Errata Notice on Schema Locations

(September 30, 2020)

This standard makes use of namespace locations with a form of http://www.scte.org/schemas/xyz/*, where “xyz” is the location of the specific schema being referenced. Due to limitations on the current SCTE•ISBE website, those specific locations are not available.

To find such schemas:

1. Go to the standards download page at https://www.scte.org/download-scteisbe-standards/
2. Search for the standard number (xyz in the above example)
3. Expand the listing by clicking the plus (+) button to the left of the standard number

The expanded list will show the desired schema.

This notice will be removed once the exact namespace values are functional.
Digital Video Subcommittee

AMERICAN NATIONAL STANDARD

ANSI/SCTE 130-3 2020

Digital Program Insertion-Advertising Systems Interfaces

Part 3

Ad Management Service (ADM) Interface
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</tr>
<tr>
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<td>323</td>
</tr>
</tbody>
</table>
Digital Program Insertion—Advertising Systems Interfaces
Part 3—Ad Management Service (ADM) Interface

1.0 SCOPE

This document in conjunction with the SCTE 130 Part 3 Extensible Markup Language (XML) schema document (i.e., the XSD document) defines the XML messages expressing placement opportunities, placement decisions, and placement related event data typically exchanged between an Ad Management Service (ADM) and an Ad Decision Service (ADS). Additionally, this document and the accompanying schema document describe the auxiliary XML messages, elements, and attributes supporting the primary message exchanges.

2.0 REFERENCES

2.1 Normative references

The following documents contain provisions, which, through reference in this text, constitute provisions of the standard. At the time of Subcommittee approval, the editions indicated were valid. All standards are subject to revision; and while parties to any agreement based on this standard 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 may not be compatible with the referenced version.

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
</tr>
</thead>
</table>

All normative references found in SCTE 130 Part 2 are normatively included and apply to this document. See [SCTE130-2] for additional information.

2.2 Informative References

The following documents may provide valuable information to the reader but are not required when complying with this standard.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SCTE236]</td>
<td>ANSI/SCTE 236—Content Metadata.</td>
</tr>
<tr>
<td>[SCTE118-2]</td>
<td>ANSI/SCTE 118-2: Program-Specific Ad Insertion-Content Provider to Traffic Communication Applications Data Model</td>
</tr>
</tbody>
</table>

### 3.0 COMPLIANCE NOTATION
### 4.0 DEFINITION OF TERMS

Throughout this standard the terms below have specific meanings. Because some of the terms are defined in other SCTE documents having very specific technical meanings, the reader is referred to the original source for their definition. For terms defined by this standard, brief definitions are given below.

All SCTE 130 Part 2, SCTE 130 Part 7 and SCTE 130 Part 8 definitions are normatively included herein. See [SCTE130-2], [SCTE130-7] and [SCTE130-8] for additional information.

This document additionally defines the following terms:

**ADM interface:** The ADM to ADS message communication link defined by SCTE 130 Part 3 (i.e., this document and its companion XML schema document).

**interstitial:** A placement opportunity occurring between entertainment assets (e.g., placement opportunities that exist between music videos in a playlist). An interstitial placement opportunity is not associated with the entertainment assets that *may* be part of a session containing interstitial placement opportunities. An interstitial placement opportunity does not preclude the entertainment asset preceding the interstitial placement opportunity from having post-roll placement opportunities or the entertainment asset following from having pre-roll placement opportunities.
**mid-roll:** A placement opportunity occurring within an entertainment asset.

**placement:** The decision resulting from a placement opportunity which *may* include a content binding and a set of constraints.

**placement management:** The aggregated operational sequence of placement messaging and placement update messaging.

**placement operations:** Placement management aggregated with placement status messaging.

**placement messaging:** The PlacementRequest / PlacementResponse message exchange sequence.

**placement status messaging:** The PlacementStatusNotification / PlacementStatusAcknowledgement message exchange sequence.

**placement update messaging:** The PlacementUpdateNotification / PlacementUpdateAcknowledgement message exchange sequence.

**placement opportunity:** A potentially constrained location relative to digital content where ad insertion or content alterations *may* occur. The alterations *may* include insertions, replacements, or deletions of content in whole or in part. These locations, which contain the opportunity for content insertion, have traditionally been referred to as avails [SCTE35] for linear video content; however, placement opportunity refers to address and time locations where content *may* be placed, regardless of platform.

**placement service:** The distinctive information (i.e., characteristic set) identifying an entertainment content flow where advanced advertising techniques *may* apply.

**post-roll:** A placement opportunity following the play out of an entertainment asset.

**pre-roll:** A placement opportunity preceding an entertainment asset. (Note: Definition differs from SCTE 35. See [SCTE35].)

**registration-established service channel:** A service channel duration commencing with a successful placement service registration and continuing until either participating logical service completes terminating an active service channel. (Note: This document refines the SCTE 130 Part 2 definition by qualifying the registration as a placement service registration. See [SCTE130-2] for the base definitions.)

### 5.0 ABBREVIATIONS

All SCTE 130 Part 2, SCTE 130 Part 7 and SCTE 130 Part 8 abbreviations are normatively included herein. See [SCTE130-2], [SCTE130-7] and [SCTE130-8] for additional information.
This document additionally uses the following abbreviations:

NPT: Normal Play Time

PODM: Placement Opportunity Data Model

SCTE: Society of Cable Telecommunications Engineers

UTC: Coordinated Universal Time

VOD: Video on Demand
6.0 INTRODUCTION

The Ad Management Service (ADM) and the Ad Decision Service (ADS) are core elements in a standardized SCTE 130 advanced advertising system. Both the ADM and the ADS shall be SCTE 130 compliant logical services implementing all messages and message semantics as defined in SCTE 130 Part 2 and this document. See [SCTE130-2] for additional Part 2 information.

The ADM originates messages articulating ad insertion opportunities (i.e., placement opportunities) with the primary communication consumer being the ADS. The ADS determines how advertising content is combined with non-advertising (entertainment) content assets (i.e., placement decisions). The ADM completes the opportunity/decision lifecycle via reporting activity events (i.e., placement status). The ADM/ADS communication interface is defined herein and it is referred to as the ADM interface throughout the remainder of this specification. The ADM interface facilitates both preconfigured ad decisions as well as real-time placement selection.

Figure 1 illustrates a very basic example advertising system utilizing only an ADM and an ADS. Figure 1 represents one possible configuration and many other combinations beyond the illustration are possible.

![Figure 1: A Very Basic SCTE 130 Advertising System](image_url)

In Figure 1, the placement system, represented by the Placement Execution cloud, is responsible for opportunity determination and placement execution (e.g., content insertion/splicing). Communication between the ADM and the Placement Execution cloud is outside the scope of this specification. The ADM, via the ADM interface, communicates placement opportunities and placement status to the ADS and the ADS returns placement decisions as a response to placement opportunities. The Campaign Management cloud symbolizes the system providing the information necessary for the ADS to render ad decisions. Communication between the ADS and the Campaign Management cloud is outside the scope of this specification. The internal implementation and operation of both the ADM and the ADS are outside the scope of this specification.

The ADM and the ADS may be clients of any SCTE 130 defined logical service as illustrated in Figure 2.
The Content Information Service (CIS) provides content asset metadata and availability information for both advertising and non-advertising content. See [SCTE130-4] for additional information. The Placement Opportunity Information Service (POIS) may supply placement opportunity descriptions. See [SCTE130-5] for additional information. The Subscriber Information Service (SIS) may provide relevant subscriber information such as advertising focus refinement parameters. See [SCTE130-6] for additional information. With the exception of the ADM interface (i.e., the ADM/ADS communication path), all Figure 2 elements are outside the scope of this specification.

An ADM may support multiple, simultaneously active ADS as each ADS may provide different placement decision services. An ADS may provide the same decision services or different services to multiple ADM simultaneously. Figure 3 illustrates these possible high-level interconnects.
Figure 3: ADM/ADS Interconnects

Figure 4 illustrates a more sophisticated example SCTE 130 advertising system leveraging multiple SCTE 130 logical services. Figure 4 represents one possible configuration and many other combinations beyond the illustration are possible.
In this example, the Placement Execution cloud and/or the ADM block may consult the POIS for placement opportunity information with the POIS fronting the Inventory System cloud. Additionally, the ADS may communicate with the POIS to acquire the same placement opportunity information for its usage. The Inventory System cloud symbolizes the advertising opportunity scheduling systems. Either or both the ADM and ADS may communicate with the CIS to obtain content asset metadata and ad asset availability information. The ADM, ADS, and/or the POIS may communicate with the SIS in order to obtain relevant subscriber information such as advertising focus refinement parameters and placement opportunity enablement. This SIS fronts the Back Office cloud which represents the Operation Support Systems (OSS) and Business Support Systems (BSS). With the exception of the ADM interface, all Figure 4 elements are outside the scope of this specification.

6.1 Document Organization

This document provides a structured, logical approach to the SCTE 130 ADM interface. Each subsequent section focuses on a particular specification aspect and this document’s presentation order provides a top-down, conceptual introductory understanding necessary to implement the ADM interface.

Section 7 explains this document’s notational conventions and Section 8 identifies the processing conventions. Section 9 defines the XML namespace usage and the applicable XML semantics. Section 10 introduces the ADM interface messaging concepts.
Section 11 defines the ADM interface logical service management messages and Section 12 defines the placement operations messages. Section 11 and subsequent sections often may reference XML attributes and elements defined later in this document. The reader may occasionally need to reference other document sections or SCTE 130 Part 2 [SCTE130-2] in order to find the complete explanation of a syntactic component.

Section 13 presents the ADM interface’s XML attributes and complex types followed by Section 14 which defines the specification’s individual XML elements. Attributes, complex types, and elements in Section 13 and Section 14 are presented in alphabetical order. Appendix A provides the normative status code values, their meanings, and their message usage applicability followed by Appendix B which is an informative example.

6.2 Placement Service

The term placement service refers to the distinctive information identifying an entertainment content flow where advanced advertising techniques may apply. Typically, the ADM is provisioned to be aware of the entertainment content for which it shall offer placement opportunities and this configuration generally occurs via some external mechanism which is outside the scope of this specification. Example entertainment content includes a traditional linear broadcast network feed, a zoned form of the broadcast network, or a specific provider’s collection of on-demand video assets to name just a few types.

The actual placement service definition is a compound information grouping utilizing two XML elements—the SystemContext element and the Service element. See Section 14.52 and Section 14.44 respectively for additional information. A placement service is identifiable via the Service element’s @id attribute. Placement service organization is facilitated via the ServiceDescription element. See Section 14.45 for additional information. The combination of elements and their sub-elements provide for a rich placement service expression capability.

The ADM may be queried for its list of provisioned placement services via the list ADM services message exchange. See Section 11.2 for additional information. Based upon the list of offered placement services, the ADS registers for the placement services for which it desires to provide placement decisions. See Section 11.3 for additional information regarding registration. The ADS registration may be more or less general than the details provided by the list ADM services message exchange.

The remainder of this document defines the ADM interface.

7.0 NOTATIONAL CONVENTIONS

7.1 Normative XML Schema

See [SCTE130-2] for information.
7.2 Document Conventions

This specification utilizes the same document conventions as SCTE 130 Part 2. See [SCTE130-2] for conventions and XML schema illustration nomenclature explanations.

This specification utilizes XML substitution groups for additional extensibility. XML substitution groups designate elements as substitutes for other element declarations without changing the original schema documents. Within this document, substitutable elements are graphically identified using the following illustrative technique.

![Diagram of Substitution Group Schema Convention]

**Figure 5: Substitution Group Schema Convention**

In Figure 5, the element referred to as “SubstituteElement” may be used in place of the element named “BaseSubstitutableElement” provided the XML namespace declarations are included in the document as per [W3C-XSD]. The diagram’s illustrative arrow signals the reader of the possible element substitution.

8.0 PROCESSING CONVENTIONS

8.1 Unknown/Unrecognized/Unsupported XML Elements and Attributes

See [SCTE130-2] for information.

9.0 XML NAMESPACES

This document uses the ‘adm’ prefix for the interface associated with this specification’s XML namespace URI. This URI **shall** be used by all implementations applying this specification. Table 1 lists the prefix, the corresponding namespace, and a description of the defining specification.
<table>
<thead>
<tr>
<th>Standard</th>
<th>XML Schema Prefix</th>
<th>XML Schema Elements</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>core (SCTE 130-2)</td>
<td>Schema namespace</td>
<td><a href="http://www.scte.org/schemas/130-2/2008a/core">http://www.scte.org/schemas/130-2/2008a/core</a>&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schema version attribute</td>
<td>20200321</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schema filename</td>
<td>SCTE_130-2_core_20200321.xsd</td>
<td></td>
</tr>
<tr>
<td>adm (This doc.)</td>
<td>Schema namespace</td>
<td><a href="http://www.scte.org/schemas/130-3/2013/adm">http://www.scte.org/schemas/130-3/2013/adm</a>&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schema version attribute</td>
<td>20200326</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schema filename</td>
<td>SCTE_130-3_adm_20200326.xsd</td>
<td></td>
</tr>
<tr>
<td>podm (This doc. Appendix D)</td>
<td>Schema namespace</td>
<td><a href="http://www.scte.org/schemas/130-3/2013/adm/podm">http://www.scte.org/schemas/130-3/2013/adm/podm</a>&lt;sup&gt;3&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schema version attribute</td>
<td>20200326</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schema filename</td>
<td>SCTE_130-3_podm_20200326.xsd</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> While this specification has a ratified year of 2020, the XML schema/XSD namespace has a year of 2008a, which is the year the XSD and this specification’s syntax was initially ratified. All subsequent changes have been backwards compatible and thus, the namespace has not changed.

<sup>2</sup> While this specification has a ratified year of 2020, the XML schema/XSD namespace has a year of 2013, which is the year the XSD and this specification’s syntax was initially ratified. All subsequent changes have been backwards compatible and thus, the namespace has not changed.

<sup>3</sup> See note 2.
<table>
<thead>
<tr>
<th>Schema namespace</th>
<th>Schema version attribute</th>
<th>Schema filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>podm_query</td>
<td>20200326</td>
<td>SCTE_130-3_podm_query_20200326.xsd</td>
</tr>
<tr>
<td>gis</td>
<td>20200325</td>
<td>SCTE_130-8_gis_20200325.xsd</td>
</tr>
<tr>
<td>admwsdl</td>
<td>n/a</td>
<td>adm_20200326.wsdl</td>
</tr>
</tbody>
</table>

---

4 While this specification has a ratified year of 2020, the XML schema/XSD namespace has a year of 2013, which is the year the XSD and this specification’s syntax was initially ratified. All subsequent changes have been backwards compatible and thus, the namespace has not changed.

5 While this specification has a ratified year of 2020, the XML schema/XSD namespace has a year of 2011, which is the year the XSD and this specification’s syntax was initially ratified. All subsequent changes have been backwards compatible and thus, the namespace has not changed.

6 While this specification has a ratified year of 2020, the WSDL namespace has a year of 2013, which is the year the WSDL and this specification’s syntax was initially ratified. All subsequent changes have been backwards compatible and thus, the namespace has not changed.
9.1 @version Attribute

For this specification’s defined messages, the message’s @version attribute shall be set to the value “1.4” corresponding to this document’s revision. For those messages defined by SCTE 130 Part 2, the @version value shall be set to the value defined and specified in SCTE 130 Part 2. See [SCTE130-2] for additional information.

The @version attribute in conjunction with the namespace identifier (see Table 1) form the formal specification version identification.

See Section D.4.1 for further clarification of PODM versioning in this release and backward compatibility for this version and previous versions including specific element usage limitations applicable to version "1.4".

10.0 ADM INTERFACE MESSAGE INTRODUCTION

The following topics are covered by SCTE 130 Part 2 and this specification considers all aspects defined therein to be normative and applicable herein. See [SCTE130-2] for information specific to this list and for expanded associated topics.

- Message format

---

7 While this specification has a ratified year of 2020, the WSDL namespace has a year of 2013, which is the year the WSDL and this specification’s syntax was initially ratified. All subsequent changes have been backwards compatible and thus, the namespace has not changed.
The ADM interface defined herein shall include all messages defined in SCTE 130 Part 2 and all ADM interface messages shall be compliant with SCTE 130 Part 2. Table 2 enumerates the ADM interface messages defined herein along with the message originators (i.e., the message sources). Both the ADM and the ADS shall be compliant with all messages listed in Table 2 and all Table 2 message’s @version attribute shall comply with Section 9.1.

<table>
<thead>
<tr>
<th>Message</th>
<th>Source</th>
<th>Registration Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCTE 130 Part 3 Defined Messages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ListADMServicesRequest</td>
<td>ADS</td>
<td></td>
</tr>
<tr>
<td>ListADMServicesResponse</td>
<td>ADM</td>
<td></td>
</tr>
<tr>
<td>ADSRegistrationRequest</td>
<td>ADS</td>
<td></td>
</tr>
<tr>
<td>ADSRegistrationResponse</td>
<td>ADM</td>
<td></td>
</tr>
<tr>
<td>ListADSRegistrationRequest</td>
<td>ADS</td>
<td></td>
</tr>
<tr>
<td>ListADSRegistrationResponse</td>
<td>ADM</td>
<td></td>
</tr>
<tr>
<td>ADSDeregisterRequest</td>
<td>ADS</td>
<td>X</td>
</tr>
<tr>
<td>ADSDeregisterResponse</td>
<td>ADM</td>
<td>X</td>
</tr>
<tr>
<td>ADSDeregistrationNotification</td>
<td>ADM</td>
<td>X</td>
</tr>
<tr>
<td>ADSDeregistrationAcknowledgement</td>
<td>ADS</td>
<td>X</td>
</tr>
<tr>
<td>PlacementRequest</td>
<td>ADM</td>
<td>X</td>
</tr>
<tr>
<td>PlacementResponse</td>
<td>ADS</td>
<td>X</td>
</tr>
<tr>
<td>PlacementUpdateNotification</td>
<td>ADS</td>
<td>X</td>
</tr>
<tr>
<td>PlacementUpdateAcknowledgement</td>
<td>ADM</td>
<td>X</td>
</tr>
<tr>
<td>PlacementStatusNotification</td>
<td>ADM</td>
<td>X</td>
</tr>
<tr>
<td>PlacementStatusAcknowledgement</td>
<td>ADS</td>
<td>X</td>
</tr>
<tr>
<td>SCTE 130 Part 2 Defined Messages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>core:ServiceStatusNotification</td>
<td>ADM or ADS</td>
<td></td>
</tr>
<tr>
<td>core:ServiceStatusAcknowledgement</td>
<td>ADM or ADS</td>
<td></td>
</tr>
<tr>
<td>core:ServiceCheckRequest</td>
<td>ADM or ADS</td>
<td></td>
</tr>
<tr>
<td>core:ServiceCheckResponse</td>
<td>ADM or ADS</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: SCTE 130 Part 3 Messages and Message Sources

Typically, a communication channel, referred to as service channel (see [SCTE130-2] for additional information) is established between two logical services in order to enable one
service to deliver messages to another logical service. The service channel comprises both the logical and physical characteristics and the service channel lifecycle is dependent on the message type.

There are two common service channel lifecycles for this specification’s messages. The first service channel lifecycle is limited to the duration of the single message pair exchange (i.e., a send and receive). The second service channel lifecycle duration commences with a successful placement service registration and continues until either participating logical service completes terminating the active service channel. This second service channel lifecycle is referred to herein as a registration-established service channel.

In Table 2, the column “Registration Required” indicates whether the specific message requires a registration-established service channel in order to be sent or received. A successful and active registration message exchange creating a registration-established service channel shall occur before any of these messages shall be sent and these messages shall only be exchanged for the active service channel duration. Registration-established service channel termination shall prohibit these messages from being exchanged on the concluded service channel.

Once successfully constructed, the registration-established service channel shall remain active until terminated via deregistration. Normal service channel termination shall occur via a deregistration message exchange. Abnormal termination (e.g., a system failure, etc.) should attempt to use the normal deregistration sequences. However, these situations may require alternative deregistration mechanisms outside the scope this specification.

Deregistration may be initiated by either the ADS or the ADM using an ADSDeregisterRequest or an ADSDeregistrationNotification message respectively. Physical and/or transport layer connections may transition without impacting the service channel active state. That is, the registration-established service channel maintains its operational state independent of the transport persistence. For example, if TCP/IP is used as the transport protocol, the TCP/IP connection may be terminated and re-established multiple times during which time the registration-established service channel is considered to remain persistent.

The ADM interface message exchanges are grouped into the following general activity categories:

Logical service management which covers:

- Communication management including placement service offering descriptions, registration, and deregistration

- Status management including logical service health checks, logical service status notifications, and active registration listing

Placement operations which includes:

- Placement management including placement opportunity descriptions, placement decisions which may include placements and placement updates
Placement status consisting of placement event reporting which “close the loop” on placement decisions

Figure 6 illustrates a high-level overview of the typical message exchange sequences between an ADS and an ADM.

Figure 6: Message Exchange Overview

The ADS may obtain the list of offered ADM placement services, capabilities and message exchange endpoints using the ListADMServices message exchange. The ADS registers its placement decision intentions using the registration message exchange and terminates its
placement service relationship using the deregistration message exchange. At any time, either logical service may notify or check the service health and status of the peer.

The placement operations message exchanges encompass placement messaging (i.e., PlacementRequest/PlacementResponse messages), placement update messaging (i.e., PlacementUpdateNotification/PlacementUpdateAcknowledgement messages), and placement status messaging (i.e., PlacementStatusNotification/PlacementStatusAcknowledgement messages). These messages exchanges describe placement opportunities, placement decisions, placement decision updates, and placement reporting for the placement decisions.

11.0 ADM INTERFACE—LOGICAL SERVICE MANAGEMENT MESSAGES

Excluding placement operations messages, this specification defines the following message exchanges for the purpose of logical service provisioning and status management:

- List offered placement services—a detailed list of ADM provided placement services, ADM capabilities, and ADM message exchange endpoints.
- Registration—ADS placement service identification and establishment of the service channel(s).
- Registration status—a report of the established placement services and their service channels.
- Deregistration—the termination of placement services and their established service channels.
- Logical service health—the abilities to verify that a service channel, logical service and transport connection are alive and operational and to provide logical service status notifications. The capabilities leverage the SCTE 130 Part 2 core:ServiceStatus and core:ServiceCheck message exchanges as defined therein. See [SCTE130-2] for additional information.

The following sections detail this specification’s logical service management messages.

11.1 ADM Logical Service Discovery

Initial ADM logical service discovery is outside the scope of this specification. SCTE 130 Part 7 may provide details. See [SCTE130-7] for additional information.

With the exception of the ADM and its ListADMServicesRequest message exchange endpoint discovery, the remaining endpoints may be directly provided by both the ADM and ADS (i.e., they do not require separate discovery mechanisms and may be bootstrapped using the messages defined herein). See Sections 11.2 and 11.3 for additional information.
11.2 List ADM Placement Services

Any logical service may query an ADM at any time for its offered placement services, capabilities, and message exchange endpoint addresses. The querying entity is not required to be registered prior to making this query and the query may occur at anytime. This message exchange duration defines this service channel lifecycle. Typically, the message exchange occurs before registration and its associated registration-established service channel establishment. Figure 7 illustrates the list ADM placement services message exchange.

![Figure 7: List ADM Placement Services Message Exchange](image)

An ADS initiates the message exchange using the ListADMServicesRequest message and the ADM shall respond with a ListADMServicesResponse message. The ADM response includes the following:

- The ADM offered placement service list
- The ADM capabilities
- The ADM message exchange endpoint list

How an ADM determines its offered placement service list and capabilities is outside the scope of this specification.

The ADM message exchange endpoint list may supply the ADS with ADM endpoints for individual message processing entry. Typically, the list is populated with the endpoint set necessary for bootstrapping ADS to ADM communications. With the exception of the discovery of the ListADMServicesRequest endpoint, the remaining ADM/ADS message exchange endpoints may be provided using a combination of the ListADMServicesResponse message and the registration message exchange (i.e., ADSRegistrationRequest/ADSRegistrationResponse messages).

The list ADM offered placement services message schemas are described in the following sections.

11.2.1 ListADMServicesRequest Message Schema

Figure 8 illustrates the list ADM placement services request message schema.
11.2.1.1 Semantic Definitions for the ListADMServicesRequest Message

@**messageId** [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@**version** [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@**identity** [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@**system** [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@**resend** [Optional, core:resendAttrType]—The message is a retransmit of a previous ListADMServicesRequest message. The
attribute’s value is the original message’s @messageId value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the ListADMServicesResponse message. See [SCTE130-2] for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The ListADMServicesRequest element’s value may be empty.

11.2.2 ListADMServicesResponse Message Schema

Figure 9 illustrates the list ADM placement services response message schema describing the placement services offered by the ADM.
Figure 9: ListADMServicesResponse Message Schema
11.2.2.1 Semantic Definitions for the ListADMServicesResponse Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the paired ListADMServicesRequest message element initiating this message exchange. The value shall be the ListADMServicesRequest message’s @messageId attribute value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the ListADMServicesRequest message’s core:InitiatorData element and shall only be present if found in the paired request message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the ListADMServicesRequest message processing. See [SCTE130-2] and Appendix A for additional information.

ADMCapabilities [Optional]—ADM supported options and limitations. Element omission shall indicate the ADM is using the element’s defined default values. See Section 14.1 for additional information.

ServiceDescription [Optional]—Zero or more ServiceDescription elements where each ServiceDescription element uniquely describes a collection of ADM offered placement services. See Section 14.45 for additional information. If the core:StatusCode element does not contain a success value, the ServiceDescription elements may be omitted. If an ADM is offline, then no elements may be present. The element sequence order shall not convey information.

core:Callout [Optional]—Zero or more core:Callout elements specifying the ADM message exchange endpoint(s). See [SCTE130-2] for additional information. Zero core:Callout elements may be returned for either an error condition or if the ADM endpoint discovery is occurring via a different mechanism.
A single message exchange endpoint may be defined to handle all ADM destined messaging identified in Table 3. If a single endpoint is handling all messaging, there should be only one core:Callout element present in the ListADMServicesResponse message and the core:Callout element’s @message attribute shall not be used. This core:Callout element is referred to as the default endpoint.

If independent endpoints are desired, the core:Callout element’s @message attribute shall be used and each core:Callout element shall contain a value from Table 3. The core:Callout element’s @message attribute’s value shall appear exactly as shown in Table 3.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceStatusNotification</td>
<td>Destination for ServiceStatusNotification messages.</td>
</tr>
<tr>
<td>ADSRegistrationRequest</td>
<td>Destination for ADSRegistrationRequest messages.</td>
</tr>
<tr>
<td>ADSDeregisterRequest</td>
<td>Destination for ADSDeregisterRequest messages.</td>
</tr>
<tr>
<td>ListADSRegistrationRequest</td>
<td>Destination for ListADSRegistrationRequest messages.</td>
</tr>
<tr>
<td>…</td>
<td>User defined message endpoints which are outside of this specification’s scope. The string shall be prefixed with the text “private:”.</td>
</tr>
</tbody>
</table>

Table 3: ListADMServicesResponse/core:Callout/@Message Attribute Values

If independent message exchange endpoints are desired for only a subset of endpoints, the default endpoint may be used in conjunction with one or more additional core:Callout elements containing values from Table 3. All message endpoints listed in Table 3 that are not specifically referenced by an @message attribute shall be available through the default endpoint (assuming one is supplied). This behavior allows an ADM to provide message exchange endpoints for one or more core:Callout endpoints while utilizing a single, general purpose endpoint for all other messaging.

If no default endpoint is supplied and only a subset of the Table 3 endpoints are provided in the ListADMServicesResponse message, the unlisted endpoints shall be discovered by a different, unspecified mechanism which is outside the scope of this specification.

Within the core:Callout element, the ADM may provide one or more core:Address elements. The processing rules for these elements are not specified here and are outside the scope of this specification.

Each core:Address element contained within the core:Callout element shall support the core:ServiceCheck message exchange as per [SCTE130-2]. When a Callout element contains more than one Address element, at least one Address element specified reception endpoint shall successfully
respond to the ServiceCheckRequest message as required by [SCTE130-2].

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

### 11.2.3 List ADM Placement Services Examples

Example 1 illustrates a successful list ADM placement services request and response (Example 2) message exchange for an ADM offering a single entry representing “all” services (thus, a generic service description element). Note: The string “All ADM Offered Services” is an implementation choice specific to this example. This specification’s usage of this string in conjunction with the concept of all placement services is purely coincidental and it shall not be considered normative when representing said concept.

```xml
<ListADMServicesRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A0" version="1.4" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"/>
```

**Example 1**

Example 2 declares the ADM capabilities and indicates the ADM is using a default endpoint for all message processing. This behavior is indicated by the presence of a single core:Callout element and the core:Callout element omitting the @message attribute. It also declares support for PODM namespace version 1.2.

```xml
<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-"
```
Example 2

Example 3 illustrates a successful response message, assuming the Example 1 request message, for an ADM offering placement services for a service group identified as “Den”. The ADM supplies a default endpoint used for all message exchanges except the ADSRegistrationRequest and the ADSDeregisterRequest message exchanges for which it is supplying unique endpoints. It also declares support for PODM namespace version 1.1.

```
<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-
```
Example 3

Example 4 is a success response message, assuming the Example 1 request message, for an ADM offering on-demand placement services for the provider’s moviego.com and movies_r_us.com. For moviego.com, the ADM is handling pre-roll and post-roll placement opportunities using an “interactive” placement decision policy. For movies_r_us.com, the ADM is only handling local pre-roll placement opportunities for the specific product type using a “default” placement decision policy. The ADM is using a single, default endpoint for all message processing. It also declares support for PODM namespace version 1.1 and 1.2. A subsequent ADSRegistrationMessage can choose the PODM namespace to utilize.
421B23F525F4" system="adm" messageRef="29D61093-6E81-4A5B-A1F6-8544AA7F29A0">  
  <core:StatusCode class="0"/>  
  <ADMCapabilities placementStatusOnlyRegistration="false">  
    <NameSpaceVersion  
      namespace="http://www.scte.org/schemas/130-3/2013/adm/podm"  
      version="1.1"/>  
  </ADMCapabilities>  
  <ServiceDescription>  
    <SystemContext/>  
    <Service id="Service1" opportunityType="preRoll" decisionPolicy="interactive">  
      <ContentProvider providerID="moviego.com">  
        <core:ContentDataModel type="SCTE236">URI</core:ContentDataModel>  
      </ContentProvider>  
    </Service>  
    <Service id="Service2" opportunityType="postRoll" decisionPolicy="interactive">  
      <ContentProvider providerID="moviego.com">  
        <core:ContentDataModel type="SCTE236">URI</core:ContentDataModel>  
      </ContentProvider>  
    </Service>  
    <Service id="Service3" opportunityType="preRoll" decisionPolicy="default">  
      <ContentProvider providerID="movies_r_us.com">  
        <core:ContentDataModel type="SCTE236">URI</core:ContentDataModel>  
      </ContentProvider>  
      <ProductType>FOD</ProductType>  
      <Scope>Local</Scope>  
    </Service>  
  </ServiceDescription>  
  <core:Callout>  
    <core:Address>www.adshark.com/allMessages</core:Address>  
  </core:Callout>  
</ListADMServicesResponse>  

Example 4

Example 5 is a successful response message, assuming the Example 1 request message, for an ADM offering traditional linear replacement services for two different zones of a specific network feed. The decision policy is “preload” for both listed services and the ADM is using unique entry points for every service channel message endpoint. It also declares support for PODM namespace version 1.2. It also declares support for a non SCTE 130 namespace from www.foo.com. This declaration informs the ADS that it can use private extensions supported by version 1.0 of the specified www.foo.com namespace.
This declaration informs the ADS that it can use private extensions supported by the specified www.bar.com namespace.

```xml
<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0"/>
  <ADMCapabilities placementStatusOnlyRegistration="true">
    <NameSpaceVersion namespace="http://www.scte.org/schemas/130-3/2013/adm/podm" version="1.2"/>
    <NameSpaceVersion namespace="http://www.foo.com/schemas/namespace/foo" version="1.0"/>
    <NameSpaceVersion namespace="http://www.bar.com/schemas/namespace/bar"/>
  </ADMCapabilities>
  <ServiceDescription>
    <SystemContext>
      <Network>ABC</Network>
      <Zone>Z3</Zone>
    </SystemContext>
    <Service id="ABC Network Zone3" decisionPolicy="preload"/>
  </ServiceDescription>
  <ServiceDescription>
    <SystemContext>
      <Network>ABC</Network>
      <Zone>Z4</Zone>
    </SystemContext>
    <Service id="ABC Network Zone4" decisionPolicy="preload"/>
  </ServiceDescription>
  <core:Callout message="ServiceStatusNotification">
    <core:Address type="HTTP">http://175.33.33.33:7381/scte130/ssn</core:Address>
  </core:Callout>
  <core:Callout message="ADSRegistrationRequest">
    <core:Address type="HTTP">http://175.33.33.33:7382/scte130/arr</core:Address>
  </core:Callout>
  <core:Callout message="ADSDeregisterRequest">
    <core:Address type="HTTP">http://175.33.33.33:7383/scte130/adr</core:Address>
  </core:Callout>
  <core:Callout message="ListADSRegistrationRequest">
    <core:Address type="HTTP">http://175.33.33.33:7384/scte130/larr</core:Address>
  </core:Callout>
</ListADMServicesResponse>
```

Example 5
Example 6 illustrates a failure response message, assuming the Example 1 request message, for an ADM not currently offering any services.

```xml
<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" 
version="1.4" identity="ADMLogicalService" system="adm" messageRef="29D61093-6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="1" detail="11">
    <core:Note>ResourceNotFound. No provisioned ADM services.</core:Note>
  </core:StatusCode>
</ListADMServicesResponse>
```

### Example 6

#### 11.3 Registration

A registration-established service channel, as defined in Section 10.0, is created between two logical services using the registration message exchange. Typically, this service channel is used for placement operations messaging. An ADS service contacts an ADM by sending an ADSRegistrationRequest message and the ADM shall respond with an ADSRegistrationResponse message. Figure 10 illustrates this message exchange.

![Registration Message Exchange](image)

**Figure 10: Registration Message Exchange**

During the registration request message processing, the ADM may optionally verify each ADS supplied endpoint via a SCTE 130 Part 2 core:ServiceCheck message exchange before returning an ADSRegistrationResponse message. (See [SCTE130-2] for additional information regarding the core:ServiceCheck message exchange.) The ADS shall be prepared to receive the core:ServiceCheckRequest message on the registration supplied endpoints before receiving a response else the ADM may fail the registration request (i.e., the ADM may test each core:Address element supplied in each core:Callout element). When a core:Callout element contains more than one core:Address element, at least one core:Address element specified reception endpoint shall successfully respond to the core:ServiceCheckRequest message. The ADM may reject the registration request message if all core:Address elements of a core:Callout element fail to successfully respond. An ADM shall not reject the registration message if only a subset of each core:Callout element’s core:Address elements successfully respond to the core:ServiceCheckRequest message.
The ADS may provide unique service channel endpoint identifiers for the placement operation message exchanges including specific destinations for PlacementRequest messages and PlacementStatusNotification messages. In the ADM response message, the ADM may provide the PlacementUpdateNotification message callout.

ADM implementations may choose to limit the number of supported service channel connections. An ADM shall not be required to support independently registered callbacks for each offered placement service identified by the ListADMServicesResponse message’s ServiceDescription elements. ADM implementations are encouraged to support at least as many service channel connections as the count of offered placement services itemized in the ListADMServicesResponse message. An ADM implementation shall not be required to accept an ADS registration solely for status reporting. An ADM may optionally offer this feature by indicating support within the ADMCapabilities element and allowing an ADSRegistrationRequest message containing a core:Callout element which specifies only a PlacementStatusNotification endpoint.

ADM registration conflict determination and resolution are outside the scope of this specification.

During registration, the ADS specifies the placement services for which it is providing placement decisions and it declares the endpoint information for where associated PlacementRequest and PlacementStatusNotification messages are to be sent. These endpoints may be the same value or they may be unique. The endpoints may be different addresses on the same system or they may be endpoints on physically separated systems as illustrated in Figure 11. This figure is one possible example implementation with many other abstractions possible and not represented by this single illustration.

![Figure 11: ADS Registering Independent Endpoints](image)
The ADSRegistrationRequest message shall always be identified using the original ADSRegistrationRequest message’s @messageId attribute value which in a retransmitted registration message shall be the @resend attribute’s value. This original message’s @messageId attribute value is subsequently used for registration listing and deregistration message exchange per SCTE 130 Part 2. See [SCTE130-2] for additional information.

The ADM registration message schemas are described in the following sections.

11.3.1 ADSRegistrationRequest Message Schema

Figure 12 illustrates the ADSRegistrationRequest message schema.
Figure 12: ADSRegistrationRequest Message Schema
11.3.1.1 Semantic Definitions for the ADSRegistrationRequest Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information. An ADS shall use this attribute to identify all their placement services and their registration-established service channels for registration listing and deregistration purposes.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous ADSRegistrationRequest message. The attribute’s value is the original message’s @messageId value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the ADSRegistrationResponse message. See [SCTE130-2] for additional information.

ServiceDescription [Required]—One or more placement service descriptions for which the registering entity desires interaction. Generally, the expected registration-established placement service interaction is to supply placement decisions and placement status message exchanges. As an alternative, a placement status only registered service may optionally be supported by an ADM. Typically, each ServiceDescription element should exactly match a ServiceDescription element as provided in the ListADMServicesResponse message described in Section 11.2.2.

An ADS may restrict a placement service’s scope by adding elements to a ListADMServicesResponse message’s ServiceDescription element’s children. For example, if an ADM returns a ServiceDescription element contain the Network element with the value “ESPN,” the ADS may register a ServiceDescription element containing a Network element with the value “ESPN” and a Scope element with the value “Local”.

An ADS may also expand a placement service’s scope by removing elements from a ListADMServicesResponse message’s
ServiceDescription element’s children. For example, if an ADM returns a ServiceDescription element containing a Network element with the value “ESPN” and a Service/@oppotunityBinding value of “preRoll,” the ADS may register a ServiceDescription element containing only a Network element having the value “ESPN.”

An ADM may optionally accept ADSRegistrationRequest messages which are not exact matches to the ServiceDescription elements returned in the ListADMServicesResponse message. The ServiceDescription element sequence shall be processed in document order.

**NameSpaceVersion** [Optional] – One or more NameSpaceVersion elements specifying the namespaces to use on the exchange end point(s). The version attribute is optional but shall be supplied if returned for a given namespace in the ListADMServicesResponse. The list of supported namespaces is returned in the ListADMServicesResponse (see Section 11.2). See Section 14.20 for additional information.

An implementation may support registration for multiple versions of a given namespace. The specific end point behavior if registering for multiple versions of a given namespace is out of scope of this standard.

**core:Callout** [Required]—One or more core:Callout elements specifying the ADS message exchange endpoint(s). See [SCTE130-2] for additional information. A single message exchange endpoint may be defined to handle all ADS destined messaging. If a single message exchange endpoint is handling all messaging (i.e., a default endpoint), there should be only one core:Callout element present and the core:Callout element’s @message attribute shall not be used.

If independent endpoints are desired, the core:Callout element’s @message attribute shall be used and each core:Callout element shall contain a value from Table 4. The core:Callout element’s @message attribute’s value shall appear exactly as shown in Table 4.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ServiceStatusNotification</td>
<td>Destination for ServiceStatusNotification messages.</td>
</tr>
<tr>
<td>PlacementRequest</td>
<td>Destination for PlacementRequest messages.</td>
</tr>
<tr>
<td>PlacementStatusNotification</td>
<td>Destination for PlacementStatusNotification messages.</td>
</tr>
<tr>
<td>ADSDeregistrationNotification</td>
<td>Destination for ADSDeregistrationNotification messages.</td>
</tr>
</tbody>
</table>
| …                             | User defined message endpoints which are outside of this specification’s scope. The string shall be prefixed with the text “private:”.

| **Table 4: ADSRegistrationRequest/core:Callout/@Message Attribute Values** |
If independent endpoints are desired for a subset of message exchange endpoints, the default endpoint may be used with one or more additional core:Callout elements containing values from Table 4. All messages that are not specifically referenced by an @message attribute shall be available through the default endpoint.

If no default endpoint is supplied and only a subset of the Table 4 endpoints are provided in the ADSRegistrationRequest message, the unlisted endpoints shall be discovered by a different, unspecified mechanism which is outside the scope of this specification.

Within the core:Callout element, the ADS may provide one or more core:Address elements. The processing rules for these elements are not specified here and are outside the scope of this specification.

Each core:Address element contained within the core:Callout element shall support the core:ServiceCheck message exchange as per [SCTE130-2]. When a Callout element contains more than one Address element, at least one Address element specified reception endpoint shall successfully respond to the ServiceCheckRequest message as required by [SCTE130-2] and an ADM shall not reject the registration message if only a subset of the Address elements successfully respond to the ServiceCheckRequest message.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

11.3.2 ADSRegistrationResponse Message Schema

Figure 13 illustrates the ADSRegistrationResponse message schema.
Figure 13: ADSRegistrationResponse Message Schema

11.3.2.1 Semantic Definitions for the ADSRegistrationResponse Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.
@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the paired ADSRegistrationRequest message element initiating this message exchange. The value shall be the ADSRegistrationRequest message’s @messageId attribute value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the ADSRegistrationRequest message’s core:InitiatorData element and shall only be present if found in the paired request message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the ADSRegistrationRequest message processing. See [SCTE130-2] and Appendix A for additional information.

If the core:StatusCode element indicates an error, no registration for any placement service (i.e., for any ServiceDescription element) shall be deemed to have occurred (i.e., no transaction).

core:Callout [Optional]—Zero or more core:Callout elements specifying the ADM message exchange endpoint(s). See [SCTE130-2] for additional information. Zero core:Callout elements may be returned for either an error condition or if the ADM message exchange endpoint discovery is occurring via a different mechanism.

A single message exchange endpoint may be defined to handle all ADM destined messaging identified in Table 5. If a single endpoint is handling all messaging, there should be only one core:Callout element present in the ADSRegistrationResponse message and the core:Callout element’s @message attribute shall not be used. If an ADM desires to use the same default endpoint as the ListADMServicesResponse message, then the default endpoint shall be identically repeated in this message and consequently, it applies additionally to all endpoint destination listed in Table 5. The ADM may optionally use a different default endpoint for the message exchange endpoints identified in Table 5. In this case, the default endpoints are mutually exclusive as the message exchange endpoint list is
disjoint between the ListADMServicesResponse and ADSRegistrationResponse messages.

If independent endpoints are desired, the core:Callout element’s @message attribute shall be used in each Callout element and it shall contain a value from Table 5. The core:Callout element’s @message attribute’s value shall appear exactly as shown in Table 5.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PlacementUpdateNotification</td>
<td>Destination for PlacementUpdateNotification messages.</td>
</tr>
<tr>
<td>...</td>
<td>User defined message endpoint outside of the scope of this specification. The string shall be prefixed with the text “private:”.</td>
</tr>
</tbody>
</table>

Table 5: ADSRegistrationResponse/core:Callout/@Message Attribute Values

If independent message exchange endpoints are desired for only a subset of Table 5 endpoints, the default message exchange endpoint may be used in conjunction with one or more additional core:Callout elements containing values from Table 5. All message endpoints listed in Table 5 that are not specifically referenced by an @message attribute shall be available through the default endpoint (assuming one is supplied).

If no default endpoint is supplied and only a subset of the Table 5 endpoints are provided in the ADSRegistrationResponse message, the unlisted endpoints shall be discovered by a different, unspecified mechanism which is outside the scope of this specification.

Within the core:Callout element, the ADM may provide one or more core:Address elements. The processing rules for these elements are not specified here and are outside the scope of this specification.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

11.3.3 Registration Examples

Example 7 illustrates an ADSRegistrationRequest message and Example 8 illustrates a successful ADSRegistrationResponse message. Example 7 indicates the ADS is handling all placement decisions. The ADSRegistrationRequest message’s single core:Callout element omits the @message attribute indicating all messages are to utilize the same endpoint (i.e., the default endpoint). The ADS provides two Address elements where the first address may be interpreted as the primary message exchange endpoint and the second endpoint may be
utilized as a backup or secondary destination. This endpoint interpretation is outside the scope of this specification.

In Example 7, the ADS decided to identify this registration-established placement service as “All Services” and to utilize PODM version 1.2 for these services. This value is ADS determined and was developed specifically for this example only. This specification’s usage of this string in conjunction with the concept of all placement services shall not be considered normative when representing said concept.

```
<ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00000" version="1.4" system="ads" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
  <ServiceDescription>
    <SystemContext/>
    <Service id="All Services"/>
  </ServiceDescription>
  <NameSpaceVersion
    namespace="http://www.scte.org/schemas/130-3/2013/adm/podm"
    version="1.2"/>
  <core:Callout>
    <core:Address type="HTTP">http://192.168.201.7:80/SCTE130Msgs</core:Address>
    <core:Address type="HTTP">http://192.168.208.9:80/SCTE130Msgs</core:Address>
  </core:Callout>
</ADSRegistrationRequest>
```

**Example 7**

In Example 8, the ADM accepts the registration and responds with a duplicate default endpoint as Example 2. Consequently, all message exchanges are routed through this message exchange endpoint.

```
<ADSRegistrationResponse messageId="35EC24A4-9D72-11DB-96CA-005056C00002" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="35EC24A4-9D72-11DB-96CA-005056C00000">
  <core:StatusCode class="0"/>
  <core:Callout>
    <core:Address type="HTTP">http://173.35.23.33:80/SCTE130MessageProcessor/default</core:Address>
  </core:Callout>
</ADSRegistrationResponse>
```

**Example 8**

Example 9 illustrates a registration request message where the ADS registers as a decision provider for nationally scoped, interstitial placement opportunities for
two product types. The registration also handles all pre-roll and post-roll placement opportunities with local scope. The ADS registers independent PlacementRequest and PlacementStatusNotification endpoints via the two core:Callout elements. All other message exchanges use the supplied default endpoint. This registration request also indicates the end points will utilize PODM version 1.1.

```xml
<ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00006" version="1.4" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads">
  <ServiceDescription>
    <SystemContext/>
    <Service id="Service1" opportunityType="interstitial">
      <ContentProvider providerID="espn.com"/>
      <ProductType>MOD</ProductType>
      <Scope>National</Scope>
    </Service>
    <Service id="Service2" opportunityType="interstitial">
      <ContentProvider providerID="espn.com"/>
      <ProductType>FOD</ProductType>
      <Scope>National</Scope>
    </Service>
    <Service id="Service3" opportunityType="preRoll">
      <Scope>Local</Scope>
    </Service>
    <Service id="Service4" opportunityType="postRoll">
      <Scope>Local</Scope>
    </Service>
  </ServiceDescription>
  <NameSpaceVersion
    namespace="http://www.scte.org/schemas/130-3/2013/adm/podm"
    version="1.1"/>
  <core:Callout message="PlacementRequest">
    <core:Address>adselector1.ads.com</core:Address>
  </core:Callout>
  <core:Callout message="PlacementStatusNotification">
    <core:Address>adstatus1.ads.com</core:Address>
  </core:Callout>
  <!-- Default handler for all other messages.-->
  <core:Callout>
    <core:Address>adselectorgeneral.ads.com</core:Address>
  </core:Callout>
</ADSRegistrationRequest>
```

Example 9
Example 10 illustrates the ADM response where the ADM specifies a message exchange endpoint specific for PlacementUpdateNotification messages.

```
<ADSRegistrationResponse messageId="35EC24A4-9D72-11DB-96CA-005056C00112"
version="1.4" identity="ADMLoicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="5EC24A4-9D72-11DB-96CA-005056C00006">
  <core:StatusCode class="0"/>
  <core:Callout message="PlacementUpdateNotification">
    <core:Address type="HTTP">http://192.168.3.33:80/SCTE130api/PUN</core:Address>
  </core:Callout>
</ADSRegistrationResponse>
```

**Example 10**

Example 11 illustrates a registration request which has errantly attempted to register for the same placement services as in Example 9. The response message (Example 12) indicates the registration failure. This is an example of a duplicate registration request where an ADM has decided to reject duplicates. An ADM may decide to accept duplicates. This implementation specific behavior is outside the scope of this specification.

```
<ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00006"
version="1.4" identity="ADSLoicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads">
  <ServiceDescription>
    <SystemContext/>
    <Scope id="Service3" opportunityType="preRoll">
      <Scope>Local</Scope>
    </Scope>
    <Scope id="Service4" opportunityType="postRoll">
      <Scope>Local</Scope>
    </Scope>
  </ServiceDescription>
  <NameSpaceVersion
    namespace="http://www.scte.org/schemas/130-3/2013/adm/podm"
    version="1.2"/>
  <core:Callout>
    <core:Address>adselector1.ads.com</core:Address>
    <core:Address>adselector2.ads.com</core:Address>
  </core:Callout>
</ADSRegistrationRequest>
```

**Example 11**

```
<ADSRegistrationResponse messageId="35EC24A4-9D72-11DB-96CA-005056C00008"
version="1.4" identity="ADMLoicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="adm" messageRef="5EC24A4-9D72-11DB-96CA-005056C00008">
  <core:StatusCode class="0"/>
  <core:Callout message=
"PlacementUpdateNotification">
    <core:Address type="HTTP">http://192.168.3.33:80/SCTE130api/PUN</core:Address>
  </core:Callout>
</ADSRegistrationResponse>
```
11.4 List ADS Registrations

The active registrations may be viewed using the ListADSRegistrationRequest message. The ADM shall respond with a ListADSRegistrationResponse message. This message exchange duration defines this service channel lifecycle. Figure 14 illustrates the list ADS registration request and response message exchange and the individual message schema descriptions follow in subsequent sections.

![Figure 14: ADM Registration Status Message Exchange](image)

There are two list registration granularity levels:

- Per logical service (i.e., via the @identity attribute)
- Per registration message

An ADM may restrict access to registration information by returning a status code equating to “not authorized” for the list registration request on a per logical service basis. The per registration message granularity level shall be supported by all compliant ADMs.

The message exchange shall be conformant with SCTE 130 Part 2 list registration requirements. See [SCTE130-2] for additional information

11.4.1 ListADSRegistrationRequest Message Schema

Figure 15 illustrates the ListADSRegistrationRequest Message Schema.
Figure 15: ListADSRegistrationRequest Message Schema

The ListADSRegistrationRequest message returns all active registrations associated with a specific logical service source as identified by the @identity attribute when the @registrationRef attribute is omitted. If only a specific registration is to be returned, both the @identity and the @registrationRef attributes shall be included. The following table defines the inclusion relationships.
### Table 6: List ADS Registration Inquiry Granularity Control

The access restrictions permitted column indicates whether the status code equivalent to not authorized *may* optionally be returned.

<table>
<thead>
<tr>
<th>@identity</th>
<th>@registrationRef</th>
<th>Description</th>
<th>Access Restrictions Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included</td>
<td>Omitted</td>
<td>All registrations for matching the supplied @identity value.</td>
<td>Yes</td>
</tr>
<tr>
<td>Included</td>
<td>Included</td>
<td>A specific registration matching the @identity and @registrationRef values.</td>
<td>No</td>
</tr>
</tbody>
</table>

#### 11.4.1.1 Semantic Definitions for the ListADSRegistrationRequest Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. A logical service *may* use this attribute to identify all related registration-established placement services and their service channels for registration listing. See [SCTE130-2] along with Table 6 for supplementary usage details.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous ListADSRegistrationRequest message. The attribute’s value is the original message’s @messageId value. See [SCTE130-2] for additional information.

@registrationRef [Optional, core:registrationRefAttrType]—A reference to an original ADSRegistrationRequest message element for which the registration information is to be returned. The value *shall always* be the original ADSRegistrationRequest message’s @messageId attribute value which in a retransmitted registration message *shall* be the @resend attribute’s value. See [SCTE130-2] for additional information and refer to Table 6 for supplementary usage details.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which *shall* be returned in the
ListADSRegistrationResponse message. See [SCTE130-2] for additional information.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The ListADSRegistrationRequest element’s value *may* be empty.

11.4.2 ListADSRegistrationResponse Message Schema

Figure 16 illustrates the ListADSRegistrationResponse element schema describing the active ADS service channel registrations.
11.4.2.1 Semantic Definitions for the ListADSRegistrationResponse Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.
@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, messageRefAttrType]—A reference to the paired ListADSRegistrationRequest message element initiating this message exchange. The value shall be the ListADSRegistrationRequest message’s @messageId attribute value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the ListADSRegistrationRequest message’s core:InitiatorData element and shall only be present if found in the paired request message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the ListADSRegistrationRequest message processing. See [SCTE130-2] and Appendix A for additional information.

ADSRegistrationRequest [Optional]—Zero or more ADSRegistrationRequest message elements. The ADSRegistrationRequest element shall be a recoded copy of the accepted registration message. The message element order does not convey any information (e.g., element order does not reflect registration order). See [SCTE130-2] for compliance requirements and Section 11.3.1 for additional details regarding the ADSRegistrationRequest message schema.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

11.4.3 ADS Registration Status Examples

Example 13 and Example 14 illustrates the list all ADS registrations request and response messages respectively when there are no active ADS registrations.

Example 13

```
<ListADSRegistrationRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A0" version="1.4" identity="ADSSLiteralService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"/>
```
Example 14

Example 15 assumes Example 13’s list all request message was issued. The returned data includes the ADS Registration section’s Example 9 and Example 7 messages assuming the two messages are the only active registrations. The included element order carries no meaning.

Example 15

```xml
<ListADSRegistrationResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A5" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0">
    <core:Note>There are currently no ADS registrations.</core:Note>
  </core:StatusCode>
</ListADSRegistrationResponse>
```
<core:StatusCode class="0"/>
<ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00006" version="1.4" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads">
  <ServiceDescription>
    <SystemContext/>
    <Service id="Service1" opportunityType="interstitial">
      <ContentProvider providerID="espn.com"/>
      <ProductType>MOD</ProductType>
      <Scope>National</Scope>
    </Service>
    <Service id="Service2" opportunityType="interstitial">
      <ContentProvider providerID="espn.com"/>
      <ProductType>FOD</ProductType>
      <Scope>National</Scope>
    </Service>
    <Service id="Service3" opportunityType="preRoll">
      <Scope>Local</Scope>
    </Service>
    <Service id="Service4" opportunityType="postRoll">
      <Scope>Local</Scope>
    </Service>
  </ServiceDescription>
  <NameSpaceVersion
    namespace="http://www.scte.org/schemas/130-3/2013/adm/podm"
    version="1.2"/>
  <core:Callout message="PlacementRequest">
    <core:Address>adselector1.ads.com</core:Address>
  </core:Callout>
  <core:Callout message="PlacementStatusNotification">
    <core:Address>adstatus1.ads.com</core:Address>
  </core:Callout>
</ADSRegistrationRequest>
Example 15

Example 16 illustrates a list request message for a single registration message. The example requests the ADS Registration section’s Example 7 registration. The response message provided in Example 17 contains the ADS Registration section’s Example 7 ADSRegistrationRequest message.

Example 16

Example 17

Example 18 illustrates a list request message for a specific logical service source using the @identity attribute. This ADM implementation has chosen to return a
not authorized response as demonstrated in Example 19. An ADM implementation may accept this request and then return the appropriate data. This implementation specific behavior is outside the scope of this specification.

Example 18

<ListADSRegistrationRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A3" version="1.4" system="ads" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5"/>

Example 19

An ADS may cancel an active registration (i.e., terminate an active registration-established service channel) using the ADSDeregisterRequest message. The ADM shall acknowledge the request by sending an ADSDeregisterResponse message.

If an ADM terminates a registration for any reason other than an ADSDeregisterRequest message, it should send an ADSDeregistrationNotification message indicating the end of the registration-established service channel. The ADS shall confirm receipt of this notification message by issuing an ADSDeregistrationAcknowledgement message.

A peer logical service shall not initiate a deregistration sequence for the same registration-established service channel after receiving a deregistration (i.e., for the same registration-established service channel, the ADM shall not send an ADSDeregistrationNotification message after the receipt of an ADSDeregisterRequest nor shall the ADS send a ADSDeregisterRequest message after receiving a ADSDeregistrationNotification message). Note: This restriction does not prevent a possible simultaneous deregistration for the same registration-established service channel.

Figure 17 illustrates this message exchange followed by the schema descriptions.
There are two ADS or ADM initiated deregistration granularity levels:

- Per logical service (i.e., via the @identity attribute)
- Per registration message

An ADM may restrict deregistration access to a per registration message only by returning a status code equating to “not authorized” for a deregistration request on a per logical service basis. All implementations shall support the per registration message granularity level.

Deregistration cancels all active PlacementRequest, PlacementResponse, and PlacementUpdateNotification messages and any forthcoming or undelivered PlacementStatusNotification messages.

When an ADS initiates a deregistration message exchange, the ADS shall be prepared to receive and process any ADM originated messages on the deregistering service channel until it receives the ADSDeregisterResponse message. During the time between the ADSDeregisterRequest and the ADSDeregisterResponse messages, the ADM may initiate any message exchanges it deems necessary in order to close the service channel. For example, the ADM may deliver pending PlacementStatusNotification messages. SCTE 130 Part 7 [SCTE130-7] may specify a maximum deregister message processing timeout value and any other similar values.

If an ADM initiates the deregistration sequence via the ADSDeregistrationNotification message, the ADS shall not initiate any message exchanges associated with this deregistering service channel as identified in Table 2 with the “Source” column containing the value ADS and the “Registration Required” column being checked following receipt of the ADSDeregistrationNotification message. The ADS shall return the ADSDeregistrationAcknowledgement message when processing is complete.

Figure 17: Deregistration Message Exchange
The deregistration message schemas are described in the following sections.

11.5.1 ADSDeregisterRequest Message Schema

Figure 18 illustrates the ADSDeregisterRequest element schema.

![Figure 18: ADSDeregisterRequest Message Schema](image)

The ADSDeregisterRequest message terminates all current registrations for a specific logical service source when only the @identity attribute is included and the @registrationRef attribute is omitted. If only a specific registration is to be terminated, both the @identity and the @registrationRef attributes shall be included. The following table illustrates the defined inclusion relationships.
Table 7: ADS Deregistration Granularity Control

<table>
<thead>
<tr>
<th>@identity</th>
<th>@registrationRef</th>
<th>Description</th>
<th>Access Restrictions Permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Included</td>
<td>Omitted</td>
<td>All registrations matching the supplied @identity value.</td>
<td>Yes</td>
</tr>
<tr>
<td>Included</td>
<td>Included</td>
<td>A specific registration matching the @identity and @registrationRef values.</td>
<td>No</td>
</tr>
</tbody>
</table>

The access restrictions permitted column indicates whether the status code equivalent to “not authorized” may optionally be returned.

11.5.1.1 Semantic Definitions for the ADSDeregisterRequest Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. A logical service may use this attribute to delete all related registration-established placement services and their service channels. See [SCTE130-2] along with Table 7 for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous ADSDeregisterRequest message. The attribute’s value is the original message’s @messageId value. See [SCTE130-2] for additional information.

@registrationRef [Optional, core:registrationRefAttrType]—A reference to an original ADSRegistrationRequest message element for which the sender is now deregistering the service channel. The value shall always be the original ADSRegistrationRequest message’s @messageId attribute value which in a retransmitted registration message shall be the @resend attribute’s value. See [SCTE130-2] for additional information and refer to Table 7 for supplementary usage details.

@##any [Optional]—Additional attributes from any namespace.
core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the ADSDeregisterResponse message. See [SCTE130-2] for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The ADSDeregisterRequest element’s value may be empty.

