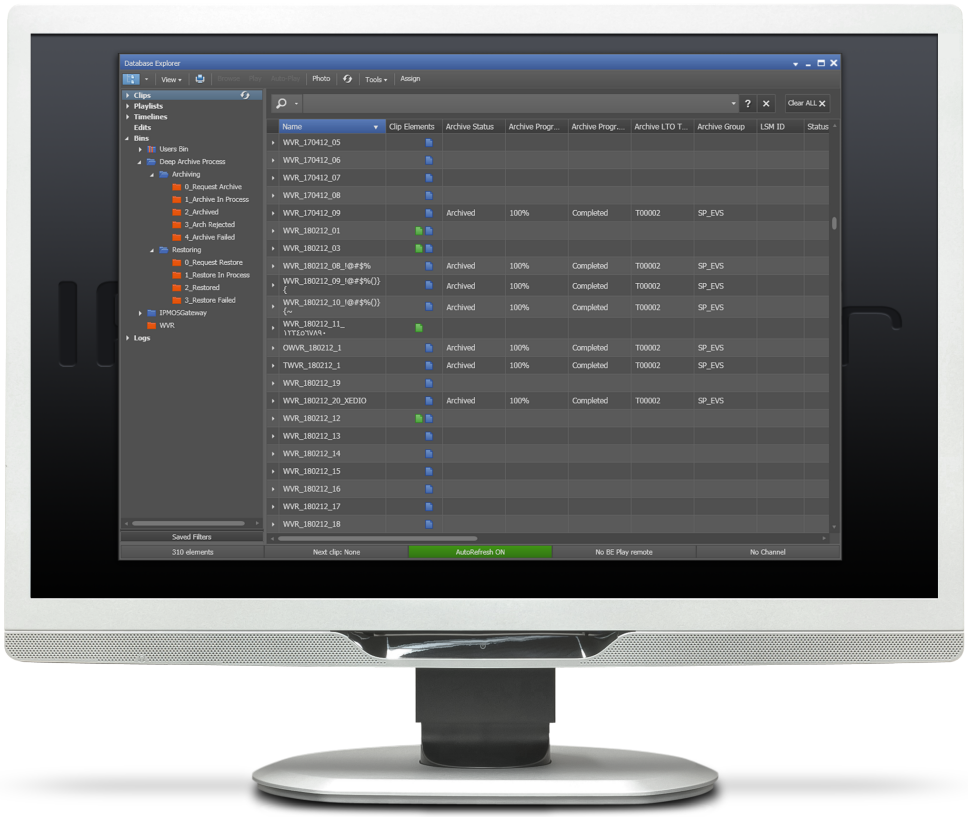
USER MANUAL

IP2ARCHIVE

Version 1.5 - March 2015



IP2Archive

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1. Introduction

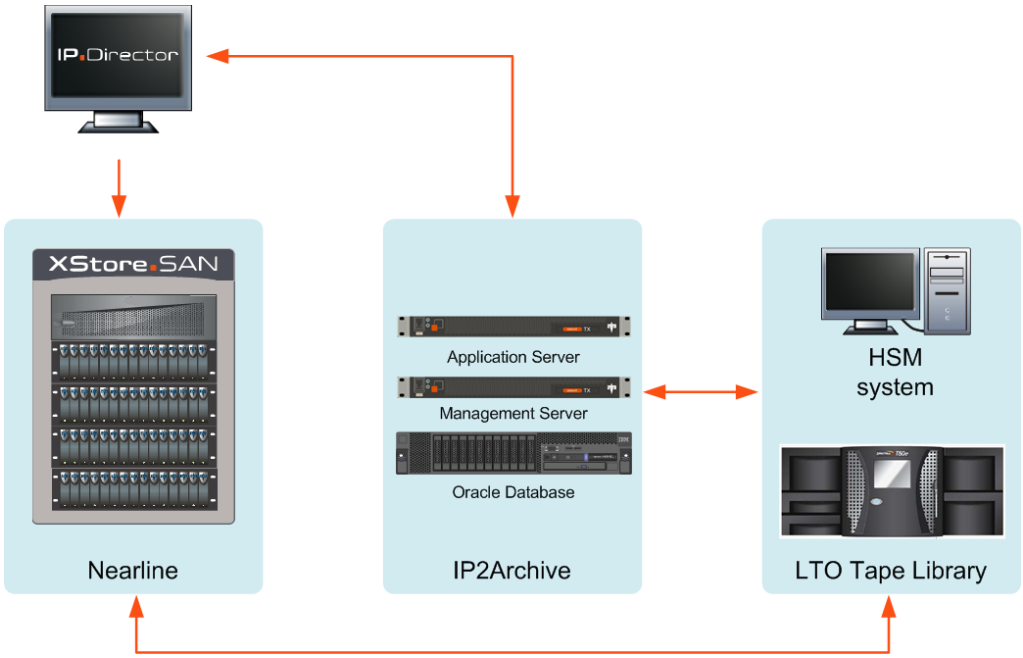
1.1. About IP2Archive

General Description

IP2Archive is an add-on for IPDirector that facilitates the connectivity between IPDirector and a third party hierarchical storage management system (HSM) and LTO tape library. It allows easy archiving and (partial) restoring of video clips and makes it possible to keep track of the archive and restore progress and status (in cache, online, offline, on tape) of each video clip.

IP2Archive Environment

The diagram below displays the interaction between IP2Archive, IPDirector and the HSM system and LTO tape library.



1.2. Requirements

1.2.1. Hardware Requirements

The following hardware requirements should be met:

- A nearline storage should be present.
- An XTAccess server containing XTAccess should be present.

1.2.2. Software Requirements

The following software requirements should be met:

- At least IPDirector 5.99.30 and 6.07.90 (API version) should be installed.
- In IPDirector XTAccess must be configured for the creation of low-resolution files.
- Remote access to the IP2Archive setup for EVS support and maintenance should be provided.

1.2.3. Workflow Requirements

The following workflow requirements should be met:

- The high- and low-resolution video files should be stored on a nearline storage.
- The low-resolution video files and their metadata XML file must be available. However, if deleted by accident, they can be restored using the Deep Archive Sync application.
- The VarID must be unique for a media asset!
- The VarID of the low-and high-resolution video file must be the same!

1.2.4. License Requirements

The following IP2Archive licenses are available:

- To be able to use the IP2Archive applications, the XSecure 'Base Package' software license is needed. This license also allows to handle 50 LTO tapes in the tape library and to use one instance of the IP2Archive database.
- To be able to handle an additional 50 tapes in the LTO tape library, the XSecure 'Number of Tapes' software license is needed.
- To be able to handle an unlimited number of tapes in the LTO tape library, the XSecure 'Unlimited Tapes' software license is needed.
- To be able to perform partial restores with IP2Archive, the XSecure 'Partial Restore' software license is needed.

- To be able to launch the Deep Archive Manager, the XSecure 'Deep Archive Manager' software license is needed.

These licenses have to be requested and activated in the EVS XSecure application.

1.3. Hardware Setup

1.3.1. Overview Hardware Components

By default, the IP2Archive system consists of the following hardware components:

- Oracle database server
- Application server
- Managment server
- Third party network switch (Cisco)
- Third party Hierarchical Storage Management system (HSM): DIVArchive (DIVA) from Front Porch Digital, XenData from XenData, FlashNet from SGL and Atempo Digital Archive from Atempo.
- Third party LTO tape library (Spectralogic) We support any hardware here because this should be supported by the HSM system.

The following hardware components can be added for failover and performance:

- Oracle failover database server
- Additional application servers

1.3.2. Description and Technical Specifications

Oracle Database Server

The Oracle database server has redundant power supplies and redundant memory. The system drives containing the operating system (Linux 6.5 x64) and Oracle software are configured in RAID 1 (mirror). The data drives are configured in RAID 5.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
16 kg	675 Watts	2260 BTU/h	2	IBM System X3650 M4	2x Intel Xeon 6C E5-2620	32GB	2 x 300GB SAS (RAID1) + 6 x 300GB SAS (RAID5)

Oracle Failover Database Server

The failover database server runs Oracle Data Guard. Oracle Data Guard ensures high availability, data protection and disaster recovery and synchronizes with the main Oracle database server. It has redundant power supplies and redundant memory. The system drives containing the operating system (Linux 6.5 x64) and Oracle software are configured in RAID 1 (mirror). The data drives are configured in RAID 5.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
16 kg	675 Watts	2260 BTU/h	2	IBM System X3650 M4	2x Intel Xeon 6C E5-2620	32GB	2 x 300GB SAS (RAID1) + 6 x 300GB SAS (RAID5)

Application Server

The application server is the central server containing all the applications necessary to run the solution. It runs Windows 2008 R2x64. The application server runs all background applications needed for archiving and restoring. It has redundant power supply and two drives in RAID 1 (mirror). Multiple application servers can be used for performance reasons.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
11 kg	320 Watts	1093 BTU/h	2	XT Access I7 HP	2x Intel Xeon E5-2430	8GB	2 x 250GB SAS (RAID1)

Management Server

The management server runs Windows 7. It is the server on which the applications are running used to manage and monitor the IP2Archive system. This server must allow remote access for EVS support and maintenance purposes.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
11 kg	320 Watts	1093 BTU/h	2	Management server I7 HP	2x Intel Xeon E5-2430	8GB	2 x 250GB SAS (RAID1)

Cisco Catalyst Ethernet Switch

Connects the various network devices. Series: 3750-E or 3750-X.

