

Oracle Digital Evidence Management

An Offering for Justice and Police Organizations

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Executive Overview

Public prosecution and police organizations are increasingly looking to improve how digital evidence is handled, while maintaining control over costs. The challenges regarding streamlining the entire end-to-end process of gathering, documenting, using, archiving, and preserving digital evidence and assets are not trivial; nor is the insurance of long-term compliance with national and international regulations. Further, the increased use of digital assets (including social media uploads) and technologies (on-body cameras, etc.) in modern law enforcement will only add to this list of challenges, which must be dealt with moving forward.

Oracle is dedicated to accelerating innovation by simplifying information technology. Oracle offers a comprehensive and fully integrated stack of business applications, platform services, and engineered systems to help customers reduce complexity and achieve business agility. Oracle's industry-leading cloud-based and on-premises solutions give customers complete deployment flexibility and unmatched benefits including application integration, advanced security, high availability, scalability, energy efficiency, powerful performance, and low total cost of ownership.

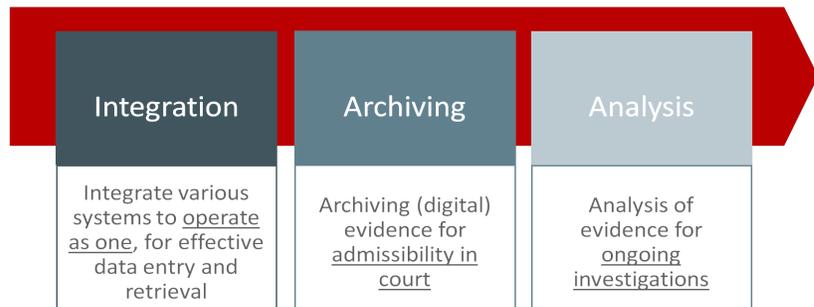
Oracle has spent years focusing on the development of end-to-end business solutions to support the needs of the justice and public safety community. These solutions are developed based on Oracle's standard software components and further developed by Oracle domain partners and global system integrators, and directly support critical business processes at police and intelligence services, correctional services, border controls, courts and command and control centers.



Challenges Managing Digital Evidence

The justice and public safety community faces several challenges when it comes to managing digital evidence. The challenges regarding the authenticity of digital evidence/asset are often huge; quite often we see evidence being dismissed in court because authenticity is being challenged. Additionally, the increased use of digital assets (including social media uploads) and technologies (body-worn cameras, etc.) in modern law enforcement will only add to this list of challenges, which must be dealt with moving forward.

Challenges with managing Evidence



In the area of archiving, proving authenticity of the evidence in court is the biggest challenge. Public prosecutors must prove that the evidence they present is authentic and has not been tampered with. At the same time, investigators need to do their work and perform high value analysis of the evidence, to find that one piece of information that proves the guilt or innocence of the suspect in court.

These challenges call for a robust, flexible, scalable, secure, intelligent, and user-friendly solution enabling organizations to support their desired business requirements and workflows – both now and in the future. Oracle has the unique capability to deliver and implement such a solution enabling the support of a much more efficient and cost-effective way to conduct investigations and daily police work. Our expertise with customers in the justice and public safety industry enables Oracle to provide our customers with a digital evidence management (DEM) system that will strengthen law enforcement and support handling information, securely and according to legislation.

The Oracle based DEM system enables organizations to:

- » Securely collect, store, process, retrieve, and present digital assets in a single environment;
- » Preserve chain-of-custody and auditing of digital assets;
- » Build a central storage of digital assets, that can be made available for different platforms and accessed from different geographical locations;
- » Integrate tools for browsing, searching, filtering, analysis, and editing of assets for subsequent processing.

The Oracle Digital Evidence Management Framework

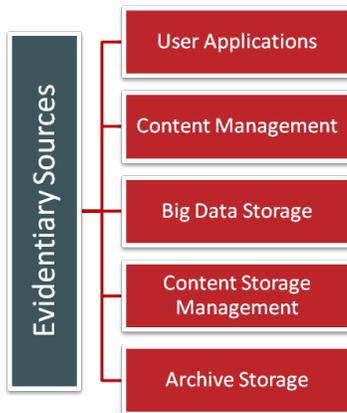
The Oracle DEM solution is a framework, made up from a comprehensive stack of products, working together to provide justice and public safety customers the right tools to manage their digital evidence. These components provide digital asset storage, protection and preservation, and suspect search, supporting an entire end-to-end process of gathering, documenting, searching, archiving, and preserving digital evidence and assets.

This Oracle solution will also enable users to easily leverage the output and the insight from other solutions (e.g. analytics platform, case management, command and control, etc.).

The native security model and chain-of-custody in the components ensures user rights, access control, data security, auditing, and compliance are handled at the highest level.

Important aspects of the Oracle DEM solution are openness and vendor neutrality based on open standards. We strongly believe that such an approach is of greatest importance. We will recommend an open and vendor neutral system that focuses on sharing data, integration, and security. It is essential to ensure that this platform will never

become a monolith. Implementing an Oracle DEM solution will provide you with an open platform, which from inception includes law enforcement domain specific content, metadata, content workflows, etc. allowing you to quickly configure the solution to match your precise needs now, and into the future. The open platform will also allow third party vendor software to easily integrate into the infrastructure, thereby meeting precise requirements for instance biometrics and advanced video analysis.



