Preamble

This document was presented and discussed at the SBP-3 working group meeting in Monterey, in November 2001. When SBP-3 was sent for public ballot, it was noticed that this document had never been officially logged, so here it is…

Why have content-specific isoc recording formats?

In June, the working group discussed 01-179r0, which discussed the possibility of adding content-specific recording formats to the one already proposed in SBP3. This paper represents the essential elements of that proposal in simplified form. This is not intended to deprecate the usefulness of the generic format, merely to argue the merit of additional content-specific formats.

Introduction

For a market application which simply records an isochronous stream for later playback, the current scheme will be sufficient. However for some applications (trick play, direct non-linear editing of the content), it seems more appropriate to record the data in a form related to the content rather than the 1394 traffic, for the following reasons:-

DV images (normally fixed size) will be stored in variable-length structures.

Depending on the speed of the frame clock in a camcorder, a variable number of null packets will be recorded on the media.
Example:

DV (PAL) data = 25±1% fps where 1 frame = 300 packets,

Data rate = 7500 packets/s
Bus rate = 8000 packets/s

Therefore, one empty packet will be inserted into the stream for every 15 'real' packets, ie 500 null packets per second, or 20 per frame

If the frame clock runs at 25.25 fps (max tolerance):-
Data rate = 7575 packets/s, therefore 425 null packets per sec, or 17 per frame

Before everyone starts to think I only ever talk about clock tolerances (!!), NTSC has a similar problem even without frame clock tolerance:-

DV (NTSC) data = 29.97±1%, where 1 frame = 250 packets,
Data rate = 7492.5 packets/s, which equates to 507 or 508 null packets per second before tolerances even enter the equation.

Recorded cycle marks have to be manipulated

In trick-play situations, some cycle marks will need to be discarded on playback. Also, there is some possibility of discontinuities in the cycle time during record (e.g. change of cycle master on bus reset) – this could adversely affect the data being recorded.

Video files created on a PC/Mac
If a user creates a video file and then wishes to store it on an AV/C disk to be played back later, the host computer must generate all the cycle marks/empty packets and insert them into the data at an appropriate frequency.

Proposal

The proposal is that additional content-specific formats be added to the description of recorded data format. Currently this would only include DV, however we anticipate similar formats for MPEG2-TS and possibly audio in the near future. None of these would be mandatory for any device, merely for those which have some more advanced functionality.