

Constellation VCM™

Video Asset Management Software

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Constellation VCM™ Video Asset Management

- What She Needs..... 3
- The Information Repository..... 4
 - Vaults..... 4
 - Media..... 5
 - Storage Pools..... 5
- Constellation Application Tools..... 5
 - VCM..... 5
 - Search & Retrieve..... 6
 - Target & Process..... 6
 - Target & Process Policies..... 6
 - Data Service Policies..... 6
 - Network Activity..... 7
- Constellation Features..... 7
 - eShadow..... 7
 - Cloning and Digital Fingerprinting..... 7
 - Computer OS Compatibility..... 8
 - Universal Storage Compatibility..... 8
 - Universal Editing System Compatibility..... 8
 - Video and Digital Cinema Compatibility..... 8
 - Project Migration to Editing Systems..... 8
 - Multi-Tiered Storage..... 8
 - Security..... 9
 - Scalability and Capacity for Growth..... 9
 - Export..... 9
 - Store & Archive Audio Projects..... 9
- Constellation On-Set Data Management..... 9
 - Archive Station..... 10

What She Needs

A client of ours recently described her video content management needs:

- Where's my stuff?
- I need to put my hands on it.
- How do I get it?
- I want to see it now.
- Archive it.
- Purge it.
- Retain integrity.
- Guard security.

After we took her through a Constellation demonstration, she summed it all up:

“Well, this is clearly not just video management but full-on asset management. But not just asset management, it's an enterprise management solution and it has life cycle management and storage resource management. The fact that it can search inside files...”

She's right. Constellation is a powerful solution that incorporates all of the above. It is the result of 15 years of development and contains over a million lines of code.

But first, Constellation is a true digital video asset management solution.

Constellation ingests, stores, migrates, archives, replicates, searches, displays and retrieves virtually any form of digital video and audio. Digital files are preserved in their entirety in a form that is identical to the original source material. Original metadata plus extended metadata elements are tracked and preserved.

Constellation handles files from most digital cinema cameras such as RED One, or Genesis, and from most conventional digital video cameras. It also stores audio and any other related digital material such as logs, script notes or storyboards, estimates, and actuals.

As Constellation ingests video files, it creates thumbnail image representations and low-resolution proxies of the video. After files have been ingested, thumbnails and low-res video can be searched and viewed immediately. Constellation allows you to search for a file, view a thumbnail for initial identification, then screen the proxy. This works for material ingested ten minutes ago or two years ago. Proxies can be configured to size for greater or less resolution.

Search criteria ranges from episode name, to time code, to a spoken word of dialogue, or any other criteria. Users can easily configure extended metadata to tailor searches to specific needs. Constellation allows you to find an element or scene or take, edit that

segment in a built-in video editor, then retrieve only the exact clip needed from the master footage, even if that footage has been relegated to deep storage on media such as LTO tape or Blu-ray disk. Constellation performs this task by retaining the thumbnails and low-res proxies even after files have been migrated to deep storage.

Constellation is a cross-platform client-server application that works with any combination of different types of storage devices simultaneously. Any number of authorized users on a network can access data from their own desktop computers. A VPN (Virtual Private Network) allows Constellation to work across the country or around the world.

The Information Repository

The Constellation Information Repository is where data is stored and processed. The Information Repository is comprised of “Vaults” and “Media” that provide “data lifecycle management.” The Information Repository ingests data so that it can be properly managed, stored, tracked, and migrated for the best control of digital assets.

Instead of managing separate storage areas for primary files, backup files, regulatory files, and archives, Constellation incorporates mixed storage resources as a “federated” Information Repository. Constellation uses “policies” which are rules that manage the archiving of files. Federated storage is “media agnostic.” You don’t need to know where the media is in order to access it. It’s a matter of, “Who’s got space for this info?” Whatever storage area has the room gets the files.

The Information Repository can include multiple networked data storage technologies running on diverse operating systems. It can work simultaneously with existing Windows, Linux, and Macintosh computers already on an existing network.

The Information Repository requires only an IP connection to link computers. Anything that can be stored on a computer can be stored in the Information Repository and any file in the Information Repository can be content-searched.

The Information Repository manages the entire life cycle of data with an,1 “information lifecycle management” function. Data that is no longer required on a daily basis in primary hard disk storage can be scheduled to be protected, classified according to captured metadata, processed and purged automatically.

Finally, the Information Repository supports full eDiscovery capabilities, including the ability to provide a Chain of Custody so thorough that retrieved data is viable as legal evidence.

Vaults

The Information Repository comprises one or more “vaults.” A vault consists of Constellation server software running on a host computer with mass storage attached to

it. The host provides computing and memory resources for program execution, metadata management and Information Repository monitoring and management. Generally, each vault is a separate computer. However, a single computer can host up to four vaults.

Media

Constellation vaults contain “media.” “Media” refers to objects on which data can be stored, such as hard disks, tapes, CDs, DVDs, Blu-ray disks and LTO tapes. Hard disk media is sometimes referred to as “virtual media.” Tape, CD, and DVD media is sometimes referred to as “physical media.” Media always resides in vaults. Vaults use media to store all files that are protected and managed by the Information Repository.

