PROJECT

Etere

a consistent system

RANGIRI TV:

An enterprise media management system

January 15th 2013

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▼ 1. INTRODUCTION

Rangiri TV is a Sri Lanka television station of the **Rangiri Sri Lanka Media Network** as a special project under the **Rangiri Dambulla Development Foundation** which manages besides the television station, also a radio station and a newspaper. **Rangari TV's** broadcast programming mainly consists of Buddhist programs transmitted via television and internet streaming.

Etere proposes a **"Total Media Management System"** comprising media ingest, archive, management and distribution solution combining powerful modules with an easy to use interfaces, this solution will permit to straightly connect content captured by Etere Ingest with Etere MAM to view and catalog video assets before delivering them via workflow, in either standard definition or high definition. Etere MAM (Media Asset Management) will be the core of the overall system, providing workflow management, production project management and content management features; thus ensuring a streamlined tapeless environment able to capture, edit, catalog and deliver contents, fast and efficiently.

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 any time 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 contents.

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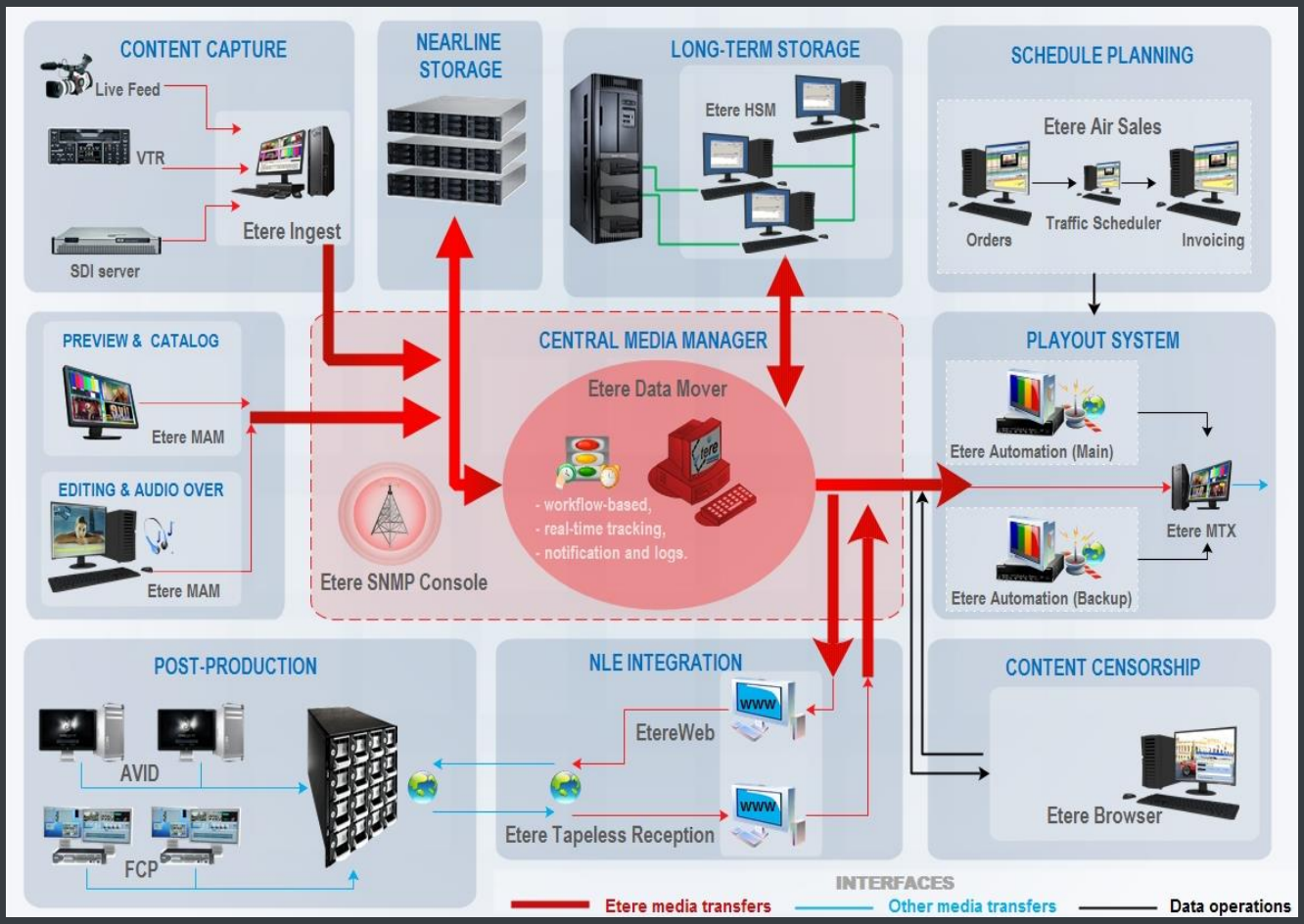
▼ 2. PROJECT OVERVIEW

Etere will implement **a "MERP Management"** solution able to store and transparently manage the facilities' archive material over the long term in a tape robotic system. Etere's solution consist of a system intended to be the core of the central archive, providing media archive management and delivery services to the global system including instant access and delivery of media files; all this media management is cemented on a file-based workflow framework featuring a wide range of function-specific workflows for ingest, production and playout with additional integration capabilities.



The diagram above illustrates how Etere can take control of the various operations that makes part of the entire station's workflow. The solution proposed by Etere will provide the station with a rock-solid distributed system able to integrate into a single solution the key features of a Media Asset Management. Additionally, Etere's solution will permit to straightly connect ingest channels with Etere MAM to browse and edit media assets before their delivery.

Etere's solution consist of a system intended to be the core of the global system, providing media archive management and delivery services including instant access and delivery of media files.

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Operations related to all contents present in the station are cemented on a file-based workflow framework featuring a wide range of function-specific workflows for ingest, production and playout with additional traffic capabilities. The modules that Etere will implement across the system are briefly described below:

INCLUDED MODULES

- **Etere Ingest**, the flexible solution for capturing contents from a wide range of sources,
- **Etere MTX**, the most advanced, tightly integrated and cost-efficient driver to implement a video server based on the ultimate HD/SD Matrox digital video cards,
- **Etere MAM**, the best solution for indexing and editing a huge amount of media assets, it provides tools for an easier metadata insertion and video cut and merge,
- **Etere Air Sales**, a robust solution for Traffic departments which permits to maximize the productivity of the commercial on-air planning, from an initial proposal to a final invoice.
- **Etere HSM**, an automatic tape-based storage system for long-term management archive,
- **Etere Media Manager**, the enterprise workflow-based media manager that guarantees timing and effectiveness on media transfers between devices,
- **Etere Automation**, a fault-tolerant system to automate the playout of scheduled contents,
- **EtereWeb**, a secure and robust threshold to the station's outside world, a web-based interface that will permit a tight integration with NLE systems and remote facilities (e.g. post-production).

The station will be mainly provided with the following key features:

- A distributed architecture managed via workflow to avoid any single point of failure
- Seamless integration with existing and co-existing systems
- Safe and fully-tracked access to the content archive
- Enterprise management and transport of media between storage devices
- Transparent media transferring, the correct media format will be always delivered
- Quality control to ensure the reliability of archived assets over short and long terms
- High preservation and high availability of archived and catalogued media content
- Browsing features including preview, slow-motion, timecode, bookmarking and metadata
- Robust editing functions including video cut, merge, overlay and restore
- Best flexibility on digitizing media content from multiple sources
- Full integration support for NLE systems (Avid, FCP, etc.), including content uploading/downloading
- Fast and efficient transferring connection between internal –and external- systems
- Reliable monitoring of the modules and equipment integrated within the global system

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.

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▼ 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.

▼ 3.1 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.

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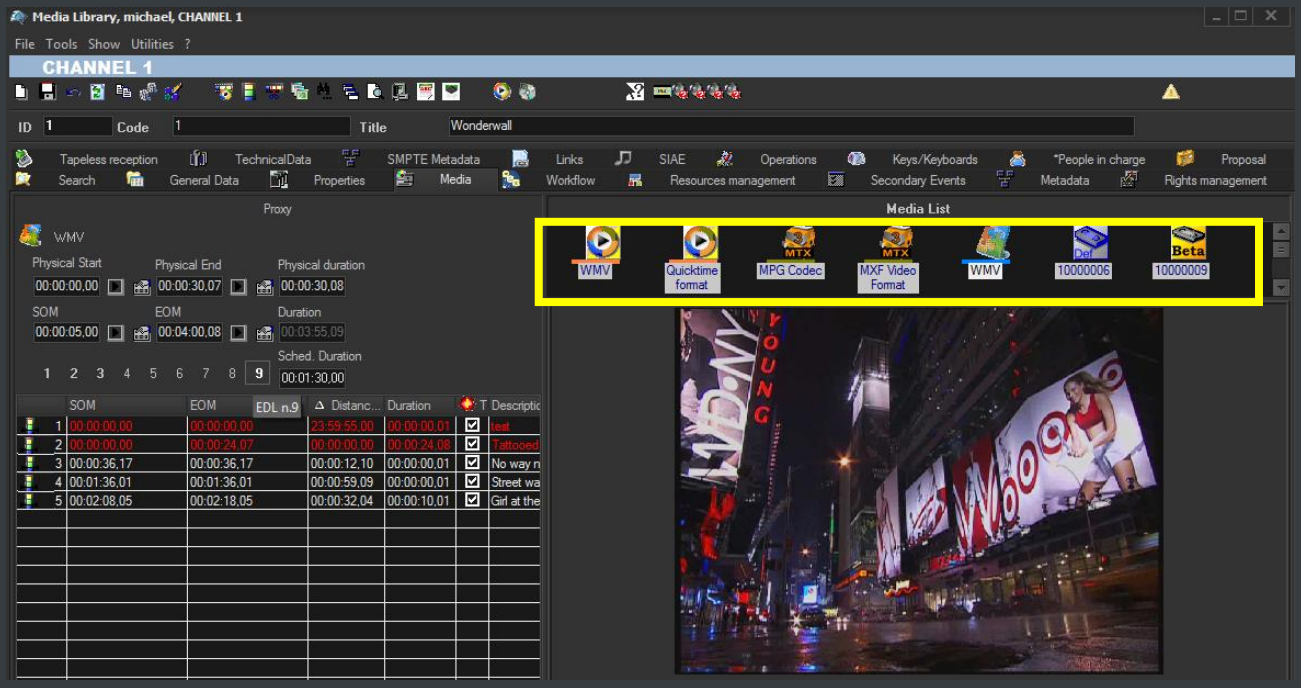
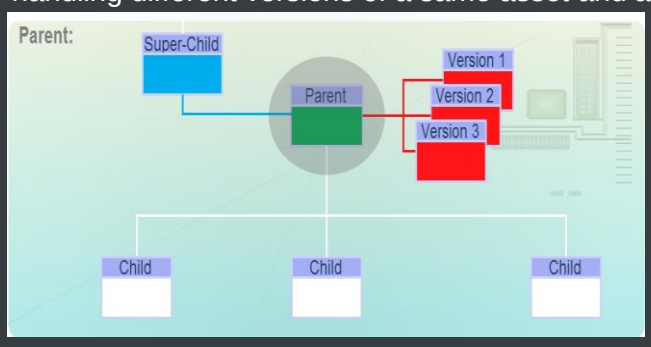
▼ 3.2 Multi-level Storage Hierarchy

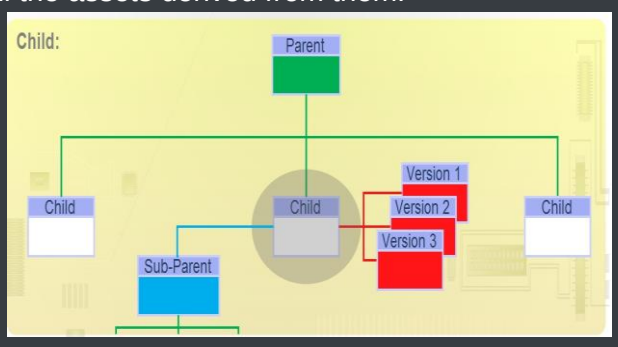
Etere systems improves the media management by introducing a multi-level storage management consisting in the use of different storage levels based on the frequency of use of the files stored on them. For example, data files which are frequently used will be stored on video servers (i.e. online servers) whereas those which are not used for a certain period of time (e.g. typically a few months) will be eventually archived in tapes (or any other long-term storage mean) and then automatically restored -to video servers- every time they are required by the broadcast playlist.

Etere offers a hierarchical storage management of media content, it allows organizing in user-specific levels an unlimited number of content versions with different access times (e.g. video servers, near-line servers, archive servers), all levels are available to operators under a user-friendly interface:



Moreover, media holders (i.e. asset forms) can be organized –along with their related information- under a hierarchical structure based on Parent-Children relationships, thus allowing, for example, handling different versions of a same asset and all the assets derived from them:





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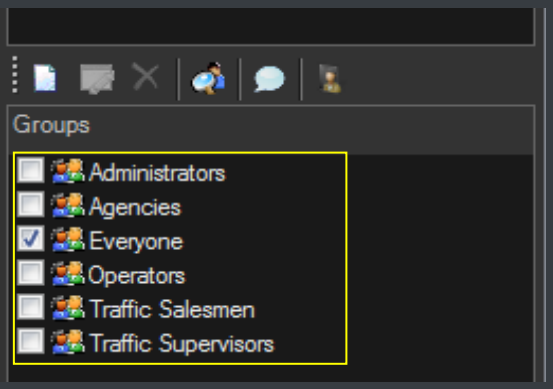
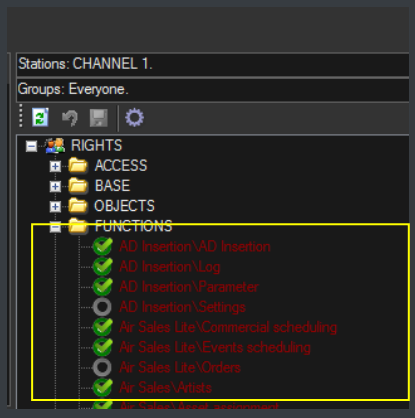
▼ 3.3 User Access Levels



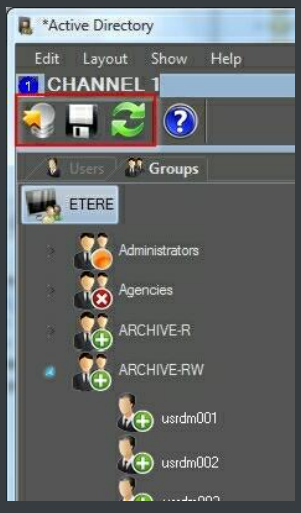
Etere provides stations with a 'Rights Management Tool' to control and track access to its various modules and functions, with it, stations will be able to freely assign (grant or deny) access to specific user groups (i.e. roles to which one or more users belongs to), thus allowing to set different mixtures of access levels for each group.
Etere allows managing different –and fully customizable- access levels for users which form part of the system, with Etere; set specific access rights not only for different users, but also for different stations.

▼ 3.4 Rights-based Operations

All the functions provided by an Etere system (e.g. quality control, event scheduling, program playback, etc.) falls under different categories according to their nature (e.g. media manager, air sales, automation), the availability of these functions is determined by the 'Right Management Tool'.
Thanks to this tool, stations will be allowed to reflect into the Etere system the actual way in which rights are managed within the station facility, for example, scheduling operators will be allowed to use only those modules to which they are authorized to use, including (or excluding) some sensitive functions intended to be managed by system administrators.



▼ 3.5 Active Directory Integrated



Etere allows creating a new rights structure importing groups and users from your organization's **MS Active Directory**. Once opened, this tool will display all groups and users present in the Etere Rights structure, allowing to update the Etere Rights structure by synchronizing it against the MS Active Directory. Groups and users will be displayed along with a status icon:

	The group/user will be added to the *Etere Rights* since it is present in the *MS Active Directory*.
	The group/user will be removed from the *Etere Rights* since it is missing in the *MS Active Directory*.
	The group has users that will be added/removed from the *Etere Rights* since they are present/ missing on the *MS Active Directory*

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▼ 4. MEDIA FUNCTIONALITIES

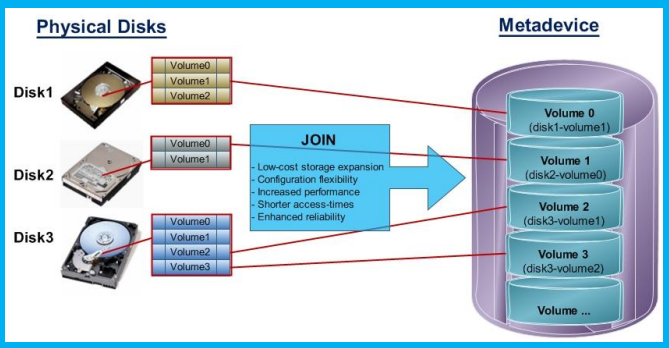
Etere's solution features an integrated and professional approach based on a workflow management to optimize the station's entire broadcasting system, reduce operating costs and facilitate overall process control. Etere Workflow permits modules to for example, seek confirmation for sensitive process,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

▼ 4.1 Multiple Storage Management

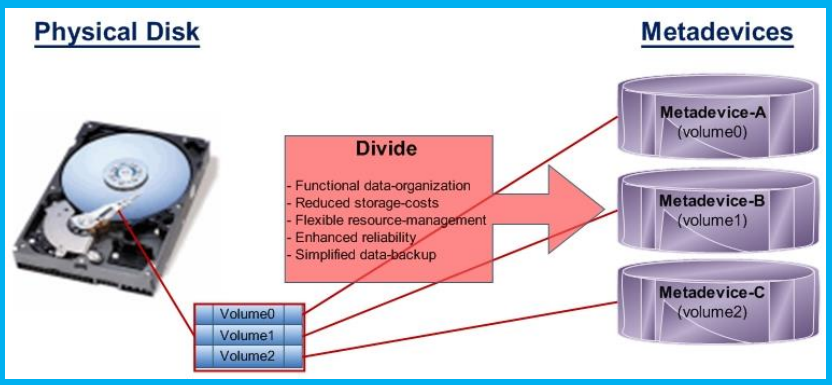
Etere reduce the complexity of managing storage devices by arranging physical storage devices present across the system into metadevices (logical devices), the use of metadevices improve the overall media management by offering the following features:

KEY STORAGE 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:



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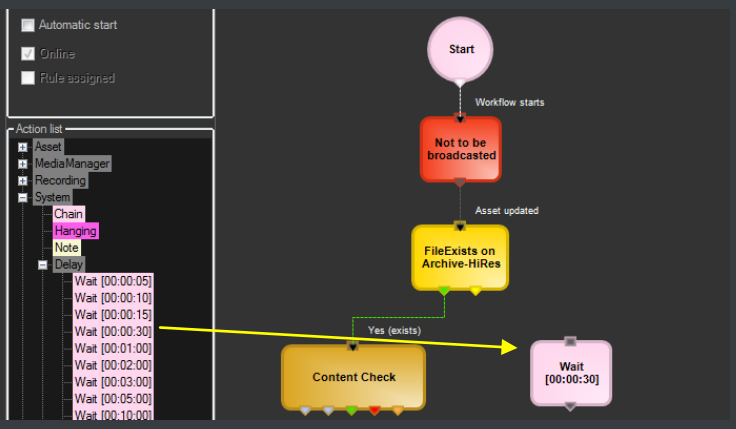
▼ 4.2 Custom

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:

KEY CUSTOMIZATION FEATURES

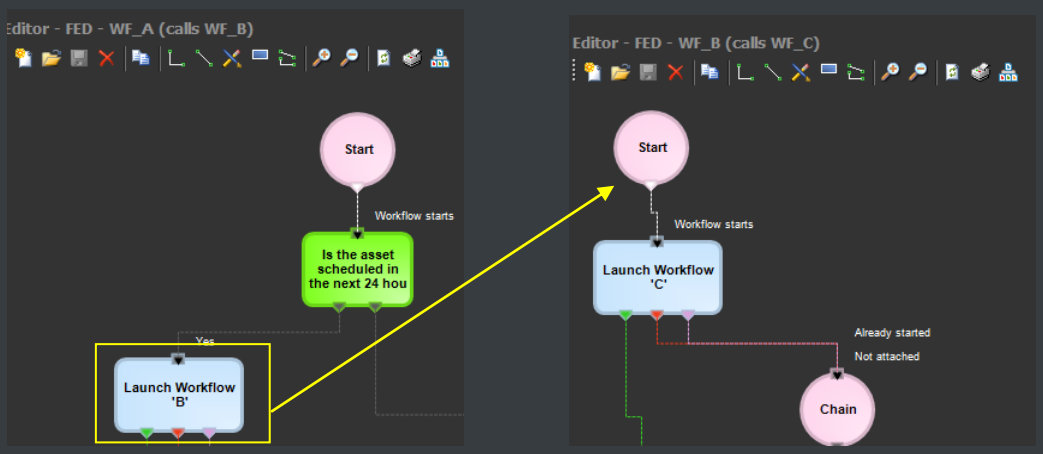
- Clear definition of each complex step of the broadcasting process,
- Visual representation of each step mapped out on a PC not in a paper document,
- Set of instructions and authorizations that must be followed in order to move forward,
- Complete log of all steps carried out, operations denied etc.

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



▼ 4.3 Integration between workflows

Etere allows calling workflows from others just by inserting an action that can perform a specific task (i.e.: attach, attach and start, start, abort, reset, restart, detach, etc.) on a certain workflow:



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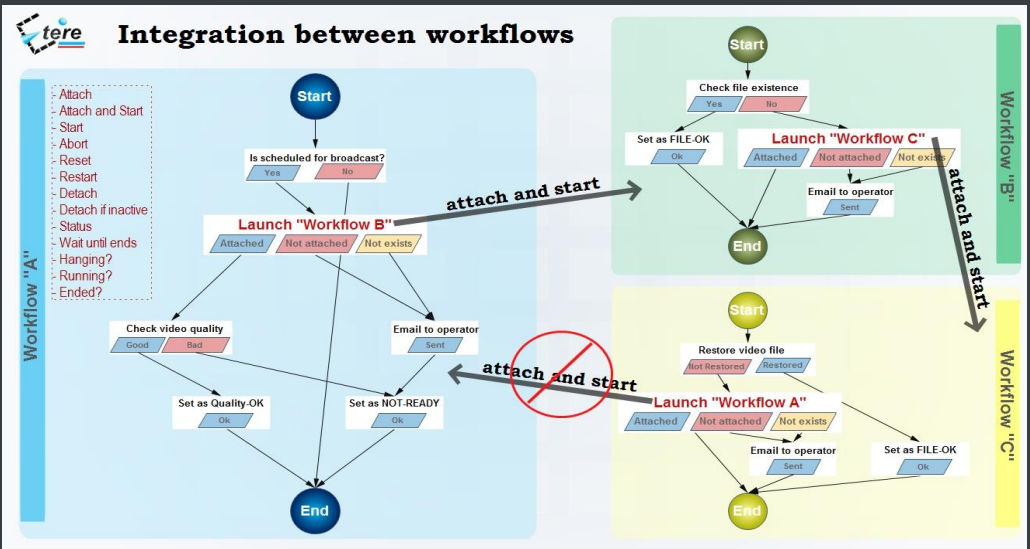
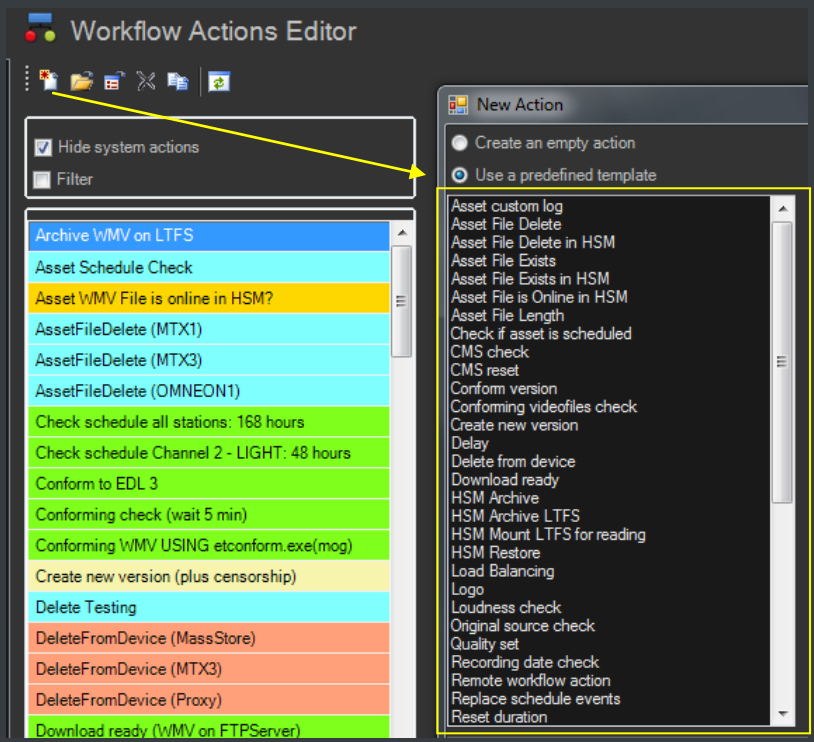
The diagram below illustrates how Etere maintains the system consistency by avoiding loops between workflows (a message is displayed indicating action incompatibilities between workflows):



As shown above, for example, if 'workflow A' calls 'workflow B' and the 'workflow B' calls 'workflow C', the 'workflow C' will not be able to call the 'Workflow A'.

▼ 4.4 Workflow File-based Processing

Etere provides a wide range of templates for creating workflow actions regarding the most common file-based media operations, allowing customizing them and also using completely user-defined actions:



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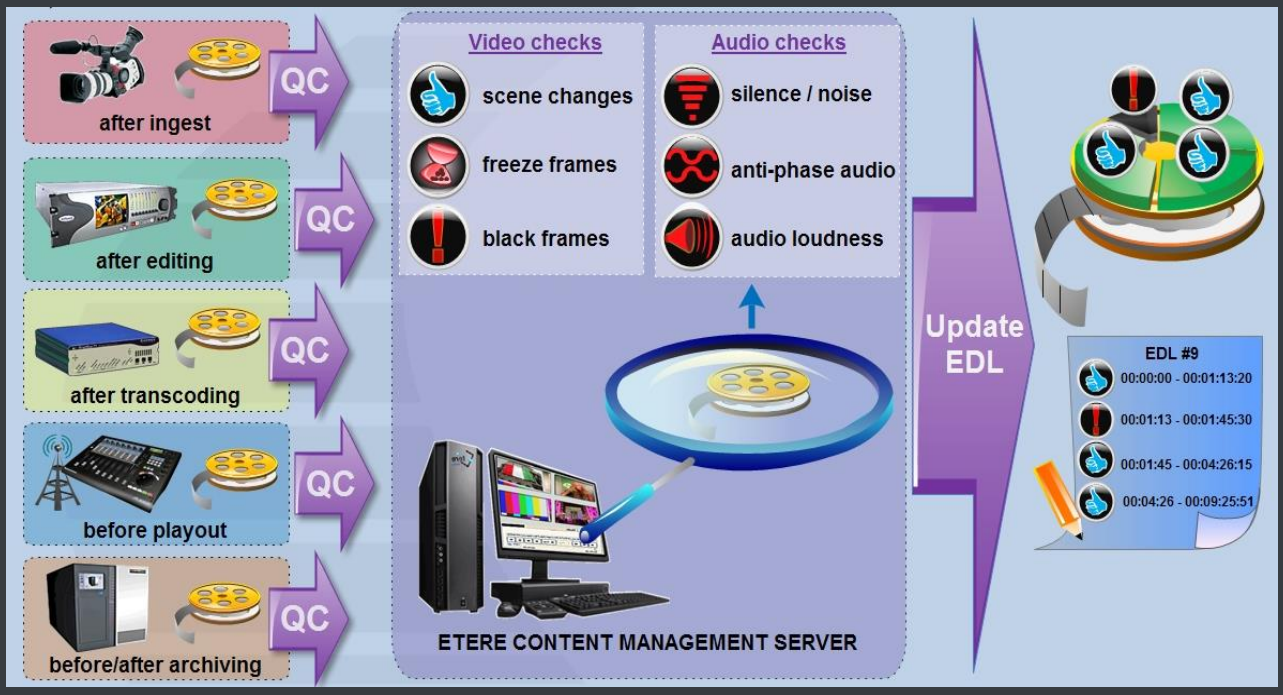
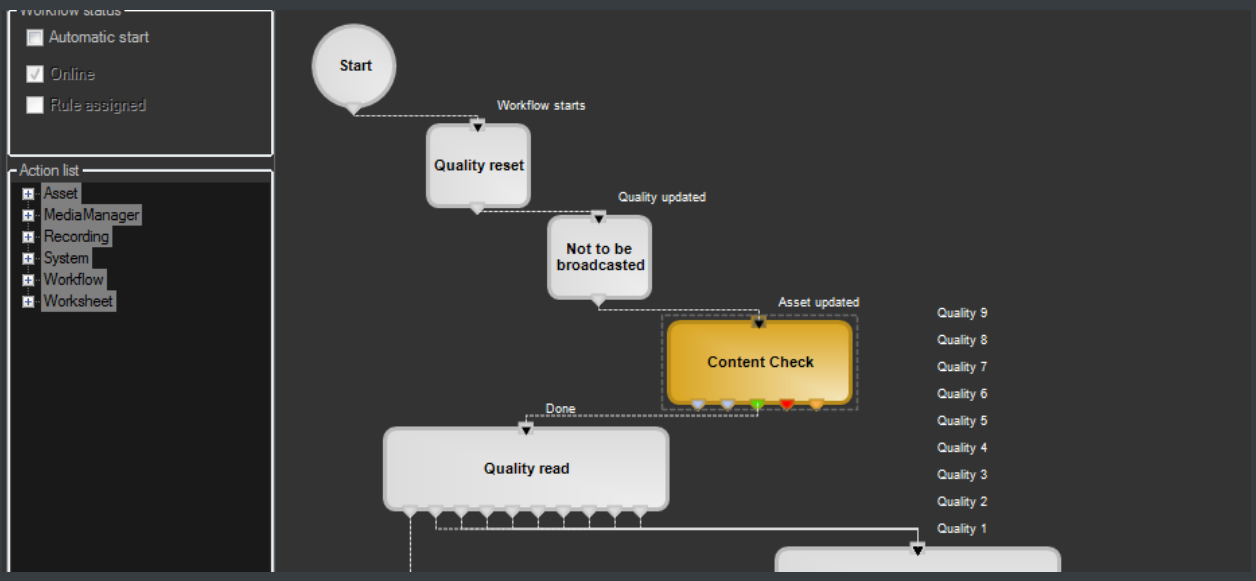
▼ 4.4.1 Content Check

Etere CMS, which stands for Content Management Server, an integrated file-based module for performing Quality Controls (QC) via workflow. Etere CMS is the best solution for checking audio/video either prior (e.g. playout, repurpose, archiving) or after (e.g. encoding, ingest, editing, transcoding, archiving) a media operation.