Weight	Power	BTU	# power sockets
10 kg	212 Watts	1023 BTU/h	2

Third Party HSM System

IP2Archive can be used in combination with the following HSM systems:

- Front Porch Digital DIVArchive
- XenData Digital Archive
- SGL FlashNet
- Atempo Digital Archive

See the websites of the manufacturers for the functional and technical specifications.

Third Party LTO Tape Library

If EVS may supply the LTO tape library, then it will be a tape library by Spectralogic. If the LTO tape library is not supplied by EVS, then only the HSM software is supported. The following Spectralogic LTO tape libraries are supported:

- T50e
- T120
- T200

T50e

- Technical specifications: see www.spectralogic.com.
- Capacity and throughput

Media	Max Drives	Max Slots/Tapes	Max Capacity	Max Throughput
LTO-5	4	50	75TB	2.0 TB/h
LTO-6	4	50	125 TB	2.3 TB/h

T120

- Technical specifications: see www.spectralogic.com.
- Capacity and throughput

Media	Max Drives	Max Slots/Tapes	Max Capacity	Max Throughput
LTO-5	10	120	180 TB	5.1 TB/h
LTO-6	10	120	300 TB	5.8 TB/h

T200

- Technical specifications: see www.spectralogic.com
- Capacity and throughput

Media	Max Drives	Max Slots/Tapes	Max Capacity	Max Throughput
LTO-5	8	200	300 TB	4.0 TB/h
LTO-6	8	200	500 TB	4.6 TB/h

1.4. Software Components

1.4.1. Overview Software Components

IP2Archive is a modular system. It consists of several software components each with a specific function, running on the application or management server connected to the IP2Archive database.

The following software components can be distinguished:

- Deep Archive Manager
- Deep Archive Sync
- Configurator
- Application Monitor
- IP2Archive Communicator
- Deep Archive Controller
- File Transfer Daemon (XenData)
- Deep Archive Sync Controller (DIVA)
- License Controller

The File Transfer Daemon is only used when IP2Archive interfaces with Digital Archive by XenData.

1.4.2. Deep Archive Manager

The Deep Archive Manager can be considered the portal to the deep archive system. It allows librarians to manage the nearline storage by archiving and restoring clips to and from the deep archive.

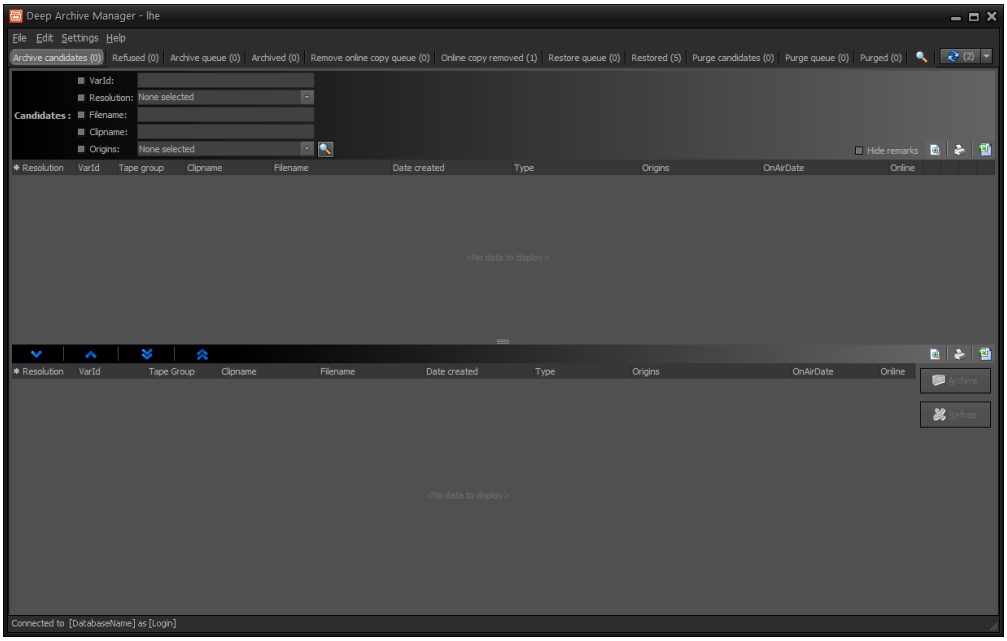
It displays the clips that have been requested in IPDirector to be archived or restored.

In the first case, the clips are displayed as archive candidates. A user can manually make a selection and accept or reject clips. The accepted clips will be archived to LTO tape, the refused clips will remain on the nearline storage. The archive process of each clip can be monitored. Once the process has been completed, the user gets an overview of all the clips that have been archived.

In the second case, the user can monitor the restore process of each clip.

Deep Archive Manager also allows the user to delete the high- or low-resolution video file of archived clips from the nearline storage, to purge archived files from LTO tape or to restore archived files to the nearline storage. Again, the status and progress of each of these processes can be monitored.

Deep Archive Manager can also be configured to automatically archive, refuse and purge particular types of clips, and to remove their high- or low-resolution video file from the nearline storage.



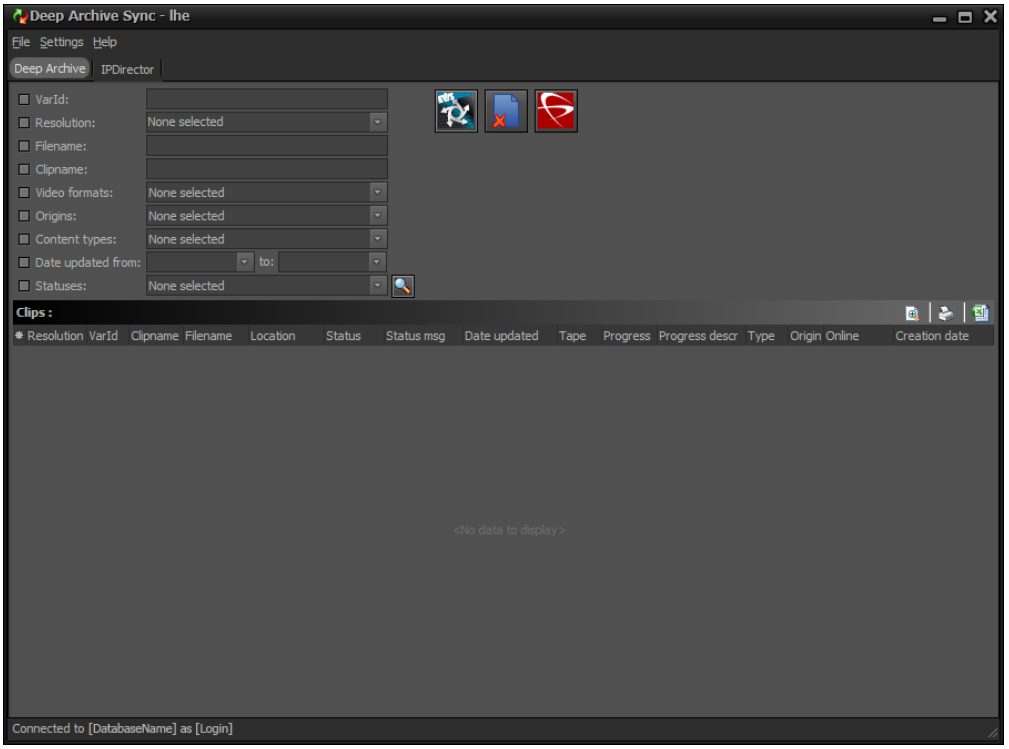
This application is installed on the workstation of the system administrator, librarian or documentalist. See the Deep Archive Manager user manual for more information.

1.4.3. Deep Archive Sync

Deep Archive Sync is an application which allows an administrator to compare the archive metadata of clips in the IP2Archive database with the archive metadata of these clips in the IPDirector or DIVArchive database. It will highlight any differences and allow the administrator to synchronize the databases.

Deep Archive Sync also permits to check the existence and online availability of the low-resolution video files and will suggest the necessary actions to undertake to get the low-resolution video file back online.

