Etere
a consistent system

VSTV Project:

Functional and technical specifications

VSTV
VIETNAM SATELLITE DIGITAL
TELEVISION COMPANY LTD.

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1. INTRODUCTION

Vietnam Satellite Digital Television (VSTV) is a company recently created in the framework between the French Canal+ Group and the Vietnamese public television broadcaster VTV to bring a satellite TV service provided by various channel packages delivered through the highest satellite technology.

VSTV project requires an experienced software provider that will allow it to delivery a host of new channel packages while employing the latest in satellite technology to ensure high-quality visual and audio features.

At present, Etere has a strong relationship with VTV, based on years of management of the VTV's nine channels playout by using an Etere system, a choice that has permitted VTV to achieve an operative efficiency while meeting audience's quality expectations.

This paper describes how all VSTV's specifications can be satisfied by the solution proposed by Etere, describing its architecture and identifying the functional advantages and benefits offered by a system able to manage and streamline the most important phases of VSTV's playout workflow with a wide set of cutting edge applications that goes from to an accurate contents management to an automatic delivery of contents.

2. VSTV REQUIREMENTS

VSTV has requested the capability to digitally perform the playout of their distribution channel in order to achieve the benefits of a tapeless asset management with a subsequent improvement of the quality of the entire broadcasting system.

All contents needs to be managed under a digital environment, where they will be catalogued including all content-related metadata, thus facilitating the search and query of video contents through a comprehensive browsing application.

In these terms, VSTV's technology department has summarized the characteristics that the solution must include:

- Automated playout of the four channels offered by the station (i.e.: Premium, Women, Teenagers and Preschool) plus an alternative playout channel,

- Complete integration with all existing hardware and software to create a bulletproof framework,

- Complete network integration, so it must be possible to move video from/to existing servers and editing stations,

- Ability to manage various media servers for ingest, preview, storage and playout,

- Integration with the archive to send and retrieve material, being also capable of sharing information with the existing omnibus automation system,

- Programming schedule arrives from Canal+ Group Antenne Traffic system to which also an As-Run log goes back.
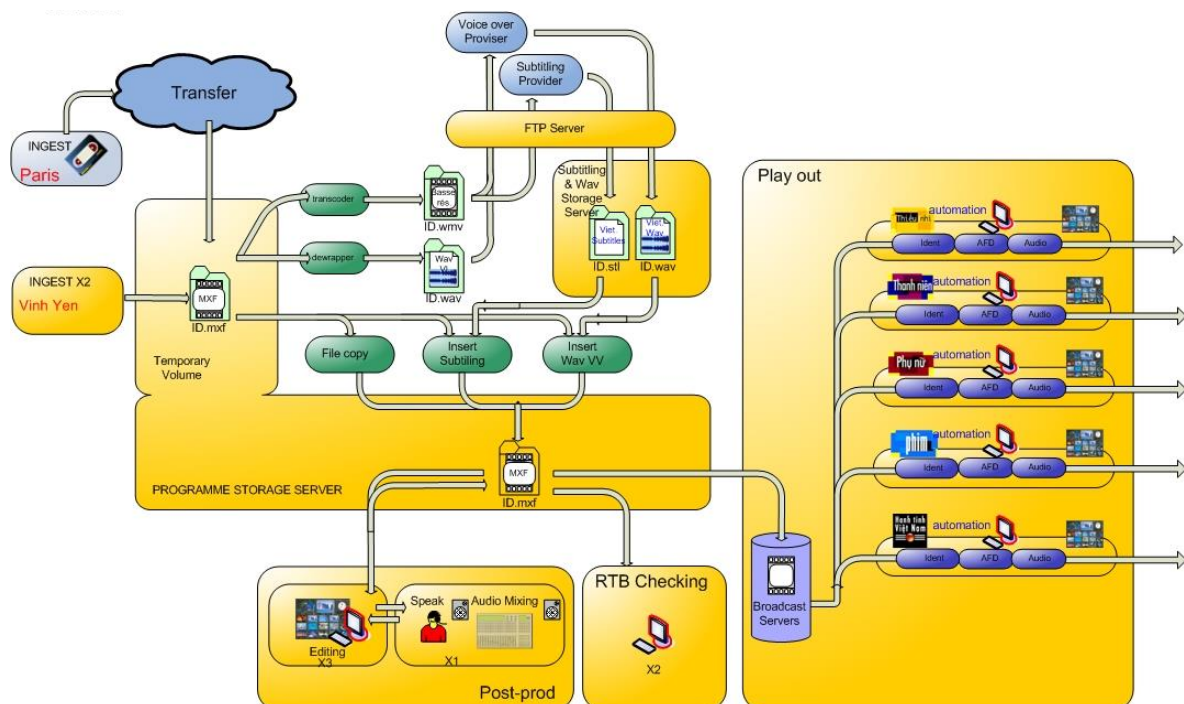
3. OVERALL SOLUTION

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. Etere allows achieving a greater availability and reliability in the playout process thanks to its ability to manage two parallel automation systems able to manage independent resources (main and clone) that in case of failure can recover from any hardware or software failure by simply switching to the clone automation.

The implementation of a comprehensive Etere playout system encloses the following remarkable characteristics:

- A patented distributed playout which avoids any single point of failure,

- Safe and fully-tracked access to video files, enabling remote upload/download of contents,

- Fast and efficient transferring connection for all the video servers and archives,

- Intelligent and customized workflow management including low-res transfers for subtitling,

- Best power and flexibility on import and export from traffic system.

4. 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.

Etere allows achieving a greater availability and reliability in the playout process thanks to its ability to manage two parallel automation systems able to manage independent resources (main and clone) that in case of failure can recover from any hardware or software failure by simply switching to the clone automation.