CMS will speed up, automate and streamline the operational efficiency of file-based quality controls performed via workflow across the entire content life cycle.



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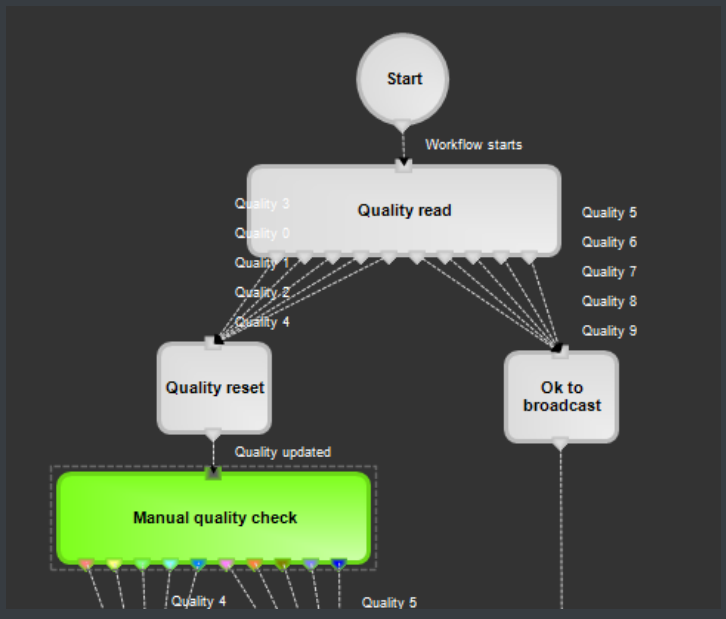
CMS is based on a workflow action which, once included into a workflow that will automatically analyze the asset's proxy video to detect and log (into its EDL) the following audio/video issues:

KEY QC FEATURES

- **Scene changes**: Video stream segment containing brightness differences between consecutive frames.
- **Black frames**: Video stream segment containing black frames and an audio volume lower than a reference level.
- **Freeze frames**: Video stream segment containing a single frame image repeated -as a frozen like a snapshot- for a period of time.
- **Audio silence**: Video stream segment containing silent frames (i.e. frames matching a certain silent audio level and a black video level).
- **Audio level**: Video stream segment presenting "noisy audio signals" which are greater than a given maximum threshold.
- **Anti-phase audio**: Video stream segment containing audio waves with "anti-phase signals", that is, opposite channels which mutually cancel each other out.
- **Audio loudness**: Measurement performed based on the ITU-R BS.1770 loudness metering algorithm widely used as loudness-compliant standard.

▼ 4.4.2 Quality Check

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:



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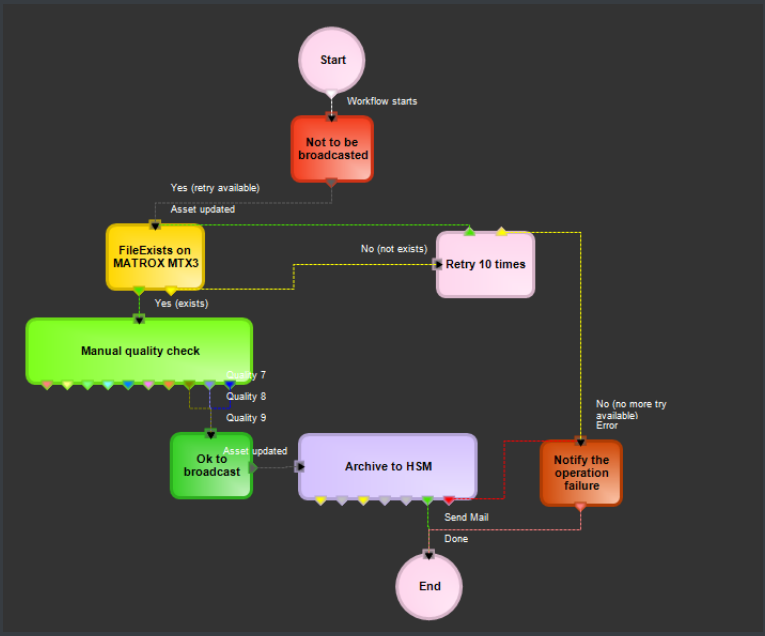
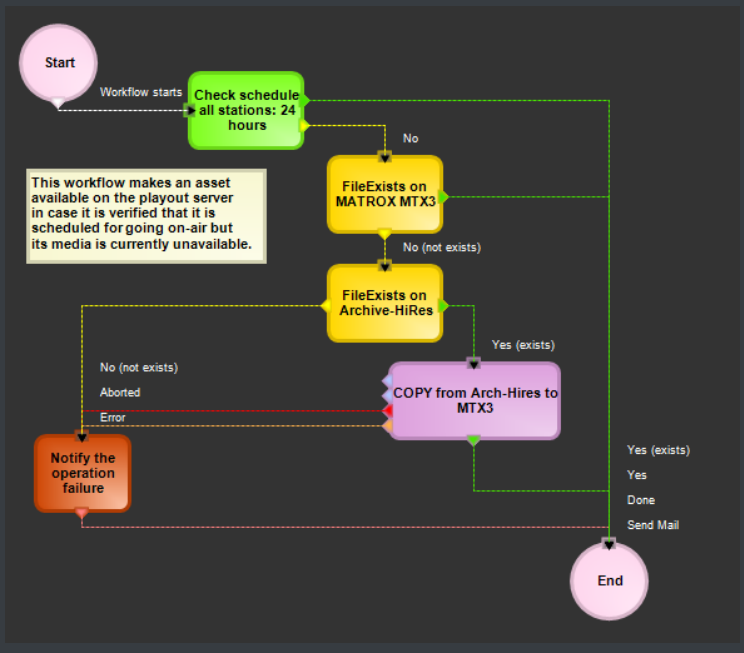
▼ 4.4.3 Archiving

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:



▼ 4.4.4 Restore

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:



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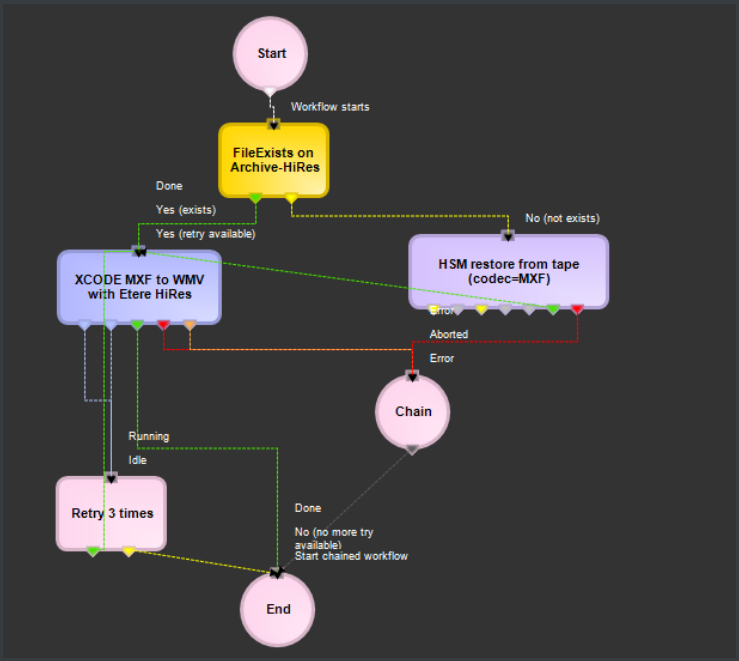
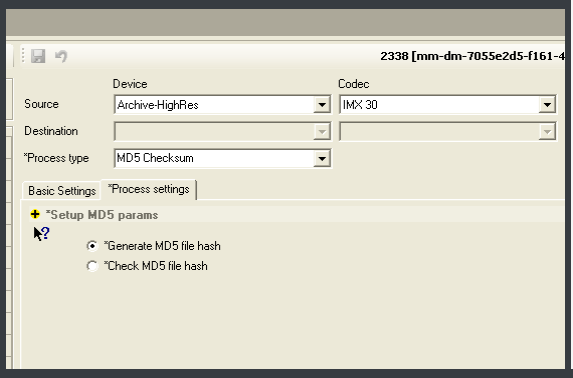
▼ 4.4.5 Transcoding

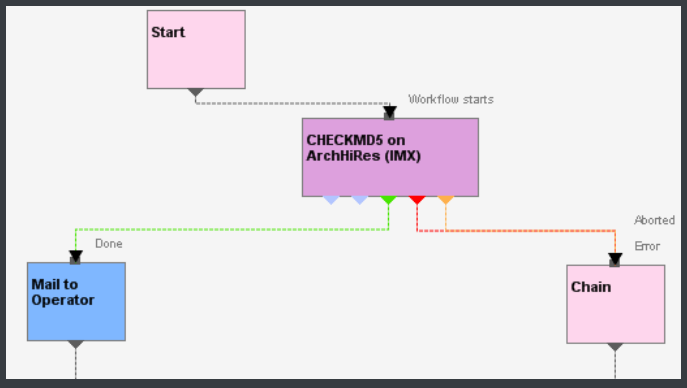
Etere's integration with Rhozet's Carbon Coder software handles a wide array of critical operations including format conversions, workflow operations that can be launched for example, immediately after a content capture:



▼ 4.4.6 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.

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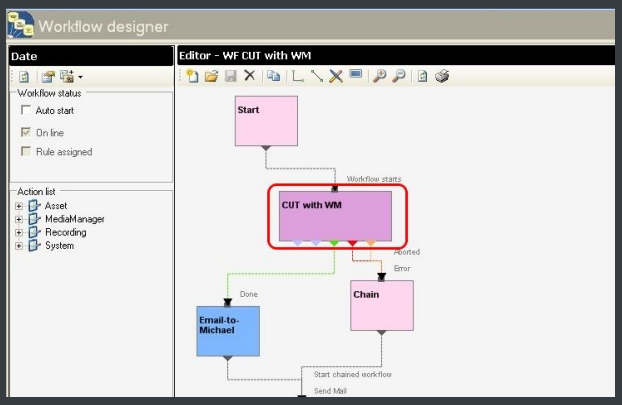
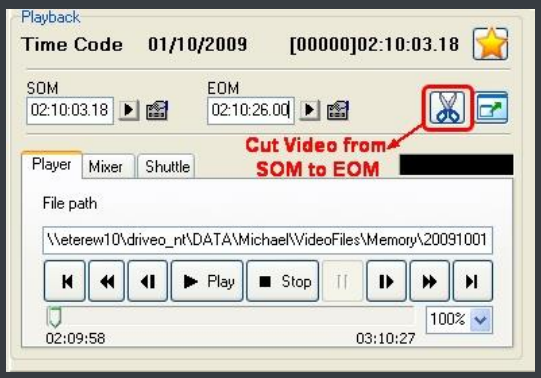
▼ 4.4.7 Video Cut

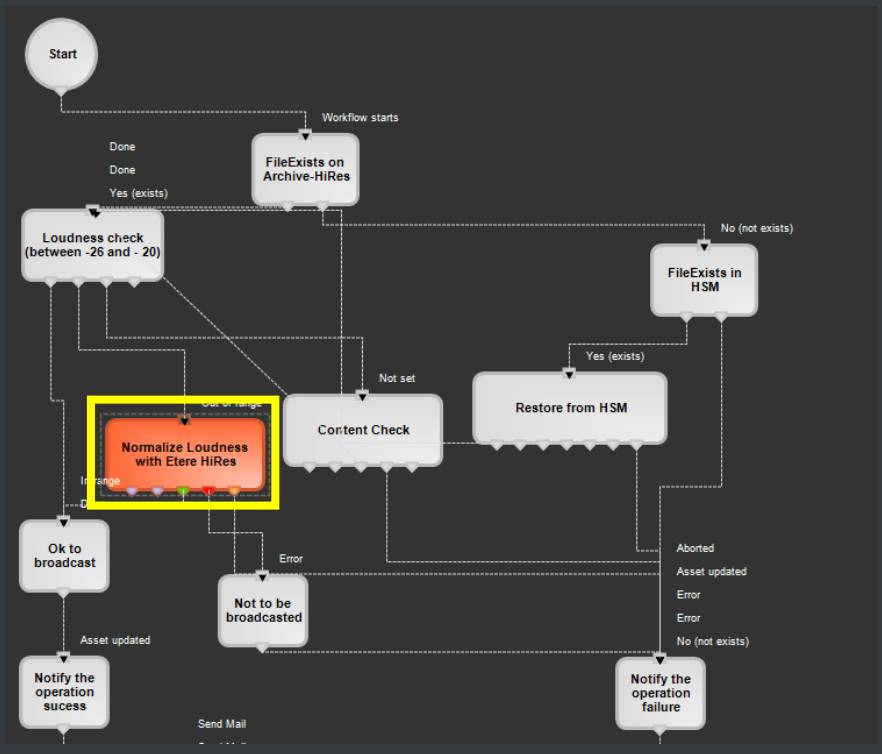
Etere offers 'Cut actions' that permits to take only a portion of a certain video file, using a given time code SOM and EOM. Defining and using a Memory Cut operation is as easy as shown below:





▼ 4.4.8 Loudness Normalization

Etere provides a file-based loudness control, allowing stations not only to check the loudness level of media contents but also to normalize them to meet specific limitations.



As shown in the sample above, "loudness normalization" workflows can be launched automatically for specific assets, for example, after their ingestion or tapeless reception (i.e. web upload).

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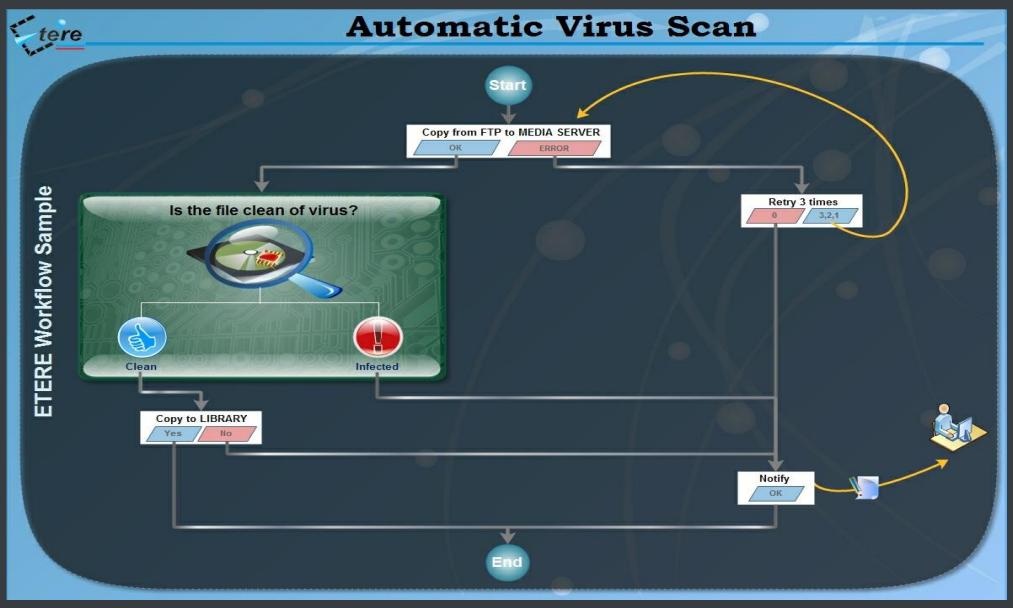
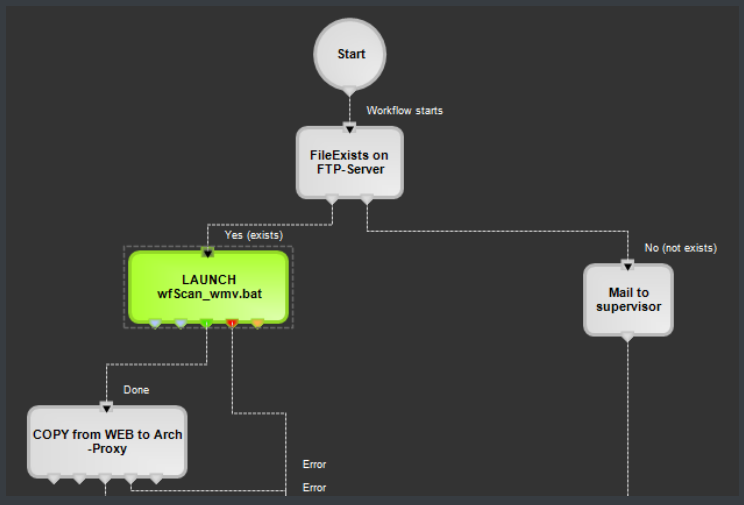
▼ 4.4.9 Antivirus Scan

Etere includes, as a part of its enterprise media management, the capability of integrating antivirus protection within workflows, allowing stations to improve their media workflows (e.g.: post-upload workflows) by giving them the capability of automatically scanning transferred files for virus and thus end their work with a flourish.



As shown in the figure above, the automatic virus scan capability can be easily integrated within any workflow at any stage just by inserting an action block configured to perform the virus checking; stations can insert them, for example, within the default workflow to be launched after an EtereWeb upload.



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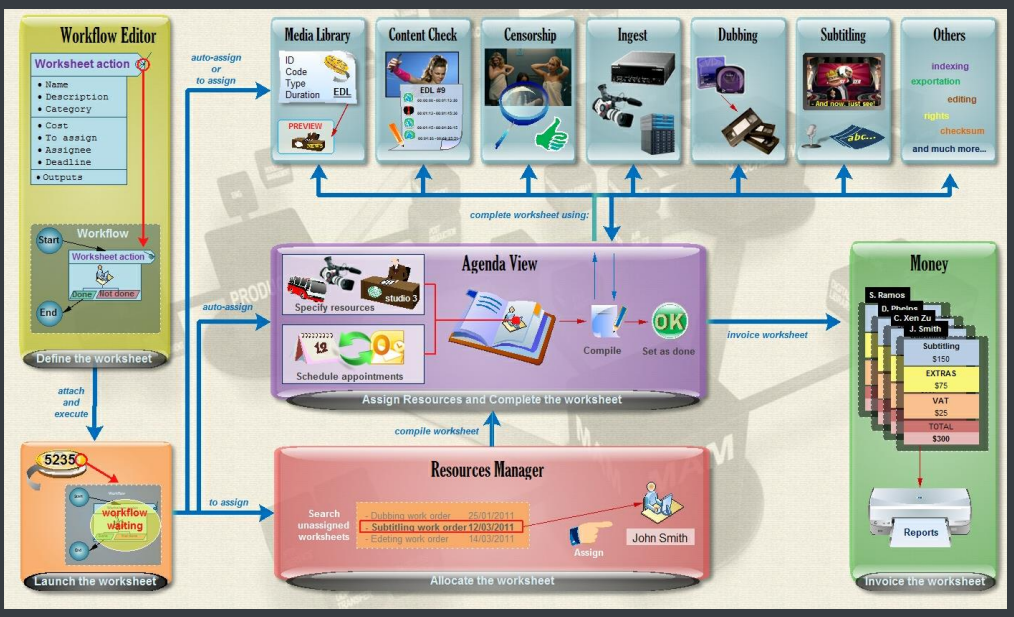
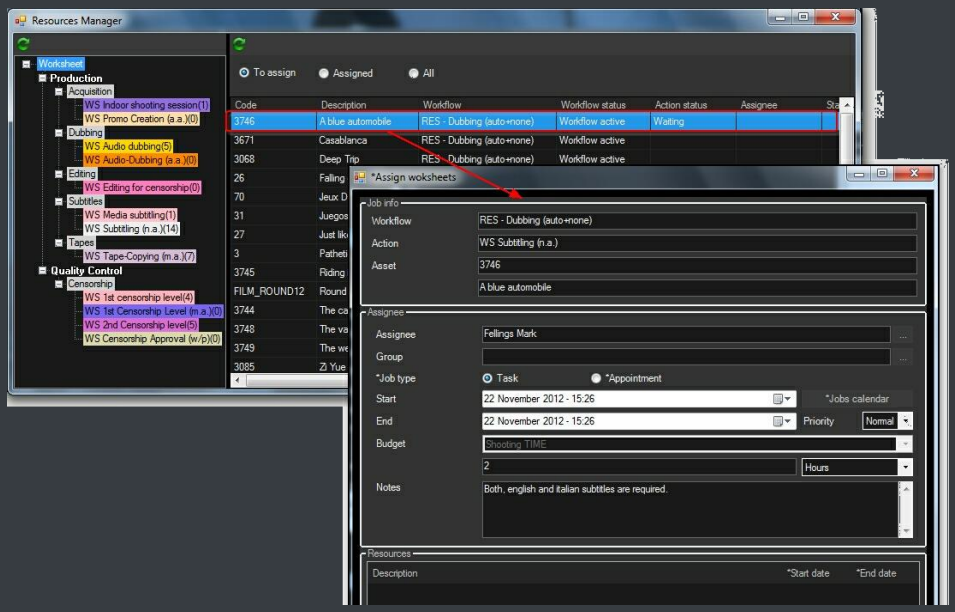
▼ 4.5 Resources Management

Resources Management is the flexible solution that permits to virtually manage all operations actually involved in the media asset management, such as for example, subtitles generation, promo creation, tape copying, media editing, audio dubbing, etc. Etere integrates the management of worksheets, from their creation and compilation to their tracking and invoicing.



Worksheets are based on a custom structure and are fully integrated into the workflow management, being possible to create user-defined worksheets and include them in automated workflows which current status can be consulted at any time in real-time from either a desktop or web interface:



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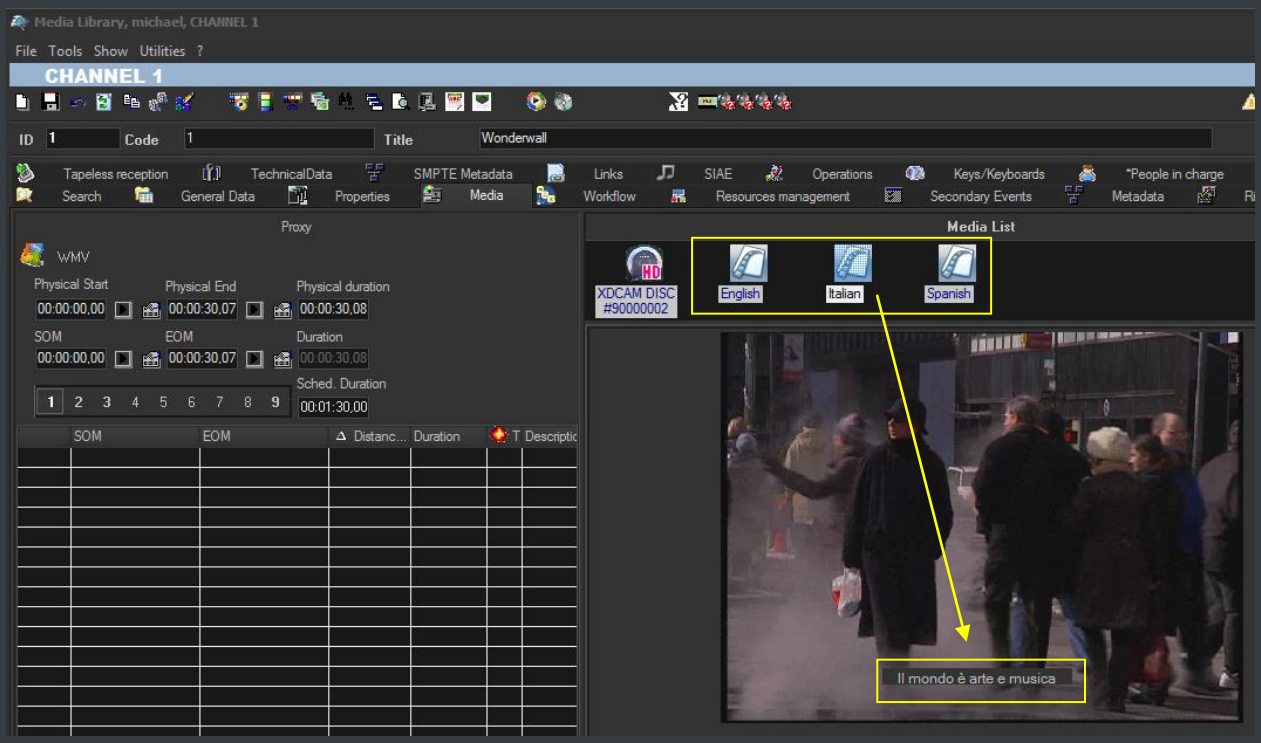
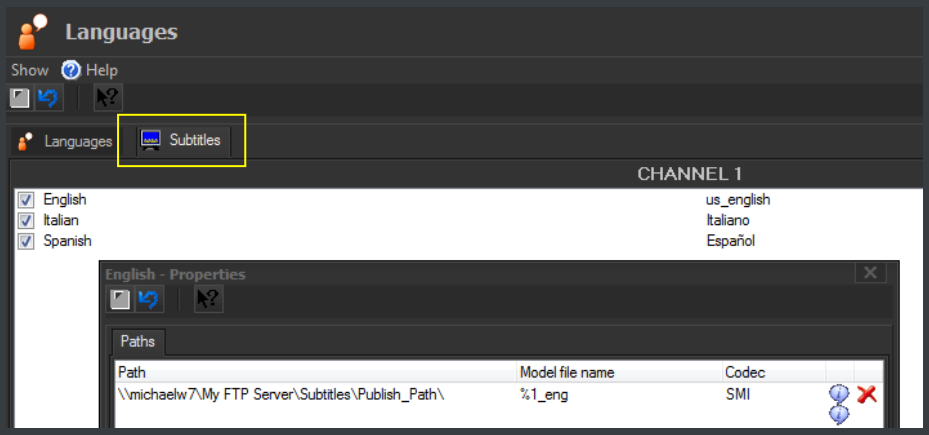
▼ 4.6 Subtitles Management

Etere includes, as a part of its enterprise media management, the capability of managing subtitles, subtitles can be generated whether using the WMP synchronized lyrics tool or any other external tool, in all cases Etere will import them automatically:



As shown above, subtitles are stored in a repository, ready to be moved to the subtitle engine when either the broadcast playlist will require it or a proxy preview will be performed (e.g. for quality check purposes). Additionally, multiple language subtitle files are supported, allowing stations to specify so many subtitling languages as needed (including their storage paths):



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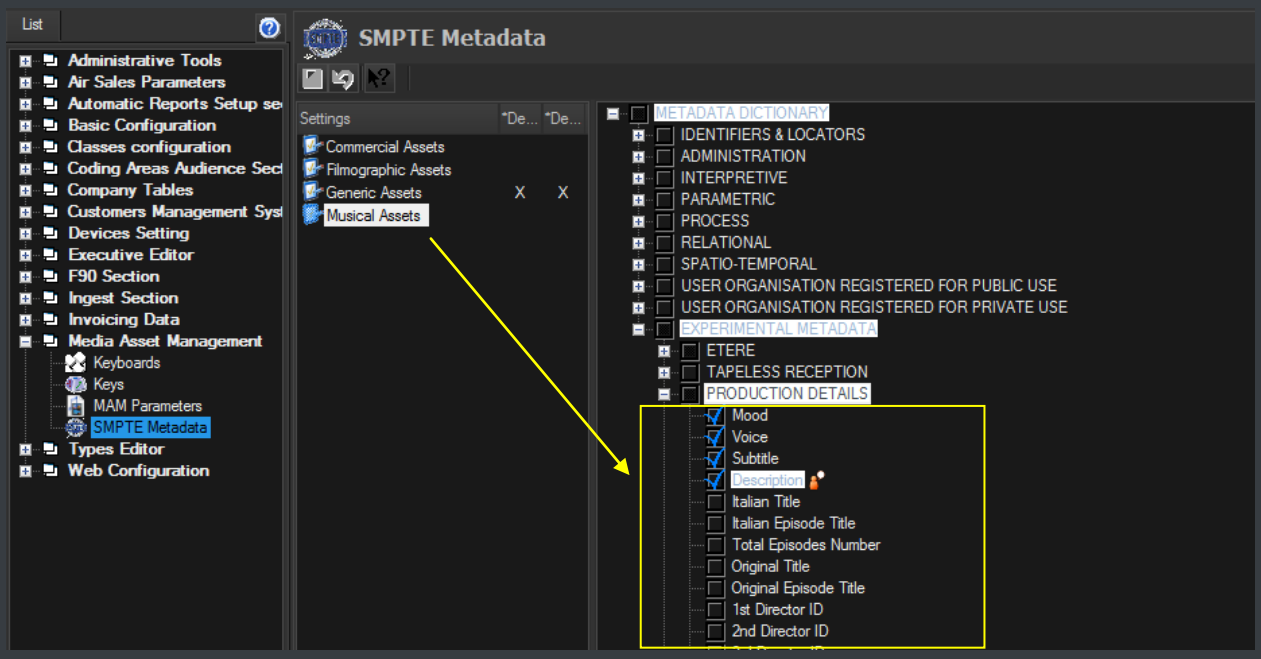
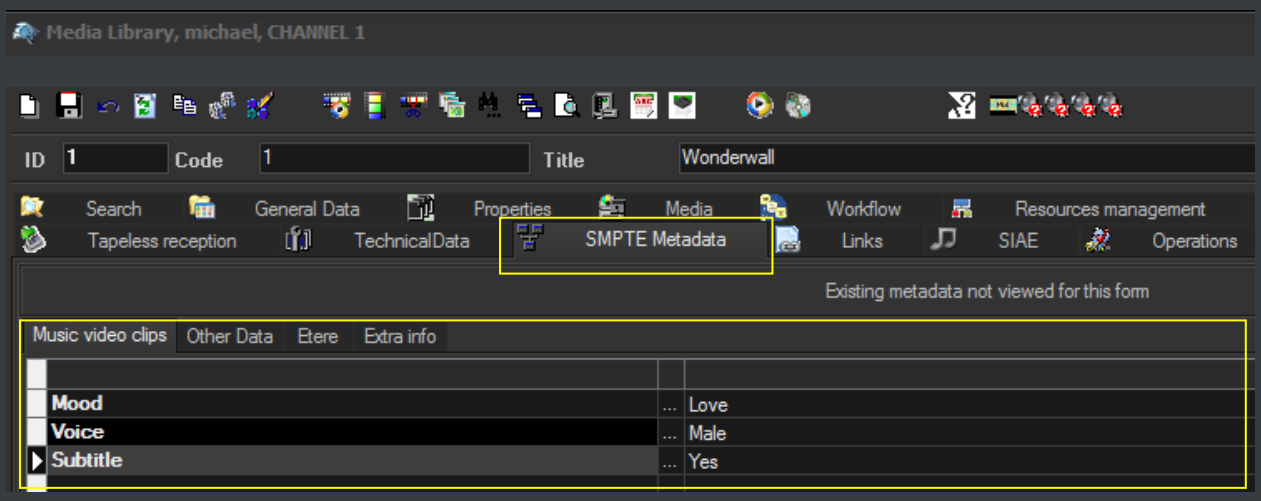
▼ 4.7 SMPTE Metadata

SMPTE (Society of Motion Picture and Television Engineers) Metadata is a key part of the media management, that's why Etere provides a dedicated module for defining eventually useful metadata (e.g.: 'technical comments', 'descriptive names', 'intellectual rights') and store them into a robust SMPTE dictionary:



In Etere, all assets contain user-defined SMPTE metadata fields, these fields can be either manually compiled or automatically compiled (retrieved from specific asset properties):



SMPTE metadata can be used also for cataloguing media content, allowing operators to quickly add specific information to a video segment.

