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Event Triggering Distribution Specification Supplement (ETDSS)

29 January 2019

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Preamble

This Event Triggering Distribution Specification Supplement (ETDSS) facilitates agreements between television broadcasting and distribution companies concerning in-band distribution of Event Triggering according to SCTE standards. The goal is to enable novel business models by means of support of applications. The ownership of the ETDSS resides with the Event Triggering Workgroup of the Dutch Media Perspectives Foundation, having its place of business in Hilversum, the Netherlands.

The participants of the Workgroup believe that harmonisation of the technologies in this document across Europe is desirable and are interested in hearing from other stakeholders who share this vision. It is an option to transfer the document to a suitable international organisation to support further standardisation and application.

Please contact Media Perspectives for feedback, questions, if you wish to contribute or if your organisation wants to use this document for its own use.

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1 Introduction

This document is an extension to the Event Triggering Distribution Specification (ETDS). It supplies general information and describes several examples of Event Triggering messages that may be used by broadcast stations.

The purpose of Event Triggering is to allow applications and services downstream to support a variety of features. Examples of these features are, but are not limited to:

- National and targeted ad-replacement
- Trick play enabling
- Content blanking
- Archiving
- Video-on-Demand triggering
- Regional windowing
- Electronic Program Guide update provisioning
- Audio loudness measurements
- Broadcaster, Service and Program identification

More functionality can be added in the future, while using the same or added in-band information. The signalling can be applied in traditional linear broadcasting as well as in streaming video applications. The triggering can be extended with out-of-band metadata to provide more detailed information about a certain trigger, its identity and the corresponding action.

2 References

The in-band signalling complies with the following standards and recommendations:

ANSI/SCTE-35 2018	Digital Program Insertion Cueing Message for Cable.
ANSI/SCTE-104 2018	Automation System to Compression System Communications Applications Program Interface.
ANSI/SCTE-67 2017	Recommended Practice for SCTE 35 Digital Program Insertion Cueing Message for Cable.
SMPTE ST2010 2008	Vertical Ancillary Data Mapping of ANSI/SCTE-104 messages.
IETF RFC 4122 1998	Universally Unique Identifiers.
ETSI TS 101 231 v1.3.1	Television systems; Register of Country and Network Identification (CNI), Video Programming System (VPS) codes and Application codes for Teletext based systems.
EBU TS 101 231 Codes Register 2017-10b	Television systems; Register of Country and Network Identification (CNI) and of Video Programming System (VPS) codes.

3 Event triggering

3.1 Introduction

This section describes the generic application of Event Triggering at broadcast stations and television distribution companies.

3.2 Generation and distribution

Figure 1 shows generic examples of the signal flow between a broadcasting station and several methods of distribution. Signalling according to SCTE-104 is generated by the play-out automation at the broadcast station and is locally distributed via LAN. Alternatively, SCTE 104 signalling can be generated by an intermediate system that communicates with the play-out automation and the scheduling system. An embedder adds the signalling according to SMPTE ST2010 to the (HD)SDI output of the play-out system.

Three different imaginary distribution forms are displayed. From top to bottom:

1. Linear transmission encoded by the distributor combined with 'on-top-of-the-network' based delivery (OTT).
2. Linear transmission encoded by the broadcast station combined with OTT provided by the distributor.
3. OTT combined with third party access.

Distributors that process the (HD)SDI signal receive the signalling embedded as SCTE-104 messages. A DVB encoder converts the messages to SCTE-35 data, distributed in a dedicated DVB Packet Identifier (PID), individually per service and time-aligned combined with video, audio and other data of the television service. The SCTE-35 data can be decoded downstream for features as described in section 1.

Additional data about the events is sent by means of a separate path, also known as out-of-band communications. This data channel may occupy considerably more information than SCTE-35 messages themselves. One of the ways to send such information is described in SCTE-224, an Event Scheduling and Notification Interface. However, legacy systems such as EPG supply schemes can also be used as out-of-band communications for Event Triggering. Practice of this data channel is however out of scope of this specification.

In the outlined examples, SCTE-35 data serves as an input for OTT systems. Compatible with their characteristic encoding structure, this data is used to modify the manifest file. In case of ad-replacement, the manifest sequence points the media player frame accurately to the video stream of the alternative content, such as a commercial. There are several ways to control this process, such as ESAM, VAST or SCTE-130. These processes are however out of scope of this document.

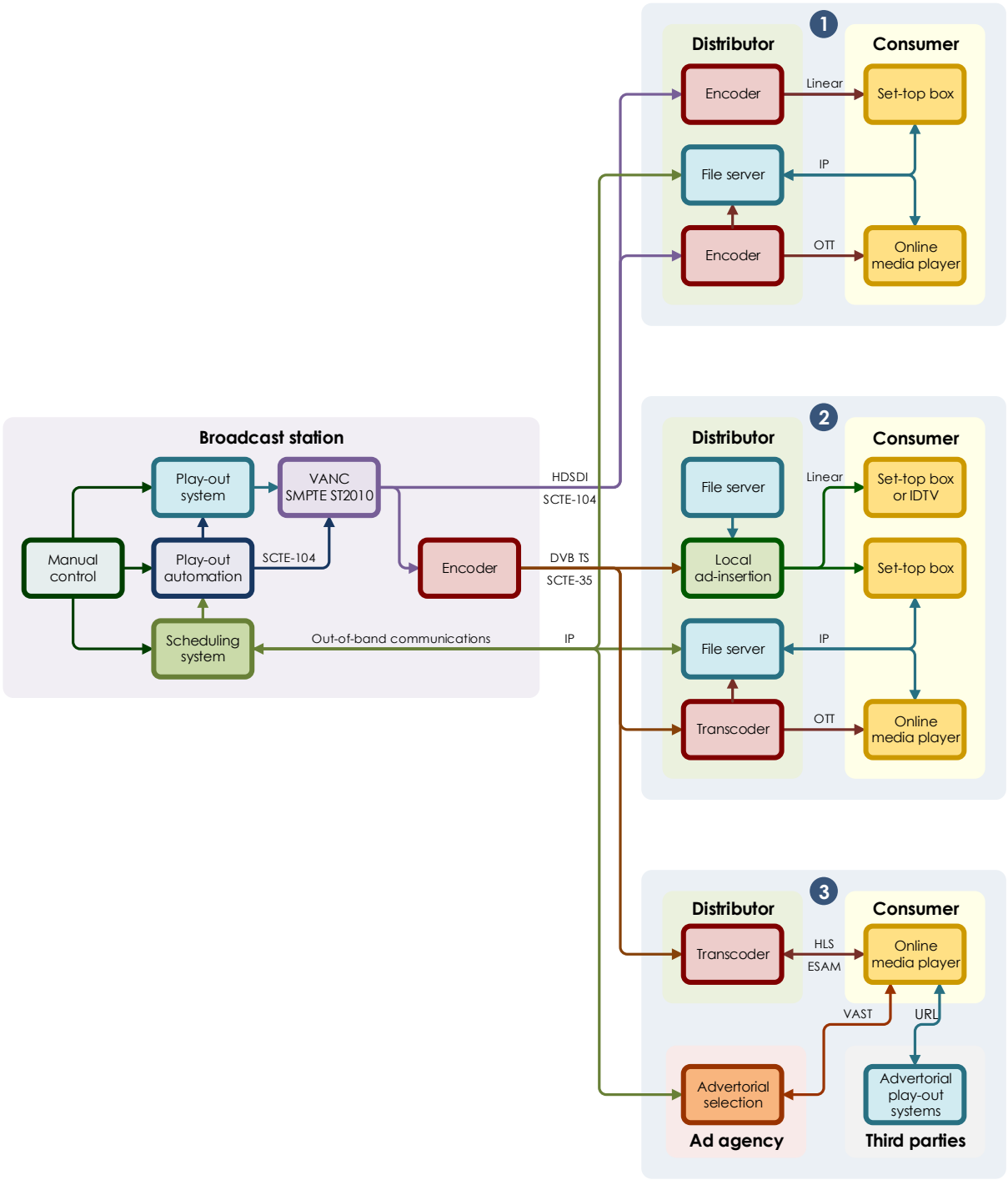


Figure 1 – SCTE-104/35 signal flow examples

4 Format and timing

4.1 Introduction

In this section, the main structure of Event Triggering messages is described.

4.2 Splice commands

The SCTE-35 standard offers the opportunity to keep using traditional splice_insert() commands in order to stay backward compatible with older equipment. In this specification it is assumed that downstream applications are up to date. To avoid interference, all events are signalled using time_signal() messages only, enriched with segmentation descriptors.

4.3 Segmentation

According to the SCTE-104 and SCTE-35 standards, all individual broadcast events in the linear playlist can be signalled by use of segmentation descriptors. The event elements can be distinguished as follows:

Segment	A uniquely identifiable broadcast playlist element such as a Program, a Chapter or an Interstitial.
Program	An individual, self-contained audio-visual item, not being an Interstitial.
Chapter	A part of a Program followed by one or more Interstitials or by the Chapter of another Program. Chapters are sequentially numbered per Program, starting at one within a given collection.
Break	A complete block of one or more Interstitials in advance of, interrupting or following up a Program. Breaks are sequentially numbered per Program. A Break in between two Programs can either: • Belong to the first Program as a whole. • Belong to the second Program as a whole. • Belong to both Programs for a part. Not belong to a Program and be considered standalone.
Advertisement	See Interstitial.
Interstitial	An individual, self-contained commercial, billboard, promotional (promo) or similar item, not being a Program. Interstitials are sequentially numbered per Break, starting at one within a given collection. The referenced version of SCTE-35 does not include a dedicated segmentation_type_id for promotional items or billboards. These Segments therefore need to be signalled as Advertisements.

Commercial	An individual, self-contained lucratively oriented Interstitial, not being a billboard, a promo or a similar item.
Provider Placement	A delineation of Segments such as a block of one or more Advertisements. There can be more than one Provider Placement present within one Break. A collection of Provider and Distributor Placements is sequentially numbered per Break. A Provider Placement can also be used to signal other events such as regional windows within the scheduling of a national TV network.
Distributor Placement	A block of one or more Provider Advertisements identified to be available for local replacement by one or more Distributor Advertisements. This arrangement is traditionally known as 'Avail'. There can be more than one Distributor Placement present within one Break. Placements may be specifically addressed to distributors, to other organisations or to the broadcaster itself. A collection of Provider and Distributor Placements is sequentially numbered per Break.

Signalling is performed using the segmentation_type_id values as defined in Table 8-8 of SCTE-35. The following values are expected to appear in pairs:

- Program Start/End
- Program Breakaway/Program Resumption
- Chapter Start/End
- Provider Advertisement Start/End
- Distributor Advertisement Start/End
- Break Start/End
- Provider Placement Opportunity Start/End
- Distributor Placement Opportunity Start/End
- Unscheduled Event Start/End
- Network Start/End

A Program End can be replaced by a Program Early Termination if necessary to signal an unexpected closing. A Program can also include a Breakaway (a Program in a Program) or a Resumption (a continuation of the previous Program after a Breakaway). These exceptions only apply if inserted between Program Start and Program End or between Program Start and Program Early Termination.

4.4 Identification

The SCTE-35 standard allows using segmentation_type_id and segmentation_upid descriptors to send identification of the transmitted content. According to this specification, the information is sent as:

- A general part A that contains the start and end triggers and the Airing ID UPID (Unique Program Identifier). Airing ID is one of the standard options registered in table 21 of SCTE-35 and represents a 64-bit integer value.

- A specific part B transmitted as Managed Private Data. This data includes the Format Identifier as disclosed by the SMPTE Registration Authority which is meant to identify the broadcast organisation. Managed Private Data contains additional identification. It is also sent in messages that signal individual Interstitials in order to refer to the Program they run with.

General part A:		
Using segmentation_type_id	0x10	Program Start
	0x11	Program End
	0x12	Program Early Termination
	0x13	Program Breakaway
	0x14	Program Resumption
	0x20	Chapter Start
	0x21	Chapter End
	0x22	Break Start
	0x23	Break End
	0x30	Provider Advertisement Start
	0x31	Provider Advertisement End
	0x32	Distributor Advertisement Start[1]
	0x33	Distributor Advertisement End
	0x34	Provider Placement Opportunity Start
	0x35	Provider Placement Opportunity End
	0x36	Distributor Placement Opportunity Start
	0x37	Distributor Placement Opportunity End
	0x40	Unscheduled Event Start
	0x41	Unscheduled Event End
	0x50	Network Start
	0x51	Network End
	For a complete overview of segmentation_type_ids, see table 22 of SCTE-35.	
and segmentation_upid_type	0x08	Airing ID
segmentation_upid	Uses a 64-bit unsigned numeric value Airing ID that uniquely identifies content such as a Program or an Interstitial, or delineation of a collection of Segments such as a Break or a Placement. In this specification, the Airing ID of the first Chapter carries the same value as its associated Program.	

[1] Distributor Advertisement Start and Distributor Advertisement End can be used in the distribution stage.

Specific part B:	
Using segmentation_type_id	0x01 Content Identification
and segmentation_upid_type	0x0C Managed Private UPID
format_identifier	Uses a 32-bit string 'Format Identifier' representing the name of the broadcaster as disclosed by the SMPTE Registration Authority. In the examples in section 5, the name 'TVST' is used, referring to the imaginary broadcaster 'TV Station'.
private_cni	Uses a 16-bit hexadecimal value 'Country and Network Identification (CNI)' which refers to the ETSI TS 101 231 Codes Register. The CNI identifies the Service Name. In the examples in section 5, the imaginary code '3199' is used.
private_version	Uses an 8-bit unsigned numeric value 'version number' which indicates the lay-out version of the data. It is changed if a new one is not backward compatible with earlier versions. Extension of the data fields while the original content is preserved does not lead to a new version number. Applications downstream shall always be prepared that the number of data fields in the descriptor loop may be extended.
Additional identification fields	The next part contains one or more additional Program identifiers. Section 6 specifies this identification for each organisation participating in the composition of this specification, if relevant. In the examples in section 5, the following fields are used:
private_file_id	Uses a 10 character long alphanumeric string 'File ID' of the imaginary broadcast company 'TV Station', which refers to the stored file of the running Program.
private_registry_id	Uses a 10 character long alphanumeric string 'Registry ID' of the imaginary broadcast company 'TV Station', which refers to the stored entry in its registry of Programs.

4.5 Heartbeat

The Heartbeat is an optional repetitive message type B as described in the previous section which can be used to monitor proper operation of the system. It includes Content Identification data which allows periodic signalling of the running content and allows quick recovery of the applications after a failure. Section 5.9 shows an example of the syntax.
A proper frequency of the Heartbeat signal is around every 60 seconds, restarting its cycle at presence of other messages. The frequency can be changed according to necessity and capacity. Start and End messages always have priority above Heartbeats.

4.6 Timestamp

Scheduled messages shall contain a valid timestamp that points to the frame accurate start and end time of the event. To avoid undefined behaviour, a pre-roll time of 4 seconds is included in the message. There are nevertheless always situations where the start or end of a broadcast item must be signalled immediately instead of planned. This can be done by setting the time_type to 0 in SCTE-104 and the time_specified_flag to 0 in SCTE-35, which means that there is no time reference included in the message. A typical application is the end of a live event that is determined real-time. The consequence of using such an immediate command is that processes that make use of the triggering cannot be controlled with the usual timing accuracy. Organisations and applications that process the signalling shall be aware that this may happen and shall handle them in the best possible manner.

The timing reference is UTC. To achieve frame accurate timing, the Automation System generating the SCTE-104 messages must be able to configure a static time offset to compensate for any video delay between the play-out system and the embedder or the encoder. If the Automation System feeds the same message to more than one encoder – for example, the same TV channel in HD and SD resolution – this time offset must be independently configurable to support different delays that may exist in the signal chain.

4.7 Command cancellation

Theoretically, an issued command can be updated by sending a new message with the correct or more accurate data or it can be cancelled by a message that has the segmentation_event_cancel_indicator_flag set to 1. This is however not supported in this specification.

4.8 Shared use of Placement Opportunity Starts

A collection of Placement Opportunity Ends that share the segmentation_event_id of one common Placement Opportunity Start is not supported in this specification.

4.9 Sample events

Figures 2 to 4 describe some sample events in further detail using the syntax of SCTE-104. The samples do not indicate a limitation; several combinations can be active at the same time if, for example, a Program is interrupted by more than one other Program (Program Breakaway). The yellow blocks include the segmentation_descriptor() values for the corresponding events. The messages also include Content Identification data as described as message type B in section 4.4.

Figure 5 shows an example of how segments are numbered using the fields segment_num, segment_expected, sub_segment_num and sub_segment_expected. Numbering is useful for error detection purposes. Its use is recommended but also optional in this specification.

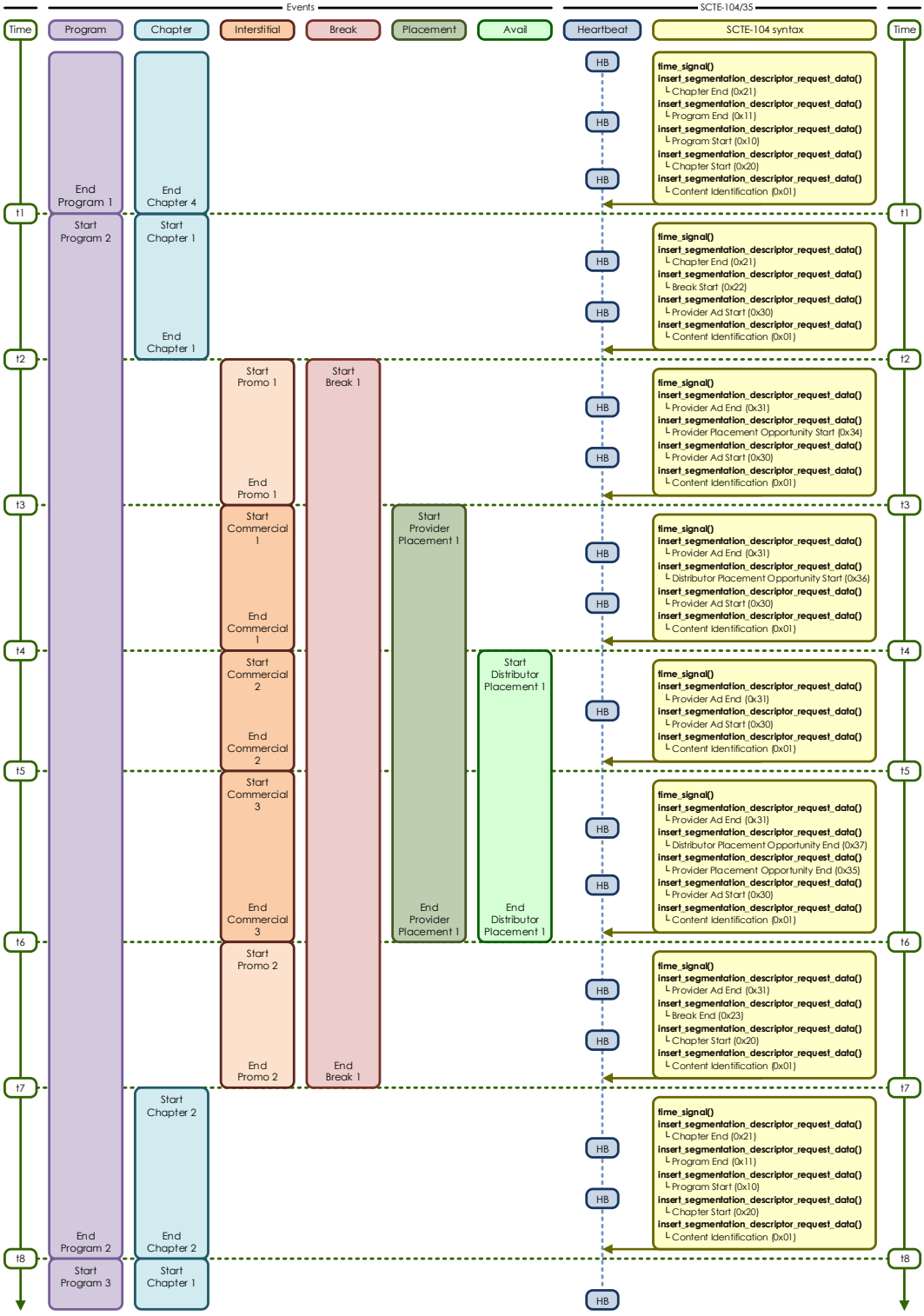


Figure 2 – Event Triggering examples (Program/Commercial transitions and Avail)

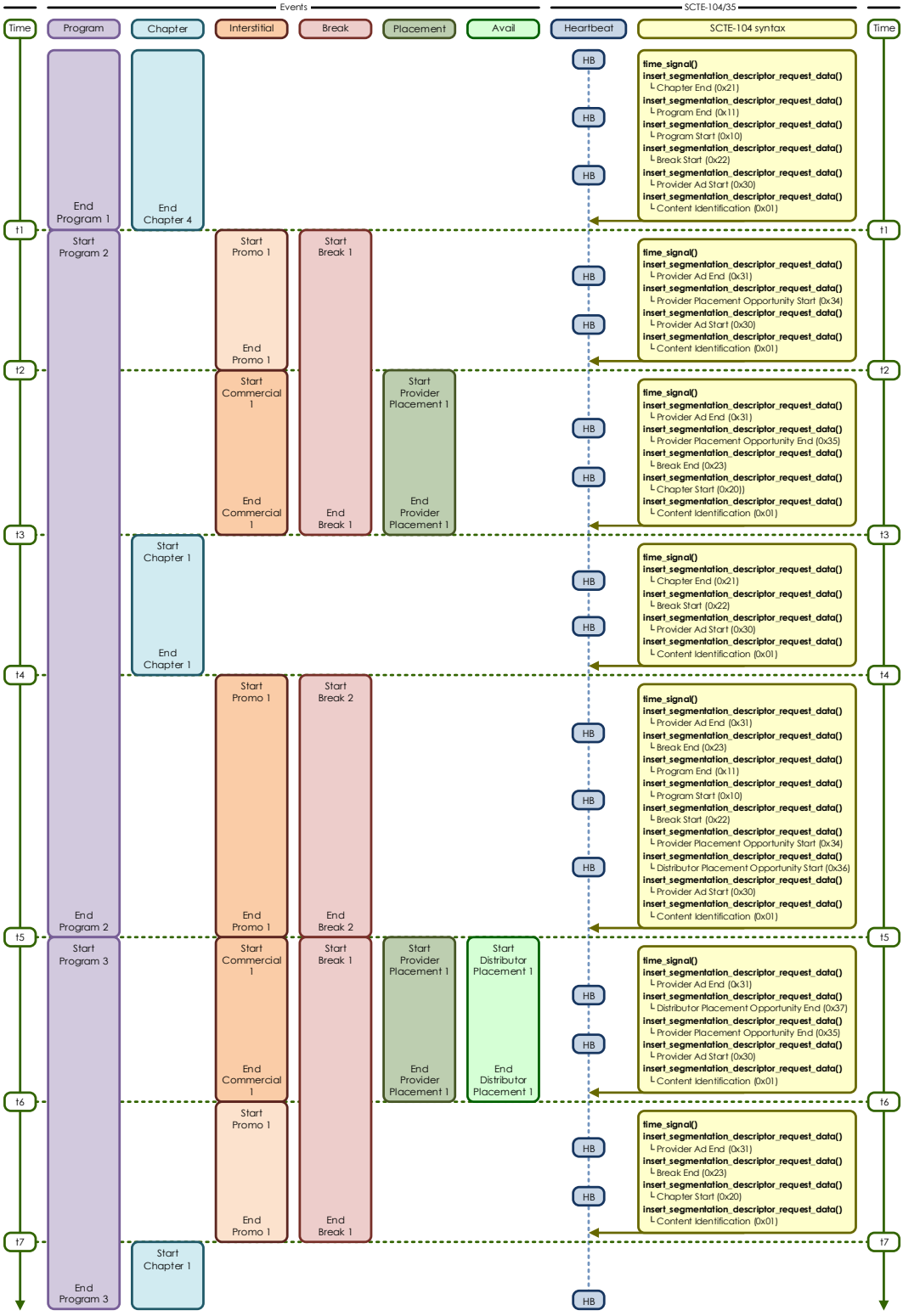


Figure 3 – Event Triggering examples (Break delineation)

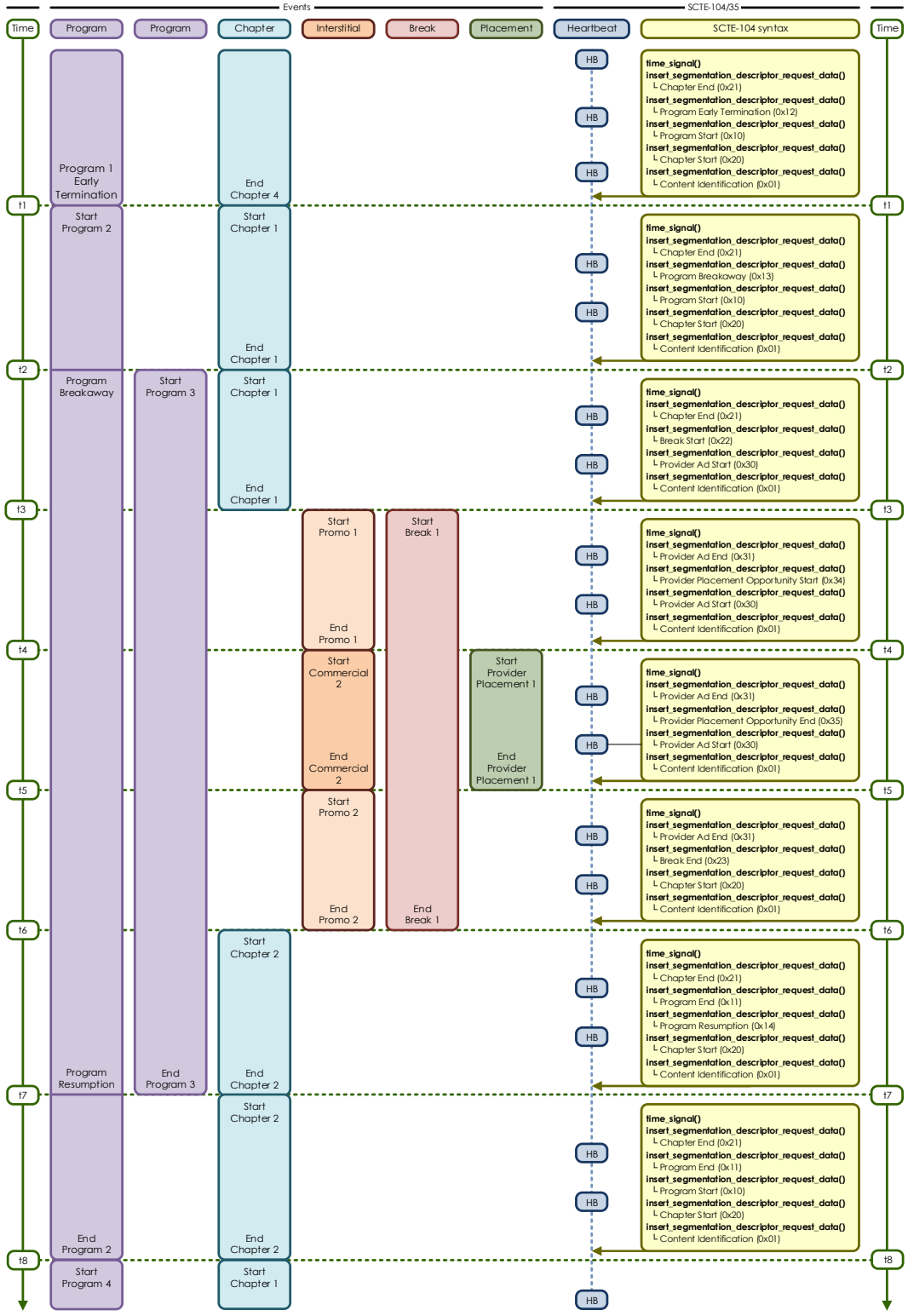


Figure 4 – Event Triggering examples (Program Early Termination and Program Breakaway)

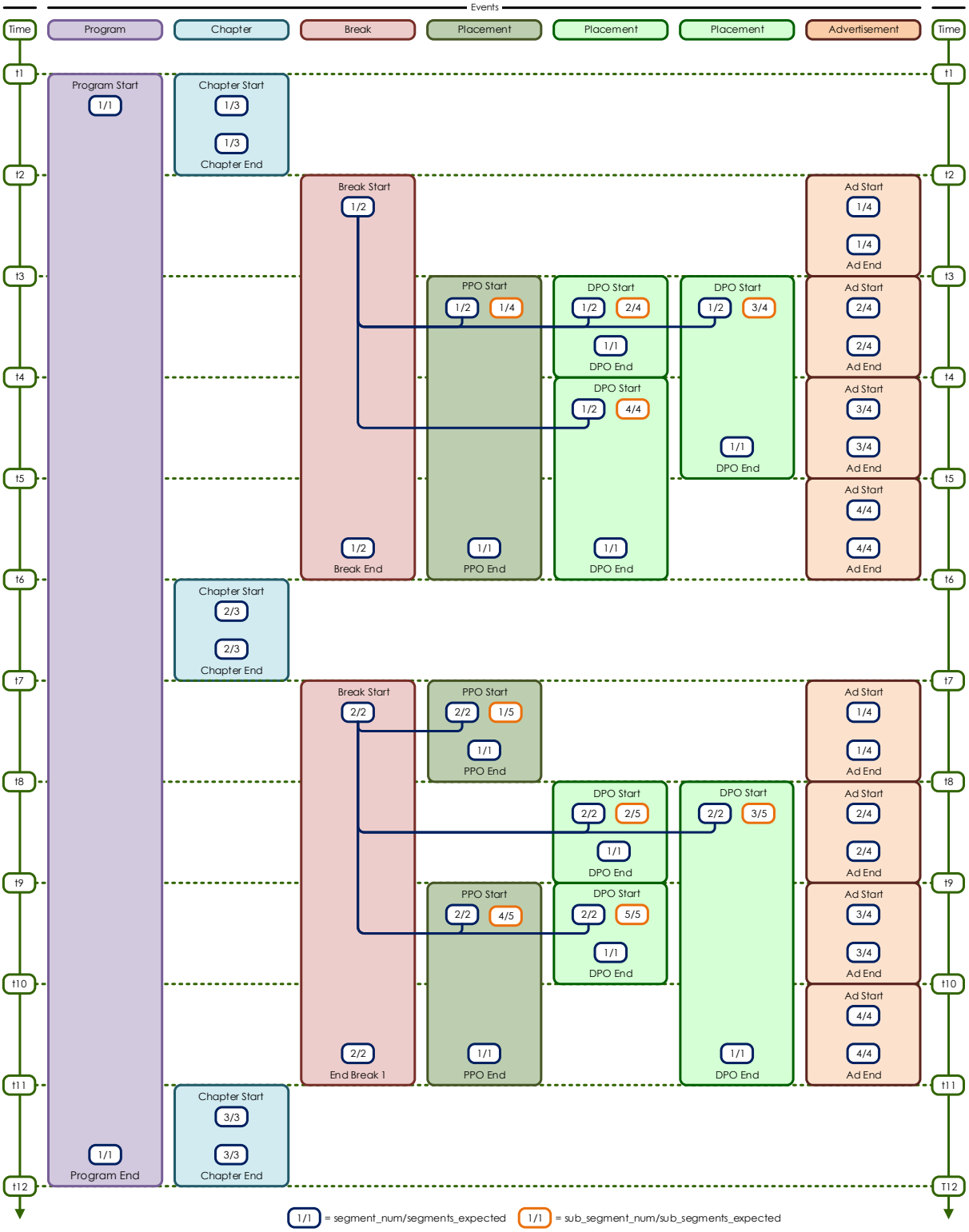


Figure 5 – Event Triggering examples with corresponding segment numbering

5 Applied composition

5.1 Introduction

In order to verify the full syntax, this section shows examples of SCTE-104 and SCTE-35 segmentation descriptors which can support further deployment by, for example, software programmers of broadcasters, distributors and manufacturers. The following imaginary transmission events can be distinguished. Numbers are formatted as unsigned integers. Information between quotes is formatted as ASCII text.

Program 1		Program 2	
segmentation_upid	1923755329936	segmentation_upid	2699312669362

Program 1 – Chapter 4		Program 3	
segmentation_upid	3874482648827	segmentation_upid	8373115539323

Break 1		Distributor Placement 1	
segmentation_upid	7499310032125	segmentation_upid	5720992718833

Provider Placement 1	
segmentation_upid	4472639441165

Program 2 – Chapter 1		Commercial 3 (associated with Program 2)	
segmentation_upid	2699312669362	segmentation_upid	7319263374901
private_file_id	'5F7368276'	private_file_id	'5F7368276'
private_registry_id	'J1B0038792'	private_registry_id	'J1B0038792'

Commercial 1 (associated with Program 2)		Program 2 – Chapter 2	
segmentation_upid	4272418349021	segmentation_upid	9336472229302
private_file_id	'5F7368276'	private_file_id	'5F7368276'
private_registry_id	'J1B0038792'	private_registry_id	'J1B0038792'

Commercial 2 (associated with Program 2)		Program 3 – Chapter 1	
segmentation_upid	1246213299233	segmentation_upid	8373115539323
private_file_id	'5F7368276'	private_file_id	'5F6410575'
private_registry_id	'J1B0038792'	private_registry_id	'J1B0044862'

5.2 Base message – Scheduled

The following syntax is used in a scheduled start message that contains one or more segmentation descriptors. Only fields that require a specific value in this specification are listed below. For other fields of the descriptor, please consult the SCTE standards.

5.2.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
multiple_operation_message()		
{		
AS_index = 0	1	Uniquely identifies the Automation System (AS). Just one AS is expected.
DPI_PID_index = 1	2	Signals that messages are carried in the first DPI PID of the service in the transport stream.
}		
timestamp()		
{		
time_type = 2	1	Defines VITC as the timing reference.
hours = 10	1	The hour of the day in 24-hour format (10 in this example).
minutes = 10	1	The minutes within the hour (10 in this example).
seconds = 10	1	The seconds within the minute (10 in this example).
frames = 10	1	The number of frames within the second (10 in this example).
}		
time_signal_request_data()		
{		
pre-roll_time = 4000	2	Adds pre-roll time to the message signalling that the splice point is programmed 4 seconds later than the time indicated in timestamp().
}		

5.2.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
splice_time()		
{		
time_specified_flag = 1	1	Indicates that a timestamp is included in the message.
reserved	6	Fills up the remaining byte.
pts_time	33	Time in 90 kHz clock ticks that represents the intended splice point. This value may have an offset defined by the field 'pts_adjustment' in the 'splice_info_section' of the message.
}		

5.3 Base message – Immediate

The following syntax is used in every immediate start message that contains one or more segmentation descriptors. Only fields that require a specific value in this specification are listed below. For other fields of the descriptor, please consult the SCTE standards.

5.3.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
multiple_operation_message()		
{		
AS_index = 0	1	Uniquely identifies the Automation System (AS). Just one AS is expected.
DPI_PID_index = 1	2	Signals that messages are carried in the first DPI PID of the service in the transport stream.
}		
timestamp()		
{		
time_type = 0	1	Signals an immediate trigger.
}		
time_signal_request_data()		
{		
pre-roll_time = 0	2	Signals that the message must be processed immediately.

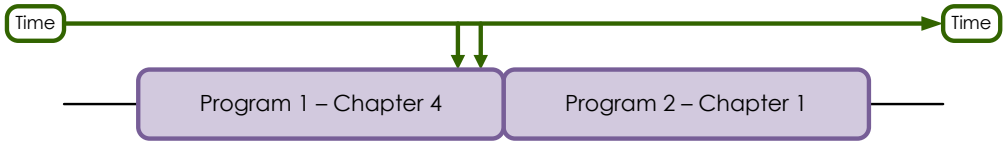
Syntax SCTE-104	Bytes	Explanation
}		

5.3.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
splice_time()		
{		
time_specified_flag = 0	1	Signals an immediate trigger.
reserved	7	Fills up the remaining byte.
}		

5.4 Program Transition

The following example specifies the syntax transmitted at the end of 'Program 1 – Chapter 4' and the start of 'Program 2 – Chapter 1'.



5.4.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Chapter Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 3874482648827	8	Uniquely identifies 'Program 1 – Chapter 4'.
segmentation_type_id = 0x21	1	Chapter End.
segment_num = 4	1	Fourth Chapter within the running Program.
segments_expected = 4	1	A total of 4 Chapters is expected.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.

Syntax SCTE-104	Bytes	Explanation
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Program Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 1923755329936	8	Uniquely identifies 'Program 1'.
segmentation_type_id = 0x11	1	Program End.
segment_num = 1	1	This field is set to 1 in Program messages.
segments_expected = 1	1	This field is set to 1 in Program messages.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.

Syntax SCTE-104	Bytes	Explanation
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Program End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 1231	2	Duration of the whole Program in seconds, including assigned Breaks. This field shall be 0 if the expected duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 2699312669362	8	Uniquely identifies 'Program 2'.
segmentation_type_id = 0x10	1	Program Start.
segment_num = 1	1	This field is set to 1 in Program messages.
segments_expected = 1	1	This field is set to 1 in Program messages.
duration_extension_frames = 2	1	The total length of the Program is duration in seconds plus duration_extension_frames.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.

Syntax SCTE-104	Bytes	Explanation
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Chapter End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 89	2	Duration of 'Program 2 – Chapter 1' in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 2699312669362	8	Uniquely identifies 'Program 2 – Chapter 1'.
segmentation_type_id = 0x20	1	Chapter Start.
segment_num = 1	1	First Chapter within the running Program.
segments_expected = 3	1	A total of 3 Chapters is expected.
duration_extension_frames = 18	1	The total length of the Chapter is duration in seconds plus duration_extension_frames.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.

Syntax SCTE-104	Bytes	Explanation
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	4	Representing the name 'TV Station'.
private_cni = 0x3199	2	Signals the CNI of the TV Station's service.
private_version = 1	1	Version of the specification.
private_file_id = '305723H1\0'	10	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	10	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

5.4.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Chapter Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 3874482648827	64	Uniquely identifies 'Program 1 – Chapter 4'.

Syntax SCTE-35	Bits	Explanation
segmentation_type_id = 0x21	8	Chapter End.
segment_num = 4	8	Fourth Chapter within the running Program.
segments_expected = 4	8	A total of 4 Chapters is expected.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Program Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 1923755329936	64	Uniquely identifies 'Program 1'.
segmentation_type_id = 0x11	8	Program End.
segment_num = 1	8	This field is set to 1 in Program messages.
segments_expected = 1	8	This field is set to 1 in Program messages.
}		

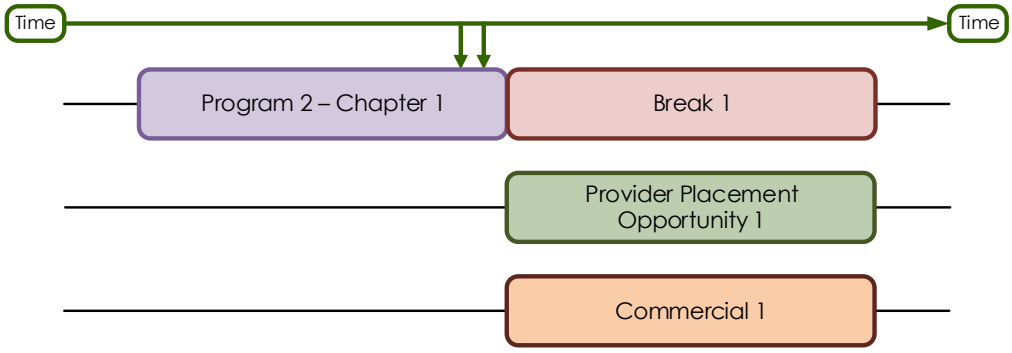
Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Program End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_duration = 110797200	40	Duration of 'Program 2' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 2699312669362	64	Uniquely identifies 'Program 2'.
segmentation_type_id = 0x10	8	Program Start.
segment_num = 1	8	This field is set to 1 in Program messages.
segments_expected = 1	8	This field is set to 1 in Program messages.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.

Syntax SCTE-35	Bits	Explanation
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Chapter End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_duration = 8074800	40	Duration of 'Program 2 – Chapter 1' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 2699312669362	64	Uniquely identifies 'Program 2 – Chapter 1'.
segmentation_type_id = 0x20	8	Chapter Start.
segment_num = 1	8	First Chapter within the running Program.
segments_expected = 3	8	A total of 3 Chapters is expected.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 39	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.

Syntax SCTE-35	Bits	Explanation
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x0C	8	Managed Private UPID.
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	32	Representing the name 'TV Station'.
private_cni = 0x3199	16	Signals the CNI of the TV Station's service.
private_version = 1	8	Version of the specification.
private_file_id = '305723H1\0'	80	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	80	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

5.5 Break Start

The following example specifies the syntax transmitted at the end of 'Program 2/Chapter 1' and the start of 'Break 1/Provider Placement Opportunity 1/Commercial 1'.



5.5.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Chapter Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 2699312669362	8	Uniquely identifies 'Program 2 – Chapter 1'.
segmentation_type_id = 0x21	1	Chapter End.
segment_num = 1	1	First Chapter within the running Program.
segments_expected = 3	1	A total of 3 Chapters is expected.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.

Syntax SCTE-104	Bytes	Explanation
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Break End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 312	2	Duration of 'Break 1' in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 749931032125	8	Uniquely identifies 'Break 1'.
segmentation_type_id = 0x22	1	Break Start.
segment_num = 1	1	First Break associated with the running Program.
segments_expected = 5	1	A total of 5 Breaks associated with the running Program is expected.
duration_extension_frames = 12	1	The total length of the Break is duration in seconds plus duration_extension_frames.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.

Syntax SCTE-104	Bytes	Explanation
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Placement Opportunity End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 274	2	Duration of the Provider Placement in seconds. This field shall be 0 if the expected duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 4472639441165	8	Uniquely identifies 'Provider Placement Opportunity 1'.
segmentation_type_id = 0x34	1	Provider Placement Opportunity Start.
segment_num = 1	1	First Break associated with the running Program.
segments_expected = 5	1	A total of 5 Breaks associated with the running Program is expected.
duration_extension_frames = 8	1	The total length of the Placement is duration in seconds plus duration_extension_frames.

Syntax SCTE-104	Bytes	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 1	1	The descriptor contains sub-segment numbering.
sub_segment_num = 1	1	First Placement within the current Break.
sub_segments_expected = 1	1	One Placement is expected in the current Break.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Advertisement End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 28	2	Duration of 'Commercial 1' in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 4272418349021	8	Uniquely identifies 'Commercial 1'.
segmentation_type_id = 0x30	1	Provider Advertisement Start.
segment_num = 1	1	First Interstitial within the Break.
segments_expected = 1	1	One Interstitial is expected in the Break.
duration_extension_frames = 7	1	The total length of the Interstitial is duration in seconds plus duration_extension_frames.

Syntax SCTE-104	Bytes	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	4	Representing the name 'TV Station'.
private_cni = 0x3199	2	Signals the CNI of the TV Station's service.
private_version = 1	1	Version of the specification.
private_file_id = '305723H1\0'	10	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	10	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.

Syntax SCTE-104	Bytes	Explanation
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

5.5.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Chapter Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.

Syntax SCTE-35	Bits	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 2699312669362	64	Uniquely identifies 'Program 2 – Chapter 1'.
segmentation_type_id = 0x21	8	Chapter End.
segment_num = 1	8	First Chapter within the running Program.
segments_expected = 3	8	A total of 3 Chapters is expected.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Break End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.

Syntax SCTE-35	Bits	Explanation
segmentation_duration = 28123200	40	Duration of 'Break 1' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 749931003212 5	64	Uniquely identifies 'Break 1'.
segmentation_type_id = 0x22	8	Break Start.
segment_num = 1	8	First Break associated with the running Program.
segments_expected = 5	8	A total of 5 Breaks associated with the running Program is expected.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 30	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Placement Opportunity End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.

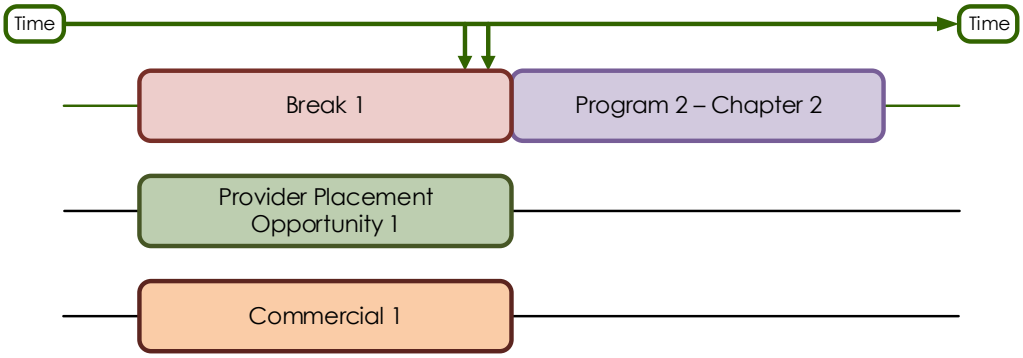
Syntax SCTE-35	Bits	Explanation
segmentation_duration = 24688800	40	Duration of the Provider Placement in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 4472639441165	64	Uniquely identifies 'Provider Placement Opportunity 1'.
segmentation_type_id = 0x34	8	Provider Placement Opportunity Start.
segment_num = 1	8	First Break associated with the running Program.
segments_expected = 5	8	A total of 5 Breaks associated with the running Program is expected.
sub_segment_num = 1	8	First Placement within the current Break.
sub_segments_expected = 1	8	One Placement is expected in the current Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Advertisement End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.

Syntax SCTE-35	Bits	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_duration = 2545200	40	Duration of 'Commercial 1' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 4272418349021	64	Uniquely identifies 'Commercial 1'.
segmentation_type_id = 0x30	8	Provider Advertisement Start.
segment_num = 1	8	First Interstitial within the Break.
segments_expected = 1	8	One Interstitial is expected in the Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 39	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x0C	8	Managed Private UPID.

Syntax SCTE-35	Bits	Explanation
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	32	Representing the name 'TV Station'.
private_cni = 0x3199	16	Signals the CNI of the TV Station's service.
private_version = 1	8	Version of the specification.
private_file_id = '305723H1\0'	80	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	80	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

5.6 Break End

The following example specifies the syntax transmitted at the end of 'Break 1/Provider Placement Opportunity 1/Commercial 1' and the start of 'Program 2 – Chapter 2'.



5.6.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Advertisement Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 4272418349021	8	Uniquely identifies 'Commercial 1'.
segmentation_type_id = 0x31	1	Provider Advertisement End.
segment_num = 1	1	First Interstitial within the Break.
segments_expected = 1	1	One Interstitial is expected in the Break.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Placement Opportunity Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 4472639441165	8	Uniquely identifies 'Provider Placement Opportunity 1'.
segmentation_type_id = 0x35	1	Provider Placement Opportunity End.
segment_num = 1	1	This field is set to 1 in Placement Opportunity End messages.
segments_expected = 1	1	This field is set to 1 in Placement Opportunity End messages.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Break Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 7499310032125	8	Uniquely identifies 'Break 1'.
segmentation_type_id = 0x23	1	Break End.
segment_num = 1	1	First Break associated with the running Program.
segments_expected = 5	1	A total of 5 Breaks associated with the running Program is expected.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.

Syntax SCTE-104	Bytes	Explanation
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Chapter End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 1650	2	Duration of 'Program 2 – Chapter 2' in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 9336472229302	8	Uniquely identifies 'Program 2 – Chapter 2'.
segmentation_type_id = 0x20	1	Chapter Start.
segment_num = 2	1	Second Chapter within the running Program.
segments_expected = 3	1	A total of 3 Chapters is expected.
duration_extension_frames = 11	1	The total length of the Chapter is duration in seconds plus duration_extension_frames.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.

Syntax SCTE-104	Bytes	Explanation
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	4	Representing the name 'TV Station'.
private_cni = 0x3199	2	Signals the CNI of the TV Station's service.
private_version = 1	1	Version of the specification.
private_file_id = '305723H1\0'	10	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	10	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

5.6.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Advertisement Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 4272418349021	64	Uniquely identifies 'Commercial 1'.
segmentation_type_id = 0x31	8	Provider Advertisement End.
segment_num = 1	8	First Interstitial within the Break.
segments_expected = 1	8	One Interstitial is expected in the Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.

Syntax SCTE-35	Bits	Explanation
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Placement Opportunity Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 4472639441165	64	Uniquely identifies 'Provider Placement Opportunity 1'.
segmentation_type_id = 0x35	8	Provider Placement Opportunity End.
segment_num = 1	8	This field is set to 1 in Placement Opportunity End messages.
segments_expected = 1	8	This field is set to 1 in Placement Opportunity End messages.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Break Start message.

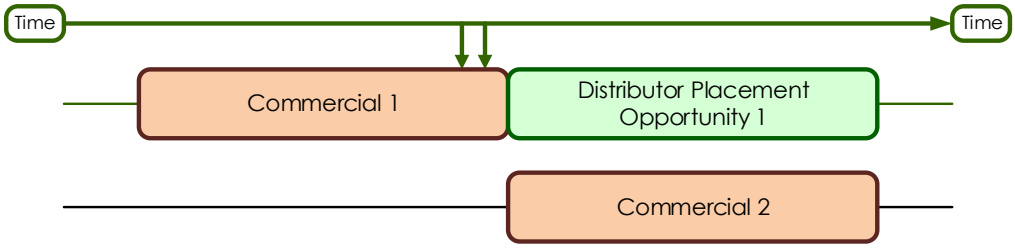
Syntax SCTE-35	Bits	Explanation
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 7499310032125	64	Uniquely identifies 'Break 1'.
segmentation_type_id = 0x23	8	Break End.
segment_num = 1	8	First Break associated with the running Program.
segments_expected = 5	8	A total of 5 Breaks associated with the running Program is expected.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Chapter End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.

Syntax SCTE-35	Bits	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_duration = 148539600	40	Duration of 'Program 2 – Chapter 2' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 9336472229302	64	Uniquely identifies 'Program 2 – Chapter 2'.
segmentation_type_id = 0x20	8	Chapter Start.
segment_num = 2	8	Second Chapter within the running Program.
segments_expected = 3	8	A total of 3 Chapters is expected.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 39	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.

Syntax SCTE-35	Bits	Explanation
segmentation_upid_type = 0x0C	8	Managed Private UPID.
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	32	Representing the name 'TV Station'.
private_cni = 0x3199	16	Signals the CNI of the TV Station's service.
private_version = 1	8	Version of the specification.
private_file_id = '305723H1\0'	80	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	80	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

5.7 Distributor Placement Opportunity Start

The following example specifies the syntax transmitted at the end of 'Commercial 1' and the start of 'Commercial 2' which is available to be replaced by the distributor. This is indicated by the start of a Distributor Placement Opportunity, also known as Avail.



5.7.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Advertisement Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 4272418349021	8	Uniquely identifies 'Commercial 1'.
segmentation_type_id = 0x31	1	Provider Advertisement End.
segment_num = 1	1	First Interstitial within the Break.
segments_expected = 3	1	A total of 3 Interstitials is expected in the Break.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Distributor Placement Opportunity End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 45	2	Duration of the Distributor Placement in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 5720992718833	8	Uniquely identifies 'Distributor Placement Opportunity 1'.
segmentation_type_id = 0x36	1	Distributor Placement Opportunity Start.
segment_num = 1	1	First Break associated with the running Program.
segments_expected = 5	1	A total of 5 Breaks associated with the running Program is expected.
duration_extension_frames = 22	1	The total length of the Placement is duration in seconds plus duration_extension_frames.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.

Syntax SCTE-104	Bytes	Explanation
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 1	1	The descriptor contains sub-segment numbering.
sub_segment_num = 2	1	Second Placement within the current Break.
sub_segments_expected = 2	1	A total of 2 Placements is expected in the current Break.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Advertisement End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 45	2	Duration of 'Commercial 2' in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 1246213299233	8	Uniquely identifies 'Commercial 2'.
segmentation_type_id = 0x30	1	Provider Advertisement Start.
segment_num = 2	1	Second Interstitial within the Break.
segments_expected = 3	1	A total of 3 Interstitials is expected in the Break.
duration_extension_frames = 22	1	The total length of the Interstitial is duration in seconds plus duration_extension_frames.

Syntax SCTE-104	Bytes	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	4	Representing the name 'TV Station'.
private_cni = 0x3199	2	Signals the CNI of the TV Station's service.
private_version = 1	1	Version of the specification.
private_file_id = '305723H1\0'	10	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	10	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.

Syntax SCTE-104	Bytes	Explanation
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

5.7.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Advertisement Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.

Syntax SCTE-35	Bits	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 4272418349021	64	Uniquely identifies 'Commercial 1'.
segmentation_type_id = 0x31	8	Provider Advertisement End.
segment_num = 1	8	First Interstitial within the Break.
segments_expected = 3	8	A total of 3 Interstitials is expected in the Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 30	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Distributor Placement Opportunity End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.

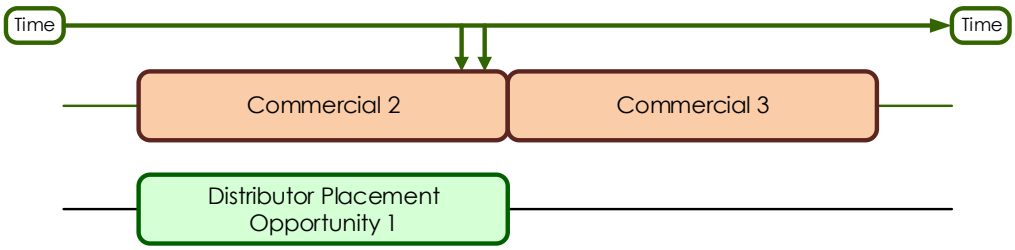
Syntax SCTE-35	Bits	Explanation
segmentation_duration = 4129200	40	Duration of the Distributor Placement in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 5720992718833	64	Uniquely identifies 'Distributor Placement Opportunity 1'.
segmentation_type_id = 0x36	8	Distributor Placement Opportunity Start.
segment_num = 1	8	First Break associated with the running Program.
segments_expected = 5	8	A total of 5 Breaks associated with the running Program is expected.
sub_segment_num = 2	8	Second Placement within the current Break.
sub_segments_expected = 2	8	A total of 2 Placements is expected in the current Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Advertisement End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.

Syntax SCTE-35	Bits	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_duration = 4129200	40	Duration of 'Commercial 2' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 1246213299233	64	Uniquely identifies 'Commercial 2'.
segmentation_type_id = 0x30	8	Provider Advertisement Start.
segment_num = 2	8	Second Interstitial within the Break.
segments_expected = 3	8	A total of 3 Interstitials is expected in the Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 39	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.

Syntax SCTE-35	Bits	Explanation
segmentation_upid_type = 0x0C	8	Managed Private UPID.
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	32	Representing the name 'TV Station'.
private_cni = 0x3199	16	Signals the CNI of the TV Station's service.
private_version = 1	8	Version of the specification.
private_file_id = '305723H1\0'	80	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	80	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

5.8 Distributor Placement Opportunity End

The following example specifies the syntax transmitted at the end of 'Commercial 2' which was available to be replaced by the distributor. This is indicated by the end of the Distributor Placement Opportunity, also known as Avail. The message also signals the start of 'Commercial 3'.



5.8.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Advertisement Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 1246213299233	8	Uniquely identifies 'Commercial 2'.
segmentation_type_id = 0x31	1	Provider Advertisement End.
segment_num = 2	1	Second Interstitial within the Break.
segments_expected = 3	1	A total of 3 Interstitials is expected in the Break.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Distributor Placement Opportunity Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in 'End' messages.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 5720992718833	8	Uniquely identifies 'Distributor Placement Opportunity 1'.
segmentation_type_id = 0x37	1	Distributor Placement Opportunity End.
segment_num = 1	1	This field is set to 1 in Placement Opportunity End messages.
segments_expected = 1	1	This field is set to 1 in Placement Opportunity End messages.
duration_extension_frames = 0	1	This field is set to 0 in 'End' messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier. The same number is used for the related Provider Advertisement End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 39	2	Duration of 'Commercial 3' in seconds. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	1	Airing ID.
segmentation_upid_length = 8	1	Length of the UPID in bytes.
segmentation_upid() = 7319263374901	8	Uniquely identifies 'Commercial 3'.
segmentation_type_id = 0x30	1	Provider Advertisement Start.
segment_num = 3	1	Third Interstitial within the Break.
segments_expected = 3	1	A total of 3 Interstitials is expected in the Break.
duration_extension_frames = 8	1	The total length of the Interstitial is duration in seconds plus duration_extension_frames.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.

Syntax SCTE-104	Bytes	Explanation
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	4	Representing the name 'TV Station'.
private_cni = 0x3199	2	Signals the CNI of the TV Station's service.
private_version = 1	1	Version of the specification.
private_file_id = '305723H1\0'	10	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	10	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.

Syntax SCTE-104	Bytes	Explanation
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

5.8.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Advertisement Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 1246213299233	64	Uniquely identifies 'Commercial 2'.

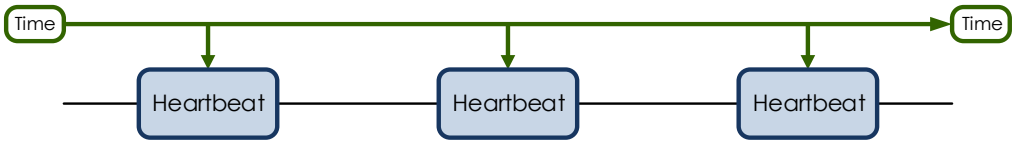
Syntax SCTE-35	Bits	Explanation
segmentation_type_id = 0x31	8	Provider Advertisement End.
segment_num = 2	8	Second Interstitial within the Break.
segments_expected = 3	8	A total of 3 Interstitials is expected in the Break.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 23	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Distributor Placement Opportunity Start message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	This field is set to 0 in 'End' messages. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 5720992718833	64	Uniquely identifies 'Distributor Placement Opportunity 1'.
segmentation_type_id = 0x37	8	Distributor Placement Opportunity End.
segment_num = 1	8	This field is set to 1 in Placement Opportunity End messages.

Syntax SCTE-35	Bits	Explanation
segments_expected = 1	8	This field is set to 1 in Placement Opportunity End messages.
}		
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 28	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier. The same number is used for the related Provider Advertisement End message.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 1	1	Duration is specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_duration =	40	Duration of 'Commercial 3' in 90 kHz clock ticks. This field is set to 0 if the duration is not known.
segmentation_upid_type = 0x08	8	Airing ID.
segmentation_upid_length = 8	8	Length of the UPID in bytes.
segmentation_upid() = 7319263374901	64	Uniquely identifies 'Commercial 3'.
segmentation_type_id = 0x30	8	Provider Advertisement Start.
segment_num = 3	8	Third Interstitial within the Break.
segments_expected = 3	8	A total of 3 Interstitials is expected in the Break.
}		
segmentation_descriptor()		

Syntax SCTE-35	Bits	Explanation
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 39	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x0C	8	Managed Private UPID.
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	32	Representing the name 'TV Station'.
private_cni = 0x3199	16	Signals the CNI of the TV Station's service.
private_version = 1	8	Version of the specification.
private_file_id = '305723H1\0'	80	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	80	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

5.9 Heartbeat

The following example specifies the syntax transmitted as a periodic Heartbeat. The identification in the message corresponds to the running Program.



5.9.1 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	4	Representing the name 'TV Station'.
private_cni = 0x3199	2	Signals the CNI of the TV Station's service.
private_version = 1	1	Version of the specification.
private_file_id = '305723H1\0'	10	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	10	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.

Syntax SCTE-104	Bytes	Explanation
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

5.9.2 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 39	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x0C	8	Managed Private UPID.

Syntax SCTE-35	Bits	Explanation
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'TVST'	32	Representing the name 'TV Station'.
private_cni = 0x3199	16	Signals the CNI of the TV Station's service.
private_version = 1	8	Version of the specification.
private_file_id = '305723H1\0'	80	Carries the File ID of 'Program 2'.
private_registry_id = '277319\0'	80	Carries the Registry ID of 'Program 2'.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

6 Operator specific identifiers

6.1 Introduction

This section specifies additional Program identification, if relevant, for each participating organisation. The operators are listed in alphabetic order.

6.2 RTL Netherlands

Contact person	Hank van de Loo

6.2.1 Airing ID

The Airing ID corresponds to the following identifiers:

Programs	Event ID
Chapters	Event ID
Interstitials	Event ID
Breaks	Break ID
Provider Placements	Placement ID
Distributor Placements	Placement ID
Network Start/End	Network Start/End ID

6.2.2 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 27	1	Total length in bytes of the private descriptors.
format_identifier = 'RTLN'	4	Representing the name 'RTL Netherlands'.
private_cni = 0x31XX	2	Signals the CNI of the RTL service.
private_version = 1	1	Version of the specification.

Syntax SCTE-104	Bytes	Explanation
private_material_id = '305723H1\0'	11	An 11 character long alphanumeric string that refers to the RTL File/Tape ID of the running Program.
private_library_key = '277319\0'	9	An 9 character long alphanumeric string that points to the RTL Rights ID of the running Program.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

6.2.3 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 41	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.

Syntax SCTE-35	Bits	Explanation
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x0C	8	Managed Private UPID.
segmentation_upid_length = 27	8	Total length in bytes of the private descriptors.
format_identifier = 'RTLN'	32	Representing the name 'RTL Netherlands'.
private_cni = 0x31XX	16	Signals the CNI of the RTL service.
private_version = 1	8	Version of the specification.
private_material_id = '305723H1\0'	88	An 11 character long alphanumeric string that refers to the RTL File/Tape ID of the running Program.
private_library_key = '277319\0'	72	An 9 character long alphanumeric string that points to the RTL Rights ID of the running Program.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

6.3 Talpa TV Broadcasting

Contact person Marjan Kortekaas

6.3.1 Airing ID

The Airing ID corresponds to the following identifiers:

Programs	Transmission ID
Chapters	Chapter ID
Interstitials	Interstitial ID
Breaks	Break ID
Provider Placements	Placement ID
Distributor Placements	Placement ID
Network Start/End	Not available

6.3.2 Message composition SCTE-104

Syntax SCTE-104	Bytes	Explanation
insert_segmentation_descriptor_request_data()		
{		
segmentation_event_id	4	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
duration = 0	2	This field is set to 0 in Content Identification messages.
segmentation_upid_type = 0x0C	1	Managed Private UPID.
segmentation_upid_length = 48	1	Total length in bytes of the private descriptors.
format_identifier = 'SBSB'	4	Representing the name 'SBS Broadcasting'.
private_cni = 0x31XX	2	Signals the CNI of the SBS service.
private_version = 1	1	Version of the specification.
private_transmission_id = 2699312669362	8	A 64 bits unsigned numeric value which is the SBS identifier of a unique slot within the schedule for a specific Program.
private_product_code = 27610	8	A 64 bits unsigned numeric value which is the SBS unique identifier of the Program and its episode.

Syntax SCTE-104	Bytes	Explanation
private_web_publication_key = 'Hyf3BAHsOTPn\0'	25	A 25 character long alphanumeric string private_web_publication_key which refers to the SBS unique identifier of the product, used for web publishing and video on demand.
segmentation_type_id = 0x01	1	Content Identification.
segment_num = 0	1	This field is set to 0 in Content Identification messages.
segments_expected = 0	1	This field is set to 0 in Content Identification messages.
duration_extension_frames = 0	1	This field is set to 0 in Content Identification messages.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
web_delivery_allowed_flag = 1	1	Not used.
no_regional_blackout_flag = 1	1	Not used.
archive_allowed_flag = 1	1	Not used.
device_restrictions = 0	1	Not used.
insert_sub_segment_info = 0	1	The descriptor does not contain sub-segment numbering.
sub_segment_num = 0	1	Not used.
sub_segments_expected = 0	1	Not used.
}		

6.3.3 Message composition SCTE-35

Syntax SCTE-35	Bits	Explanation
segmentation_descriptor()		
{		
splice_descriptor_tag = 0x02	8	Defines the body of the descriptor.
descriptor_length = 63	8	The length of the descriptor in bytes.
identifier = 'CUEI'	32	Identifies the descriptor.
segmentation_event_id	32	A unique segmentation event identifier.
segmentation_event_cancel_indicator = 0	1	No cancellation.
reserved	7	Fills up the remaining byte.
program_segmentation_flag = 1	1	All PIDs of the program are to be segmented.
segmentation_duration_flag = 0	1	Not used. Duration is not specified.
delivery_not_restricted_flag = 1	1	This field is set to 1 which means that the delivery restriction flags and field are not used.
reserved	5	Fills up the remaining byte.
segmentation_upid_type = 0x0C	8	Managed Private UPID.
segmentation_upid_length = 48	8	Total length in bytes of the private descriptors.
format_identifier = 'SBSB'	32	Representing the name 'SBS Broadcasting'.
private_cni = 0x31XX	16	Signals the CNI of the SBS service.
private_version = 1	8	Version of the specification.
private_transmission_id = 2699312669362	64	A 64 bits unsigned numeric value which is the SBS identifier of a unique slot within the schedule for a specific Program.
private_product_code = 27610	64	A 64 bits unsigned numeric value which is the SBS unique identifier of the Program and its episode.

Syntax SCTE-35	Bits	Explanation
private_web_publication_key = 'Hyf3BAHsOTPn\0'	200	A 25 character long alphanumeric string private_web_publication_key which refers to the SBS unique identifier of the product, used for web publishing and video on demand.
segmentation_type_id = 0x01	8	Content Identification.
segment_num = 0	8	This field is set to 0 in Content Identification messages.
segments_expected = 0	8	This field is set to 0 in Content Identification messages.
}		

7 Abbreviations

ANSI	American National Standards Institute.
AS	Automation System.
ASCII	American Standard Code for Information Interchange.
CNI	Country and Network Identification.
DPI	Digital Program Insertion.
DVB	Digital Video Broadcasting.
EBU	European Broadcasting Union.
ESAM	Event Signalling and Management.
ETDS	Event Triggering Distribution Specification
ETDSS	Event Triggering Distribution Specification Supplement
ETSI	European Telecommunications Standards Institute.
EPG	Electronic Program Guide.
HD	High Definition.
HDSDI	High Definition Serial Digital Interface.
ID	Identifier.
IETF	Internet Engineering Task Force.
OTT	Over The Top.
PID	Packet Identifier.
RFC	Request for Comments.
SCTE	Society of Cable Telecommunications Engineers.
SD	Standard Definition.
SDI	Serial Digital Interface.
SMPTE	Society of Motion Picture and Television Engineers.
TV	Television
VANC	Vertical Ancillary Data.
VAST	Digital Video Ad Serving Template.
UPID	Unique Program Identifier.
UTC	Coordinated Universal Time.