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.
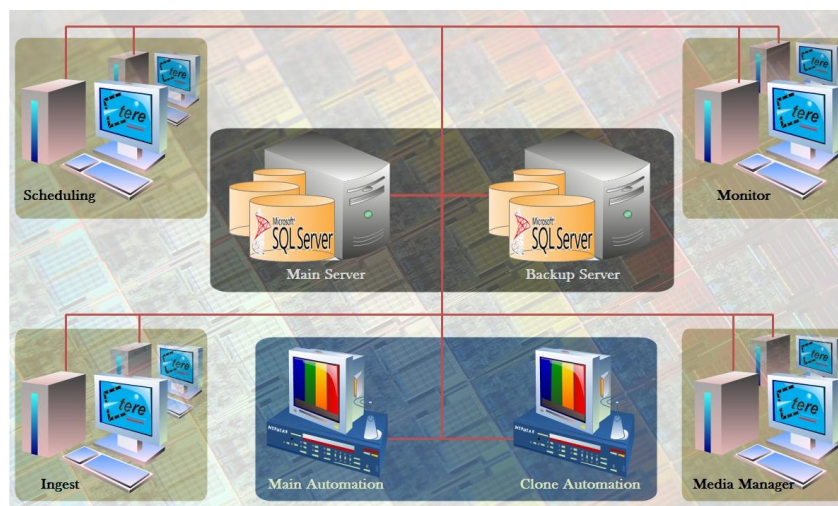

4.2 Secondary Events Management

Etere Automation is the powerful, reliable and modular playout system able to enhance VSTV's potential in terms of functions and workflow design, it is based on a unique approach which combines in a single product real-time device control and media asset management, offering a powerful mix of solutions and capabilities under a graphical user-friendly interface displaying for each event its source, type, description, properties, live status, secondary events, time code, GPI status, scheduled and real times, etc:

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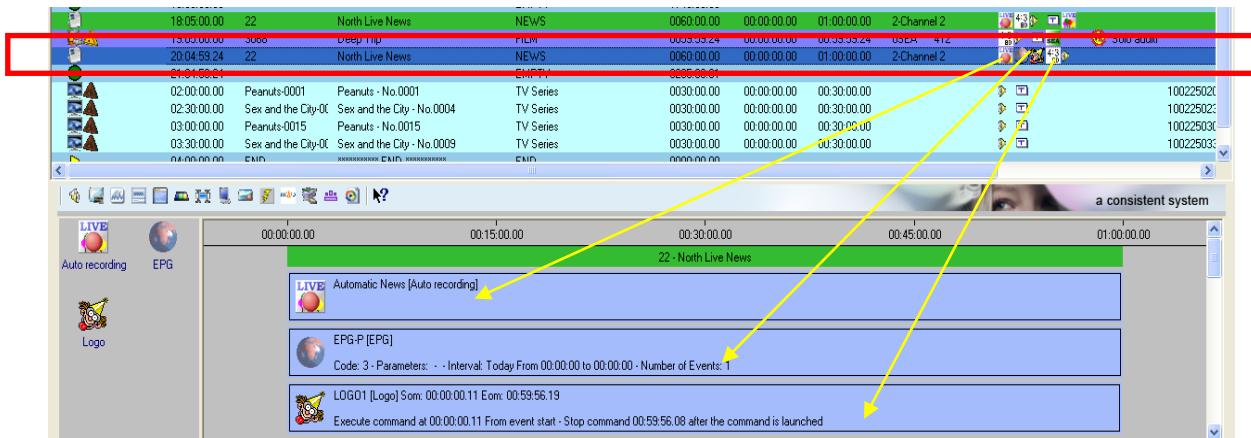
Furthermore, Etere Automation manages all the secondary events with a simple graphical tool, allowing previewing secondary events in low res before their playout through a browsing application:
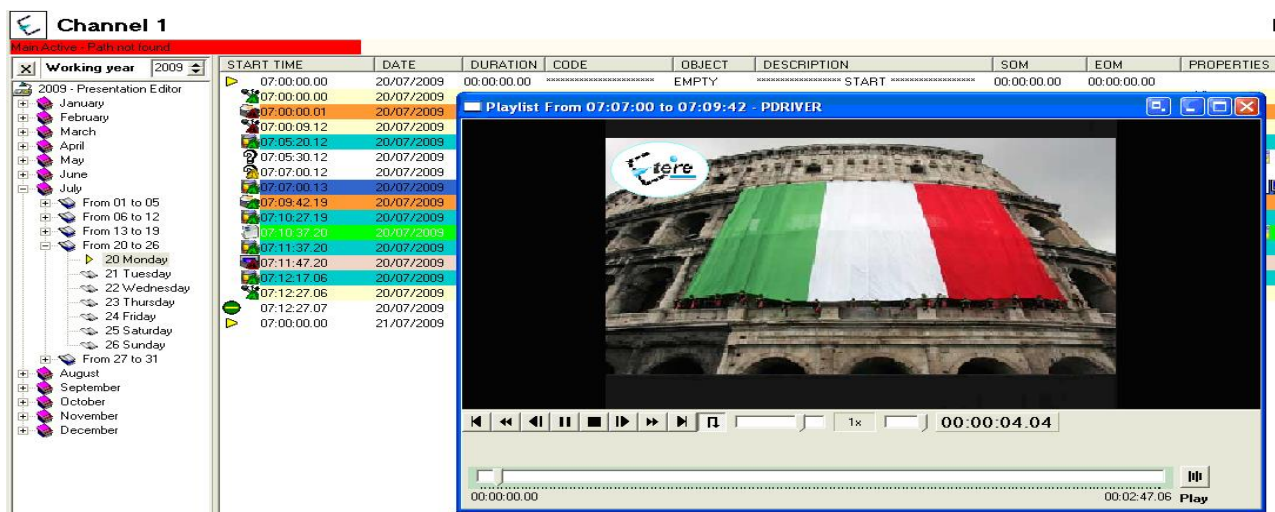
4.3 Main Clone Redundancy

Etere offers the best fault tolerant automation solution on the market, because it is the only system with distributed playout intelligence and with real-time main and clone systems running.

Clients can rely on the best data protection and the most advanced Fault Tolerant technologies achievable by Etere's Main/Clone redundancy, which consists in two synchronized automation systems that run two independent copies of the same play-list, and manages independent playout resources

4.4 Interfacing and Data Exchanging

Etere F90 provides the system with the ability to import/export the daily programming between Etere and the Canal+ Group Antenne Traffic system, including associated rights, alternative schedules and as-run logs, thus allowing to keep both traffic and automation systems always reconciled.

The entire system will be improved with a highly efficient and reliable connection between VSTV's system and external departments, guarantees the maximum accuracy in the process of exporting or importing information through a fully automated, paperless data flow application. The benefits of the automation of this process are evident, as human mistakes which could cause the interruption of the work processes are completely avoided. The application is particularly helpful when the periodical export or import of this data becomes a part of the natural workflow of a station.