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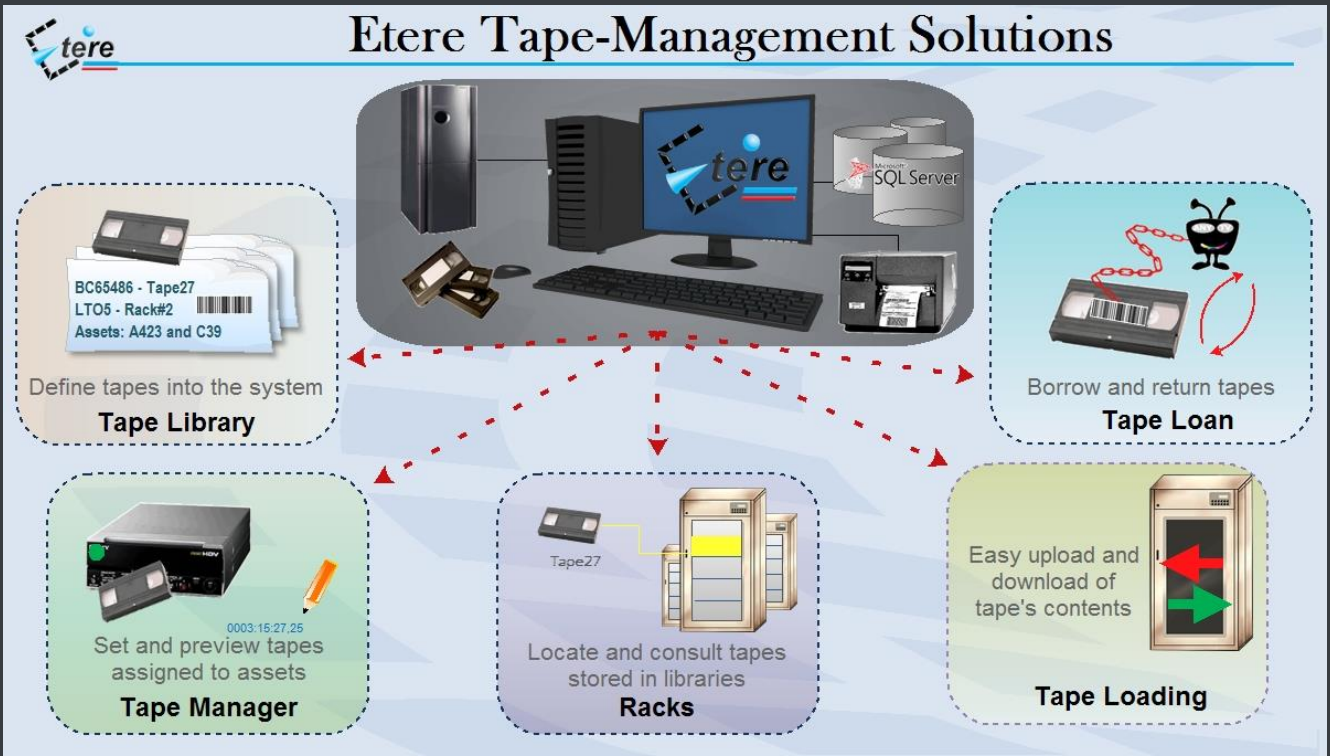
▼ 5. ETERE COMPONENTS

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 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. All modules that make part of the Etere's proposed solution will be treated throughout this chapter, explaining their roles in the global distributed and integrated system.

▼ 5.1 Tape Management: A powerful management of tapes

Etere allows stations to manage their tape archives (video tapes, data tapes, discs) through a set of modules specifically designed to perform the most important tape-related operations; these modules are illustrated in the figure below and described all throughout the current chapter:



It's worth mentioning that the tapes management provided by Etere can be greatly complemented with the remote tapeless capabilities described in the chapter dedicated to the EtereWeb module.

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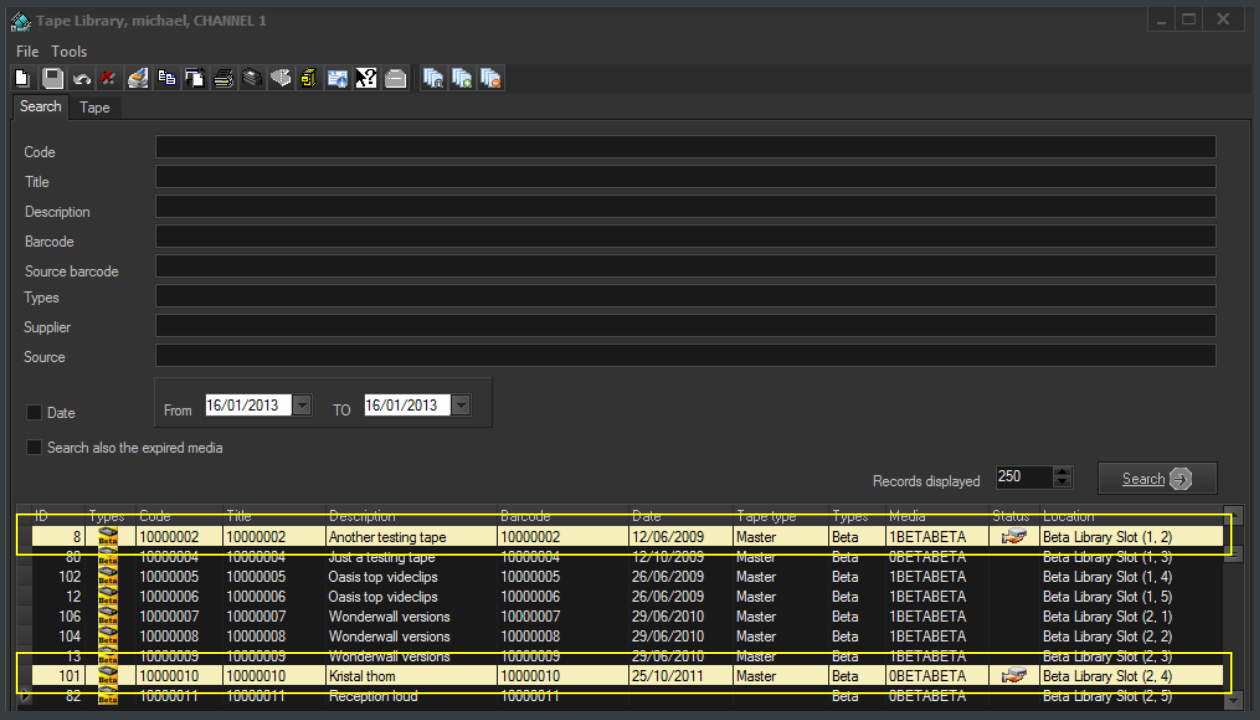
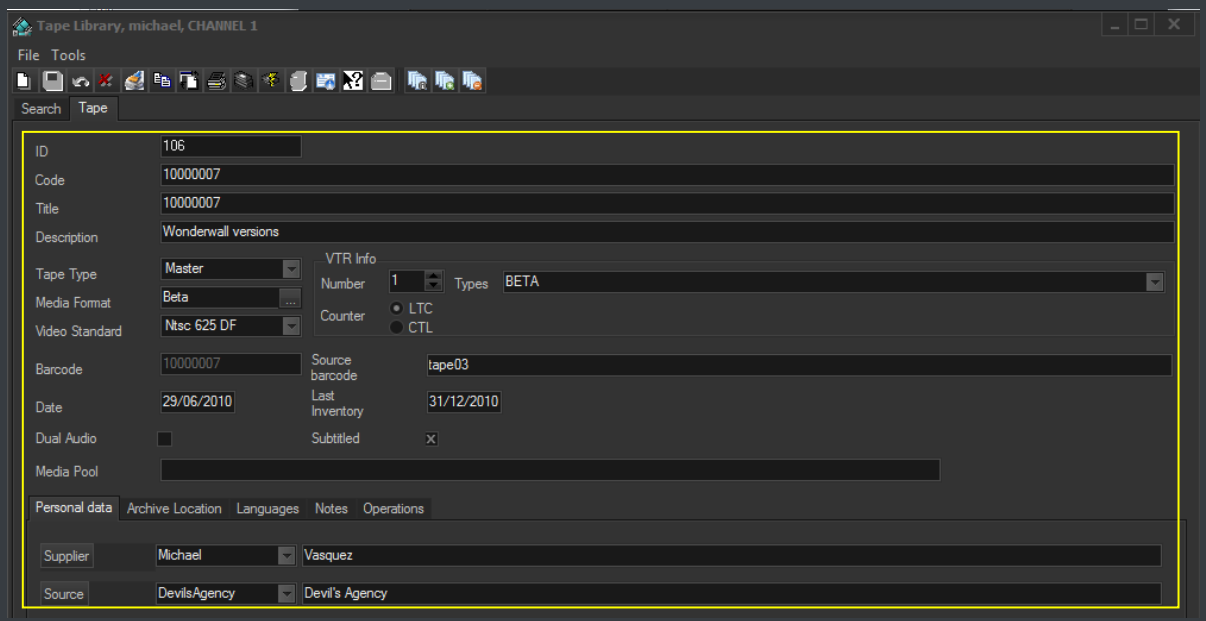
▼ 5.1.1 Tape Library

The **Tape Library** module is the inventory where all tapes managed within the system are inserted and defined, being possible to search them through a robust search engine (loaned tapes are highlighted to point out their unavailability):



Retrieved tapes can be consulted by viewing their main information (i.e. ID, code, description, type, format, barcode, media pool, rack location):



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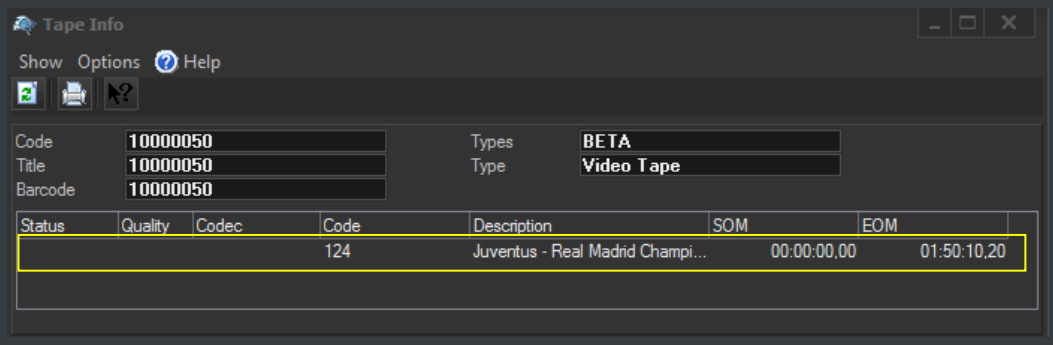
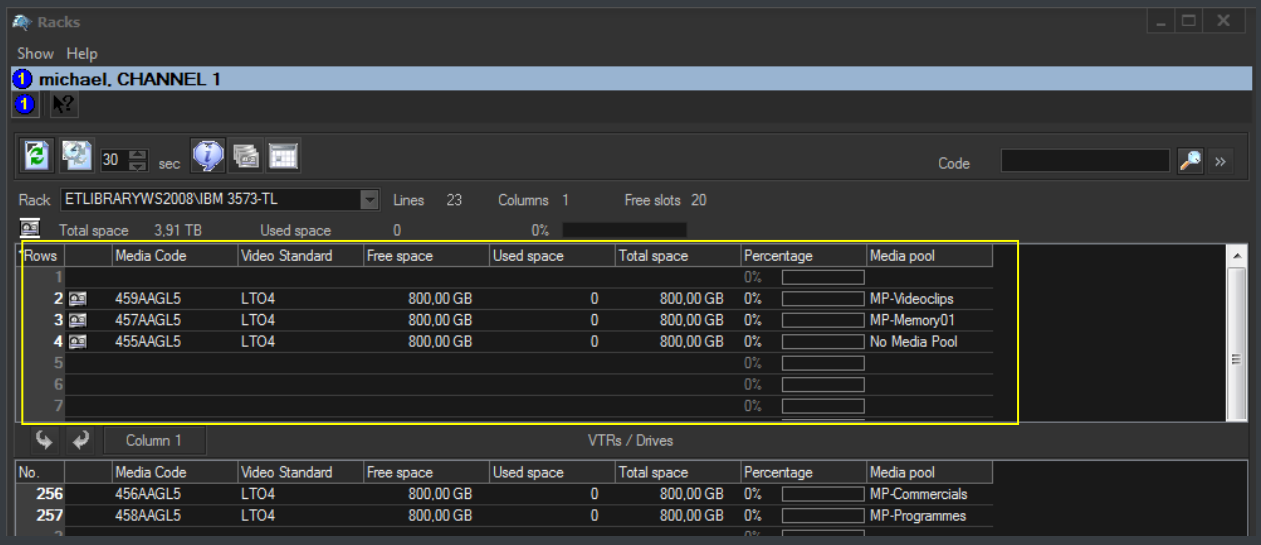
Moreover, it will be also possible to perform various operations such as tape creations, tape loans, tape copies and status consultations (e.g. empty tapes, loaned tapes, etc.):

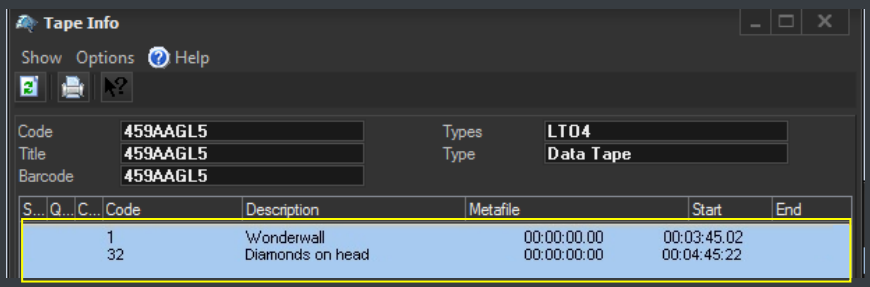


▼ 5.1.2 Racks

The **Racks** module provides a simple user-interface for locating tapes inside specific racks and libraries and consult some of their more important storage properties (e.g. free space, used space, etc.). As shown in the figure below, the user interface is mainly composed by the Content List (i.e. where contents of each single library/cart can be consulted) and a Toolbar (holding the functions supported for their management).



All tapes contained into a library can be consulted through a very useful “Tape Info” form which details some important information such as its code, type, barcode, title and contained assets:



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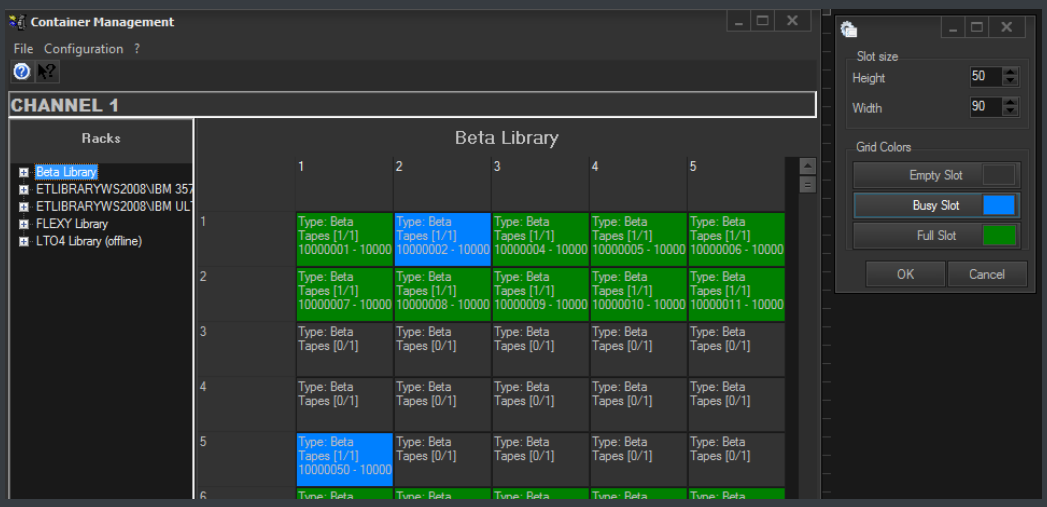
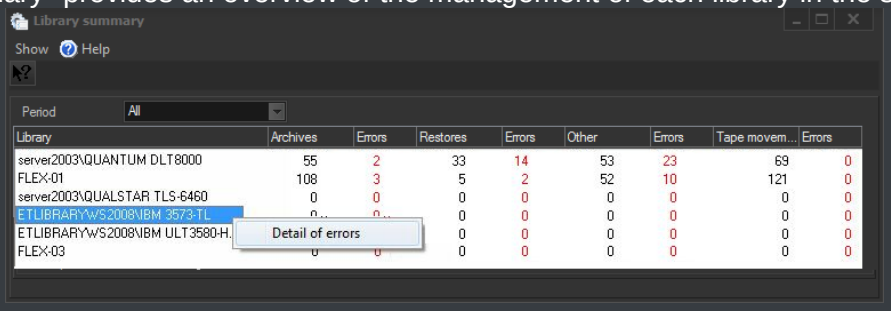
A "Container Management" form displays an array-view of the slots contained within Racks and provides visual information on their space status (e.g. green=empty, yellow=used, red=full):

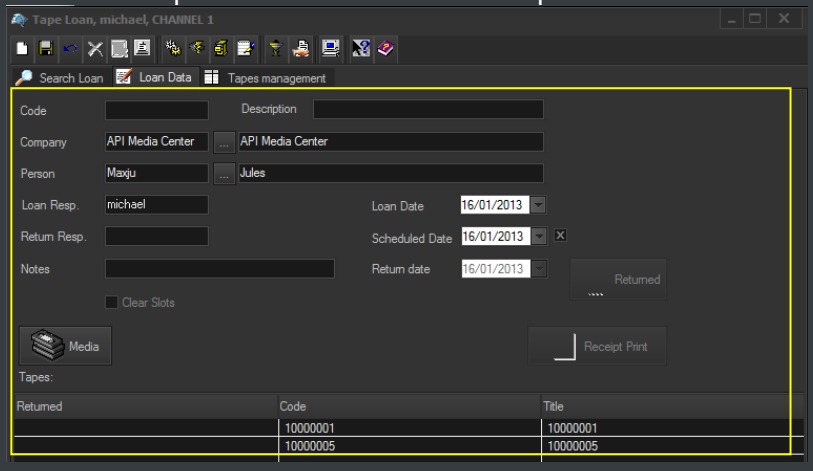


A "Library Summary" provides an overview of the management of each library in the system:



▼ 5.1.3 Tape Loan

Tape Loan is the module that allows managing all information related to the borrowing and return of tapes. Loans are recorded in the database detailing the loaner (company and person), the loan and return responsible, the actual loan data, the expected return data, the loaned media (tapes), being also possible to print a loan receipt document for each loan operation:



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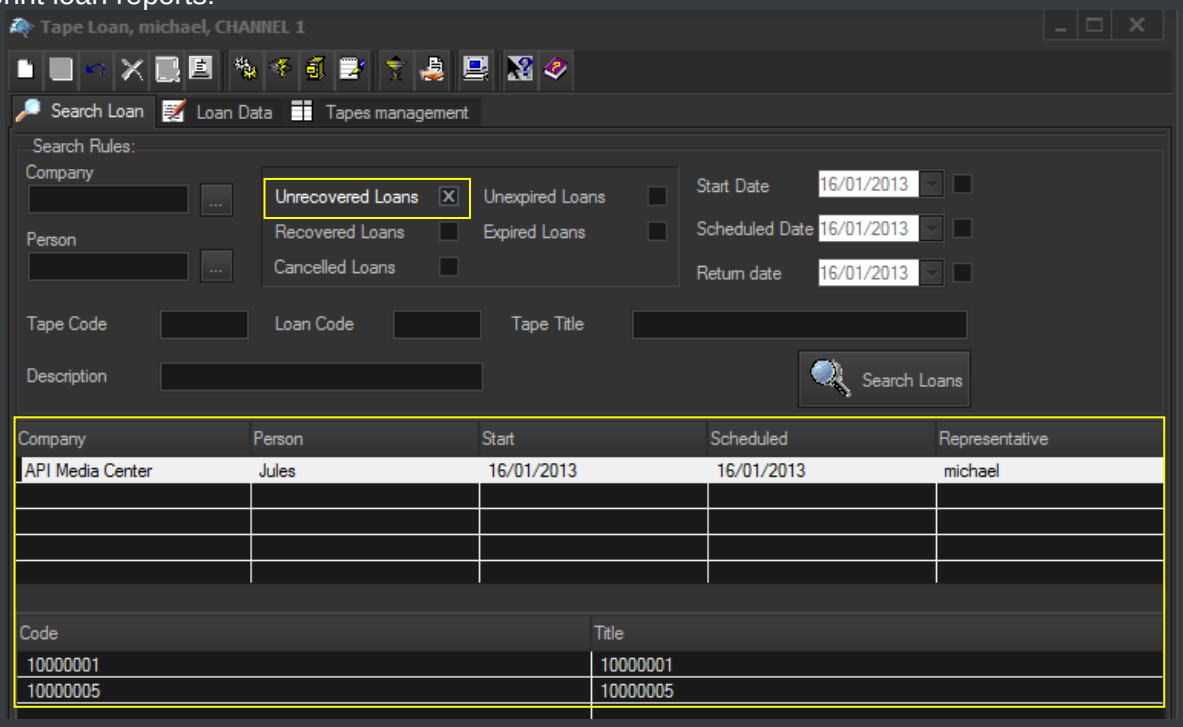
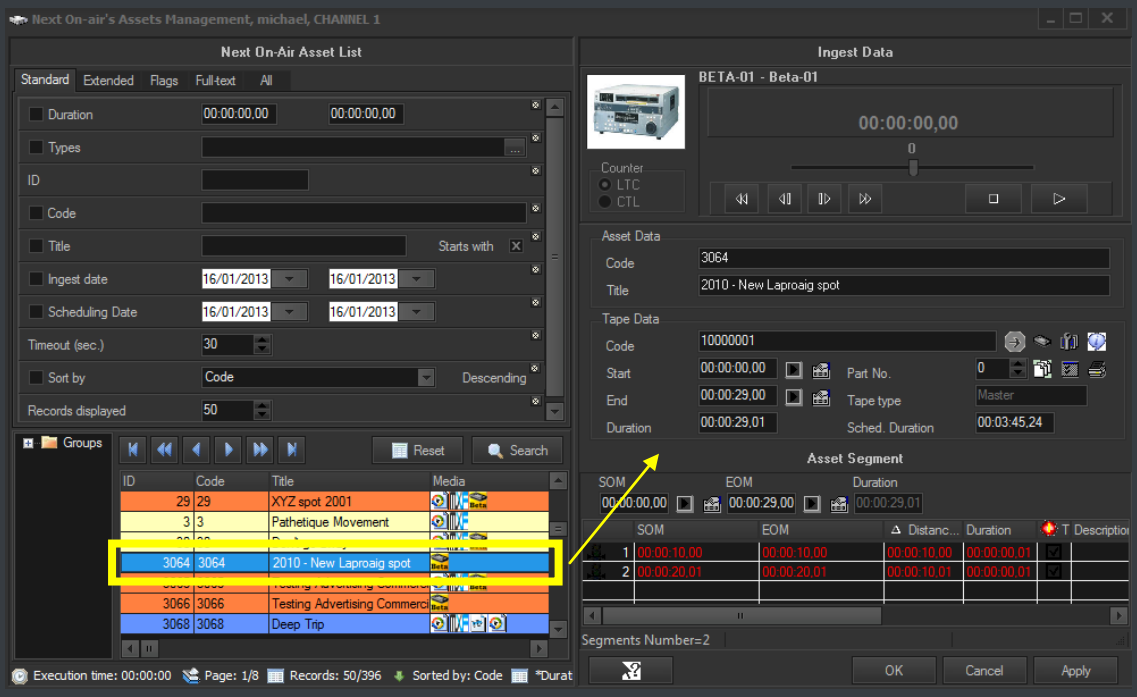
Stations will be allowed to search due-for-return tapes and consult pending loans, settle loan returns and print loan reports:



▼ 5.1.4 Tape Manager

Tape Manager allows assigning new or existing tapes to assets, detailing the information required for their subsequent recording (e.g. SOM, EOM, EDL instructions, split parts):



