

EPG Test Transport Stream Generation for DTMB receivers.

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OUTLINE

- Background
- EPG Descriptors
- Transport Stream Generation Process
- Validation and Results
- Conclusions

BACKGROUND (I)



BACKGROUND (II)

How to test the compliance of the ETSI EN 300 468 standard in DTMB receivers, concerning the EPG service, if all of the possible functionalities are not used in the current transmissions?



BACKGROUND (III)

Final draft **ETSI EN 300 468**



Digital Video Broadcasting (DVB);
Specification for Service Information (SI) in DVB systems

ETSI TS 101 211



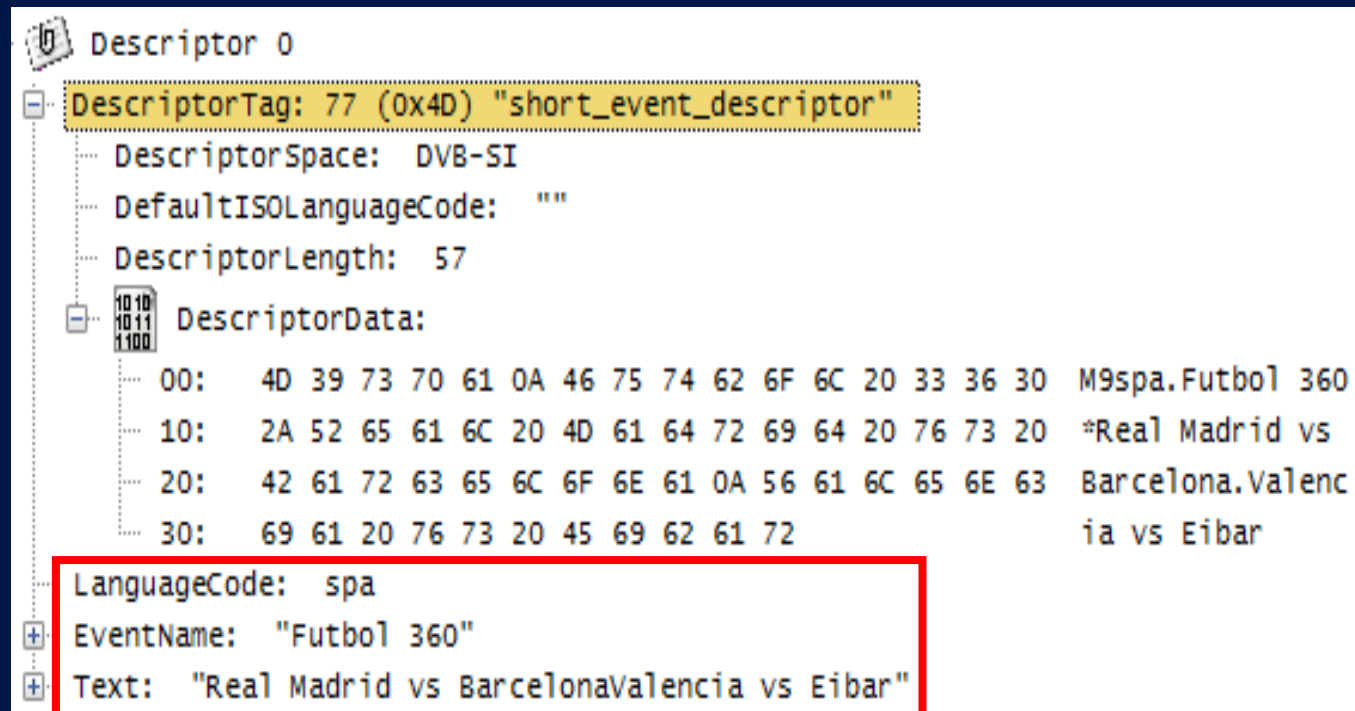
Digital Video Broadcasting (DVB);
Guidelines on implementation and usage
of Service Information (SI)

EIT (Event Information Table)

EIT DESCRIPTORS (I)

Short Event Descriptor

- Event Name
- Brief description
- Language Codification



Descriptor 0

DescriptorTag: 77 (0x4D) "short_event_descriptor"

DescriptorSpace: DVB-SI

DefaultISOLanguageCode: ""

DescriptorLength: 57

DescriptorData:

Offset	Hex	ASCII
00:	4D 39 73 70 61 0A 46 75 74 62 6F 6C 20 33 36 30	M9spa.Futbol 360
10:	2A 52 65 61 6C 20 4D 61 64 72 69 64 20 76 73 20	*Real Madrid vs
20:	42 61 72 63 65 6C 6F 6E 61 0A 56 61 6C 65 6E 63	Barcelona.Valenc
30:	69 61 20 76 73 20 45 69 62 61 72	ia vs Eibar

LanguageCode: spa

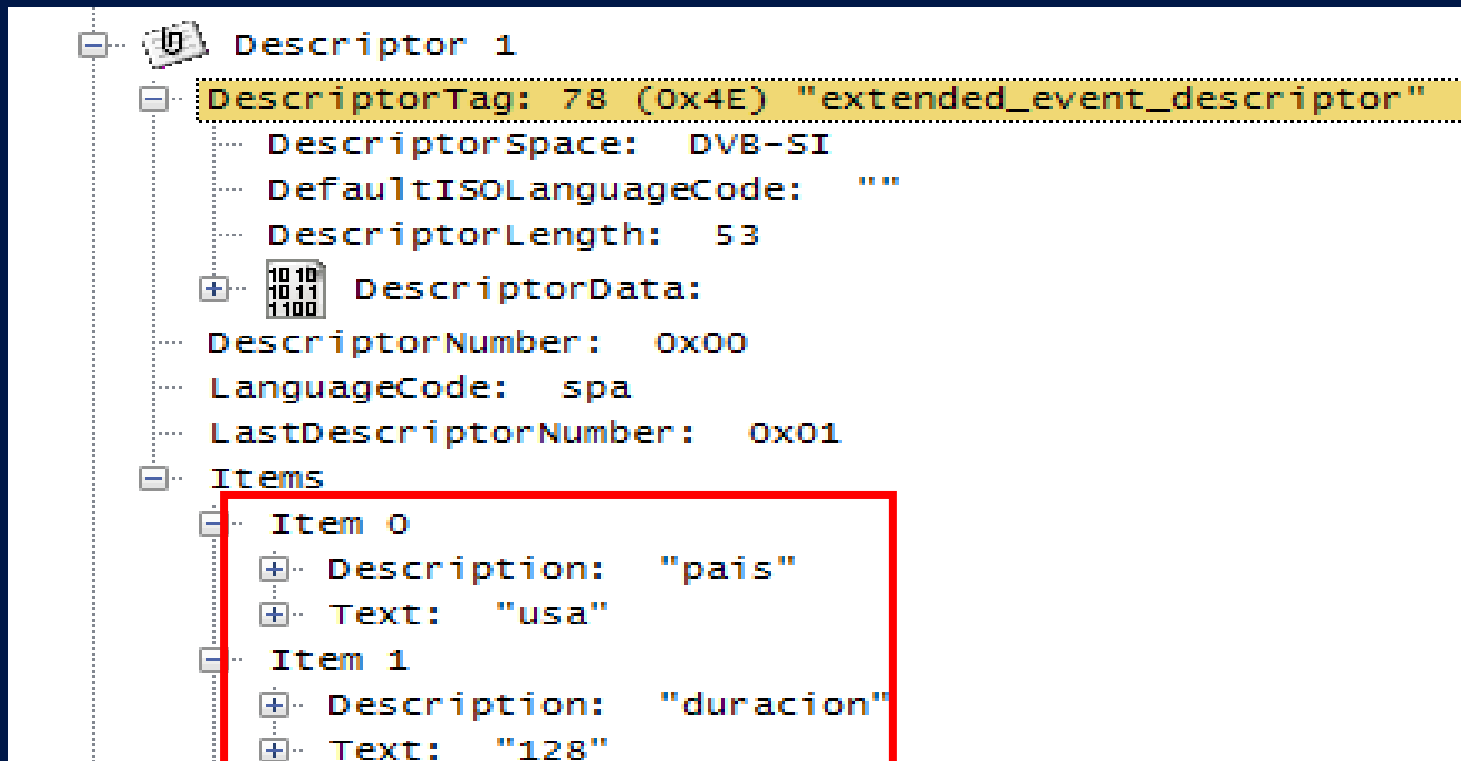
EventName: "Futbol 360"

Text: "Real Madrid vs BarcelonaValencia vs Eibar"

EIT DESCRIPTORS (II)

