

IP over MPEG-2/DVB (ipdvb) WG

CHAIR:

Gorry Fairhurst <gorry@erg.abdn.ac.uk>

Active Drafts:

draft-ietf-ipdvb-ar-04.txt

draft-cruickshank-ipdvb-sec-req-02.txt

draft-cruickshank-ipdvb-sec-02.txt

draft-ppillai-ipdvb-sule-00.txt

draft-cantillo-ipdvb-s2encaps-02.txt

draft-fairhurst-ipdvb-ule-ext-00.txt

Archive:

<http://www.erg.abdn.ac.uk/ipdvb/archive>

<ftp://ftp.ietf.org/ietf-mail-archive/ipdvb/>

6th IETF ipdvb WG meeting

- 1. Agenda Bashing (10 minutes) Chair**
 - Election of scribes
 - jabber: ipdvb@ietf.xmpp.org
- 2. Document Status (5 minutes) Chair**
- 3. Address Resolution (10 minutes) M-JM**
- 4. IPDVB Security Requirements (15 minutes) HC**
- 5. ULE Security Extension (10 minutes) PP**
- 6. ULE Security Extension (5 minutes) HC**
- 7. DVB-S2 Encapsulation (5 minutes) A.Jain / Chair**
- 8. IP Encapsulation for DVB-S.2 (10 minutes) JC**
- 9. ULE Formats to support GSE (10 minutes) GF**
- 10. Implementation Status (10 minutes) Chair**

2. Document Status

Gorry Fairhurst <gorry@erg.abdn.ac.uk>

Published RFCs:

[RFC 4259 Framework/Architecture ID \(INFO\)](#)

[RFC 4326 Unidirectional Lightweight Encapsulation \(ULE\) \(PS\)](#)

RFC Ed Queue:

None.

IESG Review:

None.

Documents in Last Call:

[draft-ietf-ipdvb-ar-04.txt](#)

Adopted WG I-Ds:

None.

IP Address Configuration

[None active](#)

IPDVB Security

[draft-cruickshank-ipdvb-sec-req-02.txt](#)

[draft-cruickshank-ipdvb-sec-02.txt](#)

[draft-ppillai-ipdvb-sule-00.txt](#)

IP Encapsulation for DVB-S.2

[draft-cantillo-ipdvb-s2encaps-03.txt](#)

[draft-fairhurst-ipdvb-ule-ext-01.txt](#)

Draft of a WG Architecture ID - Done

Draft of a WG ID on the new Encapsulation - Done

Submit Architecture to IESG - Done

Draft of a WG ID on the AR Framework - Done

Submit Encapsulation to IESG - Done

Draft of a WG ID defining Security Requirements - Jan 06

Submit AR Framework to IESG - Mar 06

Draft of a WG ID defining AR protocol - Apr 06

Submit ULE Security Requirements to IESG- Aug 06

Progress the ULE along the IETF standards track - Dec 06

Submit AR Protocol to IESG - Jan 07

3. Address Resolution

Marie-Jose Montpetit

4. IPDVB Security Requirements

Haitham Cruickshank

Please sign
the Blue Sheets!

5. ULE Security Extension

Prashant Pillai

6. ULE Security Extension

Haitham Cruickshank

7. DVB-S2 Encapsulation

Axel Jain (proxied by Gorry Fairhurst)

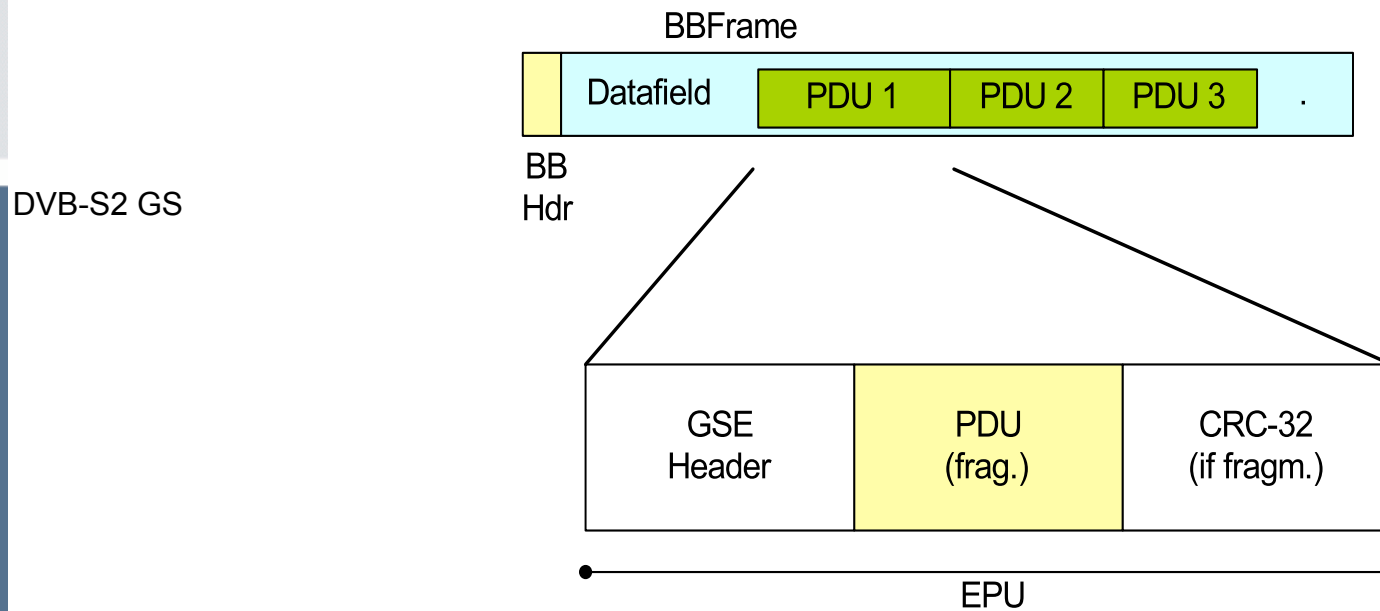
DVB-S2 Encapsulation – GBS Activities

Presentation to IETF WG IP over Digital Video Broadcast

Axel Jahn

What is GSE?

- ❑ Generic Stream Encapsulation (GSE) protocol allows for direct encapsulation of IP and other network-layer packets over DVB-S2 physical layer frames
- ❑ It replaces MPE/MPEG-TS encapsulation



GSE protocol: functionalities (I)

Multiprotocol encapsulation support capabilities:

- IPv4, IPv6, MPEG, Ethertype compatible types,...

● Transparent to network layer functionalities:

- Support for encryption and IP header compression

● Several addressing modes supported:

- Multicast and unicast addresses
- 6 Bytes MAC Address
- No Address (IP-header processing)
- 3 Bytes Address optional
 - ◆ Implicit binding to Group ID/logon ID in DVB-RCS networks -> important overhead saving
 - ◆ Use of the 3B address as Connection ID

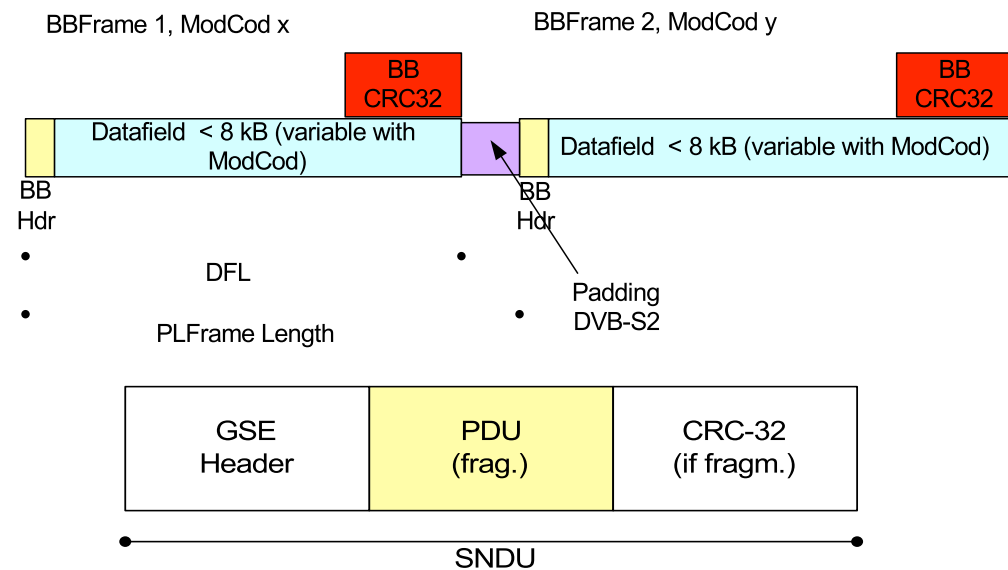
GSE protocol: functionalities (II)