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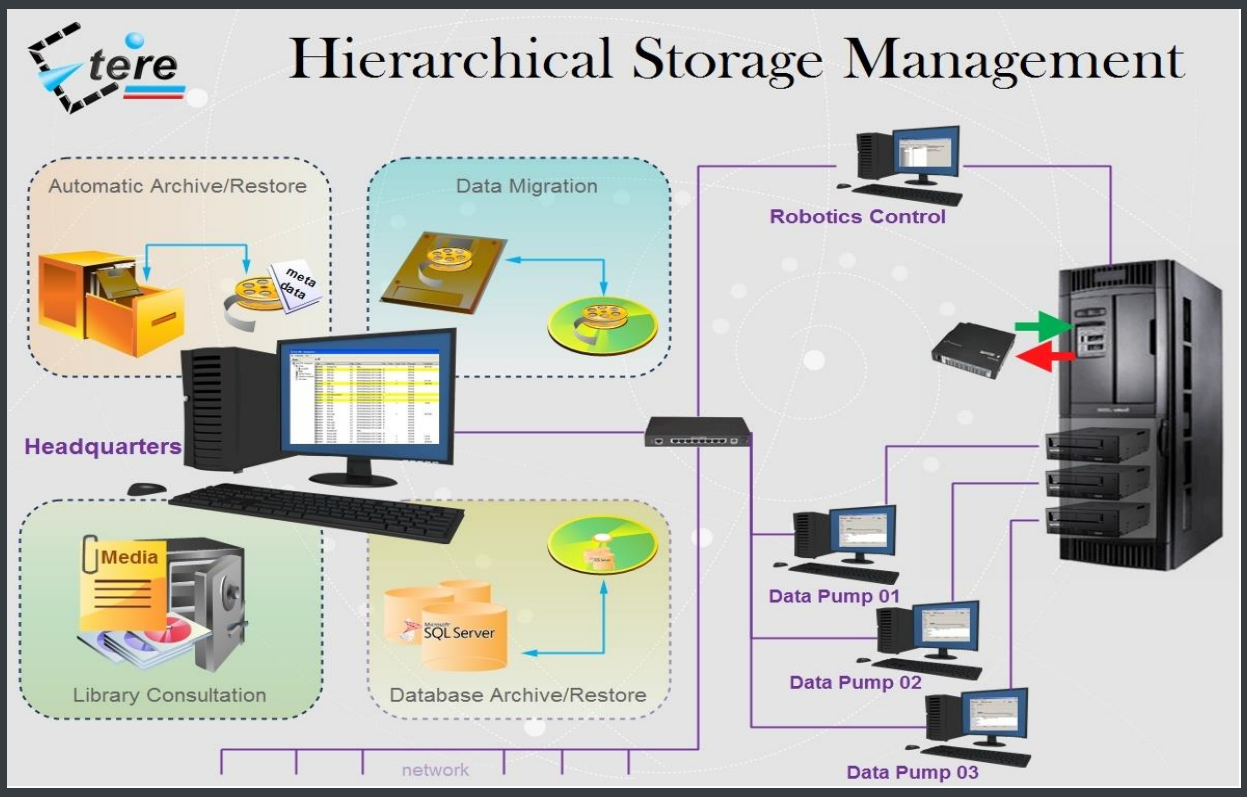
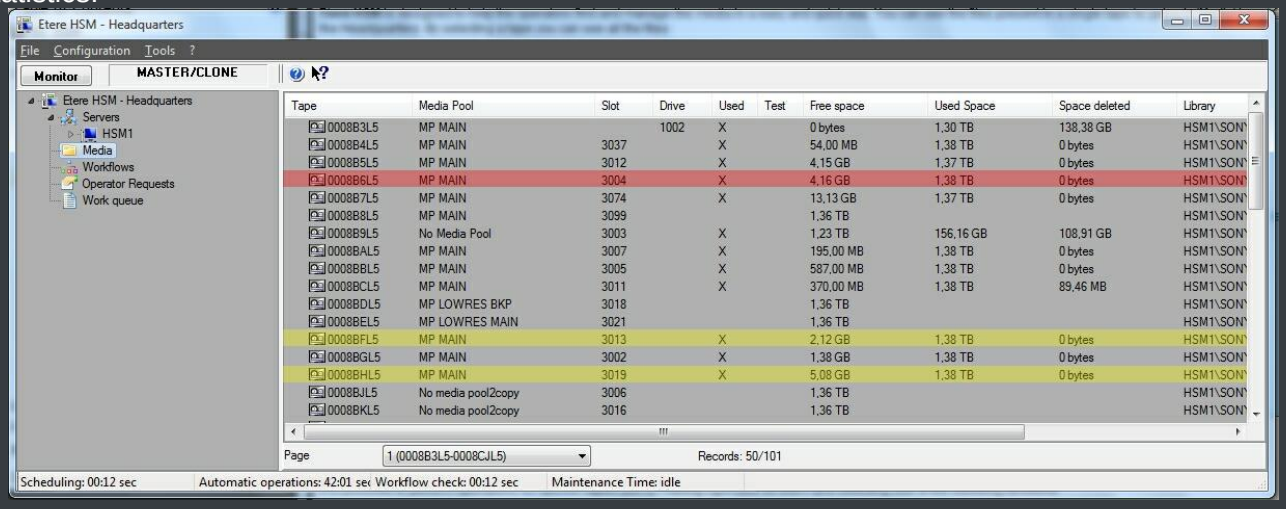
▼ 5.2 HSM: A Tape Based Archiving

LTO tape libraries present in the station will be managed by **Etere HSM**, 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.



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.



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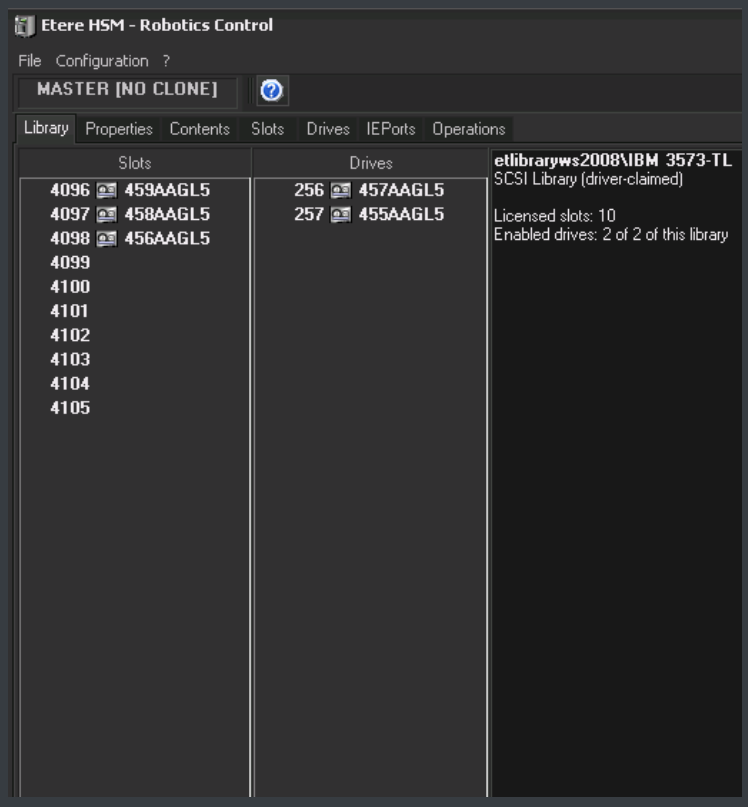
Etere HSM distinguish four different archiving levels into a broadcasting workflow, these levels required distinct access times which vary from 0 minutes (video server) to 15 minutes (standard video tapes). All these levels are managed “virtually”, that is, you can use logical devices (metadevices) based 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.

Moreover, 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.

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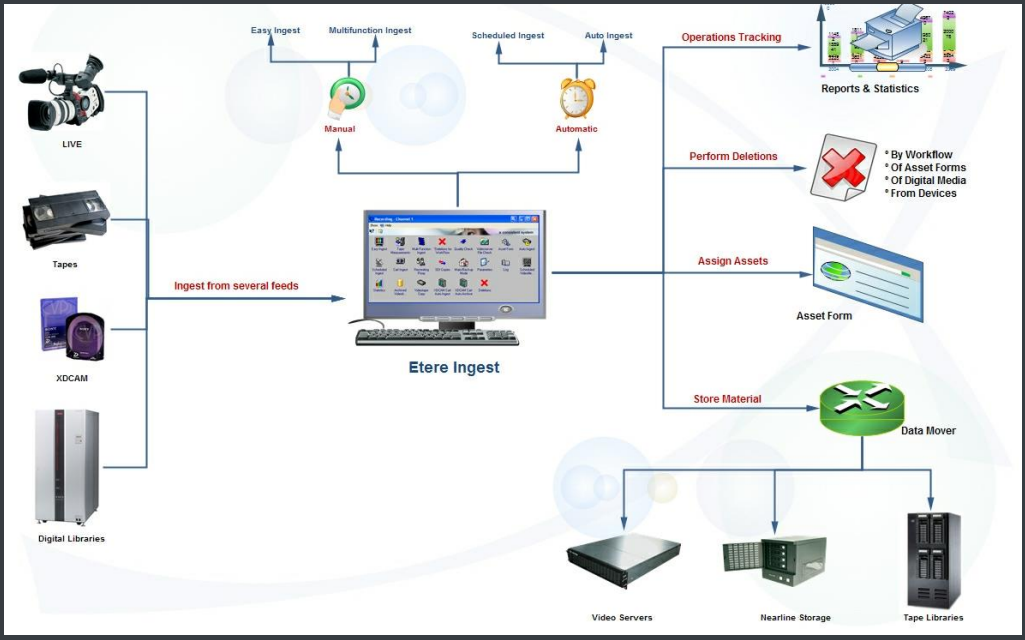
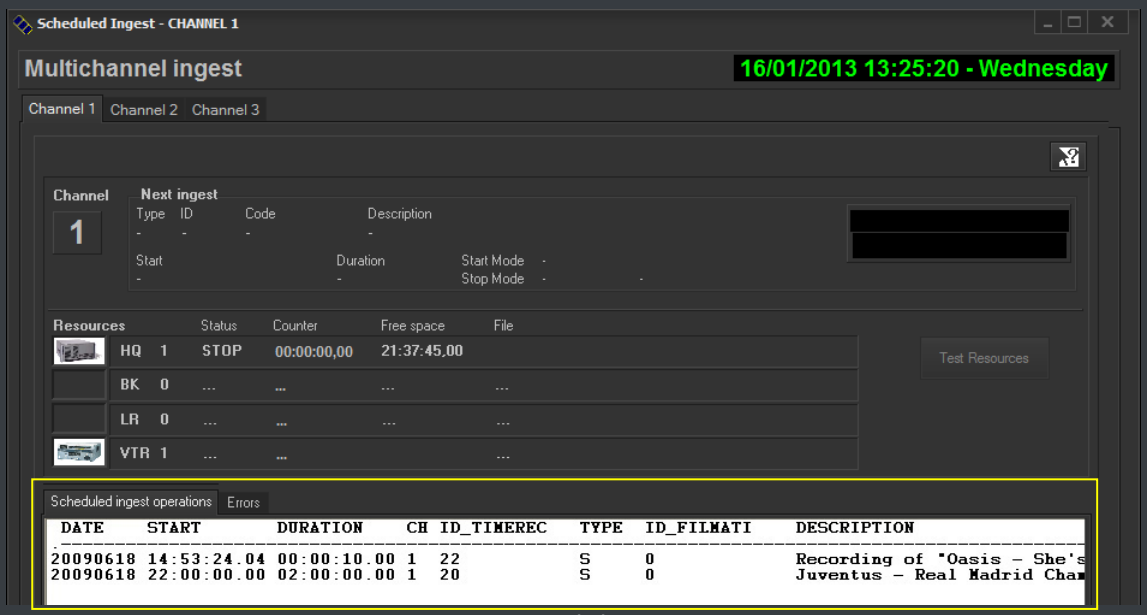
▼ 5.3 Ingest: Enterprise Capturing System

Etere ingest is a versatile set of modular applications that significantly improves the digitization process inside a broadcasting system:



▼ *5.3.1 Wide range of capturing modes*

Ingest covers any particular requirement of the entire process such as automatic and scheduled ingests:



Automatic ingest

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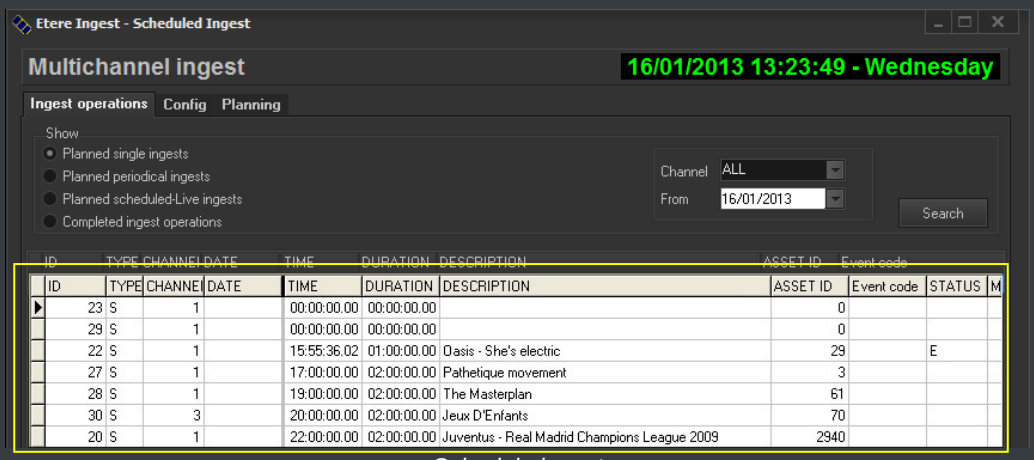
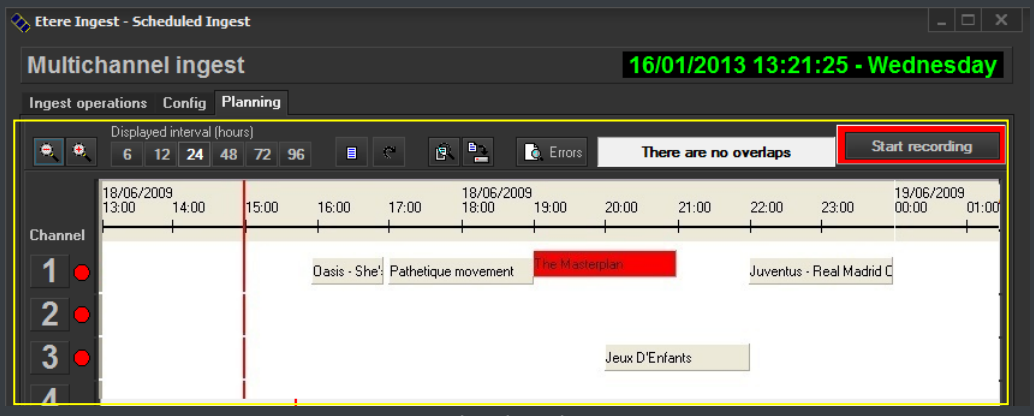


ID	TYPE	CHANNEL	DATE	TIME	DURATION	DESCRIPTION	ASSET ID	Event code	STATUS	M
23	S	1		00:00:00.00	00:00:00.00		0			
29	S	1		00:00:00.00	00:00:00.00		0			
22	S	1		15:55:36.02	01:00:00.00	Oasis - She's electric	29		E	
27	S	1		17:00:00.00	02:00:00.00	Pathetique movement	3			
28	S	1		19:00:00.00	02:00:00.00	The Masterplan	61			
30	S	3		20:00:00.00	02:00:00.00	Jeux D'Enfants	70			
20	S	1		22:00:00.00	02:00:00.00	Juventus - Real Madrid Champions League 2009	2940			

Schedule ingest

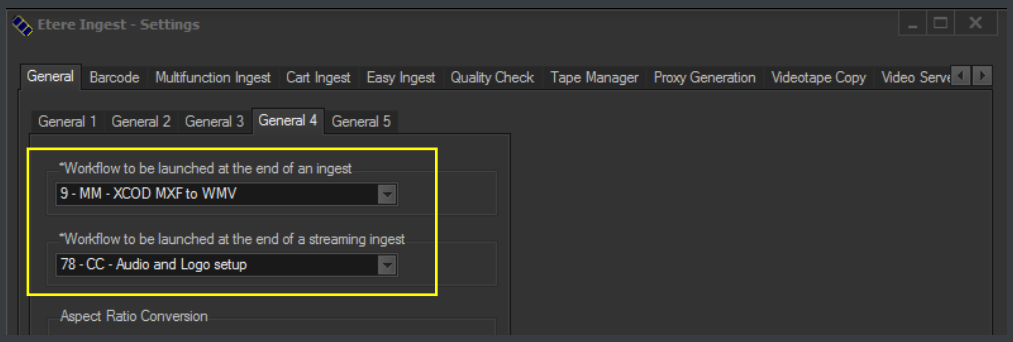
Etere Ingest supports multiple parallel ingest streams, managed automatically either on a single workstation or across various workstations, allowing also to schedule the video files to be ingested:



Planning View

▼ 5.3.2 Automatic workflow actions

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 (e.g.: archiving, playout, etc.):



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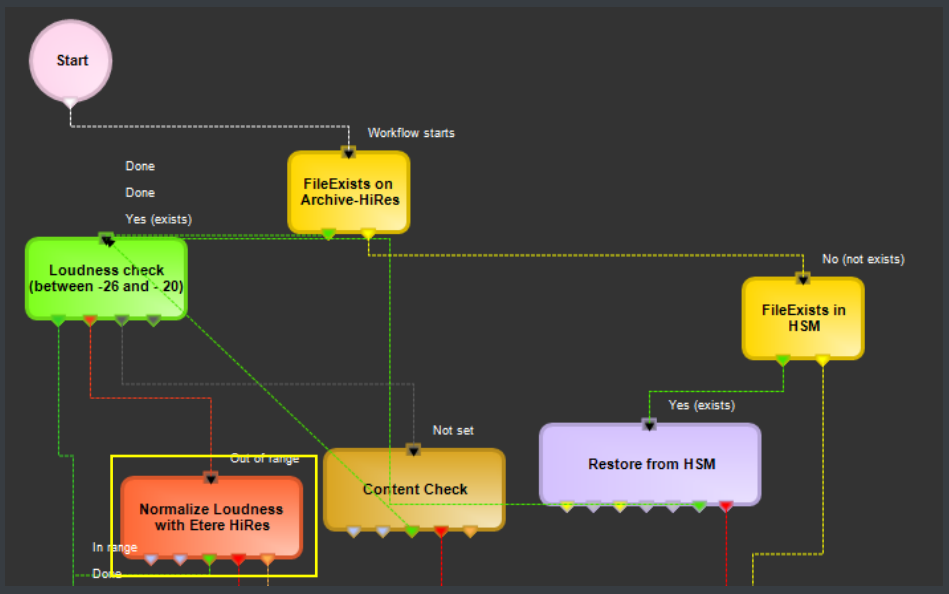
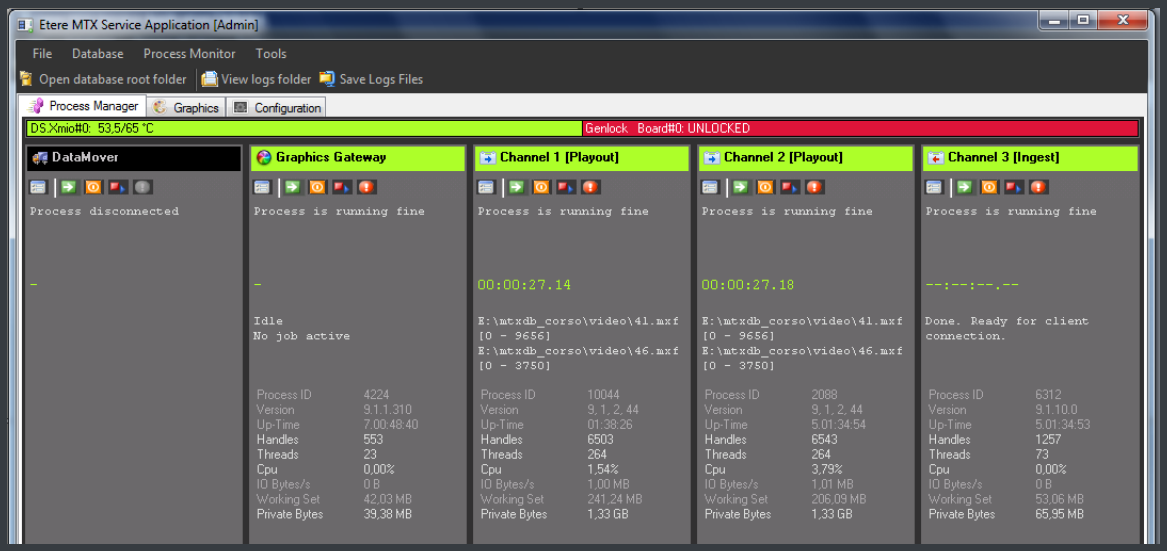
The image below illustrates how Etere allows setting the workflow to be launched at the start and end of an ingest process to for example, create a low resolution version or normalize the audio of captured contents:



▼ 5.4 MTX: Digital Capture based on Matrox technology

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.



The highly integrated, end-to-end workflow streamlines all the core processes, MTX forms part of global Etere MAM solutions, thus allowing it to use the same metadata and interface available for ingest, content management, transmission control, traffic, archiving, and monitoring.

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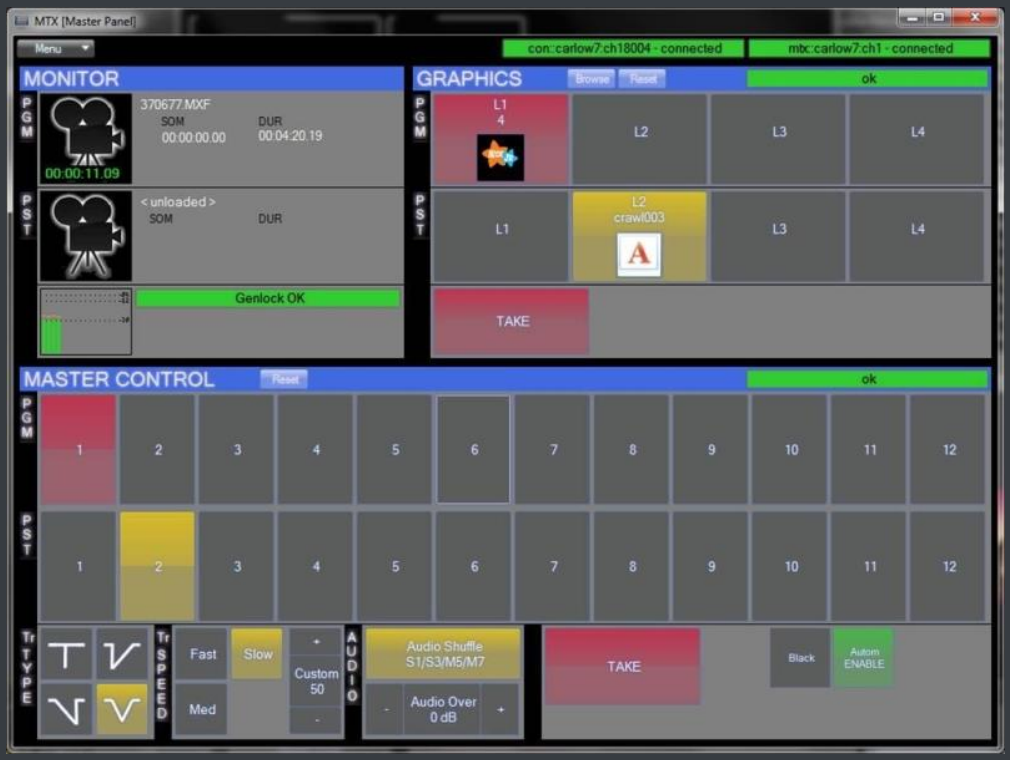
▼ 5.4.1 Robust IT solution

The multi-format ingest allows to use any codec and wrapper on the market, whereas for playout it can 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. Besides the common preset and preview bars, available on a friendly touch-screen graphic interface, MTX includes most graphics and audio functions such as:

- 8 logo layers with unlimited sizes
- 1 Crawl /CG
- Audio shuffling
- Audio control
- Dolby E Pass-through
- Video transitions

▼ 5.4.2 Control Panel

The **MTX Master Panel** is a standalone user graphical interface to allow operators to manually switch a master control, it combines the management of the inputs/outputs of a master control with its preset and take functions, allowing also to customize the various on-screen descriptions.



The **MTX Master Panel** requires only a card with 1 input and 2 outputs to deliver full Master Control functionalities, with a really cost effective system, and the possibility of working in SD and HD without any additional cost. The **MTX Master Panel** will provide all the standard functions of a master control with just a touch of the monitor.

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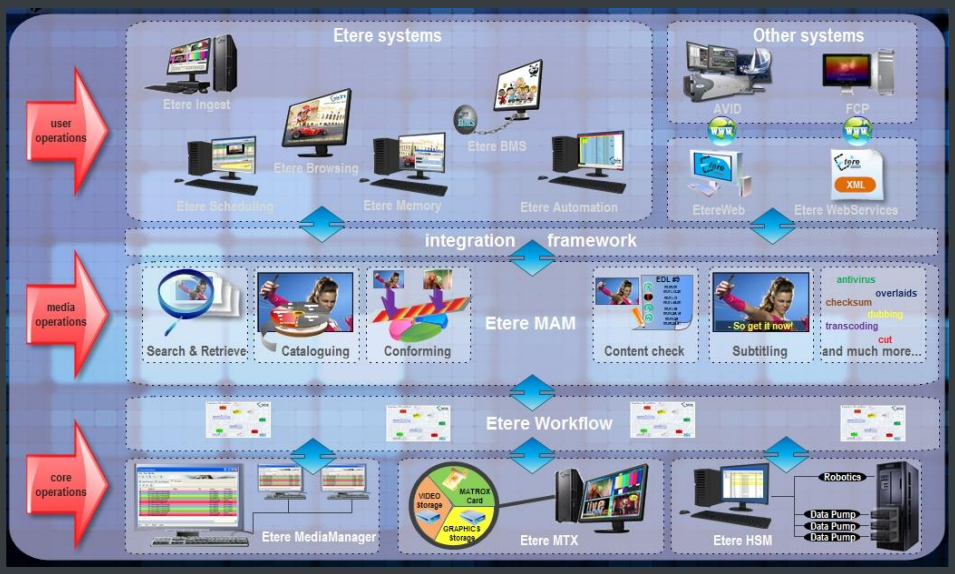
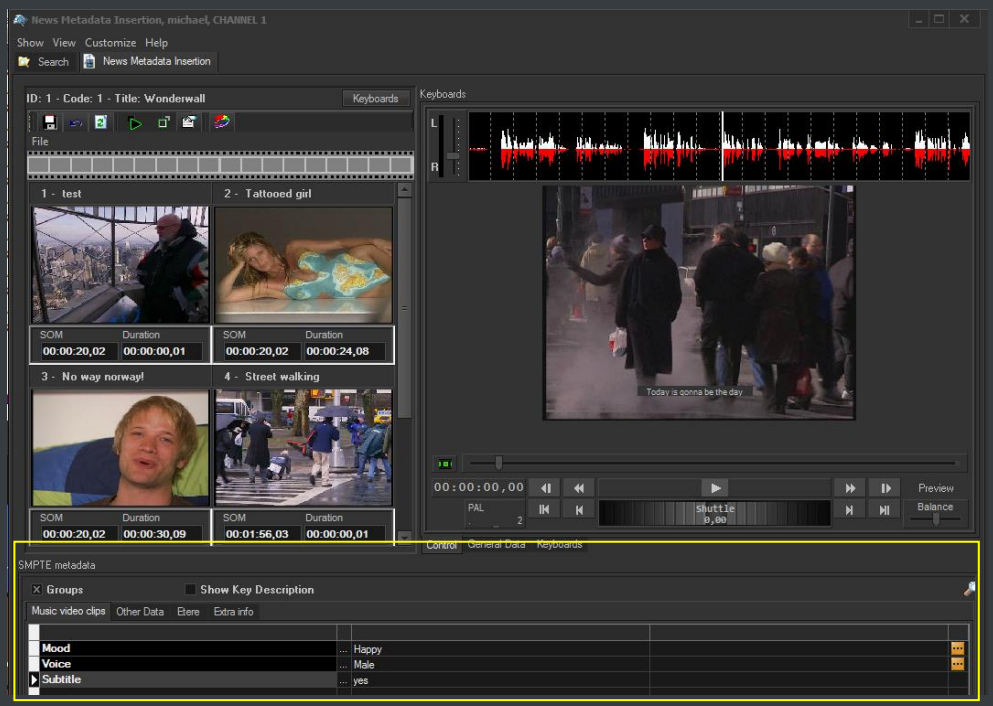
▼ 5.5 MAM: Browsing, Editing and more

MAM will allow operators to store information, search media EDL, and transfer EDL-based media to the playout server and the editing systems:



▼ *5.5.1 Media cataloguing and Metadata Insertion*

Etere enables search, browse and cataloguing of rich media, a very intuitive interface establishes a bridge between the ingest department and the production department, allowing low-res proxy browsing over the network (contents to be browsed simultaneously from various workstations):