The Oracle DEM solution is based on standard software components from Oracle, WebCenter Content, DIVArchive, Tiered Storage and BigData Discovery

Using the standard functionality in Oracle WebCenter Content and Oracle DIVArchive, the Oracle DEM solution will enable efficient storing, processing, retrieving, and preservation of digital evidence, including a secure audit trail through chain-of-custody. Oracle WebCenter Content enables both retention and disposition of information, allowing organizations to define, manage, and execute records and retention policies for all enterprise content from a single application. The Archive eXchange Format (AXF) open format, used in Oracle DIVArchive, supports interoperability among disparate content storage systems and ensures the content's long-term availability no matter how storage or file system technology evolves. Using this format allows applications to treat complex assets as a single object when copying, moving or deleting it. AXF also layers significant advanced features on top of this encapsulation including metadata encapsulation, per structure checksums to ensure validity, recovery, and index structures to add to resiliency (and prove authenticity of the evidence).

AXF objects can grow to any size and encapsulate any number of individual files of any size and type. AXF was designed from an IT-centric perspective while also serving the key requirements mandated in other industries, such as media and entertainment, medical imaging, GIS, etc.. AXF can store assets consisting of kilobytes of data through to the largest data sets envisioned today and into the future bound only by available storage technologies. AXF also supports spanning of objects across media (such as over multiple data tapes) overcoming storage media capacity limitations.

Based on the actual requirements Oracle can and will include known third-party vendor solutions, which will easily integrate with the open standard Oracle components – all leading to a flexible and future-proof, best-of-breed solution, and preventing vendor lock-in. This will allow meeting requirements for e.g. biometrics, advanced video analysis, facial recognition or behaviour recognition.

Standard software components (Commercial off-the-shelf software – COTS)

The Oracle Digital Asset Management system consists of a stack of standard, commercial-off-the-shelf components. Upon implementation, only little customization is needed to create a fully functional environment.

Oracle WebCenter Content

Oracle WebCenter Content provides document-handling capabilities for organizing content regarding evidence and “cases”. This enables customers to define and provide documents such as images, videos, and text in specified formats and sizes dynamically. This helps maintain consistent standards for digital content use.

Key standard features are:

- » Multiple input formats using one content ID ensures that the asset maintains a standard size and quality, while providing content management and workflow features.
- » Multiple output formats (renditions) provide the ability to use different devices and technologies over time to access digital assets.
- » The Video Manager feature enables users to quickly find, group, and download videos of various sizes and resolutions. For example, a video may need to be available in a variety of sizes for streaming to remote investigators, legal teams, or for copying to tape for evidentiary purposes.
- » Metadata is assigned both automatically and manually, and effectively used in searches.
- » Retention Time Management enables retention schedules and disposition rules enabling users to schedule life cycles for content to eliminate outdated or superseded information, manage storage resources, and comply with legal audit holds.

Expanding compliance legislation and the high cost of litigation make proper management and easy accessibility of an organization’s content essential. Not only must content be maintained but it must also be defensibly disposed once its usefulness has expired. Oracle WebCenter Content enables both retention and disposition of information, allowing organizations to define, manage, and execute records and retention policies for all enterprise content from a single application. Oracle WebCenter Content enables organizations to control the creation, declaration, classification, retention, and destruction of content and digital evidence.

Oracle DIVArchive

Oracle DIVArchive provides handling, storage, and retrieval of content known as digital assets (i.e. video, sound, images, documents, etc). It is a common platform for content storage management, workflows, storage, archive, and preservation. Highly scalable, reliable, open, and distributed, Oracle DIVArchive is the proven heart of mission-critical digital asset management and storage environments.

Oracle DIVArchive relies on an open-standard storage format called AXF (Archive eXchange Format) which was published by SMPTE in 2014. AXF not only protects all customers against vendor lock-in for their valuable asset repositories, but it is also key to the chain-of-custody and preservation requirements in these demanding environments regardless of the storage technologies chosen. All digital assets stored in Oracle DIVArchive are individually hashed and these values are stored in the database for quick verification but also within the AXF Object stored on the disk or tape subsystems fundamentally tying them to the digital assets themselves. This ensures full chain-of-custody protection against asset and metadata tampering and allows Oracle DIVArchive to also continuously monitor the health of all assets validating these checksum values during each and every read operation (access, replication, migration, etc.).

Powerful partial restore capabilities in Oracle DIVArchive allow retrieval only of points-of-interest within volumes of stored video, audio and file-based data without having to restore entire assets. During intensive investigations, this can help make the case by saving both time and money and allowing investigators to rapidly hone in only on the most important portions of large evidence collections.



For highly secure environments, Oracle DIVArchive also natively supports the powerful encryption and key management capabilities of Oracle Key Manager allowing encryption of data during transport and at rest.