Fully flexible fragmentation of PDUs over DVB-S2 BBFRAMEs

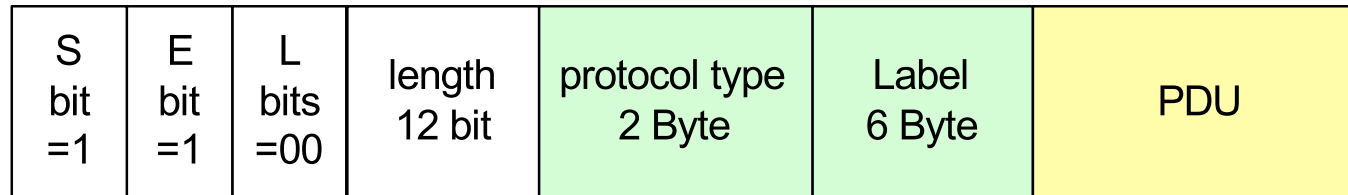
- Efficient support of ACM operation (mandatory for the DVB-S2 interactive application area)
- No constraint on the ACM scheduler
- Advantage in delay with respect to MPE/MPEG for the same throughput achievable by a smart scheduler
 - ◆ Particularly important for real-time applications
 - ◆ Satisfaction of individual quality of service targets (ref. CM-373r1)

GSE protocol: main features

- ❑ BBFrame protected by CRC
 - ❑ to be discussed with results from Juan Cantillos work
- ❑ PDUs protected by CRC when fragmented
- ❑ Any type of fragmentation is allowed to relax scheduler impact
- ❑ BBFrames may have varying ACM /ModCod



GSE protocol: Full PDU



Start (S)/End (E) Indicator Bits

Label Bits

- 4 00b value: indicates the presence of a 6 Byte Label Field
- 4 other options: no label, 3 Byte Label Field or concatenation

Length Field:

- 4 12 bit -> 4kB packets
- 4 larger packets need fragmentation

Label Field (address)

Protocol Type Field

- 4 indicates higher layer protocol
- 4 follows ULE
- 4 extension headers as with ULE

GSE protocol: Fragmented PDU

S bit =1	E bit =0	L bits =00	length 12 bit	FragID 1 Byte	Total PDU length 2 Byte	protocol type 2 Byte	Label 6 Byte	PDU frag 1
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S bit =0	E bit =0	L bits =00 n.a.	length 12 bit	FragID 1 Byte	PDU frag 2
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S bit =0	E bit =1	L bits =00 n.a.	length 12 bit	FragID 1 Byte	PDU frag 3 (last)	CRC-32
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Fragmentation ID Field

- 4 all fragments of a PDU have same FragID
- 4 255 different fragmented PDUs are possible

Total PDU Length Field (for fragmented packets)

Label Field (address) only in first fragment

CRC-32 to protect the fragmented PDU

Conclusions

- ❑ DVB-S2 Encapsulation protocol (GSE) was elaborated and a converged version came out of the study
- ❑ Support from major satellite operators and manufacturers
- ❑ Flexible fragmentation without scheduler restrictions
 - ❑ → ACM can be fully exploited
- ❑ GSE shows excellent performance
 - ❑ overhead of 2-3%
 - ❑ reduction from 10% (MPE) to 2% (GSE)
- ❑ GSE has low complexity
- ❑ GSE standardisation expected for Q3/2006 after TM decision

