



Deep Dive into SMPTE ST 2110-40 Ancillary Data

Leigh Whitcomb, Architect
Imagine Communications



IP SHOWCASE THEATRE AT IBC – SEPT. 14-18, 2018



Ancillary Data

- Over the years, lots of things have been put into the SDI “Ancillary Data” system
 - Some are tightly related to the video signal
 - Some are really separate essence
 - Some are just along for the ride
- Audio is handled a better way – don’t use this method for audio





Standards

- IETF RFC 8331, which says how to wrap ANC in IP
 - “RTP Payload for Society of Motion Picture and Television Engineers (SMPTE) ST 291-1 Ancillary Data”
- ST 2110-40 says how to use RFC 8331 in an ST 2110 system
 - “Professional Media over Managed IP Networks: SMPTE ST 291-1 Ancillary Data”



3



Break-Away Routing Ancillary Data?

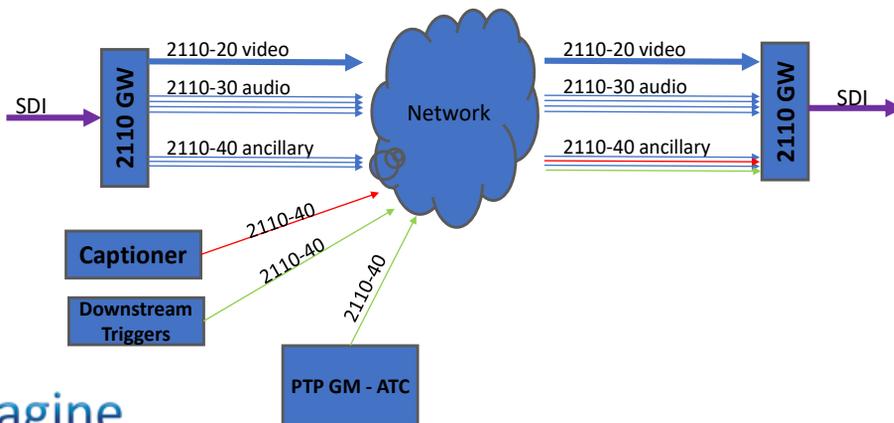
- This is a capability we’ve never had before...
- What could you do with this kind of ability?
- Today – we loop through a lot of VANC inserters
- Future – the SDI (if you need it) is “composed” from the parts



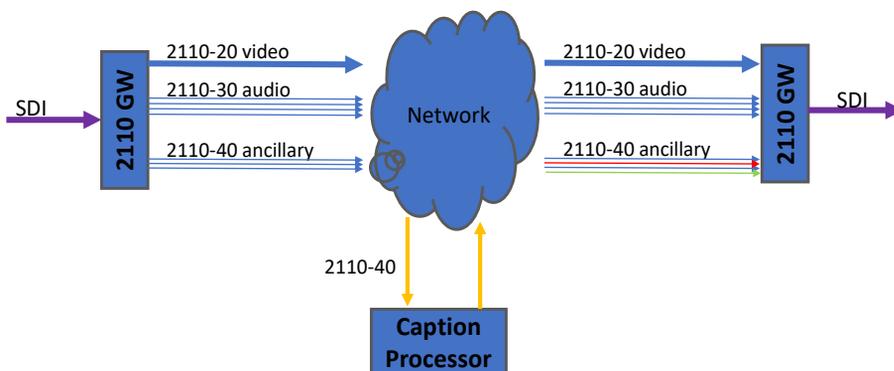
4



VANC Data Routing – Just Like Audio?

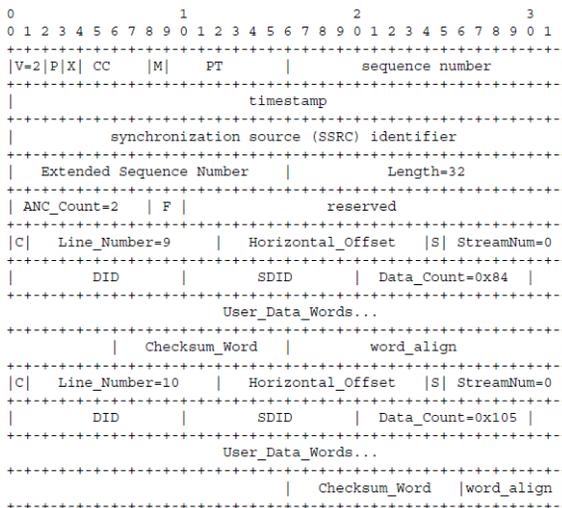


VANC Data Processing





RFC 8331



Stream configurations

- Multiple services per packet
- Different services in different packets
- Multiple services per stream
- Different services in different streams

Why have different services in different streams?





ST 2110-40

- SDI Location Information
- Generating SDI
- RTP Timestamps
- Keep alive
 - 1 packet per frame
- SDP



9



Aligning ST 2110-40 with ST 2110-20

- Same RTP are used for -40 and -20



10



WireShark Dissector

<https://github.com/FOXNEOAdvancedTechnology/smp2110-40-dissector>

```

> Ethernet II, Src: HewlettP_d1:c7:28 (98:f2:b3:d1:c7:28), Dst: IPv4mcast_79:0e:01 (01:00:5e:79:0e:01)
> Internet Protocol Version 4, Src: 192.168.1.202, Dst: 239.121.14.1
> User Datagram Protocol, Src Port: 63446, Dst Port: 40000
> Real-Time Transport Protocol
  * ST 2110_40 Data
    Extended Sequence Number: 0x0045
    Length: 124
    ANC_Count: 2
    10.. .... = (F)ield: Field 1 (0x2)
    0... .... = (C) or Y: Y:Luma
    .000 0000 1100 .... = Line_Number: 12
    ... 0000 0000 0000 = Horizontal_Offset: 0
    .01 1000 01.. .... = DID: 0x61
    .... 0000 0001 .... = SDID: 0x01:EIA 708B Data mapping into VANC space (S334-1)
    .... .01 0010 01.. = Data_Count: 73
    User_Data_Words_bytes: 26969a54953d43ade879c9f47f580602fc481e9bfec348df...
    Checksum_Word_bytes: aac0
    0... .... = (C) or Y: Y:Luma
    .000 0000 1001 .... = Line_Number: 9
    ... 0000 0000 0000 = Horizontal_Offset: 0
    .01 0000 01.. .... = DID: 0x41
    ... 0000 0101 .... = SDID: 0x05:AFD and Bar Data (S2016-3)
    .... .00 0010 00.. = Data_Count: 8
    User_Data_Words_bytes: 2154802008020080200802
    Checksum_Word_bytes: 02a2
  
```



11



Key Take Aways

- Standards
 - IETF RFC 8331
 - SMPTE ST 2110-40
- Separate essences
- Which services in each stream
- Break-Away Routing Ancillary Data
- Not used for audio



12



Thank You

Leigh Whitcomb, Imagine Communications

Leigh.Whitcomb@imaginecommunications.com

Imagine Communications, Hall 4



IP SHOWCASE THEATRE AT IBC - SEPT. 14-18, 2018