Extended Event Descriptor

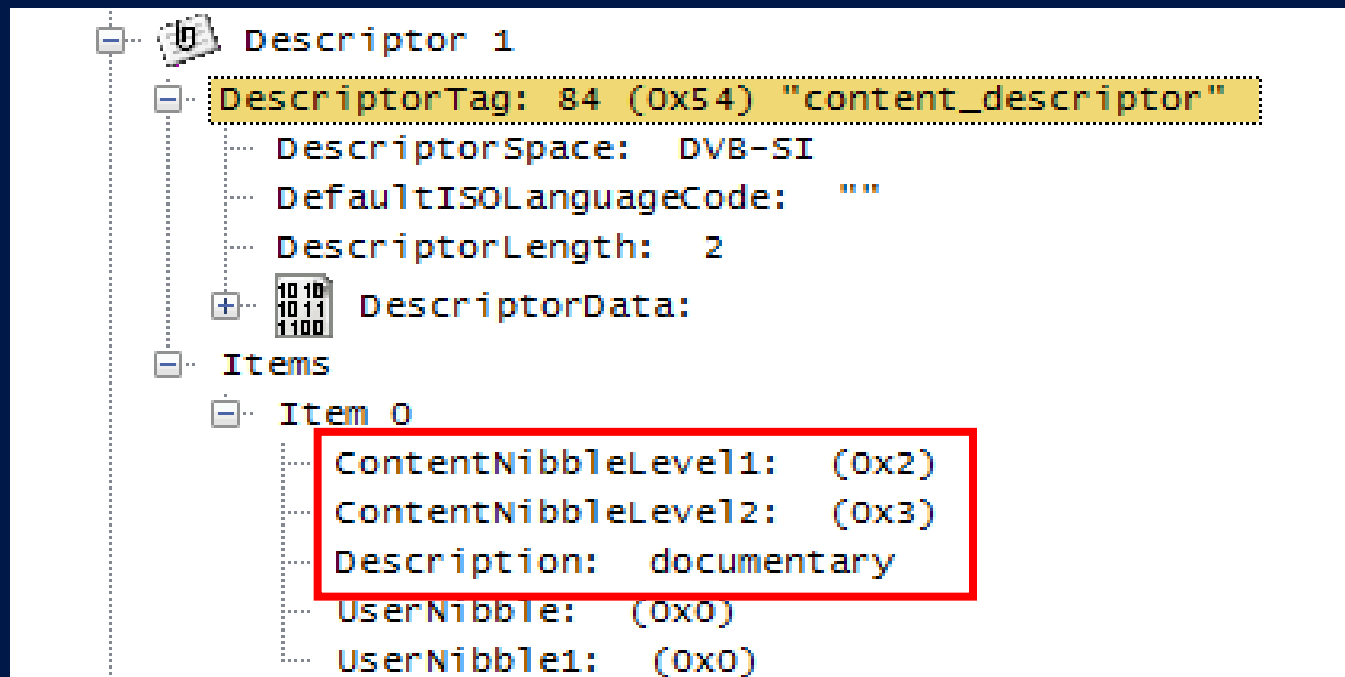
- Detailed description
 - Item
 - Text
- Language Codification



EIT DESCRIPTORS (III)

Content Descriptor

- Movie/Drama
- News
- Sports
- Series



EIT DESCRIPTORS (IV)

Parental Rating Descriptor

- Content classification by age.
- It can be extended according to other classification criteria



TRANSPORT STREAM GENERATION PROCESS (I)

