

About This Standard

Mandated

Standard Identifier SMPTE 377M:2004

Title of Standard

Material Exchange Format (MXF) File Format Specification

Standards History

Introduced to Registry	Date Emerging	Date Mandated	Last Status Update	Last Status Review	Inactive/Retired
2006-02-21	2006-02-21	2007-06-27	2007-06-27	2007-06-27	n/a

Standards Body [SMPTE](#)

[Broken Link?](#)

URL to Access or Acquire <http://www.smpte.org>

Working Group

Primary Owner Geospatial Intelligence TWG (GWG)

Secondary Interest No Secondary Interest

Service Area GEOINT: Motion Imagery

KIPs No KIP Found

Standard Applicability

2007-06-27

Application areas for MXF include: -interchange of digital video and metadata such as sensor to ground stations; ground station to exploitation; and exploitation to archive -television and movie post production systems -non-linear digital editing systems -media archive systems -media dissemination systems Exchange of finished product(s) multi-media reports and products Multi-INT fusion/reporting systems -exploitation systems interoperability exchange for Common Operational Picture (COP) display systems.

2006-02-21

Application areas for MXF include: - television and movie post production systems - non-linear digital editing systems - media archive systems - media dissemination systems - multiINT fusion/reporting systems - exploitation systems

Standard Abstract

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Material Exchange Format (MXF) is a referenced interchange format for NATO coalition operations using digital Motion Imagery and metadata via Edition 2 of STANAG 4609. MXF is a wholly contained subset of the Advanced Authoring Format (AAF) data model, and is a simple interchange format, primarily to facilitate the transfer of finished content, whole programs, or completed sections between servers and for streaming operations. MXF also helps with the migration of playout operations and simpler production systems into standard networked environments. While the MXF and AAF are complementary, there are significant differences. AAF may carry references to outside material held in other places, to be used in an edit whereas MXF is always complete and self-contained; not

requiring any access to outside material. In addition, AAF includes basic video transition processing whereas MXF, carrying completed program material, does not. The header metadata area of the MXF file is where much of the benefit of MXF comes. It is the area where metadata is added and the timing and synchronization parameters of the file are defined. Synchronization and description of the essence is controlled by 3 packages: Material, File and Source. The Material Package represents the output timeline of the file. The actual essence is described by the File Package. The derivation of that essence (previous edit decision lists, descriptions of original film stock etc.) are contained within the Source Package. MXF metadata also contains information about the file structure, body contents, key words or titles, subtitles, reference number, editing notes, location, time, date, and version number, etc. Implementers of MXF should use the ASPA-AAF Profile standard to structure the data in accordance with the ASPA standard.

2006-02-21

Material Exchange Format (MXF) is derived from the Advanced Authoring Format (AAF) data model, and is a simple interchange format, primarily to facilitate the transfer of finished content, whole programs, or completed sections between servers and to tape streamers. MXF also helps with the migration of playout operations and simpler production systems into standard networked environments. While the MXF and AAF are complementary, there are significant differences. AAF may carry references to outside material held in other places, to be used in an edit whereas MXF is always complete and self-contained; not requiring any access to outside material. In addition, AAF includes basic video transition processing whereas MXF, carrying completed program material, does not. The header metadata area of the MXF file is where much of the benefit of MXF comes. It is the area where metadata is added and the timing and synchronization parameters of the file are defined. Synchronization and description of the essence is controlled by 3 packages: Material, File and Source. The Material Package represents the output timeline of the file. The actual essence is described by the File Package. The derivation of that essence (previous edit decision lists, descriptions of original film stock etc.) are contained within the Source Package. MXF metadata also contains information about the file structure, body contents, key words or titles, subtitles, reference number, editing notes, location, time, date, and version number, etc.

Profiling Questions

GEOINT: Motion Imagery

- Does your system exchange motion imagery data with external systems or does your system task, collect, produce, process, catalog, store, read, exploit, or disseminate digital motion imagery?

Products Incorporating This Standard

Companies that manufacture MXF-enabled tools include Avid, EVS, Quantel, Leitch, MOG Solutions, Omneon, Panasonic, Pinnacle, SGI, Snell & Wilcox, Sony, and Thomson.

Relevant Information

None

Implementation Guidance

None

Standard Selection Criteria

Net-Centric Interoperability

MXF-enabled applications provide the ability to exchange files between media archive and dissemination systems. MXF is ideally suited for source, production, exploitation and dissemination processes (entire TPED process).

Technical Maturity

MXF is an established standard maintained by the Society of Motion Picture and Television Engineers (SMPTE) since 2004. See SMPTE's web site for information on the complete set of official documents. MXF is gaining support in the commercial market place with software tools to read, write, edit, disseminate, and archive MXF files. Companies that manufacture MXF-enabled tools include Avid, EVS, Quantel, Leitch, MOG Solutions, Omneon, Panasonic, Pinnacle, SGI, Snell & Wilcox, Sony, and Thomson.

Public Availability

http://www.smpte.org/smpte_store/ (requires purchase)

Implementability

Any DoD or IC organization using products from companies listed above may be using the MXF standard in their software products, and the MXF Standard is also being implemented in hardware (e.g. cameras) as an output format.

Authority

Edition 2 of NATO STANAG 4609 on Digital Motion Imagery uses SMPTE-standardized MXF. Ratified by 6 NATO countries & in promulgated stage for use in ops. The Society of Motion Picture & Television Engineers, maintains MXF File Format Spec. 16 SMPTE official docs describe the std including: -SMPTE 377M-2004 Television Material Exchange Format (MXF) File Format Specification - SMPTE 378M-2004 Television Material Exchange Format (MXF) Operational Pattern 1a (Single Item, Single Package) -SMPTE 379M-2004 Television Material Exchange Format (MXF) MXF Generic Container -SMPTE 380M-2004 Television Material Exchange Format (MXF) Descriptive Metadata Scheme-1 (Standard, Dynamic) -SMPTE 381M Television Material Exchange Format (MXF) Mapping MPEG Streams into MXF Generic Container (Dynamic) SMPTE 383M-2004 Television Material Exchange Format (MXF) Mapping DV-DIF Data to MXF Generic Container SMPTE, in conjunction w/ Pro-MPEG, & AAF Association, have open processes to maintain & develop MXF.

Standard Type Non-Military

Keywords for Search None