

PROJECT

Etere
a consistent system

ABS-CBN:

A smooth transition to a
tapeless MXF-based workflow



ABS•CBN

September 2011



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1. 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.

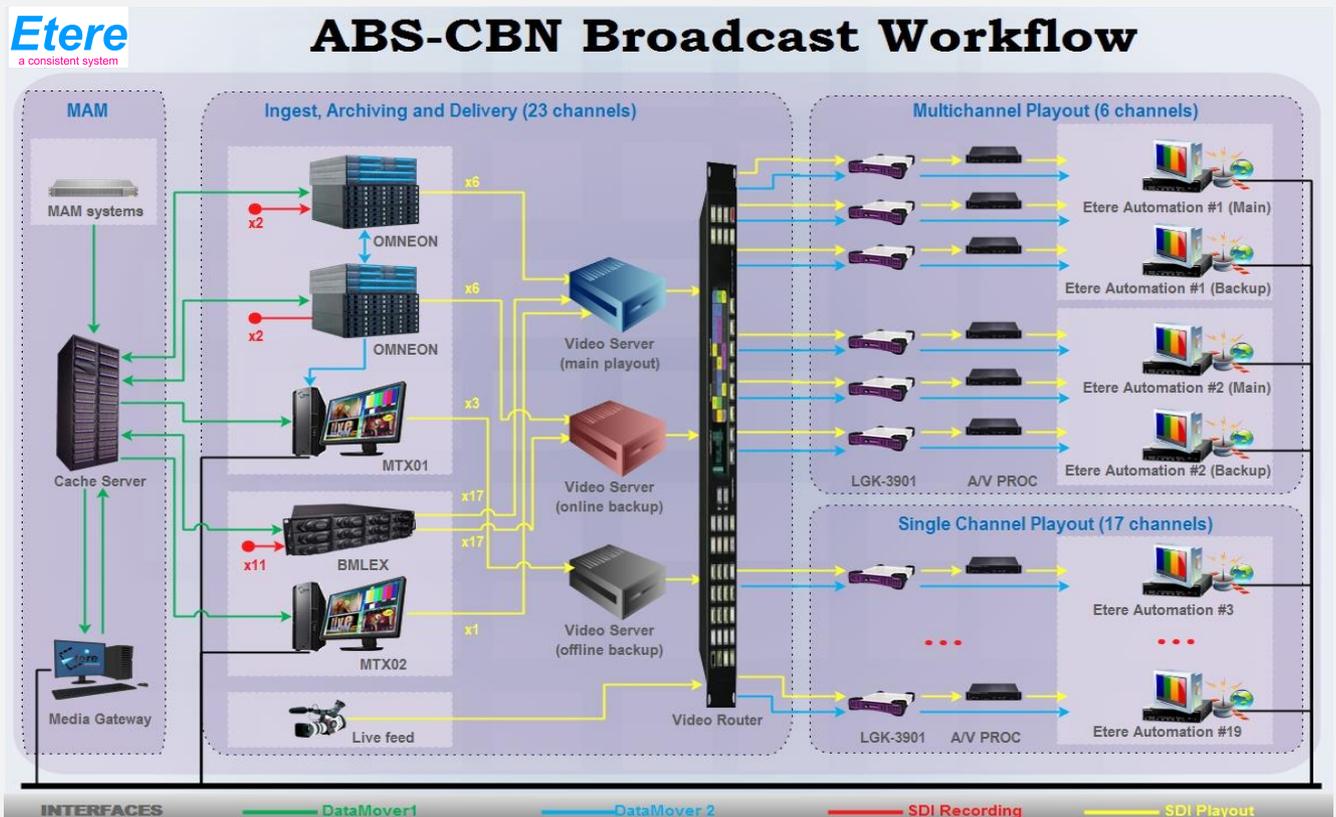
This paper will provide ABS-CBN with the guidelines for a smooth media migration to a new tapeless MXF-based workflow, explaining how to implement an Etere Workflow able to support the migration planned by the station. The guidelines provided in this document will assure that the new implemented workflow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

2. 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 playback.

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 playback, just as shown below:



As shown in the previous figure, 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 DataMover 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.

3. PRELIMINARY CHECK

In order to proceed with the content migration, there are some preliminary checks that must be performed on media servers used by the station and intended to be integrated in the new workflow, these checks are compulsory to ensure the functioning of the migrated system.

The list below summarizes all operational tasks to be performed as part of the preparation process:

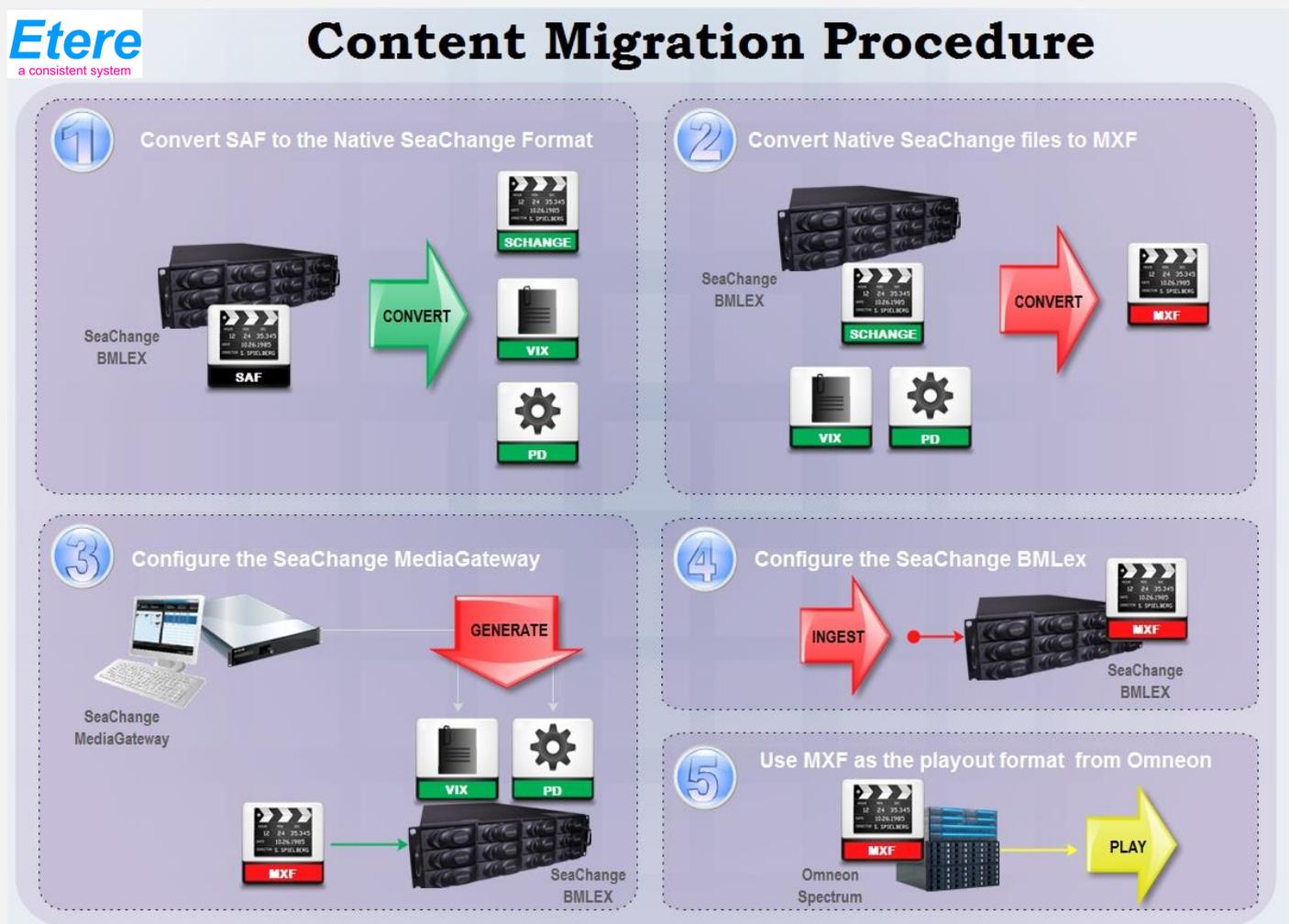
Pre-Migration Checklist	
<input type="checkbox"/>	Is the SeaChange BMLex able to record MXF files?
<input type="checkbox"/>	Is the Omneon Spectrum able to play SeaChange MXF files?
<input type="checkbox"/>	Is the SeaChange BMLex able to play MXF files recorded by the Omneon Spectrum?
<input type="checkbox"/>	Does the SeaChange MediaGateway recreate VIX and PD files as soon as files are transferred to Omneon Spectrum?
<input type="checkbox"/>	Is the SeaChange BMLex able to play MPEG-2 SeaChange files converted to MXF?
<input type="checkbox"/>	Is the Omneon Spectrum able to play MPEG-2 SeaChange files converted to MXF?

