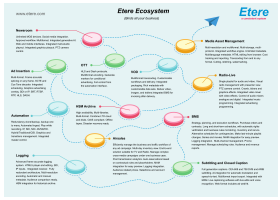
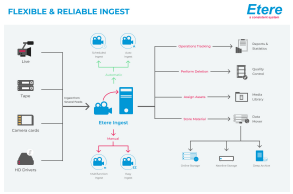
Gazprom-Media: A Central Digital Archive System

Gazprom-Media is the largest Russian media holding and one of the largest in Europe. This paper illustrates how Etere is aware about the importance of media archiving. In the attachment, you can view the full details of the case study.

Gazprom Media



Etere Ecosystem



Etere Ingest diagram

EtereWeb Multiplatform

This paper illustrates how Etere is aware about the importance of media archiving, and how it offers not only a world-acknowledged system but a hard-earned expertise on the implementation and maintenance of digital archives able to bring access to any file, at anytime and most important, with a the maximum of speed, characteristics that will ensure the improvement of each single broadcasting area with a wide set of cutting edge applications that goes from an accurate contents management to an automatic delivery of content to different market with different broadcast rights.

Introduction

Gazprom-Media is the largest Russian media holding and one of the largest in Europe. It was founded in 2000 as a subsidiary of Gazprom. Gazprom-Media Holding comprises television, radio, printing press, cinema production, advertising, movie theaters and internet assets.

Since its beginnings, Gazprom-Media has focused its efforts on the accumulation and development of high-quality media content which needs to be managed under a centralized archive framework able to render media content available to the entire global system. Accomplishing this ambitious objective requires a distributed but solid solution able to tightly integrate a variety a sub-systems that makes part of the main workflow, that's because Etere proposes streamline Gazprom-Media functionalities with the best-of-bread in Media Asset Management technology, providing the station with an integrated archive and distribution system which combines powerful servers with an easy to use browser interface.

This paper illustrates how Etere is aware about the importance of media archiving, and how it offers not only a world-acknowledged system but a hard-earned expertise on the implementation and maintenance of digital archives able to bring access to any file, at anytime and most important, with a the maximum of speed, characteristics that will ensure the improvement of each single broadcasting area with a wide set of cutting edge applications that goes from an accurate contents management to an automatic delivery of content to different market with different broadcast rights.

Overall Project

Etere will implement a "Central Digital Archive System" able to store and transparently manage the station's archive material over the long term in a tape robotic system; Etere will be a total system integrator that ensures the reliability of the global project.

An Etere-based digital archive system is able to interface existing sub-systems and encompass future expansions while maintaining the consistent set of characteristics that makes of it the right solution for an enterprise management of digital content under a file-based workflow environment, the station will be mainly provided with the following key features:

- A patented distributed architecture to avoid any single point of failure
- Reliable control at high-performances of the equipment integrated within the global system
- Enterprise management and transport of media between storage devices
- Best flexibility on digitizing media content from multiple sources
- Robust media management including high resolution files, browse copies and

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metadata
■ Seamless integration with existing and co-existing systems
■ Quality management to ensure the safety of archived assets over short and long terms
■ Intelligent and customized workflow management
■ Safe and fully-tracked access to the content archive
■ Transparent media transferring, the correct media format will be always delivered
■ Capability of NLE stations for uploading/downloading contents
■ Fast and efficient transferring connection between internal –and external-systems

Furthermore, the implementation of an Etere system will allow Editing Systems to access the digital archive directly and efficiently through a proper production environment, making use of the highest security standards. An important aspect of the selected Etere solution is functionalities which support the preservation and high-availability of media content archived and catalogued by the Etere system.

3. ETERE ARCHITECTURE
Etere is based on a distributed architecture which allows different modules to run on different workstations interconnected via a local area network. All system configuration parameters, security roles, user data, and pre-defined rules are stored in a reliable SQL database supporting backup and redundancy operations.

4.1 A Distributed System
ETERE is a distributed, modular and fully integrated broadcasting system composed by a set of applications specifically oriented to efficiently perform each complex phase of the broadcasting chain synchronously within the same database environment, being all managed by suitable user-defined workflows that ensure an efficient overall system controlling. Etere's distributed architecture allows achieving a top-level availability of resources and reliability of operations across the entire broadcast workflow thanks to its redundant capabilities to improve the fault resilience on any hardware or software failure.

4.2 Multi-level File Access Hierarchy
Etere offers a hierarchical storage management by organizing in user-specific access levels an unlimited number of content versions offering 'instant access' (from video servers), 5 minutes access (from NLE) and 15 min access (from archives), being all these levels available to the operator under a simple and user-friendly interface:

4.3 Tape Library Management
Etere allows stations to carry out the management of tapes (i.e.: video tapes, data tapes, discs, etc) by providing them with a set of modules specifically designed to improve the most important tasks involved in the logical management of tapes:

Etere provides full support for managing tape libraries within the system, being possible to monitor its status and view specific contents in real-time:

4. WORKFLOW BASED MEDIA MANAGEMENT
Etere's solution features an integrated and professional workflow management to optimize the station's entire broadcasting system, reduce operating costs and facilitate overall process control. Etere Workflow permits modules to for example, seek confirmation for sensitive process, follow specific rules, enhance the efficiency and reliability of process, and manage multiple workflows to perform different tasks simultaneously and independently.