Etere F90 is able to carry out continuously the import schedules to the main DB from a PC by setting a UNC path, as well as export data from the main DB either to a PC by setting a UNC path or to an FTP Server. Contributing to take the overall programming process to a paperless management:
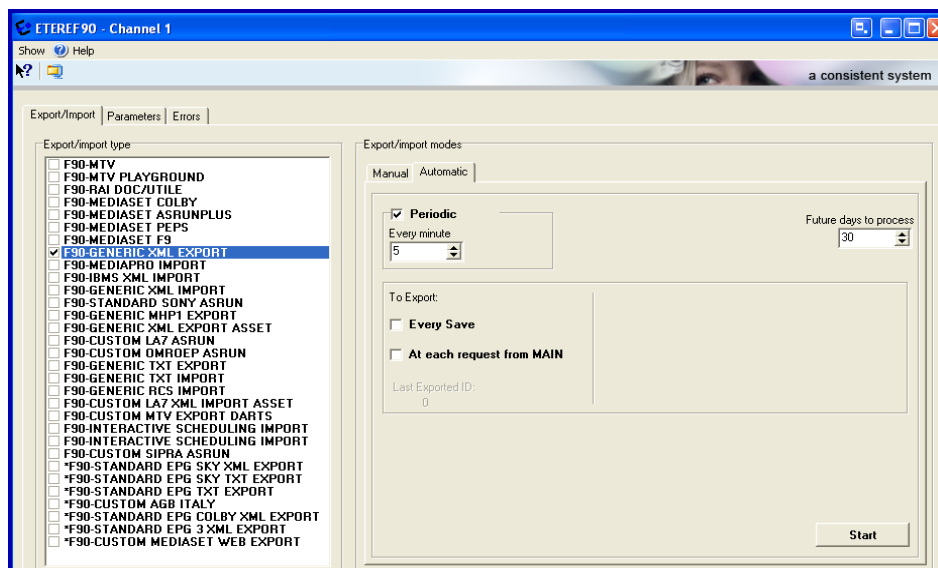
5. WORKFLOW MANAGEMENT

Etere's solution features an integrated and professional workflow management to optimize the 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 Devices and Metadevices

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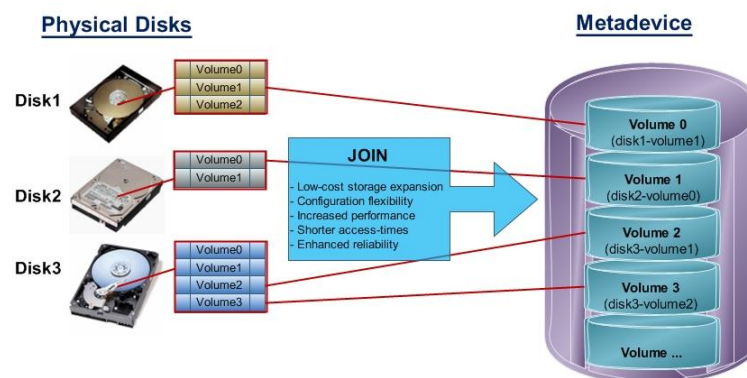
- Distributed storage according to specific requirements without the need of creating partitions, just associate individual disk volumes to different:
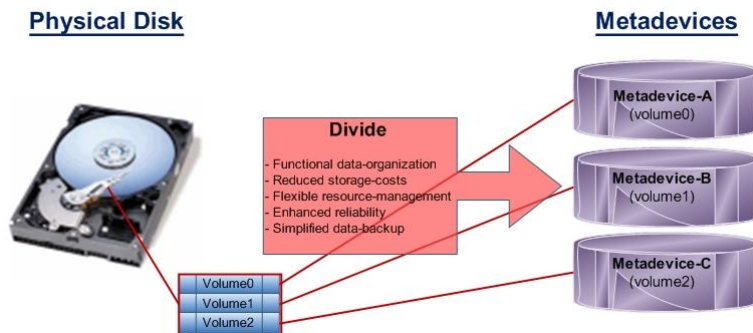
5.2 Custom Design Workflow

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:
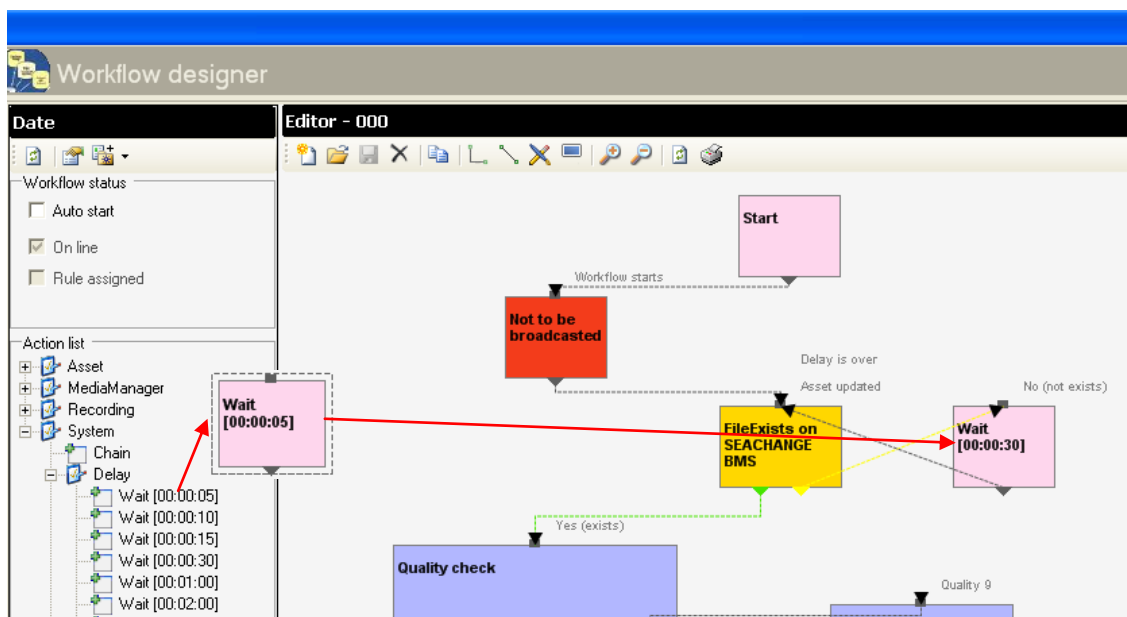
5.3 Video Files Archiving Workflow

