MARQUISE TECHNOLOGIES

Focus Sheet

IMF Quality Control with ICE

IMF IS A BUSINESS REALITY

IMF content exchange, not only from the major studios but also for some premium OTT providers like Amazon or Netlix has already started, revealing a huge diversity of IMF packages, giving the Application chosen, the encoded bitrate, the number of CPL included in the package, the number of soundfields, the color gamut or the dynamic range.

Exchanging content implies also, like yesterday with tapes, a serious quality control of the master, both before its delivery and upon reception on the other side.

ICE REFERENCE PLAYER FOR QC

ICE, for Image Control Engine, is the only Reference Player available supporting the entire diversity of IMF flavors.

As a Hero Player, beside the playback, a full set of image, audio, data and metadata monitoring tools is available to insure a perfect control of the content.

It can also be used in mixed workflows, as ICE is also supporting native RAW camera files, DCP, or uncompressed formats (DPX, OpenEXR, etc.).

IMF
#ispeakimf

SUPPORTED IMF STANDARDS

- **Application 2, 2e (Studio Profile)**
- **Application 4 (Cinema Mezzanine)**
- **Application 5 (ACES) and Academy Digital Source Master**
- **IMF RDD45**
- **TSP.2121 Application DPP**

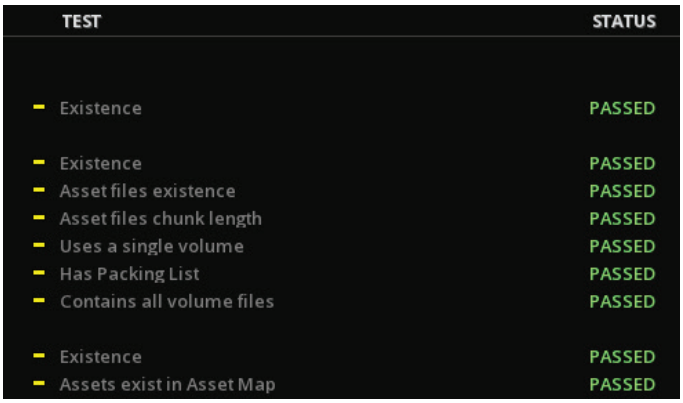
QUALITY CONTROL CAPABILITIES

IMF package validation

When receiving content, the first step is usually to verify that it matches the label or the delivery slip. Same with files, and obviously very much needed when dealing with IMF content.

ICE performs a technical validation of the IMF package, applying automatically more than 50 tests, and displays the errors detected.

ICE also integrates Photon, the Open source IMF Validation tool developed in conjunction with Netflix for ensuring compliancy with their delivery specifications.



4K Real time playback

When it is meant for Archival or Servicing master, an IMF package is often in UHD or 4K resolution, and its encoding bitrate profile quite high (BCP 5 or 7 and IMF profiles). Therefore the Player used for the playback must support those heavy files. ICE relies on GPU processing to ensure the JPEG2000 is decoded in real time up to 4K resolution.

Sync Control

One of the most important control is obviously the synchronicity between the video and the audio tracks. The only way to guaranty that the playback is in sync is to use the SDI output as a reference. The audio is embedded in the SDI signal allowing a frame accurate playback. ICE supports professional video boards like AJA and Bluefish, for display up to 4K 4:4:4 16 bit on reference monitors and projectors.

