PROJECT

Etere
a consistent system

MTV:

A Flexible Workflow-Based System

MTV
MUSIC TELEVISION®

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1. INTRODUCTION

MTV Italia is the Italian branch of MTV, the world-famous Music Television network, MTV Italia offers to the Italian public various premier entertainment channels accessible via Free-To-Air Terrestrial and Satellite TV, the channels currently transmitted by MTV Italia are MTV, MTV Hits, MTV Brand New, MTV Pulse, MTV Gold, VH1, LA7, Comedy Central and QOOB.

Etere and MTV count with a strong relationship since 2002, year in which Etere took the management of the station's channels, taking care of the content management of the entire broadcasting system to increase the productivity and flexibility of the station, making it ready to expand it network into new channels.

Etere has encompassed the exigencies of MTV which have been gradually extending with the passage of years, supporting any station step by providing it with various solutions based on the latest broadcasting technology. Nowadays, in the era of digital television, when the implementation of a workflow-based and tapeless solution is a "must", MTV can completely rely on the workflows designed by Etere to achieve a robust and reliable system, able to speed-up the local/remote management of media contents while reducing human errors.

This paper will describe all the workflows which form part of the MTV media management system and which made of it a flexible and solid framework for ensuring a more efficient and controlled management, introducing clearness and simplification to all the complex phases of the MTV broadcasting process, from acquisition ingest through to playout and delivery.

2. ETERE WORKFLOW MANAGEMENT

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 Workflow is an essential part of the broadcasting process not only because it allows to set broadcasting management rules but principally because it expresses how modules interact to perform the broadcasting process, making easy to the operator the understanding of how the system works and therefore it establishes a simple and reliable way to create or modify distinct broadcasting procedures, this approach gives to the station the possibility of a fully personalized developing manner taking broadcasting management onto a whole new level.

Etere Workflow gives full control to the station, allowing them to customize their system to make it match their requirements 100%, thus becoming into a key integration requisite for the overall functioning of the system.

Etere modules will interact with Etere Workflow to seek confirmation of whether they are permitted to do. If all previous steps in the workflow have not been undergone as defined by the operator, the software will not allow the system to move forward. Moreover, multiple workflows can run simultaneously, working independently of each other but inline with their related processes.

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.

3. CUSTOM MTV WORKFLOWS

The workflow-based management system currently installed on MTV has been specifically deployed to be suitable and efficient as well as to be perfectly integrated with all the rest of components which form the global MTV system.

All workflows have been custom-tailored designed to improve MTV's Media Asset Management, among the most important workflows currently managed by the station the following can be mentioned:

3.1 16_9 transcode
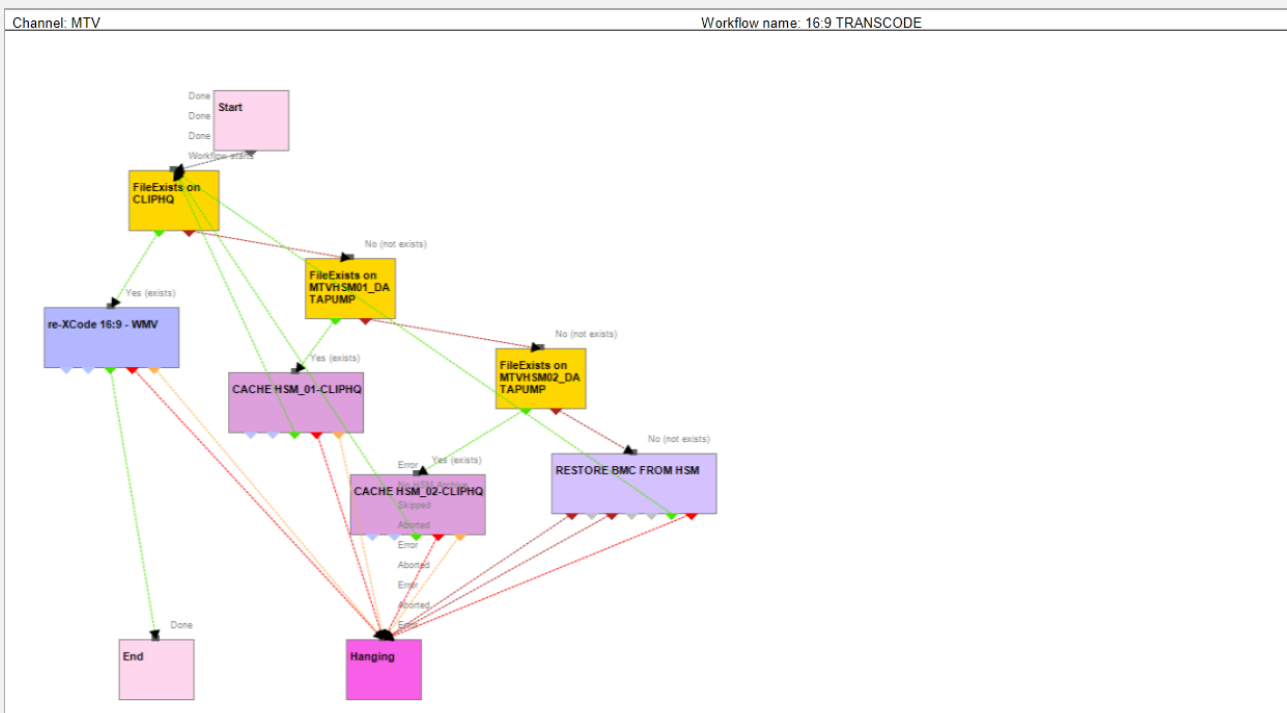
This workflow allows to transcode all media files from a HiRes format into a 16:9 WMV format, in case the clip is not available in the CLIPHQ archive it will be automatically restored by Etere HSM (preferably from the DataPump cache, otherwise from tape).

3.2 **ActiveSync_FtpSpot**
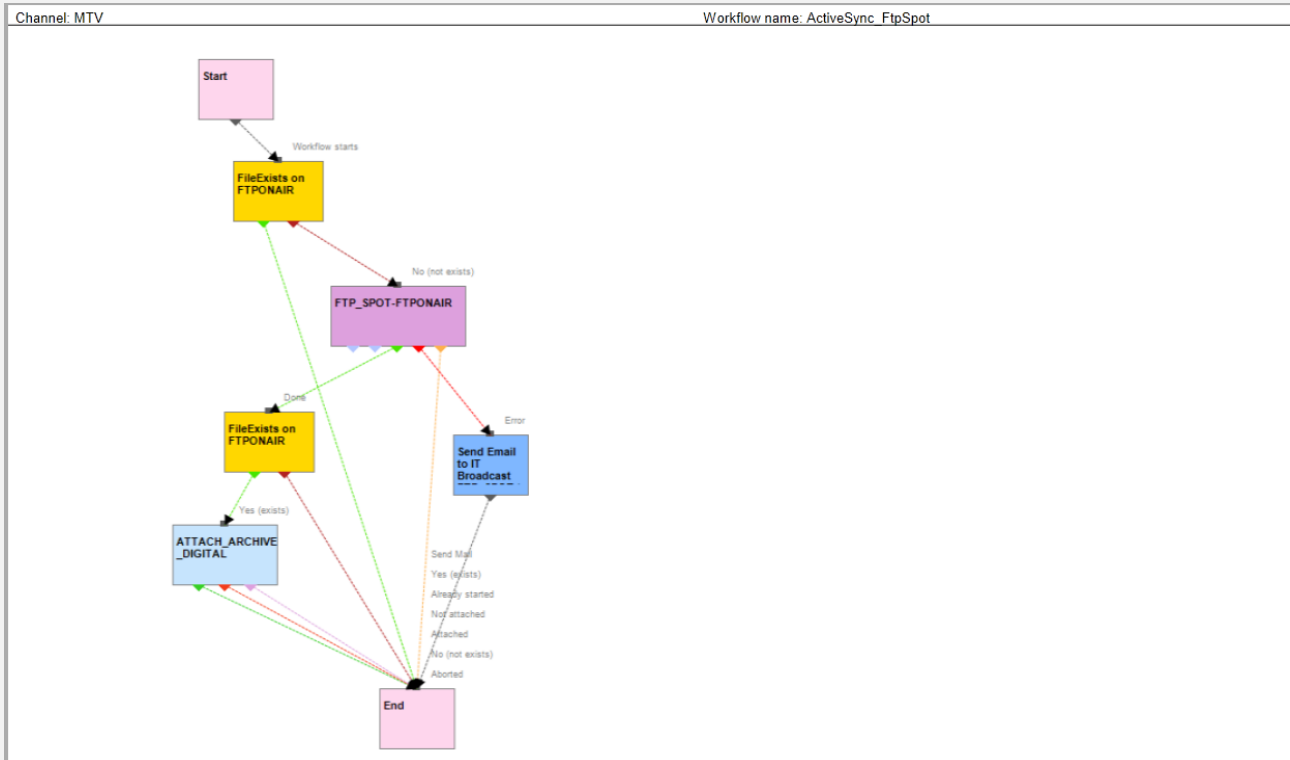
This workflow checks for the presence of metafiles into the "FTPonair" metadevice and in case they are missing, it tries to copy them from the "FTPSpot" metadevice, launching in the "Archive_Digital" workflow in case of success or sending and email in case of failure.

3.3 **Archive_Digital**
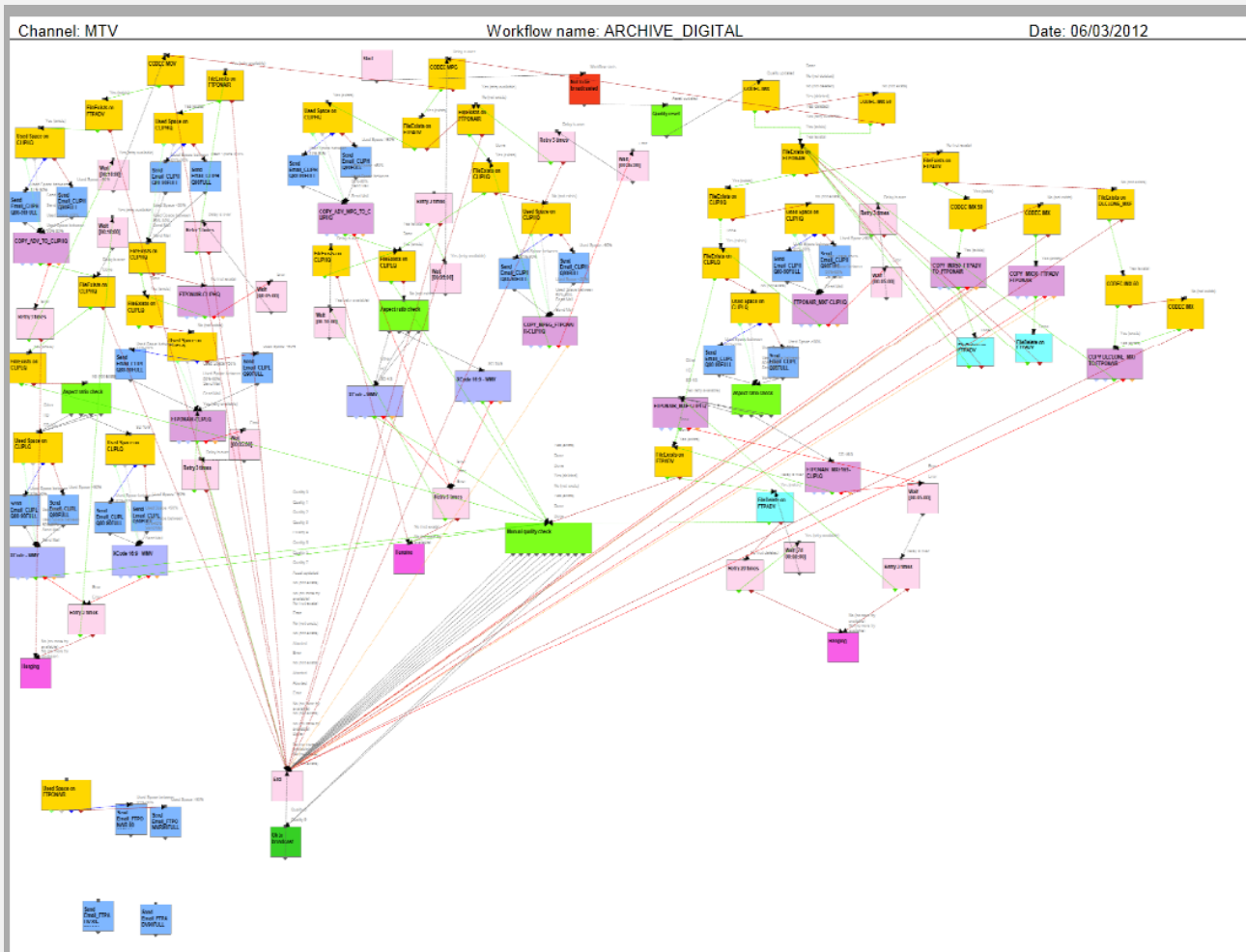
This workflow is in charge of the MTV archiving operations, it starts setting the processed asset as "not to be broadcasted" and resetting its quality control to zero, then, a check is performed to determine the codec of the asset, a different archiving action will be performed depending on the codec:

> ➢ IMX / IMX50
>
> Checks the existence of the file into the "FTPonair" metadevice and in case it doesn't exist it will be restored from the "FTPadv" metadevice into the "DLclone_mxf". Once the file is present in the "FTPonair" metadevice, it will be checked if the file is also present in the "ClipHQ" metadevice copying the file if required (i.e. if not present).
>
> Once the file is present in the "ClipHQ" metadevice, a check is performed on the "ClipLQ" metadevice to verify the existence of the file, in case it doesn't exists a transcoding operation is launched according to the video format (16:9 or 4:3); then, once the file has been transcoded the presence of the file is checked into the "FTPadv" metadevice (deleting it in case it's present).

➢ MPG

Checks if the file exists in the "FTPadv" metadevice, in case it does exist is directly copied into the "ClipHQ" metadevice, otherwise (if doesn't exist), the workflow searches for it on the "FTPonair" for copying the file from there into the "ClipHQ" metadevice.
Once the file is present in the "ClipHQ" metadevice, its presence is checked in the "ClipLQ" metadevice, generating a lowres version (according to the file aspect ratio) in this metadevice in case the file was not present.

➢ MOV

Checks the presence of the file in the "FTPadv" metadevice, in case it does exist, it is copied into the "ClipHQ" metadevice and a transcoding operation is launched to generate a lowres version of the file (according to its aspect ratio) into the "ClipLQ" metadevice.

Once all the previously detailed steps have been completed (according to the source codec), a quality control is performed for the asset in question and in case this check is successfully passed (8 or 9), the asset is set as "Ok to be broadcasted".

3.4   Archive_Digital_New_Test
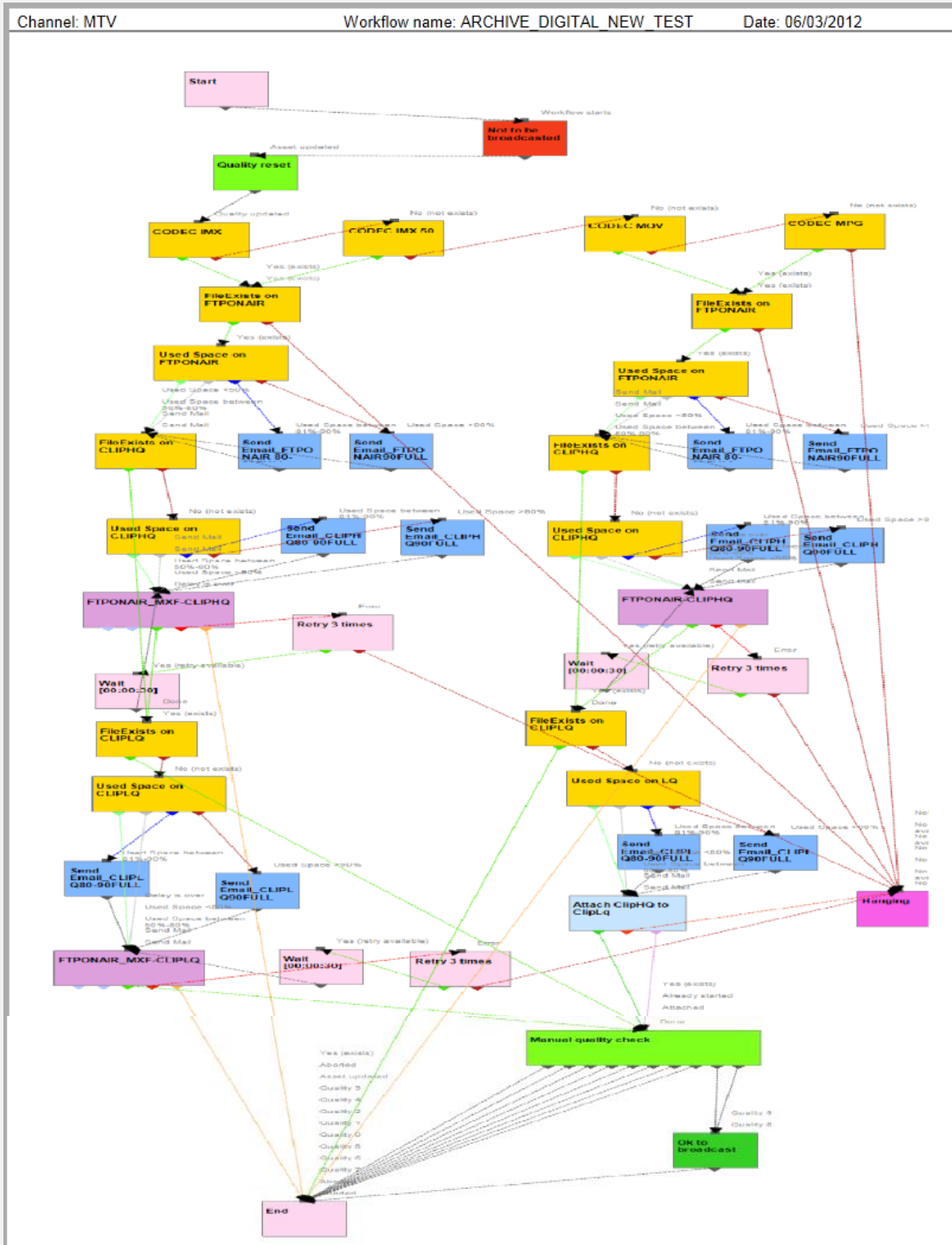
This workflow is in charge of the MTV archiving operations, it starts setting the processed asset as "not to be broadcasted" and resetting its quality control to zero, then, a check is performed to determine the codec of the asset, a different archiving action will be performed depending on the codec:

  ➢ IMX / IMX50
    Check if the file exists in the "FTPonair" and "ClipHQ" metadevices, in case the file is not present in "ClipHQ" it is copied from the "FTPonair_mxf" metadevice.
    Once the file is present in the "ClipHQ" metadevice, its existence is checked in the "ClipLQ" metadevice and in case it doesn't exist there, it is transcoded according to its format video (16:9 o 4:3).

  ➢ MOV / MPG
    Check if the file exist in the "FTPonair" and "ClipHQ" metadevices, in case the file is not present in the "ClipHQ" metadevice, it is copied from the "FTPonair" metadevice,
    Once the file is present in the "ClipHQ" metadevice, its existence is checked in the "ClipLQ" metadevice and in case it doesn't exist there, the "ClipHQ to Clip LQ" workflow is launched to generate a lowres version of the "ClipHQ" file into the "ClipLQ" metadevice.

Once all the previously detailed steps have been completed (according to the source codec), a quality control is performed for the asset in question and in case this check is successfully passed (8 or 9), the asset is set as "Ok to be broadcasted".

3.5 Archive_HSM
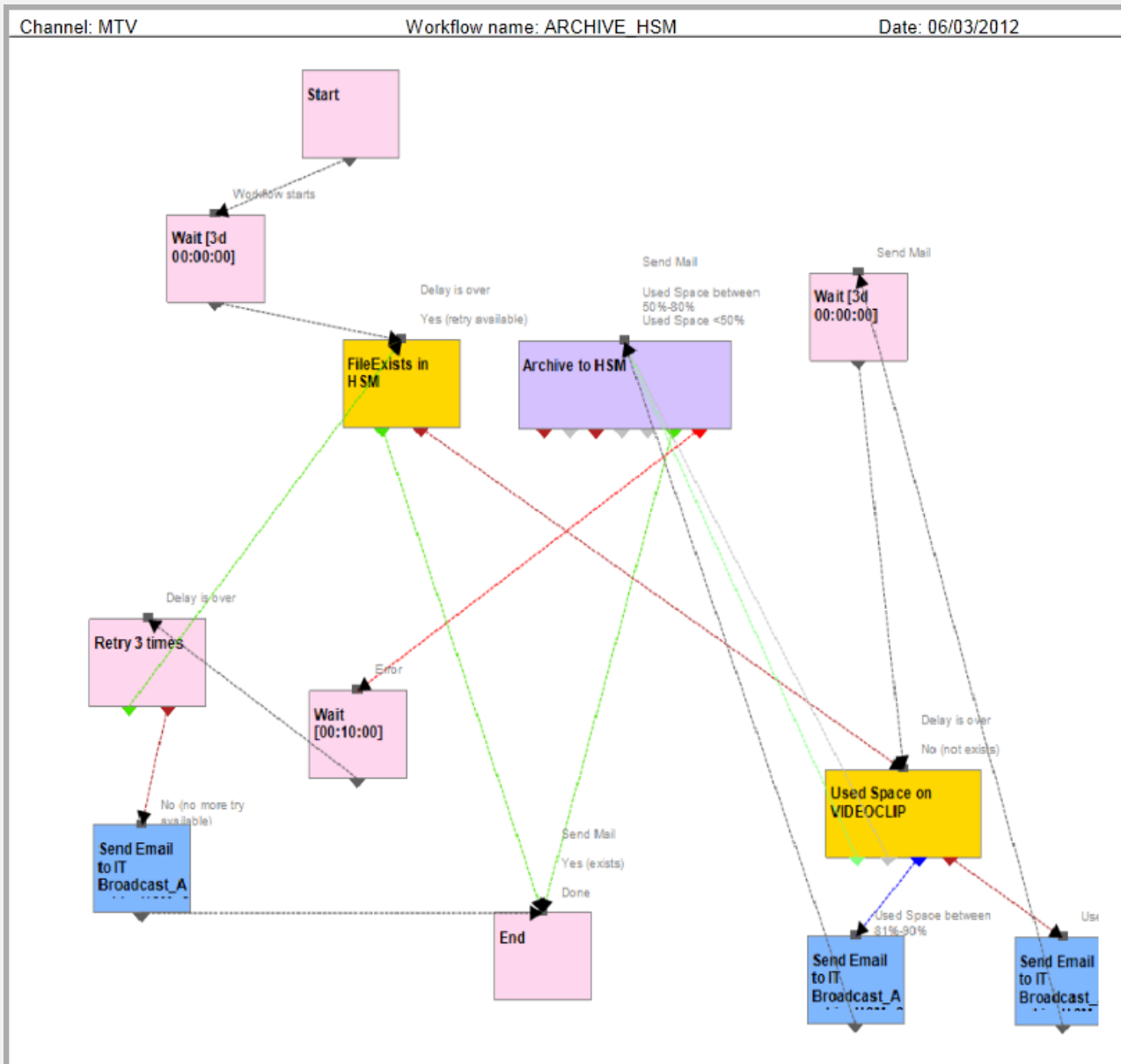
Once launched, this workflow waits 3 days before checking the current archiving status of the file into HSM; in case the file has not been archived on a LTO tape, its space used in the "VideoClip" metadevice is checked, then, a LTO archiving operation is launched according to the system rules (i.e. Media pools – Types). In case the LTO archiving operation fails, the workflow will retry 3 times to perform it and in case of 3 failures, an email notification is sent.

3.6 **Archive_Ingest**
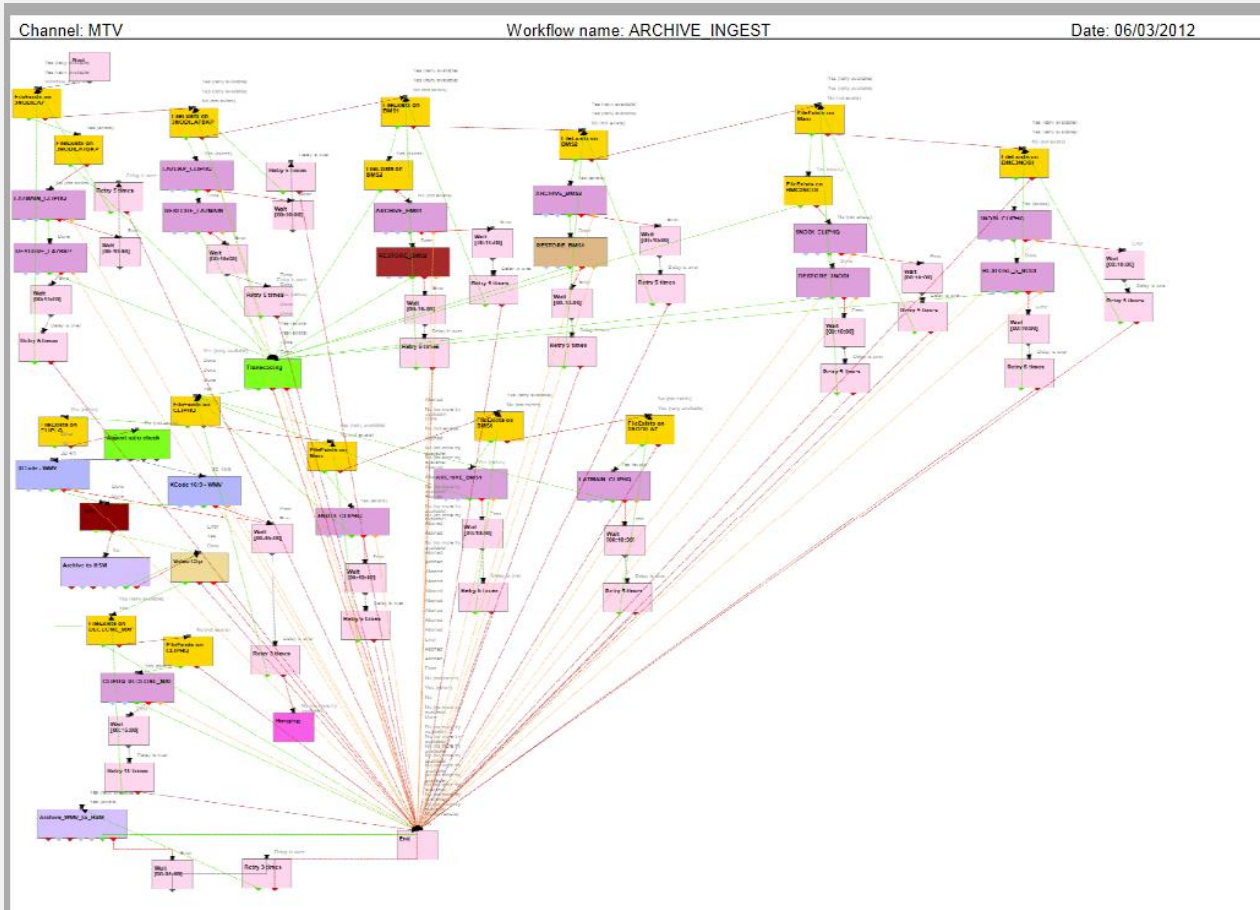
This workflow starts checking the presence of the file into the video server linked to the asset form (this, to understand on which server the asset has been ingested), once this check is completed; the file is copied from the "ClipHQ" metadevice into the related backup server.

Once archived, the file is copied in the backup and a transcoding operation is launched according to the video format (4:3 o 16:9), then, a LTO archiving operation is also launched in case the file belongs to the "_VLP" type.
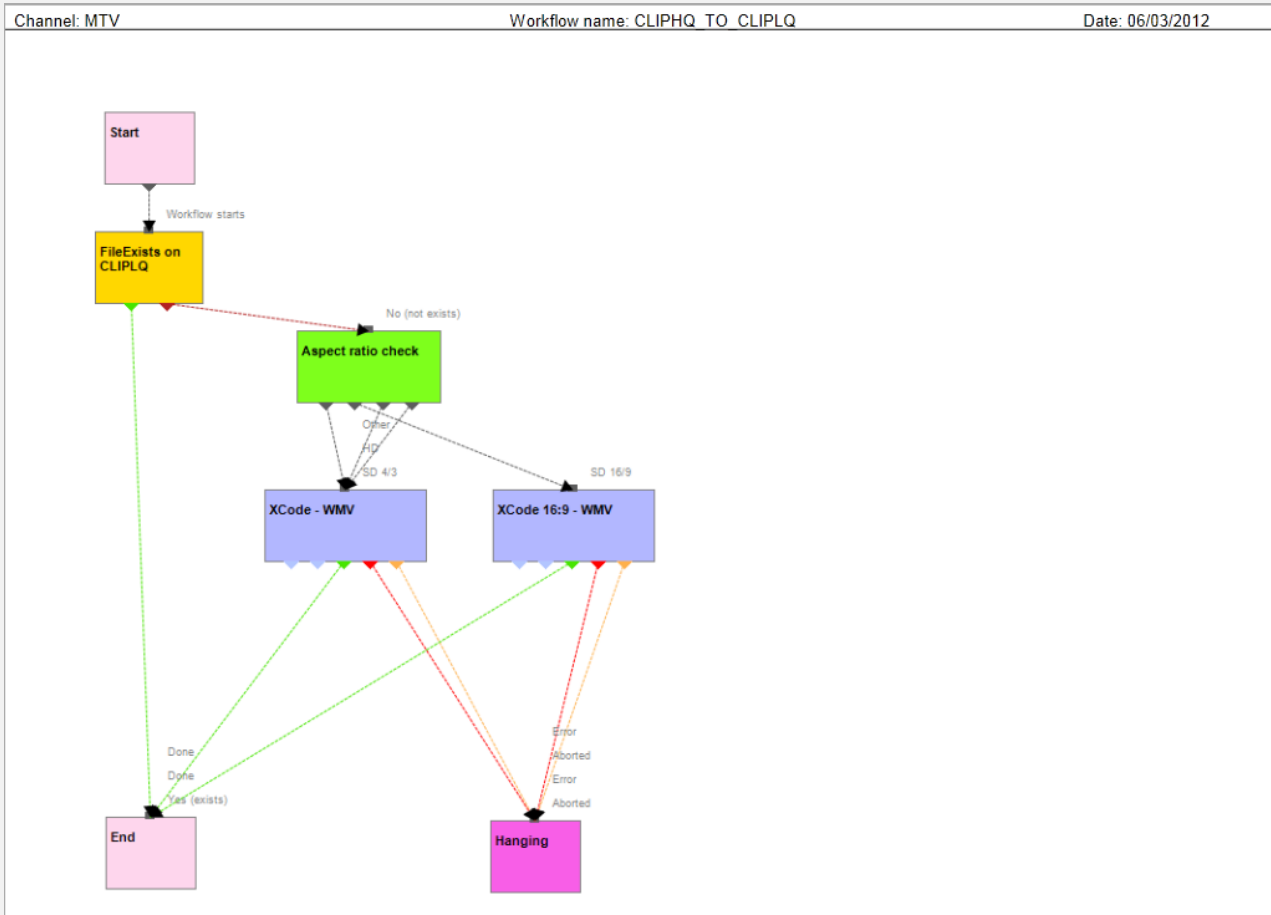
Prior to the transcoding, the presence of the file into the "ClipHQ" metadevice is checked and in case it is missing, it is copied from the related video server to the "ClipHQ" archive.

3.7 **Check_Schedule**
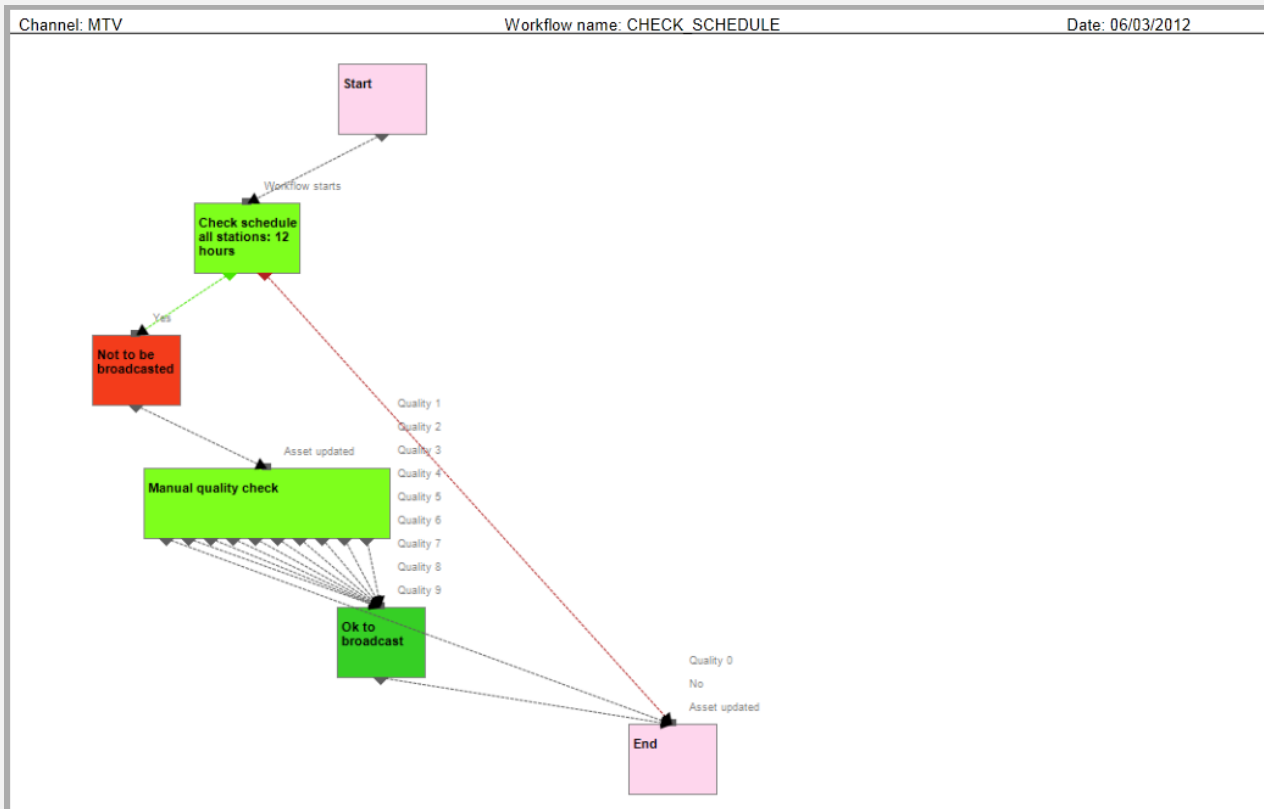
This workflow checks the presence of a file into the next 12 scheduling hours, in case it is present (i.e. scheduled for going on-air), the related asset is set as "not to be broadcasted" and a quality control is launched, then, in case of a successful quality value (1 to 9) the file is set as "Ok to be broadcasted".

3.8   ClipHQ_to_ClipLQ

This workflow is used for a standalone transcoding, it checks the presence of the file into the "ClipLQ" metadevice, and in case it is missing, its "aspect ratio" is checked for launching the related transcoding action (4:3 or 16:9).

3.9   Convert_H264
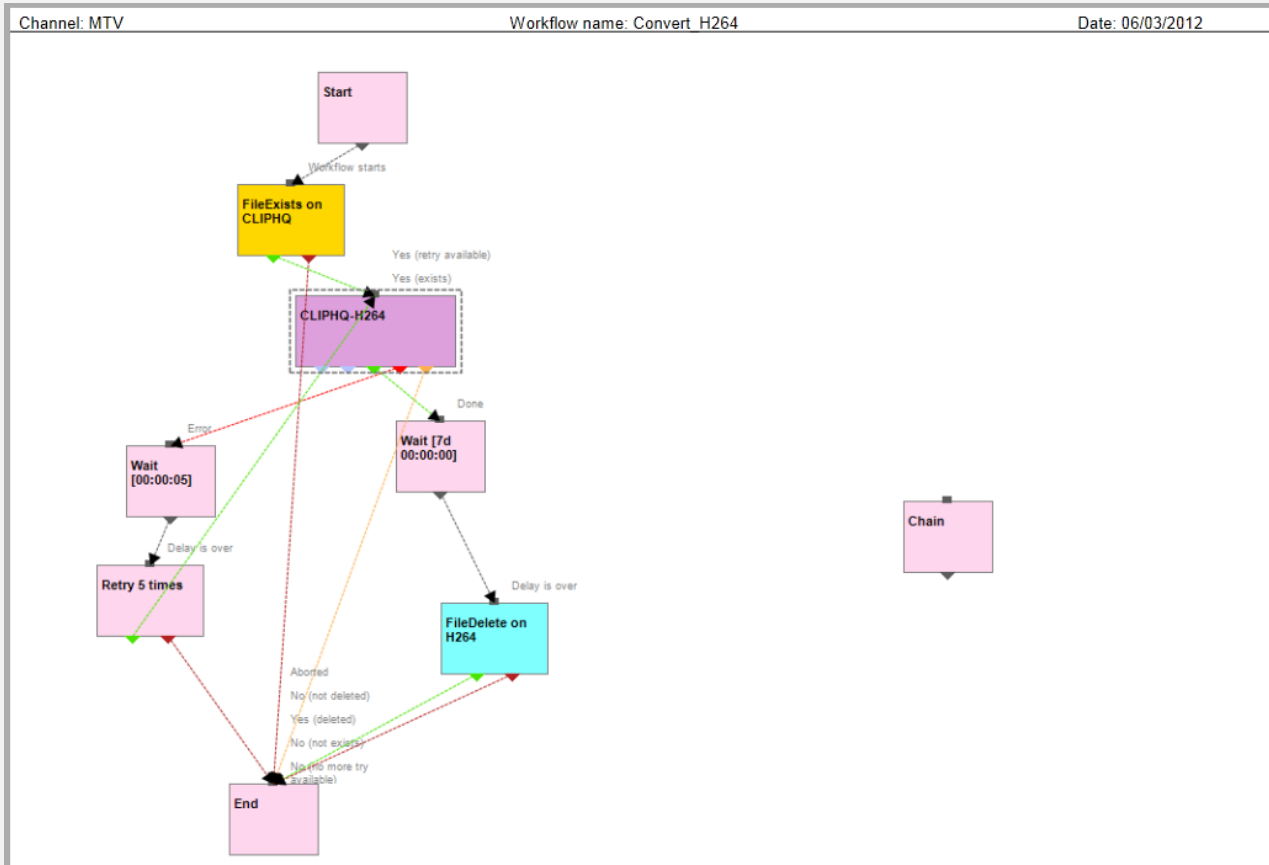
In case a file exists in the "ClipHQ" metadevice, a transcoding is launched for the file. Once the transcoded is completed, the workflow will wait 7 days before deleting the "H264" file.
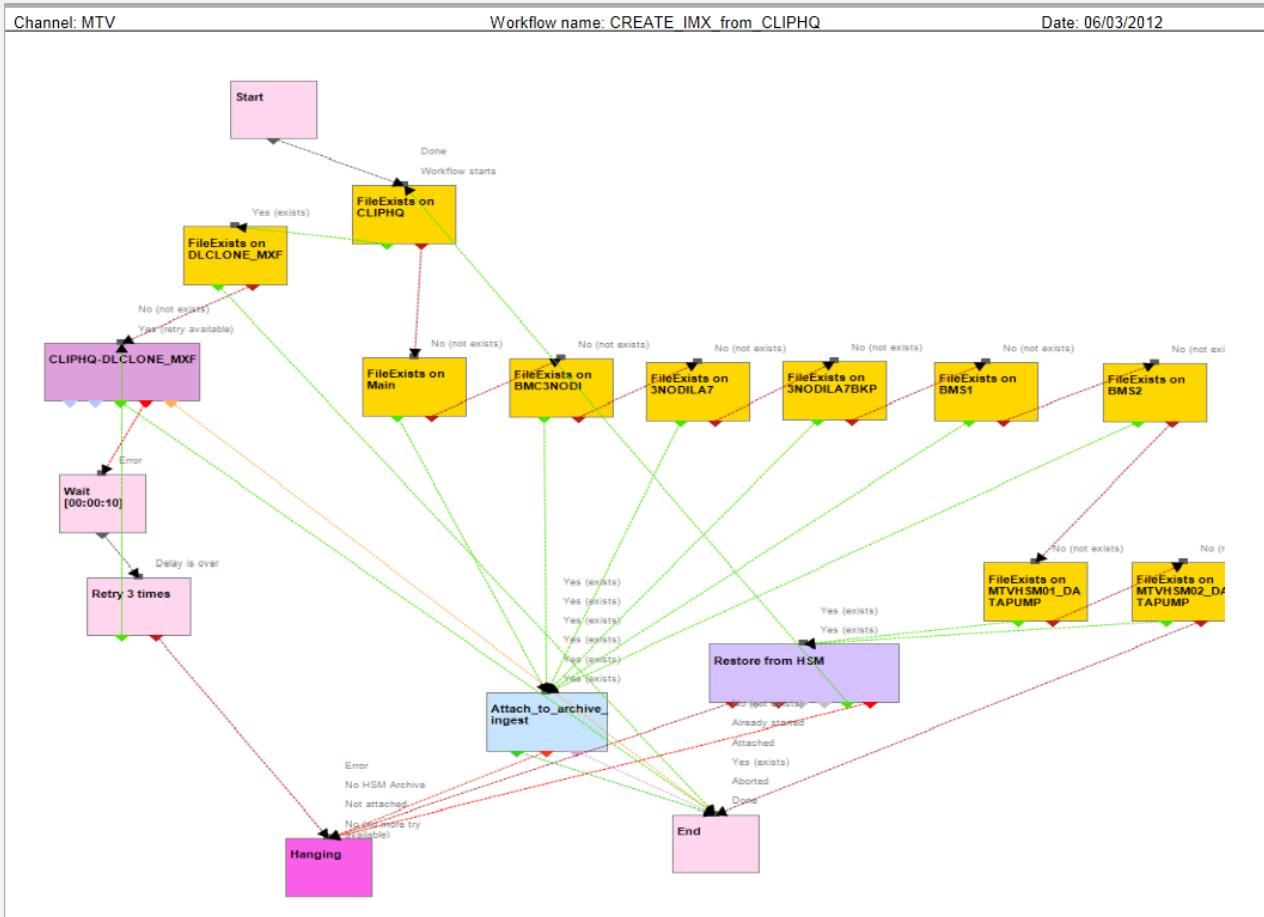
3.10 Convert_H264_16_9
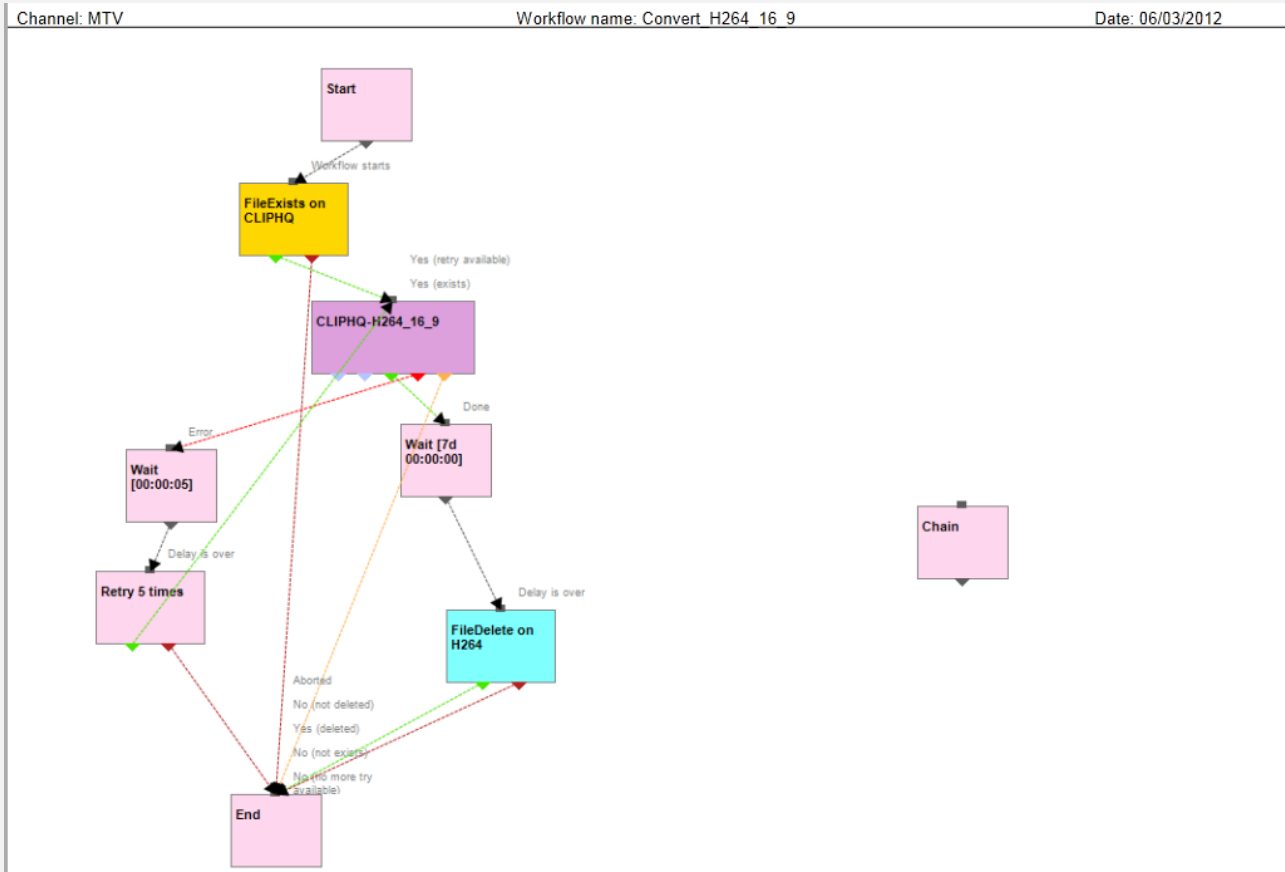
In case a file exists in the "ClipHQ" metadevice, a transcoding (16:9) is launched for the file. Once the transcoded is completed, the workflow will wait 7 days before deleting the "H264" file.

3.11   Create_IMX_from_CLIPHQ

This workflow checks if an asset form counts with a file on the "ClipHQ" metadevice, and in case it doesn't, all the asset's related video servers are checked in order to determine where the file has been ingested, once the file is found, the "WF Archive_Ingest" workflow is launched. Otherwise, in case the file is not found in any video server, all the DataPumps are checked to perform a HSM restore.

Once the clip is present in the "ClipHQ" metadevice, a transcoding operation is launched to generate an MXF file.
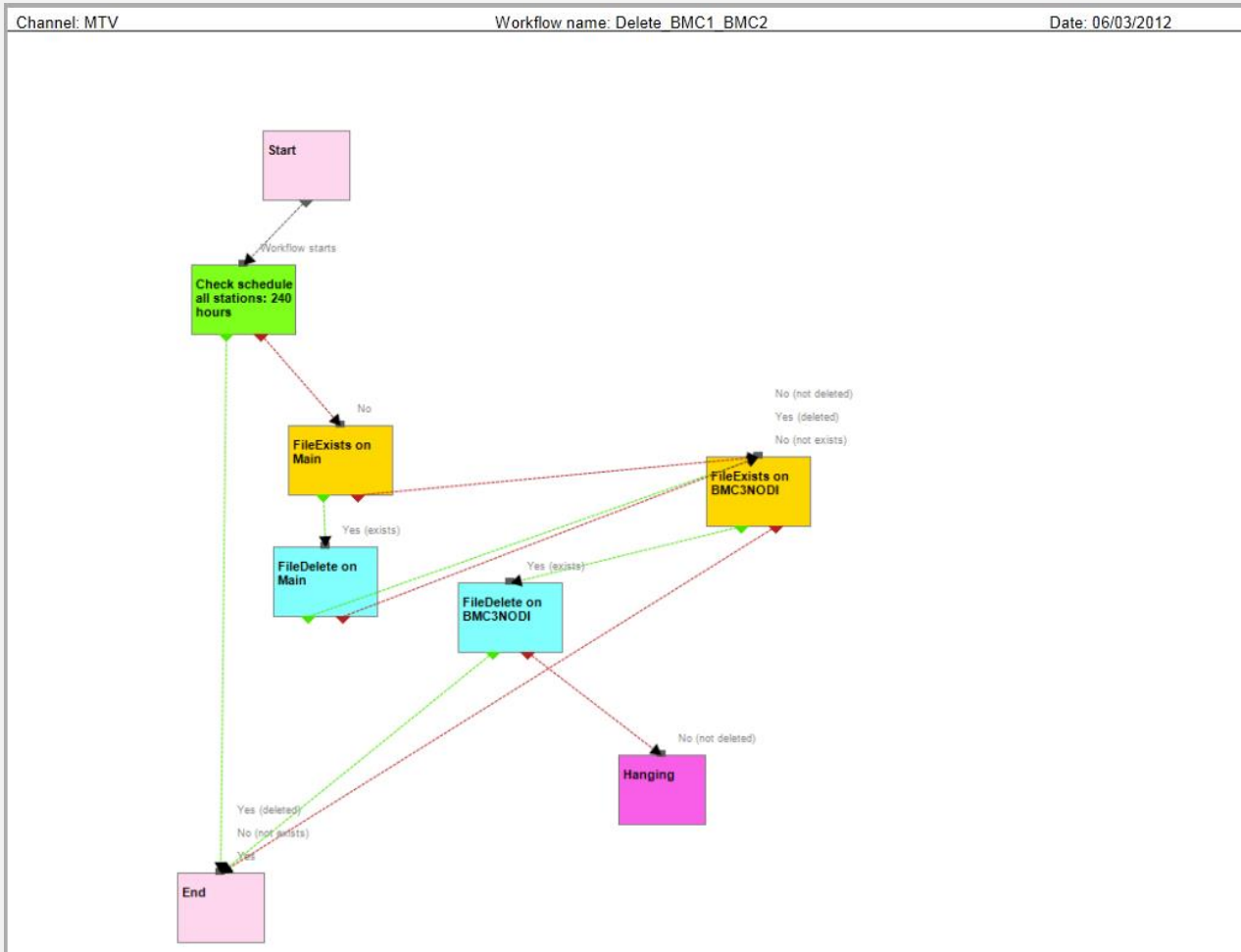
3.12 Delete_All
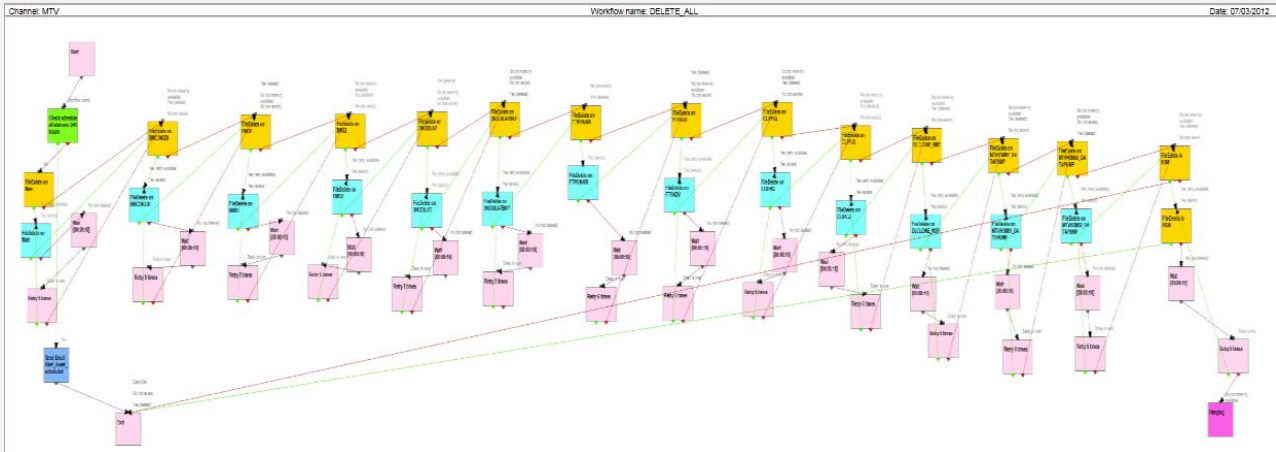
This workflow checks if an asset form is scheduled for going on-air in the next 240 hours (10 days) and in case it doesn't, the presence of its linked files is checked across all the metadevices deleting the related files (when found), this operation is performed until all the asset's related files have been removed from all the metadevices.
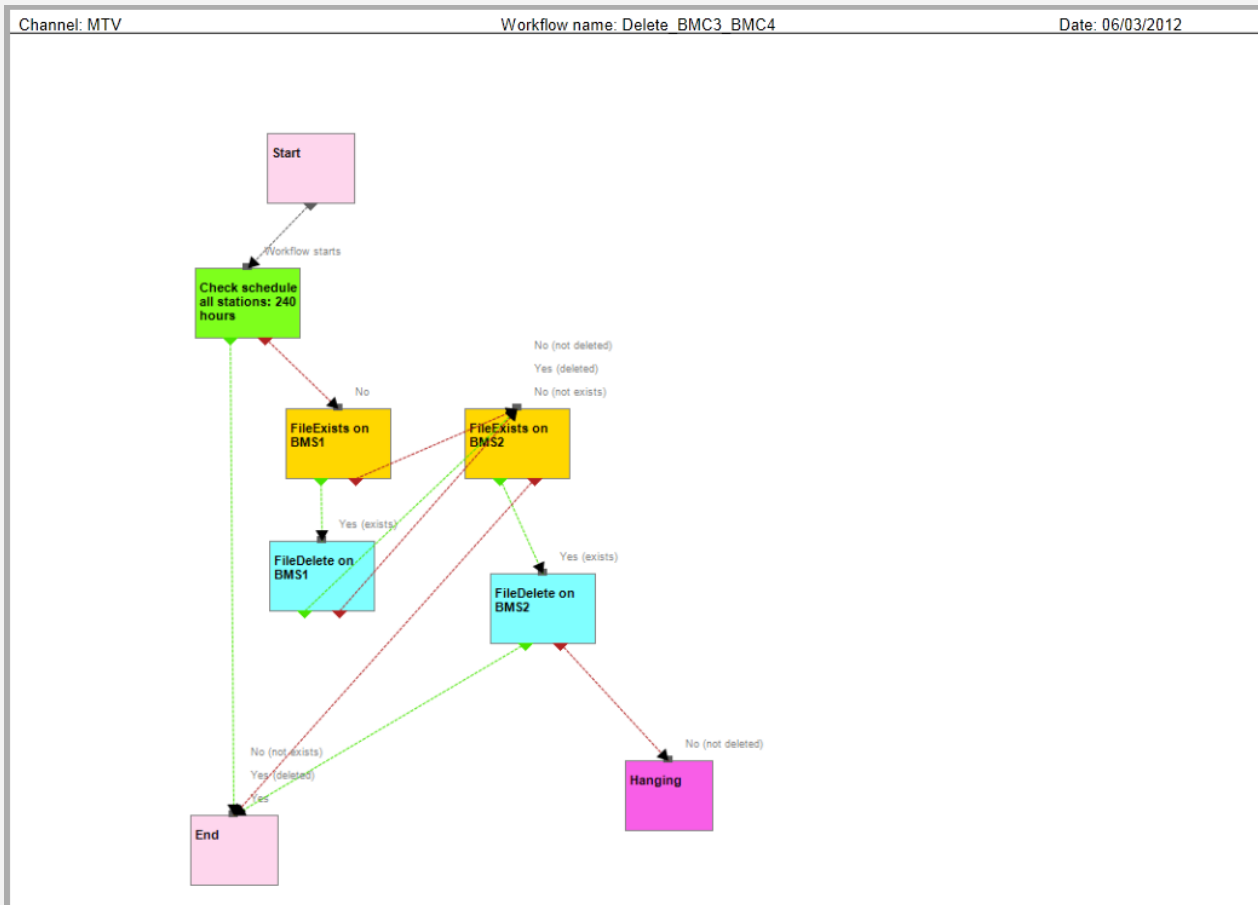
3.13 Delete_BMC_BMS
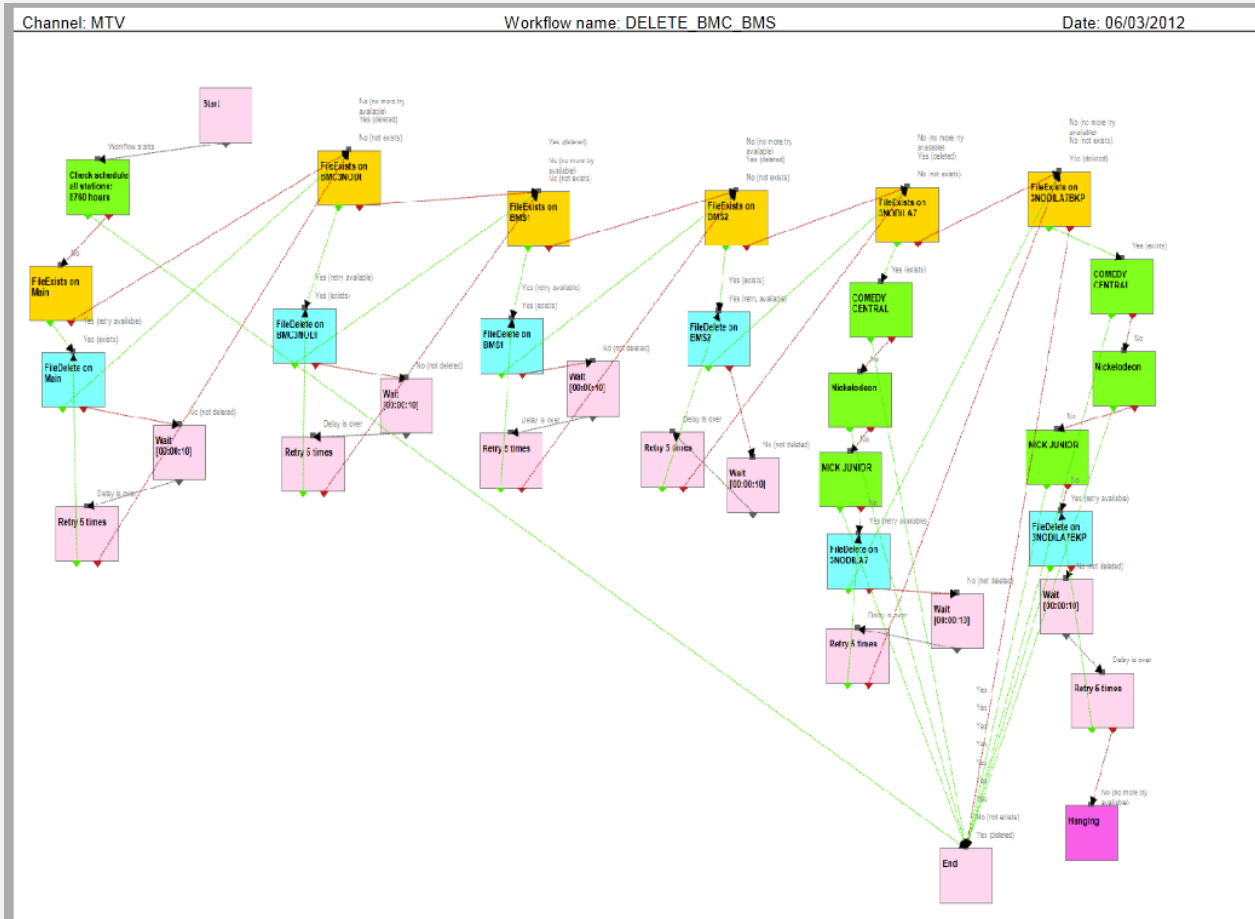
This workflow checks if an asset is scheduled for going on-air in the next 8760 hours (1 year) and in case it doesn't, the presence of its linked files is checked on the "BMS" and "BMC" video servers, deleting from these video servers any found linked file, this, excepting the "3NODILA7" and "3NODILA7BKP" video servers (for which it is also checked that files to be deleted are not used in the "Comedy Central", "Nickelodeon" and "Nick Junior" channels).

3.14 Delete_BMC1_BMC2

This workflow checks if an asset is scheduled for going on-air in the next 240 hours (10 days), and in case it doesn't, the presence of its linked files is checked across the "Main" and "BMC3nodi" video servers, deleting from these server any found linked file.
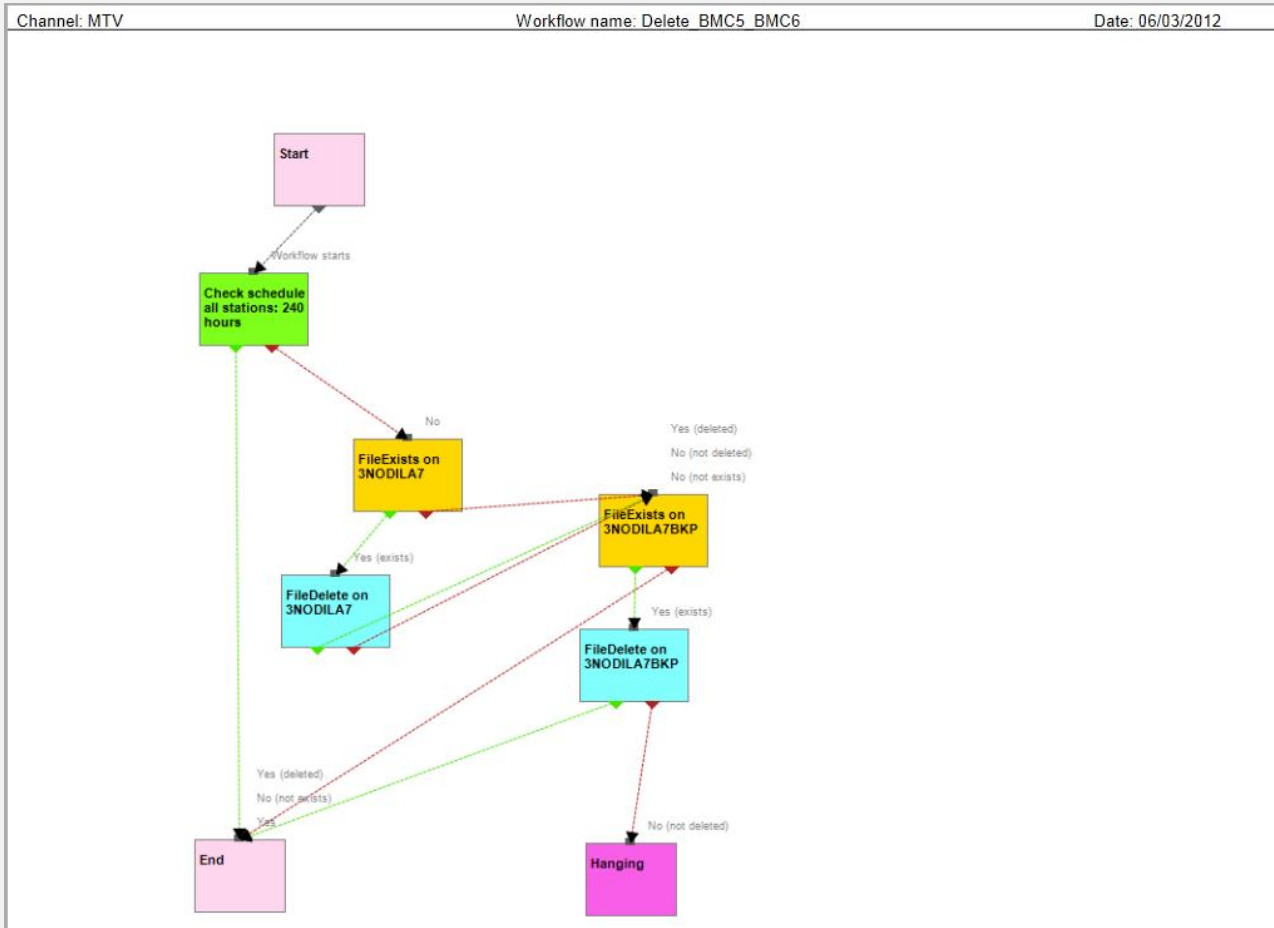
3.15 Delete_BMC3_BMC4

This workflow checks if an asset is scheduled for going on-air in the next 240 hours (10 days), and in case it doesn't, the presence of its linked files is checked across the "BMS1" and "BMS2" video servers, deleting from these server any found linked file.

3.16 Delete_BMC5_BMC6

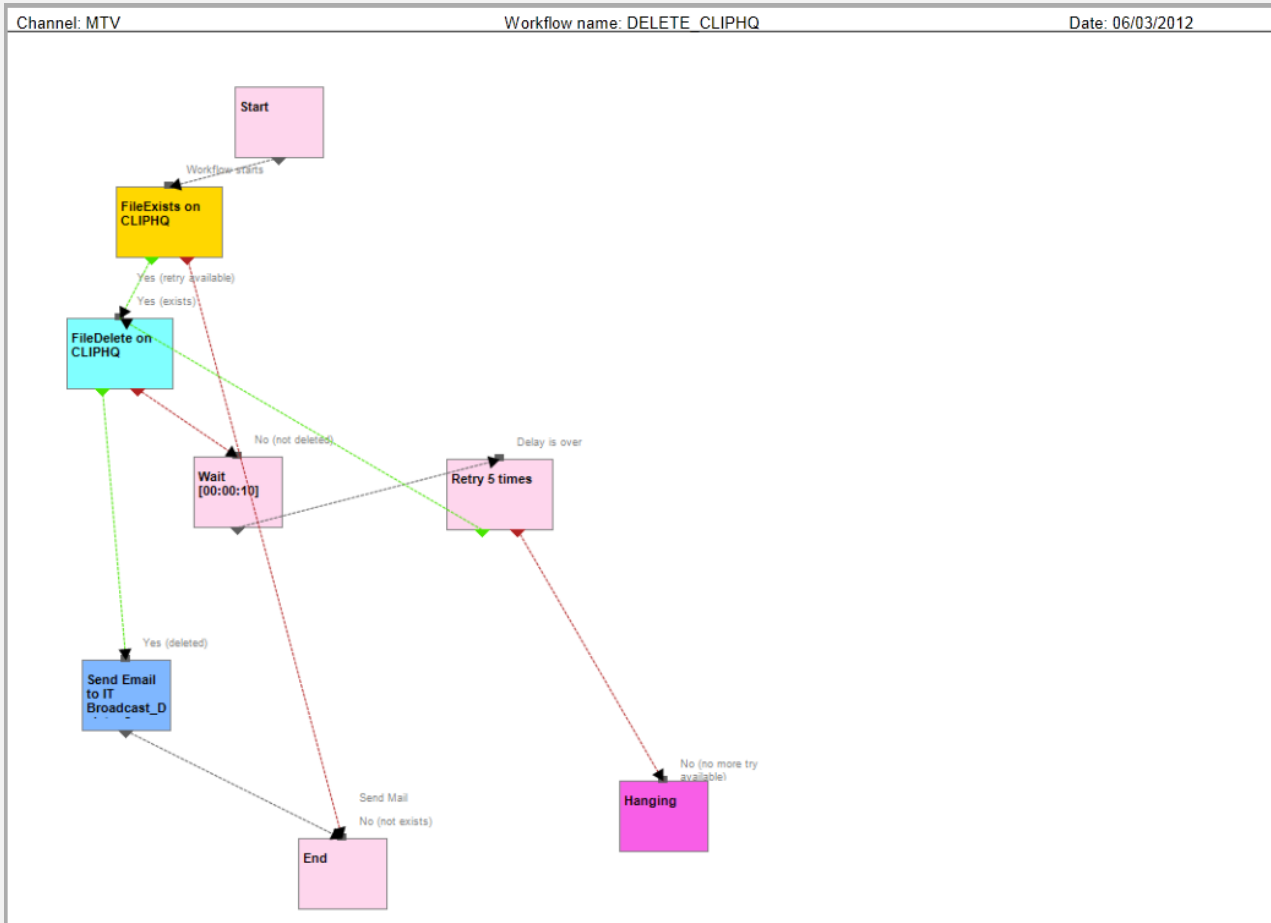| Channel: MTV | Workflow name: Delete_BMC5_BMC6 | Date: 06/03/2012 |

This workflow checks if an asset is scheduled for going on-air in the next 240 hours (10 days), and in case it doesn't, the presence of its linked files is checked across the "3NODILA7" and "3NODILA7BKP" video servers, deleting from these server any found linked file.

3.17 Delete_CLIPHQ

This workflow checks if a file is present in the "ClipHQ" metadevice, deleting from these server any found linked file and sending an email notification.
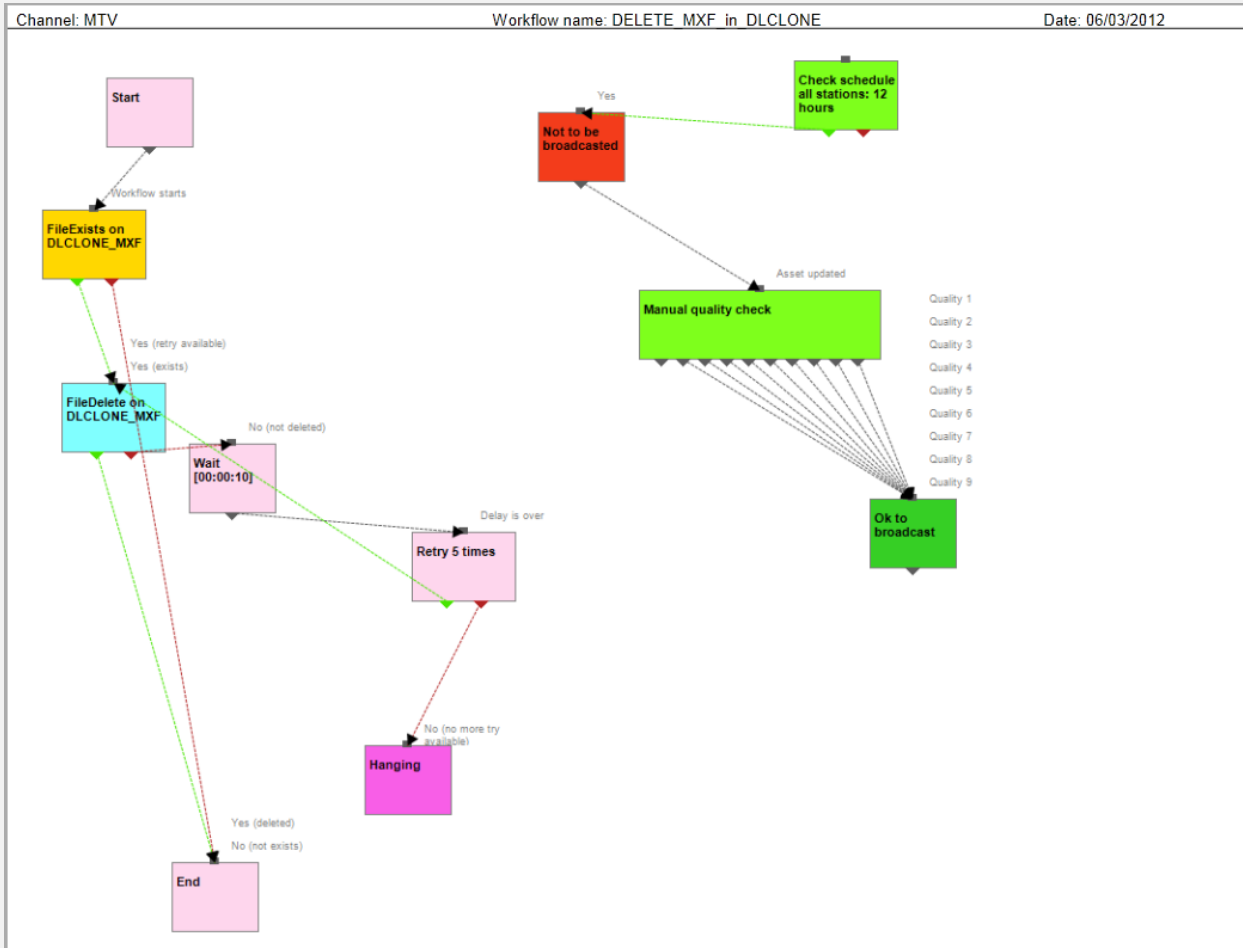
3.18 Delete_Hsm
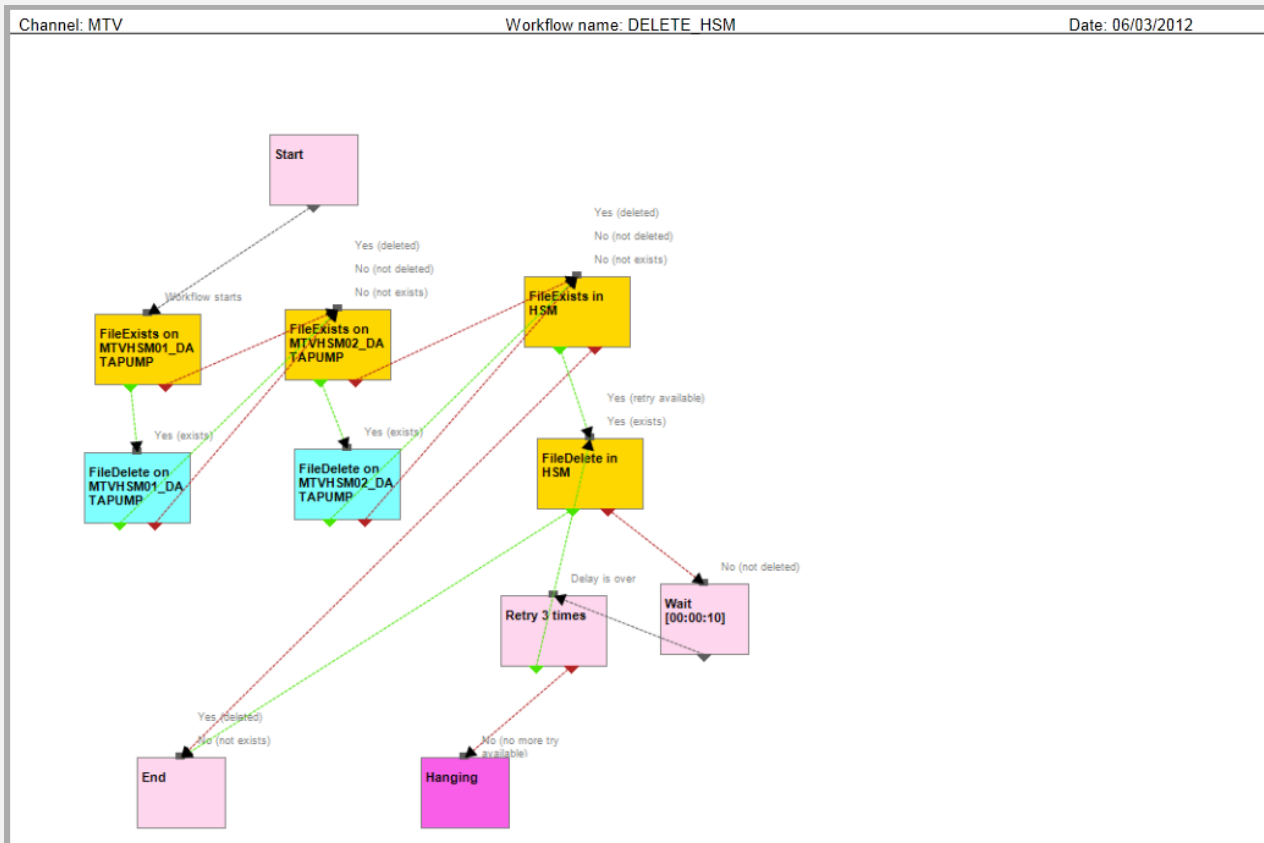
This workflow checks if an asset file is present in the "MTVHSM01_DATAPUMP" and "MTVHSM02_DATAPUMP" metadevices, deleting from these server any found linked file. Additionally, the presence of asset files will be also checked on the "HSM" metadevice from where eventual found files will be deleted.

3.19 Delete_MXF_in_dlclone

This workflow checks if the asset file is present in the "DLclone_mxf" metadevice, deleting from these server any found linked file and sending an email notification.

3.20 **Delete_uploaded_file**

This workflow checks if the asset file is present in the "FTPadv" metadevice, deleting from these server any found linked file and sending an email notification. Additionally, the presence of asset files will be also checked on the "FTPonair" metadevice from where eventual found files will be deleted.
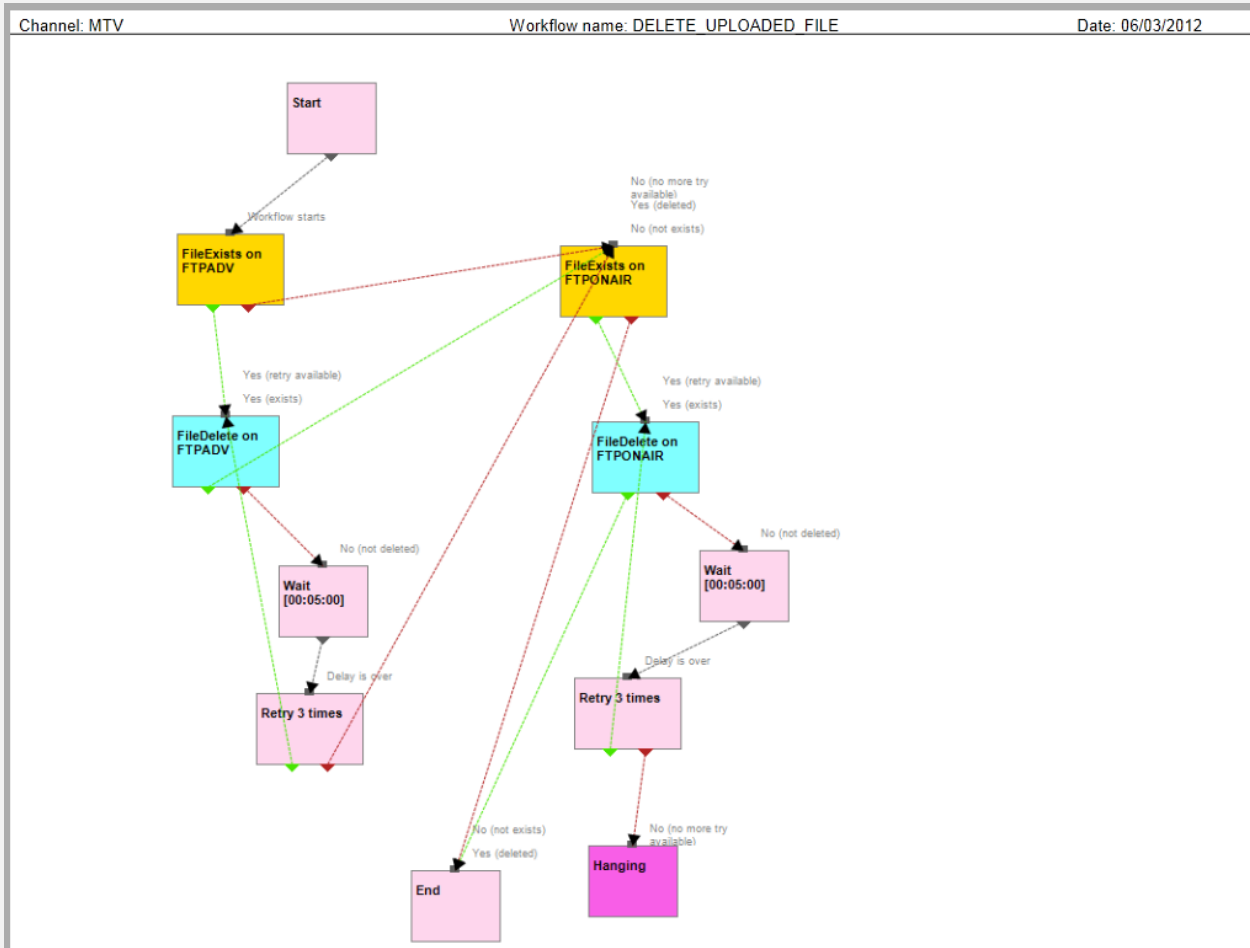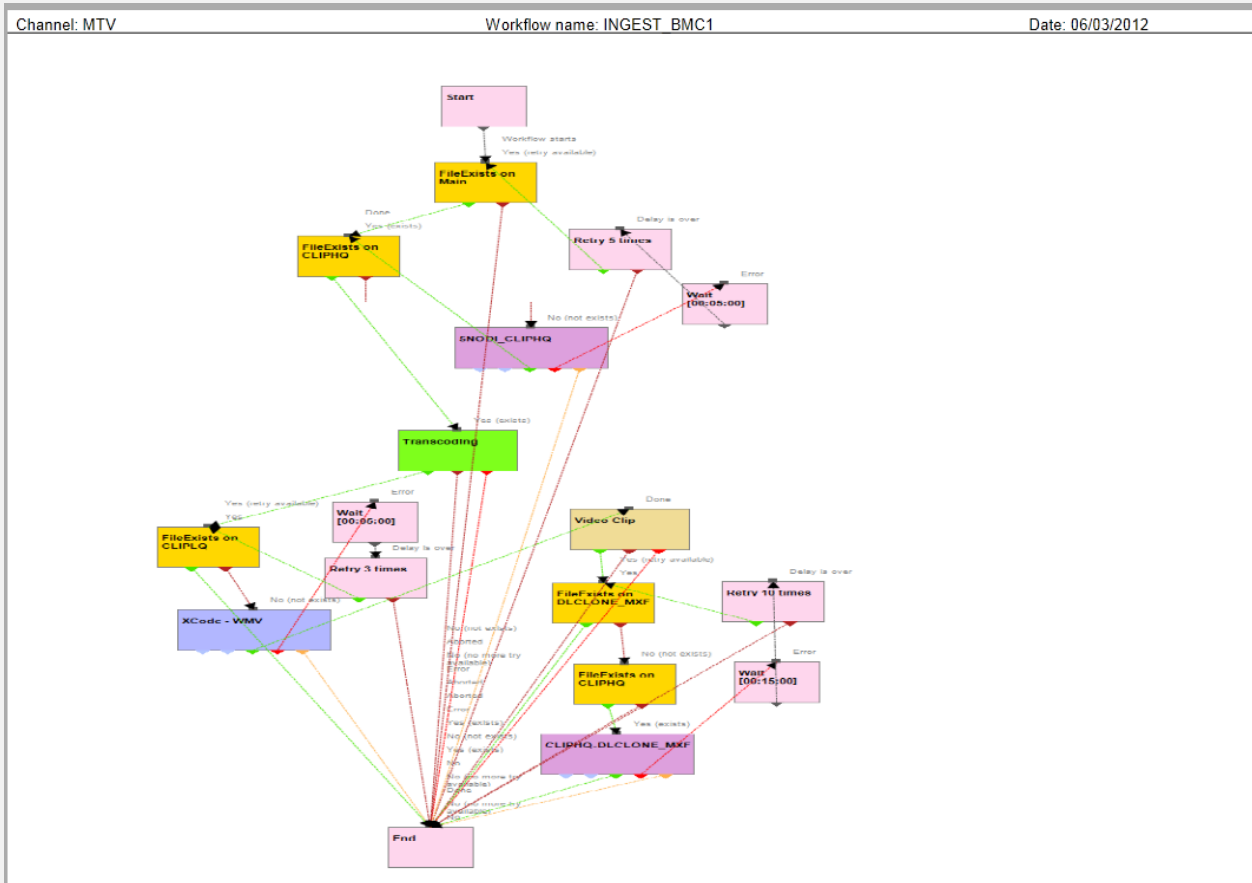
3.21   Ingest_BMC1

This workflow checks the presence of an asset file in the "Main" and "ClipHQ" metadevices, and in case the file is missing in the latter one (ClipHQ) it will be copied from the "5NODI" (Main) video server.

Then, a transcoding operation is launched in case the "transcoding" property is enabled for the asset type. Once the file is transcoded, it is copied from the "ClipHQ" to the "DLclone_mxf" metadevice in case the "videoclip" property is enabled for the asset type.

3.22   Ingest_library_BMS

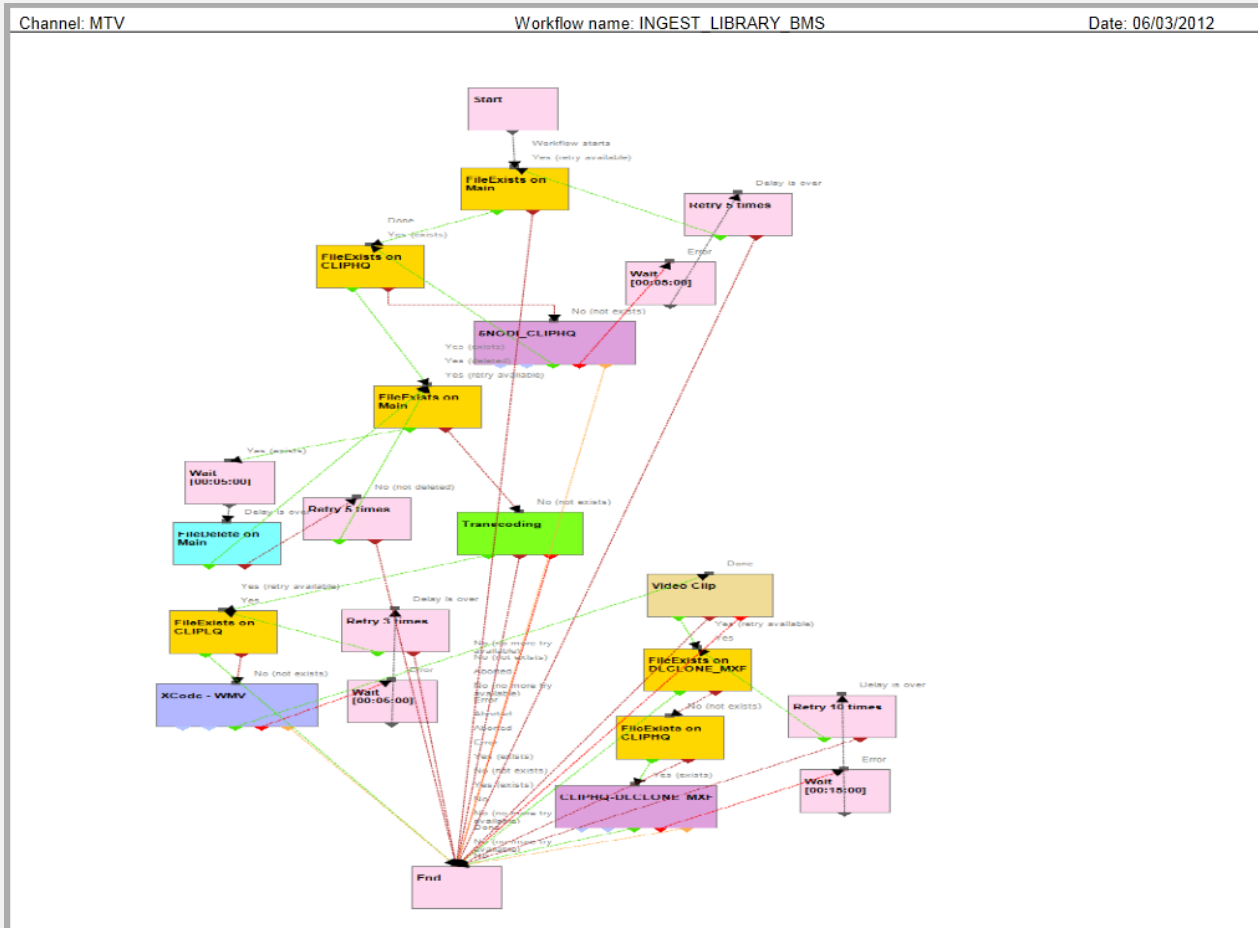| Channel: MTV | Workflow name: INGEST_LIBRARY_BMS | Date: 06/03/2012 |

This workflow checks the presence of an asset file in the "Main" and "ClipHQ" metadevices, and in case the file is missing in the latter one (ClipHQ) it will be copied from the "5NODI" (Main) video server, the file is then deleted from the "Main" metadevice.

At this point, in case the in case the "transcoding" property is enabled for the asset type and the file doesn't exist on the "ClipLQ" metadevice, a transcoding operation is launched.

Once the file is transcoded, in case the "videoclip" property is enabled for the asset type, in case the file is not present in the "DLclone_mxf" metadevice it is copied from the "ClipHQ" metadevice.

3.23 Load_balancing_test
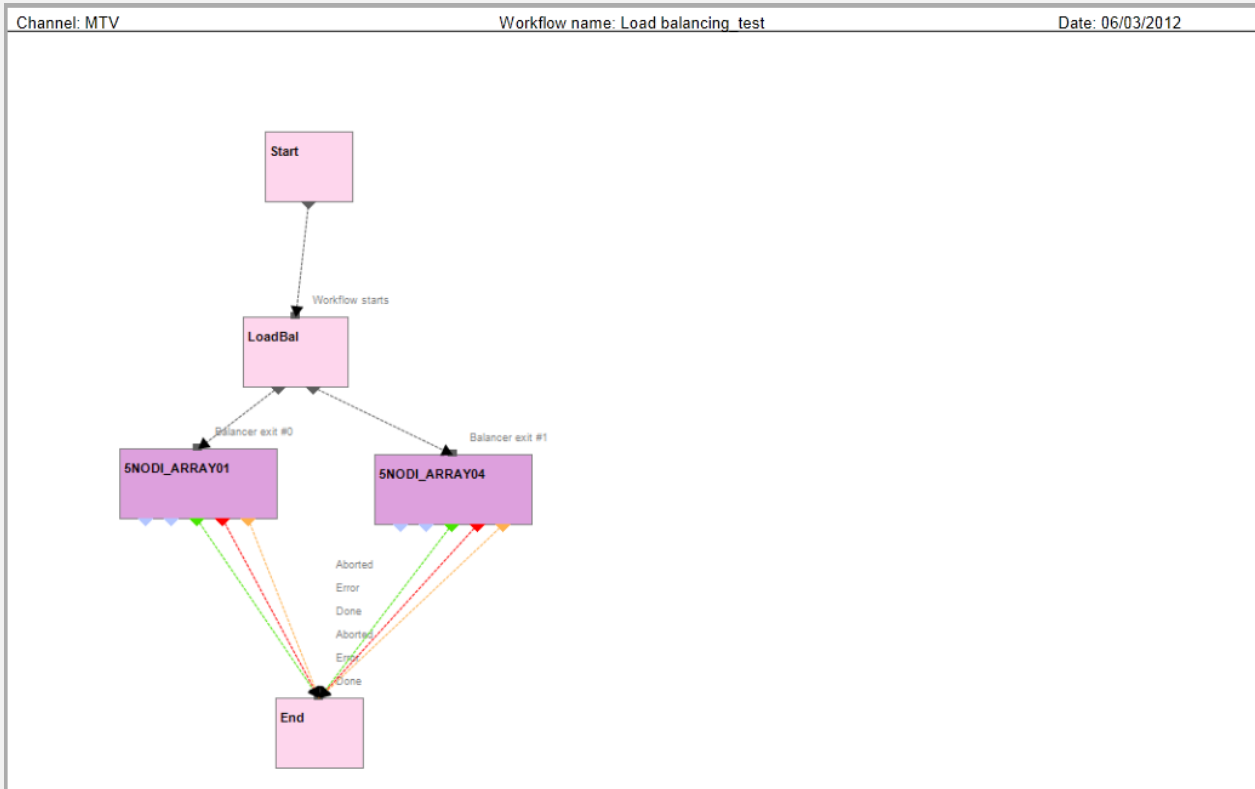
This is a test workflow used to checkout if a "load balanced" copy from the "5NODI" video server to the "ARRAY01" and "ARRAY04" metadevices is actually "balanced".

3.24 **Memory_cutting_web**
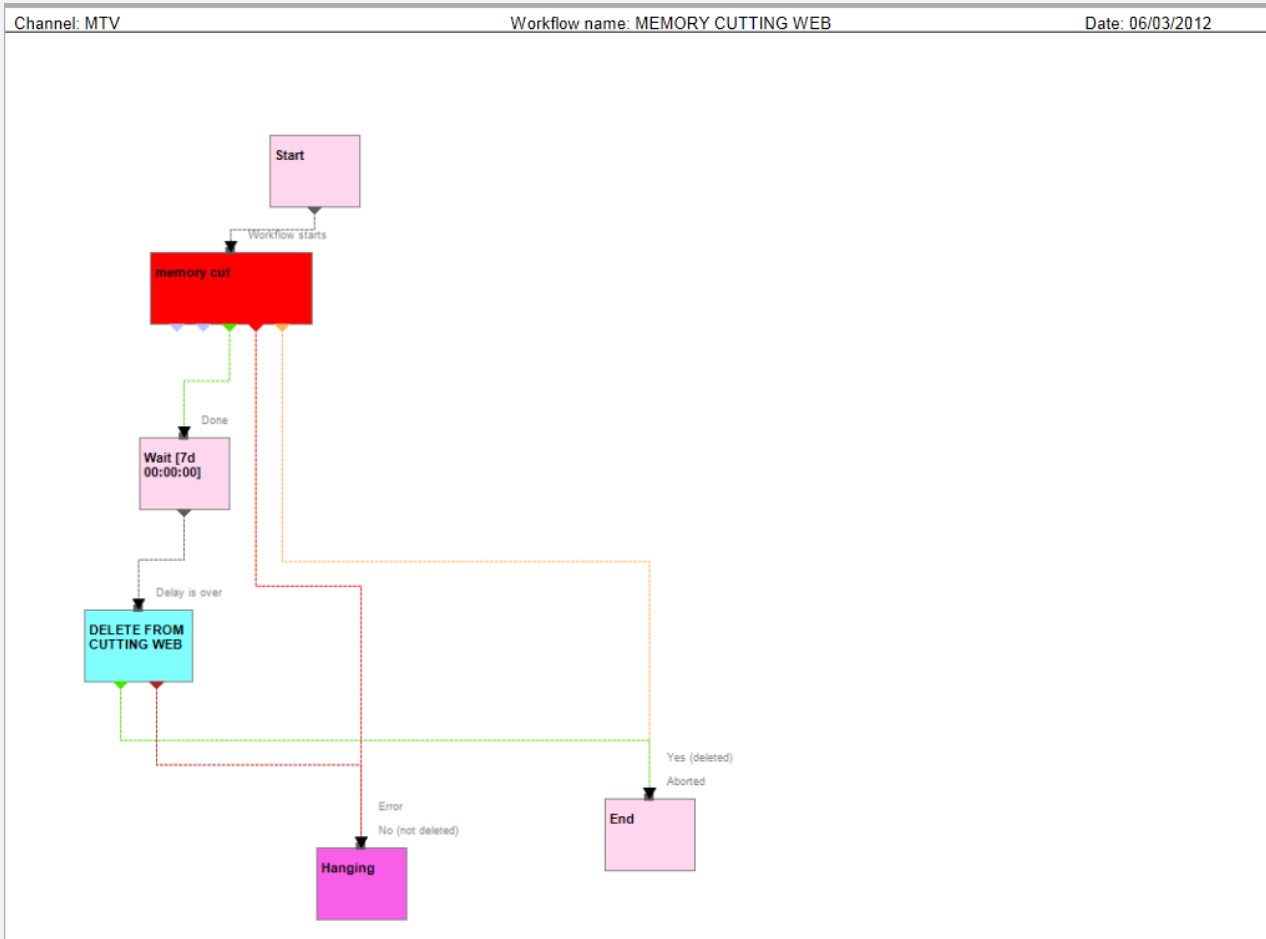
This workflow is used for "cutting" files recorded by Etere Memory, that is, for generating a new file according to the marks defined by a user. Once cut, after 7 days of its creation, the "cut" file is deleted.

3.25 Restore_BMC1_BMC2

This workflow is used for restoring video files into the on-air video servers "5NODI" and "3NODI".
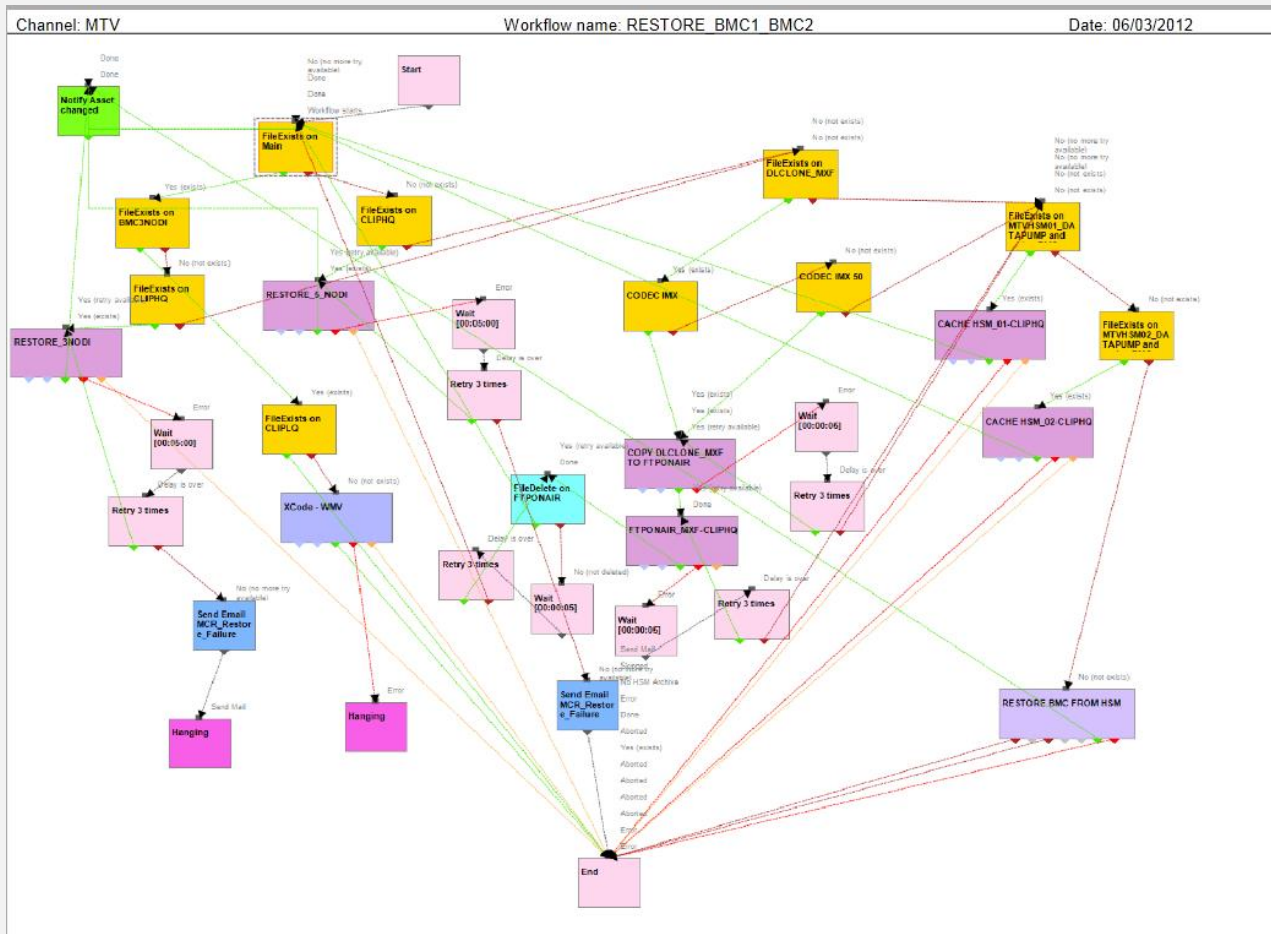
The first step consist in checking if the file is present in the "5NODI" (Main) video server and in case it doesn't it is sequentially searched on the archive (i.e. "ClipHQ", "DLclone_mxf" and "HSM"). If the file is present in "ClipHQ" it is copied in "5NODI" (sending an email if an error is encountered), otherwise, its presence is checked in the "DLclone_mxf" metadevice (in case it is found is copied into the "FTPonair" metadevice then into the "ClipHQ" metadevice and then into the "5NODI" metadevice); if the file is not present neither in the "DLclone_mxf", it is restored from HSM (preferably from the DataPump cache, otherwise from tape).

The same procedure described above is performed for copying the file into the "3NODI" metadevice.

Once the file is copied in "5NODI" and "3NODI", the system is notified about the changes occurred on the asset form. Before ending the workflow, a further check is performed for the file on the "ClipLQ" metadevice, where a lowres file version is generated in case it was missing.
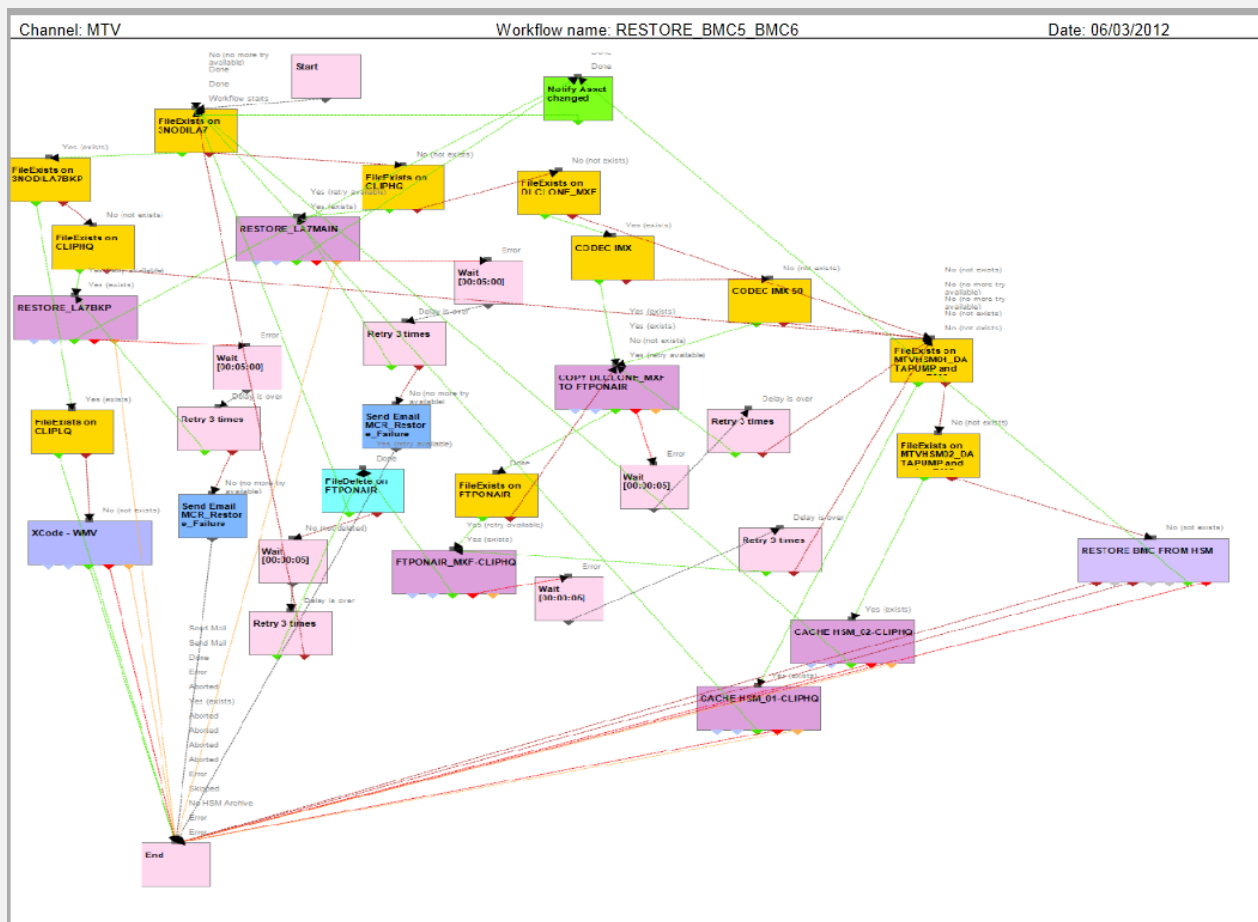
3.26 Restore_BMC5_BMC6

This workflow is used for restoring video files into the on-air video servers "3NODILA7" and "3NODILA7BKP".

The first step consist in checking if the file is present in the "3NODILA7" (Main) video server and in case it doesn't it is sequentially searched on the archive (i.e. "ClipHQ", "DLclone_mxf" and "HSM"). If the file is present in "ClipHQ" it is copied in "3NODILA7" (sending an email if an error is encountered), otherwise, its presence is checked in the "DLclone_mxf" metadevice (in case it is found is copied into the "FTPonair" metadevice then into the "ClipHQ" metadevice and then into the "3NODILA7" metadevice); if the file is not present neither in the "DLclone_mxf", it is restored from HSM (preferably from the DataPump cache, otherwise from tape).

The same procedure described above is performed for copying the file into the "3NODILA7BKP" metadevice.

Once the file is copied in "3NODILA7" and "3NODILA7BKP", the system is notified about the changes occurred on the asset form. Before ending the workflow, a further check is performed for the file on the "ClipLQ" metadevice, where a lowres file version is generated in case it was missing.

3.27 Restore_BMS

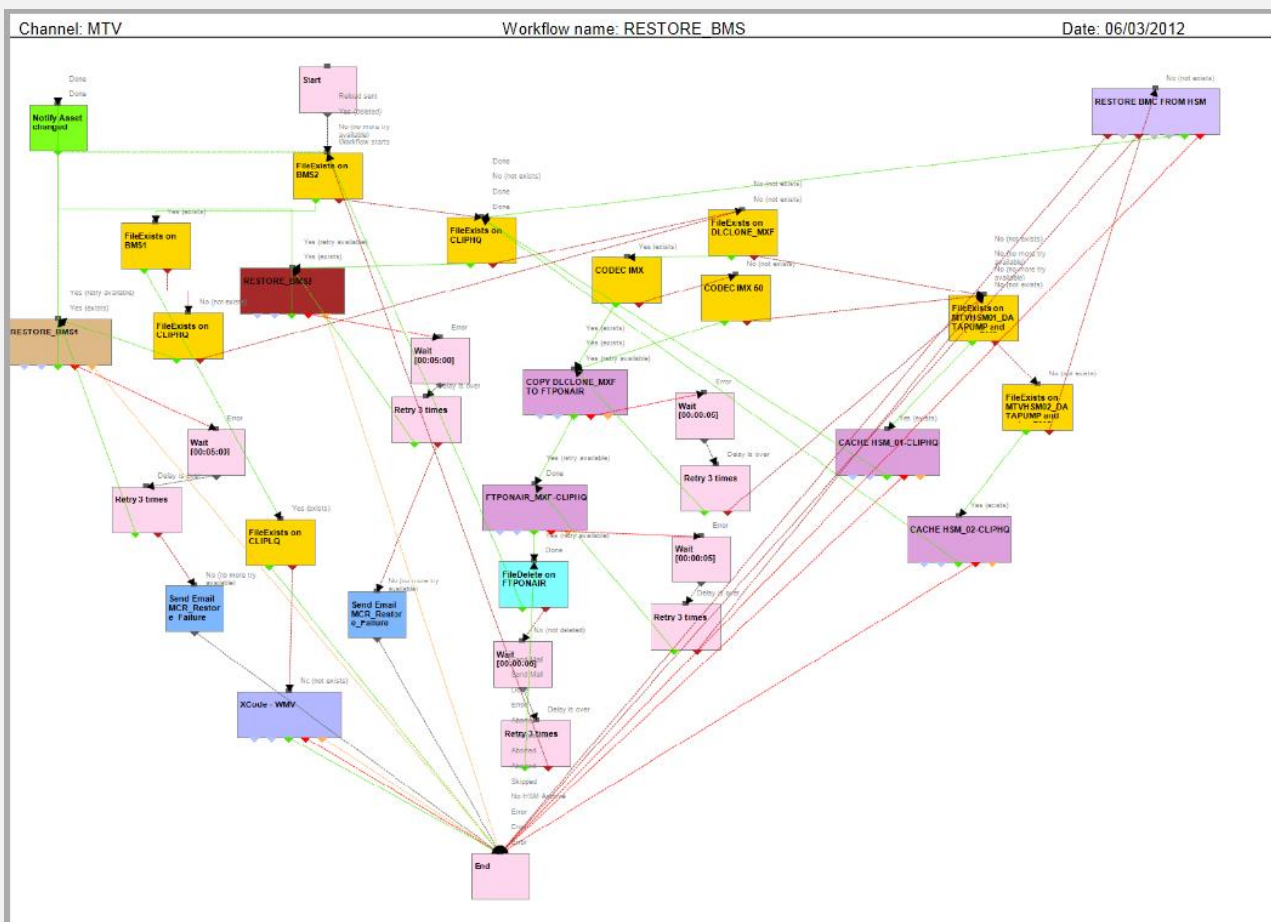This workflow is used for restoring video files into the on-air video servers "BMS2" and "BMS1".

The first step consist in checking if the file is present in the "BMS2" metadevice and in case it doesn't it is sequentially searched on the archive (i.e. "ClipHQ", "DLclone_mxf" and "HSM"). If the file is present in "ClipHQ" it is copied in "BMS2" (sending an email if an error is encountered), otherwise, its presence is checked in the "DLclone_mxf" metadevice (in case it is found is copied into the "FTPonair" metadevice then into the "ClipHQ" metadevice and then into the "BMS2"

metadevice); if the file is not present neither in the "DLclone_mxf", it is restored from HSM (preferably from the DataPump cache, otherwise from tape).

The same procedure described above is performed for copying the file into the "BMS1" metadevice.

Once the file is copied in "BMS2" and "BMS1", the system is notified about the changes occurred on the asset form. Before ending the workflow, a further check is performed for the file on the "ClipLQ" metadevice, where a lowres file version is generated in case it was missing.