Once and only once all preliminary tasks detailed above have been accomplished, it will be possible to proceed with the proper migration procedure explained in the following chapter.

4. 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. The steps on which the content migration process consists are illustrated in the following figure and detailed further on this chapter:

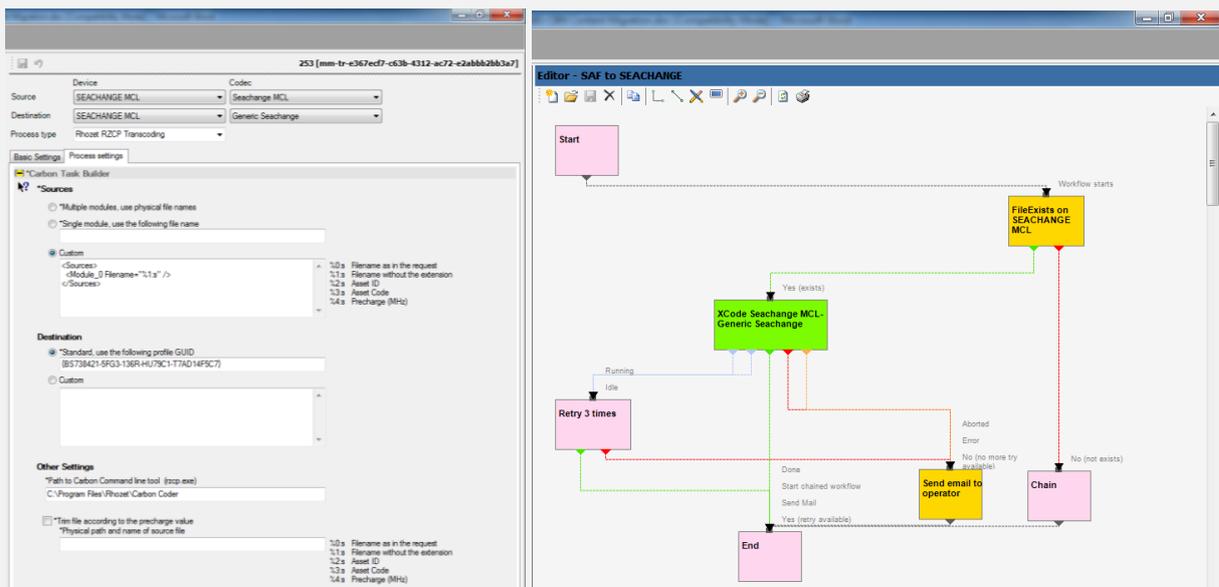


4.1 Convert SAF to Native SeaChange Format

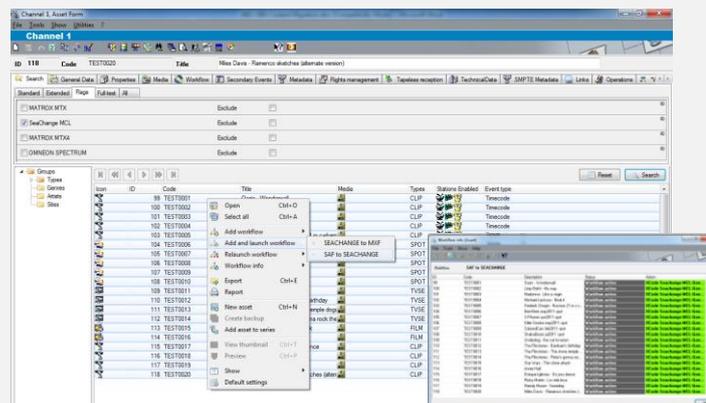
All SAF files (SeaChange Archive Format based on the MPEG-2 standard) stored in media servers must be converted into the Native SeaChange format which consists of three different files. For instance, the conversion of the CLIP.SAF file should generate the following files:

- **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 attached -and launched- to all the assets to be converted:



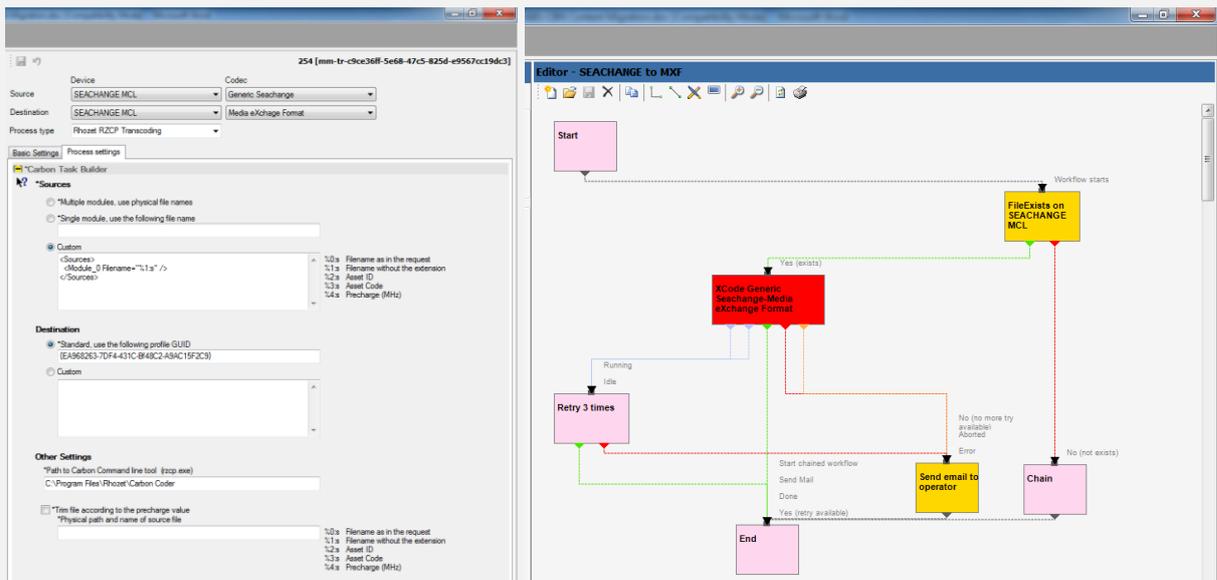
From the **Etere Media Library**, the workflow can be easily attached to all assets linked to a file (.SAF) stored in the SeaChange MCL device:



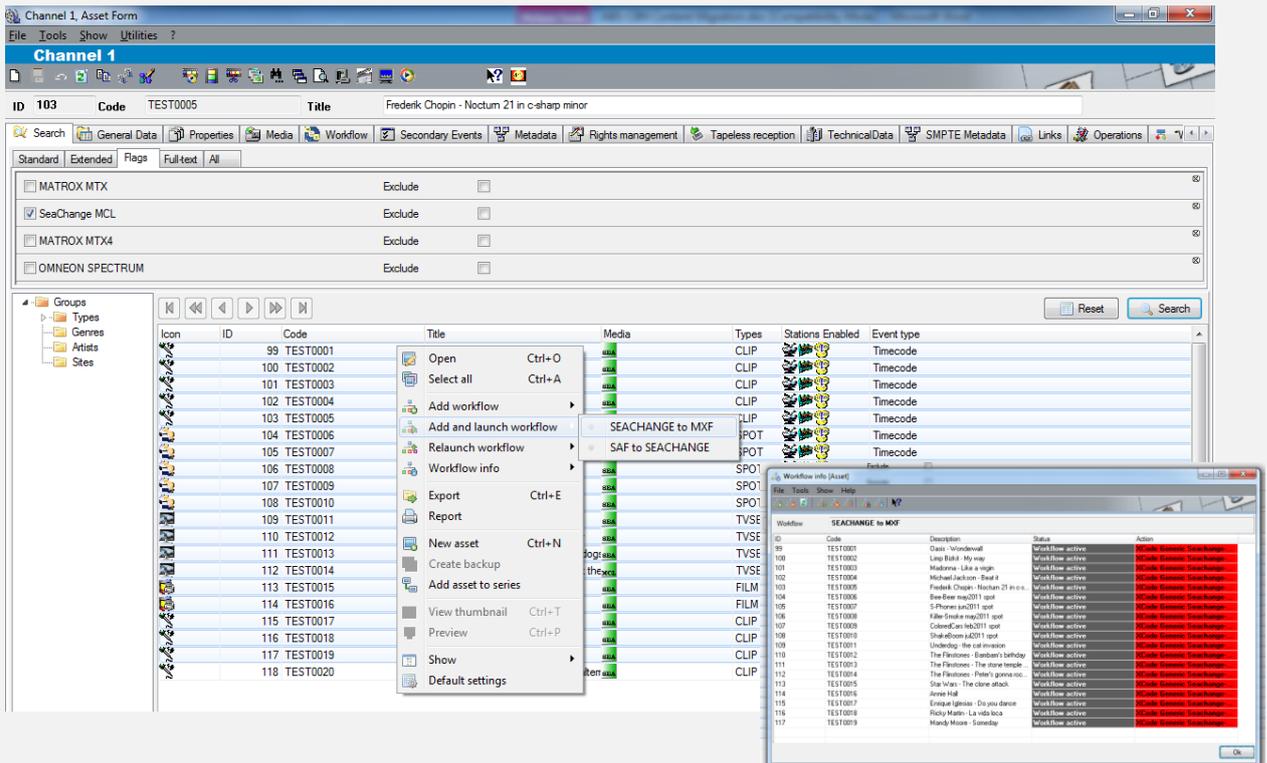
4.2 Convert Native SeaChange files to MXF

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:

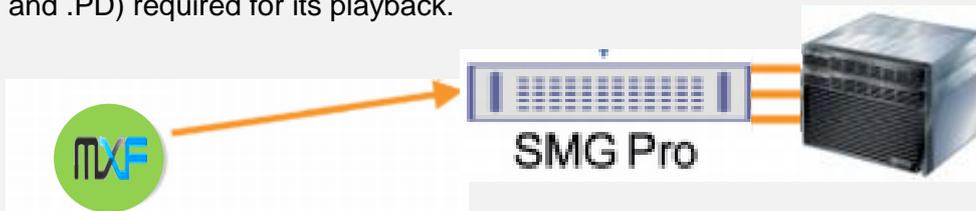


After then, the workflow must be attached –and launched- to all assets related to files stored in the SeaChange MCL device:



4.3 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.



4.4 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.



4.5 Use MXF as the playout format from the Omneon Spectrum

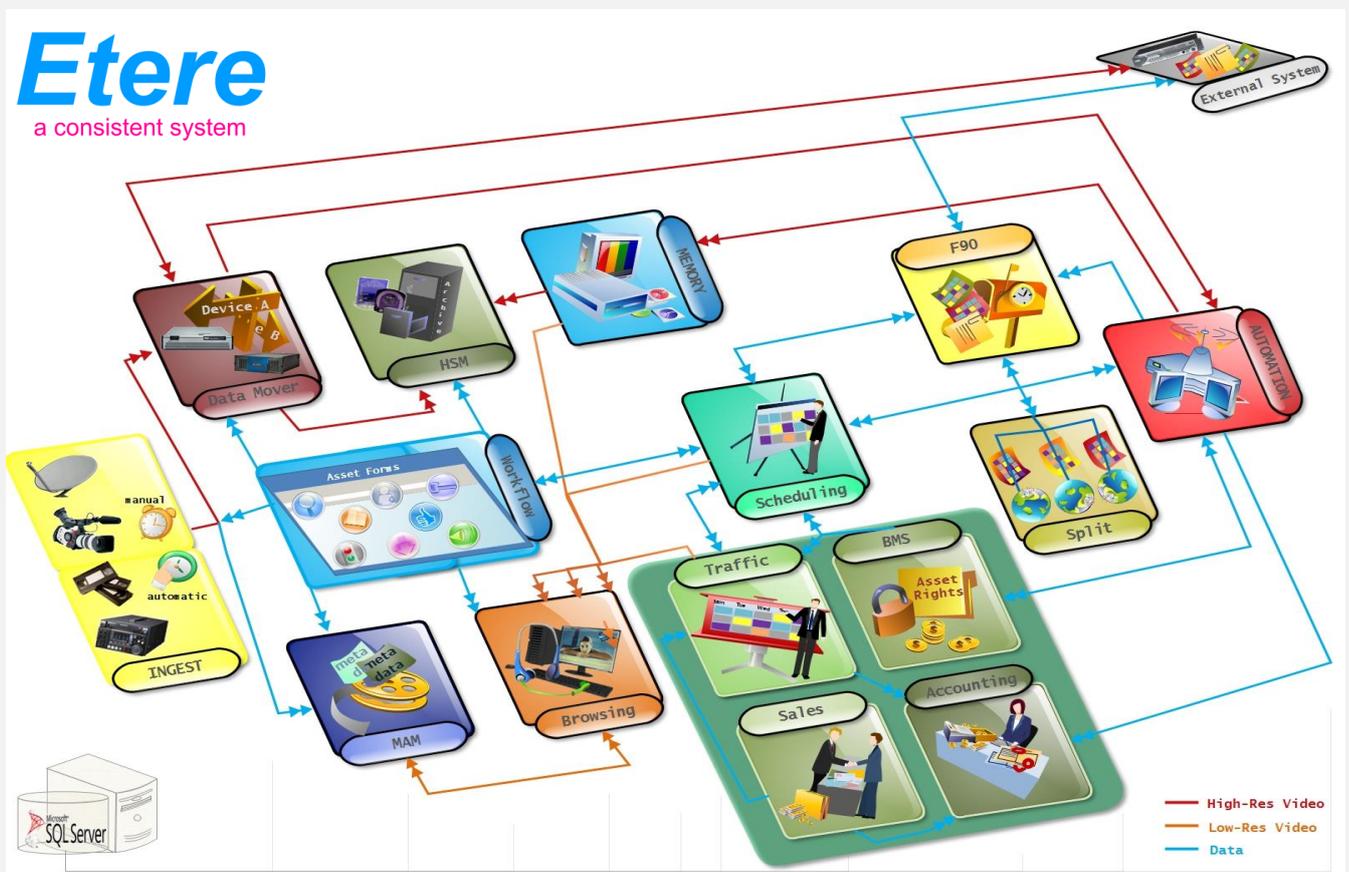
Make sure that files wrapped in MXF format will be used for the playout from the Omneon Spectrum.



Icon	ID	Code	Title	Media	Types	Stations Enabled	Event type
	99	TEST0001	Oasis - Wonderwall		CLIP		Timecode
	100	TEST0002	Limp Bizkit - My way		CLIP		Timecode
	101	TEST0003	Madonna - Like a virgin		CLIP		Timecode
	102	TEST0004	Michael Jackson - Beat it		CLIP		Timecode
	103	TEST0005	Frederik Chopin - Nocturn 21 in c-sharp		CLIP		Timecode
	104	TEST0006	Bee-Beer may2011 spot		SPOT		Timecode
	105	TEST0007	S-Phones jun2011 spot		SPOT		Timecode
	106	TEST0008	Killer-Smoke may2011 spot		SPOT		Timecode
	107	TEST0009	ColoredCars feb2011 spot		SPOT		Timecode
	108	TEST0010	ShakeBoom jul2011 spot		SPOT		Timecode
	109	TEST0011	Underdog - the cat invasion		TVSE		Timecode
	110	TEST0012	The Flinstones - Bambam's birthday		TVSE		Timecode
	111	TEST0013	The Flinstones - The stone temple dog		TVSE		Timecode
	112	TEST0014	The Flinstones - Peter's gonna rock the		TVSE		Timecode
	113	TEST0015	Star Wars - The clone attack		FILM		Timecode
	114	TEST0016	Annie Hall		FILM		Timecode
	115	TEST0017	Enrique Iglesias - Do you dance		CLIP		Timecode
	116	TEST0018	Ricky Martin - La vida loca		CLIP		Timecode
	117	TEST0019	Mandy Moore - Someday		CLIP		Timecode
	118	TEST0020	Miles Davis - Flamenco sketches (alt		CLIP		Timecode

5. 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.

5.1 ETERE WORKFLOW: Enhanced Overall Control

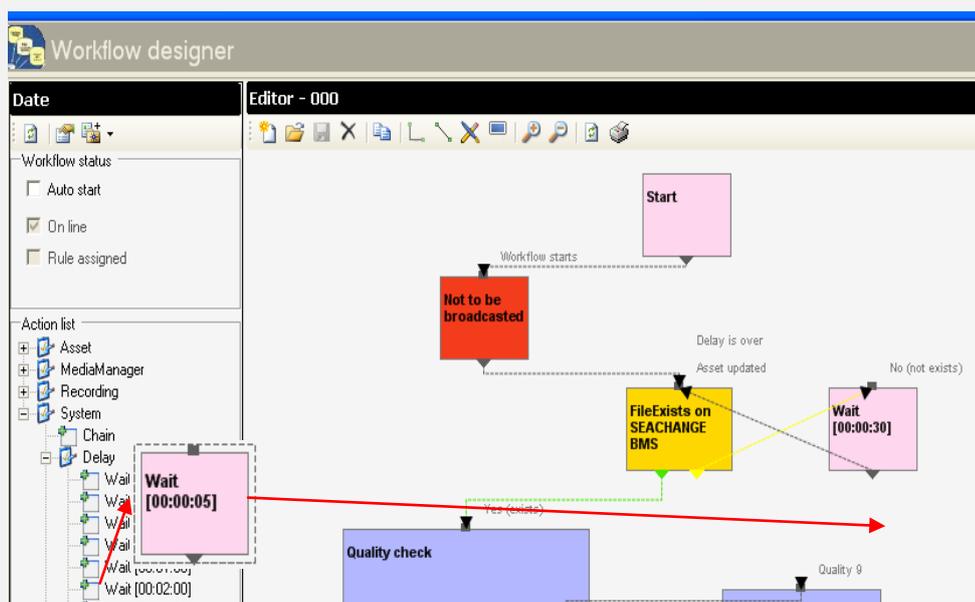
Etere’s solution features an integrated and professional approach based on a workflow management to optimize the station’s entire broadcasting system, reduce operating costs and facilitate overall process control. Etere Workflow permits modules to for example, seek confirmation for sensitive process, 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:

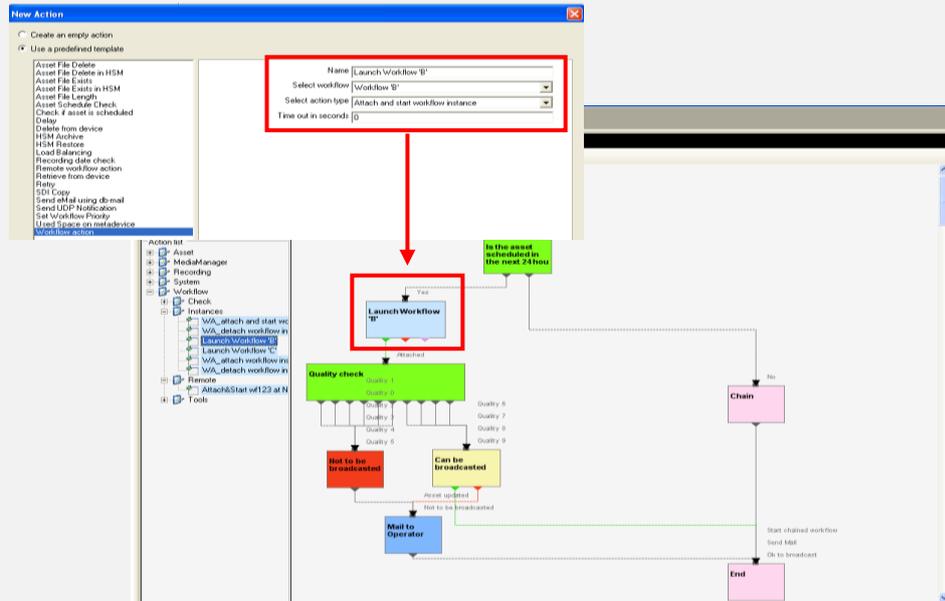
- Clear definition of each complex step of the broadcasting process,
- Visual representation of each step mapped out on a PC not in a paper document,
- Set of instructions and authorizations that must be followed in order to move forward,
- Complete log of all steps carried out, operations denied etc.

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

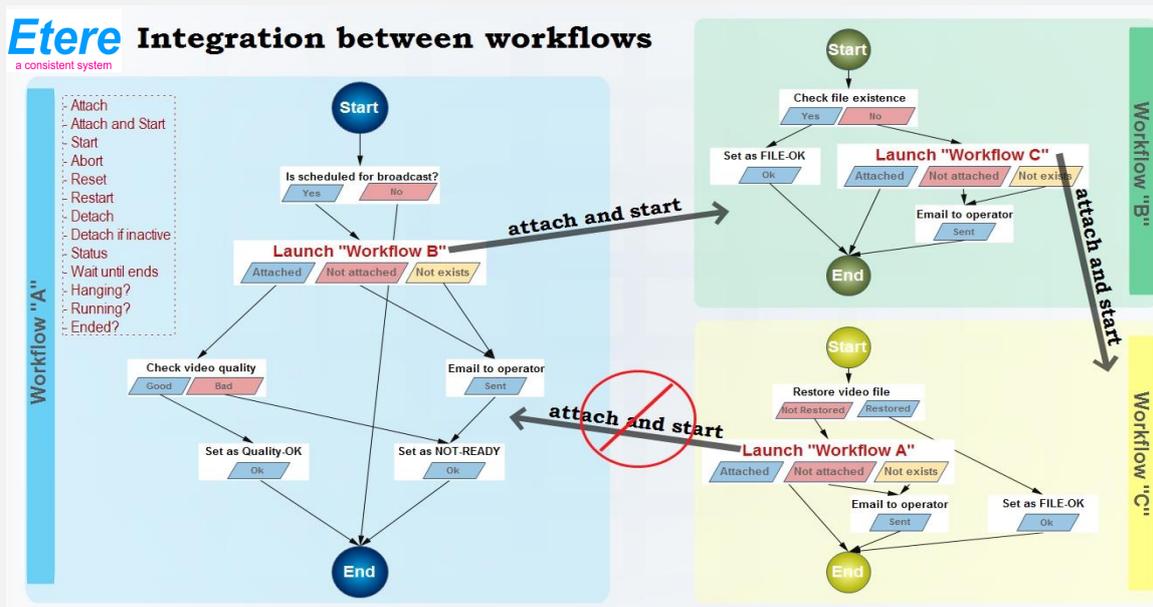


5.1.2 Integration between workflows

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:



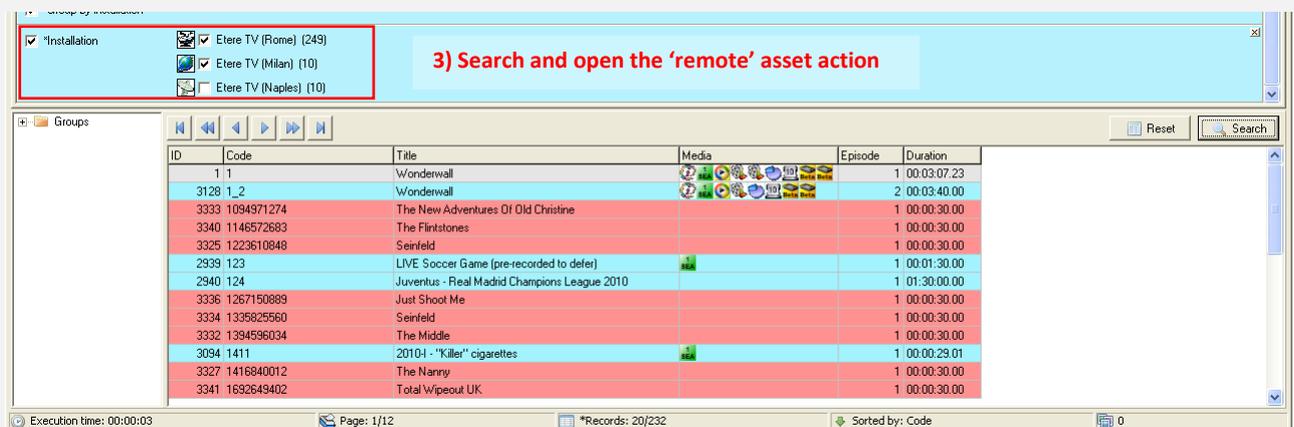
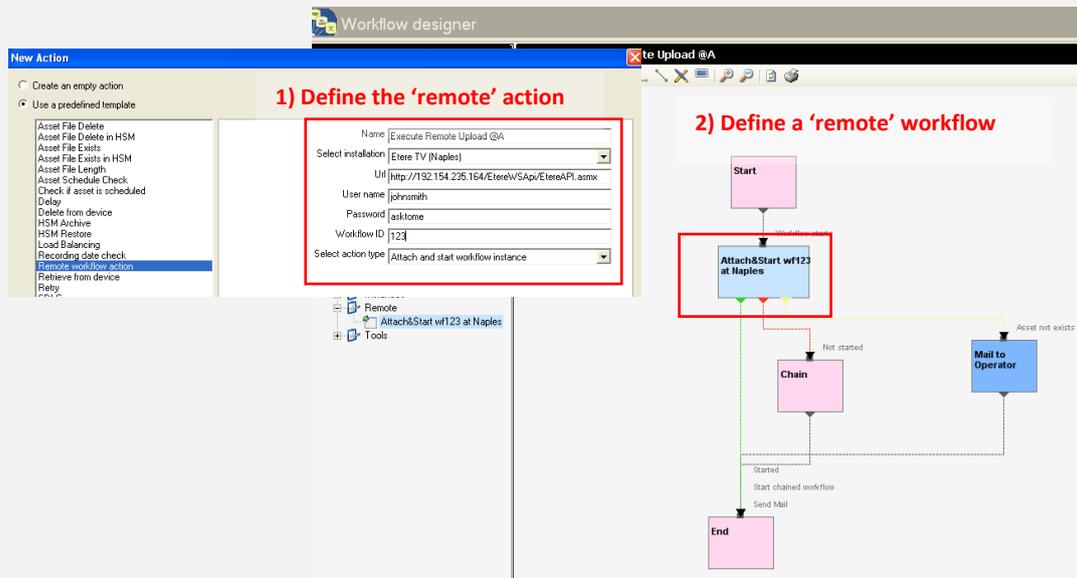
The diagram below illustrates how Etere maintains the system consistency by avoiding loops between workflows (a message is displayed indicating the incompatibility between action and workflow):

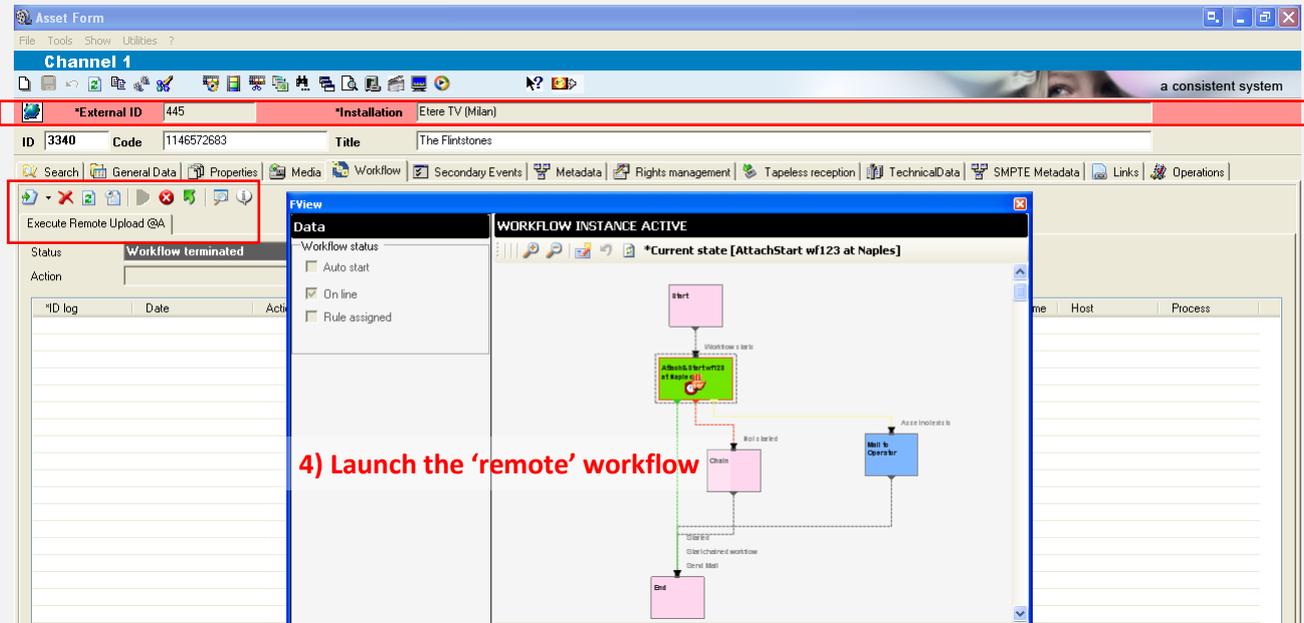


As shown above, for example, if 'workflow A' calls 'workflow B' and the 'workflow B' calls 'workflow C', the 'workflow C' will not be able to call the 'Workflow A'.

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:

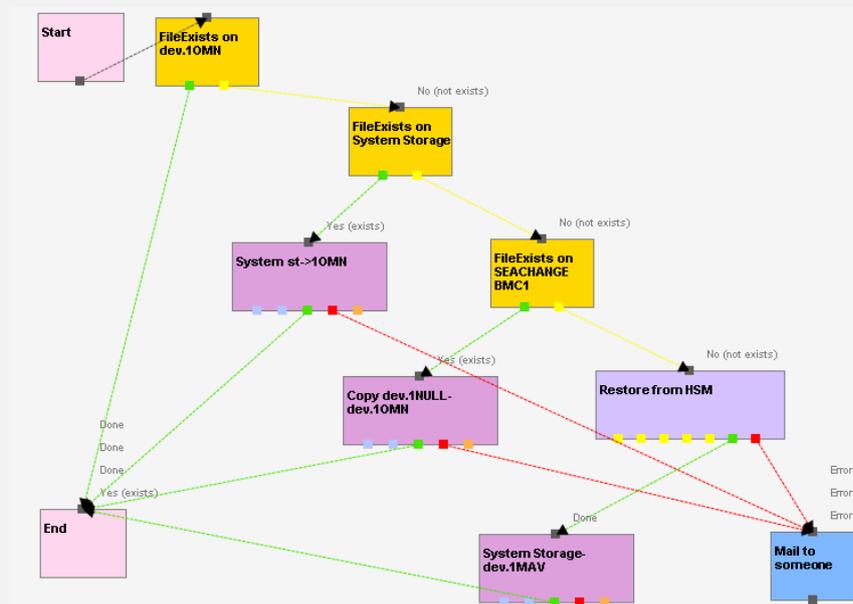




Once launched, the remote workflow will be started remotely.

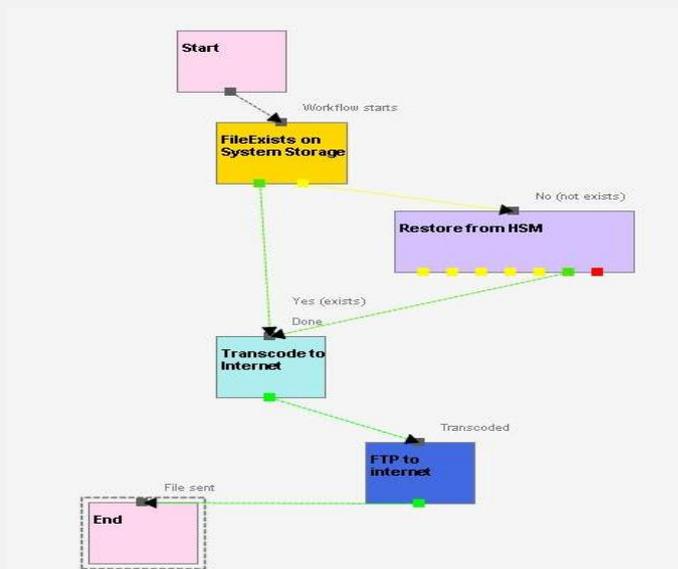
5.1.4 Video Files Restore Workflow

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:



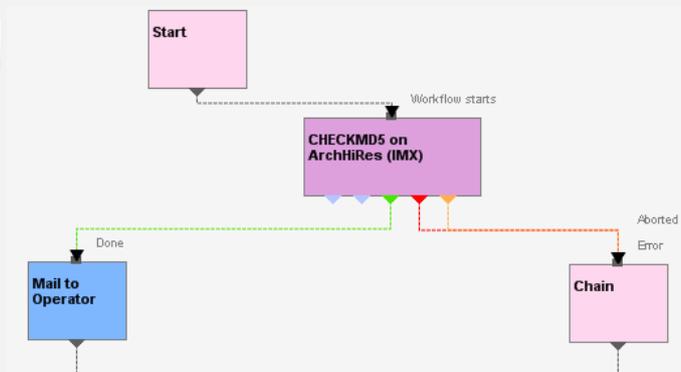
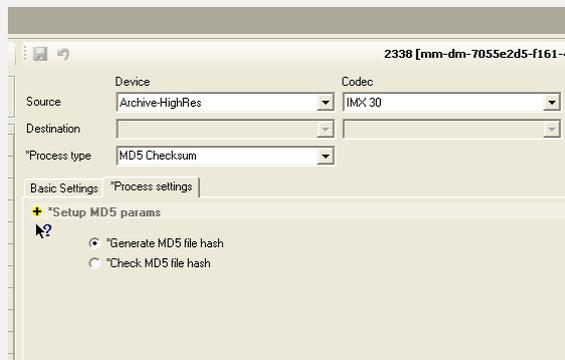
5.1.5 Video Files Transcoding and Uploading Workflow

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

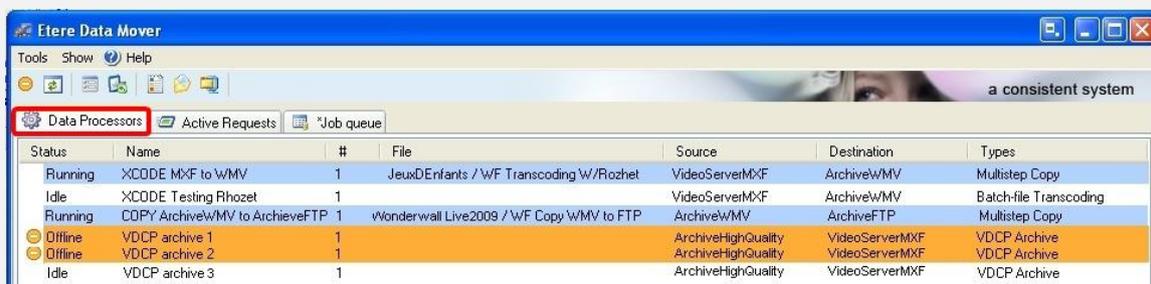
Etere offers an enterprise control of video files integrity; it keeps a log of the hash md5 of video files such in a way that it is possible to verify at any time if they have been modified after their approval. All video files registered on the Etere's database can be verified through an md5 checksum, 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.

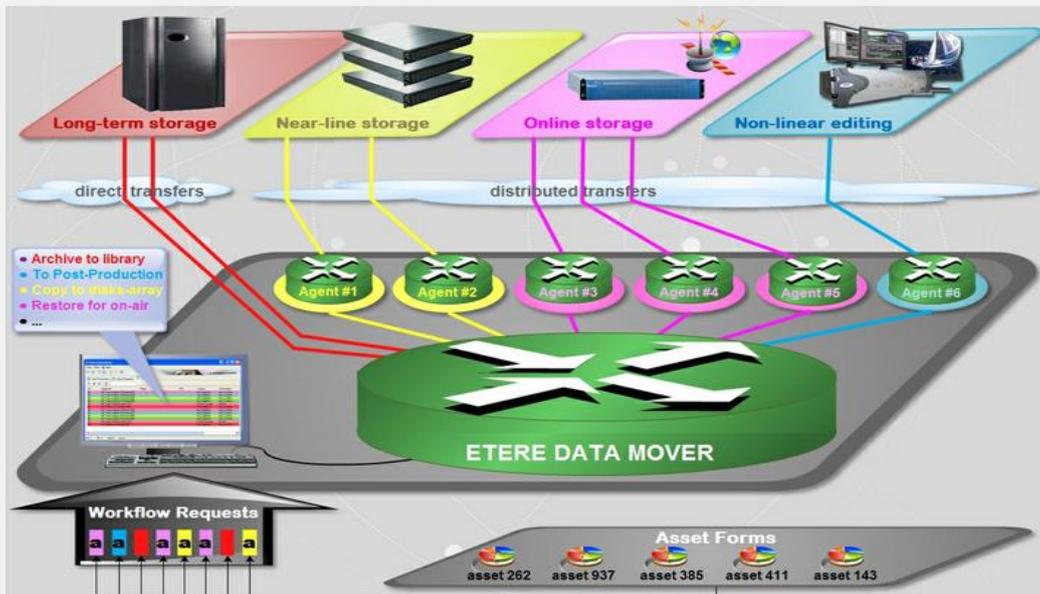
5.2 ETERE MEDIA MANAGER: File-based data transfer

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.

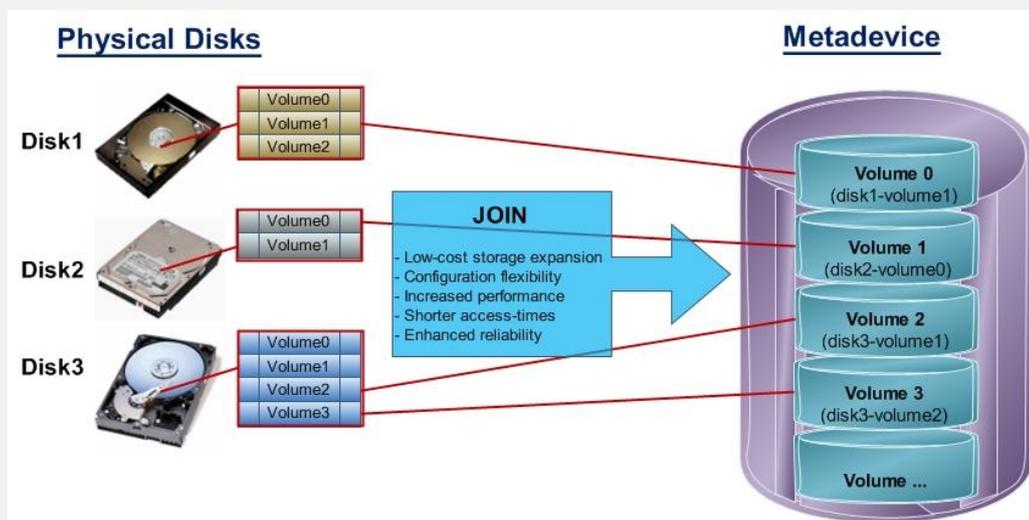
Etere Data Mover is capable to provide both, distributed processing for using an independent agent per data transfer and parallel processing for simultaneously performing different instances of one data transfer; these features will allow stations to exploit high computing resources to use a single workstation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



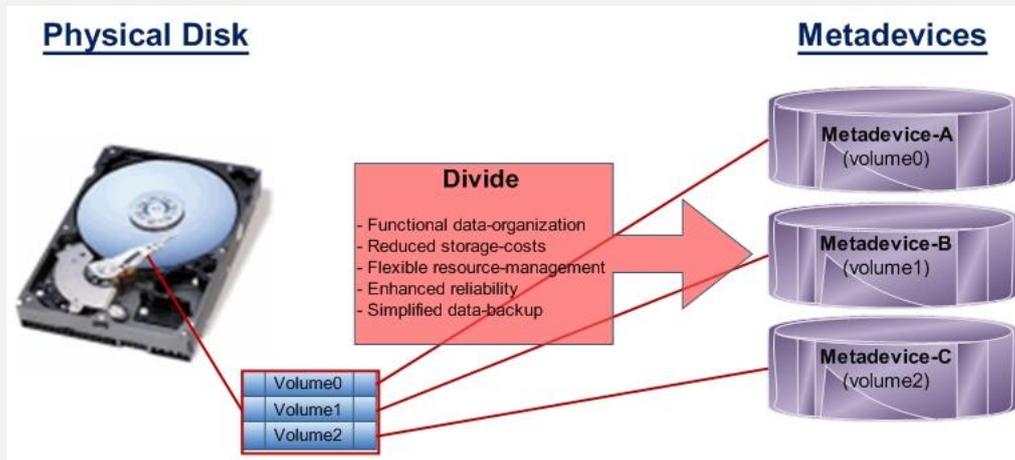
5.2.1 Multiple Storage Management

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 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 of creating partitions, just associate individual disk volumes to different:



5.2.2 Logical Management

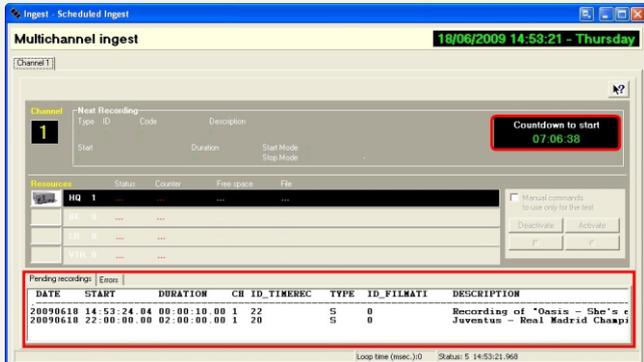
Etere manages (logical) metadevices instead of (physical) devices, this approach results in a wide range of possibilities for the media management, for example, it is possible to control with one click the available space of all metadevices:

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

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.

