

RTP Payload for SMPTE ST 291 Ancillary Data

draft-edwards-payload-rtp-ancillary



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Background

- SMPTE – Society of Motion Picture & Television Engineers, SDO for professional video
- Today: Pro uncompressed video in broadcast plant over 270 Mbps or 1.5 Gbps serial digital interface (SDI) on on 75Ω coaxial cables
- Soon: Video over IP
- Elements:
 - Uncompressed video (RFC 4175)
 - Uncompressed audio (RFC 3190 a.k.a. AES67)
 - Timing Clock (IEEE 1588 PTP)
 - Ancillary Data (thus draft-edwards-payload-rtp-ancillary)



The SDI Mux...



What is Ancillary Data?

- Non-video data embedded into SDI outside of active video
- Typically 10-bit words
- Identified by Data ID (DID) / Secondary DID (SDID)
- Registered through SMPTE, including:

DID	SDID	Used Where	Application
41h	05h	S2016-3	AFD and Bar Data
41h	06h	S2016-4	Pan-Scan Data
41h	07h	S2010	ANSI/SCTE 104 messages
41h	08h	S2031	DVB/SCTE VBI data
60h	60h	S12M-2	Ancillary Time Code
61h	01h	S334-1	EIA 708B Data mapping into VANC space
61h	02h	S334-1	EIA 608 Data mapping into VANC space

More at http://smpte-ra.org/S291/S291_reg.html

Payload Goals

- ANC data packets in SD or HD
- VANC or HANC
- ANC in the Y or C channel
- Sufficient information provided to enable the ANC packets at the output of the decoder to be restored to their "original" locations in the SDI raster (if desired for legacy compatibility)
- *Which is just what SMPTE ST 2038 (ANC data in MPEG TS) provides...*

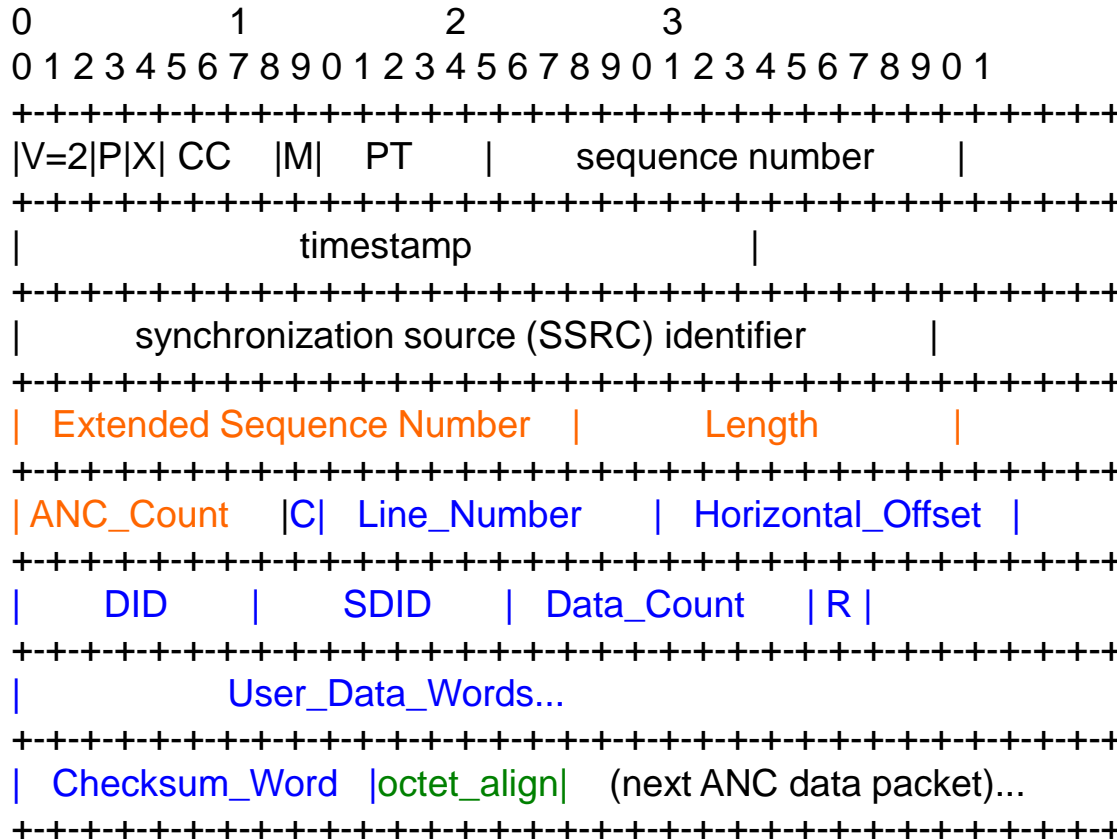
SMPTE ST 2038 Data Model

c_not_y_channel_flag	1	bslbf
line_number	11	uimsbf
horizontal_offset	12	uimsbf
DID	10	bslbf
SDID	10	bslbf
data_count	10	bslbf
for (j=0; j<data_count; j++) {		
user_data_word	10	bslbf
}		
checksum_word	10	bslbf

Proposed ANC RTP Payload Fields

- **RTP Timestamp** – sampling instant of the frame/field to which the ancillary data in the RTP packet belongs (as in RFC 4175)
- **RTP Marker Bit** – last ANC data for frame/field (as in RFC 3497 & RFC 4175)
- **16-bit Extended Sequence Number** (as in RFC 4175)
- **Length** (16 bits) of octets of payload
- **ANC_Count** (8 bits) # of ANC packets in payload
- **Octet_align** Bit padding for next ANC packet in payload to be octet aligned

Proposed ANC RTP Payload



Orange: ANC RTP payload header

Blue: ANC packet data

Green: Bit padding for octet alignment of next ANC data packet

Media Type & SDP Mapping

- Media type: **video/smpte291**
- “**Video**” because of close association with SDI
- Optional SDP format specific parameter (fmtp) may include specific DID/SDID pairs:

```
m=video 30000 RTP/AVP 112  
a=rtpmap:112 smpte291/90000  
a=fmtp:112 DID=0x61; SDID=0x02;
```

- Allows easy identification of particular ANC flows

Seeking Comments!

- Email thomas.edwards@fox.com