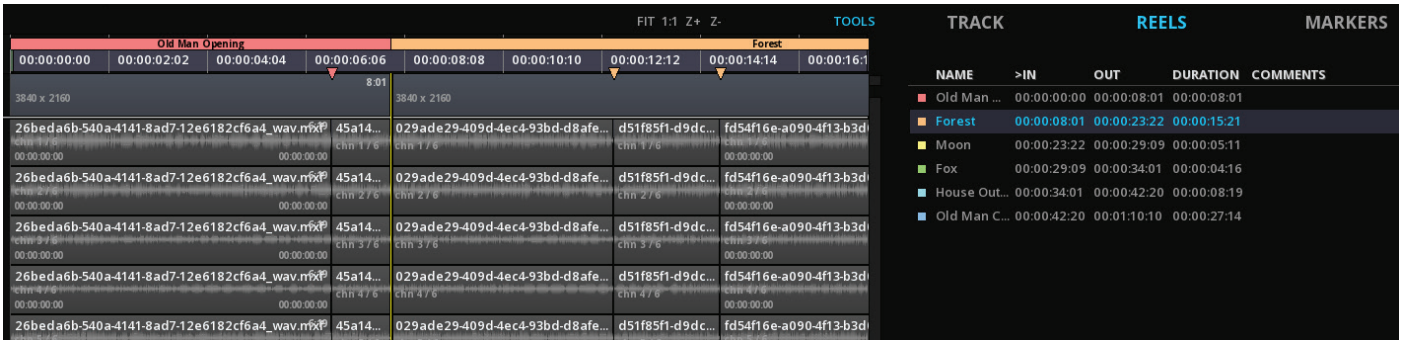
Timeline

ICE is the only QC player with an editing timeline, providing an unrivalled flexibility with the manipulation of content.

Standalone subtitle files can be imported in the timeline, as well as an independent audio channels or soundfields.

IMF, DCP, iTunes or AS-11 packages are automatically mounted in the timeline by drag&drop of the main directory.

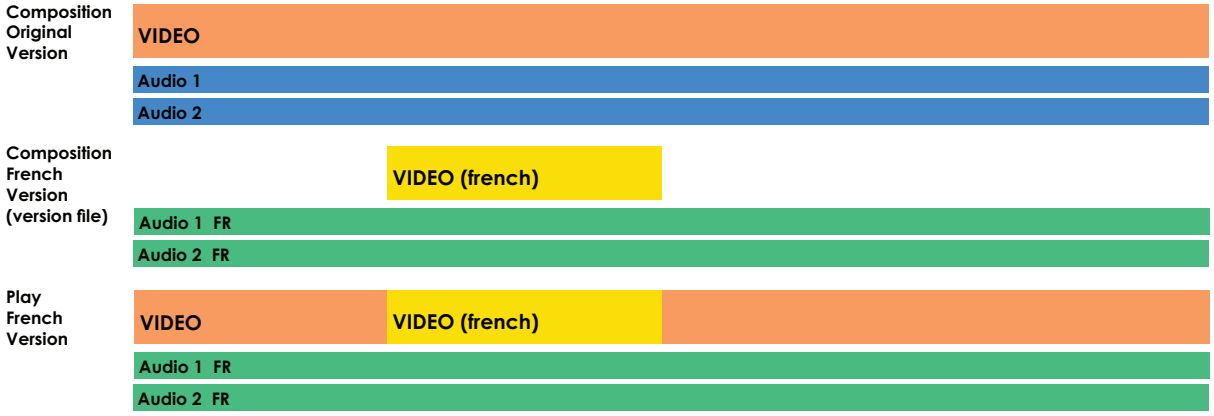
In addition, the navigation between segments and markers is facilitated using the keyboard shortcuts including the popular JKL controls or using a transport panel (Tangent or legacy RS422 panel).



Playback of supplementals

When creating the different versions of a content, for example a French language dub, the supplier may send back only the new audio track in the IMF, with reference to the master package. It is then known as supplemental package.

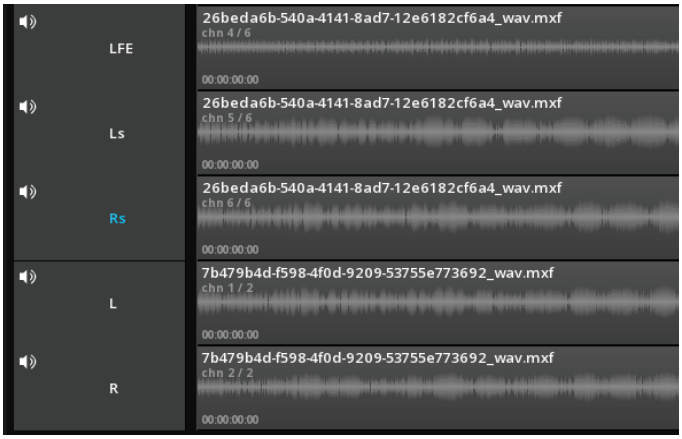
ICE will recognize, reading the unique IDs of the supplemental, to which original package it is related to, and providing it has access to the original content, will automatically combine both packages to playback the full movie in its French version.