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:
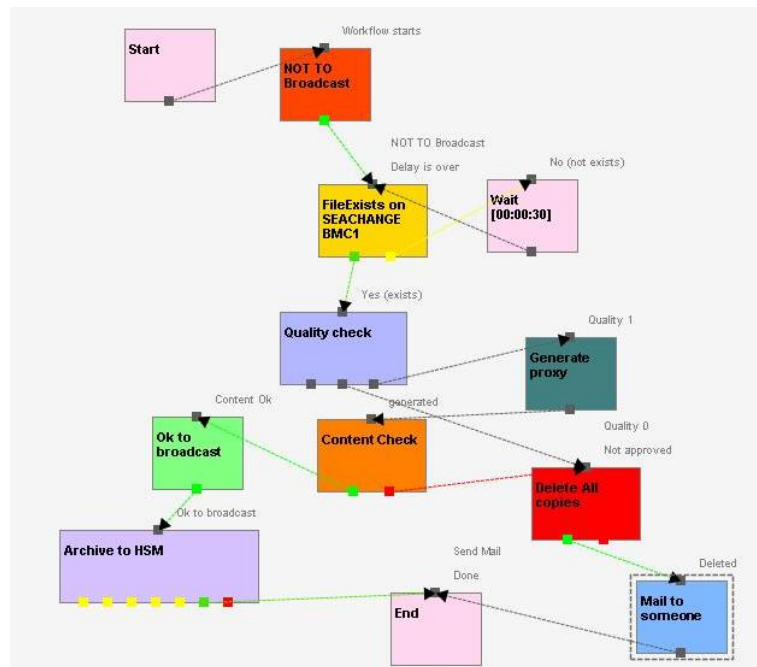

5.4 Video Files Transcoding and Uploading Workflow

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:
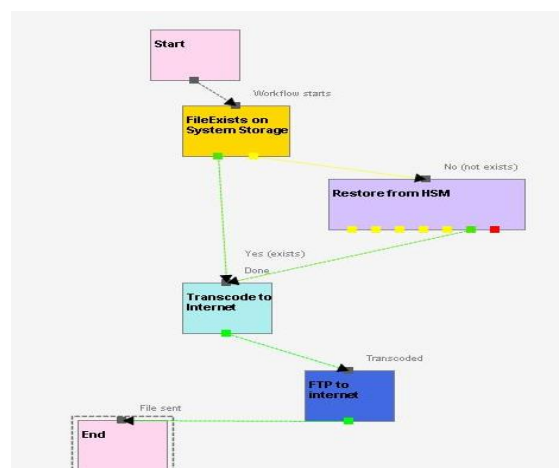
5.5 Video Files Restore Workflow

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:
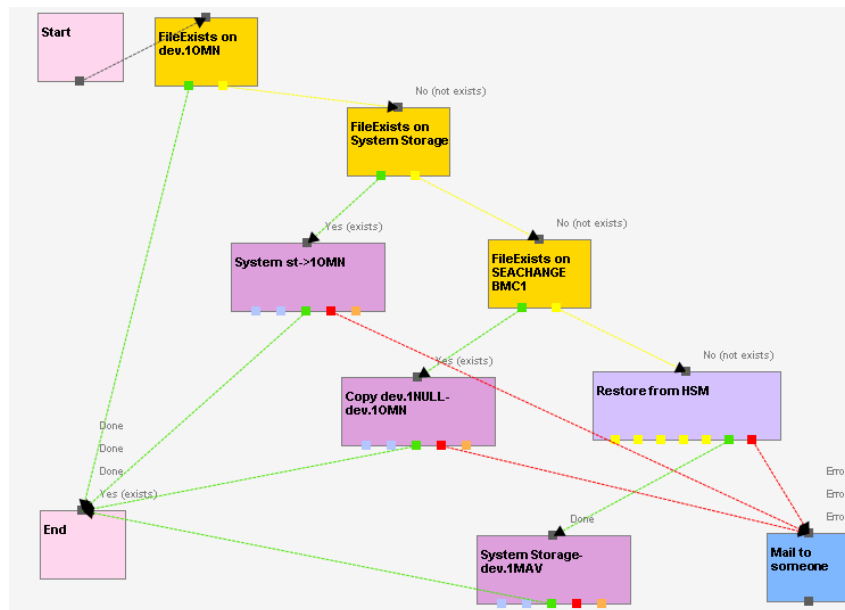

5.6 Video Server Space Check Workflow

A simple workflow will keep the video server always clean of "not scheduled" assets (e.g.: on next 24 hours), allowing in addition to except all those which are commercials:
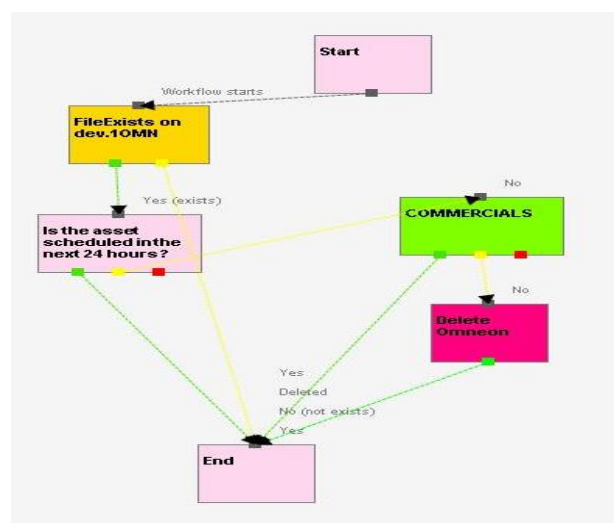
5.7 Different Codecs