Storage Pools

Constellation uses a concept called “Storage Pools” to describe one or more pieces of media with a common name that are linked together for a common use even though stored in disparate vaults.

Constellation Application Tools

Constellation is made up of a collection of application tools that enable the management of digital assets using familiar business workflows. These tools work together to ingest, manage, search and retrieve data throughout the life cycle of the data.

VCM

The Constellation Video Content Manager (VCM) is Constellation’s search, discovery, and video selection tool. It enables search, view, retrieval and manipulation of video assets. Constellation VCM locates thumbnail representations and other descriptive data. It can locate any type of data quickly, regardless of how many times and to where the data has been replicated or migrated. A click on a thumbnail opens a viewer/editor that displays video proxies for immediate screening. Multiple viewing windows can be opened to compare files. The edit function of the viewer enables the user to define the exact time code and set desired frame-accurate in and out points even when extracting clips from LTO or Blu-ray. Since thumbnails, metadata, and proxy files are stored separately from archived original files, they remain fully searchable even when the originals are offline. Only the specified clip is retrieved from tape. There is no need to retrieve the contents of the entire tape.

Once a video file has been found, associated files such as scripts, screen shots, notes, and storyboards can be reviewed and selected with the VCM. Constellation VCM makes exporting video and audio files or entire projects easy. Once a user selects clips they are placed in an export queue. The interface then enables the user to copy assets to any destination in the network. Destinations could include an on-line primary storage environment for editing, a separate network location, an online digital transfer system, a transcoding system, or optical disc publishing system.

Constellation VCM offers security from the vault level through asset level and even down to the physical media drive. Without access privileges to any of five levels of security, assets cannot be seen. It's as if they don't exist. In addition, there is a security log of all user activity that is available to the administrator. Any time the original high-resolution footage is accessed, the user, date, time and type of request is recorded.

Search & Retrieve

Search & Retrieve provides an alternative file-based method to find and retrieve information from the Information Repository. The difference is that it is not "video-centric" like Constellation VCM. This tool can locate any type of data quickly, regardless of how many times and to where the data has been replicated or migrated. Once data has been found, there is an option to restore it to its original location or retrieve it to any computer in the network.

Target & Process

Target & Process is the Constellation application that enables manual selection and ingestion of targeted data into the Information Repository. To Target & Process a file means to ingest it. This can be done by moving a file from primary storage into the Information Repository or by cloning it. When Target & Process moves data, it is removed from primary storage. When Target & Process creates a clone copy of a file, the original asset in primary storage is not modified or moved. Target & Process employs user-defined filters that limit which types of files are processed.

Target & Process Policies

Target & Process Policies is similar to Target & Process. It enables the user to easily create policies that enable Constellation to automatically ingest targeted data into the Information Repository. In Target & Process Policies, policies control what files to ingest, where to ingest them, and when to ingest. Policies also determine where a file is stored in the Information Repository; when that storage occurs, how often and when to start and stop these policies. Like Target & Process, Target & Process Policies employs user-defined filters that limit the types of files to be processed.

Data Service Policies

Data Service Policies creates policies that control the migration, replication, and purging of data already in the Information Repository. Data Service Policies provide an easy and efficient way to ensure that data is preserved and maintained and that the data meets individual access, performance and storage longevity requirements. Data Service Policies also enables the purging of data that is no longer needed. Like Target & Process and Target & Process Policies, Data Service Policies employs user-defined filters that limit the types of files that are processed.

"Dynamic Resource Allocation" gives Data Service Policies the flexibility to manage data with the utmost efficiency. Since Constellation federates all of the computers in a network, any network computer with Constellation installed has access to any storage resource accessible by the network.

Policies can be created to manage data based on its recovery time and longevity requirements. For example, files that are ingested nightly can be configured to be stored in cheaper tape storage instead of expensive storage on a hard drive. Ingest, migration, replication, and purging can be set to use a wide spectrum of targets.

If parameters are set to ingest files to hard-disk-based storage and there is a choice of available hard disk based vaults, Constellation will choose the vault that has the most available free space and best availability.

Parameters can also be set to process only certain types of files based on ownership, file type, or other settings and to use only a particular tape in a particular vault.

Network Activity

Network activity is an application with a graphic display that monitors Information Repository activity in real-time. It represents the activity of Constellation Vaults, VCM, Target and Process, Search and Retrieve and Data Services and any other activity that occurs within a Constellation Vault.

Constellation Features

eShadow

eShadow is a unique function that catalogs files in a user's primary storage environment, virtually incorporating them into the Information Repository. eShadow serves as a "table of contents" of the files that exist out in an environment and provides an inventory of what is actually on hard drives. Because these files are not inside a Constellation vault, eShadow doesn't provide protection against file damage or corruption. Protection doesn't occur until Constellation ingests data. On ingest, Constellation makes a clone copy of the information and protects it. At this point, an identical copy is created providing the security of two identical copies.