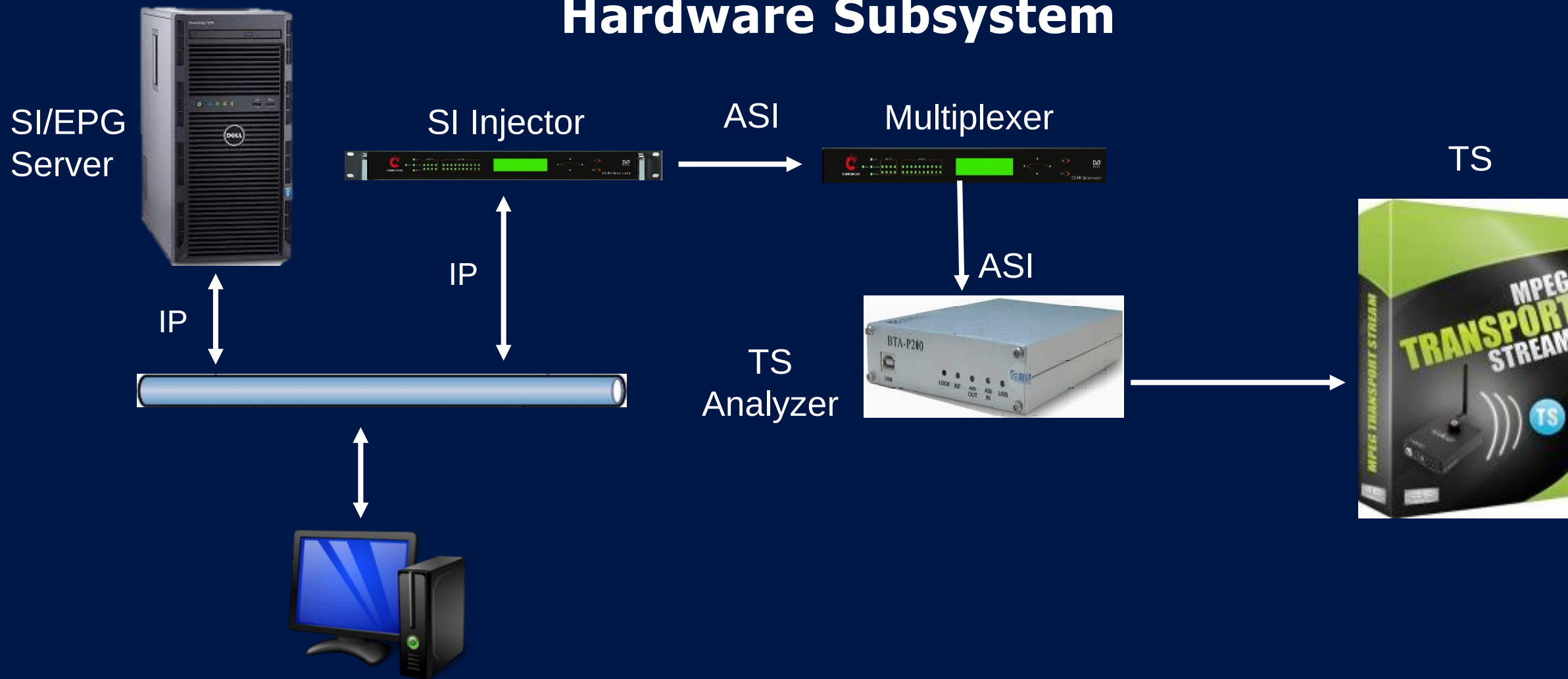
Software Subsystem



- SI-Manager
- SI-Editor
- EPG-Editor
- SI-Send

TRANSPORT STREAM GENERATION PROCESS (II)

Hardware Subsystem



TS VALIDATION (I)

4T2 Content Analyser

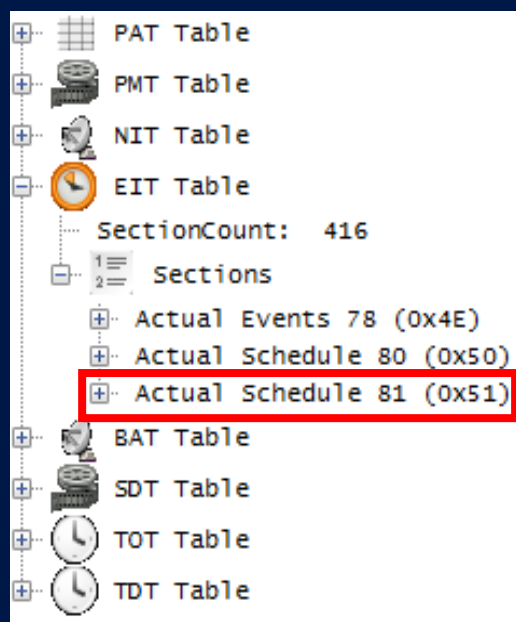


Promax TS Analyser



TS VALIDATION (II)