5.1 Multiple Storage Management
Etere reduce the complexity of managing storage devices by arranging physical storage devices present across the system into metadevices (logical devices), the use of metadevices improve the overall media management by offering the following features:
■ Automated management via workflow of logical devices including arching, restoring, transcoding, etc,
■ Monitored storage space owing to the set of restrictions,

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■ Increased storage and better performance since metadevices acts as a virtual device representing several logical disks or disk systems:
■ Distributed storage according to specific requirements without the need of creating partitions, just associate individual disk volumes to different:

5.2 Custom Design Workflow
All workflows can be customized to fit the real needs of the station and thus give complete control
over the overall system management which offers:
■ Clear definition of each complex step of the broadcasting process,
■ Visual representation of each step mapped out on a PC not in a paper document,
■ Set of instructions and authorizations that must be followed in order to move forward,
■ Complete log of all steps carried out, operations denied etc.

A comprehensive and user-friendly workspace allows creating suitable workflows based on custom actions just by dragging and dropping the necessary elements into it:

5.3 Video Files Quality check Workflow
An Etere quality check workflow is able to automatically ask operators to assign a quality value to a certain asset(s) after browsing its video content:

5.4 Video Files Content Check via Workflow
Etere counts with a workflow action called content check, that once inserted into a workflow and attached to an asset, searches on its related proxy video file for defective video issues to subsequently mark (into their EDL list) all encountered defective segments including black scenes, scene changes and freeze video:

5.5 Video Files Archiving Workflow
Etere allows you to design a workflow for archiving your assets on LTO tapes, including a quality and content check, a proxy copy generation and a final email indicating the result of the process:

5.6 Video Files Restore Workflow
Create a workflow to automatically restore any scheduled asset for its playout by searching for them amongst a group of devices arranged on basis of their priority:

5.7 Video Files Transcoding and Uploading Workflow
In case you need to make your assets available for a web-server, just create a workflow that will automatically retrieve them from the archive, transcoding them automatically to a more suitable codec (e.g.: low-res mpeg1, wm9, QuickTime, mpeg4, etc) and upload it to a web server:

5.8 Video Files Checksum MD5 Verification
Etere offers an enterprise control of video files integrity; it keeps a log of the hash md5 of video files such in a way that it is possible to verify at any time if they have been modified after their approval. All video files registered on the Etere's database can be verified through an md5 checksum, this control is performed via workflow, each time that a video file is moved from one device to another, its initial hash md5 is calculated to allow a future checking. The workflow editor allows creating custom Checksum workflows to either generate or check the MD5 hash of a video file.

5. DETAILED FUNCTIONALITIES
ETERE is an integrated broadcasting solution that implements a modular system formed by a set of modules specifically oriented to cover each complex phase of a broadcasting system, focusing to efficiently carry out specific operations such as media ingest, archiving, transferring, browsing, etc. All these operations are synchronously performed within the same database environment and managed by suitable user-defined workflows that ensure an efficient overall system control; these are some of the main features that make of ETERE a solution that can easily fit any media management workflow.

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All modules that make part of the Etere's proposed solution will be treated throughout this chapter, explaining how its distributed architecture and integrated complementation are key parts of the success of the global system where a top-level performance and reliability is reached.

6.1 ETERE MTX: Digital Capture using Matrox Video Cards
Etere MTX is the application offered by Etere to drive the most popular HD/SD Matrox digital video editing platforms, it combines the professional effects technology of a wide range of industry standard codecs with an Etere system, allowing to capture in both high and standard definition formats over digital inputs, mix in real-time all types of footage on a timeline with more layers and/or effects, as well as parallel multi-format ingestions, all these under a user-friendly interface:

The station will be benefited with a real benefit due to an Etere MTX strong, its lower cost, that permits Etere to offer a cutting-edge product to acquire contents through four different channels with an outstanding performance, a complete support and most important, an unbeatable relation between quality and price.

6.2 ETERE INGEST: An Enterprise Capturing System
Etere Ingest is a versatile set of modular applications that significantly improves the digitization process inside a broadcasting system, this software covers any particular requirement of the entire process such as automatic and scheduled ingest:

Automatic ingest
Etere Ingest supports multiple parallel ingest streams, managed automatically either on a single workstation or across various workstations, allowing also to schedule the video files to be ingested:

Planning View
Etere ingest allows recording satellite signals to any storage target including video tapes, video servers, etc, just by configuring GPI devices to trigger the ingest process.
Etere Ingest permits to capture contents from a wide range of video storage devices including the broadcast industry standard Sony XDCAM. Etere counts with a XDCAM-dedicated module to acquire contents from professional XDCAM discs either manually or automatically, via SDI or FTP:

Moreover, Panasonic's DVCPRO P2 series products are fully supported by Etere, that access either the PC or the NLE system where the Panasonic P2 cards are placed, permitting operators to manage them as simple metadevices with immediate availability (e.g.: via LAN, FTP, etc).

