

## Etere System for Media Nusantara Citrac

Media Nusantara Citra (MNC) MNC is the largest Indonesian media company, founded in 1997 and 70% owned by PT Global Mediacom TBK group. MNC's significant content library is the largest in Indonesia comprising entertainment and news content accumulated –with an increasing rate of more than 10,000 hours per year- from in-house produced content (movies, series, realities, comedies and TV films), third-party acquired content and multi-platform generated content.



MEDIA NUSANTARA  
CITRA logo

For more information, please refer to the attachment.

### Etere Proposal

Etere, a worldwide leader in broadcasting and media solutions, will respond through this chapter point-by-point to MNC's request. The proposed system is mainly an integrated archive and distribution system able to manage all contents under a file-based environment, where content will be catalogued including all related metadata, thus facilitating the search and query of video contents through a comprehensive browsing application and providing the following key features:

- A distributed architecture managed via workflow to avoid any single point of failure
- Enterprise management of digital content under a file-based workflow environment
- Seamless integration with existing and co-existing systems
- Fast, safe and fully-tracked local/remote access to the content archive
- Direct and efficient access for Editing Systems to the digital 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, time code, 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 including content uploading/downloading
- Reliable monitoring of the modules and equipment integrated within the global system

Etere will implement a "Digital Archiving Management System" able to capture, store and transparently manage the facilities' archived material over the long term, this system will be a distributed solution which combines rock-solid reliability and high availability with increased bandwidth and storage, allowing operators to easily search, retrieve and browse any media they want from the digital archive. The station will be mainly provided with the following key features. The features requested by the customer are following listed explaining how Etere is able to accomplish them with the maximum of reliability:

### 3.1 Efficient Capture/Ingest system

Etere will provided MNC with Etere Ingest (see chapter 6.1), the flexible solution for capturing content from a wide range of sources including tapeless cameras (P2, XDCAM, DVCPRO, HD Ready, etc.) and video cassettes (BetaCam, Mini DV, DVCAM, etc.) as well as satellite feeds, multi-format file-based and IP-based video streaming.

### 3.2 Ingest management system

As mentioned before, Etere Ingest (see chapter 6.1) is the module that will take care of capturing content, covering any particular requirement of the entire process such as automatic and scheduled ingests, supporting also multiple parallel ingest streams managed automatically either on a single workstation or across various workstations. Etere Ingest counts with a reliable failover system which permits to manage different sets of recording resources ready to be switched in case of error or maintenance, providing also a dedicated logging module for detailed information on each single operation performed while capturing content.

### 3.3 Metadata

MNC will be provided with Etere MAM (see chapter 6.2), the best solution for indexing and enriching media content through a comprehensive, fast and robust environment for searching, browsing and cataloguing media with custom metadata (either user-defined or SMPTE). Etere MAM, thanks to a 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 (with further import/export functions from and to other systems respectively).

### 3.4 Central Storage

The central storage will be managed following the basis of an enterprise video file system (i.e. ability to play major file formats, compatibility with editing systems, SD/HD conversion capabilities, etc.).

Etere Media Manager (see chapter 6.3) will guarantee – besides a workflow-based media management- also timing and effectiveness on media transfers between devices, offering high performances and availability under an expandable and scalable context.

Etere HSM (see chapter 6.4) will allow MNC to have an automatic and tape-based storage system for long-term management archiving (supporting LTO1-2-3-4-5, DLT, DTF, etc.). Etere HSM will improve the management of libraries inside the station 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.

EtereWeb (see chapter 6.5), provides a secure and robust threshold to the station's outside world, featuring a web-based interface to permit a tight integration with NLE systems and remote facilities.

### 3.5 Integration with Master Control (MCR) video server and automation

Etere will provide MNC with a seamless integration of all critical components with the station's existing automation systems (Harris and Pebble Beach systems). An Etere Digital Archiving Management System will be designed to be agnostic of non-Etere playout servers, it will "simply" make all required content available at the right place, in the right time and -last but not least- in the right format thanks to the media management module Etere Media Manager (see chapter 6.3).

### 3.6 Open and scalable system

Due to its fully distributed architecture, Etere is able to provide an open and scalable system ready to be tightly integrated with current future new elements without changing the overall station workflow, thus making possible a smooth upgrade of MNC's MAM system. Etere BMS (see chapter 6.6) is the right solution for distributing contents across different platforms (e.g. Digital Mobile TV, HD TV, IP TV, News media), this, due a professional rights management of licensed assets which includes the definition of purchasing contracts where a supplier gives to the station the right of transmitting copyrighted media assets (e.g.: TV series, movies, etc.) in return to an agreed payment (i.e.: prepaid or at the use) under specific conditions (e.g.: platforms, dates, etc.)