8. Requirements for IP Encapsulation for DVB-S2

Juan Cantillo

9. ULE Extension Formats for DVB-S2

Gorry Fairhurst

ULE and GSE can share the same type space

GSE frames >> MPEG-2 TS Packets

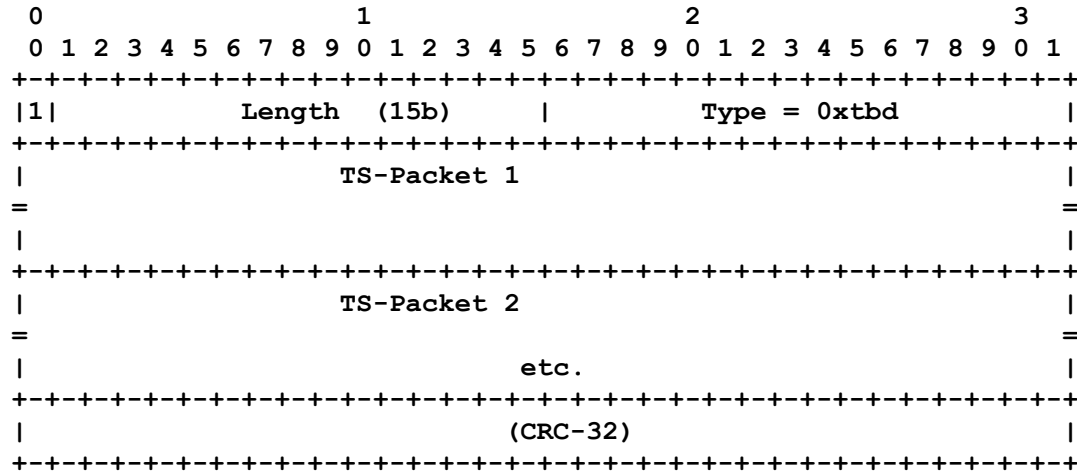
- High link rates
- Small packet overhead a concern

GSE lacks a signaling plane

- Needed for clock timing (NCR)
- Needed for service description (SI)
- Needed for address resolution

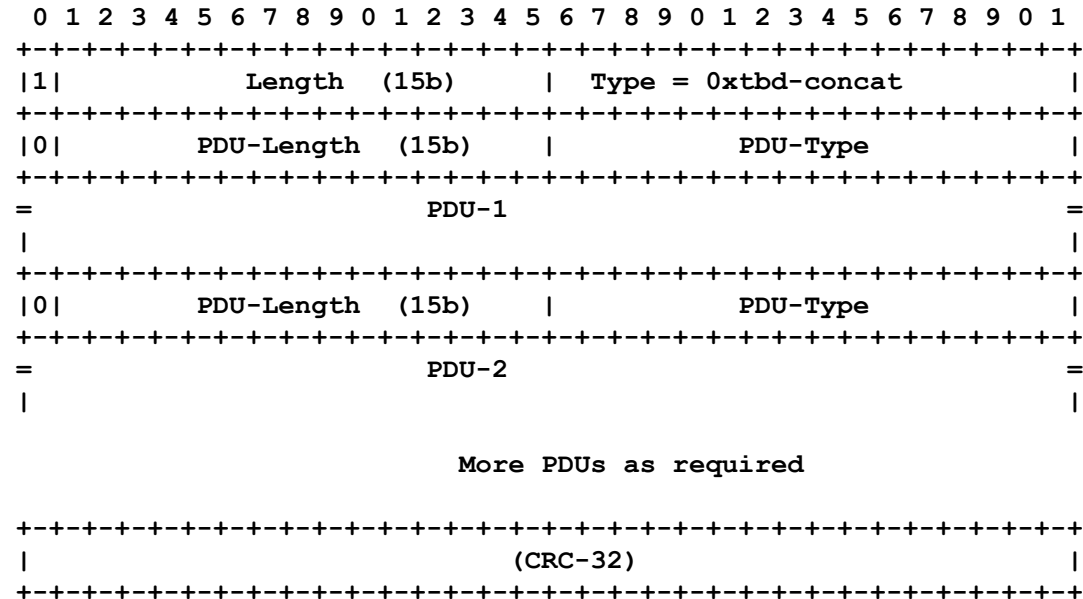
Goal define 2 simple extensions to allow this

Format for TS Packets



1 or more MPEG-2 TS Packets

IP over MPEG-2/DVB Transport (ip-dvb) Format for PDU concat



Saves overhead for small PDUs

- any type of PDU
- overhead of MAC address
- processing overhead at high speed

10. ULE Implementation Status

Chair/Various