Etere

a consistent system

ABS-CBN: A Smooth Transition to a Tapeless MXF-Based Workflow

ABS-CBN has requested to Etere, as a part of the overall transition to a completely tapeless MXF-based workflow, technical and operational support to migrate its current media workflow which works with SAF files (SeaChange Archive Format) to a new media workflow entirely based on MXF files (Media eXchange Format MXF) for achieving handling flexibility and essence preservation.

ABS CBN

ABS CBN Broadcast Workflow

Etere Ingest diagram

Etere Workflow diagram

For more information, please refer to the attachment.

Introduction
Founded in 1946, ABS-CBN (Alto Broadcasting System-Chronicle Broadcasting Network) is the largest integrated media and entertainment company in the Philippines, ABS-CBN broadcast also to the Filipino enclaves located in the USA and other geographical areas such as Australia, Asia Pacific, Middle East and Europe.

The ABS-CBN main facility located at Philippines, counts with an Etere system implemented to send on-air its more than 20 satellite channels, ABS-CBN has always renewed its preference for Etere every time they have planned to expand its existing broadcasting system, being always provided with rock-solid solutions empowered with a seamless integration.

In order to streamline its global production system, ABS-CBN began moving to a fully tapeless workflow back in 2008, since then the station has digitalized all areas of its production and now, three years later, is ready to take the next step up in terms of interoperability, and plans switching its whole workflow to MXF.

Due to the sensitive nature of a full media migration process, the best of expertise and specific equipment is required, in these terms Etere will support the station on the introduction of a new Omneon server by providing an extreme modular solution that tightly integrates existing equipment with the new device, thus permitting to achieve a level of productivity that will consistently meet the expectations set forth at the beginning of the process.

This paper will provide ABS-CBN with the guidelines for a smooth media migration to a new tapeless MXF-based workflow, explaining how to implement an Etere Workflow able to support the migration planned by the station. The guidelines provided in this document will assure that the new implemented workflow will be compatible with all the elements making part of the current system, and also with any other elements introduced later on.

Overview
ABS-CBN has requested to Etere, as a part of the overall transition to a completely tapeless MXF-based workflow, technical and operational support to migrate its current media workflow which works with SAF files (SeaChange Archive Format) to a new media workflow entirely based on MXF files (Media eXchange Format MXF) for achieving handling flexibility and essence preservation.

The current media workflow uses a SeaChange BMC, a SeaChange BMLex and an Infortrend SAN solution for storing files encoded using either the SeaChange Archiving Format (SAF) or the Native SeaChange Format (DV, VIX and PD). Moreover, a SeaChange MediaGateway (SMG) converts SAF files into the Native SeaChange Format when they are moved into the archive, and files in Native SeaChange Format into SAF (18 Mb Long-GOP) files for playout.
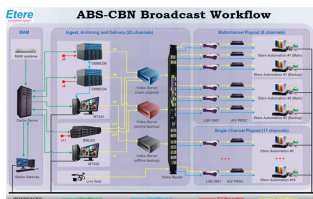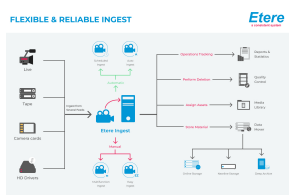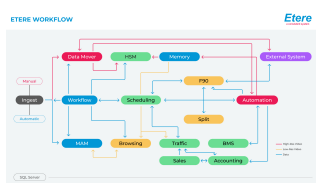
The new MXF-based media workflow will be based on the existing SeaChange BMLex plus one Omneon Spectrum and two Etere MTX media servers, all these devices will be seamlessly integrated with Etere as an end-to-end MXF broadcast workflow, forming a streamlined, scalable and reliable storage infrastructure for ingest, archiving and playout.

all media servers used by the station will be managed within the media workflow as three video servers, one for playout, one for online backup and one for offline backup, thus providing a very high level of fault-tolerance and high-availability.

Media content will be compressed in MXF format and will be delivered through the SDI outputs of an NVISION router, transfers between the cache server and media servers will be performed by Etere Media Manager which will also transfer data from the Etere MTX server to the mirrored Omneon servers.

The broadcast workflow implemented for managing the transfer of media content between media server will permit the station to send on-air the 23 channels provided by the station, distributing them in the following way:
■ 3 channels (Studio21, CGETV and MYXG) will be transmitted as multi-channels from the same main/backup automation server
■ 3 channels (C1G, SPORTCH and INTERACTIVE) will be transmitted as multi-channels from the same main/backup automation server
■ Remaining 17 channels (ABS-CBN, STUDIO23, ANC, DTT1, DTT2, DTT3, TFC1, TFC2, TFC3, TFC4, ANCG, KAPAMILYA, KNOWLEDGE, MYXL, MYXG, MYX, C1L, C1G, HERO, LSN, VELVET, BALLS AND CGE) will be broadcasted as single channels from dedicated automation servers

Detailed information on how to prepare the system before the migration and how to perform the migration itself will be fully explained through the following chapters of this document.

Migration Procedure
The content migration procedure leads to a number of special requirements for the migration process, these requirements have been detailed in the previous chapter and its accomplishment is assumed in order to proceed with the migration process.

The procedure detailed in this chapter should be accomplished by following all the steps described on it; some of these tasks are intended to be performed via workflow to ensure an automated and consistent accuracy.

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Convert SAF to Native SeaChange Format
All SAF files (SeaChange Archive Format based on the MPEG-2 standard) stored in media servers must be converted into the Native SeaChange format which consists of three different files. For instance, the conversion of the CLIP.SAF file should generate the following files:
■ CLIP: The DV essence file
■ CLIP.VIX: The index path file
■ CLIP.PD: The private data file for playout
In order to proceed with the automatic conversion, under the Etere Configuration Editor module, a transcoding action must be created to implement a media

manager workflow to be attacched -and launched- to all the assets to be converted.

From the Etere Media Library, the workflow can be easily attached to all assets linked to a file (.SAF) stored in the SeaChange MCL device.

Convert Native SeaChange files to MXF
At a second stage, all files stored in Native SeaChange Format must be converted into a MXF format.
As for the previous task (convert SAF to SeaChange), a transcoding action must be created and included into a workflow.

After then, the workflow must be attached –and launched- to all assets related to files stored in the SeaChange MCL device.

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Configure the SeaChange MediaGateway
The SeaChange MediaGateway must be set in "Media Monitor" mode to monitor the SeaChange BMLex and detect incoming MXF files, allowing, each time a MXF file is moved into the monitored server (i.e. passes through the SMG) to automatically check the compliance of the format for the SeaChange MediaClient playback, recreating the two files (.VIX and .PD) required for its playback.

Configure the SeaChange to ingest in MXF format
The SeaChange BMLex must be configured to ingest media content as MXF, that is, to directly capture video signals into MXF format.

Use MXF as the playout format from the Omneon Spectrum
Make sure that files wrapped in MXF format will be used for the playout from the Omneon Spectrum.

Etere Components
Currently, the ABS-CBN's workflow is managed by an Etere system that integrates into a single broadcasting solution a comprehensive set of modules specifically oriented to cover each complex phase of its broadcasting process, this distributed architecture allows Etere to make all these modules work even remotely with a user-defined synchronization that will avoid any possible fault or incongruence between networks, thus ensuring an efficient overall system management.

All Etere modules directly involved to the ABS-CBN's content migration process because related to media management operations will be treated throughout this chapter, explaining its distributed architecture and integrated complementation as key parts of the overall system.

ETERE WORKFLOW: Enhanced Overall Control

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.

5.1.1 Custom Workflow Design
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.

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'.
5.1.3 Remote launching of external workflows

Etere counts with predefined templates to allow an easy creation of workflows able to launch operations on other Etere installations, Etere will connect with remote installations using Etere Web Services, a web service that makes the most important Etere functions (e.g. data consultation, workflow execution, etc.) available to other systems through the use of standardized XML messages. Defining and launching remote workflows is an easy task with Etere; it needs following four steps only.

Once launched, the remote workflow will be started remotely.

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

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

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

5.2 ETERE MEDIA MANAGER: File-based data transfer
Media content will be transferred between media servers by Etere DataMover including rewrapping and transcoding capabilities. 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

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

Etere Media Manager 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.

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
■ 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

Logical Management
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 Media Manager is the application used to perform the physical storage and retrieval of video files, a typical Media Manager 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.

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

Etere ingest allows recording satellite signals to any storage target (i.e. video tapes, video servers, etc.) just by configuring GPI devices to trigger the ingest process. Etere Ingest permits to capture contents from a wide range of video storage devices including the broadcast industry standard Sony XDCAM. Etere counts with a XDCAM-dedicated module to acquire contents from professional XDCAM discs either manually or automatically, via SDI or FTP. Once ingested, video files are transcoded into the specific format of the destination device on which they will be stored, in the same way; video files are transcoded each time they are moved from one device to another. The image below illustrates how Etere allows setting the workflow to be launched at the start and end of an ingest process to for example, create a low resolution version or normalize the audio of captured contents.

ETERE MTX: 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.

BENEFITS

By implementing a complete end-to-end MXF-based workflow, ABS-CBN will achieve the advantages of a fully tapeless system to speed up production and reduce costs, and will be one of the very few companies using a complete end-to-end MXF-based system for real tapeless operations, a system strongly supported by Etere which will provide the station with the solutions required to ingest, manage, play and also archive media contents.

Among all the benefits derived from the migration to a MXF-based tapeless workflow, the most remarkable ones are mentioned below
■ Seamless integration, between all the devices used by the station due to the use of standard codec technologies
■ High preservation, of pictures at even the most basic storage levels while saving time and improving quality
■ Increased efficiency and performance of all media tasks performed by the station thanks to the import/export of single MXF files
■ Full scalability, for adding storage device to the media workflow, currently MXF is a standard file format supported by nearly any storage equipment
■ Operational flexibility, on the direct use of video material, MXF files contain a finished program (or program segment) with its associated metadata (video, audio, aspect ratio, parental control)
■ Workflow reliability, since all media operations are performed following specific workflow rules and monitored from a central management module
■ Cost efficiency, on media versioning, unnecessary versions are avoided and only one copy is stored along with information describing the making up of the final versions