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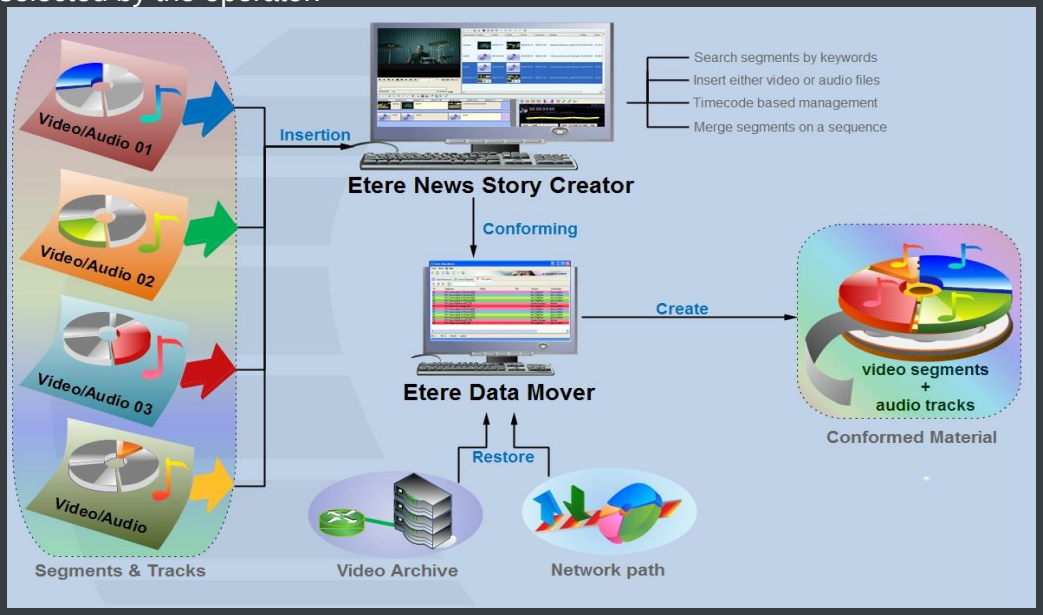
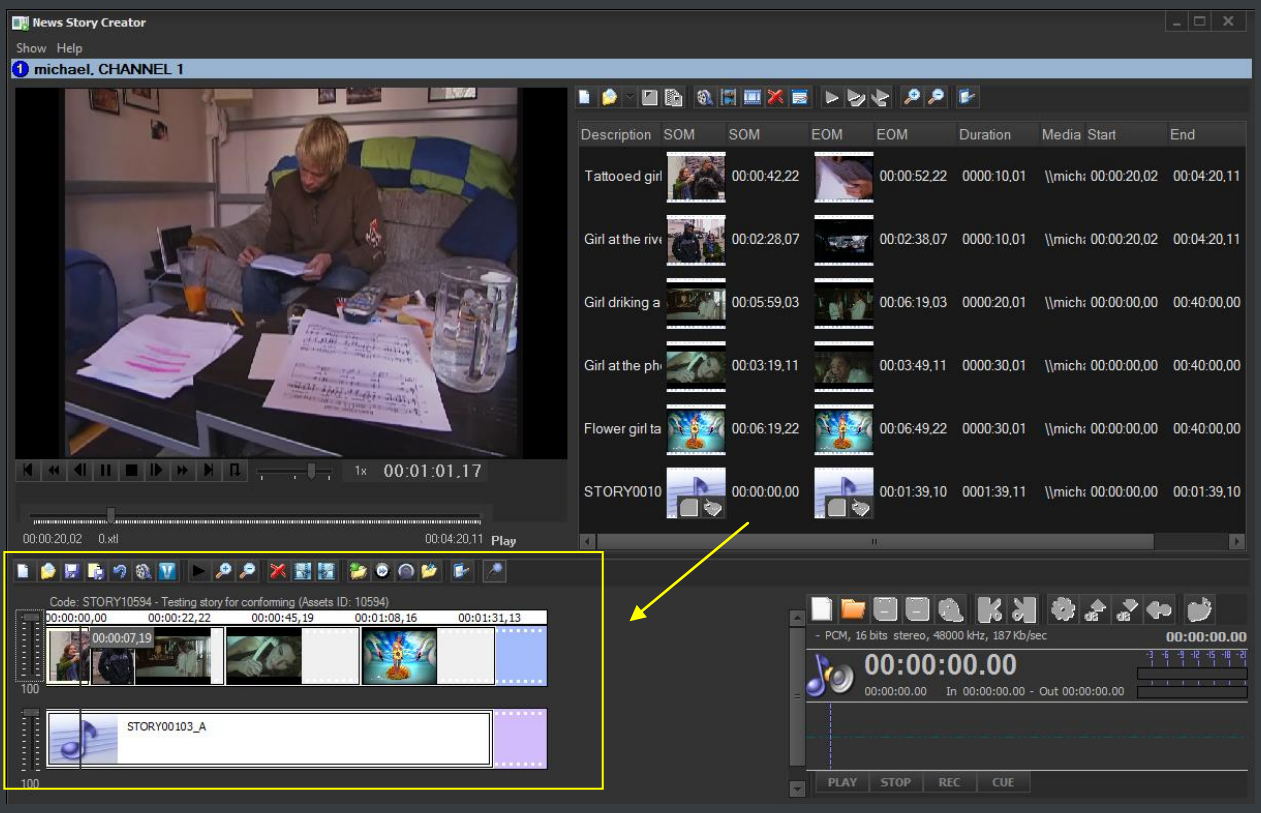
▼ *5.5.2 Video conforming and Audio over*

MAM permits to join cut segments from different sources, to create a single final video file containing all scenes selected by the operator:



Use this function to, for example, dubbing contents by overlaying audio tracks over a video(s):



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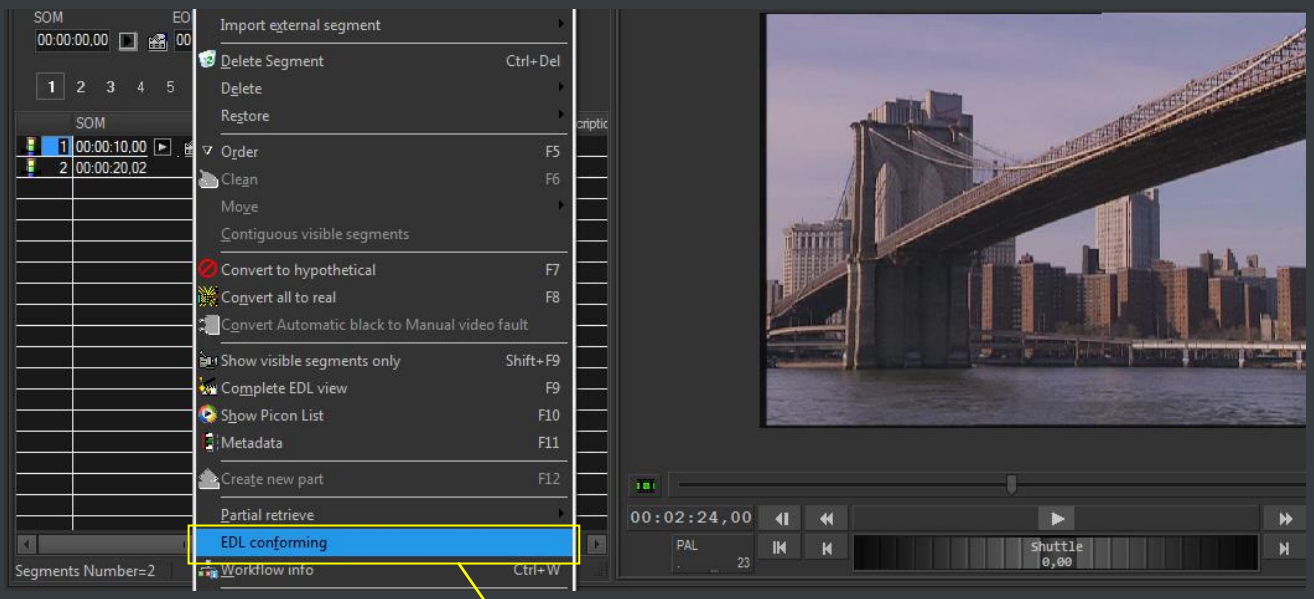
The image above illustrates the user-friendly interface on which operators creates new video sequences of MAM captions which includes all relevant metadata associated to the inserted scenes.

▼ *5.5.3 Partial restore of assets*

Etere also allows restoring only a part of video files by creating either high or low resolution video files including specific 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:



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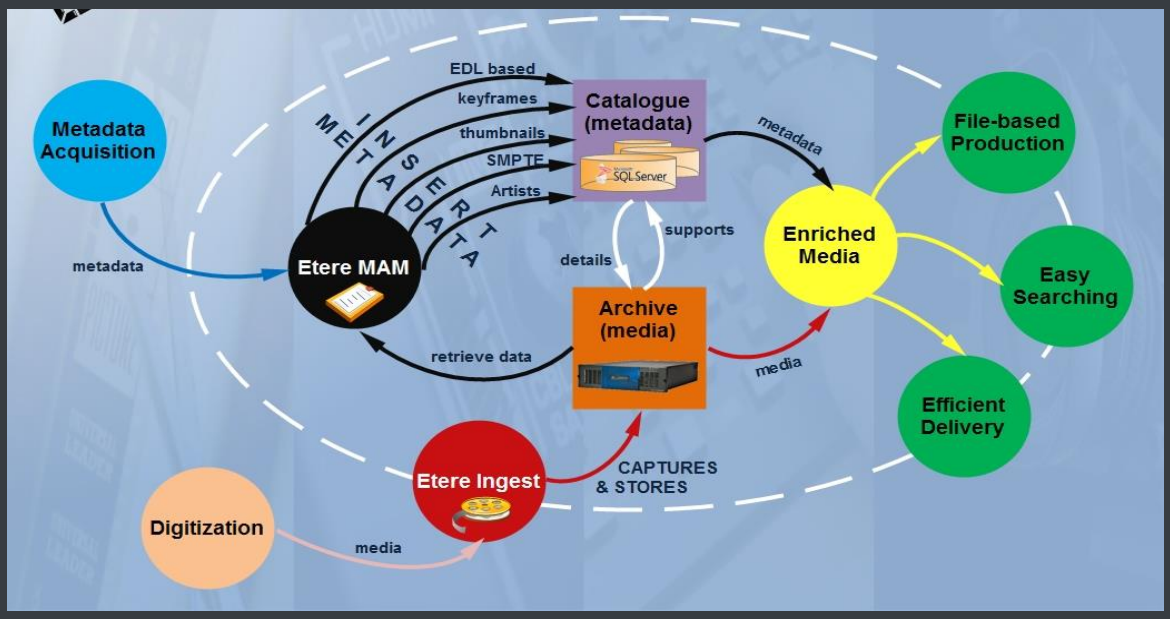
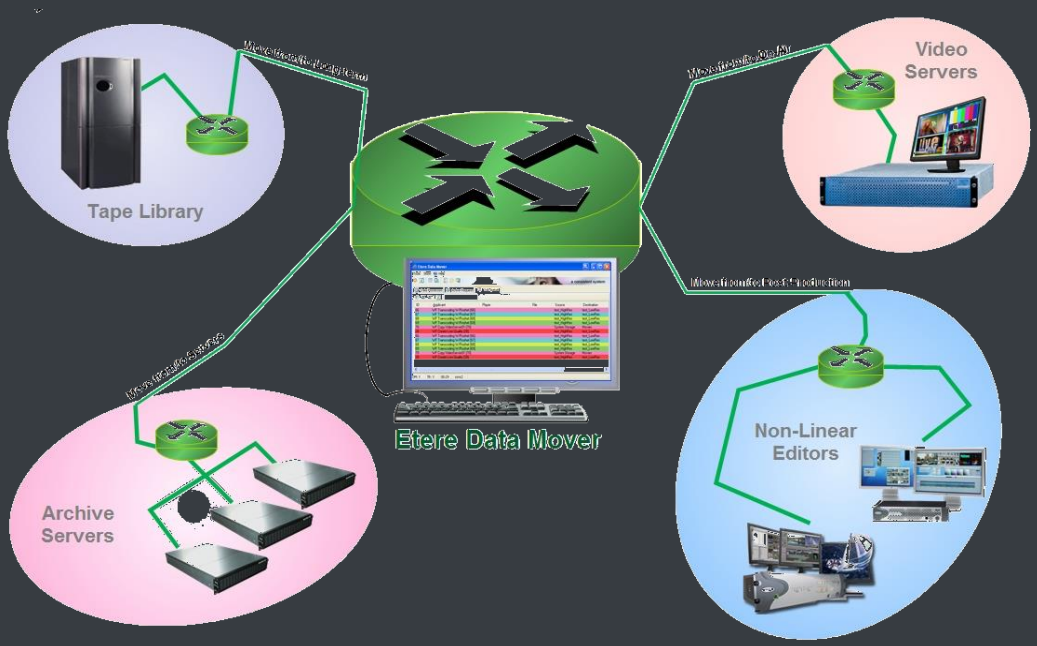
▼ *5.5.4 Integration between MAM and Ingest*

MAM can be used along with Etere Ingest to enrich captured media contents and thus leverage all benefits of a file-based production including easy research and efficient delivery capabilities:



▼ 5.6 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.



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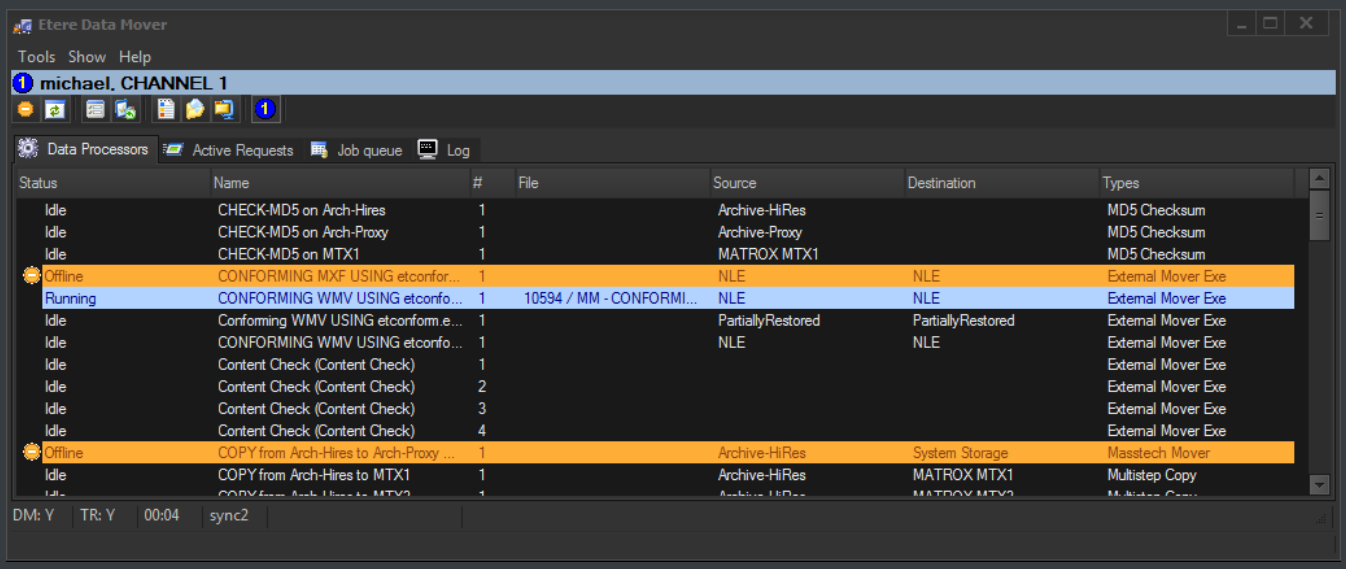
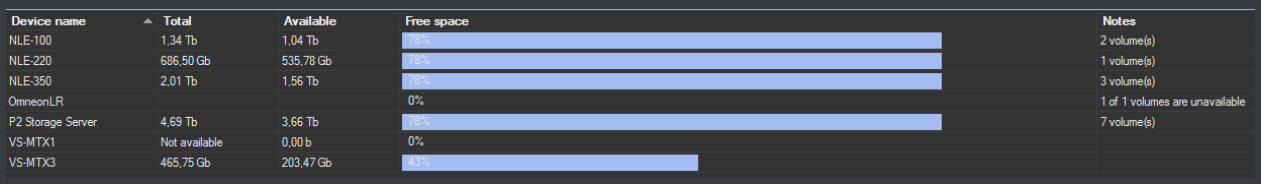
▼ 5.5.1 Simple and user-friendly interface

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 Media Manager; this migration process also includes rewrapping and transcoding capabilities.



▼ 5.5.2 Logical management of data

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:



Device name	Total	Available	Free space	Notes
NLE-100	1,34 Tb	1,04 Tb	78%	2 volume(s)
NLE-220	686,50 Gb	535,78 Gb	78%	1 volume(s)
NLE-350	2,01 Tb	1,56 Tb	78%	3 volume(s)
OmneonLR			0%	1 of 1 volumes are unavailable
P2 Storage Server	4,69 Tb	3,66 Tb	78%	7 volume(s)
VS-MTX1	Not available	0,00 b	0%	
VS-MTX3	465,75 Gb	203,47 Gb	43%	

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.

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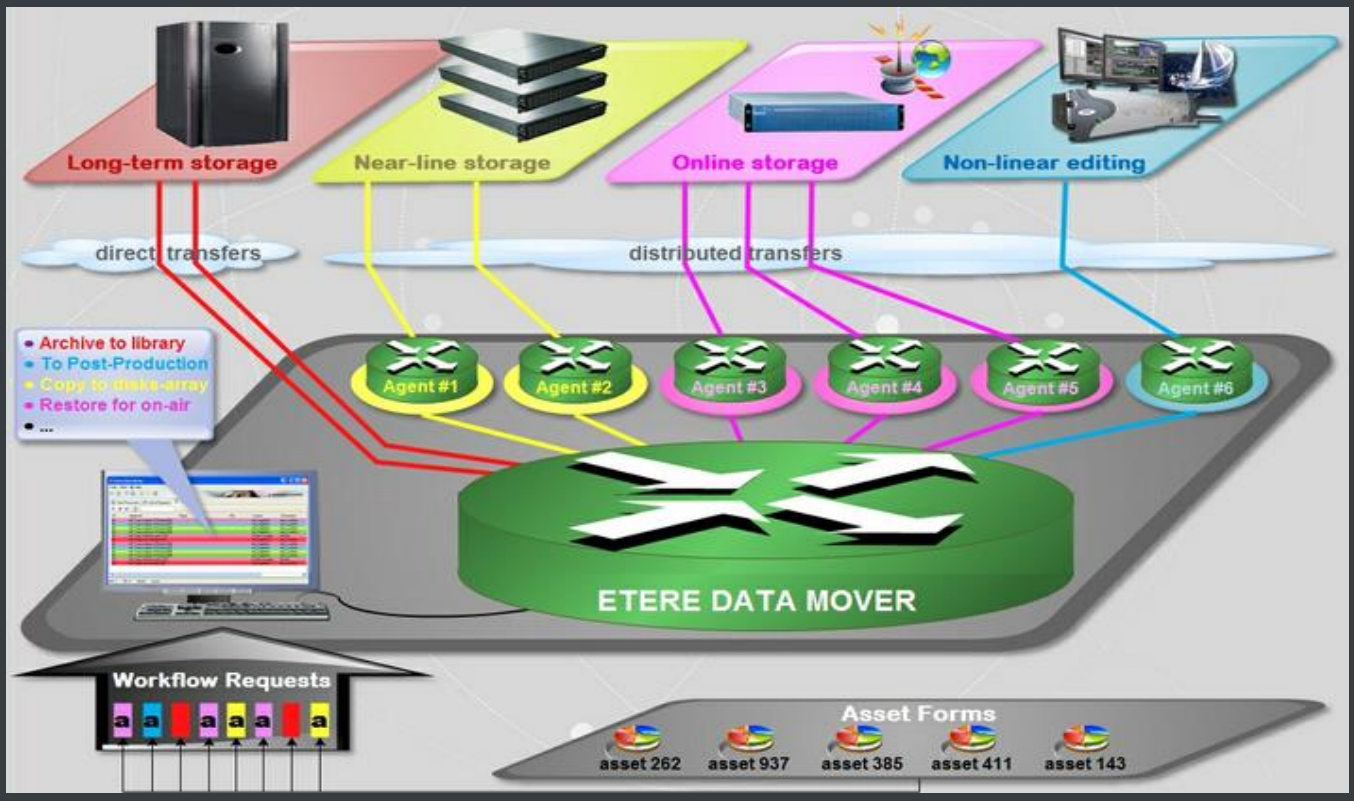
▼ 5.5.3 Distributed parallel transfers

Data Mover is capable to provide both, distributed processing for using an independent agent per data transfer and parallel processing for simultaneously performing different instances of one data transfer; these features will allow stations to exploit high computing resources to use a single workstation to perform multiple transfers, thus enhancing the flexibility, scalability and fault-tolerance of the entire Etere system.



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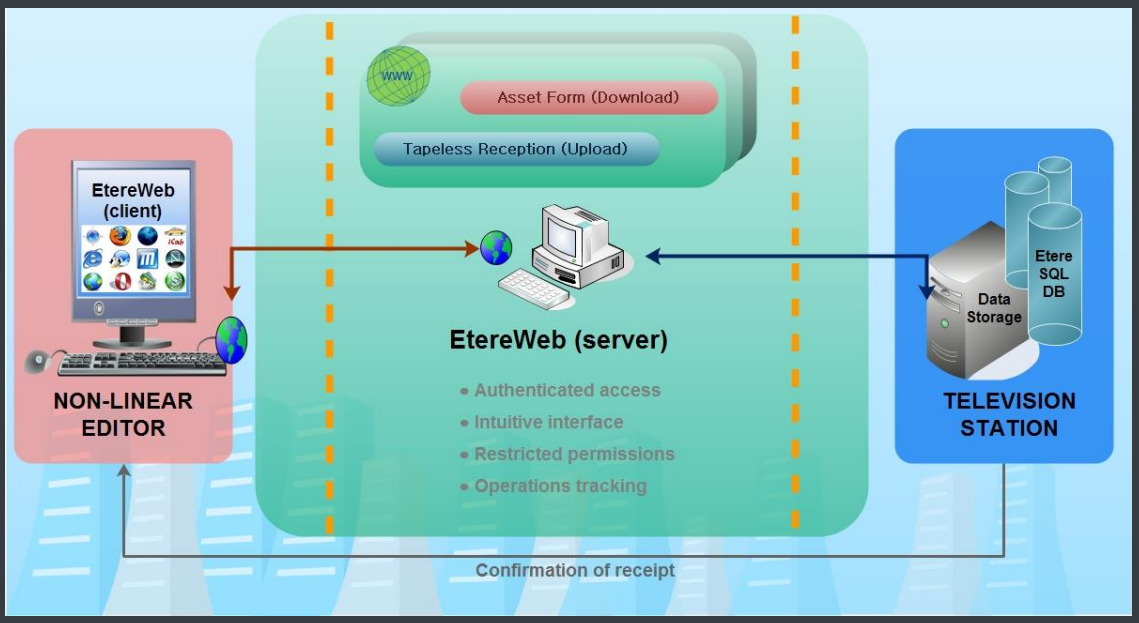
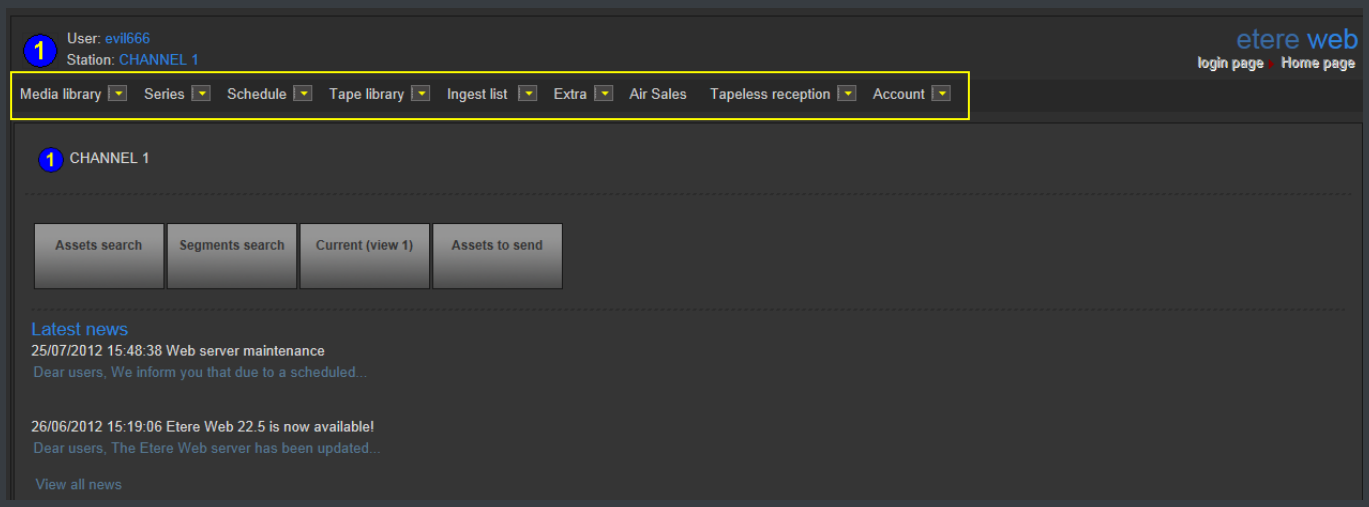
▼ 5.7 ETEREWEB: Post-Production Integration

Etere's NLE integration will allow stations to achieve a tight integration with NLE systems, without using insecure "hot folders" or "ftp open sites" but including full tracked uploads (i.e. digital receipt of files) and immediate workflow triggering. EtereWeb is best solution for integrating NLE systems (e.g. FCP, Avid, Edius) with the station's broadcast workflow; it provides non-linear editors with an authentication web portal for managing media contents through a user-friendly interface:



EtereWeb web service supports all major browsers including Microsoft Internet Explorer, Mozilla Firefox and Apple Safari; thus ensuring the reliability and quality of the service. 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:



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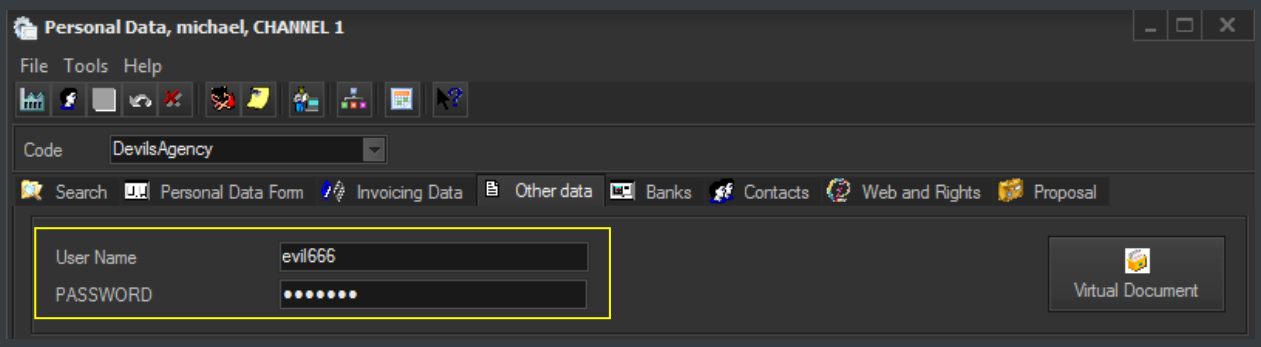
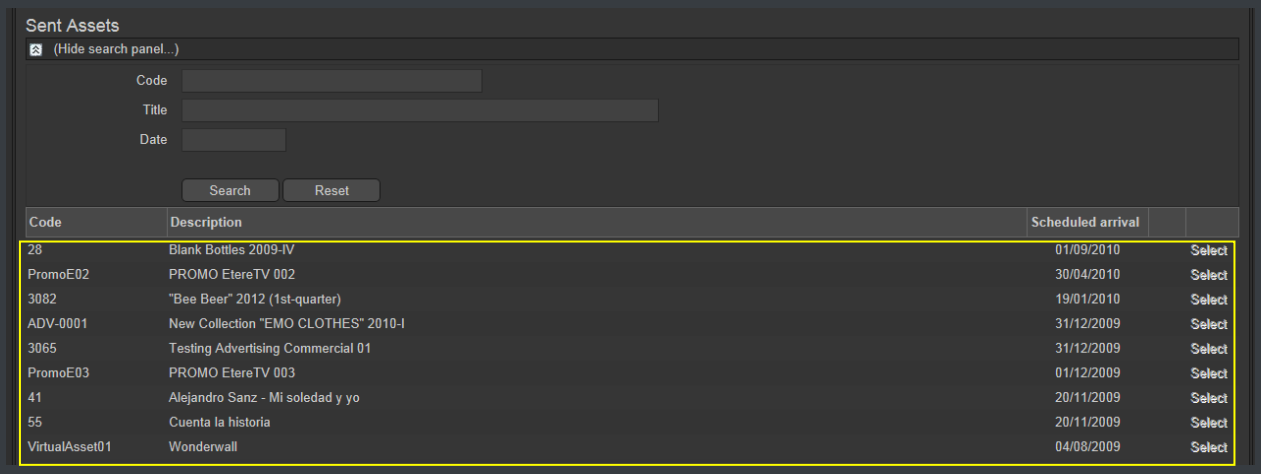
▼ 5.7.1 Authenticated access and rights

In order to ensure that only authorized persons access the web service, EtereWeb counts with an encrypted authentication method on which users must count with a username and password in order to enter the web portal:



▼ 5.7.2 Digital Delivery

Tapeless Reception is an extension of **EtereWeb** designed with the purpose of offering an efficient solution for digital content delivery between external agencies and stations, it 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:



Etere provides **Tapeless Reception** to allow remote clients to deliver digital content into the library, this web portal will permit other station's areas (e.g. NLE systems, News providers, MAM systems) to easily and safely upload content (and its related metadata) into a web server; once content is delivered (i.e. uploaded), a post-upload workflow (e.g. nearline archiving) is automatically triggered and a confirmation email is sent to the deliverer (attaching a proxy video) and the station operator.