Once ingested, video files are transcoded into the specific format of the destination device on which they will be stored, in the same way; video files are transcoded each time they are moved from one device to another. The image below illustrates how Etere allows setting the workflow to be launched at the start and end of an ingest process to for example, create a low resolution version or normalize the audio of captured contents:

6.3 ETERE DATA MOVER: A Digital Archiving and Delivery
The Media Management solution proposed to encompass station's content transfer and archiving goes beyond of a simple copy concept by moving video files based on custom policies, transcoding video files when required and offering a full track of all operations.

Video contents will be transferred between the various departments (e.g.: near-line storage, archive, post-production, playout, browsing, and even non-Etere systems) by Etere Data Mover; this migration process also includes rewrapping and transcoding capabilities. Etere's approach is oriented to "virtualize" the entire media management process, improving it with flexibility, customization and most important cost-effectiveness.

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Etere manages (logical) metadevices instead of (physical) devices, this approach results in a wide range of possibilities for the media management, for example, it is possible to control with one click the available space of all metadevices:

Etere Data Mover is the application used to perform the physical storage and retrieval of video files, a typical Data Mover operation would be to move a video clip from a video server to an archive based on custom actions which are defined and executed via workflow.

Additionally, the crucial logging function is available for all Etere applications, log files are written by the software each time it performs a task so it will be possible to trace their execution status, interaction level, and final result.

6.4 ETERE HSM: A Tape Based Archiving

Etere HSM is the cost-effective solution to radically streamline the management of expensive tape libraries; allowing stations to optimize the migration of contents including high and low versions as well as associated metadata. Etere HSM improves the management of libraries by controlling their mechanical movements through the HSM Robotics Control and HSM Data Pump applications, which are able to run several data pumps on different machines to boost their throughput, while offering access to real-time logs, reports and statistics.

Etere HSM distinguish four different archiving levels into a broadcasting workflow, these levels required distinct access times which vary from 0 minutes (video server) to 15 minutes (standard video tapes). All these levels are managed “virtually”, that is, you can use logical devices (metadevices) based on physical devices to free design your storage layout, enriching in this way the entire system with the benefits derived from the use of metadevices:

- Carry out loan-balanced movements on an intelligent multi-volume scenario,
- Extend your storage space by joining physical devices into one metadevice, without altering the archiving workflow,
- Categorize your storage devices by dividing them into metadevices with no partitioning required,
- Space limits and storage distribution are defined by the user and not by devices itself,
- Classify metadevices in media pools in order to automate their management,
- Background defragmentation and online/offline tape management,
- Scheduled archiving of devices, media contents and entire databases.

Etere HSM forms a tandem with Etere Data Mover to be the only solution in the market with an embedded multi-level and multi-rule cache that offers an intelligent management which ensures the best performances with low investments. Owing to Etere’s comprehensive character, these applications are perfectly integrated with other modules (e.g.: Ingest, EtereWeb, etc) to allow all these modules to use shared resources and have unlimited communication.

6.5 ETEREWEB: Post-Production Integration

Etere Web is the web service seamlessly integrated with the playout and media management system to permit arriving contents to be managed digitally, resulting into a faster and more efficient delivery process which also includes digital signing features for any delivered content. EtereWeb integrates the latest streaming technologies for video distribution and a comprehensive rights management system that gives to authorized users the possibility to access via web to a user-friendly interface:

NLE systems can deliver contents via EtereWeb as a digital equivalent of physical reception, where selected people can deliver video and metadata to the station, but owing to its digital nature, operations are perfectly organized, performed and logged, avoiding loss of any content information. Etere Web works perfectly behind a DMZ router so remote access and ftp transfers are drastically improved.

6. Conclusions

This paper has described how the development and deployment of a comprehensive Etere-based “Workflow Based Archiving System” is able to provide

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the station with a large number of operational benefits and advantages derived from the correct use of ultimate media management technology; Etere will entirely manage the digital contents of the station, from acquisition to delivery, by providing them with the following key features:

■ Workflow Reliability, all operations automatically generates fully customizable logs to track both the overall and individual functioning of the entire system,

■ Flexibility, on meeting all requirements by proving a versatile media management system tightly integrated with all capturing and storage devices present on the station,

■ Scalability, for increasing the number of capturing channels and devices without altering the system workflow complexity, thus minimizing operational overheads and reducing overall costs,

■ Efficiency, reduced need for repetitive manual operations, allowing to define them in advance and then include them in the ingest workflow, thus increasing productivity,

■ Accuracy, during the whole media management process, reducing the risk of mistakes when retrieving data since all archived contents are continuously checked.

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