Etere not only allows to move video files to different locations with just one workflow, but it also allows to put a copy on each destination with a different codec, thus allowing to have video files in the right place, with the right codec and at the right time:
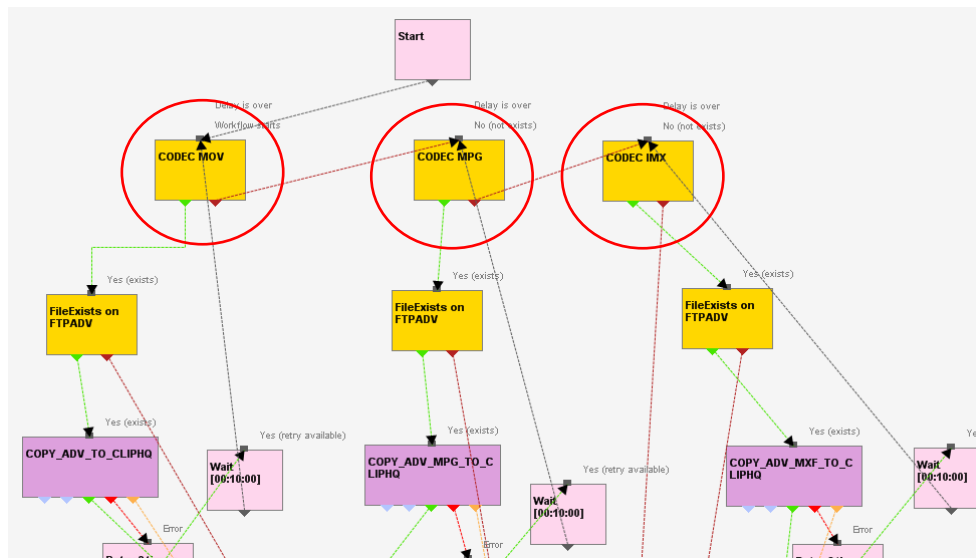

5.8 On-Demand Transcoding

Workflows can "decide" if a video file needs or not to be transcoded in order to be suitable to its destination, for example, if the file is being moved to a low resolution archive, the workflow transcode it to a suitable low resolution format (e.g.: wmv):
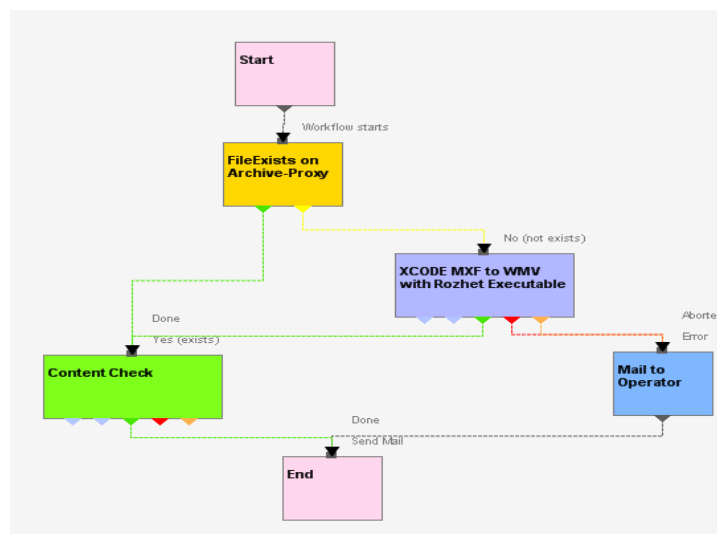
5.9 Checksum MD5 Verification

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.
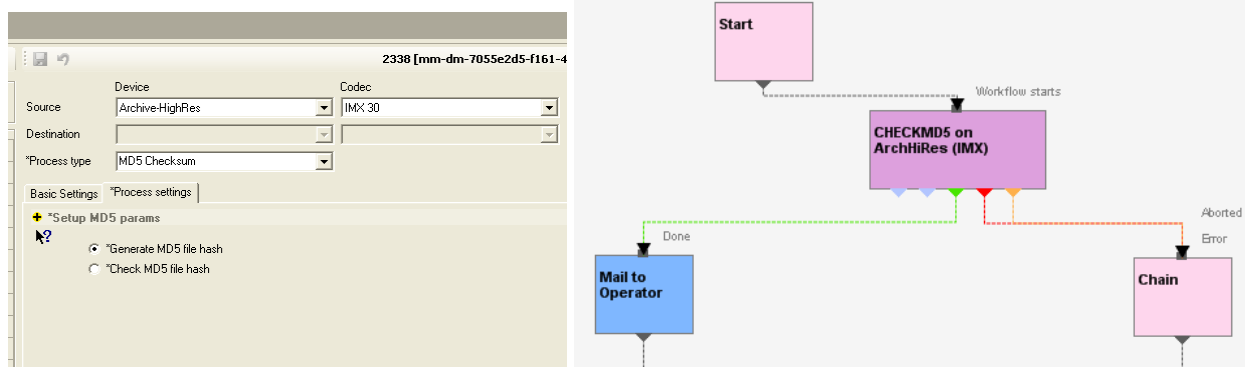
The workflow editor allows creating custom Checksum workflows to either generate or check the MD5 hash of a video file.

6. 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 ingestion, scheduling, automation, media management, 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 VSTV's broadcasting workflow.