Actual Transmission



PAT Table

PMT Table

NIT Table

EIT Table

SectionCount: 416

Sections

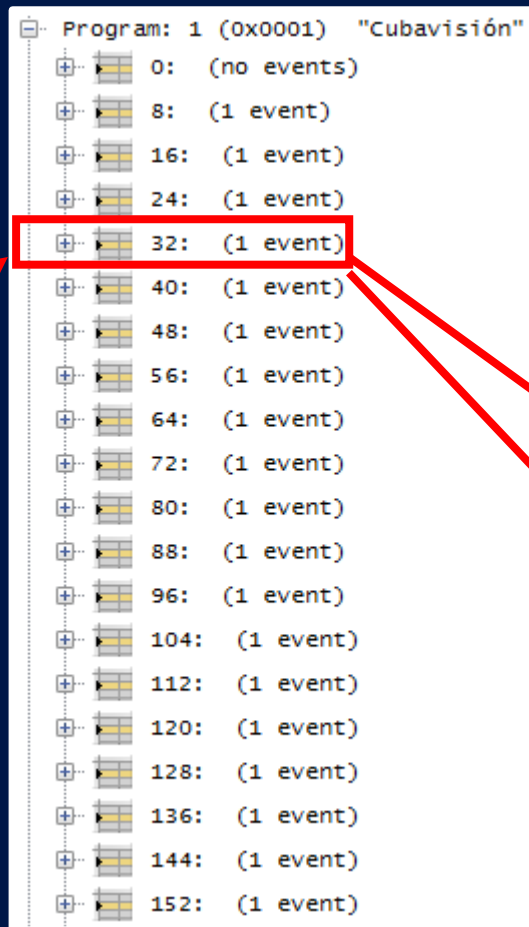
- Actual Events 78 (0x4E)
- Actual Schedule 80 (0x50)
- Actual Schedule 81 (0x51)**

BAT Table

SDT Table

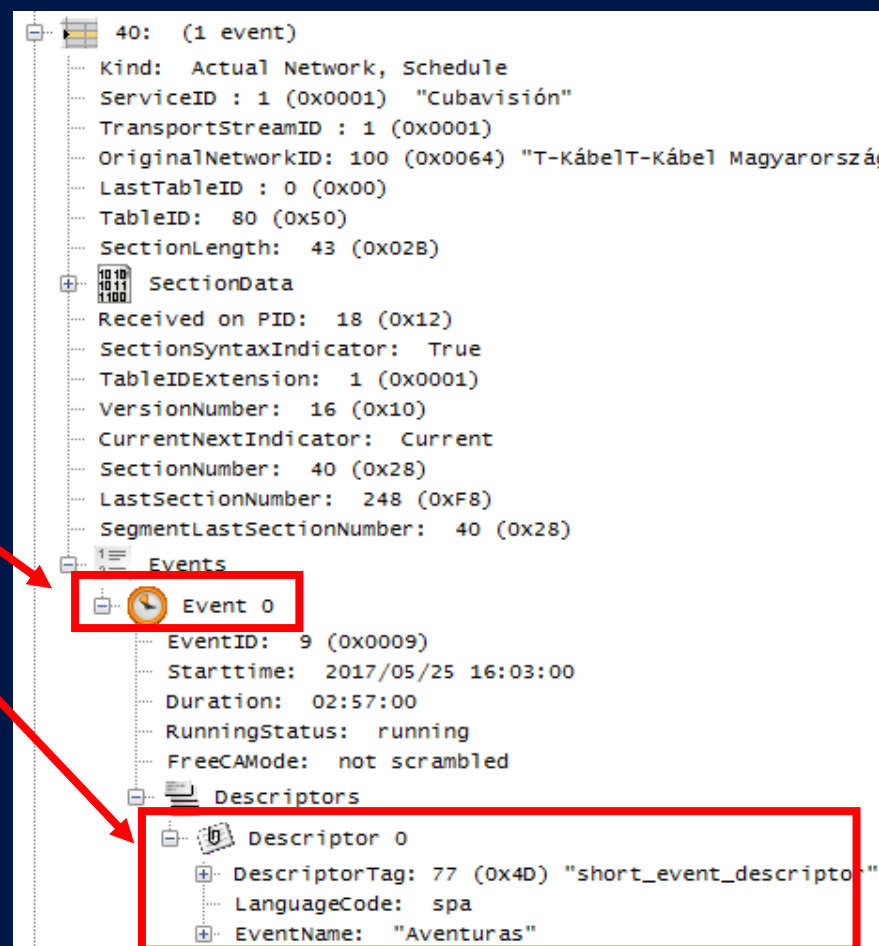
TOT Table

TDT Table



Program: 1 (0x0001) "Cubavisión"

- 0: (no events)
- 8: (1 event)
- 16: (1 event)
- 24: (1 event)
- 32: (1 event)**
- 40: (1 event)
- 48: (1 event)
- 56: (1 event)
- 64: (1 event)
- 72: (1 event)
- 80: (1 event)
- 88: (1 event)
- 96: (1 event)
- 104: (1 event)
- 112: (1 event)
- 120: (1 event)
- 128: (1 event)
- 136: (1 event)
- 144: (1 event)
- 152: (1 event)



40: (1 event)

Kind: Actual Network, Schedule

ServiceID : 1 (0x0001) "Cubavisión"

TransportStreamID : 1 (0x0001)