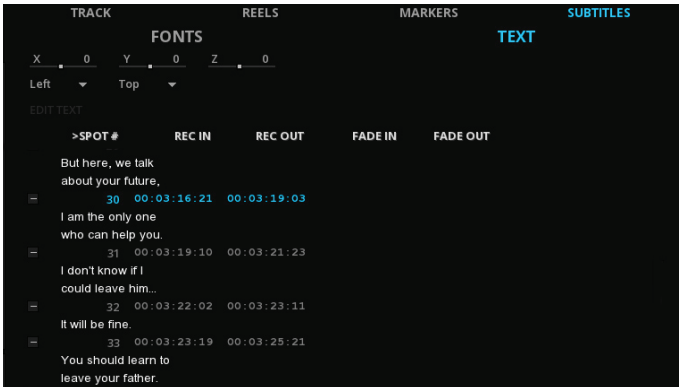


Managing multiple soundfields

IMF can store an infinity of audio mixes, also known as soundfields. When a package contains multiple soundfields either audio dubs or audio mixes (stereo, 5.1, etc..), ICE can easily toggle between soundfields on the fly during the playback.

When monitoring without a surround sound system, ICE provides down mixing from 5.1 and 7.1 to stereo. A VU-meter for control of the down mix is also available.





Inspection of subtitles

ICE supports the standard for IMF subtitles, the TTML IMSC 1.0. The subtitle inspector panel allows to display and navigate within the spotting list. If several subtitle tracks are present, ICE can toggle between the different versions during the playback.

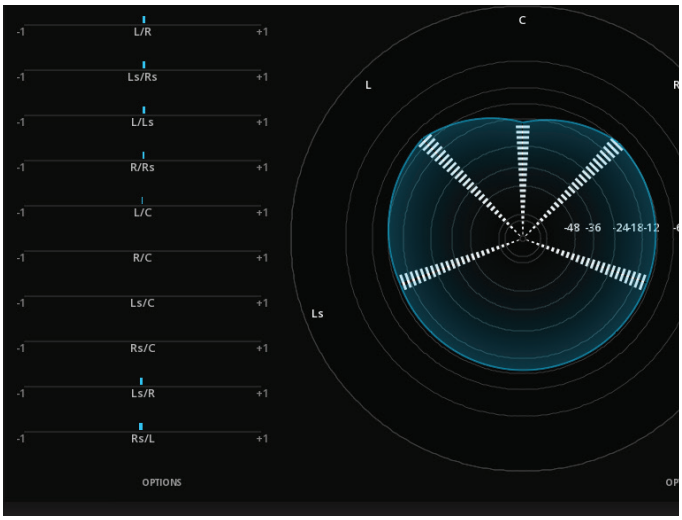
Inspection of metadata

Metadata in an IMF package is quite extensive. ICE offers full display of the different CPLs, and the assets. External references stored in a CPL like an EIDR identifier are immediately accessible (a mouse click will open the url in the web browser).

Audio Control

Audio control is an important part of the quality process. In order to achieve it with precision, ICE offers several audio meters: VU-Meter, Sample Peak and True Peak for the channels inspection, and a Loudness Meter based on EBU R128 Loudness Recommendation.

A Surround Scope displaying the repartition of the channels and a Phase Correlation Meter complete the audio metrics toolset.

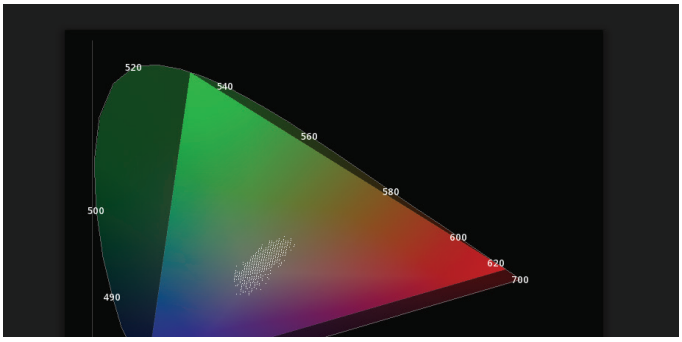


Control of the Mastering Display

ICE automatically configures the reference monitor to the right color space, EOTF, luminance levels, etc. This feature is currently available with Canon, TV-Logic and Eizo 4K HDR monitors.

Image Monitoring

For monitoring the image, usual graphs like Waveform, Vectorscope and Histogram are of course available. In addition a CIE chromaticity diagram gives indications of how the color is distributed within the boundaries of the color space.



Bitrate Measurement

IMF packages can have different encoding bitrates according to the requested specifications. However, depending on the encoding tool used, some important disparities can appear. The scope displays minimum, average and maximum bitrate information.