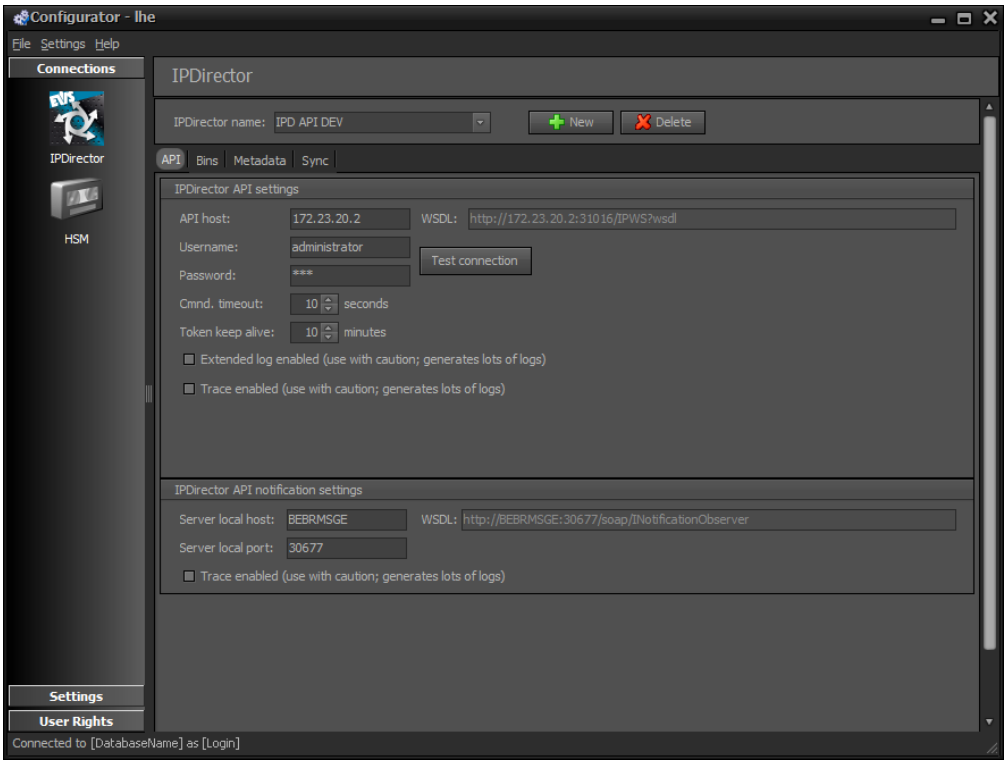
Finally, Deep Archive Sync makes it possible to search the IPDirector database for clips with archive metadata that are unknown in the IP2Archive database and to remove this archive metadata from the IPDirector database.



This application is installed on the workstation of the system administrator, librarian or documentalist. See the Deep Archive Sync user manual for more information.

1.4.4. Configurator

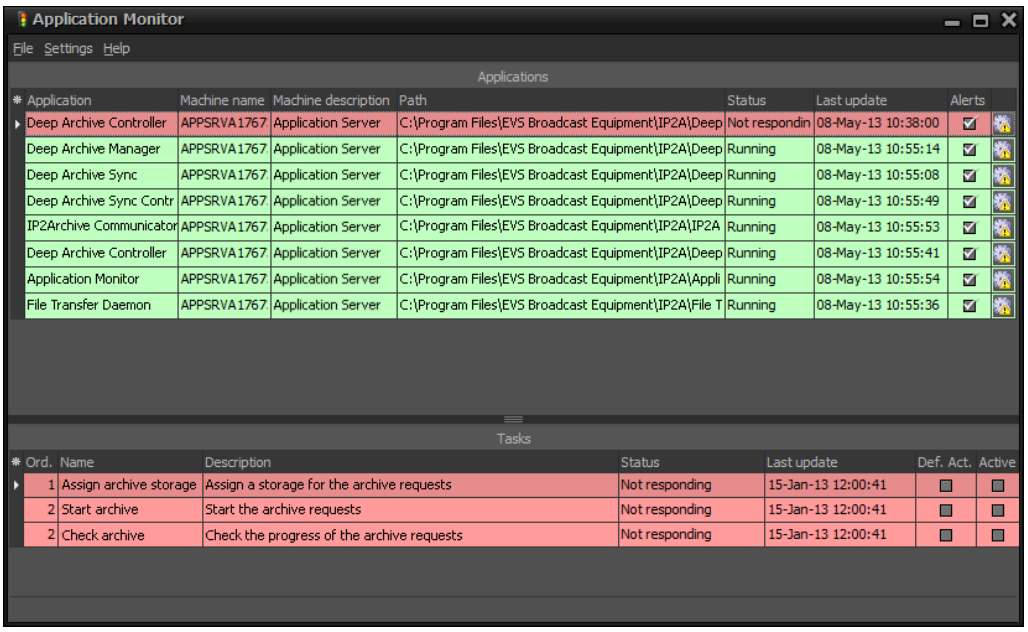
Configurator is an application which allows a system administrator to configure the IP2Archive applications. It also allows to create users and assign them user rights.



This application is installed on the workstation of the system administrator, librarian or documentalist. See the Configurator user manual for more information.

1.4.5. Application Monitor

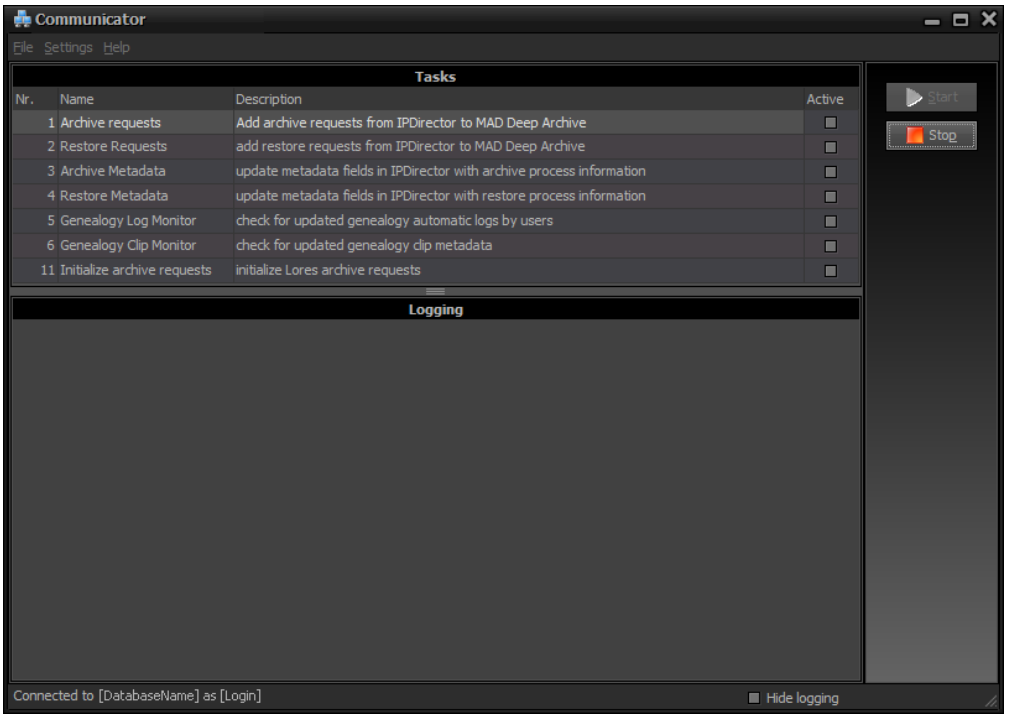
Application Monitor is used in the IP2Archive setup to monitor the status of the (automatic) IP2Archive applications and their tasks and also the status of particular database jobs.



1.4.6. IP2Archive Communicator

IP2Archive Communicator is an automated application or robot that is used to interact with IPDirector using the IPDirector API. It will monitor the archive and restore process bins in IPDirector. It will enter archive and restore requests in the IP2Archive database.

It will also update the clip archive metadata in IPDirector, for example the archive status and progress. Depending on their archive status, it will move the clips to the right archive or restore process bin in IPDirector. This will allow the IPDirector users to monitor the archive or restore process of each clip.



This application is installed on the application server. See the Communicator configuration manual for more information.

1.4.7. Deep Archive Controller

Deep Archive Controller is an automated application or robot that picks up archive and restore requests. It will assign these requests to an available hierarchical storage management system and request to initiate the archive, (partial) restore and purge process.

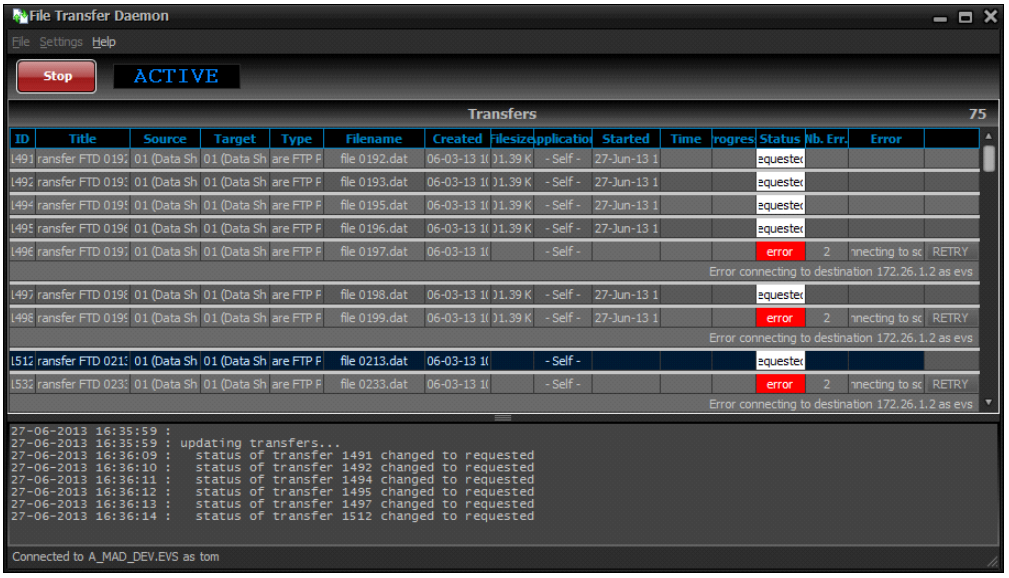
It will check the progress and status of the archive, restore and purge processes and also synchronize the status of the high- and low-resolution video files in the IPDirector database with the status in the IP2Archive database.