OriginalNetworkID: 100 (0x0064) "T-KábelT-Kábel Magyarország"

LastTableID : 0 (0x00)

TableID: 80 (0x50)

SectionLength: 43 (0x02B)

SectionData

Received on PID: 18 (0x12)

SectionSyntaxIndicator: True

TableIDExtension: 1 (0x0001)

VersionNumber: 16 (0x10)

CurrentNextIndicator: Current

SectionNumber: 40 (0x28)

LastSectionNumber: 248 (0xF8)

SegmentLastSectionNumber: 40 (0x28)

Events

Event 0

EventID: 9 (0x0009)

Starttime: 2017/05/25 16:03:00

Duration: 02:57:00

RunningStatus: running

FreeCAMode: not scrambled

Descriptors

Descriptor 0

DescriptorTag: 77 (0x4D) "short_event_descriptor"

LanguageCode: spa

EventName: "Aventuras"

TS VALIDATION (III)

TS Generated

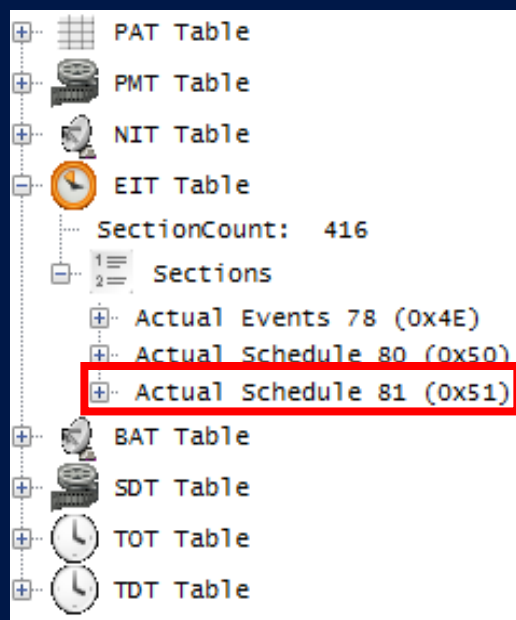


Diagram showing the structure of the Transport Stream (TS) tables. The tables listed are:

- PAT Table
- PMT Table
- NIT Table
- EIT Table
- SectionCount: 416
- Sections
 - Actual Events 78 (0x4E)
 - Actual Schedule 80 (0x50)
 - Actual Schedule 81 (0x51)
- BAT Table
- SDT Table
- TOT Table
- TDT Table

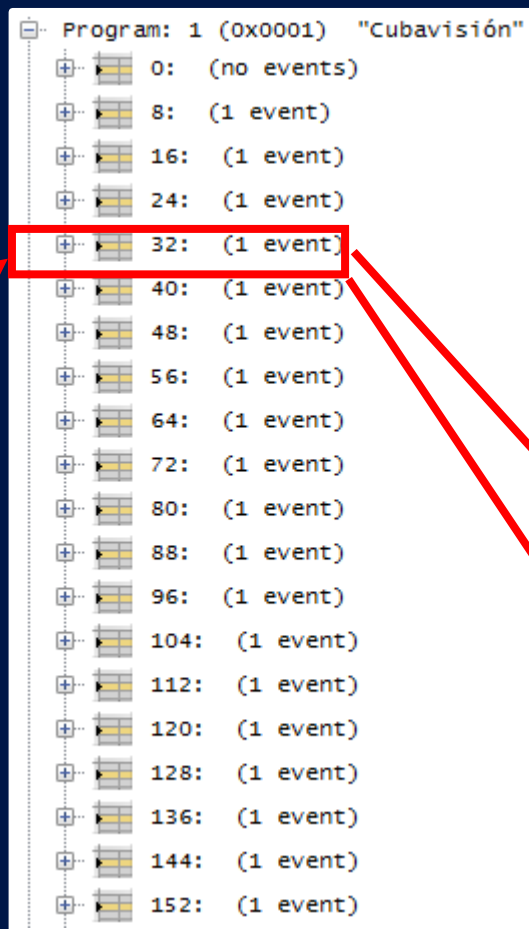


Diagram showing the Program 1 (0x0001) "Cubavisión" table. The table lists events for various Program IDs (0 to 152). The event for Program ID 32 is highlighted with a red box.

