.
- Only flagged footage is stored in active databases, while historical footage is archived.

Benefits:
- Efficient fault tracking over time.
- Cost savings in storage while ensuring compliance with regulatory audits.

Conclusion

The strategic use of metadata within OT video files significantly optimizes operational efficiency across manufacturing, law enforcement, and power utilities. By leveraging metadata for indexing and deep archiving video artifacts, organizations can reduce storage costs, enhance searchability, and derive actionable intelligence.

Solutions such as GRAU Data MetadataHub and Panzura Symphony provide industry-leading tools for metadata scanning, compliance, and data management. As data volumes continue to grow, industries must embrace metadata-driven storage solutions to remain competitive and cost-efficient.



Panzura empowers today's digital-first organizations to do impossible things with file data, making them more agile, efficient, and productive. They trust Panzura to help them consolidate dispersed data, see and manage data in and out of the cloud, make it more cyber-resilient and AI-ready, and ensure it is available to people and processes where and when it's needed.

Discover how Panzura can fuel your success at **panzura.com.**