Cloning and Digital Fingerprinting

One of the greatest strengths of Constellation is that it enables users to manually or automatically make perfect clones of any data ingested into the Information Repository. It also provides the logging information to prove that the protected, ingested file is an exact copy of the original.

Constellation employs the most secure data moving and replication method available, created and patented by the National Security Agency. It employs SHA 256, a 256 bit "Secure Hash Algorithm" that compares files bit by bit. The "hash value" changes if even one bit of data is changed, indicating a problem. Furthermore, activity logs document everything that happens to a file and assigns a unique "fingerprint" to every file. The logs can be saved and printed.

Computer OS Compatibility

Constellation supports a wide range of operating systems, including MAC OS X, Windows, XP, Vista, and Linux,

Universal Storage Compatibility

Constellation supports hard disk based storage as well as storage systems such as Blu-ray Disk and library systems, plus all tape drives and tape library systems. Constellation is compatible with Avid Unity, xSAN, SAN, NAS & RAID and JBOD Storage and external drives. It is compatible with LTO-3 and LTO-4, SAIT, AIT and other digital tape libraries.

Video and Digital Cinema Compatibility

Since Constellation ingests, stores, and archives nearly every video and digital cinema format along with original metadata, files can be reconstructed exactly in their original master form.

Constellation includes support for Red One, Panavision Genesis, Vision Research Phantom, Sony F23/F35, EX3, XDCAM, Panasonic Varicam, DVCPRO, DVCProHD, P2 and HDCAM SR, HDCAM, XDCAM EX3 and Codex video acquisition systems.

Constellation recognizes all standard digital video formats, such as mpg, wma, and mov. It supports metadata extraction and processing for categories of video metadata including SMPTE time codes.

Universal Editing System Compatibility

Constellation recognizes and supports virtually any video editing software, including Apple Final Cut Studio, Avid, Pro Tools (audio) and PilotWare.

Project Migration to Editing Systems

Constellation facilitates migration from Final Cut Pro or Avid Unity systems to primary archive storage resources. It can migrate files and projects from primary to secondary storage to archive levels of storage. It controls migration from primary hard drive to second tier storage or offline archive such as LTO or Blu-ray. Constellation can be configured to automatically distribute files to digital delivery systems and has built-in compatibility with Rimage disk publication devices.

Multi-Tiered Storage

Constellation manages, catalogs, and migrates files for the efficient use of storage resources. Constellation can be configured to create policies that automatically migrate files to lower, less expensive levels of storage as the content become less essential. The lowest level of storage is where the content is physically removed from hard drive storage and migrated to LTO tapes or Blu-ray. Even when originals are taken offline, they remain fully searchable via low resolution proxy files.

Tapes and disks are cataloged for physical storage, labeled, and barcoded for retrieval. On a large scale, retrieval can be accomplished by a robotic library system. On a smaller scale, Constellation instructs a person to locate the media and place it into a tape or disk reader.

Security

Constellation offers security at the vault, media, and file level. If a user does not have access privileges, the asset is not available or even visible. It's as if it doesn't exist. The Administrator has access to a security log of all user activity. Any time the original high-resolution footage is accessed, the user, date, time and type of the request is recorded.

Scalability and Capacity for Growth

Constellation is easy to scale. You can start with a very basic Constellation configuration and expand the system as needed to handle the most demanding and complex tasks. The system also easily supports existing workflows. For example, Constellation operates in pre-existing Ethernet and Gigabit Ethernet networking environments, as well as Fibre Channel and iSCSI, SAN, or NAS storage environments.

Export

Constellation easily exports video and audio files or entire projects. Files are placed in an export queue within Constellation VCM. The interface facilitates moving assets to destinations such as primary storage for editing, a separate network location, an on-line digital transfer system, a transcoding system, or optical disc publishing system. In short, you can export to any location in the network.

Store & Archive Audio Projects

Constellation Search & Retrieve can handle Pro Tools audio sessions. It provides a view into the audio structure of Pro Tools sessions. Additional supporting files can be added as part of a collection. Constellation stores and tracks incremental changes to Pro Tools sessions. It is possible to work on a single audio track without loading the entire session. An entire Pro Tools session is moved or cloned when ingested.

Constellation On-Set Data Management

Archive Station

Archive Station is a specific Constellation-based solution for on-set data management. Constellation comes installed in a hardware and software-based portable device. It is designed to ingest camera files and simultaneously clone them to multiple hard drives and subsequently to LTO tape. Archive Station automatically verifies the integrity of the clone and provides a report of the operation. This provides a high level of confidence not attainable with conventional systems.

In addition, Archive Station provides typical Constellation search capabilities and on-set playback of proxies of ingested camera footage. This means that a Director or DP can reference anything that was shot and ingested that day or that week or anytime during the production. If a segment of the actual master version is needed, Constellation will retrieve it from storage and provide an exact clone of the original that can be sent to an editor or colorist, for example.

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