

Transitional 1, or JPEG Interop or Interop DCP (Legacy Format)

The Interop DCP is the legacy distribution format for digital cinema. While it is encouraged that distributions eventually migrate to SMPTE DCP format, players must continue to support Interop DCP format. Interop DCPs, KDMs and Certificates shall follow the specifications in Table 1 below. Note that that “mpeg_ii” stands for MPEG Interop Initiative, the name of the effort that led to Interop DCP. Also note that the Interop DCP stage does not include projector configuration (PCF) files.

Interop documents may be downloaded at ftp://ftp.digicine.com/Document_Release_2.0. Please note that we do not manage this site, but will forward requests for the password.

Specification	Document	Comments
Sound & Picture Track File	mpeg_ii_track.doc (v2.7)	Some ULs are not listed in any Registry. Only two partitions allowed. Undocumented change from MPEG to JPEG encoding.
Track File Encryption	mpeg_ii_track_file_encryption.doc (v5)	Key indicating encrypted essence in KLV triplet is not registered. Files may not have proper MIC value.
Constraints	mpeg_ii_pack_constraints.doc (v2.6)	
Key Delivery Message	SMPTE 430-1	Some fields required by DCI are not populated or are ignored upon playback. Note that the ContentAuthenticator field is not used. see ISDCF Document 5 (Guideline formulations Interop and SMPTE-KDM) for additional guidelines.
Certificate	SMPTE 430-2	Certificate rules may not be enforced.
Extra-theater messages	SMPTE 430-3	
Asset Map	mpeg_ii_am_spec.doc (v3.4)	Filename is ASSETMAP
Composition Playlist	mpeg_ii_cpl_spec.doc (v2.4)	
Subtitles	TI_sub-titling_2504760b.pdf	Subtitle track file is an XML file that cannot be encrypted. Requires special directory structure to deliver.
Sound	S382M-GC-aesbwf-20040808.zip	Supports only a single, fixed channel mapping. See ISDCF Document 4 - Audio Channel Assignments.
JPEG 2000 Wrapping	MXF J2K-v3e 200509231.doc	JPEG Subdescriptor UL is not registered.
JPEG 2000 D-Cinema Constraints	MXF JPEG 2000 Application for D- Cinema (SMPTE 3285B)	Very similar to final SMPTE specification.
Packing List	mpeg_ii_pkl_spec.doc (v2.4)	
Stereoscopic Picture Track File	3D_Interop_Single_File_2007_18_05_v1_5.doc	Similar to SMPTE 429-10, but uses Digicine namespace for CPL and uses unregistered JPEG subdescriptor UL.
Closed Captions	ClosedCaption_Interop_2007_11_16_v1_9 (clean).pdf	

Table 1. Interop DCP

SMPTE DCP

The SMPTE DCP stage reflects the set of published SMPTE specifications as summarized and constrained by SMPTE ST429-2, D-Cinema Packaging – DCP Operational Constraints. SMPTE DCPs, KDMs, and Certificates shall follow the specifications in Table 2 below. While Table 2 lists the core specifications for SMPTE DCP requirements, developers should note that this list may not be complete. Normative references may apply, and DCI imposes additional requirements for both DCP and playback that are not contained in the SMPTE standards.

Players must be compatible with both SMPTE DCP and Interop DCP. Developers should note that there are distinct differences between SMPTE DCP and Interop DCP in the XML namespace, and in the partitions and ULs. In addition, there are differences in requirements for content, KDM and Certificate validation.

SMPTE standards may be purchased in the SMPTE store at <https://store.smpte.org/>

Specification	Document	Comments
Sound & Picture Track File	SMPTE 429-3	Three partitions required.
Track File Encryption	SMPTE 429-6	Similar to JPEG Interop but uses correct encrypted essence key and MIC value.
Constraints	SMPTE 429-2	Additional constraints such as: <ul style="list-style-type: none"> • All Reels must have picture and sound • Picture size constraints • Timed text rate • Hash element is required for encrypted track
Key Delivery Message	SMPTE 430-1	All elements required by the SMPTE spec and by DCI must be present and validated for playback to take place. In particular, DCI adds a selective audio forensic marking flag to those listed in Section 5.2.9.1 of ST 430-1:2006. See also ISDCF Document 5 (Guideline formulations of Interop and SMPTE KDM) for additional guidelines
Certificate	SMPTE 430-2	DCI requirements must be met. In particular, DCI defines roles not included in Annex A of 430-2 and specifies minimal sets of device roles.
Extra-theater messages	SMPTE 430-3	
Asset Map	SMPTE 429-9	Filename is ASSETMAP.xml
Composition Playlist	SMPTE 429-7	Uses SMPTE namespace.
Subtitles	SMPTE 429-5 and SMPTE 428-7	Change to XML source format. Subtitle track file is now an MXF file that encapsulates XML source and aux data and supports encryption. No special packaging directory structure needed.
Sound	SMPTE 382M	ChannelAssignment label allows multiple channel assignments to be used.
JPEG 2000 Wrapping	SMPTE 422M	JPEG subdescriptor UL is now correct.
JPEG 2000 D-Cinema Application	SMPTE 429-4	
Packing List	SMPTE 429-8	The GroupID element was added to support delivery of "Asset Packages."
Stereoscopic Picture Track File	SMPTE 429-10	StereoscopicPicture Sub Descriptor added to identify stereo essence.
Closed Captions	SMPTE 429-12 and SMPTE 428-10	

Table 2. SMPTE DCP

<http://isdcf.com/papers/ISDCF-Doc2-DCP-TransitionReview.pdf>

SMPTE DCP System Requirements

1. *The system is required to provide the capability for 16 channels of audio playback.* (DCI Specification v1.2, Section 7.5.6.1)
2. *The digital cinema server shall route Access Audio tracks (HI and VI-N) to owner-designated outputs.* (NATO Requirements v2.1, Section 4.3)

For more information:

DCI Specification: <http://dcimovies.com/specification/>

NATO System Requirements: <http://www.natoonline.org/Digital.htm>

SMPTE Closed Caption Communication Protocol

The CSP/RPL protocol is standardized by SMPTE and recommended for implementation in all players. The protocol provides the communication method between players and 3rd party closed caption systems, and is defined by these standards:

SMPTE standards may be purchased in the SMPTE store at <https://store.smpte.org/>

ST430-10 Digital Cinema Operations:

Auxiliary Content Synchronization Protocol (CSP)

ST430-11 Digital Cinema Operations:

Auxiliary Resource Presentation List (RPL)