Solar TV Media Asset Management and Newsroom Integration

Please refer to the attachment for more details.

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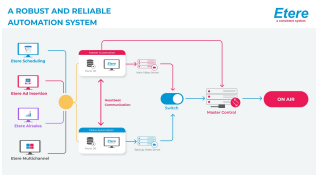
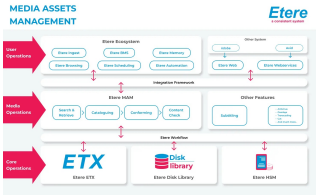
This paper describes how Etere, a world-wide media management solutions provider for broadcasters, media companies, content providers and house, is able to provide a solution that will closely interact with the current News system as well as with the other sub-systems present in the station, from ingest to playout, allowing to search, browse, edit and deliver media files stored across the various sub-systems present in the global solution.

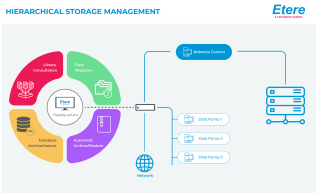
Solar News Channel



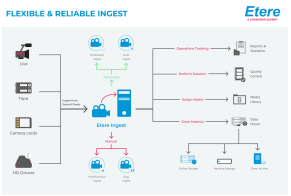
Etere Playout Automation diagram



Media Asset Management diagram



HSM Diagram



Etere Ingest diagram

Introduction
Solar TV is a Philippine broadcast television network owned by the Government Communications Group; initially branded on 1960 as RPN (Radio Philippines Network), in October 2008 it changed its name to C/S 9 and on November 2009 the network re-branded again under its actual name: Solar TV.

Solar TV-9 Manila is one of the fastest rising Philippine TV market, it is the flagship station of the RPN network which studios and transmitters are located at Broadcast City. Its programming is managed by the Philippine media company Solar Entertainment Corporation, which provides the audience with News watch, Sport events, TV series, Reality shows, and many more.

The main content provided by Solar TV-9 Manila consists of local and national News, which are managed using an ANNOVA system, a software solution for the production of broadcast news able to be integrated with third-party systems including video production systems, automation and studio devices.
Solar TV has requested the implementation of a tapeless news workflow system that interconnects the various departments of the station including Newsroom, Video Studios, Post-Production, Media Management, Playout system, as well as Archiving and Storage systems. In response to this request, Etere propose a distributed and scalable solution able to capture, edit, catalog and deliver SD/HD contents over a WAN network with high flexibility and speed for handling the essential processes of broadcast news management.

Etere will allow rundowns formed by news, program and commercials to be prepared in advance across an accurate schedule structure, supporting also the last minute changes that characterize the playout of News, all this, with maximum efficiency and minimum speed. Etere will allow centralizing the various tasks that form the news broadcast process while maintaining consistency between the newsroom, the production and the playout departments.

This paper describes how Etere, a world-wide media management solutions provider for broadcasters, media companies, content providers and house, is able to provide a solution that will closely interact with the current News system as well as with the other sub-systems present in the station, from ingest to playout, allowing to search, browse, edit and deliver media files stored across the various sub-systems present in the global solution.

Etere Solution: Overview
The solution proposed by Etere, implemented as a “Media Asset Management and Newsroom integrated system” will be based in the distributed architecture of Etere, a key characteristic that will permit not only to tightly integrate the systems currently used by the station but also to support future scalable growth. One of the key aspects of the proposed solution consists in the use of ultimate file transferring technology for WAN networks; Media Management operations will be managed via workflow and based on the EDT (Etere Data Transfer) protocol developed to increase up to seven times the transfer speed of large files compared to FTP

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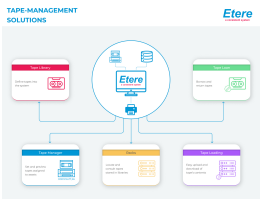

Etere Tape Loan Management

technology.

The diagram above illustrates a rock-solid distributed system able to integrate into a single solution the key features of a Media Asset Management system empowered with a tight integration with the Newsroom Computer System used by the station. Additionally, Etere's solution will permit to straightly connect ingest channels with Etere MAM to browse and edit media assets before their delivery.

The proposed system is intended to be the core of the global system, providing media archive management and delivery services including instant access and delivery of media files. 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. The modules that Etere will implement across the system are briefly described below:
■ 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 MOS Gateway, a module to create EDL-based video segments and automatically register them as MOS objects that will be instantly available for attachment in a story,
■ Etere Automation, a fault-tolerant system to automate the playout of both programs and news with full rundown integration for planning and assigning resources,
■ Etere Data Mover, the enterprise workflow-based Data Mover that guarantees timing and effectiveness on media transfers between devices,
■ Etere HSM, an automatic tape-based storage system for long-term management archive

An Etere-based media management and news integrated system is able to interface existing systems such as newsroom computer systems and NLE systems, while maintaining the consistence of its wide set of characteristics including:
■ A distributed architecture managed via workflow to avoid any single point of failure
■ Transparent media transferring, the correct media format will be always delivered
■ Browsing features including preview, slow-motion, timecode, bookmarking and metadata
■ Robust editing functions including video cut, merge, overlay and restore
■ Quality preservation and high availability of archived and catalogued media content
■ Tight integration with Newsroom systems such as ANNOVA
■ Full integration support for NLE stations, including content uploading/downloading

Etere Solution: 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.

