SCTE STANDARDS

Digital Video Subcommittee

SCTE STANDARD

SCTE 118-3 2019 (R2024)

Program-Specific Ad Insertion - Traffic System to Ad Insertion System File Format Specification

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Document Tags

☒ Specification	☐ Checklist	☐ Facility
☐ Test or Measurement	☐ Metric	☒ Access Network
☐ Architecture or Framework	☒ Cloud	☐ Customer Premises
☐ Procedure, Process or Method		

Document Release History

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SCTE 118-3 2006	*2006*
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Note: Standards that are released multiple times in the same year use: a, b, c, etc. to indicate normative balloted updates and/or r1, r2, r3, etc. to indicate editorial changes to a released document after the year.

Note: This document is a reaffirmation of SCTE 118-3 2019. No substantive changes have been made to this document. Information components may have been updated such as the title page, NOTICE text, headers, and footers.

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1. Introduction

1.1. Executive Summary

Note: This document is a reaffirmation of SCTE 118-3 2019. No substantive changes have been made to this document. Information components may have been updated such as the title page, NOTICE text, headers, and footers.

This document defines the information that ***shall*** be passed from an Affiliate's Traffic System to an Affiliate's Ad Insertion System for communications of ad insertion schedules, including Unique Program Identifiers where specified. It specifies the required data for multi-tiered, Program-Specific Insertion, as well as the file format for the data communications.

1.2. Scope

This document only describes digital ad insertion with SCTE 35 **[1]** cue messages.

1.3. Benefits

When implemented as described in SCTE 118-1 [9] and with additional reference to SCTE 118-2 [8], Program-Specific Ad Insertion will allow for an avail to be associated with a specific Program, as communicated by the content provider. By associating advertising to programming instead of simply to windows, the Affiliate *should* be able to earn more revenue by guaranteeing the context of the advertisement, and by adapting to occurrences surrounding live events, such as delayed starts, early ends, or overrun. These scenarios, especially when dealing with sports programming, can involve a great deal of high value advertising.

1.4. Intended Audience

The intended audience is content providers, multi-channel video program distributors, TV Everywhere providers/distributors and vendors/developers who build solutions.

1.5. Areas for Further Investigation or to be Added in Future Versions

See SCTE 118-1, Section 1.5 for implementation comment.

2. Normative References

The following documents contain provisions, which, through reference in this text, constitute provisions of this document. At the time of Subcommittee approval, the editions indicated were valid. All documents are subject to revision; and while parties to any agreement based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below, they are reminded that newer editions of those documents might not be compatible with the referenced version.

2.1. SCTE References

[1] SCTE 35 2017 – Digital Program Insertion Cueing Message for Cable

2.2. Standards from Other Organizations

[2]   ISO 8601 2004 - Data elements and interchange formats -- Information interchange -- Representation of dates and times Move to 2.2 or change to non-segmented – get updated template

 [3]   W3C Recommendation, "Extensible Markup Language (XML) 1.0 (Fourth Edition)", Tim Bray, et al, 16 August 2006

[4]   W3C Recommendation, "Namespaces In XML (Second Edition)", Tim Bray, et al, 16 August 2006

[5]   W3C Recommendation, "XML Schema Part 1: Structures (Second Edition)", H. Thompson, et al, 28 October 2004

[6]   W3C Recommendation, "XML Schema Part 2: Datatypes (Second Edition)", P. Biron, et al, 28 October 2004

2.3. Published Materials

- No normative references are applicable.

3. Informative References

The following documents might provide valuable information to the reader but are not required when complying with this document. [1]

3.1. SCTE References

[7]   SCTE 67 2017 – Recommended Practice for SCTE 35 Digital Program Insertion Cueing Message for Cable

[8]   SCTE 118-2 2019 – Program-Specific Ad Insertion – Content Provider to Traffic Communication Applications Data Model

[9]   SCTE 118-1 2019 – Program-Specific Ad Insertion - Data Field Definitions, Functional Overview and Application Guidelines

[10]   SCTE 104 2017 – Automation System to Compression System communications Applications Program Interface (API)

3.2. Standards from Other Organizations

- No informative references are applicable.

3.3. Published Materials

[11]   Ad-ID - Advertising Digital Identification, LLC - http://www.ad-id.org/.

4. Compliance Notation

shall	This word or the adjective "*required*" means that the item is an absolute requirement of this document.
shall not	This phrase means that the item is an absolute prohibition of this document.
forbidden	This word means the value specified shall never be used.
should	This word or the adjective "*recommended*" means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
should not	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
may	This word or the adjective "*optional*" means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.
deprecated	Use is permissible for legacy purposes only. Deprecated features may be removed from future versions of this document. Implementations should avoid use of deprecated features.

5. Abbreviations and Definitions

5.1. Abbreviations

See SCTE 118 Part 1 for Abbreviations used in this part.

5.2. Definitions

See SCTE 118 Part 1 for Definitions used in this part.

6. Overview

A Traffic System *shall* communicate, through a Schedule File, the spots to be played by the Ad Insertion System in response to various SCTE 35 [1] Cue Messages. The Ad Insertion System *shall* communicate, through a Verification File, which spots were played (or attempted to play), which failed to play (due to an error or due to no matching Cue Message), and any Cue Messages that were received but not acted upon.

This document defines the necessary information to communicate both the scheduling of Spots from a Traffic System to an Ad Insertion System and the return path verifications in accordance with the various Tiers of service described in SCTE 118-1 [9]. Additionally, it details the file format for communication between a Traffic System and an SCTE 35 compliant Ad Insertion System.

The schedule and verification files between the Traffic System and the Ad Insertion System are contained within Extensible Markup Language (XML) documents.

6.1. General Requirements

A Traffic System compliant with this Standard **shall** generate Schedule Files on a per zone, per network, per broadcast day basis. A single Schedule File **shall not** contain scheduled Spots for more than one Broadcast Day.

A Level 0 (as defined in Section 6.2) schedule **shall** contain all scheduled Spots per zone, network and Broadcast Day in a single Schedule File. A Level 1 (as defined in Section 6.2) Schedule File **may** contain a day part or only contain the changes to an existing Schedule File.

Each Schedule File **shall** contain the attributes as defined in Section 7.4. Program- Specific scheduling is enabled through the use of valid values for Unique Program Identifier (for Tier 1 and Tier 2), Avails Expected (for Tier 2) and Avail Number (for Tier 2) attributes. Window-Based scheduling is enabled through the use of zeros (or by omitting them) for those attributes. Both Window-Based scheduling and Program-Specific based scheduling **may** exist in the same file, in which case, the Program-Specific schedule lines will be considered the primary schedule and the Window-Based schedule lines will be considered the alternate schedule (see Section 8.3 in SCTE 118-2 [8].A single Schedule File **may** contain Tier 1 and Tier 2 elements, but a particular Program element and its child elements **shall** be either Tier 1 or Tier 2.

6.1.1. Schedule & Verification file format requirements

- The Network and Zone names defined in the Schedule Filename **shall** match the Network and Zones names within the schedule and verification files.
- No value is required for optional attributes, and they are only optionally specified.
- Unless otherwise stated, attribute character lengths are maximums.
- All times are based on the 24-hour clock.
- All times and dates, unless otherwise noted, are actual times and Calendar dates, and **shall not** be adjusted by Broadcast Day parameters.

Dates and Times **shall** be represented using ISO-8601 [2] date-time formats and **shall** exist as one attribute unless otherwise noted. They **shall** be of the format YYYY-MM-DDThh:mm:ss.ccTZD where:

YYYY = four-digit year

MM = two-digit month (01-12)

DD = two-digit day of month (01-31) hh = two-digit of hour (00-23)

mm = two-digit minute (00-59) ss = two-digit seconds (00-59)

cc = two-digit fraction of seconds

TZD = time zone designator (Z or +hh:mm or –hh:mm)

- Alphanumeric attributes **shall** only contain letters and numbers and **shall** be case-sensitive/dependent.
- A Broadcast Day's definition (start and end times) *should not* normally change from day-to-day. When adjustments are required, consecutive broadcast days **shall not** have gaps or overlaps in time.
- Traffic Id's are unique for a Schedule source within a Zone, Network and Broadcast Day, and **shall not** be reused within a Broadcast Day.

6.1.2. Data Type Definitions

The schema for this standard will use name space and prefix

- scte118:date is a 8 digit integer representing YYYYMMDD.
- scte118:duration is a 8 digit integer representing HHMMSSCC.

6.2. File Levels

This Standard supports two Levels of Schedule Files. Level 0 Schedule Files **shall** be sent as a complete file and are independent of any previously received schedule files for that Network and Zone. Level 1 Schedule Files **may** be sent as updates that represent changes to a previously generated and distributed Level 0 or Level 1 schedule file ('delta' behavior). Level 0 schedule files **shall** set the \Schedule\@level attribute to zero, and Level 1 schedules **shall** set the attribute to one.

When a Level 0 schedule is received, all un-played and non-expired Spots for the Broadcast Day are purged.

When a Level 1 schedule is received, all un-played and non-expired Spots take precedence over newly scheduled Spots with duplicate Key Values.

Note: The current generation of Traffic and Ad Insertion Systems currently support only whole day schedule updates, and only support the Event Type verbs 'LOI' and 'NUL'.

6.2.1. Event Type Verbs

LOI **shall** be the verb used for any Locally Originated Insertion, and represents any insertion being performed by the specific Ad Insertion System in question.

NUL **shall** represent no insertion and signals an Ad Insertion System to perform no insertion for the specified time when the Avail is signaled (enabling chained inserters, etc.).

The DEL verb **shall** delete a previously scheduled Spot based on Traffic Id.

Support for both LOI and NUL, form the Level 0 profile compliant with this Standard. Level 0 profile only allows for entire day schedule updates.

Systems implementing a Level 1 profile *may* utilize both the LOI and NUL verbs and **shall** implement both the 'DEL' verb and a delta schedule file (Level 1). Note: Through the utilization of a Level 1 profile schedule file, a Traffic System *may* add or delete one or more scheduled Spots without sending an entire new schedule file.

6.2.2. Duplicate Key Attributes

If Level 1 schedules are supported, an Ad Insertion System parsing a Level 1 schedule **shall** reject any Spots whose key attributes (see Section 7.4.1) are duplicates of those already scheduled. An Ad Insertion System parsing a Level 1 schedule *should* process DEL Event Types before LOI or NUL Event Types to prevent encountering a duplicate Spot schedule.

When scheduling a new Spot (either as an independent event or following a delete), a new unique Traffic Id *should* be assigned for each new Spot.

7. Format Of The XML Files

7.1. File Naming

The schedule filename, *shall* include the following fields in order, separated by dashes:

Table 1 - Schedule Filename Fields

Field	Notes
Broadcast Date	same as Broadcast Date Definition (section 7.4)
Zone Name	same as Zone name (section 7.4)
Network Name	same as Network name (section 7.4)
Schedule Revision	same as schedule revision (section 7.4)
File Extension	.SCH for Schedule Files

Example: 20051103-EAST-ESPN-1.SCH

The verification filename, *shall* include the following fields in order, separated by dashes:

Table 2 - Verification Filename Fields

Field	Notes
Broadcast Date	same as Broadcast Date Definition (section 7.6)
Zone Name	same as Zone name (section 7.6)
Network Name	same as Network name (section 7.6)
File Extension	.VER for Verification Files

Example: 20051103-EAST-ESPN.VER

7.2. Multi-Tier Support

Attributes with the 'Req' column set to 'All' are required for Tier 0, Tier 1 and Tier 2 support.

 In addition to those attributes required for Tier 0 insertion, 'Unique Program Identifier' *shall* be present to support Tier 1 insertion. These attributes are denoted by a '1' in the 'Req' column.

In addition to those attributes required for Tier 1 insertion, both 'Avail Number' and 'Avails Expected' *shall* be present to support Tier 2 insertion. They are denoted by a '2' in the 'Req' column.
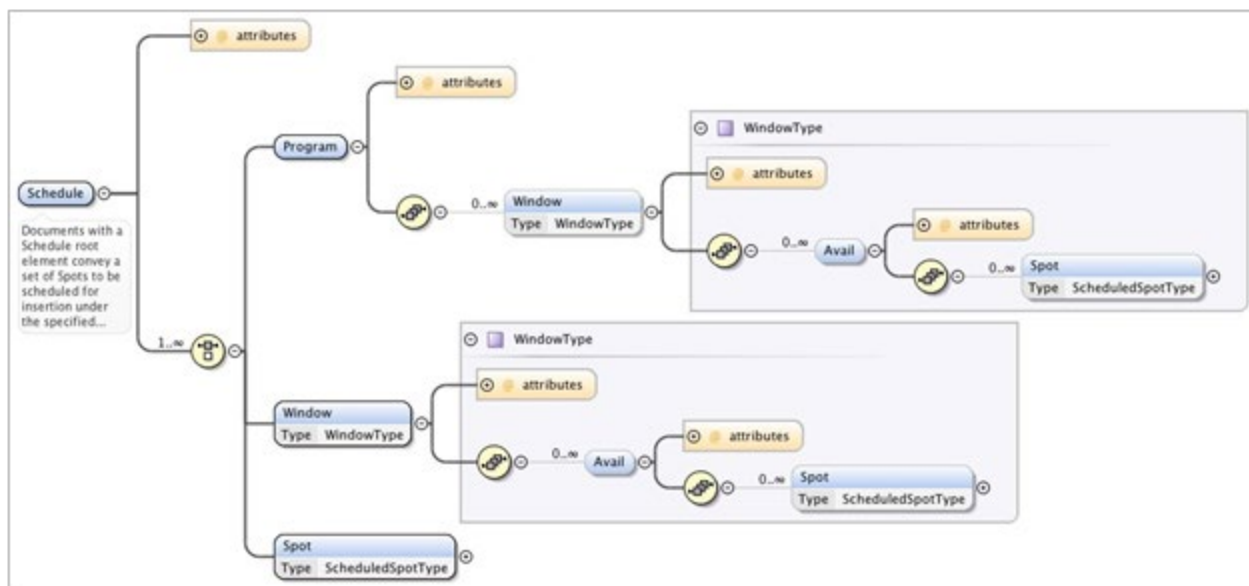
7.3. Schedule Schema Structure

Figure 1 - Schedule XML Schema Abstract

A Schedule File has a schedule element as the top-level (root) element. The Schedule File *may* have Programs, Windows and Spots as the child elements.

The schema for the Schedule File supports Windows (and their corresponding Avails and Spots) that are both associated with a Program and Windows that are specified by time only (which have Schedule as their parent element). Tier 0 insertions *may* be scheduled through either method, while Tier 1 and Tier 2 insertions *may* only be achieved through the use of Windows within a Program element.

Note: A Window whose parent is Schedule can be assumed to have a Program element with key attributes of zero. Conversely, if a schedule defines a Window whose parent element is a Program whose Unique Program Identifier is zero, the Window's behavior is essentially as if its parent is Schedule. All Windows belonging to an element with a Unique Program Identifier of zero (whether they are a child element of a Program or are child elements of Schedule) are peers and *should* implement their key attributes accordingly.

Spots *may* exist as children of the Schedule element if the Schedule is a Level 1 Schedule and the Spots that are children of the Schedule element are of Event Type 'DEL'.

The Schedule File Schema is specified in the companion schema file at http://www.scte.org/schemas/118-3/scte-118-3-2012.xsd.

7.4. Schedule File Attribute Descriptions

7.4.1. Definition of a Schedule's Key Attributes

Schedule Files **shall** avoid conflicts by not having two elements with duplicate key attributes with the same parent element. Key attributes prevent conflicts by disallowing elements that would create an ambiguous schedule file. If an element is encountered with the same parent element and whose key attributes match those of one of its siblings, it will be ignored. For example, two Programs with duplicate Unique Program Identifiers within a single Schedule element (which is prohibited in SCTE 118-1 [[9]

Section 7.1 due to overlapping Unique Program Identifiers lifespans) make it impossible to determine which Program is the intended Program of a SCTE 35[1] Cue Message.

A Schedule element's key attributes are Broadcast Date Definition, Schedule Revision, Network Name and Zone Name.

A Program element's key attributes are Unique Program Identifiers and Scheduled Program Date and Time.

All Window attributes are key attributes. If a Window occurs within a Program element, the Window's Scheduled Window Date and Time and Scheduled Window Duration *shall* be such that the Window occurs wholly within the lifecycle of the Program's Unique Program Identifier, centered on the Scheduled Program Date and Time (see SCTE 118-1[9] Section 6.1).

An Avail element's key attribute is Scheduled Avail Number within Window and Avail Number (if Tier 2).

A Spot's key attribute is Scheduled Avail Number within Window. The Traffic ID, which must also be unique, and Schedule Source represents a Spot whose own attributes and all parent elements' attributes are unique.

In the attribute description below the key attributes are represented with a 'Y' in the column labeled Key.

For the following table, the XML Reference column describes the parent element and attribute name for each attribute of the Schedule File.

Table 3 – Schedule File Attributes

Type	Format	Req	Key	Notes/Detailed Description	XML Reference
Broadcast Date Definition	scte118:date	All	Y	The calendar date which the Schedule element is considered to represent.	Schedule > @broadcastDate
Schedule Day Begin	xs:dateTime	All	N	This attribute allows for the definition of the actual date and time that is the beginning of the Broadcast Day.	Schedule > @begDateTime
Schedule Day End	xs:dateTime	All	N	This attribute allows for the definition of the actual date and time that is the end of the Broadcast Day.	Schedule > @endDateTime
Network Name	xs:string 2-5 char.	All	Y	Short Network name.	Schedule > @networkName
Zone Name	xs:string 2-8 char.	All	Y	Short Zone name.	Schedule > @zoneName

Type	Format	Req	Key	Notes/Detailed Description	XML Reference
Schedule Revision	xs:int	All	Y	This is meant to track the generation of schedule files, so that a user can differentiate between an original and updated (revised) file. Incremented each time a new revision is generated, starting from 1.	Schedule > @revision
Level	xs:int 0 or 1	N	N	If not present, 0. (see section 6.2)	Schedule > @level
SCTE [TBD] Schema Version	xs:anyURI	All	N	URI to the schema version of this Standard to which the current XML schedule is compliant.	Schedule > @schemaVersion
Program Name	xs:string 32 char.	N	N	e.g., Larry King Live, ESPN Sports Center, etc.	Program > @programName
Scheduled Program Date and Time	xs:dateTime	1 & 2	Y	When the Program is scheduled to begin, as published by the Network in SCTE 118-2[8]. This is the midpoint of the 24 hour window which is the lifecycle of a Unique Program Identifier.	Program > @programStart
Scheduled Program Duration	scte118:duration	N	N	Scheduled duration of the Program.	Program > @programDuration
Unique Program Identifier	xs:int 0 – 65535	1 & 2	Y	see SCTE 35[1] (unique_program_id) – Default to 0 if not specified. 0 means no Program ID available, and represents a Tier 0 scheduled element.	Program > @uniqueProgramId
Avails Expected	xs:int 0 – 255	2	N	see SCTE 35 (avails_expected) – Default to 0 if not specified. 0 means no Avails Expected available, and represents a Tier 0 or Tier 1 scheduled element.	Program > @availCount
Scheduled Window Date and Time	xs:dateTime	All	Y	The beginning of the active window for the spot. Used for determining when a Window is valid and when it has expired.	Window > @windowStart

Type	Format	Req	Key	Notes/Detailed Description	XML Reference
Scheduled Window Duration	scte118:duration	All	Y	The length of time the active window is open for the spot. Used for determining when a Window is valid and when it has expired.	Window > @windowDuration
Scheduled Avail Date and Time	xs:dateTime	No	N	The anticipated beginning of the avail cue message. (Informative)	Avail > @availStart
Scheduled Avail Number within	xs:int 1-999	All	Y	This is the avail number within the current window	Avail > @availInWindow
Avail Number	xs:int 0 – 255	2	Y	see SCTE 35 (avail_num) – Default to 0 if not specified. 0 means no Avail Number available and represents a Tier 0 or Tier 1 scheduled element.	Avail > @availNum
Event Type	xs:string 3 char.	All	N	(see Section 6.2.1)	Spot > @eventType
Traffic ID	xs:int	All	N	Unique ID generated by the T&B system to track a specific instance of a Spot. Used for verification and deleting a Spot.	Spot > @trafficId
Scheduled Position Number within Avail	xs:int 1-999	All	Y	Scheduled position for a specific commercial within a avail. Positions defined temporal order, not absolute time.	Spot > @positionInAvail
Scheduled Spot Length	scte118:duration	All	N	The length of the spot scheduled to play	Spot > @length
Spot Identification	xs:string 20 char.	All	N	The T&B assigned spot identifier	Spot > @spotId
Advertiser Name	xs:string 32 char.	N	N	Value provided by the T&B system as entered by the operator/MVPD.	Spot > @advertiserName
Advertiser Spot Name	xs:string 20 char.	N	N	Value provided by the T&B system as entered by the operator/MVPD.	Spot > @spotName
Spot Type	xs:string 5 char.	N	N	SCHED – Scheduled FILL – Fill BONUS – Bonus	Spot > @spotType

| Type	Format	Req	Key	Notes/Detailed Description	XML Reference
Schedule Source	xs:string 16 char.	All	N	e.g. interconnect, local, national, marketing, etc. Assigned by the originating T&B system. Uniqueness is not ensured and will need to be coordinated between sites if schedules will be merged.	Spot > @schedSource
Contract Order Start DateTime	xs:dateTime	N	N	If contract order start time is populated then contract order end time must also be populated, or they are invalid. Used to allow a missed spot to insert in a future bonus/fill location in the same day	Spot > @contractStart
Contract Order End DateTime	xs:dateTime	N	N	If contract order end time is populated then contract order start time must also be populated, or they are invalid. Used to allow a missed spot to insert in a future bonus/fill location in the same day	Spot > @contractEnd
Priority	xs:int 1-999	N	N	Determines the priority of a failed ad for inserting into a future bonus/fill location	Spot > @priority
Value	xs:int	N	N	The value of the spot to the nearest dollar	Spot > @value
Ad ID	xs:string 32 char.	N	N		Spot > @adId

7.5. Verification Schema Structure
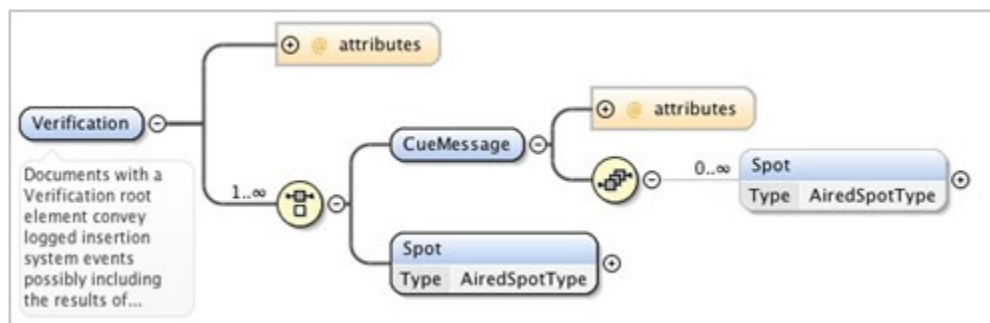
Figure 2 - Verification XML Schema Abstract

A Verification File *shall* have a verification element as the top-level (root) element. The child elements *may* be either CueMessage elements or Spot elements.

A Spot element *shall* exist as a child of the verification element for each Spot scheduled (and not Deleted).

A CueMessage element *shall* exist for each Cue Message received by the Ad Insertion System. A CueMessage *shall* have a Spot element for each Spot that the Ad Insertion System attempted to play in response to the Cue Message. If the Ad Insertion System did not attempt to play a Spot, the CueMessage will have no child elements.

A Spot element that is a child of the parent verification element *shall* exist for each Spot which did not attempt to play as a result of no corresponding Cue Message.

The Verification File Schema is specified in the companion schema file SCTE-118-3.xsd.

7.6. Verification File Structure

For the following table, the XML Reference column describes the parent element and attribute name for each attribute of the Verification File.

Table 4 - Verification File Attributes

Type	Format	Req	Notes/Detailed Description	XML Reference
Broadcast Date Definition	scte118:date	All	The calendar date which the verification element is considered to represent.	Verification > @broadcastDate
Verification Day Begin	xs:dateTime	All	This attribute allows for the definition of the actual date and time that is the beginning of the Broadcast Day.	Verification > @begDateTime
Verification Day End	xs:dateTime	All	This attribute allows for the definition of the actual date and time that is the end of the Broadcast Day.	Verification > @endDateTime

Network Name	xs:string 2 to 5 char.	All	Short Network name.	Verification > @networkName
Zone Name	xs:string 2 to 8 char.	All	Short Zone name.	Verification > @zoneName
Verification Complete	xs:boolean	N	Flag that Ad Insertion System believes that all events scheduled for the Broadcast Day have been verified.	Verification > @verComplete
SCTE [118-3] Schema Version	xs:anyURI	All	URI to the schema version of this Standard to which the current XML verification is compliant.	Verification > @schemaVersion
Cue Message Receive Time	xs:dateTime	All	Time at which the Cue Message is received.	CueMessage > @receiveTime
Cue Message Unique Program Identifiers	xs:int 0 – 65535	All	see SCTE 35 [1] (unique_program_id) – value specified in the Cue Message.	CueMessage > @uniqueProgramId
Cue Message Avail Number	xs:int 0 – 255	All	see SCTE 35 [1] (avail_num) – value specified in the Cue Message.	CueMessage > @availNum
Cue Message Avails Expected	xs:int 0 – 255	All	see SCTE 35 [1] (avails_expected) – value specified in the Cue Message.	CueMessage > @availCount
Traffic ID	xs:int	All	Traffic ID specified by the schedule file.	Spot > @trafficId
Spot Identification	xs:string 20 char.	All	The T&B assigned spot identifier	Spot > @spotId
Aired Date and Time	xs:dateTime	All	Actual time at which the system attempted to play the Spot.	Spot > @airTime

Aired Length	scte118:duration	All	Actual length the Spot Played. 0 if the Spot did not play.	Spot > @airLength
Aired Position within Avail	xs:int 1 – 999	All	Actual aired position. 0 if the Spot did not play.	Spot > @airPosition
Status Code	xs:int 1 - 9999	All	(see Appendix A)	Spot > @airStatusCode
Status Text	xs:string 0-256 char.	N	Additional Status Information.	Spot > @airStatusText
Spot Type	xs:string 5 char.	N	SCHED – Scheduled FILL – Fill BONUS – Bonus	Spot > @spotType
Schedule Source	xs:string 16 char.	All	e.g. interconnect, local, national, marketing, etc. Assigned by the originating T&B system. Uniqueness is not ensured and will need to be coordinated between sites if schedules will be merged. Must be included in Verification if specified in the Schedule.	Spot > @schedSource

Appendix A: Status Codes

Table 5 - Status Codes

Status Code	Description
0001	Aired Successfully.
0002	Generic Failed to Air.
0004	Failed, Bypass On.
0005	Failed, Logging Turned Off.
0006	Failed, Bad Video.
0008	Failed, User Abort.
0009	Failed, Inserter Abort.
0010	Failed, Device Not Ready.
0012	Failed, Unknown Error.
0013	Failed, Time Out.
0014	Failed, Device Time Out.
0015	Failed, System Error.
0016	Failed, Operator Error.
0017	Failed, Inserter Busy.
0018	Failed, Insertion Conflict.
0019	Failed, Directory Error.
0020	Failed, No Ad Copy in Inserter.
0021	Failed, Cued Late.
0022	Failed, Channel Collision.
0023	Failed, No Cue in Window.