3.28 **Restore_wmv_da_hsm**
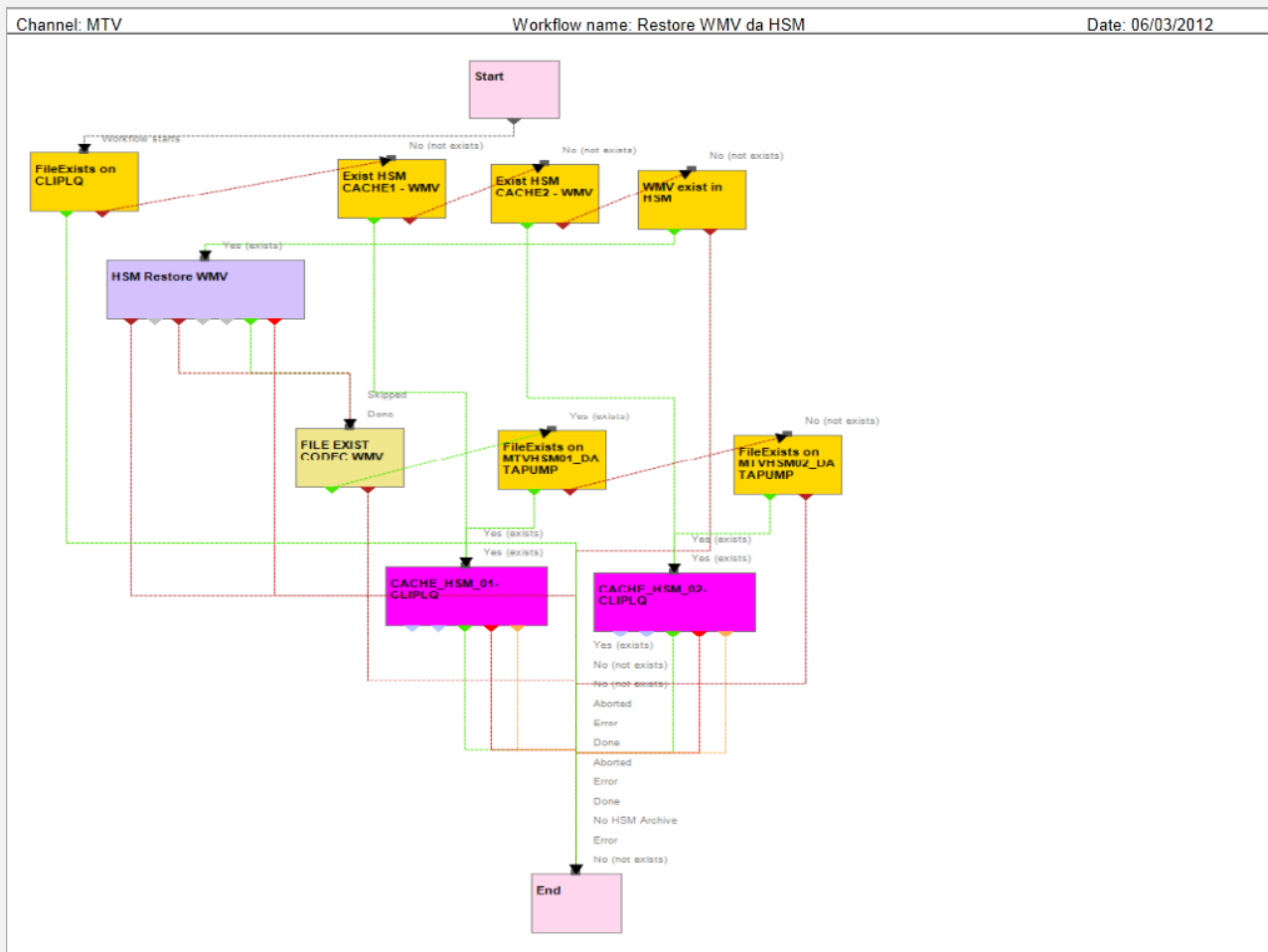
The first performed action checks if the file exists in the "ClipLQ" metadevice and in case it's missing, it is searched into the "HSM cache" to copy the file to "ClipLQ", in case the file is also missing in the "HSM cache" it is restored from the LTO tape (HSM).

3.29   Tapeless_reception
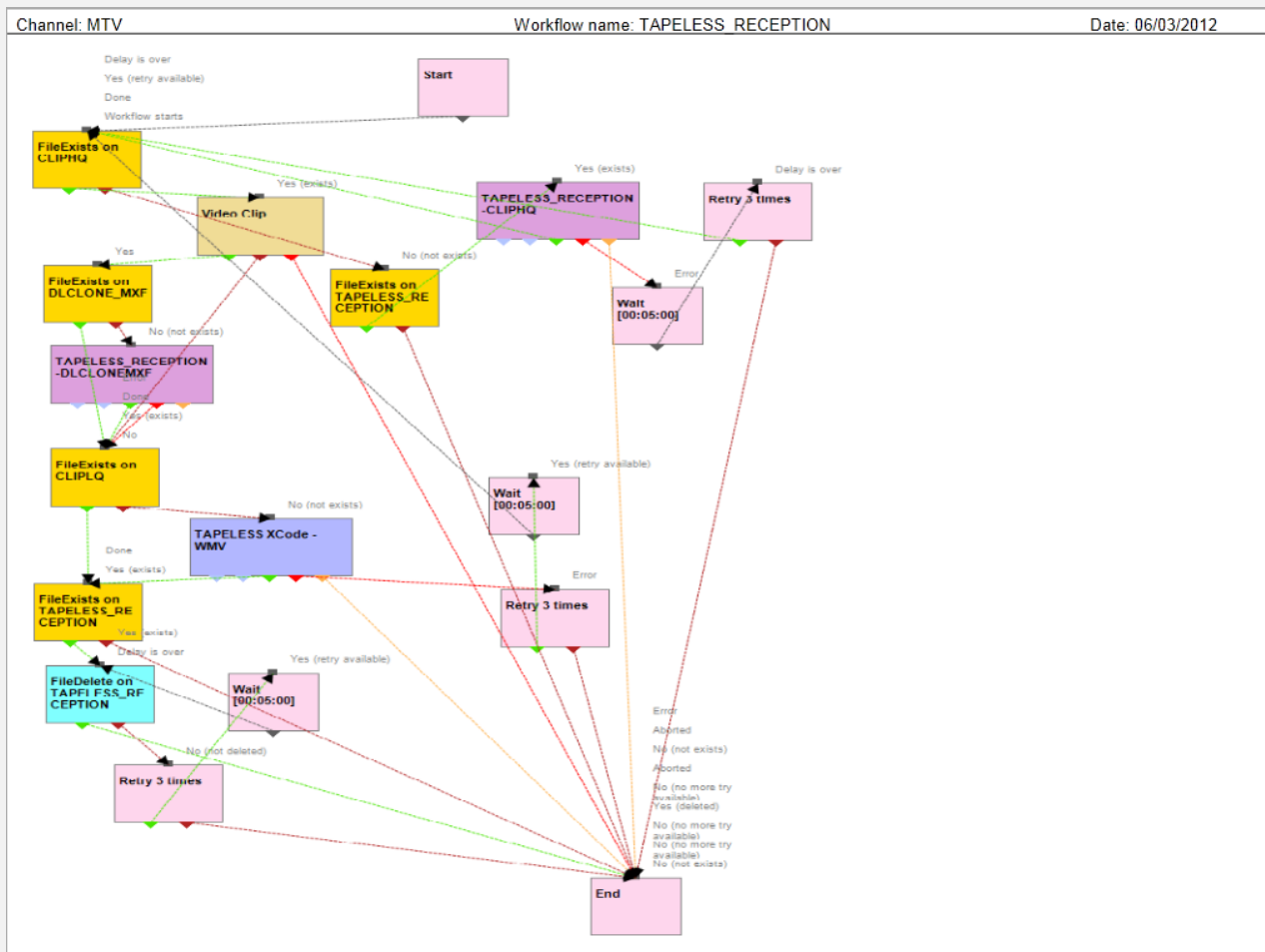
This workflow is used for receiving media files via the Tapeless Reception service. At first, the file is searched into the "ClipHQ" metadevice and in case it doesn't exist, it is searched in the "Tapeless Reception" metadevice from where it will be copied into the "ClipHQ" metadevice.

Once the file is in the "ClipHQ" metadevice, it is checked if the file's related asset form counts with the "Video Clip" property, then, the workflow checks if the file is present in the "DLclone_mxf" metadevice (in case the file is missing, it is copied here from the "Tapeless Reception" metadevice),

When the file copy is completed for the "ClipHQ" and the "DLclone_mxf" metadevices, it is checked if a lowres version of the file exists in the "ClipLQ" metadevice, generating a lowres copy in case it is missing; after which, the file is deleted from the "Tapeless Reception" source metadevice.

3.30 **Test_16_9**
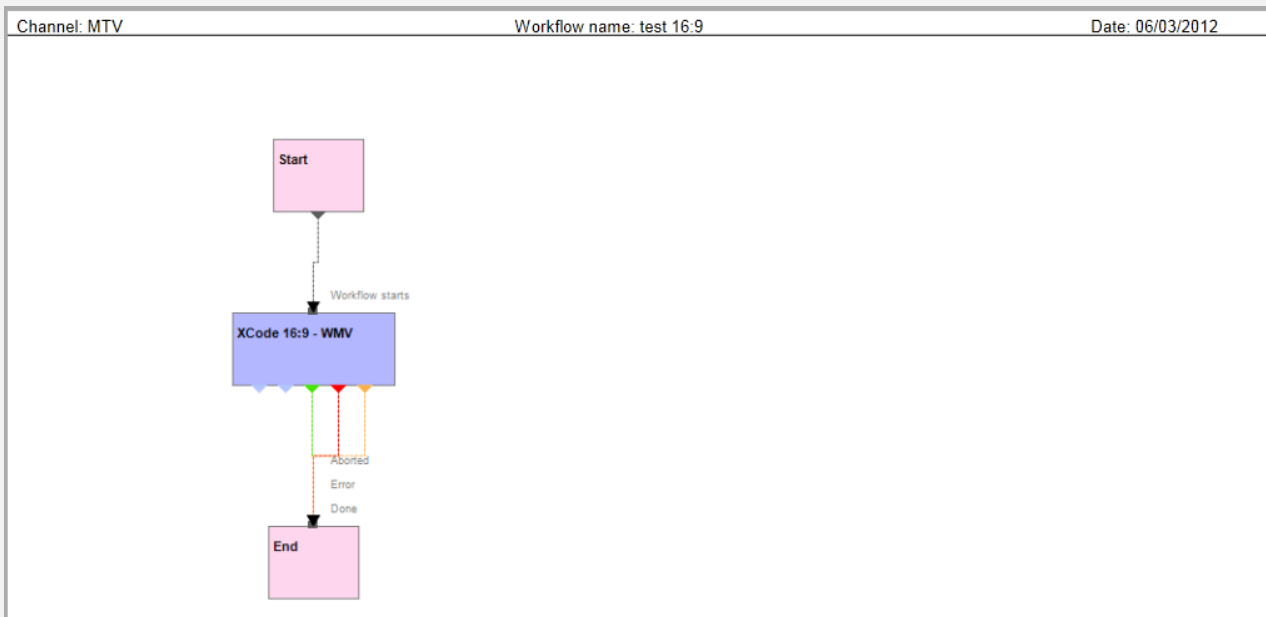
It is just a test workflow formerly used to transcode files using a 16:9 profile.

3.31   Test_CMS
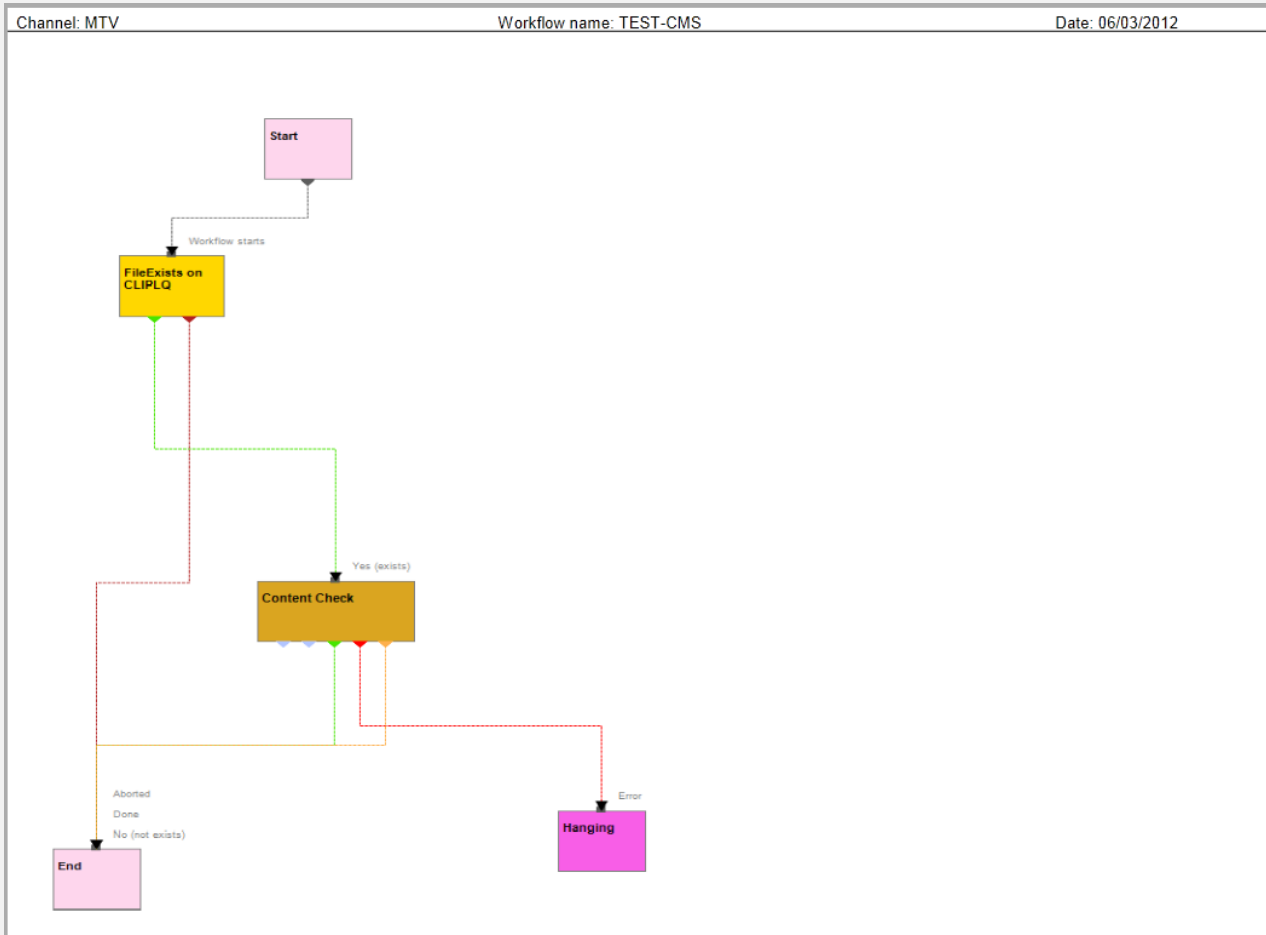
Another test workflow formerly used during the implementation of the Content Management Server (CMS), this workflow checks the presence of a file into the "ClipLQ" metadevice and in case it does, a Content Check operation is launched for it.

4. BENEFITS

This paper has described how the development and deployment of a comprehensive set of tailored workflows has made of the Etere's MTV installation, **a workflow-based and flexible system** able to encompass the station changes while providing a large number of operational benefits derived from a workflow content management. Among the most remarkable advantages of this approach, the following key benefits can be mentioned:

- **Flexibility**, a versatile workflow-based media management permits the system to tightly integrate into the global system any component (device, media and workflow).

- **Scalability**, the components used across the workflow system can be increased at any time without altering the workflow complexity, thus minimizing operational overheads.

- **Reliability**, an innovative workflow designer to reflect the real station's operations into the management system, allowing also monitoring operations through fully detailed logs.

- **Efficiency**, drastic reduction of repetitive manual operations by allowing an "in-advance" definition of workflow operations, thus ensuring also a sensitive increment of productivity,

- **Usability**, a simple and sophisticated workspace guarantees a smooth use and a robust workflow definition for reaching an accurate and enterprise management.

- **Security**, all workflow operations are based on specific user permissions based on either the station's Active Directory domain or custom access and use groups.

- **Integration**, other local and remote areas can be tightly integrated through a web-service for accessing the station's archive while making use of the highest security standards.

- **Accuracy**, the entire workflow media management process is performed under a continuous monitoring to eliminate the risk of errors when arching and retrieving contents.

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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