Additionally, a customizable security policy will allow the station to determine different levels for accessing the files delivered through the web portal, thus making possible, for example, to dictate that a certain web user (e.g. NLE system) will be allowed to retrieve only its own delivered files whereas another web user (e.g. MAM system) to retrieve its own delivered files and also other user's files.

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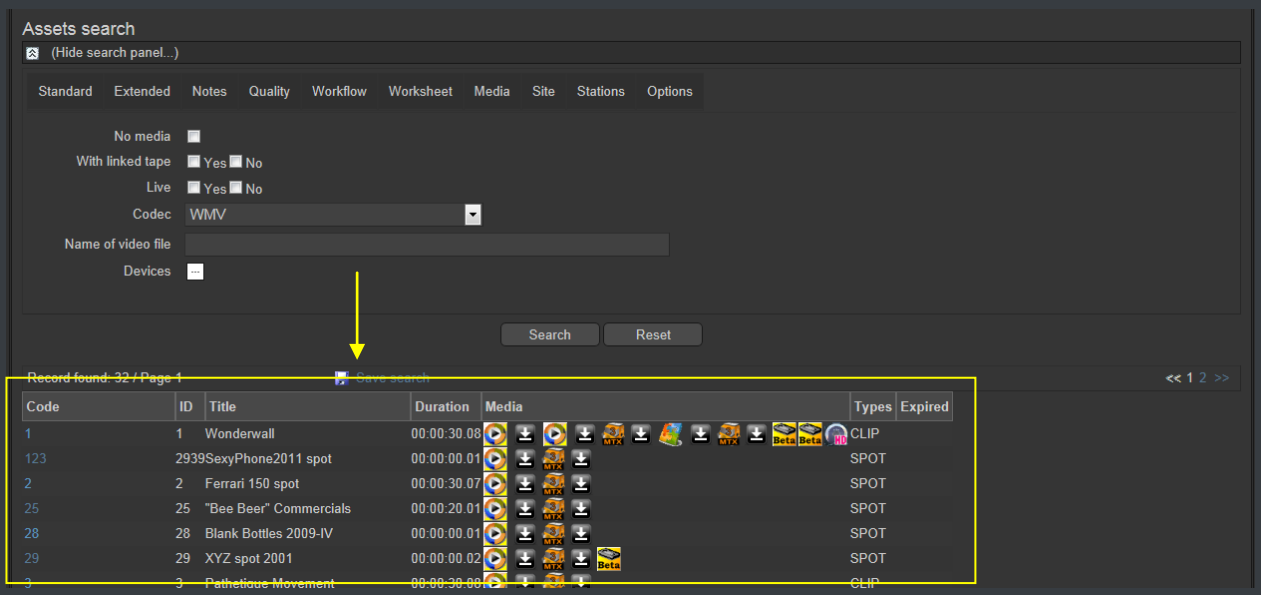
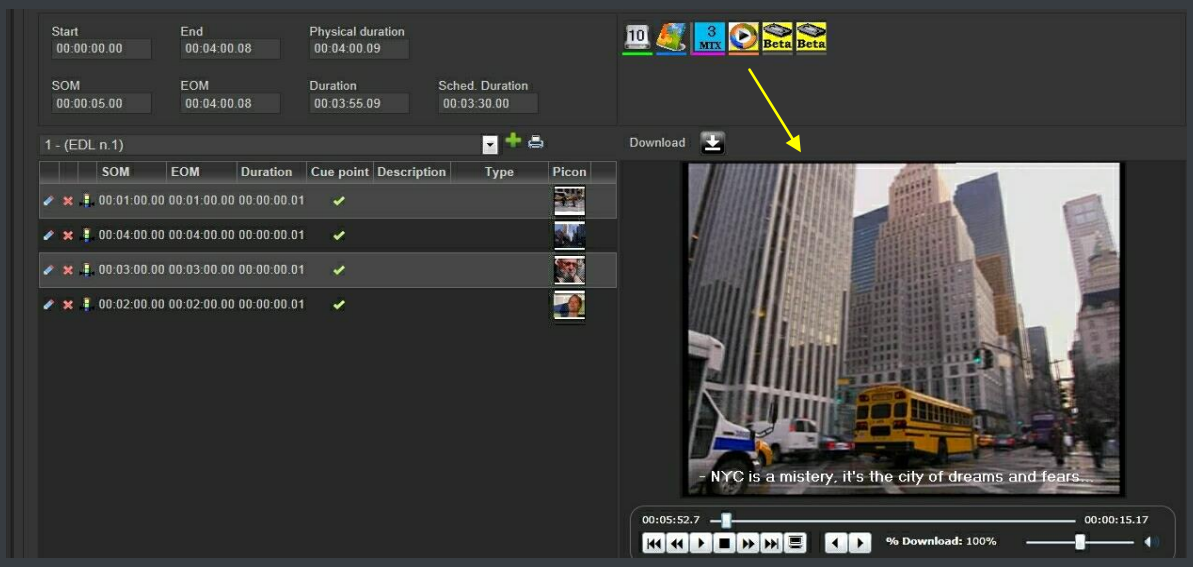
▼ 5.7.3 Search, retrieval and preview

The Quick and robust search engine of **EtereWeb** allows users to easily search and preview assets, even during the search:



The Media tab holds information regarding the media associated to the asset, time code details and EDL configuration. By double clicking on any media item, if available, it will be available the preview and download of the asset:



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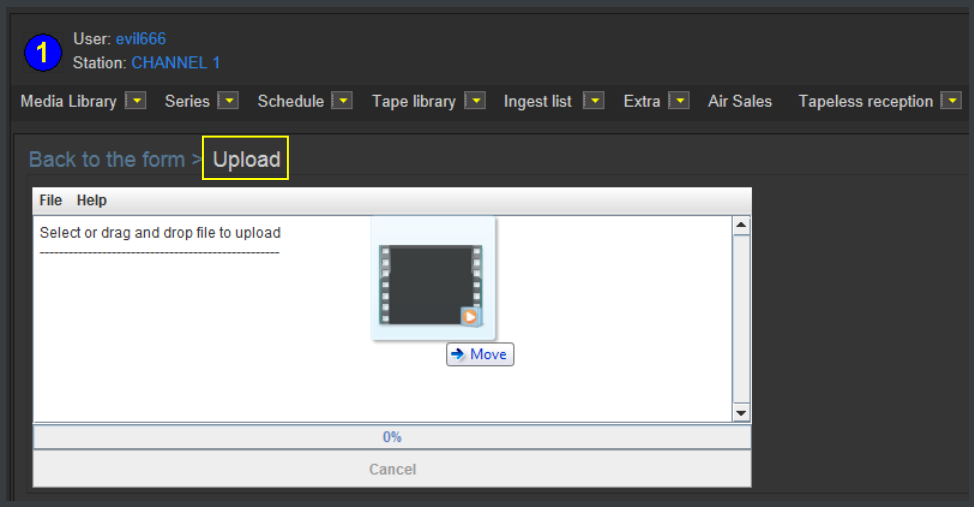
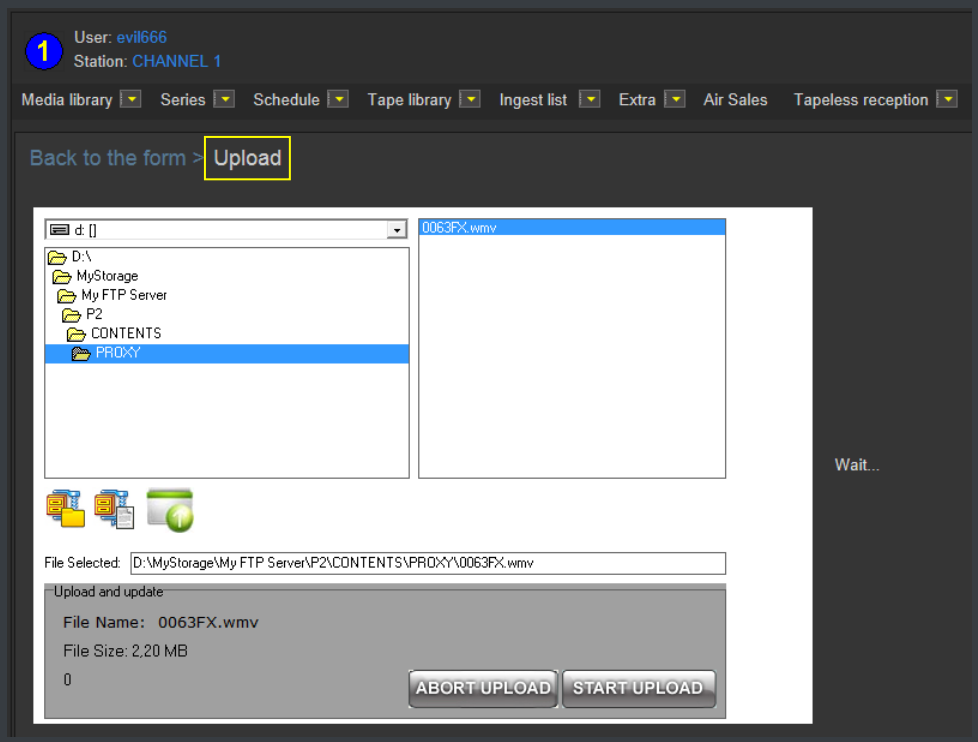
▼ 5.7.4 Selective upload interface

EtereWeb allows uploading media files into the server through a simple and intuitive wizard procedure. Depending on the upload interface set in the system, it will be possible to upload the media file using either a java-applet or an active-x interface:

- **Java-Applet**: This interface allows dragging and dropping the media file(s) to be uploaded from the file explorer into the web browser:



- **Active-X control**: This interface allows browsing for the media file(s) to be uploaded, being also possible to create a zip file for uploading an entire directory:



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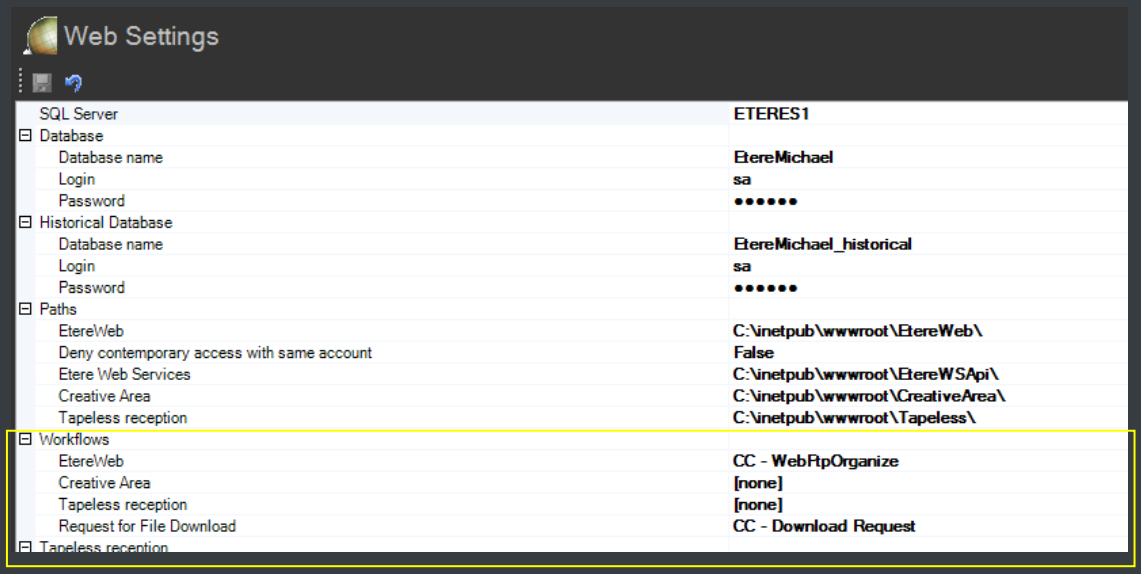
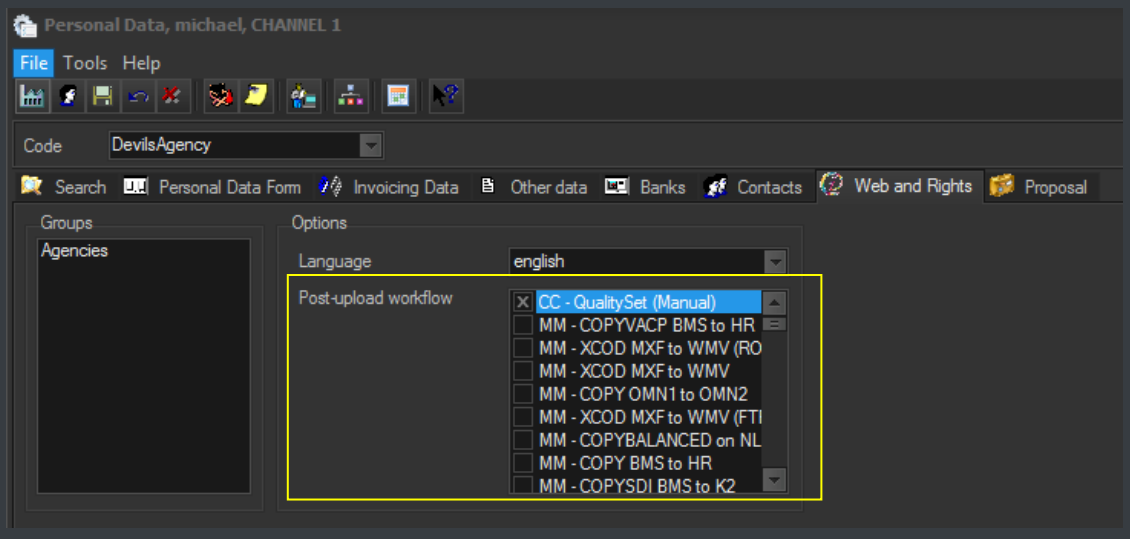
▼ 5.7.5 Pre and Post upload workflow triggering

EtereWeb allows setting different workflows to be launched at different stages of the web management, for example, it is possible to configure the following workflows:

- **Pre-upload workflow**:



- **Post-upload workflows**:



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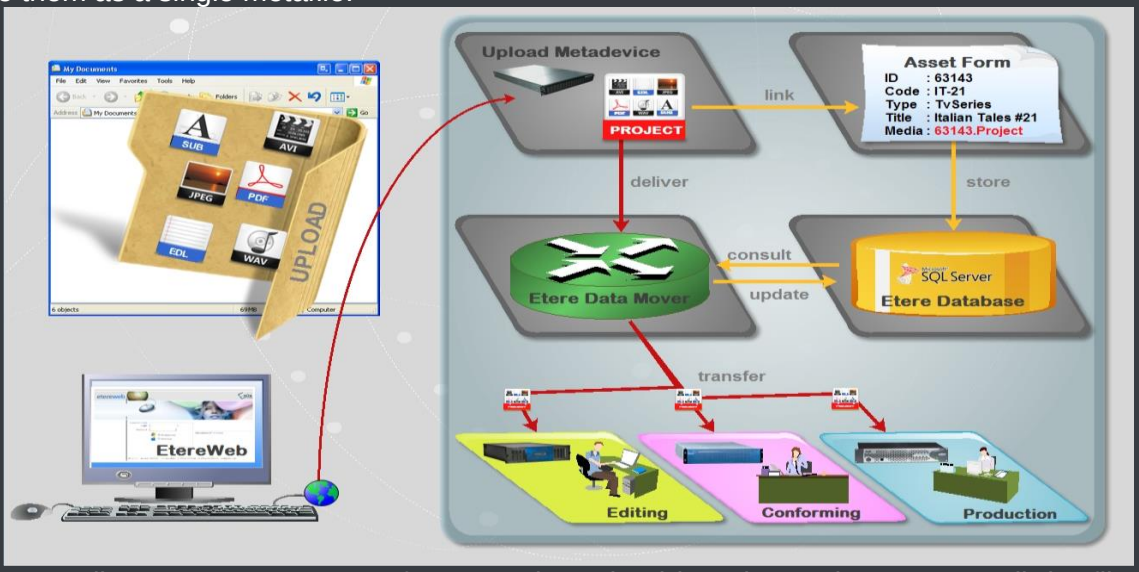
▼ 5.7.6 Multiple file upload

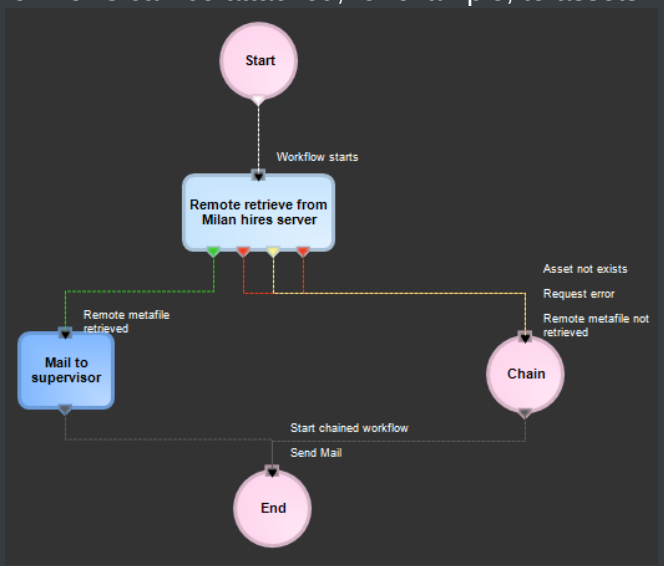
EtereWeb supports not only uploading multiple files with a simple drag and drop action, but also manage them as a single metafile:



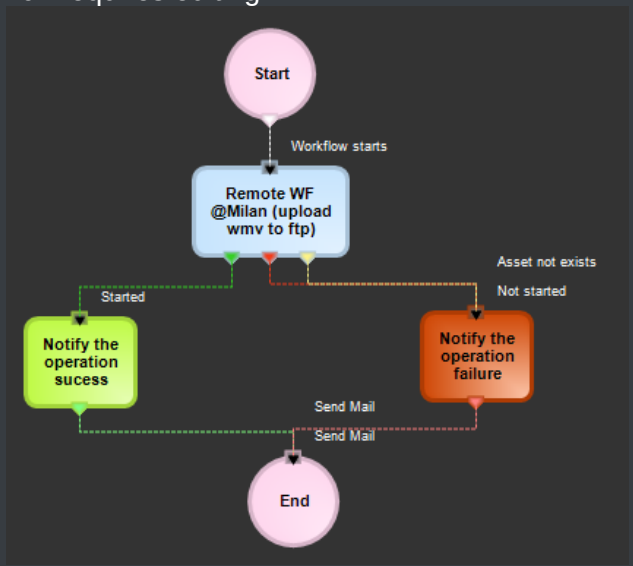
This feature allows NLE systems to, for example, upload into the station's server all the files which make part of a project (e.g. production of promos, conforming of separate scenes, editing of source material, etc.) and deliver them to the related department with a single click and with the reliability of a workflow management.

▼ 5.7.7 Workflow integration with NLE systems

Thanks to the file-based approach of its media management, EtereWeb supports interfacing centralized NLE systems (Avid Transfer manager, Final cut pro server) via workflow. With Etere, it will be possible to transfer video files from and to NLE systems automatically via workflow, these workflows can be attached, for example, to assets which requires editing:



(remote retrieve from a federated system)



(remote upload to ftp)

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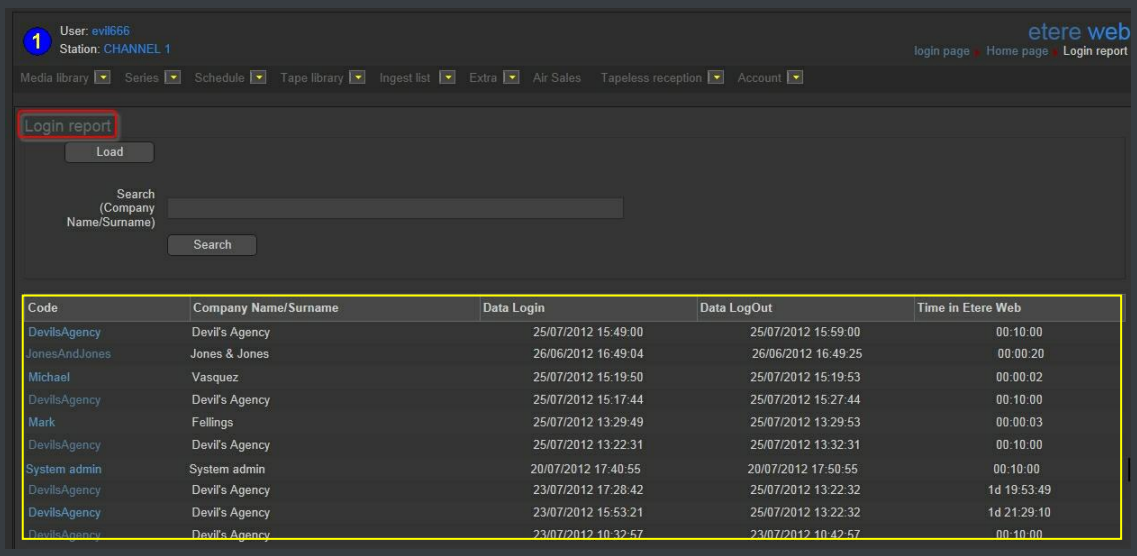
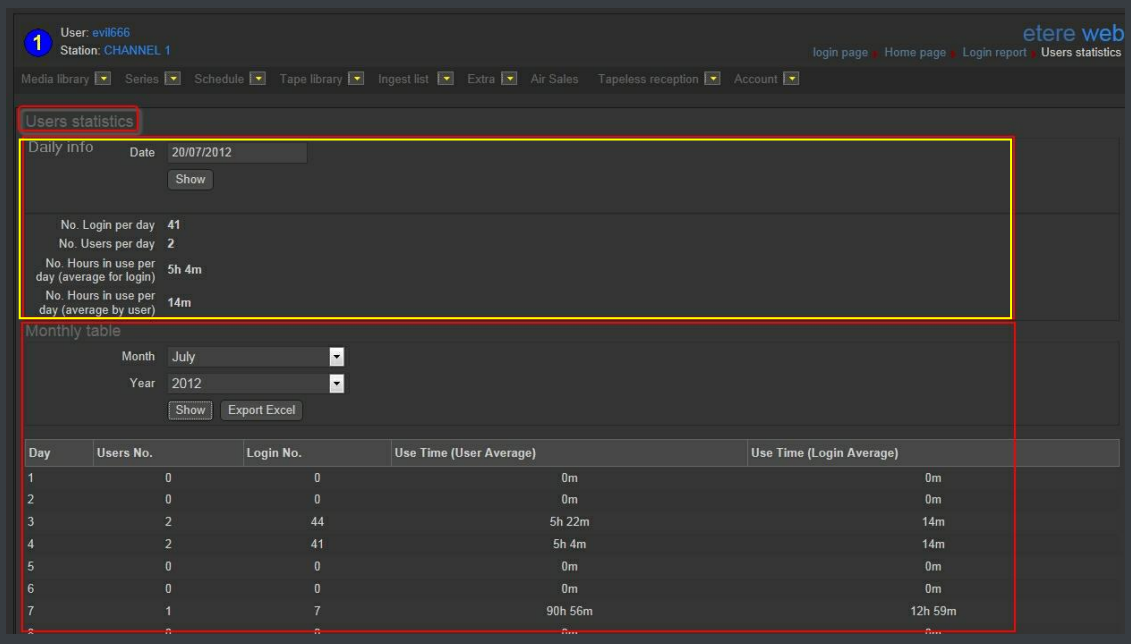
▼ *5.7.8 Centralized monitoring*

EtereWeb provides administrators with two key sections from which they will be able to consult:

- **Login Report** : Detailed information about user-specific accesses:



- **User Statistics** : Overall information about daily and weekly accesses:



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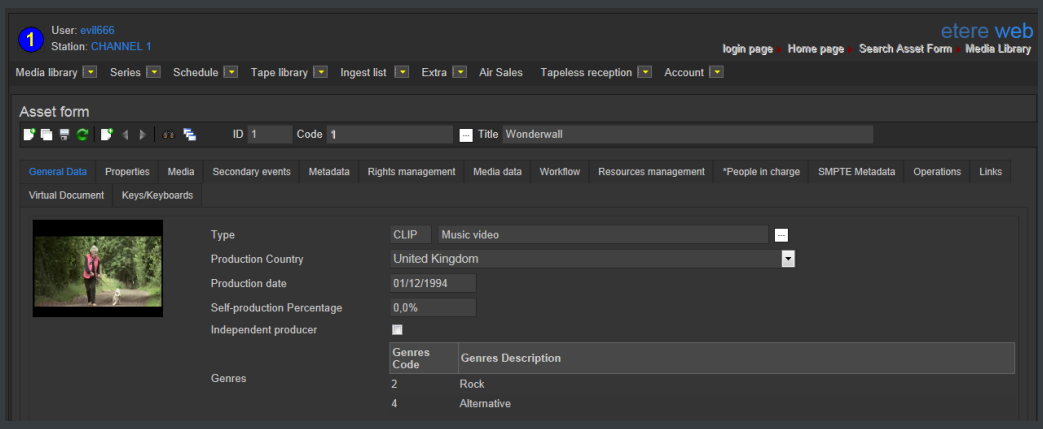
▼ 5.7.9 Remote archive consultation

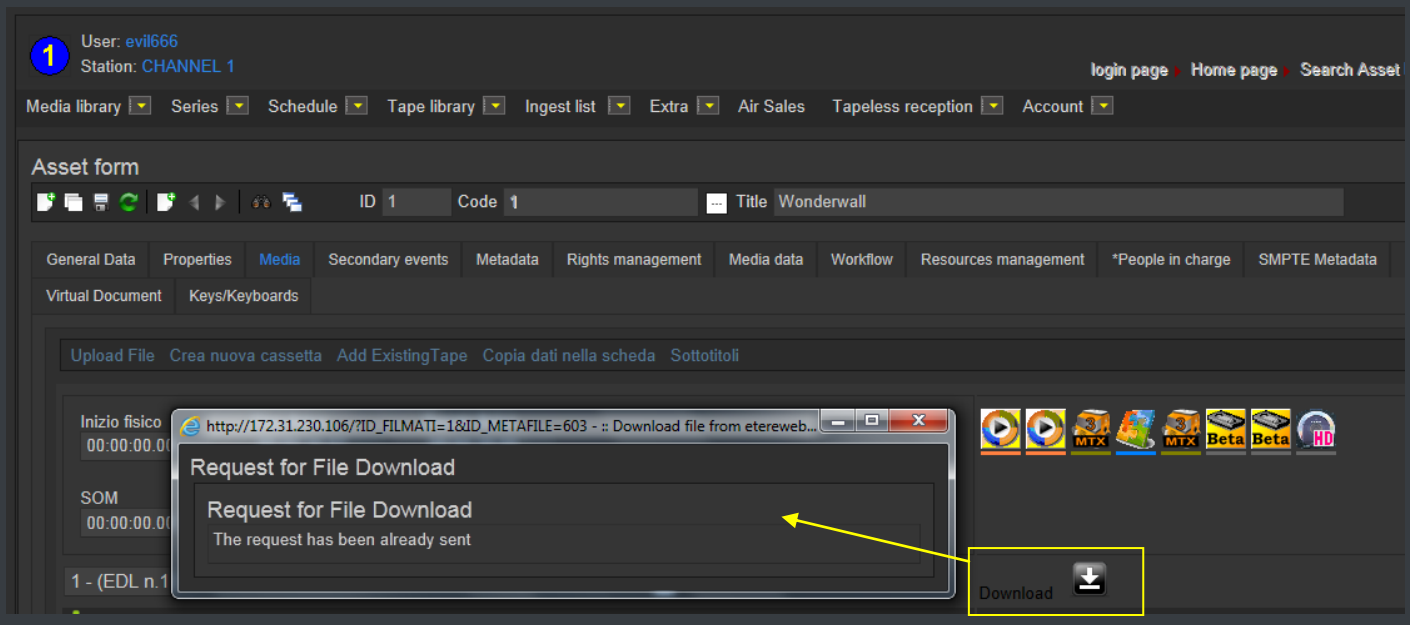
EtereWeb allows web users to check and also control the digital archive remotely via web. Web users will be provided with a fully-tracked access to the most relevant Asset Management operations through a robust search engine and including a wide set of function-specific sections (i.e. general information, media, properties, metadata, rights, technical data, workflows and much more).