Finally, when a user in Deep Archive Manager requests to remove a high- or low-resolution video file from the nearline storage, Deep Archive Controller will pick up this request and command IPDirector through the IPDirector SOAP API to perform this action.

One or more instances of this application are installed on the application server. See the Deep Archive Controller configuration manual for more information.

1.4.8. File Transfer Daemon (XenData)

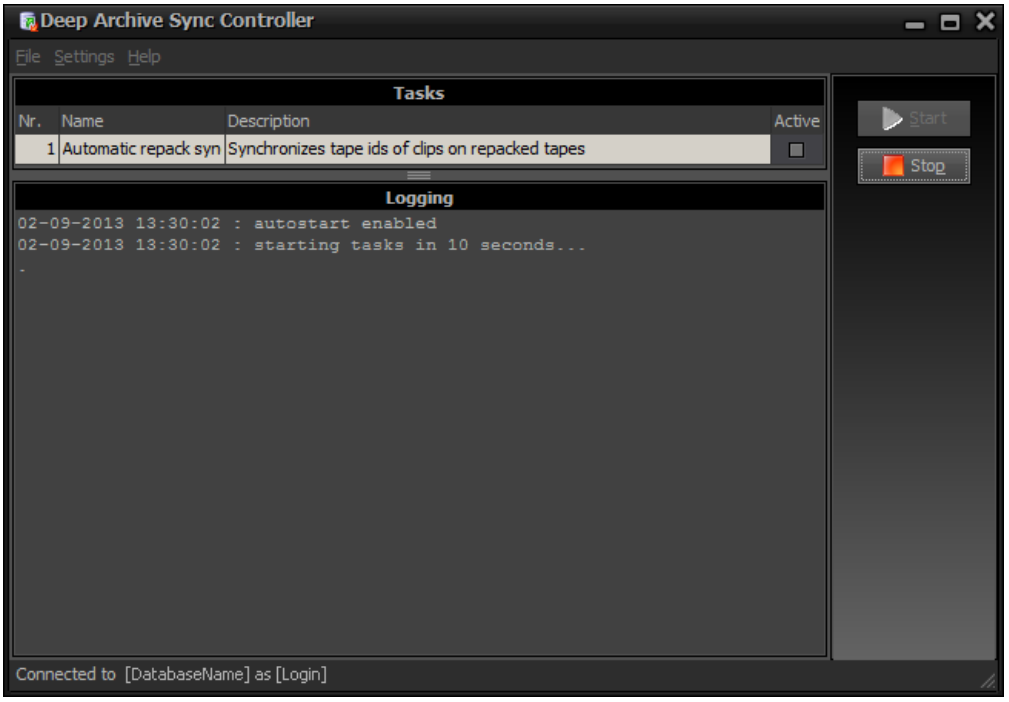
File Transfer Daemon is an automated application that transfers the files to be archived (video files, metadata XMLs, etc.) from the nearline storage to the XenData Cache where it will be picked up by the XenData archiving workflow. For restores it will check when the restoring from LTO to the Cache is finished and then transport the file back to the Nearline.



This application is installed on the application server. See the File Transfer Daemon configuration manual for more information.

1.4.9. Deep Archive Sync Controller

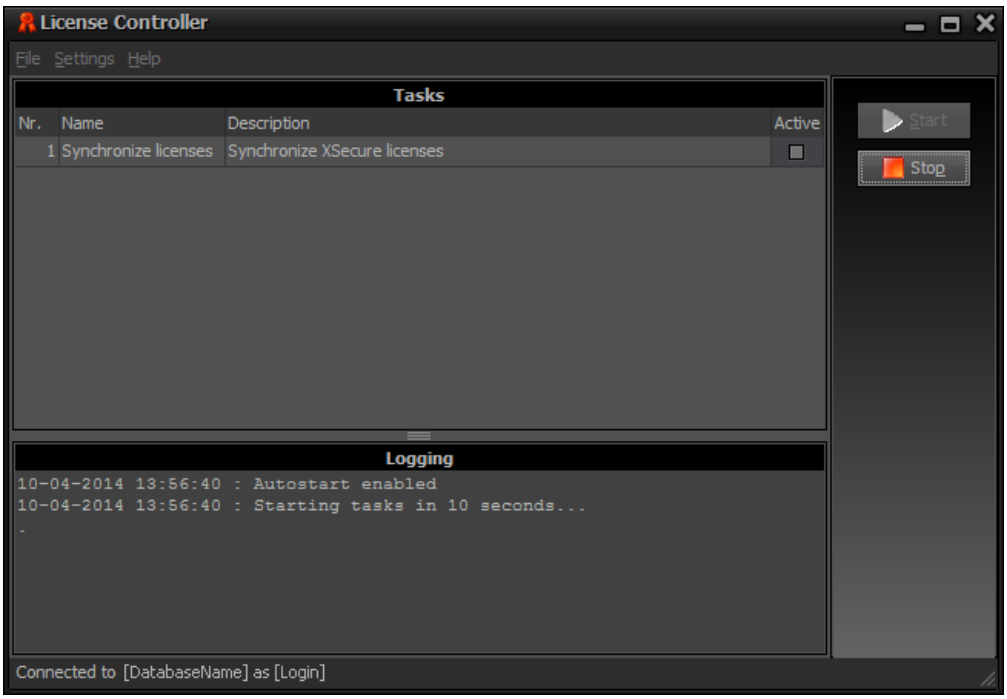
Deep Archive Sync Controller is an automated application or robot which will actively poll the DIVArchive database (using the DIVA Application Programming Interface) for clips that have been moved to another LTO tape after a repack operation by DIVA, and it will synchronize the new LTO tape IDs with the IP2Archive database.



This application is installed on the application server. See the Deep Archive Sync Controller configuration manual for more information.

1.4.10. License Controller

License Controller is an automatic application that checks the status of the IP2Archive licenses in the XSecure database and synchronizes this information with the IP2Archive database.

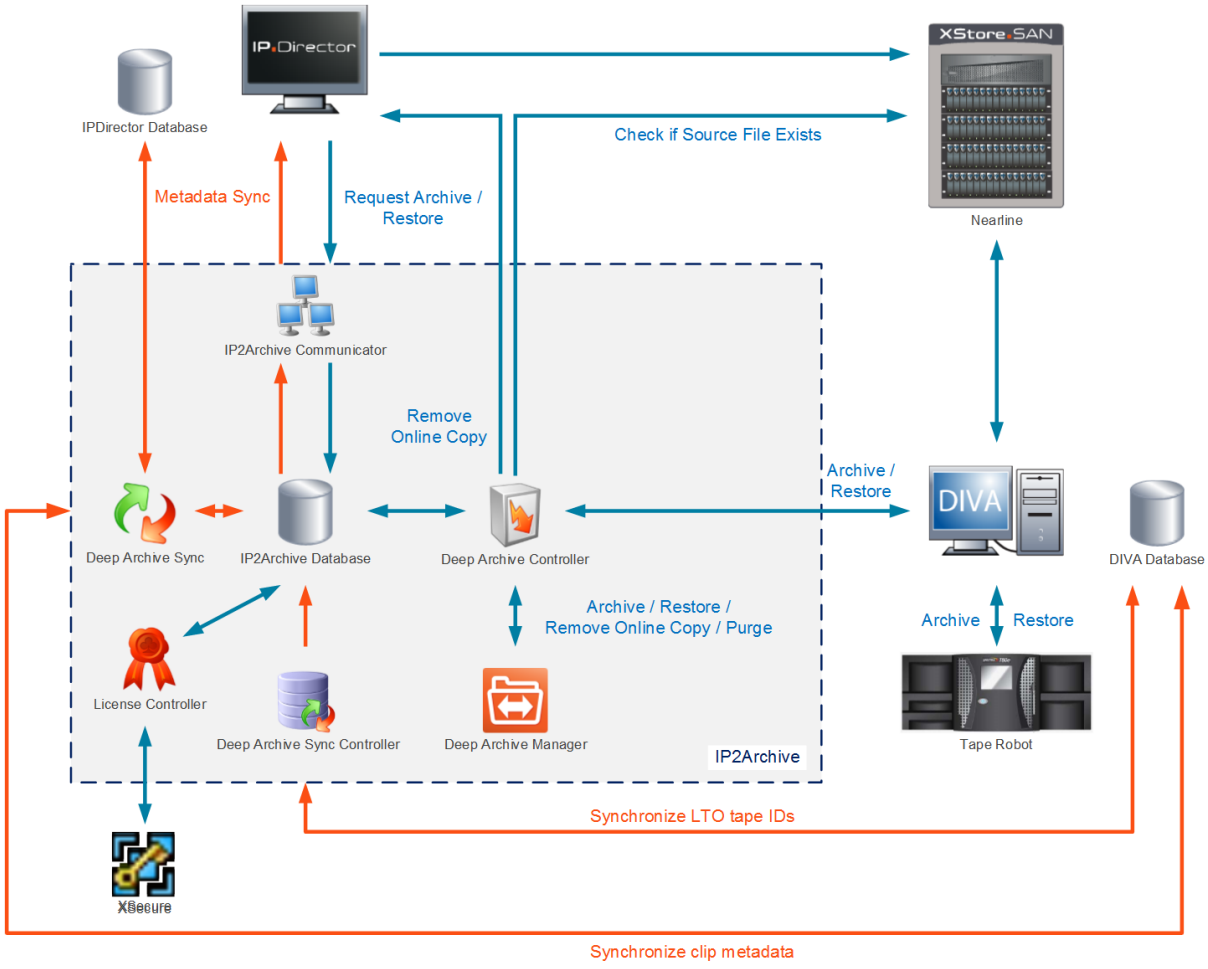


License Controller is installed on the application server.