A Distributed System
ETERE is a distributed, modular and fully integrated broadcasting system composed by a set of applications specifically oriented to efficiently perform each complex phase of the broadcasting chain synchronously within the same database environment, being all managed by suitable user-defined workflows that ensure an efficient overall system controlling.

Etere's distributed architecture allows achieving a top-level availability of resources and reliability of operations across the entire broadcast workflow thanks to its redundant capabilities to improve the fault resilience on any hardware or software failure.

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

Tape Library Management
Etere allows stations to carry out the management of tapes (i.e.: video tapes, data tapes, discs, etc) by providing them with a set of modules specifically designed to improve the most important tasks involved in the logical management of tapes. Etere provides full support for managing tape libraries within the system, being possible to monitor its status and view specific contents in real-time.

4.ETERE SOLUTION: 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:
■ 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:

4.2 EDT for data transfer over a WAN
EDT, which stands for Etere Data Transfer, is the ideal solution for stations which servers are spread over a high-latency Wide Area Network, this ultimate data transfer technology increases up to seven times the transfer speed of large files if compared to FTP protocol; thus showing its increased efficiency specially for those transfers where latency is longer.

EDT is based on UDT (UDP-based Data Transfer); a high performance data transfer protocol designed for data intensive applications over high speed wide area networks, to overcome the efficiency and fairness problems of TCP. The EDT protocol uses a streamlined algorithm able to utilize all the available WAN bandwidth and it's supported by Etere's workflow management for transfer operations, resulting into faster transfer rates (regardless of files size and transfer distances).

The EDT Server is embedded in the Etere FTP Server, which besides serving standard FTP requests supports also EDT operations using a user-defined port range. Although the FTP protocol is still one of the most used solutions for exchanging digital assets over a wide area network, its limited performance on key factors such as time and reliability makes of it an unsatisfactory solution for one of the most critical parts of the broadcast chain: data movement.

4.3 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, visual representation, secure execution and a complete log of each complex step of the broadcasting process

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

4.4 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:

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

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'.

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

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

4.7 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:

4.8 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:

4.9 Video Files Transcoding
Etere workflow is able to handle a wide array of critical operations including format conversions, workflow operations that can be launched for example, immediately after a content capture:

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

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

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

5. ETERE SOLUTION: 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 media ingest, archiving, transferring, browsing, etc.

All these operations are synchronously performed within the same database environment and managed by suitable user-defined workflows that ensure an

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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 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.

5.1 ETERE INGEST: Enterprise Capturing System
Etere will implement all required ingest channels using Etere MTX servers connected to Etere Ingest, the versatile set of modular applications that significantly improves the digitization process inside a broadcasting system, this software covers any particular requirement of the entire process such as automatic and scheduled ingest:

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
5.1.1 Launch workflows at the start/end of ingests
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):

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:

5.1.2 Aspect Ratio Conversion
Etere allows converting the aspect ratio of SD/HD media content by using either embedded or standalone aspect ratio converters through the use of remote signaling or triggering via GPI (General Purpose Interface):

Etere Ingest supports this feature, allowing to manage ARC during recording and preview. A configured GPI output is required:

It is also possible to ask for the aspect ratio set up at the start of each new recording by setting the related parameter:

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

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

5.3 Etere MAM: Browsing and Editing
Etere MAM will allow SOLAR TV operators to store information, search media EDL, and transfer EDL-based media to the playout server and the editing systems, all of this, across six different stations featuring either an either English or Russian user interface.

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

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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:

Etere 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 perform the dubbing of video contents by overlaying an audio track over a video(s):

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:

5.4 ETERE MOS GATEWAY: Newsroom Integration

Etere MOS Gateway is the perfect interface between Etere and Newsrooms; it connects to the Newsroom Computer Systems through the MOS protocol (Media Object Server Communications Protocol), allowing the exchange of information between NCS (Newsroom Computer Systems) and Media Object Servers (MOS):

Etere MOS Gateway will provide the station with the following Newsroom features:
■ Object Reception and Sending function, that is, it finds assets contained in the video server, creates the corresponding code in the SQL database and sends them – in the object form – to the ANNOVA system,
■ Simple browsing integration to record and view high and low resolution synchronized events. Journalists can readily make their own EDL straight from their PCs,
■ Media Asset Management (MAM) provides metadata indexing which lets you retrieve a video or any part of it from the database,
■ A Metadata module analyses video and automatically makes metadata entries based on scene changes, black images, no-sounds parts, subtitles, and MXF metadata. Metadata can be edited for any part of the video,
■ ActiveX MOS integration allows previewing lowres video directly from the News interface and getting direct feedback status for events that are cued, ready, playing or missing.