Specially, a section dedicated to the media management will provide information regarding all media files associated to the asset, indicating for all of them the timecode details and EDL configuration with further preview/cut/download/upload capabilities.

▼ 5.7.10 User Permissions

EtereWeb allow stations not only to share the right files to the right persons but it also allows sharing contents with the right permission levels; this capability is based on granting/denying function-specific permissions through Etere Worksheets, the module that allows web users to request temporary permission for specific functions (e.g. download a file linked to a certain asset):



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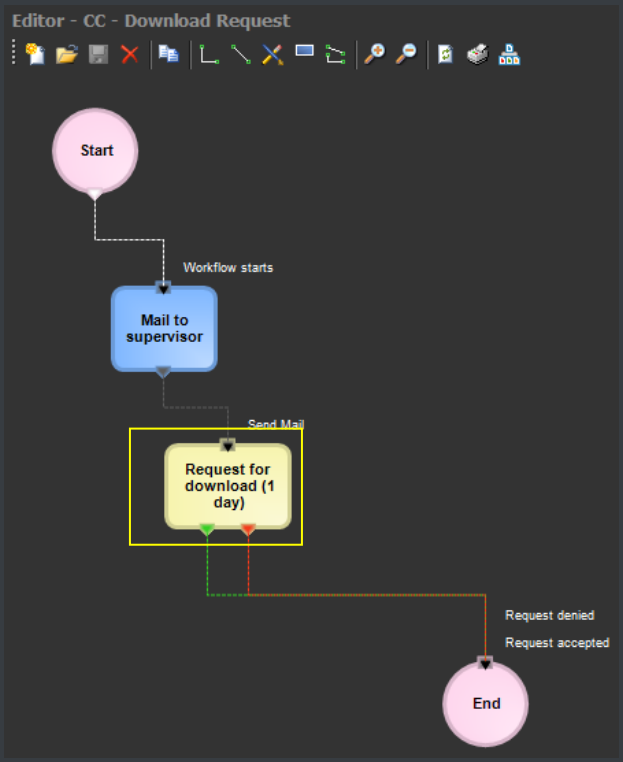
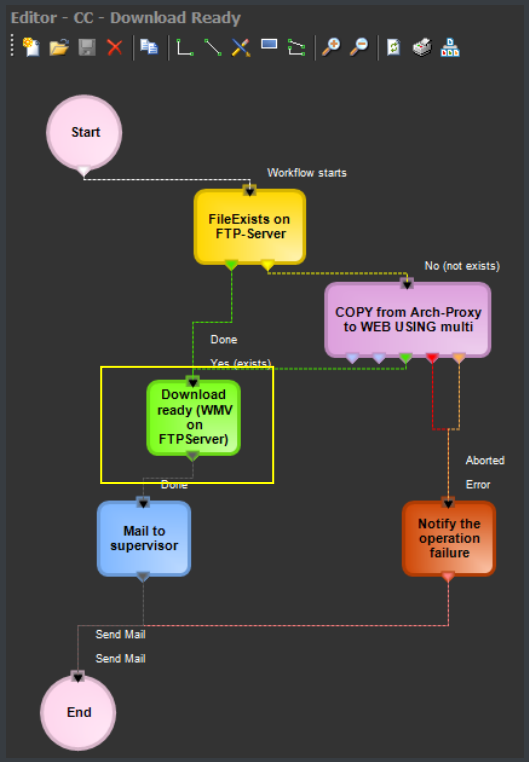
Web requests are managed via workflow to allow a custom and automatic launch of worksheets:

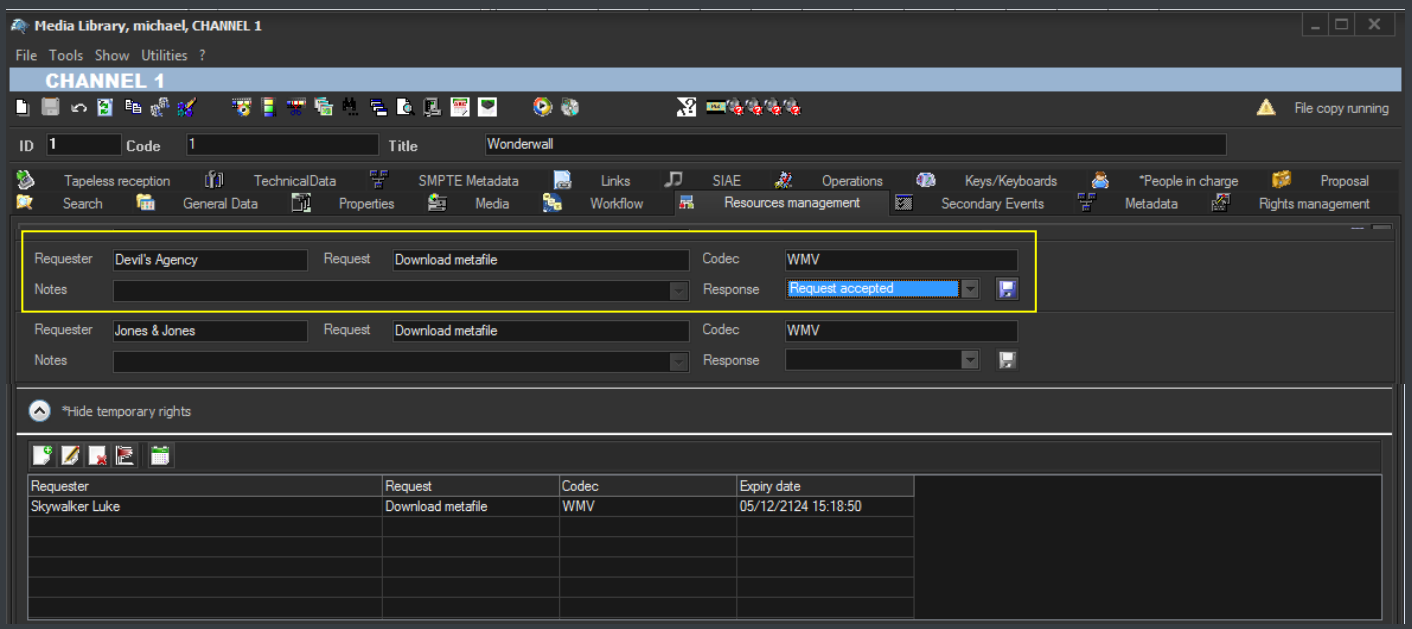


(download request)



(download ready)

Supervisors count with a dedicated interface for viewing pending requests and accept/deny them:



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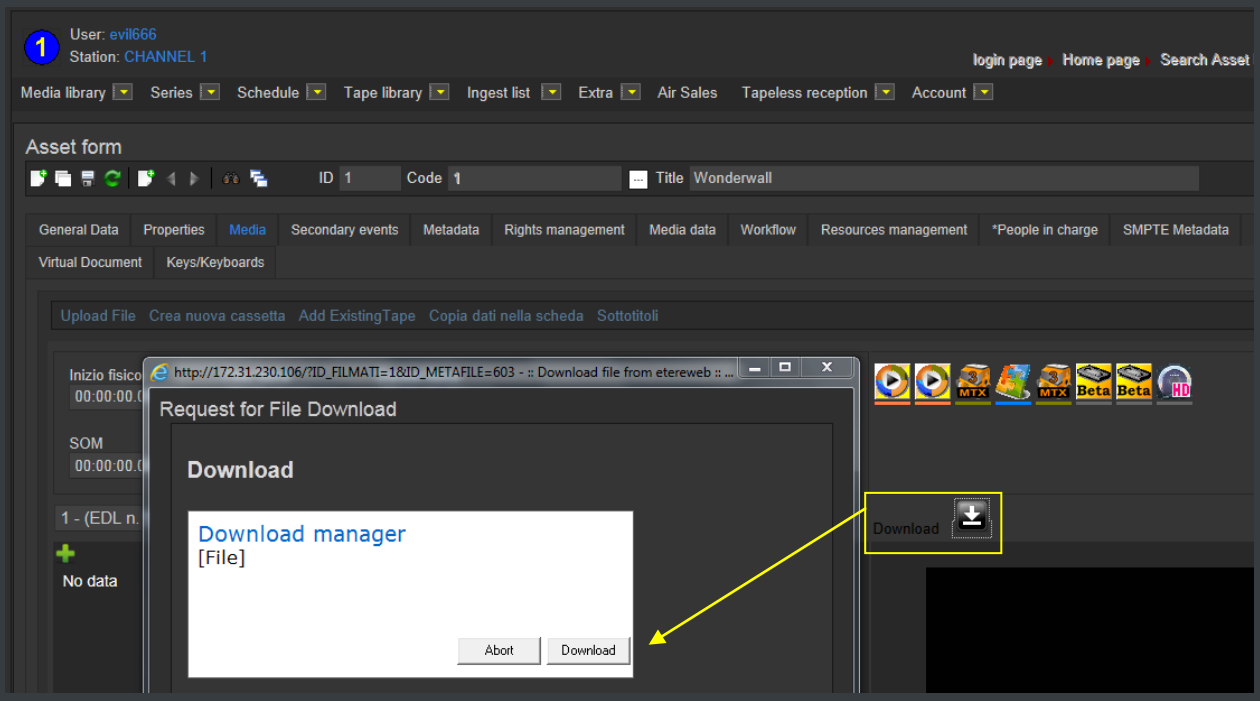
Once the requested is evaluated, web-users will automatically receive an email notification containing the information (e.g. ID, codec, fixed note and an evaluation note) about the asset for which the request has been performed. The email notification will be sent to the email specified in the personal data of the web-user who performed the request, this, depending on the entity type:

From:	supervisor@mytv.com [system-profile email account]
To:	user5@agencies.com [personal-data email account]
Subject:	WORKFLOW INFO -----(workflow status report)----- Personal data ID : 7 [personal-data code] workflow: CC - Download for NLE [workflow holding the web request action] status: Workflow active result: 0 message: <empty>

Finally, in case the request is accepted, the web-user will be now allowed to download the requested file(s) through EtereWeb:



▼ *5.7.11 Security Integration*

EtereWeb works perfectly behind routers 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. Moreover, as a further security level, Etere provides direct authentication of web users through the station's active directory domain.

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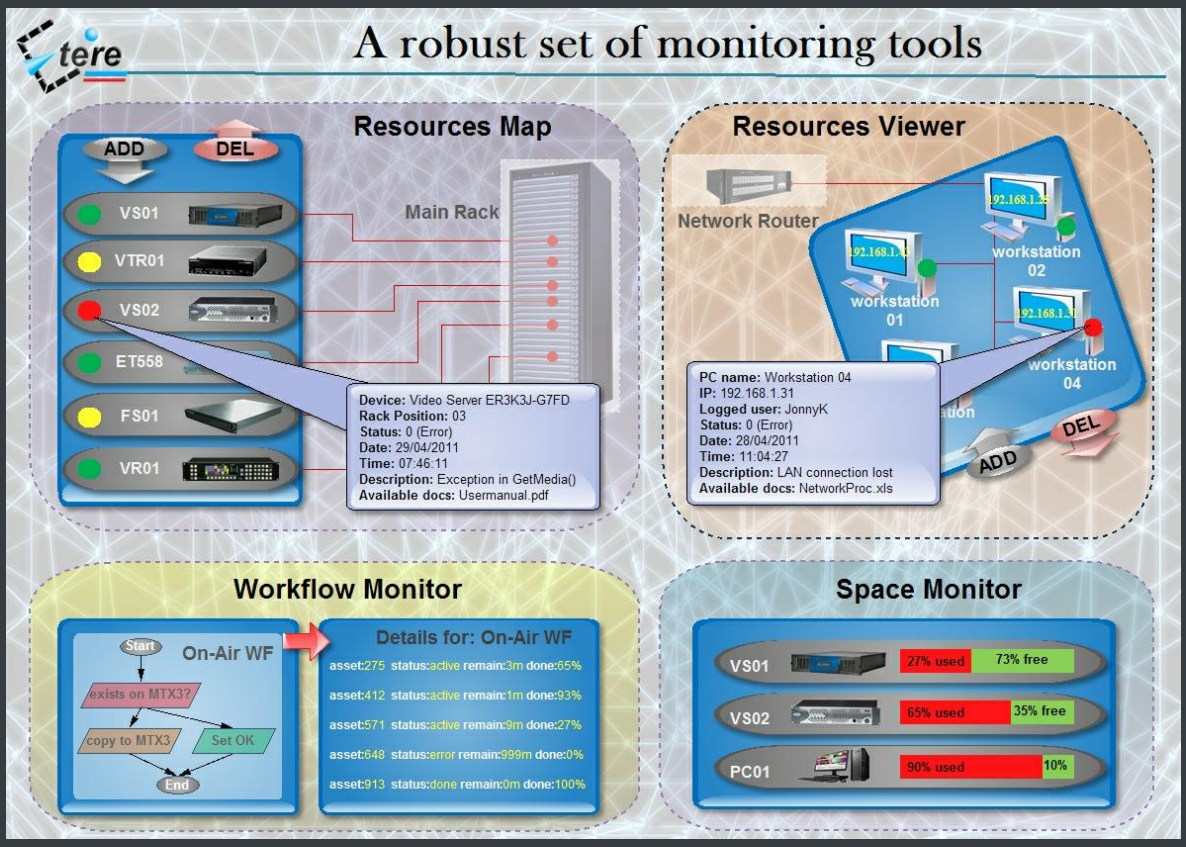
▼ 5.8 MONITORING CONSOLE: A Complete SNMP Monitoring

The **Monitoring Console** is a tool developed to help supervisors to have a global overview of the system, permitting them to monitor any Etere module which collects and stores its management information (errors, warnings, etc.) through the locally installed **SNMP Agent** which sends messages containing this information to a remote console which in this way monitors all the modules; through this console the operator can decide about the receiving policies (content, validity, filters, etc.).



The **Monitoring Console** is a key part of the broadcasting process because it permits to have a complete report of the way the Etere modules are working, allowing to catch errors, store them in a database for a further analysis and also forward them to an another console (forward the message to the pertinent operator who is intended to solve it) and thus saving time and resources on real-time which are invaluable assets in the broadcasting business.

▼ *5.8.1 SNMP monitoring support*

In order to improve monitoring of devices, modules and workflows all Etere components are automatically subscribed to an SNMP Service, so it will monitor the periodic heartbeats sent via SNMP by the components. The Monitoring Console detects missing heartbeats and sends both a visual-alarm and an e-mail notification to the operations department. Owing to the use of this feature, the general health of the Etere system can be further examined to isolate raised faults.

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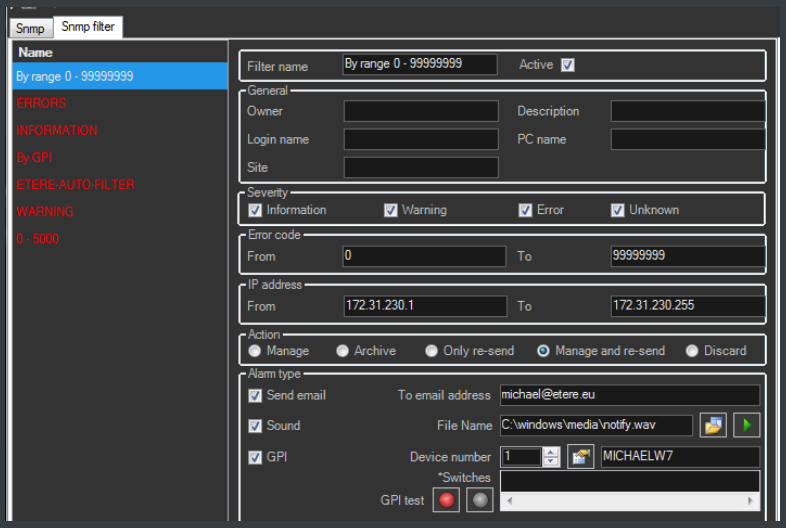
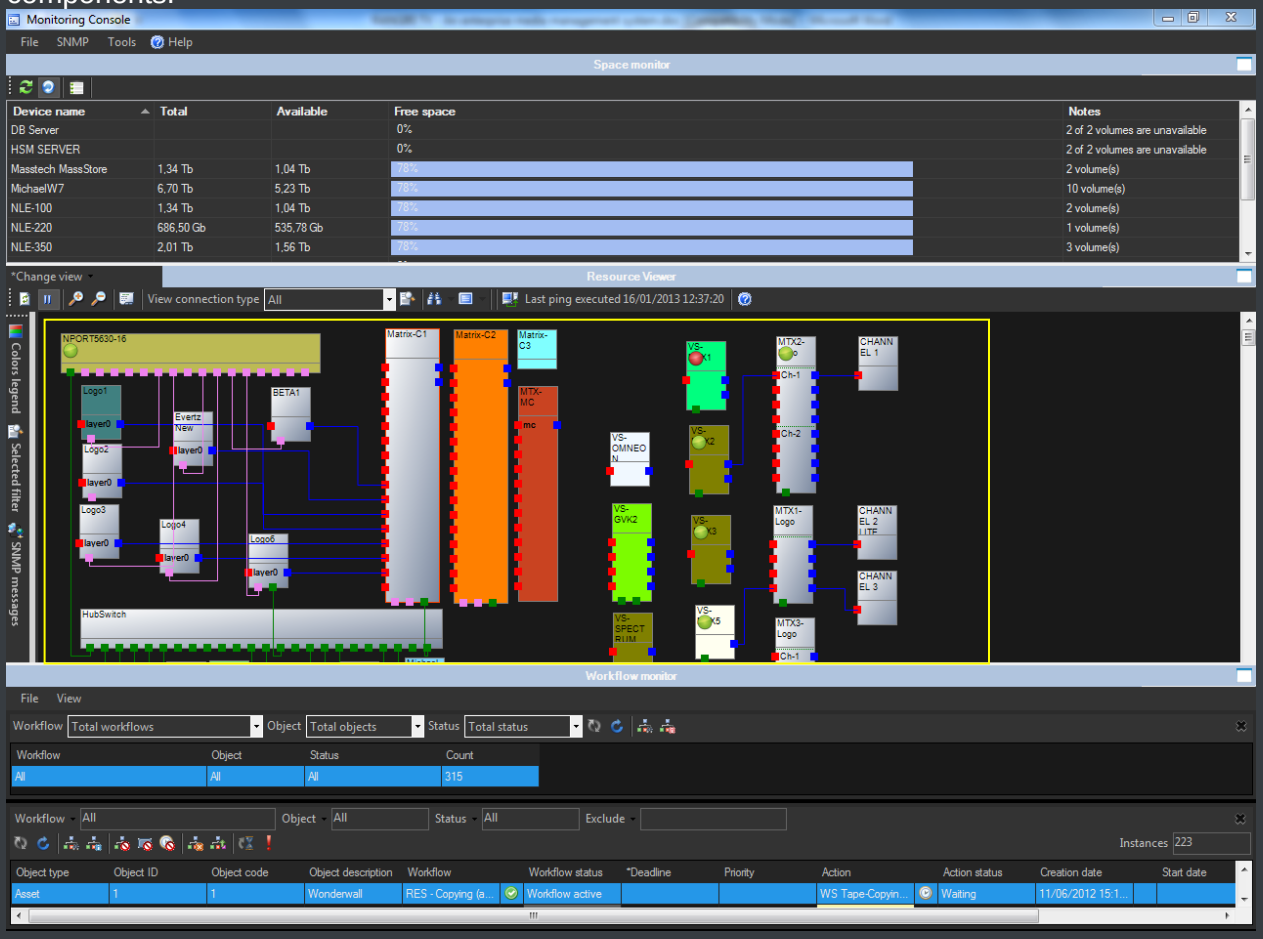


▼ 5.8.2 Graphical real-time monitoring

In order to improve monitoring of modules and devices, all Etere components are automatically subscribed to the Etere SNMP Service, so it will monitor the periodic heartbeats sent via SNMP by the components.



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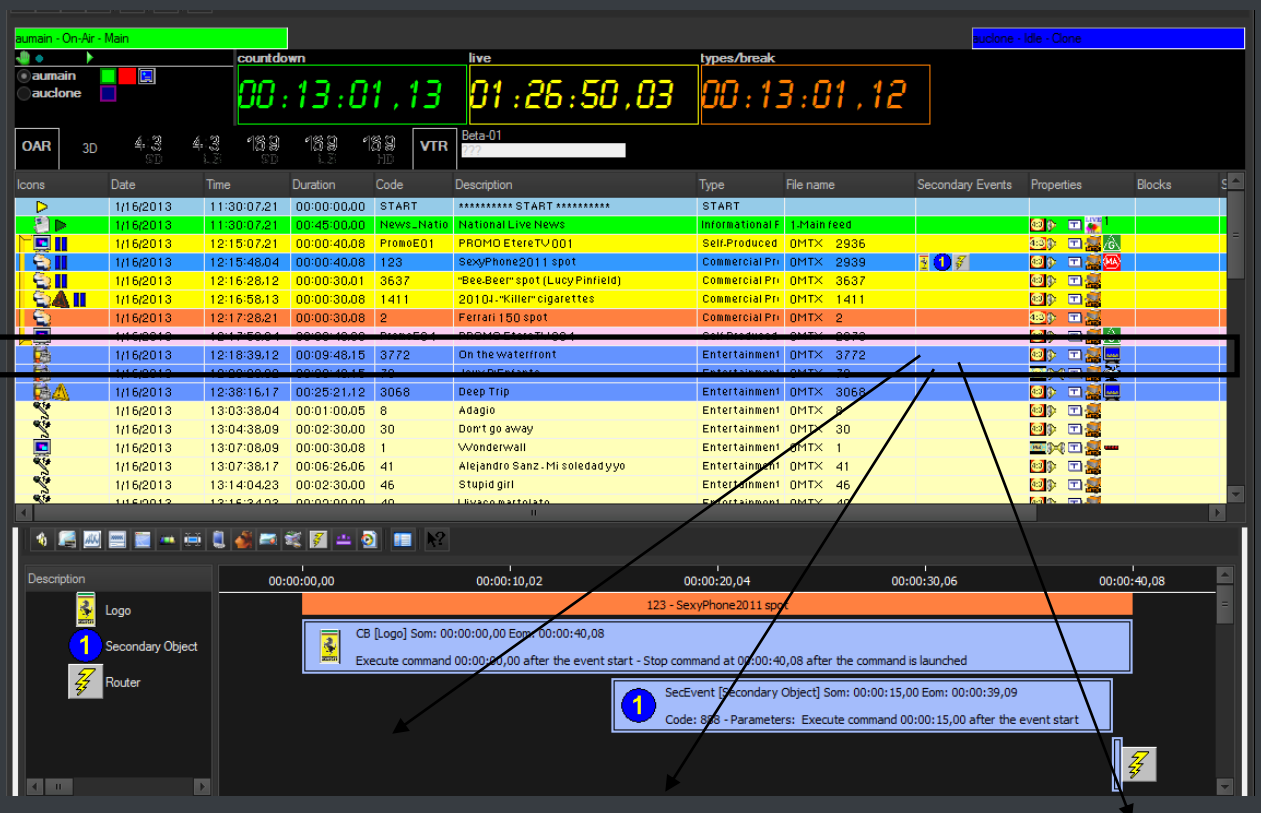
▼ 5.8.3 Wide set of features

The Monitoring Console is smartly divided across different panels to allow a quick monitoring of specific functions. Tools included in this module are listed below:

Module	Description
SPACE MONITOR	Visualize the storage space of all devices for which ***metadevices*** are defined (e.g. video servers, workstations, servers, etc).
RESOURCE MAP	View and allocate resources (e.g. workstations) across the system, thus allowing to, for example, indicate the rack position of the workstation on which an error has occurred.
WORKFLOW MONITOR	Consult all workflows (transfers, checks, requests and much more) executed on the certain station, allowing also to view and manage them each one of them.
RESOURCE VIEWER	Show a map of all resources configured in the system, showing in real-time their connection status and SNMP messages.
STATUS BAR	Display the real-time status of monitoring background tasks such as "SNMP real-time checking", "Processes monitor", "Check pingable devices from this console" , "Collect and check PC counters" and "GPI signals".

▼ 5.9 AUTOMATION: Reliable Playout System

Automation is the powerful, reliable and modular playout system able to enhance the station 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, etc.:



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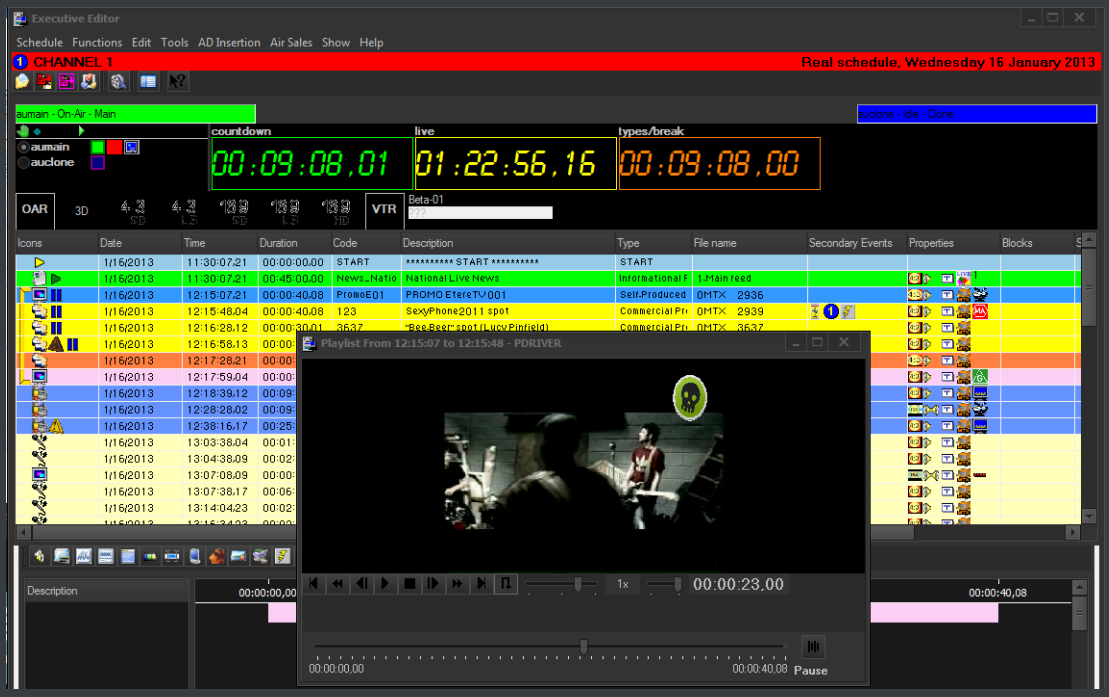
▼ 5.8.1 Secondary Events Manager

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:



▼ 5.8.2 Live Events Management

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:

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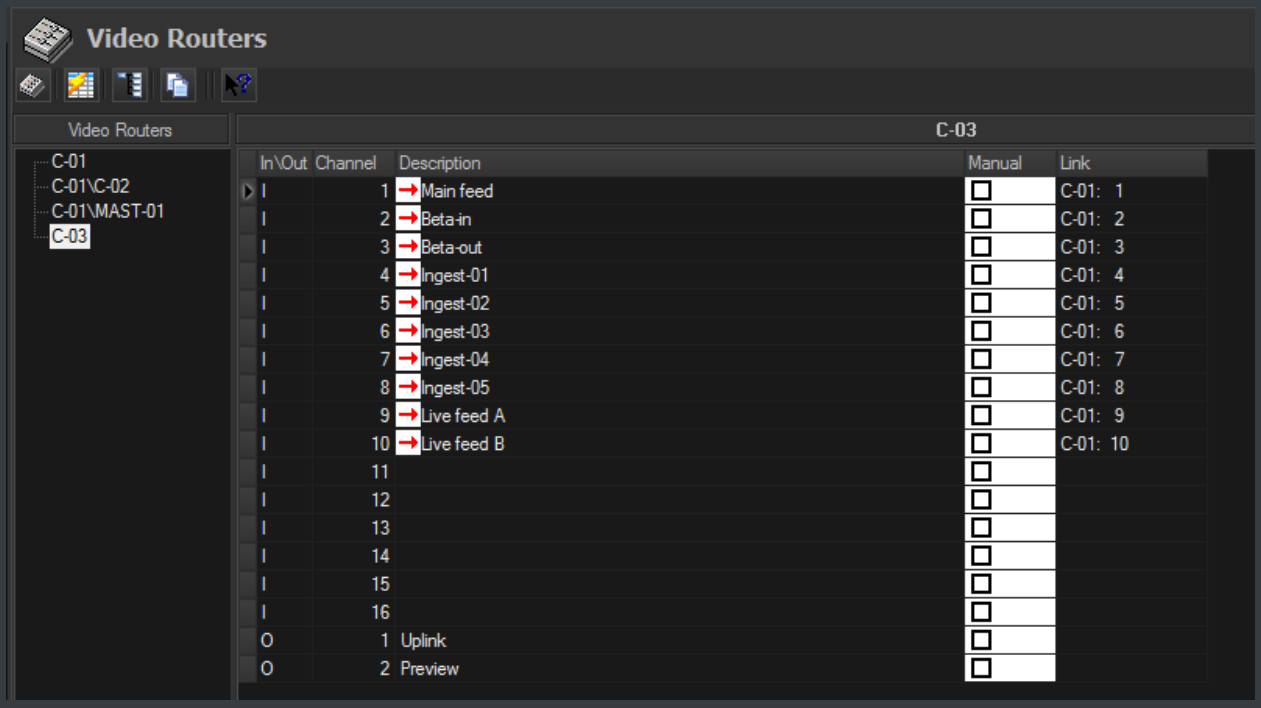
Additionally, Etere allows managing one video router per automation, being possible to create links between routers so when a channel is switched in the Main Router; the equivalent channel is also switched in the Backup Router:



▼ 5.8.3 As-Run Logging

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:

```
[-  ] 04/28 15:09:20.593 |            |Log Started
[  APP  ] [2010-04-28 15:09:20.21AUTOMATION RESET
[  APP  ] [2010-04-28 15:10:31.05AUTOMATION IS ONAIR
[  CLIP  ] [2010-04-28 15:10:30.17Y, 210136785149, 22  , 0LIVE00000    , Live News , F, 00:00:00.00, 00:59:59.24, 01:00:00.00
[  CLIP  ] [2010-04-28 16:10:01.19Y, 210135546001, 28  , 0MCL  CBBot   , B-Bottles , F, 00:00:00.00, 00:00:08.18, 00:00:08.19
[  CLIP  ] [2010-04-28 16:17:03.21Y, 210136107001, 70  , 0MCL  JeuxD   , Jeux D'E  , T, 00:00:00.00, 00:30:00.00, 00:30:00.01
[  CLIP  ] [2010-04-28 16:47:08.02Y, 100000008996, 3   , 0MCL  PathMov, PathMov  , T, 00:00:00.00, 00:08:12.24, 00:08:13.00
[  APP  ] [2010-04-28 16.48.13.20PLAYOUT COMMAND: STILL
[  APP  ] [2010-04-28 16.48.14.19PLAYOUT COMMAND: RESTART_FROM_CURRENT
[  APP  ] [2010-04-28 16.48.20.07PLAYOUT COMMAND: STILL
[  APP  ] [2010-04-28 16.48.23.01PLAYOUT COMMAND: RESTART_FROM_NEXT
[  CLIP  ] [2010-04-28 16:48:23.01Y, 100000008998, 32  , 0MCL  Minuet  , Minuet    , T, 00:00:00.00, 00:11:10.24, 00:11:11.00
[  CLIP  ] [2010-04-28 16:52:12.06Y, 100000009000, 33  , 0MCL  Prima   , Primavera , T, 00:00:00.00, 00:09:19.24, 00:09:20.00
[  CLIP  ] [2010-04-28 16:54:13.12Y, 100000009003, 49  , 0MCL  Vivace  , Vivace    , T, 00:00:00.00, 00:04:59.24, 00:05:00.00
[  APP  ] [2010-04-28 16:55:16.11PLAYOUT COMMAND: SKIP
[  CLIP  ] [2010-04-28 16:55:16.11Y, 100000009005, 51  , 0MCL  OdeJ    , Ode Joy   , T, 00:00:00.00, 00:04:59.24, 00:05:00.00
[  CLIP  ] [2010-04-28 16.57.46.19Y, 100000018164, 12  , 0LIVE00001    , Meloldy01 , T, 00.00.00.00, 00.00.14.24, 00.00.14.15
[  APP  ] [2010-04-28 16.59.53.01PLAYOUT COMMAND: EMERGENCY_LIVE_START
[  APP  ] [2010-04-28 17.05.57.05PLAYOUT COMMAND: EMERGENCY_LIVE_END
[  APP  ] [2010-04-28 17:15:35.06AUTOMATION STOP
Log Closed
```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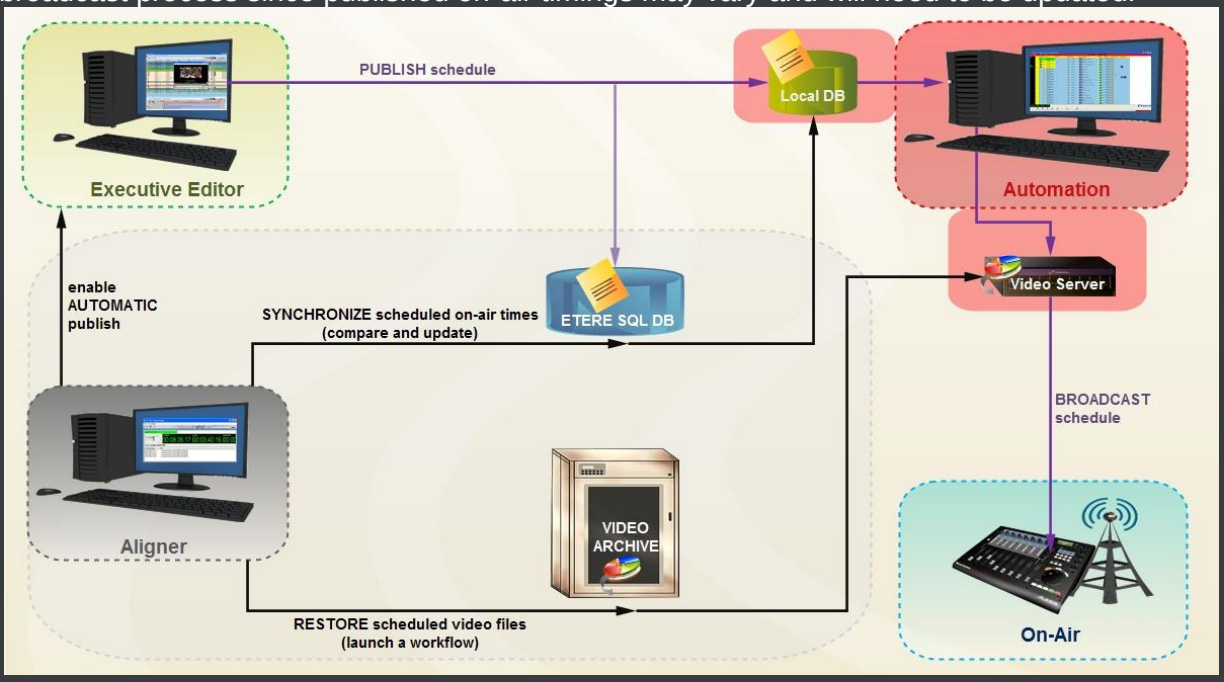
▼ 5.8.4 Synchronized broadcast

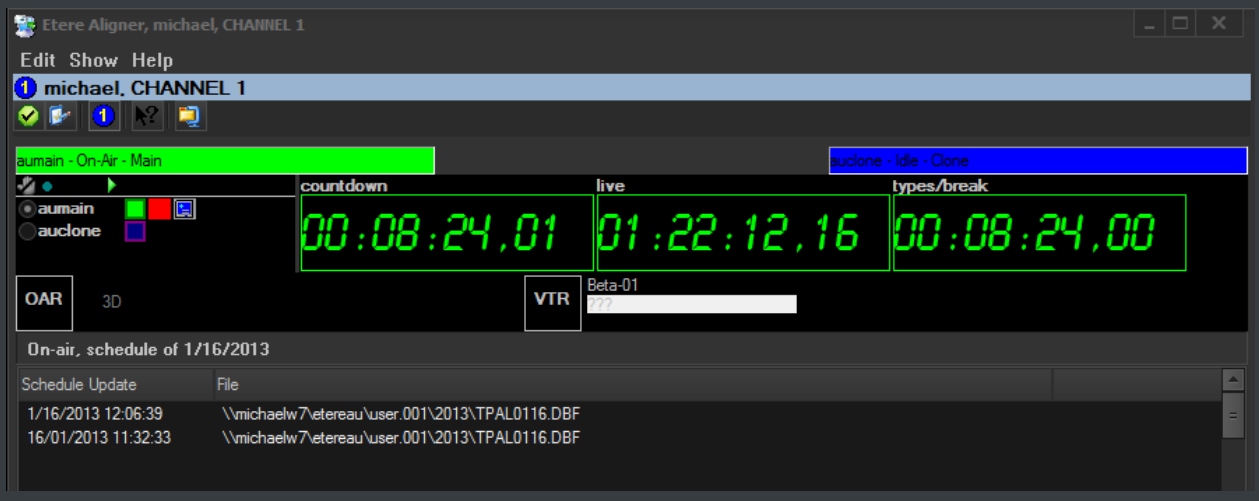
Aligner is the application that maintains the published schedule constantly synchronized, it aligns the independent automation schedule with the Etere stored schedule, this operation is very important for the broadcast process since published on-air timings may vary and will need to be updated:



Etere Aligner provides stations with the following key features on managing broadcast schedules:

- Automatic publishing of the schedule by Executive Editor,
- Ensure consistency of the published schedule by updating it with last changes,
- Launch workflows automatically to restore video clips scheduled to go on-air.

In the Parameters it's possible to specify that the system also carries out publication of the schedule at each **Etere F90** request.



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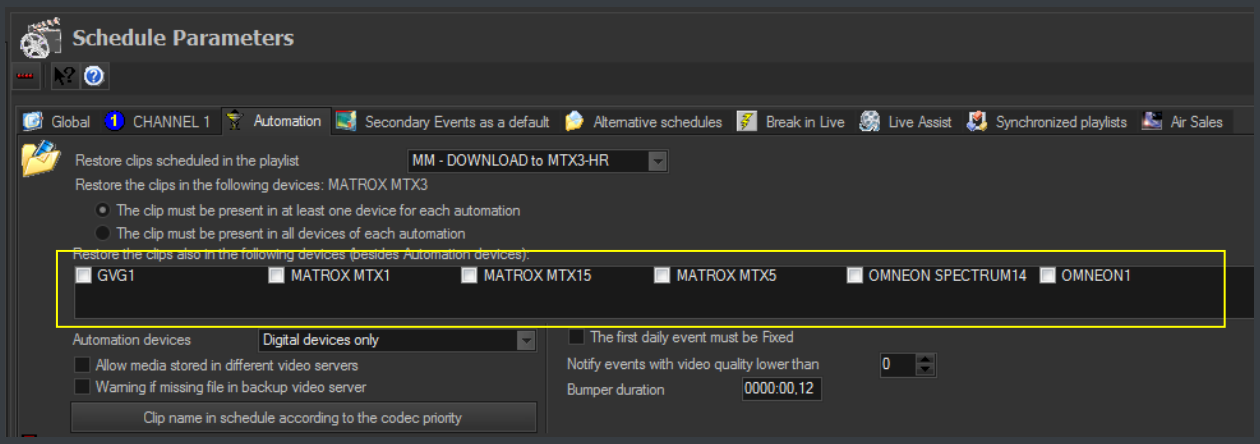
Moreover, **Etere Aligner** allows restoring via workflow all those video files associated to scheduled events and which are missing in the remote archive, either manually or automatically:



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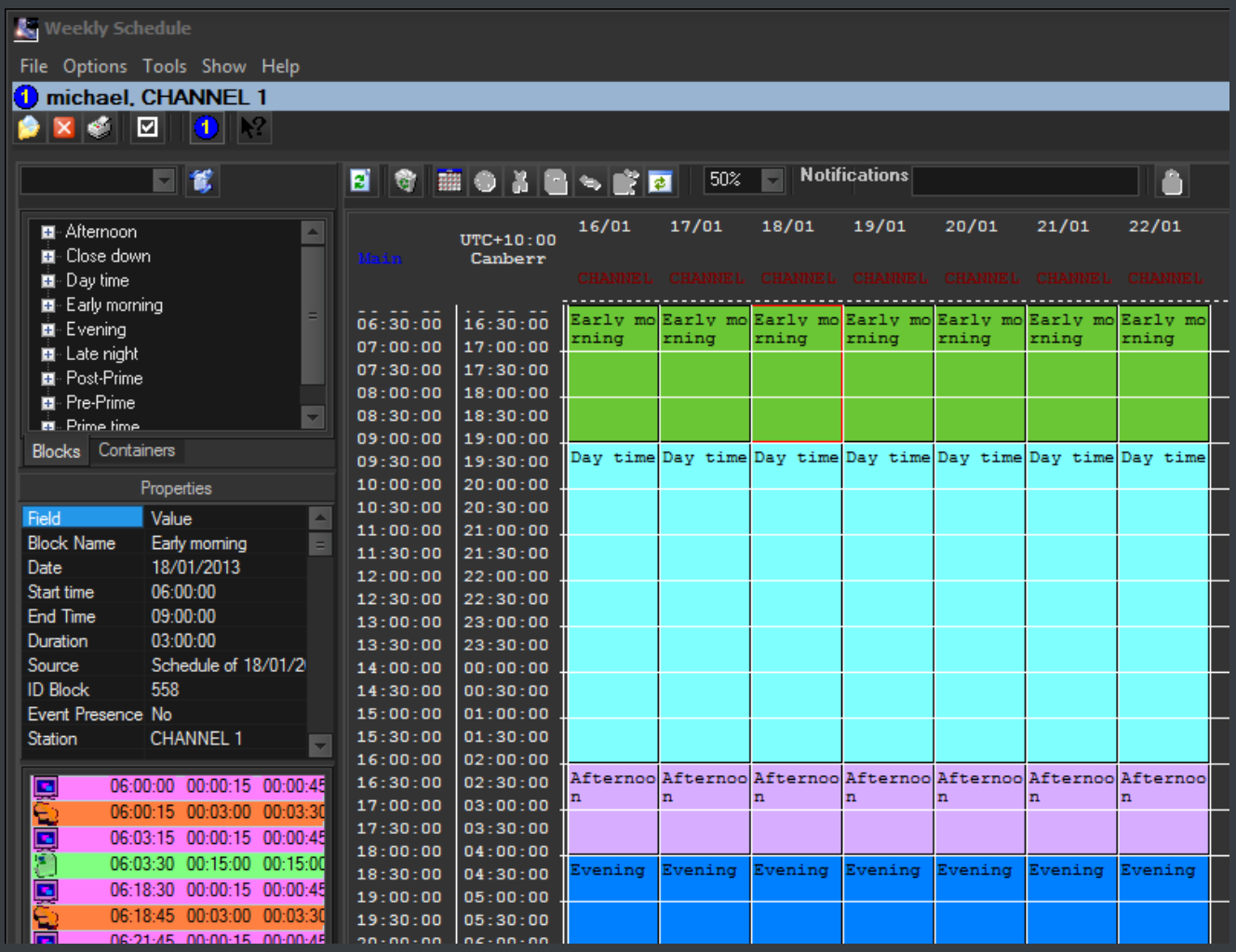
▼ 5.10 AIR SALES: Commercial Traffic Management

Etere Air Sales is a complete, modular and scalable traffic system for the management of the planning and commercial processes of a broadcaster. From planning to playout, it provides specialist application modules to manage sales, planning, presentation, scheduling and invoicing of commercial contents.

▼ *5.10.1 Weekly schedule*

Weekly Schedule is the module that permits to build long-term and frame-accurate schedule grids that will define the traffic playlist, this schedule grid is formed by program blocks which at their time are formed by program segments defined by specific properties (i.e.: time range, duration, program type, price list, etc.):



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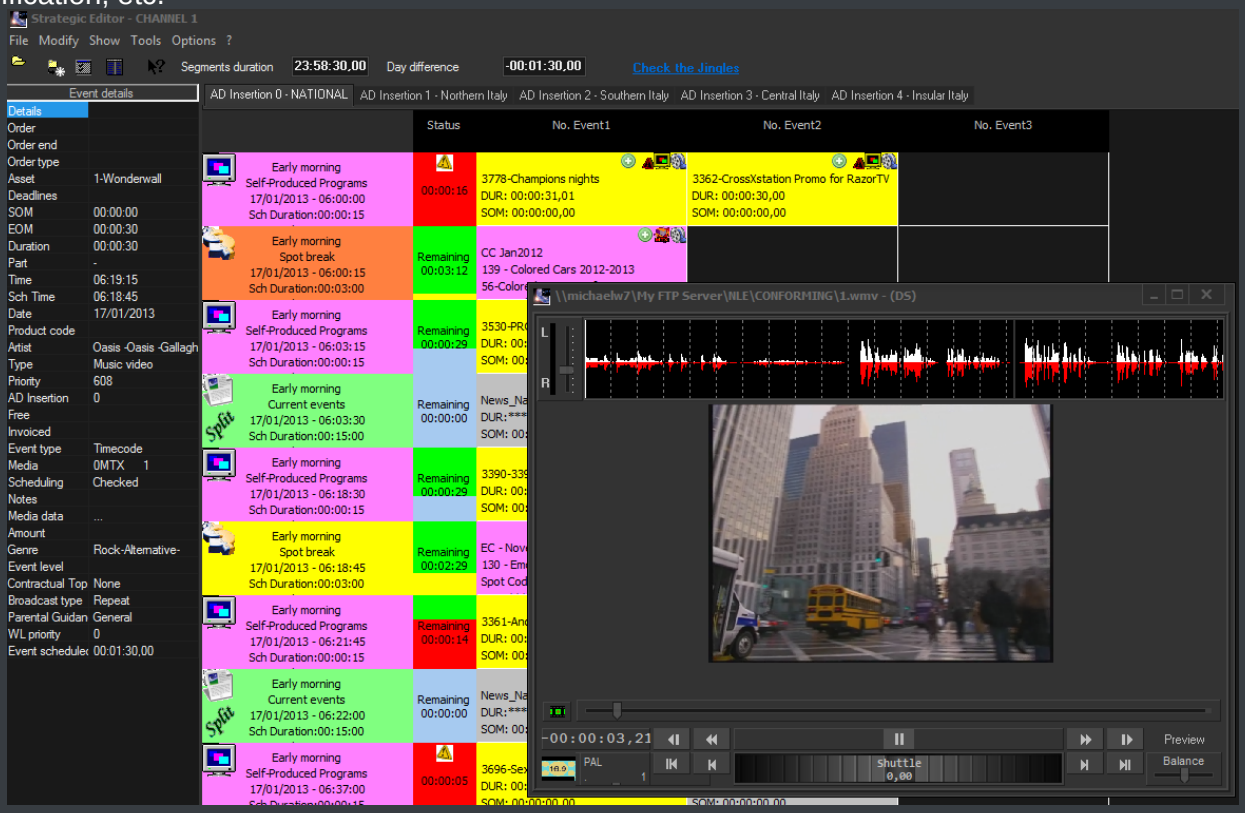
▼ 5.10.2 Strategic Editor

The **Strategic Editor** module provides a high flexibility to the scheduling process, based on a schedule grid structure; it integrates schedules with the assets' database, ensuring a rock-solid scheduling module where only valid events can be scheduled. Moreover, **Strategic Editor** features various facilities such as multiple color displays, intuitive events selection, automatic rights verification, etc.



▼ 5.10.3 Sales

The **Sales** module allows elaborating proposals that includes multiple product details which can be made up by multiple assets (e.g.: for different channels or periods).

A customer-tailored elaboration of Sales proposals is possible thanks to the use of flexible schedule grids improved with key booking features such as an automatic pricing based on day parts (e.g.: breakfast, lunch, dinner and late-night) and a powerful spot placement based on key scheduling criteria (i.e.: top, bottom, priority, rotation or optimization).

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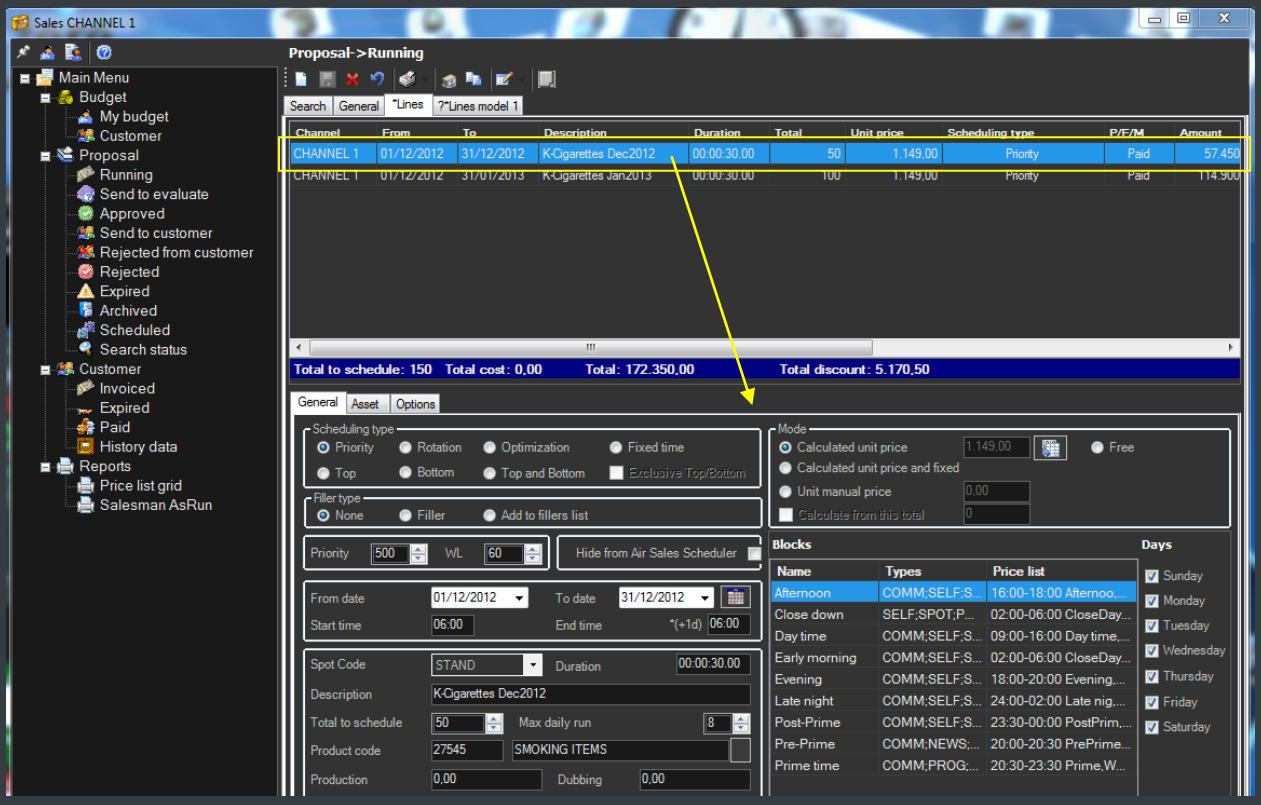
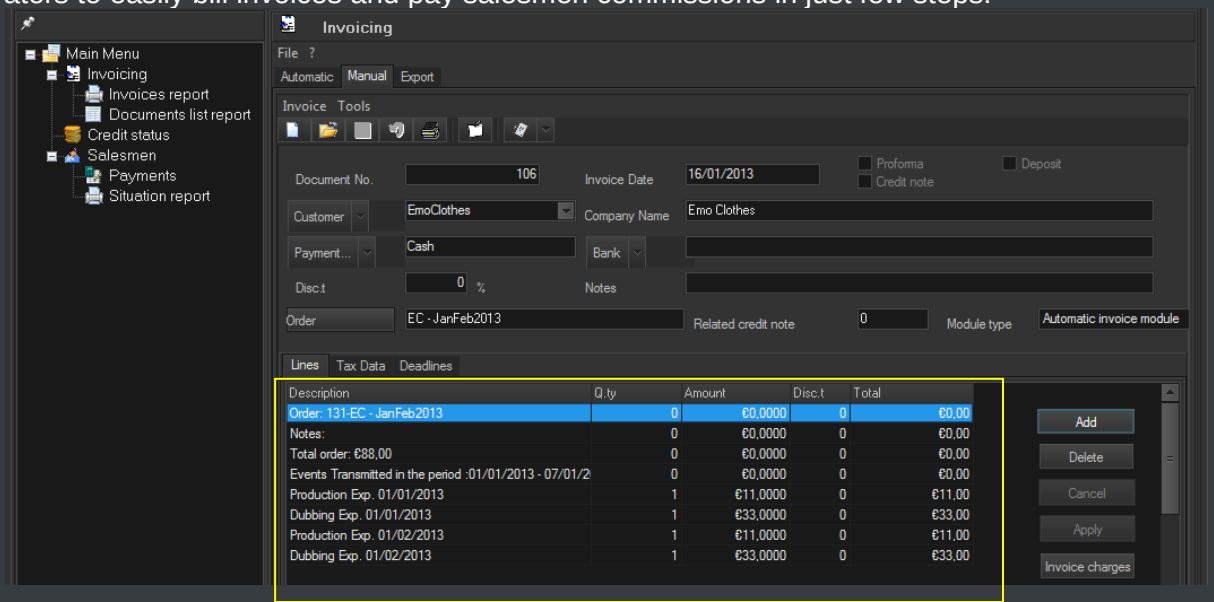


▼ 5.11 MONEY: Billing and Bookkeeping

The invoicing process is the final -and most delicate- stage in the commercial broadcast chain, where all commercial events are reconciled with the accounting department, at this stage, the **Invoicing** module, is the section dedicated to generate, settle and track invoices, it is tightly integrated with all Etere modules to permit a centralized management of invoices including a set of tools that permits operators to easily bill invoices and pay salesmen commissions in just few steps:



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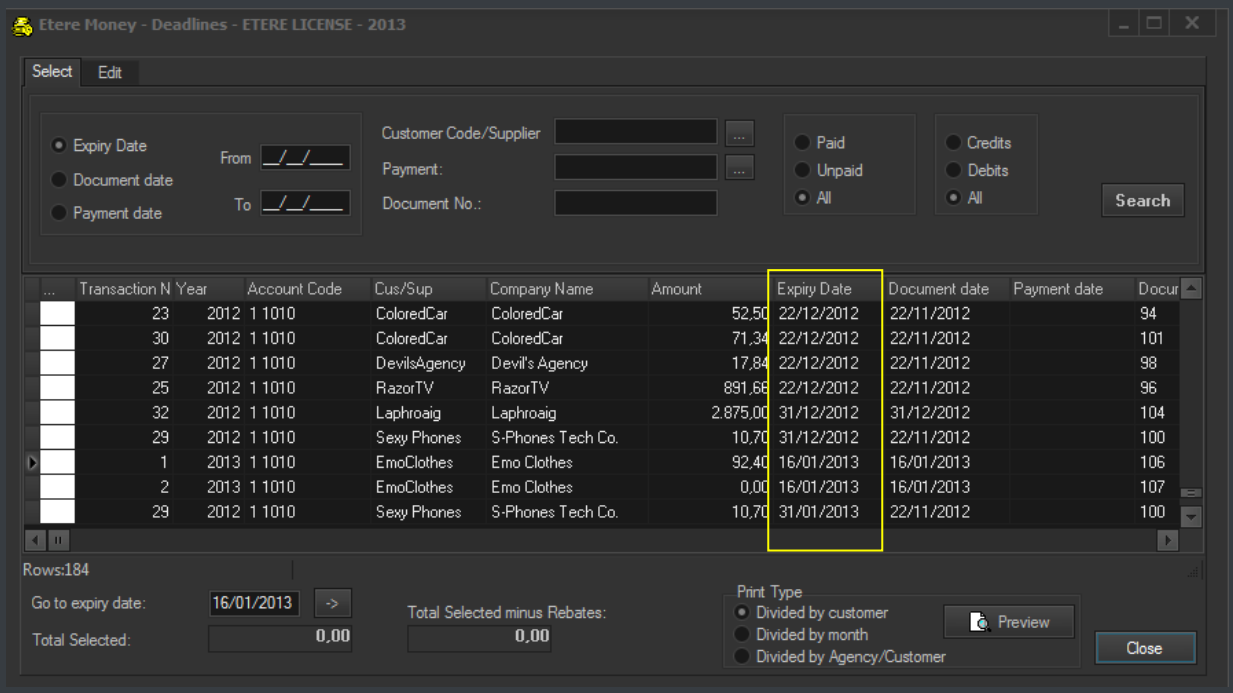
Money has a wide set of tools including the **Deadlines Management** module, which allows settling outstanding invoice deadlines (+) and credit note deadlines (-):



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▼ 7. BENEFITS

This paper has described the implementation of a comprehensive “Total Media Management” system is able to provide 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:

- ✓ **Integration**, of non-linear editing systems to allow direct access to archive through a web interface empowered with the highest security standards
- ✓ **Flexibility**, on meeting all requirements by proving a versatile media management system tightly integrated with all the metadata and equipment
- ✓ **Scalability**, to increase the capturing/playing channels without altering the workflow complexity, minimizing operational overheads overall costs
- ✓ **Efficiency**, achieved by reducing repetitive manual operations, allowing to define and include in advance in automatic preset workflows
- ✓ **Reliability**, derived from the use of streamlined workflows provided with detailed logs for tracking the overall and individual functioning of the system
- ✓ **Accuracy**, on all phases, reducing the risk of mistakes when archiving data since all archived contents are continuously checked and monitored
- ✓ **Security**, across all operations based on specific user permissions depending on the structure of the customer’s Active Directory domain
- ✓ **Usability**, a sophisticated interface guarantees a smooth use and intuitive management of media content, from ingest to playout

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Etere: a consistent system!

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.

Contact Information:
Etere Srl
Via Etere 1
62029 Tolentino (MC) – Italy
Telephone: +39 0733 9564
Email: maketing@etere.eu
Website: www.etere.eu

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