1.4.11. IP2Archive Software Interaction

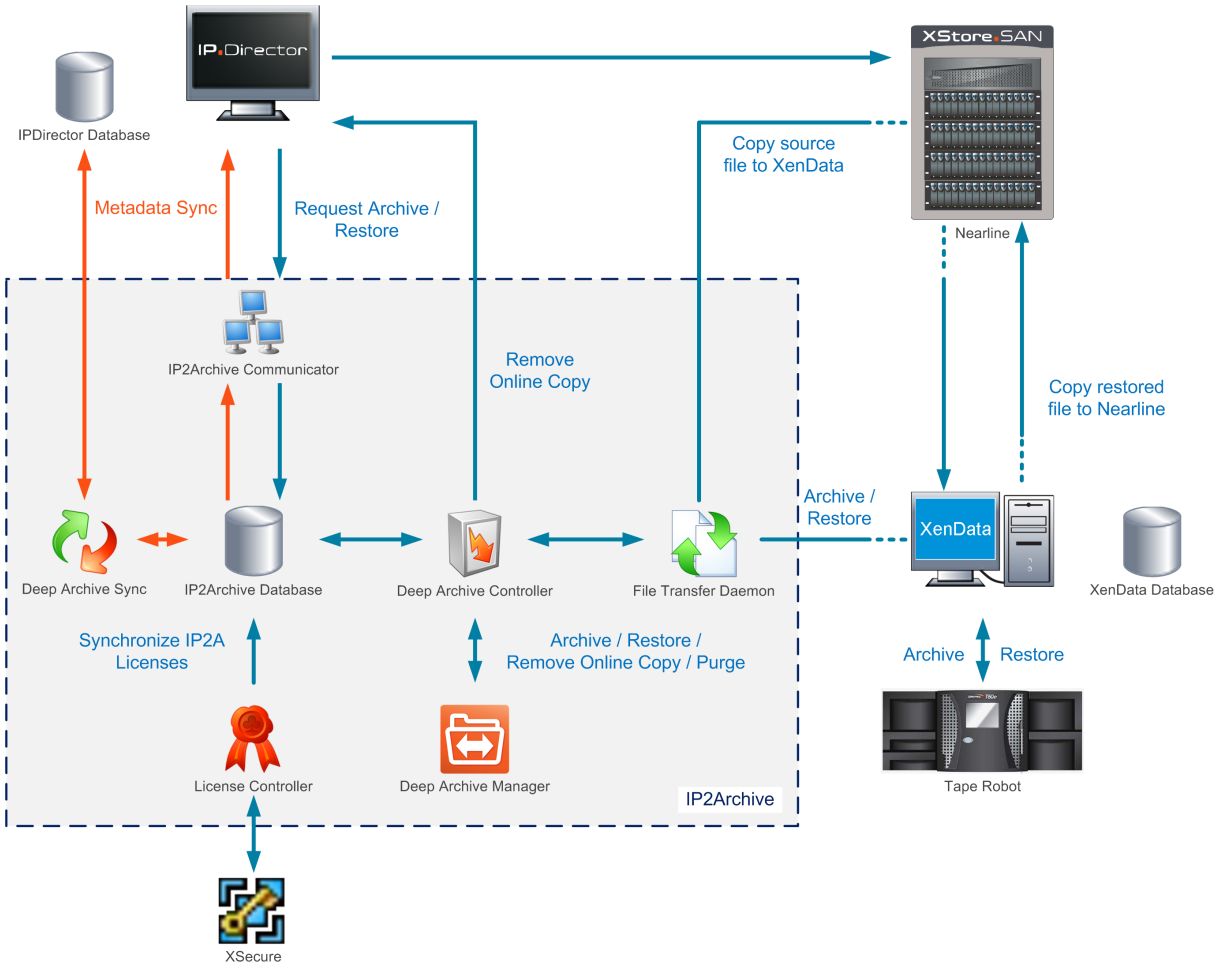
Interfacing with Front Porch Digital's DIVArchive

The following diagram shows the interactions between IPDirector and the various IP2Archive software components, and between the various IP2Archive components and FrontPorch Digital's DIVArchive.



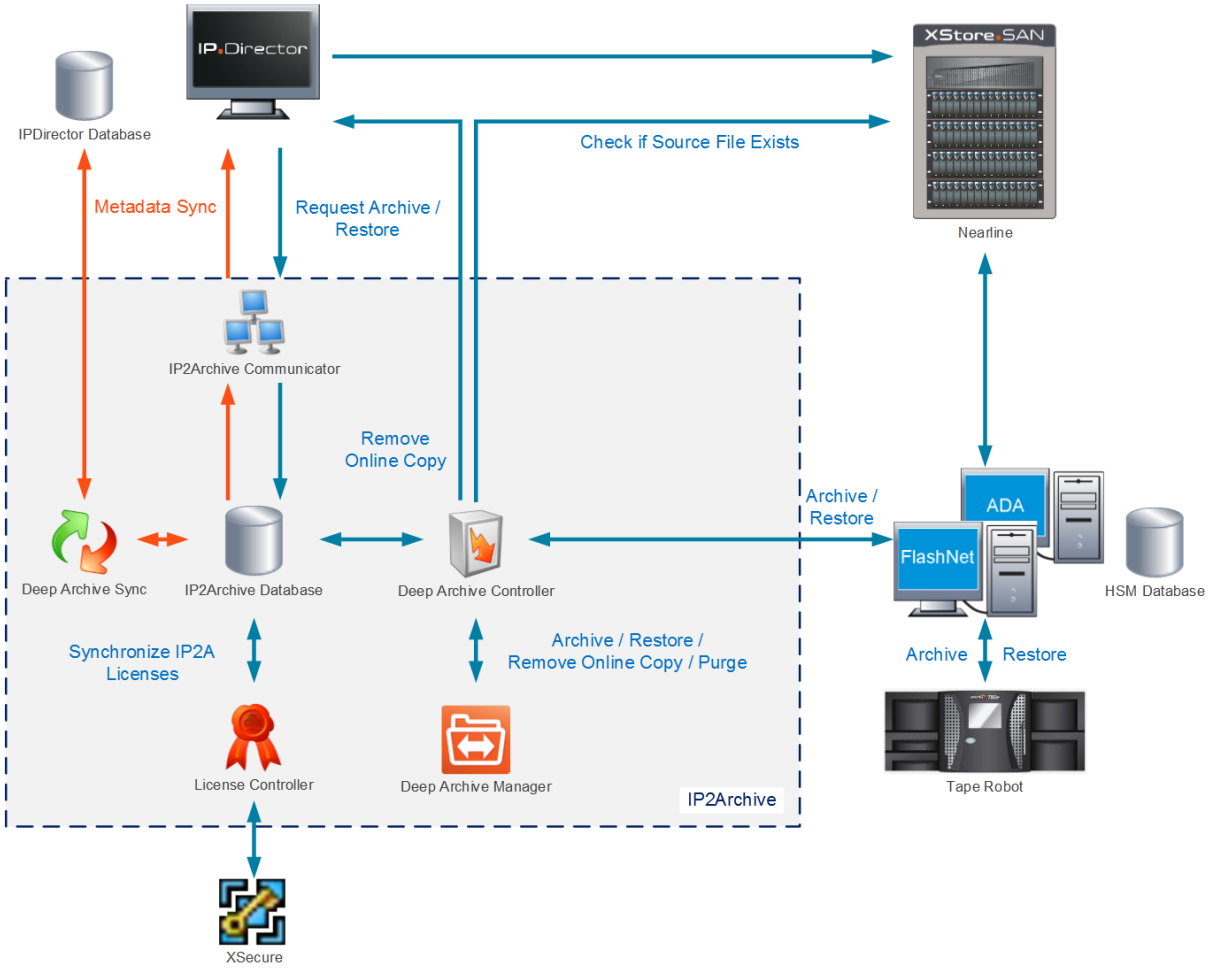
Interfacing with XenData's Digital Archive

The following diagram shows the interactions between IPDirector and the various IP2Archive software components, and between the various IP2Archive components and XenData's Digital Archive.



Interfacing with SGL's FlashNet and Atempo's Digital Archive

The following diagram shows the interactions between IPDirector and the various IP2Archive software components, and between the various IP2Archive components and SGL's FlashNet or Atempo's Digital Archive.



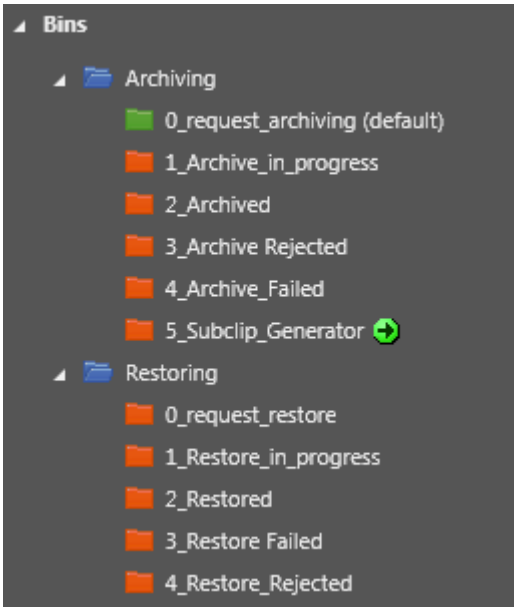
2. Archiving, Restoring and Purging Clips

2.1. Archive and Restore Bin Hierarchy

When IP2Archive is installed, an Archive and Restore bin hierarchy is created in the Database Explorer of IPDirector.

This bin hierarchy allows users to easily archive and (partially) restore clips by a simple drag-and-drop operation. It also allows them to easily keep track of the clip archive or restore status. Each bin represents namely a stage in the archive or restore process. The location of a clip in a particular bin betrays its status. When the status of a clip changes, it is moved to the bin that corresponds to its status.

In the example below 5 bins have been created for the archive process and 5 for the restore process. An additional bin has been created for generating subclips (see below).



The IP2Archive Communicator will monitor these bins, pick up the archive and restore requests and insert them in the IP2Archive database. Depending on their archive status, it will move the clips to the corresponding bin.

2.2. Archiving Clips

2.2.1. Before Archiving

Before archiving, always verify if:

- the clips have a high- and low-resolution video file that is online (= available on the nearline storage)
- the clips have not already been archived.
- an archive filter has been created in the Configurator. See the Configurator user manual for more information.
- the clips match the criteria of the archive filter.

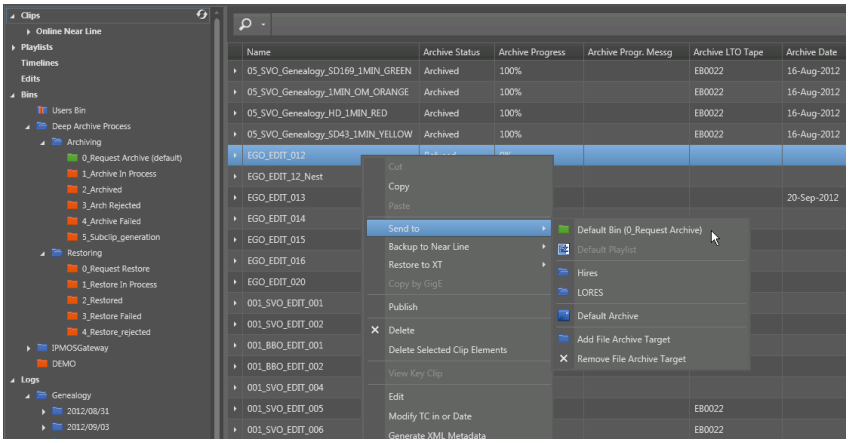
If a clip has no high- and low-resolution video file, request IPDirector to send the clip to the nearline storage first. XTAccess will then generate a high- and low-resolution video file.

2.2.2. Archiving Master Clips via IPDirector

The archive workflow of master clips proceeds as follows:

1. In the Database Explorer of IPDirector the user searches for the clips he wants to archive.
2. He drags and drops the clips in the **Request Archiving** bin.

   If the **Request Archiving** bin has been defined as the user default bin, the user can also right-click on the clip and choose **Send to > Default Bin**. See the IPDirector user manual for more information about setting a particular bin as default bin.



3. IP2Archive Communicator which continuously polls the **Request Archiving** bin detects the clips and enters the archive requests in the IP2Archive database. If all the requirements mentioned above are fulfilled, it moves the clips to the **Archive in Progress** bin. Otherwise, it moves the clips to the **Archive Rejected** bin.
4. Depending on how Deep Archive Manager is configured, the clips to be archived will either appear in the Archive Candidates tab or in the Archive Queue tab of the Deep Archive Manager.

In the first case, a librarian has to manually decide if the clips can be archived or not. He can also decide to change the tape group . See the Deep Archive Manager user manual for more information.

If the librarian accepts the clips, the corresponding high-resolution video file and its metadata XML will be archived to LTO.

In the second case, the clip has been automatically accepted by Deep Archive Manager and will immediately appear in the Archive Queue tab.

5. Deep Archive Controller picks up the archive requests in the IP2Archive database. It checks if a HSM is available, and if this is the case, assigns the archive requests to it. It then commands the HSM or File Transfer Daemon, in case of XenData, to initiate the archive process.
6. The HSM will retrieve the requested high-resolution video file from the nearline storage.
   In case of XenData, File Transfer Daemon will copy the high-resolution files and their metadata XML from the nearline storage to the XenData Cache.
7. The high-resolution video files and their metadata XML are copied to LTO.

   Deep Archive Controller enters the archive progress information provided by the HSM in the IP2Archive database and checks it.

   IP2Archive Communicator provides feedback about the archive process to IPDirector by updating the clip archive metadata in the IPDirector database. If anything goes wrong during the archive process, the clip will be placed in the **Archive Failed** bin.
8. Once the files are successfully archived, the clips are moved to the **Archived** bin in IPDirector. In Deep Archive Manager the clips appear in the Archived tab with the status 'Archived'.

2.2.3. Archiving Subclips

If you create a subclip of an existing clip in IPDirector and drag and drop this subclip in the **Request Archiving** bin, this subclip will still refer to the high- and low-resolution video file of the source clip. To avoid that the original high-resolution video file gets archived, IP2Archive Communicator will copy this subclip first to the **Subclip Generation** bin. An XML job is sent to XTAccess to create a high- and low-resolution file of this subclip on the nearline storage. Once the high- and low-resolution file are created, this will be picked up by the IP2Archive Communicator and the clip will be requested for archiving.

2.2.4. Archiving Clips with Multiple High-Resolution Files

If you try to archive a clip with multiple online high-resolution video files via IPDirector, IP2Archive will only archive the high-resolution video file that:

- is online
- matches the criteria of the archive filter with the highest priority in the Configurator

If multiple high-resolution video files are online and match the criteria of the archive filter, IP2Archive will archive the first high-resolution video file it encounters.

2.2.5. Offline Files

If you try to archive a clip that has two or more high-resolution master video files, and one or more of these files are offline (), IP2Archive will ignore the files that are offline. These offline files will not appear in the Archive Candidates tab of the Deep Archive Manager.

If you try to archive a clip that has only high-resolution video files that are offline, the clip will immediately be moved to the **Archive Rejected** bin.

If you try to archive a subclip and the master high-resolution video file is offline, the subclip will immediately be moved to the **Archive Rejected** bin.

2.2.6. Archiving Low-Resolution Video Files

Note
The low-resolution video file of a particular clip can only be archived using the Deep Archive Manager. This is not possible using IPDirector.

Moreover, it is only possible if the high-resolution video file has already been archived and has been removed from the nearline storage.

No clip archive metadata updates will be performed in IPDirector and the clip will not be moved from bin to bin.

The archiving of the low-resolution video file of one or more archived clips proceeds as follows:

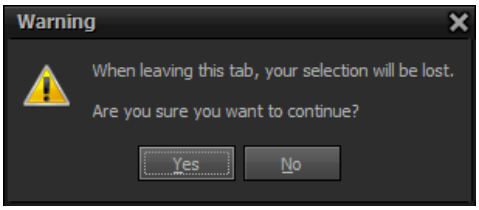
1. The user opens the Online Copy Removed tab of the Deep Archive Manager.
2. He searches for and selects the desired clips from the Online Copy Removed grid.

   Multiple clips can be selected.

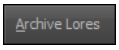
   To select a consecutive group of clips, he has to click the first item, press and hold down the **SHIFT** key, and then click the last item. To select non-consecutive clips, he has to press and hold down the **CTRL** key, and then click each item he wants to select.

3. The user clicks  to add the selected clips to the Selected Clips grid. He can also double-click a clip to add it.

Note
If the user switches to another tab when there are still items in the Selected Clips grid, a warning will appear.



If he clicks **Yes**, the selected clips will be removed from the Selected Clips grid and the other tab will be opened. If he clicks **No**, he will remain in the current tab and the selected clips will not be removed.

4. The user clicks the **Archive Lores** button  to start the archiving process.

   The selected clips will disappear from the Selected Clips grid but will remain in the Online Copy Removed tab. In the Archive Candidates tab a record will appear for each low-resolution video file with the status 'Initialize'. In the **Resolution** column the low-resolution icon () is displayed. The

   - If no errors occur and no automatic archive filter exists for the clip, the status of the clip will change into 'Archive Candidate'. Proceed to step 5.
   - If no errors occur and an automatic archive filter exists for the clip, the clip will be moved to the Archive Queue tab. The status of the clip will change into 'Request Archive'.
   - If an error occurs, the status of the clip will change into 'Initialize Error'. The clip will remain in the Archive Candidates tab. A **Retry** button will appear allowing the user to retry the action. If the retry fails, the user can refuse the clip. The clip will be moved to the Refused tab with the status 'Refused'.

5. The user clicks the **Archive** button to start the archiving.

   The clip is moved to the Archive Queue tab. The status of the clip will change into 'Request Archive'. Once the clip has been archived, the clip will be moved to the Archived tab with the status 'Archived'.

Note
When the user has selected a high-resolution video file of which the low-resolution video file has already been requested to be archived, and he clicks the **Archive Lores** button, a popup will appear with the following message 'Following clip(s) are not requested: <VARID> (Lores) exists already'. The same is true for a low-resolution video file that has already been archived.

2.3. Removing the Online Copy

Introduction

From within the Deep Archive Manager interface it is possible to remove the high- or low-resolution video file of archived clips from the IPDirector nearline storage in order to free up space.

This can also be done through the IPDirector interface, but it is strongly advised to perform the removal through the Deep Archive Manager interface in order to minimize possible mistakes (i.e. accidentally removing the low-resolution video file as well).

It is also possible to automate this process.

Workflow

The removal of the high- or low-resolution video file of archived clips from the IPDirector nearline storage proceeds as follows:

1. In the Deep Archive Manager, the user opens the Archived tab.
2. He selects the clips whose high- or low-resolution video file he wants to delete from the IPDirector nearline storage and adds them to the selection list.
3. He clicks the **Remove Online Copy** button.

   The Deep Archive Controller picks up the removal request in the IP2Archive database. It commands IPDirector through the IPDirector SOAP API to remove the high- or low-resolution video file from the IPDirector nearline storage.
4. In the Deep Archive Manager the clips are moved to the Remove Online Copy Queue tab.
5. Once the high- or low-resolution video file has been removed, the clips are moved to the Online Copy Removed tab in Deep Archive Manager.

   IP2Archive Communicator will provide feedback to IPDirector by updating the clip archive metadata.

2.4. Restoring Clips

2.4.1. Before Restoring

Before restoring a clip, verify if the clip has been archived and only contains a low-resolution video file on the nearline storage. If you try to restore a clip of which the high-resolution video file is still online, the clip will be moved to the **Restore Rejected** bin.

When the low-resolution video file is archived, it does not have to be online for the high-resolution video file to be restored.

2.4.2. Fully Restoring Clips

Introduction

The archived high-resolution video file of a clip can be fully restored to the nearline storage by dragging the clip into the **Request Restore** bin in IPDirector, or by selecting the clip in the Online Copy Removed tab of the Deep Archive Manager and by clicking the **Restore** button.

The archived low-resolution video file of a clip can only be fully restored to the nearline storage by selecting the corresponding clip in the Online Copy Removed tab of the Deep Archive Manager and by clicking the **Restore** button.

Workflow 1: Restoring Clips via IPDirector

The restore workflow in IPDirector proceeds as follows:

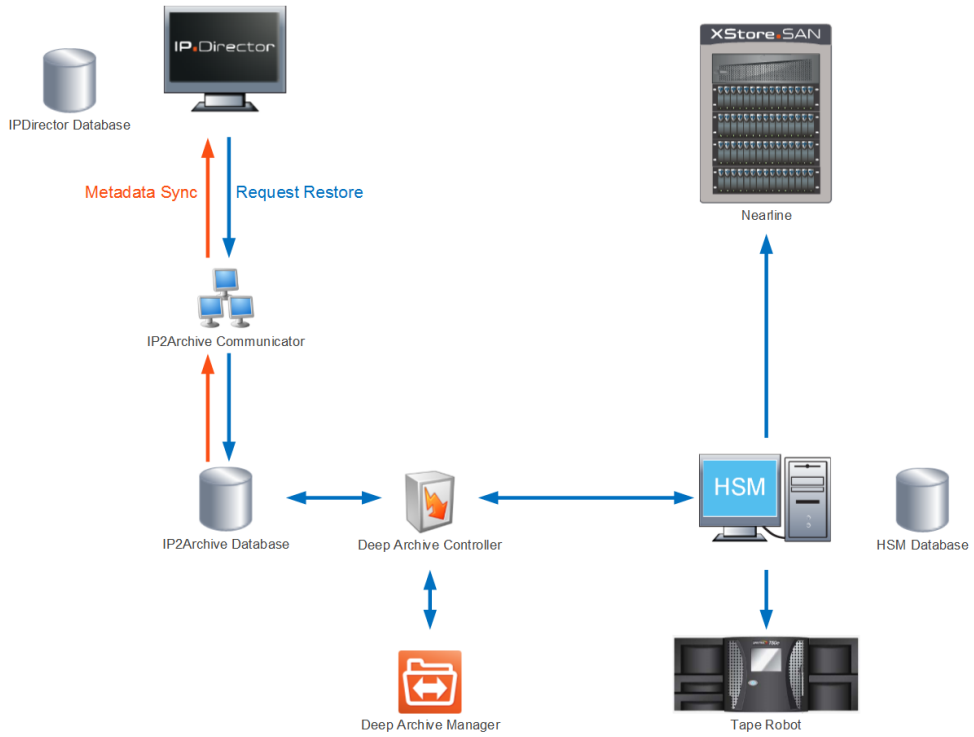
1. In the Database Explorer of IPDirector the user searches for the clips whose high-resolution video file has to be restored to the nearline storage.
2. The user drags and drops the clips in the **Request Restore** bin.

   If the **Request Restore** bin has been defined as the user default bin, the user can also right-click the clips and choose **Send to > Default Bin**. See the IPDirector user manual for more information about setting a particular bin as default bin.
3. IP2Archive Communicator which continuously polls the **Request Restore** bin detects the clips and enters the restore requests in the IP2Archive database. It moves the clips to the **Restore in Progress** bin.
4. In the Deep Archive Manager the clip appears in the Restore Queue tab.
5. Deep Archive Controller picks up the restore requests in the IP2Archive database. It checks if a HSM is available, and if this is the case, assigns the restore requests to it. It then commands the HSM or File Transfer Daemon (XenData) to initiate the restore process.
6. The HSM starts the restore process. In case of XenData, File Transfer Daemon request the HSM to start the restore process.

7. The high-resolution video files are restored from LTO tape. DIVArchive, FlashNet and ADA will restore the files directly to the nearline. XenData will restore the files to its cache. File Transfer Daemon will then transfer the files to the nearline storage.

   During the restore process, IP2Archive Communicator provides feedback to IPDirector by updating the clip archive metadata. If anything goes wrong, the clips will be placed in the **Restore Failed** bin.

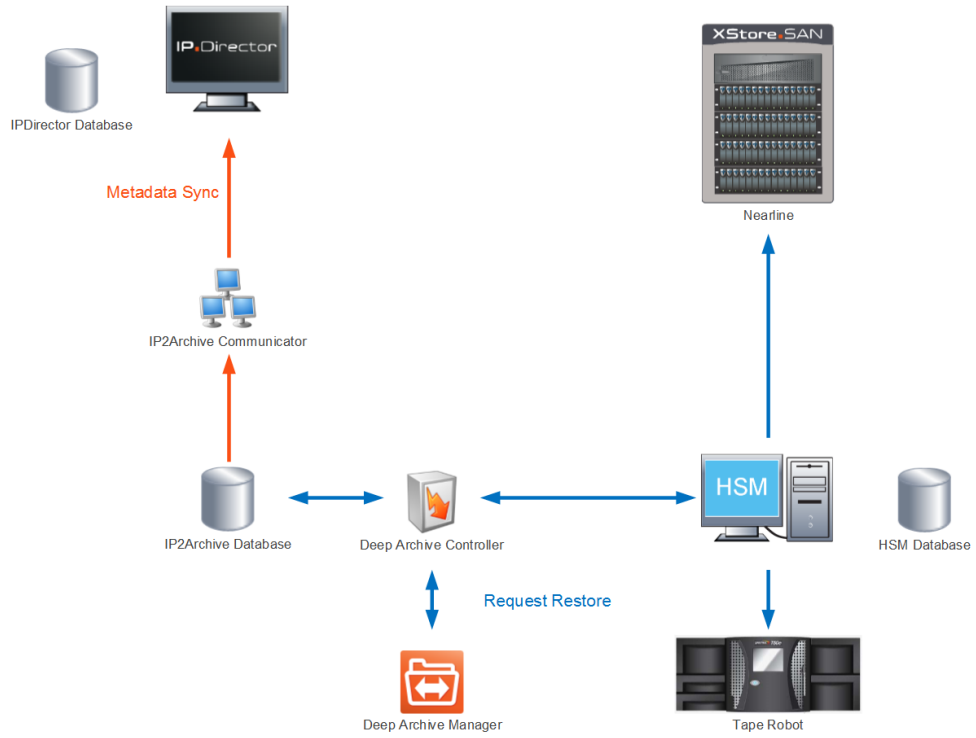
8. Once the high-resolution video file of the clips is successfully restored, the clips are moved to the **Restored** bin in IPDirector. In Deep Archive Manager the clips appear in the the Restored tab. Depending on the configuration of Deep Archive Manager, they can also appear in the Archived tab.



Workflow 2: Restoring Clips via Deep Archive Manager

The restore workflow in Deep Archive Manager proceeds as follows:

1. In the Online Copy Removed tab of the Deep Archive Manager the librarian selects the high- and/or low-resolution video file of clips he wants to restore and clicks the **Restore** button.
2. Deep Archive Controller picks up the restore requests in the IP2Archive database and initiates the restore process as described above.
3. The clips are moved to the Restore Queue.
4. Once the high- or low-resolution video file of the clips are successfully restored, the clips appear in the Restored tab. Depending on the configuration of Deep Archive Manager, they can also appear in the Archived tab.



2.4.3. Partially Restoring Clips

Introduction

Partially restoring clips is only possible:

- for archived high-resolution video files.
- in IPDirector, not in the Deep Archive Manager.
- if IP2Archive interfaces with Front Porch Digital 's DIVArchive, SGL's FlashNet and Atempo's Digital Archive.
- if the license for partial restore has been activated.
- if the hierarchical storage management system supports partial restore for the file format of the clips' high-resolution video file.
- if the clips' low-resolution video file is available on the IPDirector nearline storage.

Workflow

The partial restore workflow proceeds as follows:

1. In the IPDirector Database Explorer the user searches for the low-resolution video file of a clip that has been archived.
2. The user sets a new In and Out point within the boundaries of the archived clip.
3. He creates a subclip by clicking **New Clip**.
4. The user enters a name for the clip. He can also enter a VarID, but this is optional. If no VarID is entered, it will be automatically generated.
5. The user clicks the **Save** button.
6. The user drags and drops the clip in the **Request Restore** bin.
7. IP2Archive Communicator which continuously polls the **Request Restore** bin detects the clip and enters the restore requests in the IP2Archive database. It moves the clip to the **Restore in Progress** bin. In the Deep Archive Manager the clip appears in the Restore Queue tab with the status 'Restoring'.

   The VarID of the archived high-resolution file is retrieved from IPDirector using the full file path of the low-resolution video file the subclip was created from. It is compared with the VarID of the subclip.

   - If the VarID of this subclip already exists in the HSM, this request is handled as a “Full Restore”.
   - If the VarID does not exist, the request is handled as a “Partial Restore”.

   The TC In and TC Out of the subclip are compared with the timecodes of the archived high-resolution file.

   - If the timecodes match, this request is handled as a “Full Restore”.

- If the timecodes fall within the timecode boundaries of the archived file, the request is handled as a “Partial Restore”. A new clip will be restored using the VarID of the subclip as the name for the restored high-resolution file: VARID.xxx, together with the metadata file : VarID.evs.xml.

8. Once the subclip has been successfully restored to the nearline storage, it will be moved to the **Restored** bin. In Deep Archive Manager the clip appears in the Restored tab. The field in the column ‘Partial’ is checked.

   IPDirector will pick up the restored file in its database and link it to the low-resolution subclip previously made.

2.4.4. Removing Partially Restored High-Resolution Files

Partially restored video files can only be removed from the nearline using IPDirector. It is not possible to remove them using Deep Archive Manager.

To help the user decide which partially restored high-resolution video files can be safely removed from the IPDirector nearline storage, the corresponding clips can be sorted in the IPDirector Database Explorer by the userfield Retention Date.

The Retention Date field indicates when a partially restored high-resolution video file can be manually removed from the nearline storage. It is calculated by taking the restore date of the video file and adding to it the number of days that were entered as Retention Period in the Configuration tab of the Configurator. See the section about the Configuration tab in the Configurator user manual for more information.

Files with the oldest retention date can be safely removed from the nearline storage.

2.5. Purging Clips

Introduction

If an archived file becomes obsolete and needs to be purged from LTO, it is possible to do this from the Deep Archive Manager interface. You can purge clips in the Archived, Restored and in the Online Copy Removed tab.

Workflow

The purging of high- or low-resolution video files from LTO tape from within the Deep Archive Manager proceeds as follows:

1. In the Deep Archive Manager the user opens the Archived, Online Copy Removed or Restored tab.
2. He selects the clips he wants to purge and adds them to the selection list.
3. He clicks the **Purge** button.

   Deep Archive Controller picks up the purge request in the IP2Archive database. It commands the HSM (ADA, FlashNet, DIVArchive) or File Transfer Daemon (XenData) to start the purge process.

   In the Deep Archive Manager the clips are moved to the Purge Queue tab.

   During the purge process, IP2Archive Communicator provides feedback to IPDirector by updating the clip archive metadata.

Note
The clip archive metadata is only updated when purging a high-resolution video file, not when purging a low-resolution video file.

4. Once the clips have been purged from LTO tape, the clips are moved to the Purged tab.

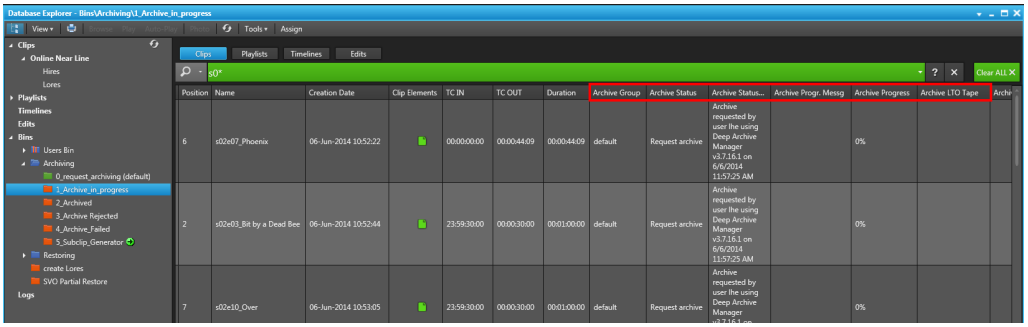
2.6. Tracking the Archive, Online Copy Remove, Restore and Purge Process

2.6.1. Archive Metadata

Archive metadata is added to the clips by means of specific IPDirector user fields. They will allow you to monitor their archive status.

The following user fields have been defined in IPDirector when installing IP2Archive:

- **Archive Status**
- **Archive Status Message**
- **Archive Progress**
- **Archive Progress Message**
- **Archive LTO Tape**
- **Archive Group**
- **Archive Date**
- **Retention Date**



During the archive, restore, purge and online copy remove process, IP2Archive Communicator will update these user fields with archive metadata.

2.6.2. Clip Status

The clip status is displayed in the **Archive Status** user field in IPDirector. It is automatically updated by the IP2Archive Communicator.

Archive Status

A clip can have the following archive statuses:

Status	Description
Unknown	The archive status of the clip is unknown.
Archive Candidate	The clip has been added to the Archive Candidates tab of the Deep Archive Manager.
Request Archive	A request to archive the clip has been performed. A deep archive system (HSM) has not yet been assigned.
Archive Storage Assigned	A deep archive system (HSM) has been found ready to perform the archive request.
Archive Requested	The request to archive the clip has been submitted to the deep archive system (HSM).
Archiving	The clip is being archived by the deep archive system (HSM).
Archived	The clip has been archived.
Archive Error	An error occurred during the archiving process.
Refused	The clip has been refused in the Archive Candidates tab of the Deep Archive Manager.
Initialize	A record for the low-resolution video file is being initialized.
Initialize Error	An error occurred during the initialization.

Remove Online Copy Status

A clip can have the following remove online copy statuses:

Status	Description
Remove Online Copy Candidate	The clip has been added to the Archived or Restored tab and its high- or low-resolution video file is a potential candidate to be removed from LTO tape.
Request Remove Online Copy	A request to remove the high- or low-resolution video file of the clip from the nearline storage has been performed in Deep Archive Manager.
Removing Online Copy	The high- or low-resolution video file of the clip is being removed from the nearline storage.
Online Copy Removed	The high- or low-resolution video file of the clip has been removed from the nearline storage.

Restore Status

A clip can have the following restore statuses:

Status	Description
Request Restore	A request to restore the high- or low-resolution video file of a clip has been performed in Deep Archive Manager or in IPDirector. A deep archive system (HSM) has not yet been assigned.
Restore Candidate	The clip has been added to the Online Copy Removed tab of the Deep Archive Manager.
Restore Storage Assigned	A deep archive system (HSM) has been found ready to perform the restore request.
Restore Requested	The request to restore the high- or low-resolution video file has been submitted to the deep archive system (HSM).
Restoring	The high- or low-resolution video file is being restored.
Restore Error	An error occurred during the restore process.
Partially Restored	The high-resolution video file of the clip has been partially restored from LTO tape.

Purge Status

A clip can have the following purge statuses:

Status	Description
Purge Candidate	The high- or low-resolution video file of the clip has been automatically requested to be purged and has been added to the Purge Candidates tab.
Purge Requested	A request to remove the high- or low-resolution video file of the clip from LTO tape has been performed in Deep Archive Manager.
Purging	The high- or low-resolution video file of the clip is being removed from LTO tape.
Purged	The high- or low-resolution video file of the clip has been removed from LTO tape.
Purge Error	An error occurred during the purge process.

2.6.3. Moving Clips From Bin to Bin

IP2Archive Communicator also provides archive and restore feedback to IPDirector by placing the clips in the **Archive In Progress** or the **Restore in Progress** bin.

When the archive or restore job is finished, the clips will be moved to the final bin: **Archived** or **Restored**.

If anything goes wrong during archiving or restoring, the clips will be placed in the **Archive Failed** or **Restore Failed** bin.

A clip will be moved to the **Archive Rejected** bin if:

- it has no online high-resolution video file
- a clip with the same VarID has already been archived
- it does not match the criteria of any archive filter in the Configurator
- ...

A (sub)clip will be moved to the **Restore Rejected** bin if:

- it does not exist in IP2Archive
- it has been purged from LTO
- the source (master) clip has not been archived yet
- ...

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