Oracle Tiered Storage

Oracle offers a highly efficient and scalable disk and tape storage platform for digital workflows, media asset archiving, and video serving. Oracle's application engineered storage and tape offerings are best of breed and integrate seamlessly with Oracle DIVArchive. Disk storage would serve the more frequently accessed data and the higher performance retrieval requirements and in combination with Oracle tape we can offer strong availability, reliability, and the lowest TCO for the preservation, and future access of high-resolution digital assets. Additionally Oracle provides the option to tightly integrate and manage disk and tape storage with Oracle Cloud, thus providing a secure hybrid solution with unequalled flexibility.

Oracle ZFS Disk Storage

Oracle ZFS Storage Appliance is a hybrid storage system based on a unique cache-centric architecture featuring massive DRAM plus Flash, and is powered by a multithreaded SMP operating system. As a result, 70- to 90-percent of I/Os are served from DRAM, enabling customers to use Oracle ZFS Storage Appliance for a variety of demanding workloads, including business analytics (BI/DW), virtualization, development and test, and data protection—in traditional on-premises deployments or in cloud environments. With a robust, high-performing platform, Oracle ZFS Storage Appliance complements the extreme performance of Oracle engineered systems, Oracle's SPARC and x86 servers, and the enterprise-class capabilities of Oracle Solaris.

Oracle Tape Storage

As the volume and value of data grows beyond online resources and backup windows, Oracle's proven StorageTek tape and library solutions help manage complexity, control costs, and deliver on service-level agreements. With the world's highest capacity and highest performance drives, including the world's first exabyte storage system, enterprise tape libraries that provide 24x7 availability, and the most scalable, integrated tiered storage environment, StorageTek tape storage systems enable you to reduce backup windows, maximize archive access, and lower your total cost of ownership.

Oracle Big Data Discovery and Oracle Big Data Appliance

Oracle Big Data Discovery provides a dynamic search engine combining various datasets with powerful search capabilities. It supports finding information based of many different types of data by providing rapid visual access to all the data in a Hadoop based infrastructure, so that you are able to:

- » Find relevant data quickly, through a rich interactive catalogue of the data stored on the Hadoop system;
- » Enhance findings with local data from Excel and CSV files through self-service wizards;
- » View data set summaries, annotations from other cases, and recommendations for related data sets;
- » Explore the data through familiar search and guided navigation.

Together with statistics about each individual attribute in any data set, these capabilities expose the shape of the data, empowering users to rapidly understand data quality, detect anomalies, uncover outliers, and ultimately finding the needed information and thereby supporting the capability of searching for a suspect.

Oracle Big Data Appliance is a flexible, high-performance, secure storage/retrieval platform for running diverse workloads on Hadoop and NoSQL systems. Oracle Big Data Appliance is an open, multi-purpose system using the Cloudera CDH distribution for Hadoop and NoSQL processing. It runs a diverse set of workloads – from Hadoop-only workloads (MapReduce 2, Spark, Hive etc.) to interactive, all-encompassing interactive SQL queries using Oracle Big Data SQL.

Value

The Oracle Digital Evidence Management solution enables justice and public safety customers to preserve digital evidence in a secure way, so authenticity can be proven in court, while in the meantime allowing for rules-based and dynamically configurable workflows and the provisioning of high-scale analytics and predictive tools for investigators to use during their search for proof and evidence.

This leads to fewer cases of evidence being dismissed from court, and less time and money spent by investigators on investigating, searching, and analyzing the digital evidence.

Business Capabilities

- Preserve digital evidence in a way that guarantees authenticity, so it can be used in court
- Allow rules-driven and dynamically configurable workflow management
- Provide Analytics and Predictive tools to investigators

Business Benefits

- Archiving all evidence in a secure way
- Full search and analyze functionality in one solution
- Less time spent on finding and analyzing the evidence
- Limitless scalability of the system
- Risk avoidance through the use of open standards and AXF

Value for Customers

- More evidence admissible in court, fewer suspects set free
- Investigators spend less time searching through the evidence, finding what they need faster
- Cost reduction and lower TCO

Conclusion

As public prosecution and police customers are continuously looking to improve the handling of digital evidence, the challenges regarding streamlining the entire end-to-end process of gathering, documenting, using, archiving, and preserving digital evidence and asset are not trivial, but can be overcome using an integrated framework for digital evidence management.

Proving authenticity of the evidence in court may well be one of the biggest challenges. Can public prosecutors prove that the evidence they present is authentic and has not been tampered with? At the same time, investigators still need to do their work and perform high value analysis on the evidence, to find that one piece of information that will prove guilt or innocence for the suspect in court.

The Oracle framework for digital evidence management is fully enterprise grade and supports both the secure archiving and storing and full-scale search and analysis functionality. Oracle is dedicated to accelerating innovation by simplifying information technology. To help customers reduce complexity and achieve business agility, Oracle offers a comprehensive and fully integrated stack of business applications, platform services, and engineered systems. Oracle's industry-leading cloud-based and on-premises solutions give customers complete deployment flexibility and unmatched benefits including application integration, advanced security, high availability, scalability, energy efficiency, powerful performance, and low total cost of ownership.



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