Etere MOS Gateway has been designed to be a robust set of features based on key characteristics such as fault tolerance and user-friendly:

5.4.1 ANNOVA compatibility

The communication between ANNOVA OpenMedia and ETERE is assured due to the support of the MOS protocol. Etere MOS Gateway allows using ANNOVA client for creating objects in the Etere database, these objects are used for creating Running-Orders that will become part of Etere/ANNOVA databases,

Etere MOS Gateway receives information from ANNOVA, and transforms this information into a format comprehensible to Etere Automation such in a way that the latter one will be able to send this information on-air. Etere MOS Gateway counts with the following ANNOVA specific integration functions:
■ Etere allows ANNOVA to dynamically build and control a playlist within the media server, changes to the Running Order in ANNOVA result in immediate changes to the sequence of media objects queued for playout by the media server,
■ Etere sends real-time status information during playback and other functions which are displayed through ANNOVA writers and producers in real-time,
■ Etere provides thumbnail images and proxy video which are closely integrated within the ANNOVA Story display and editing windows,
■ ANNOVA users can create and name placeholders within the Etere server into which media can later be ingested or recorded. Etere then updates ANNOVA with duration and other information as the placeholder is replaced with the actual media,
■ Etere enables ANNOVA users to directly assign media play-out channels from the ANNOVA Running Order,

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5.4.2 Segments management
Etere Most Gateway provides operators with a module that permits to search all assets with a hi-res media with at least one visible segment, and insert them in the playlist with just one click, being also possible to preview segments before inserting them:

5.4.3 Automation Integration
Etere Automation permits to send on-air events managed by a MOS-based system, in this case Etere Automation will run in “MOS-mode”, loading the playlist corresponding to the Running Orders received, showing information about contained objects and their story name. By using Etere Automation, the operator will only have to initialize the events' cueing process and then start the transmission:

5.5 ETERE AUTOMATION: Playout System
Etere Automation is the powerful, reliable and modular playout system able to enhance the SOLAR TV 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:

5.5.1 Secondary Events Management
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:

5.5.2 Live Events Management
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 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:

5.5.3 As-Run Logging
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.

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

Video contents will be transferred between the various departments (e.g.: near-line storage, archive, post-production, playout, browsing, and even non-Etere systems) by Etere Data Mover; this migration process also includes rewrapping and transcoding capabilities.

Etere’s approach is oriented to “virtualize” the entire media management process, improving it with flexibility, customization and most important cost-effectiveness.

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

Etere Data Mover is the application used to perform the physical storage and

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retrieval of video files, a typical Data Mover operation would be to move a video clip from a video server to an archive based on custom actions which are defined and executed via workflow.

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

5.7 ETERE 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.

Etere HSM improves the management of libraries by controlling their mechanical movements through the HSM Robotics Control and HSM Data Pump applications, which are able to run several data pumps on different machines to boost their throughput, while offering access to real-time logs, reports and statistics. Etere HSM distinguish four different archiving levels into a broadcasting workflow, these levels required distinct access times which vary from 0 minutes (video server) to 15 minutes (standard video tapes).

All these levels are managed “virtually”, that is, you can use logical devices (metadevices) based on physical devices to free design your storage layout, enriching in this way the entire system with the benefits derived from the use of metadevices:

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

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

5.8 ETEREWEB: Post-Production Integration

Etere Web is the web service seamlessly integrated with the playout and media management system to permit arriving contents to be managed digitally, resulting into a faster and more efficient delivery process which also includes digital signing features for any delivered content.

EtereWeb integrates the latest streaming technologies for video distribution and a comprehensive rights management system that gives to authorized users the possibility to access via web to a user-friendly interface:

Etere Web 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.

6. Conclusions

This paper has described the implementation of an Etere-based “Media Asset Management and Newsroom integrated system”, a reliable solution for streamlining SOLAR TV’s news operations by providing the best-of-bread on

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media management technology, from news acquisition to news delivery, with a tight integration with other existing sub-systems. The many key benefits that Etere will provide to the station have been condensed in the following points:

■ Workflow reliability, workflow-based operations from ingest to delivery that permits to monitor the individual system functioning while increasing productivity,

■ News integration, enhanced compliance with ANNOVA, one of the industry standards, to ensure a flexible yet powerful integration of the newsroom and the automation systems,

■ Faster data transfer, media content stored over the WAN network will be available for producers, reporters and editors, with the maximum of efficiency and speed due to the use of the Etere Data Transfer protocol,

■ Capturing scalability, for increasing the number of capturing channels (cameras, video servers, etc) without altering the system workflow complexity, thus minimizing operational overheads and reducing overall costs,

■ Capturing flexibility, on implementing the ingest channels from which media content will be acquired.

■ Editing features, the newsroom department of the station will be able to easily browse and edit video files, editing functions allows to easily cut segments, merge segments, overlay audio, restore composed media, etc, and all of this, under a user-friendly interface,

■ Long-term archiving , Integration of tape libraries to store and transparently manage the long-term media archiving,

■ NLE integration, Non-linear editing systems will be able to access the digital archive directly and efficiently through a proper production environment, making use of the highest security standards

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