Legacy Compatibility Note 1

Background

The following devices exhibit an image playback error when playing a Picture Track File that triggers the error condition below.

1. Dolby Cat. No. 862 (installed in DSS200)
2. Dolby DSP100

Error Condition

The error condition occurs when decoding a JPEG 2000 codestream that satisfies the following condition:

$$c[p] = 255 \text{ and } c[p+1] = 255$$

with

$$\begin{cases} p \bmod 256 = 254, 0 \ \leq p < \text{Lmh} + \ \text{Ptlm}^1 \\ (\ p - \text{Ptlm}^1) \bmod 256 = 254, \text{Lmh} + \ \text{Ptlm}^1 \ \leq p < \text{Lmh} + \ \text{Ptlm}^1 + \ \text{Ptlm}^2 \\ (\ p - \text{Ptlm}^1 - \text{Ptlm}^2) \bmod 256 = 254, \ \ \text{Lmh} + \ \text{Ptlm}^1 + \ \text{Ptlm}^2 \ \leq p \end{cases}$$

where:

1. c[i] is the i^{th} byte of the codestream with c[0] being the first byte of the codestream
2. Lmh is the length of the main header from start of SOC marker up to but not including the first SOT marker
3. Ptlm^1, Ptlm^2, and Ptlm^3 are tile-part lengths as defined in Rec. ITU-T T.800.

Recommended Codestream Constraints

The error condition can be avoided by applying the following constraints to each codestream:

- The length of the main header plus the length of any of the tile-part headers shall be less than 255 bytes;
- The SOP and EPH marker segments shall not be present (the second and third LSBs of the Scod parameter are 0); and
- Each tile-part header shall solely consist of one SOT marker segment and one SOD marker segment.

It might be possible to avoid the error condition using a different set of constraints.

Detecting the error condition

A validator to check for the error condition is available on github [1].

Example encoder configuration

Using Kakadu SDK [2] demo app encoding command lines:

```
kdu_compress -i 4K.tif -o 4K.j2c Sprofile=CINEMA4K Creslengths=1301827
Creslengths:C0=1301827,1041410 Creslengths:C1=1301827,1041410
Creslengths:C2=1301827,1041410 -fprec 12M -no_info

kdu_compress -i 2K.tif -o 2K.j2c Sprofile=CINEMA2K Creslengths=1301827
Creslengths:C0=1041410 Creslengths:C1=1041410 Creslengths:C2=1041410 -fprec
12M -no_info
```

Notes

1. Not using PLM, PLT, QCC, COC and CRG marker segments minimizes the total length of the main header and tile-part headers.
2. One or two small COM marker segments can be used so long as their total combined size does not cause a violation the header size limit described above.

References

[1] https://github.com/sandflow/note-1-validator

[2] https://kakadusoftware.com/