Slave Mode

ICE supports the RS-422 9-pin protocol, allowing it to run in slave mode and thus be controllable by an external device such as an NLE, a DAW (e.g. Protools) or a legacy transport control device.

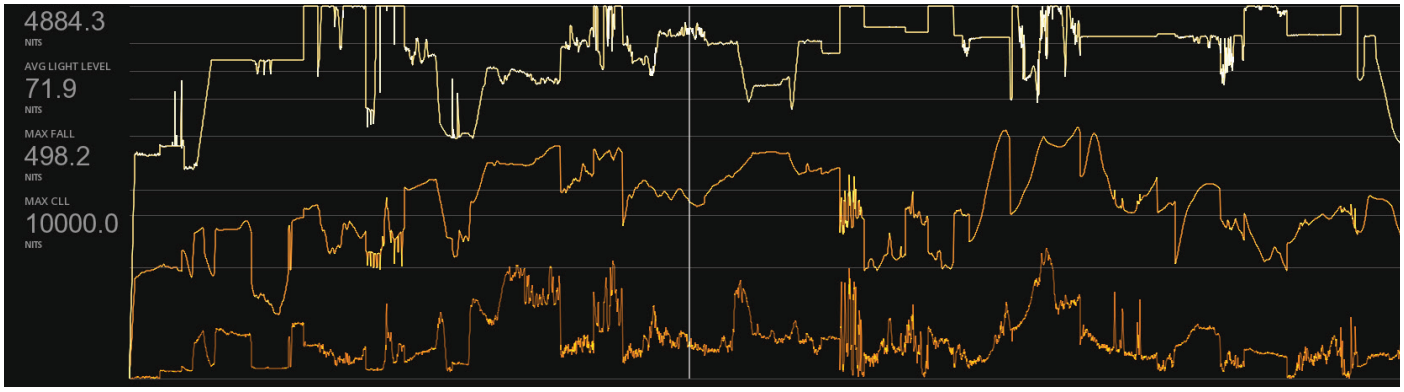
HDR Quality Control

ICE has dedicated HDR analysis tools, and permits the verification that the metadata embedded in the file are consistent with the image:

- HDR analysis tool to measure MaxFALL and the MaxCLL, Gammut and frame average PQ statistics.
- DMCVT Metadata Inspector to verify Dynamic metadata
- Scopes with HDR mode, displaying Nits values
- Export of HDR analysis in PDF and XML
- Transport of dynamic metadata in HDMI

Supported HDR standards

- Dolby Vision
- HLG
- HDR10 & HDR10+
- Dolby Cinema
- Eclair Color
- DMCVT App 1 & App 4



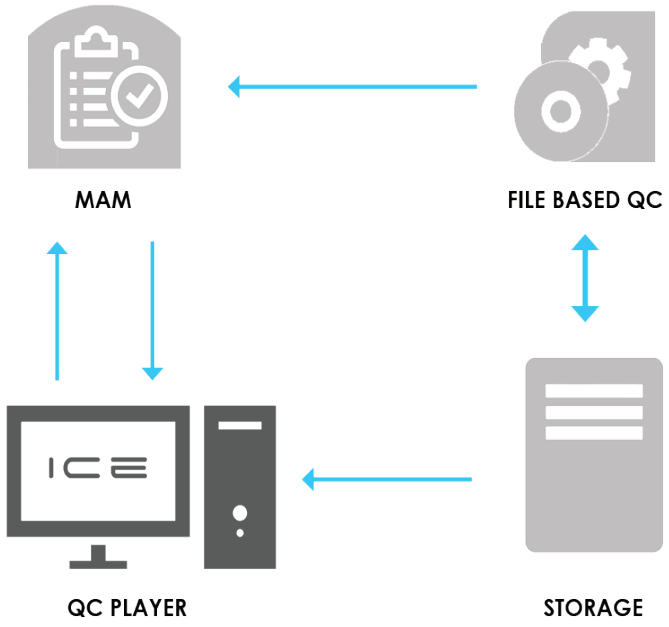
Support for file-based QC

ICE supports the following file based QC reports:

- Aurora (Tektronix)
- Baton (Interra)
- Pulsar (Venera)
- Vidchecker (Telestream)

ICE can load the XML reports from these automated QC solutions and allows the operator to manually inspect the errors of a media by navigating on the timeline from error to error.

Manual comments can be added on the content using Locators and exported as XML.



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