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 Automation: Playout

Etere Automation is the powerful, reliable and modular playout system able to enhance VSTV's potential in terms of functions and workflow design, it is based on a unique approach which combines in a single product real-time device control and media asset management, offering a powerful mix of solutions and capabilities under a graphical user-friendly interface displaying for each event its source, type, description, properties, live status, secondary events, time code, GPI status, scheduled and real times, etc:
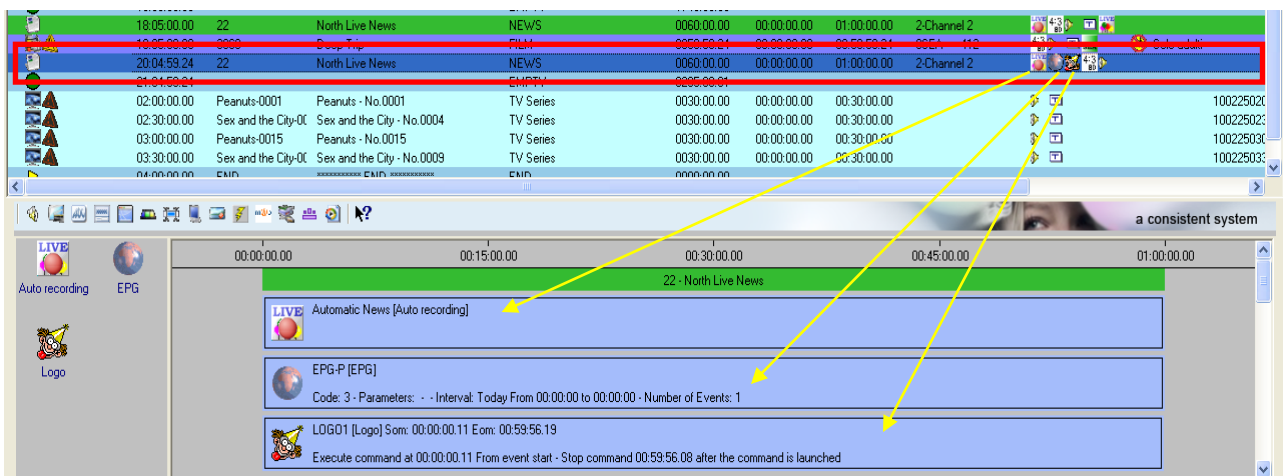
Etere Automation manages all the secondary events intended to be transmitted by dedicated devices (e.g.: Logo Generators, Crawl Generators, Subtitlers, etc) with a simple graphical tool, allowing previewing secondary events in low res before their playout through a browsing application:
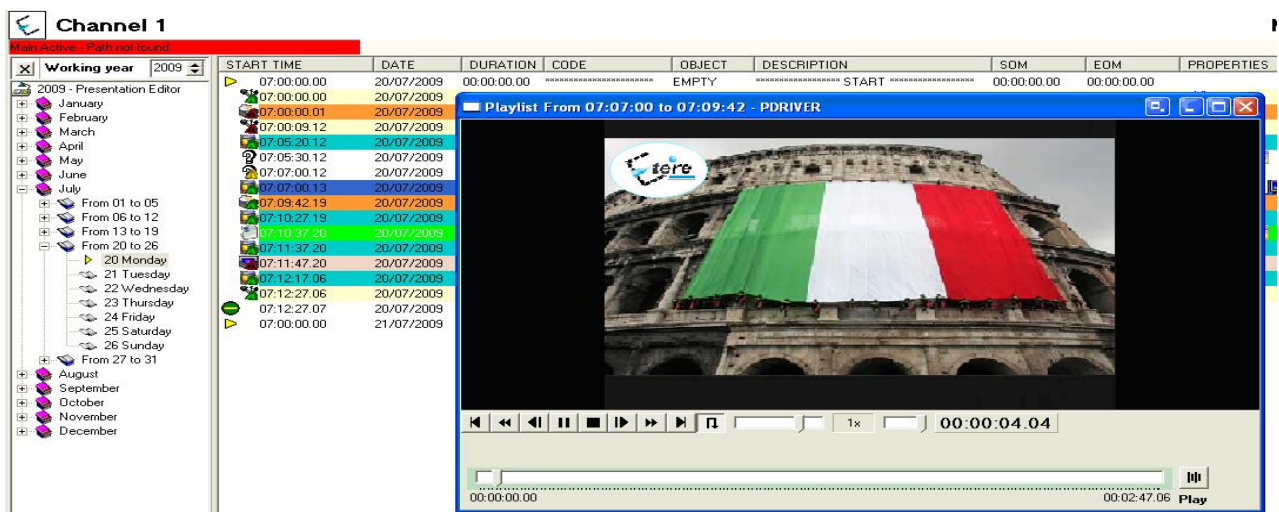
6.2 Live Events

Etere Automation offers complete support for live events present on the daily schedule, being possible to manage various different live inputs that can be switched at any time, few minutes before the event broadcasting or even during its transmission:

Additionally, Etere allows managing one video router by each automation, being possible to create links between routers so when a channel is switched in the Main Router; the equivalent channel is also switched in the Backup Router:

6.3 Etere Logger: As-Run Logs

Moreover, the ability to export As-Run logs containing the schedule "actually" transmitted allows an easy reconciliation between planned and real playout, being possible to send to multiple (UNC and FTP) destinations a frame-accurate log in any of the available formats:

ON-AIR DATE/TIME	ID	TITLE	DURATION	STATUS	DEVICE	CH	TYPE	CODE	NOTES
23/02/10 06:00:00.00	63	North Live News	01:00:00.00	OK	A	*	NEWS	22	
23/02/10 07:00:00.00	41	XYZ Running Shoes 2009	00:00:30.11	OK	A	*	COM	41	
23/02/10 07:00:30.11	34	Peanuts - No.0004	00:30:00.00	OK	A	*	TV	Peanuts-0004	
23/02/10 07:30:30.11	3082	Bee-Beer Advert 2010-1	00:00:30.00	OK	A	*	COM	3082	
23/02/10 07:31:00.11	70	Love me if you dare	01:19:59.24	MISSED	A	*	FILM	70	
23/02/10 08:51:00.10	3083	Bee-Beer Advert 2009-IV	00:00:24.12	MISSED	A	*	COM	3083	
23/02/10 08:51:24.22	234	Sex and the City - No.0002	00:30:00.00	MISSED	A	*	TV	Sex and the City	
23/02/10 09:21:24.22	3064	Testing Advertising Com.	00:00:29.20	MISSED	A	*	COM	3064	
23/02/10 09:21:54.17	345	NATIONAL Live News	01:00:00.00	MISSED	A	*	NEWS	87	
23/02/10 13:30:30.11	41	XYZ Running Shoes 2009	00:00:30.11	MISSED	A	*	COM	41	
23/02/10 19:00:29.20	412	Deep Trip	00:59:59.24	MISSED	A	*	FILM	3068	

6.4 Etere Media Manager: Migration

VSTV's video contents will be transferred from/to the required devices by Etere Media Manager; 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. 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 (see image below):

*Free device space monitor

Device name	Total	Available	Quota of available	Available free space
SEA-BMS	*Not available	58:00:00.00	58:00:00.00	78 %
K2-Client	*Not available	58:00:00.00	58:00:00.00	50 %
EtereMTX	*Not available	58:00:00.00	58:00:00.00	64 %
PDR2	16,66 Gb	5,85 Gb	5,85 Gb	65%

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. Log files can be very helpful to understand and solve software and devices problems.

All logs are located in a local shared directory of the workstation where Etere is installed. When a log exceeds a certain size (which is user-defined) it is automatically renamed including an "OLD" suffix to indicate that it is an older log file.

