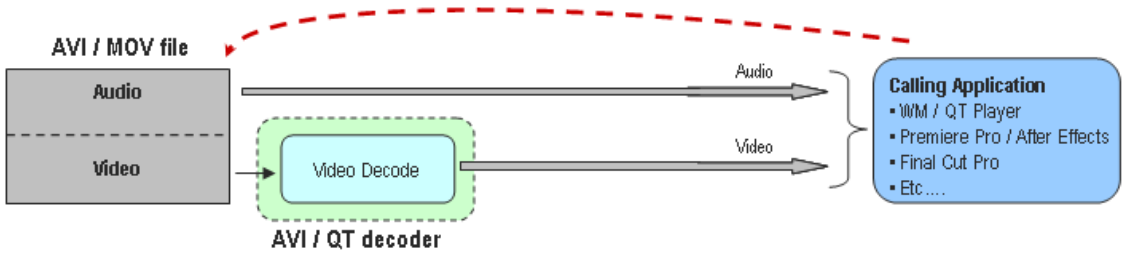
# CineForm Active Metadata™ - Technology Overview

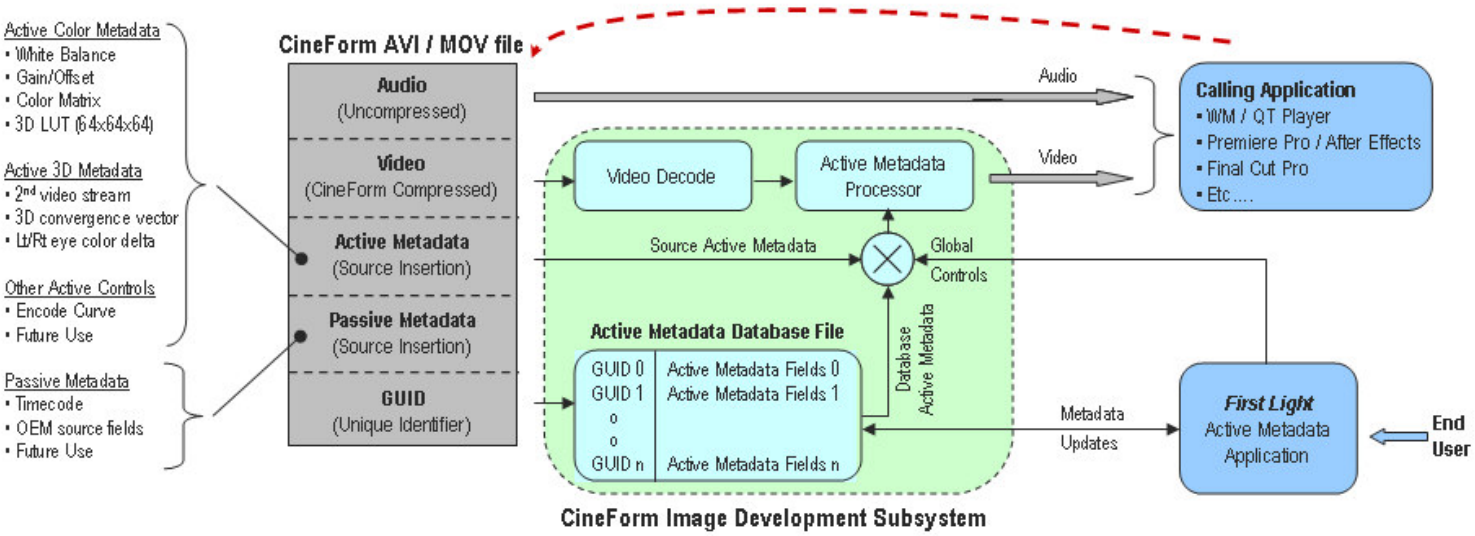
Video file formats use standard wrappers like AVI, QuickTime (MOV), or MXF to ensure broad playback compatibility with numerous video applications. A calling application requests frames from AVI/MOV files which are in turn decoded and presented to the calling application similar to the diagram below. Within the AVI or MOV wrapper, the underlying file might be compressed (or uncompressed) using various codecs, all of which guarantee compatibility with a calling application through OS-recognized AVI or QuickTime interfaces.




**Traditional request by a calling application to "play" (or decode) a compressed file.**

Using its **Active Metadata**™ architecture CineForm extends traditional codec-only capability into a full-featured image development subsystem, including:

- Combining "active" processing of decoded images with metadata based on user-established rules. Active processing allows non-destructive image development including color (White Balance, color matrix, 3D LUTs, etc), 3D editorial and playback, stream-specific information, and future use
- Metadata storage is inside the video essence within user data fields compatible with AVI/MOV files
- Active Metadata is compatible with all CineForm file types: 10-bit YUV, 12-bit RGB, 12-bit RAW, and stereo (3D)
- Cross-platform (Win / Mac) and cross-applications compatibility. Active Metadata is transparent to a calling application because all Active Metadata processing occurs within the CineForm Image Development Subsystem, prior to presenting the images to the calling application.



When a CineForm AVI or MOV file is created, active and/or passive metadata may be inserted into the file. In all cases a Globally Unique Identifier (GUID) is inserted into the file, plus the encoder curve used when the file was created. Timecode, if available, is written into a Passive Metadata field.

- The GUID provides a lookup address into the CineForm Active Metadata Database file used during playback.

- The encoder curve is included to establish the inverse curve necessary to return to linear light upon decode.

The following are a few examples of Active Metadata insertion into CineForm AVI/MOV files:

  - When recording to disk during live capture using a Silicon Imaging camera, white balance and 3D LUT information is written into the CineForm RAW file.

  - When performing disk-based conversions from Red R3D files, white balance information from the Red metadata fields is extracted from the Red SDK and written into the CineForm file (YUV, RGB, or CineForm RAW) as Active Metadata.

  - When a stereo (3D) CineForm file is created, the second stream is stored as Active Metadata, plus other optional fields.

CineForm's ***First Light*** application allows for:

- Modifying Active Metadata. Active Metadata created at source file origination always resides inside the file and can never be modified. Modifications to Active Metadata are stored in CineForm's Active Metadata Database file. First Light allows a user to revert to the source metadata regardless of future metadata modifications within First Light.

- Setting Global Playback controls. You can define for playback that all, none, or only a portion of the Active Metadata should be applied upon decode. A couple examples of when this is useful:

  - During editorial with CineForm files the editor may have used Active Metadata color to establish look-intent. But when rendering from a CineForm file to DPX files a choice might be made to only apply white balance and not apply the color look-intent used during editorial with Active Metadata.

  - During 3D playback, global playback controls allow the user to choose whether to play a CineForm stereo file as 2D (either Left eye or Right eye), or as one of four different 3D presentation formats (side-by-side, over-under, field interlace, or anaglyph).

- Defining the rules for applying CineForm's numerous demosaic algorithms for CineForm RAW content during playback or rendering.

When a calling application requests playback of a CineForm file, the Active Metadata processor computes the final output based on user-defined global playback rules plus individual Active Metadata fields.