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TV2 Csoport

TECHNICAL MEDIA SPECIFICATION

ON THE FILE BASED SUBMISSION OF MATERIALS TO BE AIRED

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1. Introduction

TV2 Group is working tirelessly to guarantee the quality and constantly improve its programs. In accordance with this, TV2 Group is now using a digital file based acquisition, archive and playout.

Due to this it is imperative to ensure that the quality of the received material is the best possible and this material reaches the format which TV2 Group is using in its systems (playout, post production, etc.) in as few transcoding steps as possible.

2. Material File Format

Every material should be transferred to TV2 Group in a separate file. Different materials (e.g.: multiple episodes of a series, or multiple advertisement spots from the same campaign) cannot be joined together into a single file.

The file format which TV2 Group is using and which TV2 Group expects from its partners is the following:

- SD
 - XDCAM SD format
 - MPEG IMX (D10) codec, 50 Mbps
 - MPEG2 4:2:2@Main video codec profile, GOP: N=1, constant bit rate
 - PAL video standard (625/50)
 - Interlaced scan, Upper Field First
 - MXF container, OP1a pattern, partition status: Closed and Complete
 - 16:9 display aspect ratio (full height anamorphic), the aspect ratio must be indicated properly in the MXF metadata.
 - 8 channel audio, 48 KHz, 16 bit, AES3 (SMPTE 331M) format
 - Uncompressed audio, constant bit rate
- HD
 - XDCAM HD 422 format
 - MPEG2 Long GOP codec, 50 Mbps
 - 422P@HL profile, GOP: M=3, N=12, first GOP must be closed
 - 1920 x 1080 resolution, 25 fps (50i)
 - Interlaced scan, Upper Field First
 - MXF container, OP1a pattern partition status: Closed and Complete
 - 16:9 display aspect ratio (full height anamorphic), the aspect ratio must be indicated properly in the MXF metadata.
 - 8 channel audio, 48 KHz, 24 bit, AES3 format
 - Uncompressed audio, constant bit rate

The above format is described in detail in the following specifications:

- SMPTE 377M-2010: Material Exchange Format (MXF) – File Format Specification
- SMPTE 378M-2004: Material Exchange Format (MXF) – Operational pattern 1A (Single Item, Single Package)
- SMPTE 379M-2010: Material Exchange Format (MXF) – MXF Generic Container
- SMPTE 381M-2005: Material Exchange Format (MXF) – Mapping MPEG Streams into the MXF Generic Container
- SMPTE 386M-2004: Material Exchange Format (MXF) – Mapping Type D-10 Essence Data to the MXF Generic Container
- SMPTE 356M-2001: Type D-10 Stream Specifications – MPEG-2 4:2:2P @ ML for 525/60 and 625/50
- SMPTE 382M-2007: Material Exchange Format – Mapping AES3 and Broadcast Wave Audio into the MXF Generic Container
- SMPTE 331M-2004: Television - Element and Metadata Definitions for the SDTI-CP
- ITU-R BT.601-5: Studio encoding parameters of digital television for standard 4:3 and wide-screen 16:9 aspect ratios
- ITU-R BT.709-5: Parameter values for the HDTV standards for production and international programme exchange

TV2 Group accepts only material that is free from all defects.

The MXF file must be closed. (SMPTE 377M, section 5.2.4)

The duration of the file must be at least 8 frames.

The file name can only contain alphanumeric characters, dash, and underscore, the file extension must be mxf.

If the file format of the material does not conform to this specification, then the supplier must convert it to the format accepted by TV2 Group using the latest known technology, so that the quality attained is as high as possible.

If the source material is SD, then the material must be submitted in SD. It is forbidden to upconvert SD materials to HD and submit them according to the HD specification.

TV2 Group provides a file validator application (computer program), which is capable checking most criteria of the file format specification and even some of the media properties (e.g. loudness). Therefore TV2 Group recommends its partners to check the files with the validator application before sending them to TV2 Group. The validator application can be downloaded from this website:

<http://validator.tv2.hu/>

3. Video properties

The video signal may not display compression or inordinately reduced black levels.

Colour reproduction should be natural, especially with regard to skin colour, and must be consistently uniform over the full length of the program.

The material may not include any blank spots, jumps, or deviations from standard, such as jumps in e-level, maximum white level, colour saturation, or colour phase or changes in burst, sync signal, or noise level.

The bit rate of video data is 50 Mb/s.

SD:

The resolution of the video must be 720 x 608 pixels, which consists of 32 lines of VBI information and 720 x 576 pixels of active image. VBI information, including the VITC will be ignored. The video frame rate is 25 frames / 50 fields per second.

The decoded PAL signal must meet the ITU-R BT.601-5 standard in order to avoid colours forbidden in a PAL environment.

HD:

The resolution of the video must be 1920 x 1080 pixels. The video frame rate is 25 frames / 50 fields per second. The GOP size is 12.

There must not be any illegal colours in the video signal, the video parameters must strictly comply with the ITU-R BT.709-5 specification.

The aspect ratio of submitted materials must be 16:9 (full height anamorphic for SD). Materials submitted in an aspect ratio other than 16:9 will be accepted only in cases where TV2 Group has agreed to this in advance. TV2 Group may charge an extra fee for materials submitted in aspect ratios other than 16:9.

All essential action in the submitted material must be protected inside the action safe area and all essential graphics must be protected inside the graphics safe area. These areas are defined in the 16:9 presentation figures of the EBU R95 recommendation. Figure 1a can be used for SD, and figure 3a can be used for HD.