### 3.7 Technical Requirement

As will be explained in detail in the "Etere Architecture" section (chapter 4), Etere is

a system based on a distributed architecture with no single point of failure on its core system.

Etere modules can run independently (and redundantly) on different workstations interconnected via a local area network. All system configuration parameters, security roles, user data, and pre-defined rules are stored in a reliable SQL database supporting backup and redundancy operations.

#### **4. Etere Architecture**

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

##### **4.1 Distributed System**

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

##### **4.2 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 server every time they are required by the broadcast playlist.

Etere offers a hierarchical storage management of media content, it allows to organize in user-specific levels an unlimited number of content versions with different access times (e.g. video servers, near-line servers, archive servers), being all these levels available to the operator under a simple and user-friendly interface

##### **4.3 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; it will be possible to configure specific access rights not only for different users, but also for different stations.

##### **4.4 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 how 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.

#### **5. Etere Media Functionalities**

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

following features:

- Automated management via workflow of logical devices, including archiving, 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 to create partitions, just associate individual disk volumes to different

### **5.2 Custom Design Workflow**

All workflows can be customized to fit the real needs of the station and thus give complete control over the overall system management which offers:

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

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

### **5.3 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

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'.

### **5.4 Workflow File-based Processing**

Etere provides a wide range of templates for creating workflow actions regarding the most common filebased media operations, allowing to customize them and also use completely user-defined actions.

#### **5.4.1 Content Check**

Etere Content Check is an integrated file-based module for performing Quality Controls (QC) via workflow; it automatically detects and marks audio/video issues (e.g. freeze frames, black frames, scene changes, audio loss) on assets' EDL according to their quality, setting also a default quality rating at the end of the process.

Etere counts with a "content check" workflow action ready to be attached to an asset to analyze its proxy file searching for audio/video issues and mark them into the asset's EDL list.

#### **5.4.2 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.

#### **5.4.3 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.

#### **5.4.4 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.

#### **5.4.5 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.

#### **5.4.6 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.

#### **5.4.7 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.

#### **5.4.8 Loudness Normalization**

Etere provides a file-based loudness control, allowing stations to check the loudness level of media contents and normalize them to meet specific limitations.

#### **5.4.9 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.

#### **Work Orders Management**

Etere's Work Order 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 work orders, from their creation and compilation to their tracking and invoicing.

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

#### **5.6 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.

Once imported, 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):

#### **5.7 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 add quickly specific information to a video segment.

## 6.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 how its distributed architecture and integrated complementation are key parts of the success of the global system where a top-level performance and reliability is reached.

### 6.1 ETERE INGEST: Enterprise Capturing System

Etere ingest a versatile set of modular applications that significantly improve the digitization process inside a broadcasting system.

#### 6.1.1 Wide range of capturing modes

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

#### 6.1.2 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.):

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

### 6.2 ETERE MAM: Browsing and Editing

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

#### 6.2.2 Video conforming and Audio over

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

#### 6.2.3 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.

#### 6.2.4 Integration between MAM and Ingest

Etere 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.

### **6.3 ETERE DATA MOVER: A Digital Archiving and Delivery**

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

#### **6.3.2 Logical management of data**

Etere's approach is oriented to "virtualize" the entire media management process, improving it with flexibility, customization and most importantly 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 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.

#### **6.3.3 Distributed parallel transfers**

Etere 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.

### **6.4 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 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.

### **6.5 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.

#### **6.5.1 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.

Etere Tapeless Reception takes full advantage of a tapeless environment to eliminate the need of creating physical copies, entrusting valuable material to private couriers, risking of excessive waiting times; thus by enabling contents to be sent digitally (i.e. without using magnetic tapes) via internet, bringing a shorter delivery time than this required by a common consignment of magnetic tapes.

#### **6.5.3 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.

#### **6.5.4 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

#### **6.5.5 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

#### **6.5.6 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.

#### **6.5.7 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 an assets which requires to be edited:

#### **6.5.8 Centralized monitoring**

EtereWeb provides administrators with two key sections from which they will be able to consult specific information about accesses, statistics and more: