

## Transcoding engine for IMF, DCP and more

TORNADO is a transcoding engine designed to be integrated in the facilities' infrastructure: Film labs, post houses, VFX studios or OTT vendors can build their own automated transcoding workflows using TORNADO's API.

Designed to permit scalability in encoding speed, TORNADO is the most versatile and powerful transcoding solution on the market.

### Extensive source media support

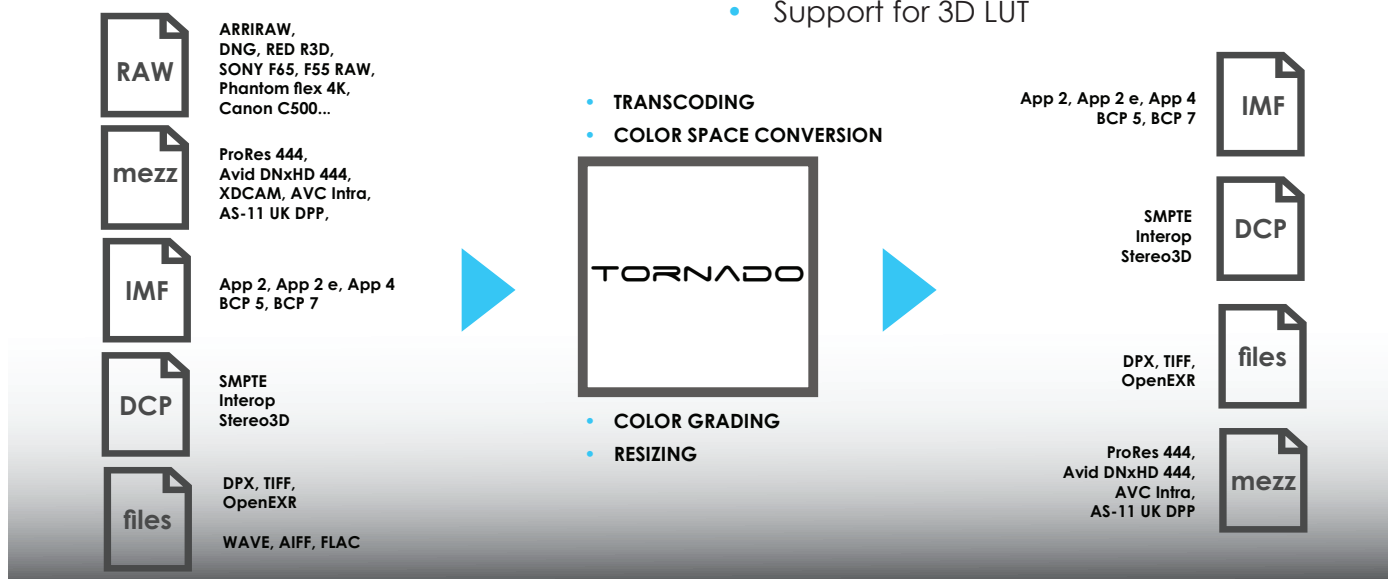
- TORNADO supports natively RAW data at the camera resolution (ARRIRAW, DNG, RED R3D, SONY F65, F55 RAW, Phantom flex 4K, Canon C500, etc.)
- Support for mezzanine formats such as ProRes 444, Avid DNxHD 444, XDCAM, AVC Intra, AS-11 DPP, IMF
- Support for Interop and SMPTE DCP, including stereo3D DCPs up to 120 FPS
- Support for uncompressed formats such as DPX, TIFF, OpenEXR, etc.
- Audio support includes WAVE, AIFF and FLAC

### Multiple Transcoding capabilities

- Simultaneous multiple rendering streams from the same source media
- Mezzanine formats such as ProRes 444, DNxHD 444, AVC Intra, IMF
- Delivery formats such as DCP, AS-11 DPP, AS-10, AS-02, HEVC, etc.
- Uncompressed formats like DPX, TIFF

### Image Processing

- Image resizing (Pan & Scan) for resolution up to 8K
- Color space conversion (support for REC 601 / 709, REC 2020, DCI XYZ, ACES 1.0)
- Primary Color correction
- Support for 3D LUT



## DCP Support

- Support full 2K and 4K DCI specs, including Stereo3D and up to 120 FPS
- Support for Interop and SMPTE DCP
- Creation of supplementary packages
- Subtitles support includes MXF, PNG, XML InterOp (Texas Instruments CineCanvas) and XML SMPTE (D-Cinema SMPTE 428-7)
- Support for Close Caption (MXF SMPTE Timed Text)
- Validation process with more than 50 tests on the packages
- Track essence encryption and DKDM generation
- Repair and re-wrap functionalities

## Special packages Support

TORNADO allows the creation of multiple types of deliverable requiring specific packaging and metadata in an automated way.

Special packages available include today:

- Apple iTunes
- AS02/AS10/AS11-DPP
- MXF J2K op1a Fox/HBO
- Disney & Netflix DSM
- Fox ISR & ISM
- Degeto

## IMF Support

- Support for IMF App 2, App 2e (Studio Profile) and App 4 (Cinema Mezzanine)
- Supported JPEG 2000 profiles include Broadcast profiles up to BPC L7 and IMF profiles 16 bit
- Support of TTML for Subtitles and C.C.
- IMF functionalities include creation of IMP and supplemental IMPs, merge and split of packages, repair and re-wrap.
- Support of multiple soundfields
- Validation process with more than 50 tests on the packages or using Netflix's Photon IMF validation tool

## HDR Workflows

- Support for full ITU BT-2100 workflow: Dolby Vision, HDR10, HDR10+ and HLG
- Support for ST-2094-40 (Samsung)
- On-the-fly cross conversions between the standards
- Up and down conversions (SDR / HDR)

## INTEGRATION

- GPU acceleration for JPEG2000 transcoding
- Support for multiple streams of GPU processing
- Requires Windows 10 64 bit, single or dual CPU, and minimum 1 NVIDIA GPU with a CUDA index of 3.5
- **Controllable with MIST or using the REST API**