Program ID	Event Count
0	(no events)
8	(1 event)
16	(1 event)
24	(1 event)
32	(1 event)
40	(1 event)
48	(1 event)
56	(1 event)
64	(1 event)
72	(1 event)
80	(1 event)
88	(1 event)
96	(1 event)
104	(1 event)
112	(1 event)
120	(1 event)
128	(1 event)
136	(1 event)
144	(1 event)
152	(1 event)

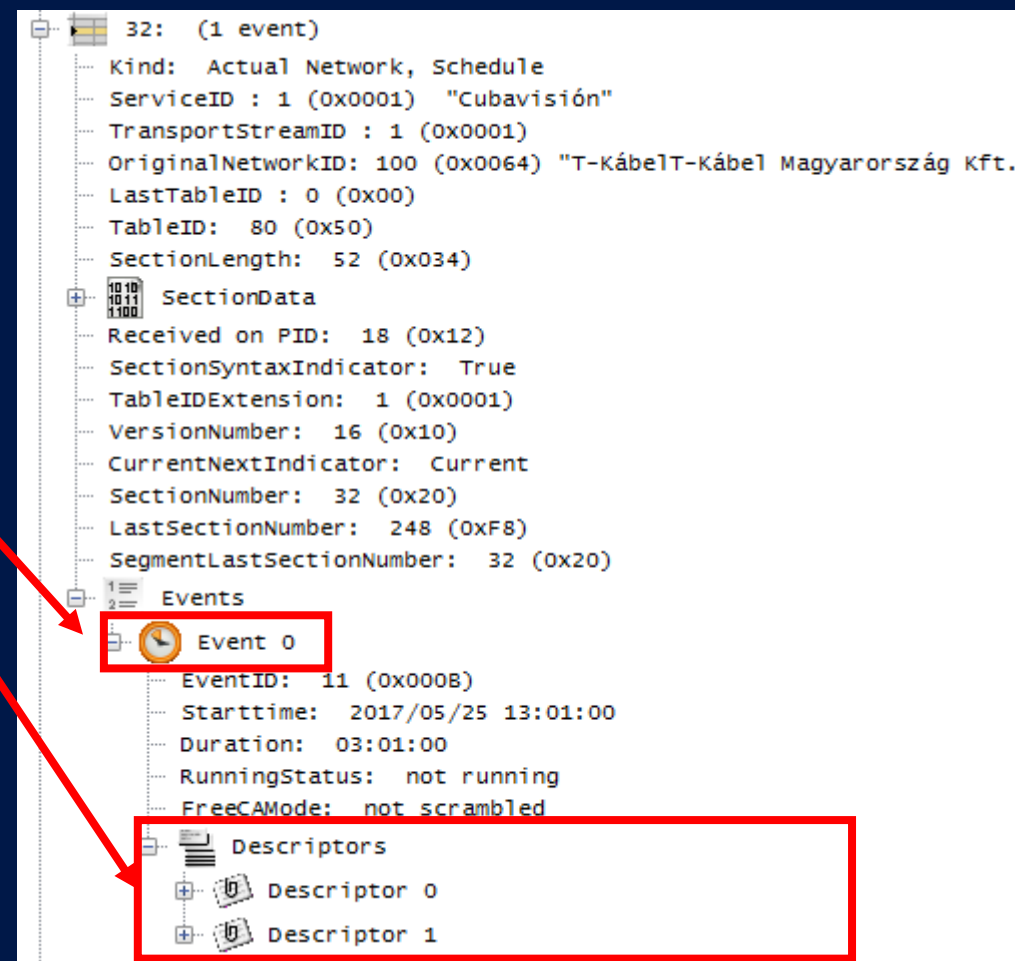


Diagram showing the details of Event 0 (EventID: 11 (0x000B)). The event is highlighted with a red box. The event details include:

- Kind: Actual Network, Schedule
- ServiceID: 1 (0x0001) "Cubavisión"
- TransportStreamID: 1 (0x0001)
- OriginalNetworkID: 100 (0x0064) "T-KábelT-Kábel Magyarország Kft."
- LastTableID: 0 (0x00)
- TableID: 80 (0x50)
- SectionLength: 52 (0x034)
- SectionData
 - Received on PID: 18 (0x12)
 - SectionSyntaxIndicator: True
 - TableIDExtension: 1 (0x0001)
 - VersionNumber: 16 (0x10)
 - CurrentNextIndicator: Current
 - SectionNumber: 32 (0x20)
 - LastSectionNumber: 248 (0xF8)
 - SegmentLastSectionNumber: 32 (0x20)
- Events
 - Event 0
 - EventID: 11 (0x000B)
 - Starttime: 2017/05/25 13:01:00
 - Duration: 03:01:00
 - RunningStatus: not running
 - FreeCAMode: not scrambled
- Descriptors
 - Descriptor 0
 - Descriptor 1

