7. DVB-S2 Encapsulation

Axel Jain (proxied by Gorry Fairhurst)

DVB-S2 Encapsulation – GBS Activities

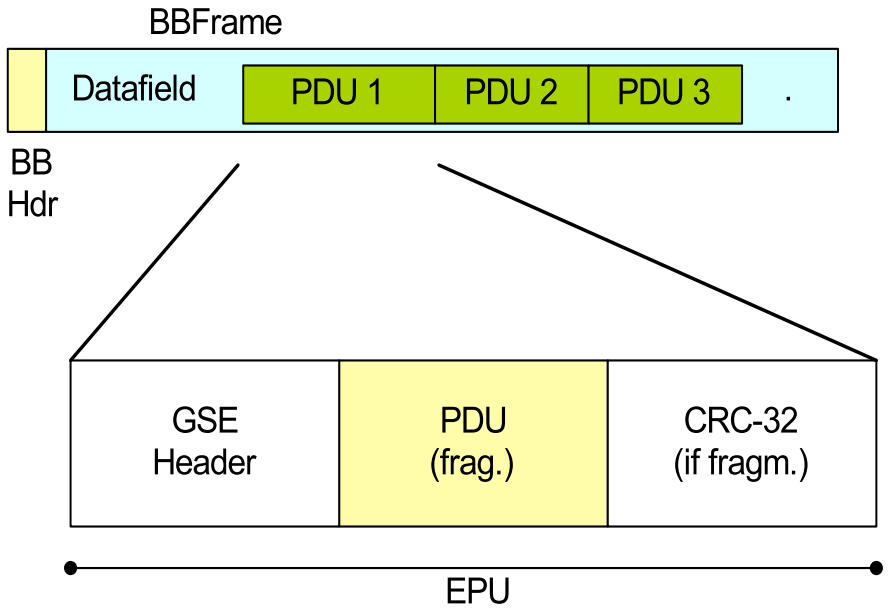
Presentation to IETF IP over DVB WG

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

DVB-S2 GS

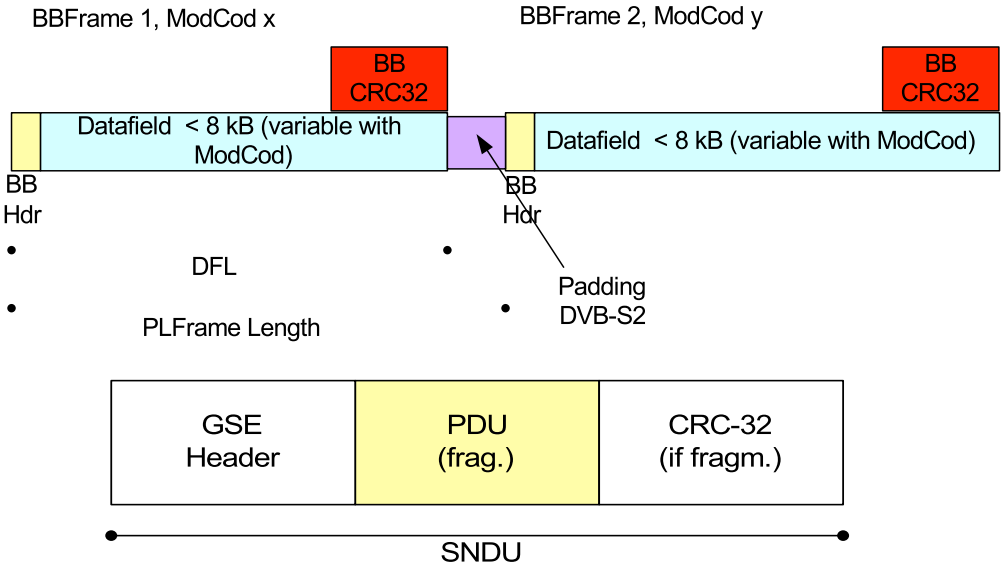


GSE protocol: functionalities

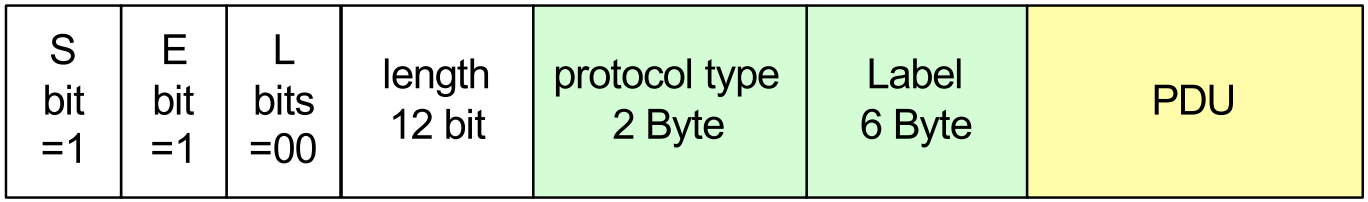
- Multiprotocol encapsulation support capabilities:
  - IPv4, IPv6, MPEG, Ethertype compatible types,…
- Transparent to network layer functionalities:
  - Support for encryption and IP header compression
- Several addressing modes supported:
  - Multicast and unicast addresses
  - 6 Bytes MAC Address
  - 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: main features

- BBFrame CRC
- 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

- **6 Byte Label Field**
- **no label**
- **3 Byte Label Field**
- **concatenation**

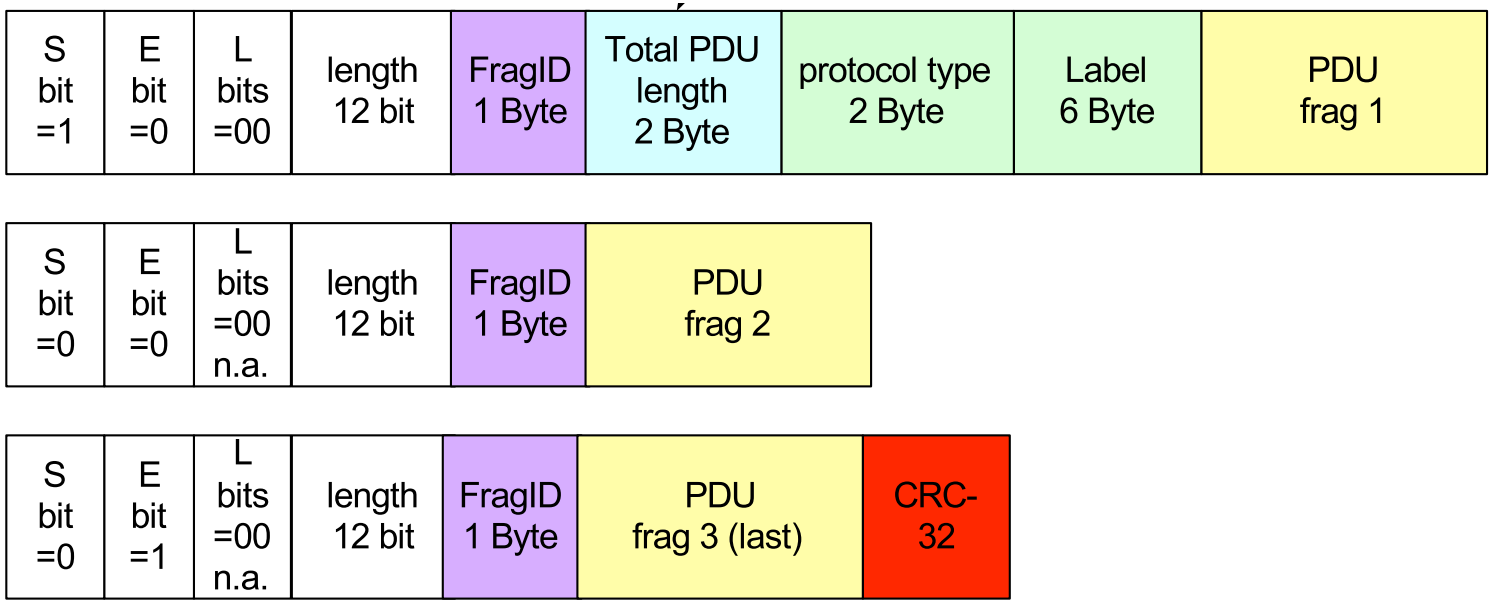
Length Field: 12 bit -> 4kB packets

Label Field (address)

Protocol Type Field follows ULE

- **extension headers as with ULE**

GSE protocol: Fragmented PDU



Fragmentation ID Field

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