5.3 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:



Automatic ingest



Schedule ingest

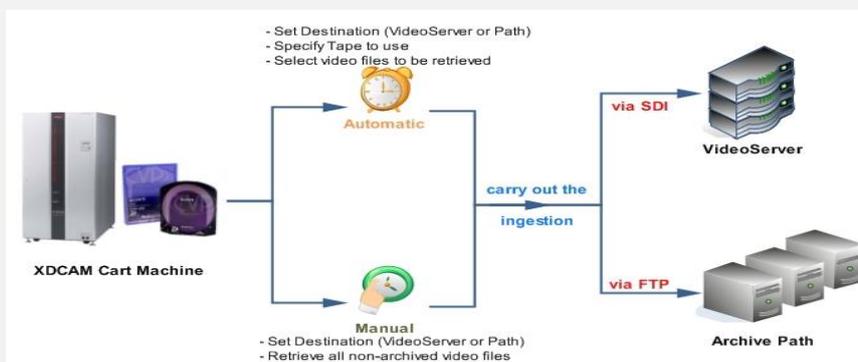
Etere Ingest supports multiple parallel ingest streams, managed automatically either on a single workstation or across various workstations, allowing also to schedule the video files to be ingested:



Planning View

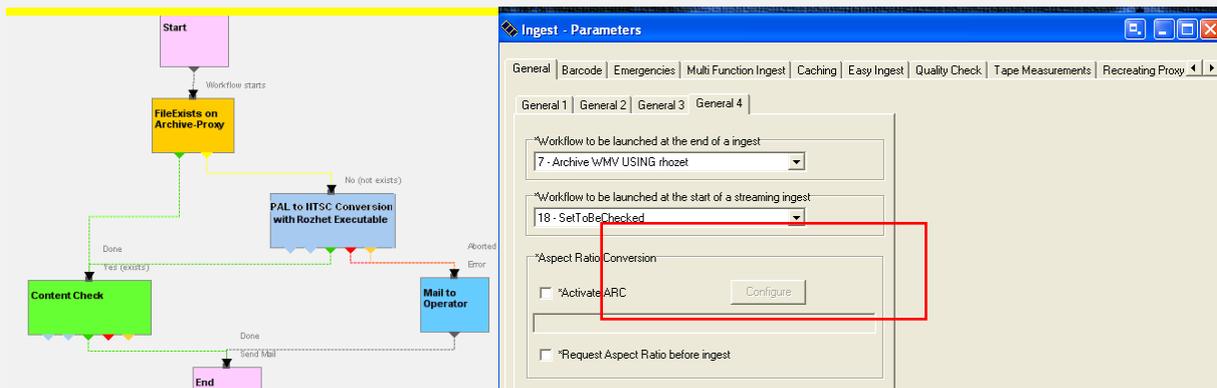
Etere ingest allows recording satellite signals to any storage target (i.e. video tapes, video servers, etc.) just by configuring GPI devices to trigger the ingest process.

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:



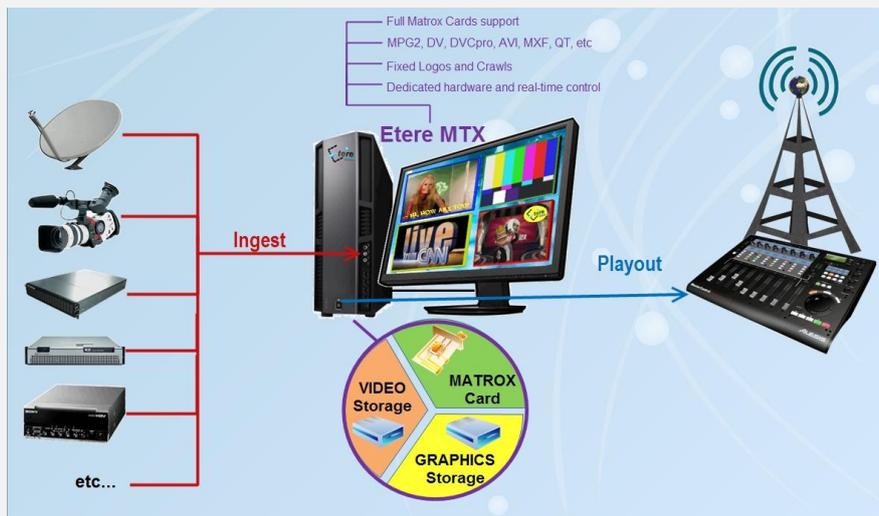
Once ingested, video files are transcoded into the specific format of the destination device on which they will be stored, in the same way; video files are transcoded each time they are moved

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:

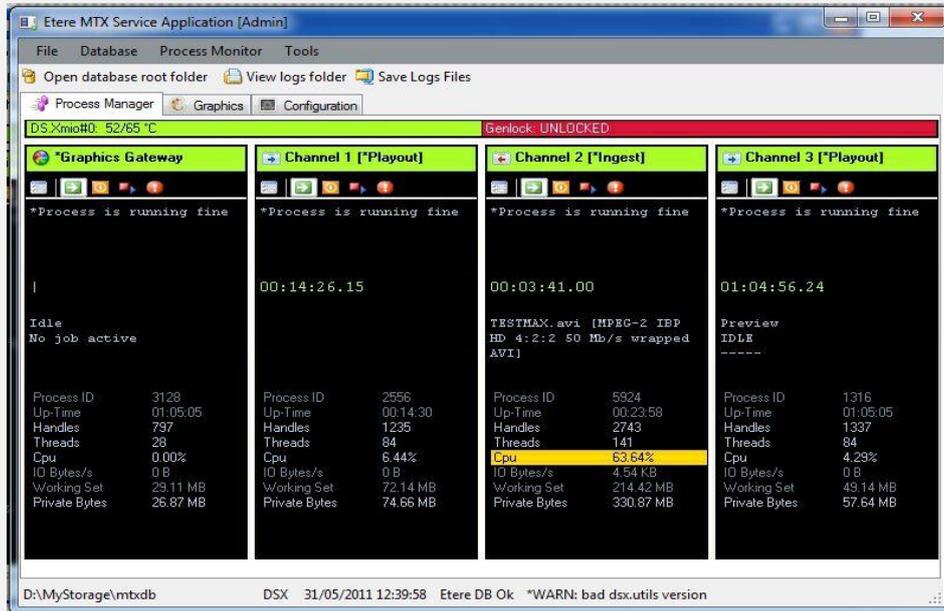


5.4 ETERE MTX: MTX: Digital Capture using Matrox Video Cards

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.



6. 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.

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 25 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.

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



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