Etere's Log Saver application offers a user-friendly interface to manage recorded logs, it allows filtering logs by channel, workstation and date such in a way that only relevant logs will be retrieved, saved and optionally send via ftp (including related attached files):
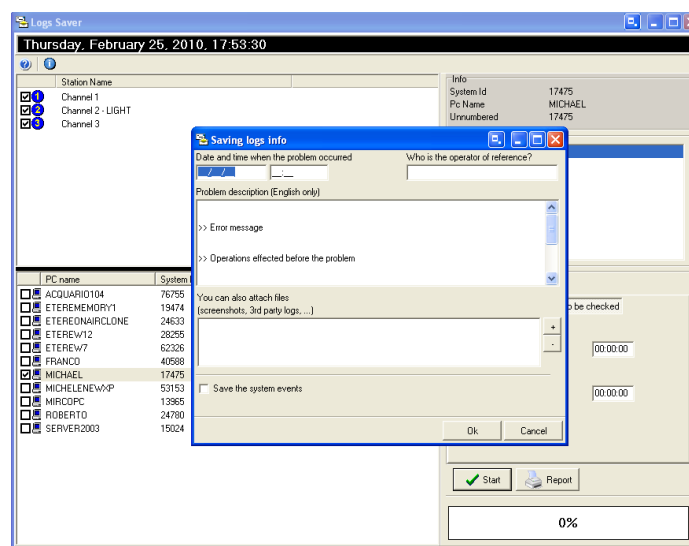
6.6 Proxy Preview: Etere MAM

Etere enables comprehensive search and browse and cataloguing of rich media, its very intuitive interface establishes a bridge between MAM and both Automation and Ingest, allowing contents to be browsed simultaneously from various workstations thus enabling low-res proxy browsing over the network.
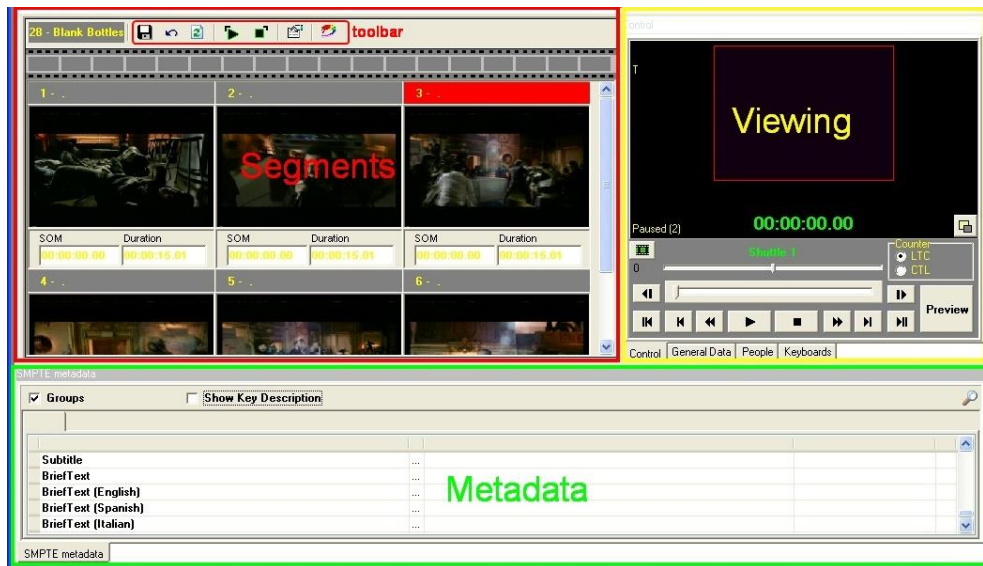
6.7 Etere HSM: Long Term Archiving

The Media Management solution provided by Etere, encompass migration and archiving of contents between devices, going 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.

Etere HSM, which stands by Hierarchical Space Manager, 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 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.

The tandem formed by Etere Data Mover and Etere HSM is 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 such as Automation, MAM and News, allowing all these modules to use shared resources and have unlimited communication.

6.9 Etere MAM: Vide and Audio Conforming

Etere allows creating either high or low resolution video files excluding all video/audio segments described on the source video EDL, it is important to note that as usual on Etere's operations, the conforming of video files is fully performed via workflow:
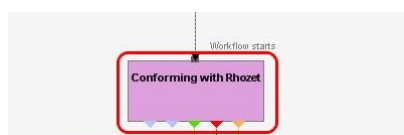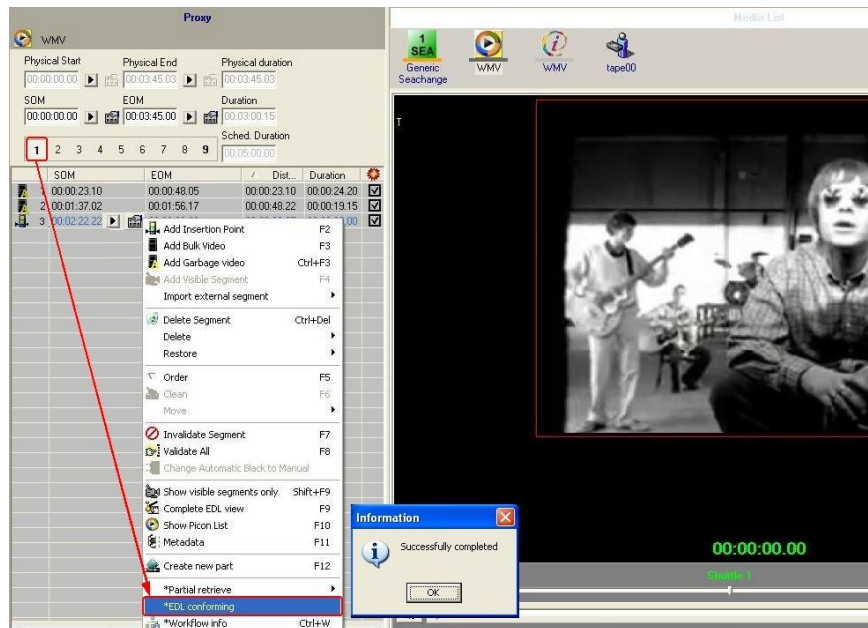
It is also possible to perform the conforming of video segments from different sources, to create a single final video file containing all scenes selected by the operator, use this function to for example perform the dubbing of video contents:
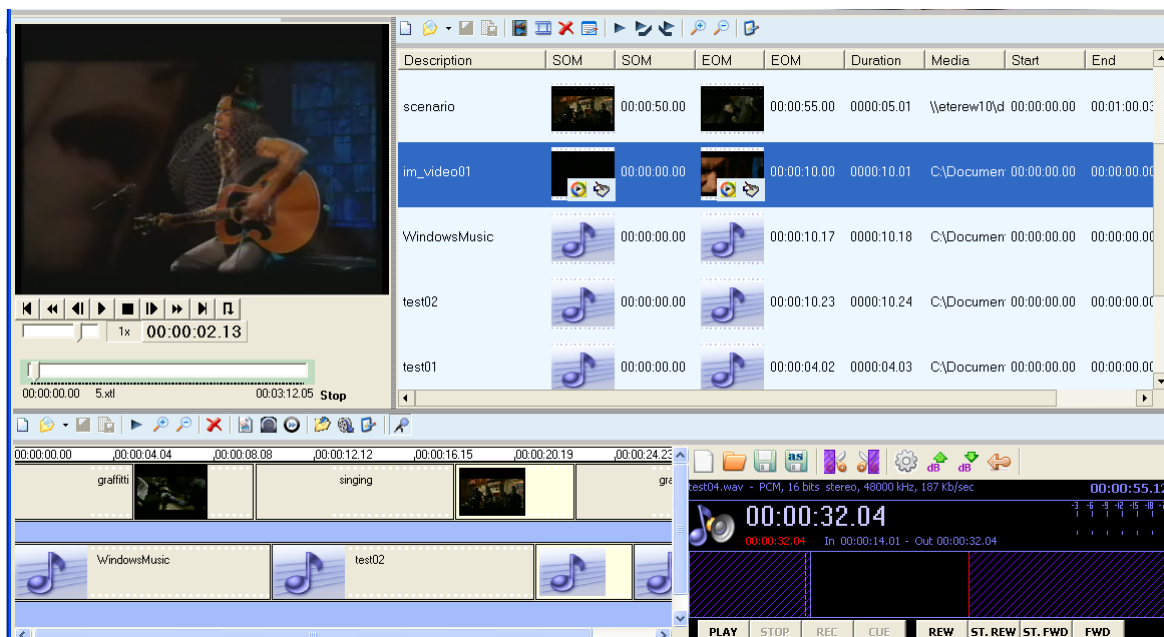
The image above illustrates the user-friendly interface on which operators creates new video sequences of MAM captions which includes all relevant metadata associated to the inserted scenes.