TS VALIDATION (IV)



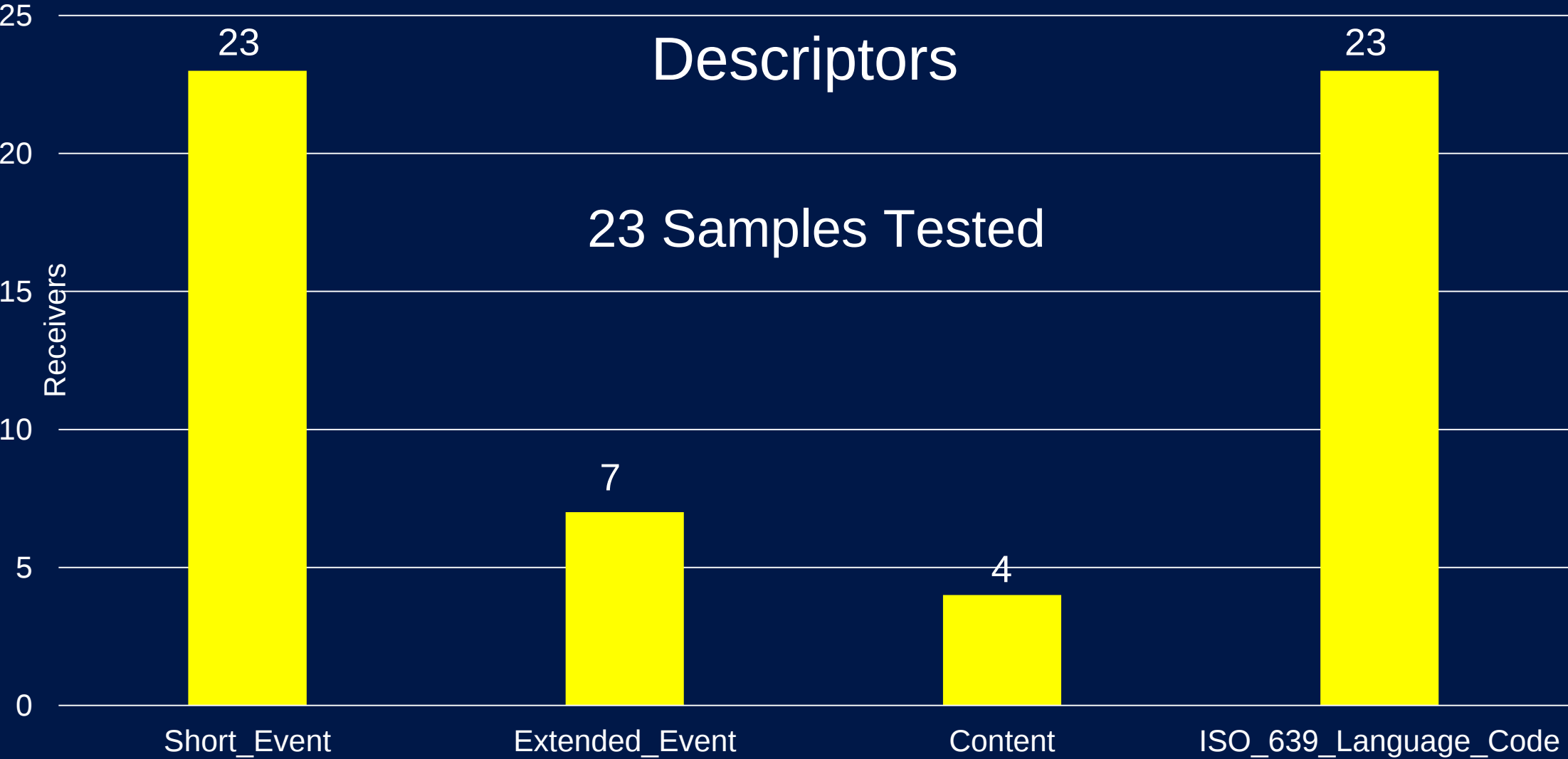
TS VALIDATION (V)

Test in receivers





RESULTS



CONCLUSIONS (I)

- 23 DTMB receivers were tested. There were found decoding and visualization deficiencies in the EPG information, regarding the content and extended_event descriptors.
- **LACETEL** will update the Evaluation Procedure. All the manufacturers will be notified.

CONCLUSIONS (II)

- The employment of the currently unused descriptors by the content generator would allow an improvement in the reception of Electronic Program Guide service.

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