4. Audio properties

Mixed stereo material must be provided to TV2 Group on a separate track, and for films and international productions, where the contract so stipulates, the mixed, original-language, and music/effects tracks must be provided on separate tracks.

There can be no changes in loudness, signal level or audio band timing with respect to video signal. Audio must be synchronised to video to within 1 frame.

The ratio of mixed material, dialogue, effects, and music must be uniform over the entire file.

The used digital reference signal (measurement signal) is 1000 Hz, -18dB PPM on digital peak meter. (-18 dBFS)

1. Audio format

The audio must be 8 channel, 16 bit (24 bit for HD), 48 KHz AES3 uncompressed audio, conforming to the SMPTE 331M standard for SD.

2. Audio levels

| | reference level | maximum peak (true peak) |
|--------------------------------|-----------------|--------------------------|
| Advertisements, Promos | -18 dBFS | -6 dBFS |
| Films (other materials) | -18 dBFS | -3 dBFS |

True peak calculation is done with four times oversampling.

3. Loudness

TV2 Group is working hard to provide a constant loudness level during its programs. Based on the EBU R128 directive the targeted loudness level is -23 LUFS, the incoming materials should have their loudness aligned to this level.

5. Audio mapping

Standalone advertisements and promos with Hungarian language must use the following audio channel mapping:

| Advertisements and promos | Content |
|---------------------------|--------------------------------|
| 1. channel | Hungarian language left mixed |
| 2. channel | Hungarian language right mixed |
| 3. channel | Silence |
| 4. channel | Silence |
| 5. channel | Silence |
| 6. channel | Silence |
| 7. channel | Silence |
| 8. channel | Silence |

Films (other materials) must use the following audio channel mapping:

| Other materials | Materials without a Hungarian language | Materials already having a Hungarian language |
|-------------------|--|--|
| 1. channel | Original language mixed left | Hungarian language mixed left |
| 2. channel | Original language mixed right | Hungarian language mixed right |
| 3. channel | Music/effects left | Original language mixed left (if not Hungarian) |
| 4. channel | Music/effects right | Original language mixed right (if not Hungarian) |
| 5. channel | Silence | Music/effects left (if available) |
| 6. channel | Silence | Music/effects right (if available) |
| 7. channel | Silence | Hungarian voice left (if available) |
| 8. channel | Silence | Hungarian voice right (if available) |

If the source is not stereo, then both the left and right channel must contain the mono sound.

If a track is not available then it must be silenced.

Any other track breakdown must be communicated to TV2 Group in advance. TV2 Group will charge an extra fee for the correction of a sound track breakdown that deviates from standard.

6. Timecode, pre-run, post-run

1. Timecode

Every file should start from 00:00:00:00 timecode. Timecode must be continuous throughout the whole file including the black, test signal or other segments (there can be no timecode jumps). Because of this, the timecode of the last frame should be 1 frame less than the duration of the file.

2. Pre-run, post-run

In case of standalone **advertisement spots and promos** the file **must not contain any pre-run or post-run**. Only the useful, to be aired material must be in the file.

In case of other materials using a pre-run or a post-run is optional. A file should not use a pre-run more than 2 minutes. The contents of the pre-run can be the combination of black screen, colour bar, test signal and countdown clock. The useful (to be aired) material must start at a full minute. The post-run (black) should be no longer than 1 minute. If there are segments before or after the main content, (promo material, textless version), then the length of the black screen separating these segments should be at most 1 minute.

For the colour bar, the EBU bar (100/0/75/0) is preferred. The preferred measurement audio signal is 1 kHz on -18 dBFs level continuously on the left channel, and with 0.25 second pauses in every 3 seconds on the right channel.

3. Using multiple files

If a material is longer than 2 hours, then it is permitted to use more than one file for a single material.

In that case, the end of every file should be in a dramaturgically proper time, for example in the end of a scene. Under no circumstances can a file end in the middle of a conversation or a scene. The second file and the files after that must not overlap with each other.

The order of the files must be clearly indicated in the filename.

7. Transfer

TV2 Group is receiving files using the following methods:

- Over the internet using the FTP server of TV2 Group
- Via an external NAS drive with ethernet interface (it has to be approved and registered by TV2 Group)
- Using spot media management solutions: AdStream, IMD
- Using guaranteed file sending services: Signiant

The available transfer methods depend on the type of the submitted material. The following table summarizes the possible delivery methods for each material type.

| Material type | FTP upload | mobile NAS | AdStream, IMD | Signiant |
|---------------------------|------------|------------|---------------|----------|
| Programs, films, series | yes | yes | no | yes |
| Promos | yes | yes | no | yes |
| Advertisements | no | no | yes | no |
| Other commercial material | yes | no | yes | no |

Further information can be obtained from your TV2 Group contact.

1. FTP upload

The address of the TV2 Group FTP server is the following: **video.tv2.hu**

Files can be uploaded to the FTP server using the standard FTP protocol after authenticating with the proper username and password. Username and password can be obtained by requesting it from your TV2 Group contact or your TV2 Group content supervisor.

Each file must be uploaded into the **root folder** of the FTP server. It is forbidden to upload files to subfolders; materials uploaded to subfolders will not be accepted. Timed out or interrupted transfers cannot be continued, in the event of an interrupted transfer, the file should be uploaded using a new filename.

Files uploaded to the FTP server will be automatically forwarded to the media management system of TV2 Group. Files already forwarded will be deleted or moved to a **done** folder on the FTP server, at the same time, a unique ID will be inserted into the filename. Uploaded files will be automatically deleted from the ftp server in a few days.