6.9 Etere Web: Remote Access

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.

Etere Web works perfectly behind a DMZ router so remote access and ftp transfers are drastically improved. NLE systems can deliver contents via Etere Web 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's tapeless approach contributes to increase the level of security of the overall system since operations performed with digital files can be performed only by authorized users and these operations are completely tracked within the system.

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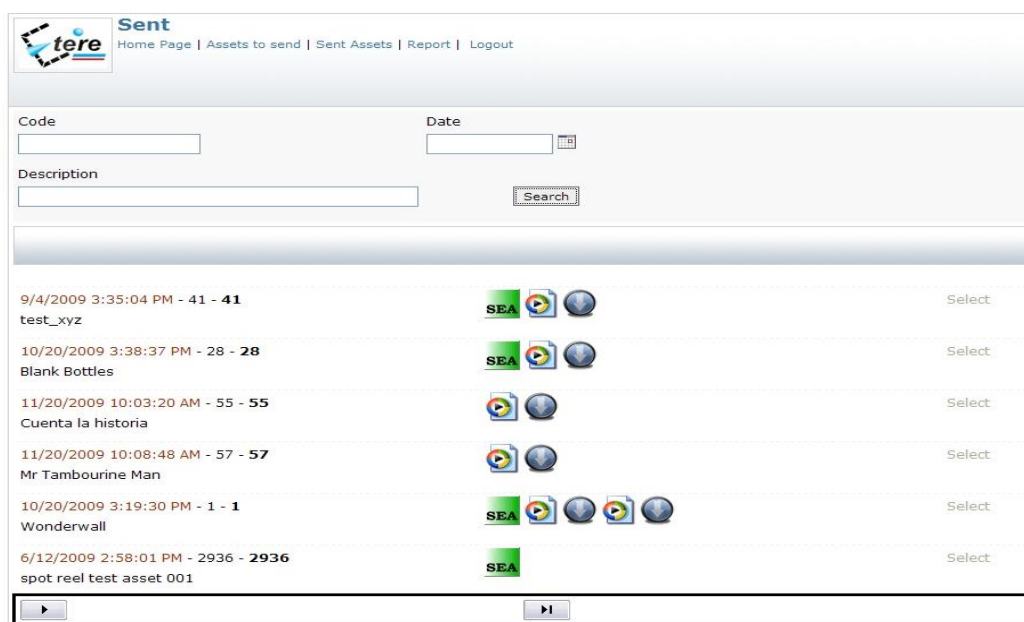
7. Conclusions

This paper has described how the development and deployment of a comprehensive Etere playout system offers a large number of operational benefits and advantages, which have been summarized in the following points:

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

- Flexibility, to meet all customer requirements and thus provide an easy playout management tightly integrated with all broadcast devices including Omneon media servers,

- Accuracy, from the media management to the final playout, reducing the risk of mistakes during on-air since the precision of archived content related information is continuously checked,

- Scalability, to enable VSTV to increase the number of channels and devices without altering the system workflow complexity, thus minimizing operational overheads and reducing overall costs,

- Reliability, all operations automatically generates fully customizable As-Run logs to track both the overall and individual functioning of the entire system.

8. About Etere

Etere is an international leader in the media market. Etere develops and distributes a wide range of high technology software for broadcasting and media businesses. With more than 20 years of experience, Etere provides powerful, flexible, cost-effective, high-performance, end-to-end media solutions. Etere is the only company worldwide that can offer you a solution to all your media needs in one single package.

Etere is the only solution 100% workflow based for all broadcast and media environments. It's a common framework where there is real-time sharing of all the data among several applications to manage all media business requirements. The workflow approach allows a fully customized design with edge performances.

From its headquarters in Tolentino, Italy, Etere guarantees the best after-sales support service on the market with engineers ready to give professional assistance 24 hours a day, 7 days a week. The service includes voice, email, VPN and VoIP with unlimited calls and connection time, and a pro-active system to help diagnose problems before they appear.

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