11.5.2 ADSDeregisterResponse Message Schema

Figure 19 illustrates the ADSDeregisterResponse element schema.
11.5.2.1 Semantic Definitions for the ADSDeregisterResponse Message

@**messageId** [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@**version** [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@**identity** [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.
@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the paired ADSDeregisterRequest message element initiating this message exchange. The value shall be the ADSDeregisterRequest message’s @messageId attribute value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the ADSDeregisterRequest message’s core:InitiatorData element and shall only be present if found in the paired request message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the ADSDeregisterRequest message processing. See [SCTE130-2] and Appendix A for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

11.5.3 ADS Deregistration Request/Response Examples

Example 20 illustrates an attempt to deregister a logical service source via the @identity attribute. Example 21 shows the ADM rejecting the request from Example 20. This ADM implementation has chosen to return a not authorized response. An ADM implementation may accept this request and subsequently terminate all registrations for the specified @identity attribute. This implementation specific behavior is outside the scope of this specification.

```
<ADSDeregisterRequest messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF0" version="1.4" identity="ADSLogenousService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"/>
```

Example 20

```
<ADSDeregisterResponse messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF5" version="1.4" identity="ADMLogenousService_1170FEF4-C19B-450E-B624-
```
Example 21

Example 22 illustrates a successful deregistration of a specific active ADSRegistrationRequest message. Example 23 shows the response message.

Example 23

Example 24 illustrates an unsuccessful attempt to deregister a logical service source via the @identity attribute only. Example 25 shows the response message where the ADM allows the action but was unable to locate any matching registrations.
Example 25

11.5.4 ADSDeregistrationNotification Message Schema

Figure 20 illustrates the ADSDeregistrationNotification element’s schema.
11.5.4.1 Semantic Definitions for the ADSDeregistrationNotification Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.
@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous ADSDeregistrationNotification message. The attribute’s value is the original message’s @ messageId value. See [SCTE130-2] for additional information.

@registrationRef [Optional, core:registrationRefAttrType]—A reference to an original ADSRegistrationRequest message element for which the ADM is providing this deregistration notice. The value shall always be the original ADSRegistrationRequest message’s @ messageId attribute value which in a retransmitted registration message shall be the @ resend attribute’s value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the ADSDeregistrationAcknowledgement message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the ADSDeregistrationNotification message’s purpose. See [SCTE130-2] and Appendix A for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

11.5.5 ADSDeregistrationAcknowledgement Message Schema

Figure 21 illustrates the ADSDeregistrationAcknowledgement element’s schema.
11.5.5.1 Semantic Definitions for the ADSDeregistrationAcknowledgement Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.
@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the paired ADSDeregistrationNotification message element initiating this message exchange. The value shall be the ADSDeregistrationNotification message’s @messageId attribute value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the ADSDeregistrationNotification message’s core:InitiatorData element and shall only be present if found in the paired request message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the ADSDeregistrationAcknowledgement message processing. See [SCTE130-2] and Appendix A for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

11.5.6 ADS Deregistration Notification/Acknowledgment Examples

Example 26 illustrates a successful message exchange when an ADM logical service is being taken out of service. The ADM is notifying the ADS of the deregistration. Example 26 is the notification message and Example 27 is the acknowledgement message.

```xml
<ADSDeregistrationNotification messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF5" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm">
  <core:StatusCode class="3">
    <core:Note>The ADM is terminating the registration as it is being taken out of service.</core:Note>
  </core:StatusCode>
</ADSDeregistrationNotification>

Example 26

<ADSDeregistrationAcknowledgement messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF0" version="1.4" identity="ADSLogicalService_1170FEF4-C19B-450E-
```
11.6 Service Check Support

The ADM and ADS shall both support the ServiceCheck message exchange, which includes the core:ServiceCheckRequest and core:ServiceCheckResponse messages, as defined by SCTE 130 Part 2. See [SCTE130-2] for additional information.

11.7 Service Status Support

The ADM and ADS shall both support the ServiceStatus message exchange, which includes the core:ServiceStatusNotification and core:ServiceStatusAcknowledgement messages, as defined by SCTE 130 Part 2. See [SCTE130-2] for additional information.

12.0 ADM INTERFACE—PLACEMENT OPERATIONS MESSAGES

Messages communicating placement opportunities, placement decisions, placement updates, and placement event reporting are collectively referred to as placement operations. Placement operations assume a registration-established service channel has been successfully completed. See Section 11.3 for details regarding registration.

Placement messaging refers to the specific exchange of a PlacementRequest message supplying placement opportunity descriptions and a PlacementResponse message containing placement decisions. Placement update messaging encompasses placement decision updating along with placement abandonment signaling (i.e., cancellation). Placement event reporting is accomplished via the placement status message exchanges.

The following sections detail the individual placement operations message exchanges.

12.1 Placement Messaging

Placement messaging refers to an ADM sent PlacementRequest message to which an ADS responds with a PlacementResponse message. The PlacementRequest message communicates placement opportunities and shall be sent to the ADS supplied callback address included in the ADSRegistrationRequest message if specified.

Placement messaging shall be initiated by an ADM. An ADM determines the presence of an ad placement opportunity and communicates information such as specific targeting criteria, entertainment content identification, etc., as part of a PlacementRequest message. The ADS shall respond with a PlacementResponse
message whose contents typically are placement decisions. The placement decisions may contain placements where each placement defines an action. Each placement may also contain a content binding and a placement constraint set.

Placement opportunity detection and its characteristic determination along with placement decision implementation are all outside the scope of this specification. This specification does not preclude or prefer any method or combination thereof.

Figure 22 illustrates the basic placement message exchange sequence and a high-level overview of the possible subsequent message exchanges.

![Diagram of Placement Messaging Message Exchange](image)

**Figure 22: Placement Messaging Message Exchange**

A placement opportunity description, implemented as an XML PlacementOpportunity element, is a potentially constrained location relative to digital content where ad insertion or content alterations may occur. To a classic linear technologist, a placement opportunity might be called an avail or a (commercial) break. The optional placement opportunity constraints may be requirements, limitations, or guidance specific to the placement opportunity. The alterations may include insertions, replacements, or deletions of content in whole or in part. Example placement opportunity constraints include minimum, maximum or fixed total ad content durations. In traditional linear broadcast, for example, the placement opportunity typically has a fixed placement opportunity duration constraint such as a total ad insertion time of 30, 60, or 120 seconds.

The following two examples illustrate possible placement opportunity detection mechanisms though many other methods are possible. In a traditional linear broadcast system for example, an SCTE 35 splice_info_section() containing a splice_insert() splice command type may signal the placement opportunity start. See [SCTE35] for additional information. Alternatively, in an on-demand system, the SCTE 130 Placement Opportunity Information Service (POIS) may be consulted at the
entertainment content start (i.e., session setup) for the subscriber specific placement opportunities and their characteristics.

There are five traditional content relative placement opportunity locations as illustrated in Figure 23 and Figure 24.

![Figure 23: Traditional Placement Opportunity Locations Within An Asset](image)

The pre-roll, mid-roll and post-roll placement opportunities are typically associated with any form of on-demand content including but not limited to video on-demand (VOD), network personal video recorder (nPVR), or time-shifted content. The pre-roll placement opportunity precedes the entertainment content while the post-roll location follows the entertainment content.

A mid-roll placement opportunity occurs within the context of the entertainment content. Traditionally, a mid-roll placement opportunity has been associated with classic linear broadcast. However, this placement opportunity type is not limited to this context.

![Figure 24: Traditional Placement Opportunity Locations Between Assets](image)

An interstitial placement opportunity occurs between entertainment content. Typically, this placement opportunity type is applied in playlist applications where multiple entertainment assets are presented in sequential fashion (e.g., music video playlist). However, this placement opportunity type is not limited to this context.
Typically, pre-roll, mid-roll, post-roll, and interstitial placement opportunity existence is predetermined. A mid-roll placement opportunity is generally planned (or scheduled) though the exact location may be determined in real-time (e.g., ad placement in a sporting event).

A pause placement opportunity is generally the result of a subscriber pressing the pause button. The pause placement opportunity, or any trick mode viewer event creating a placement opportunity of that respective type, is an example of a spontaneous placement opportunity. A spontaneous placement opportunity is an unplanned or unscheduled opening for zero or more ad placements to take place. The placement opportunity’s location relative to the entertainment content is variable and inconsistent (though it may be somewhat predictable – for example, when a classic linear broadcast interstitial commercial avail is encountered).

Spontaneous placement opportunities are never guaranteed to occur and typically, there is no limit to the number of possible placement opportunities that may transpire with respect to the entertainment content. Spontaneous placement opportunities may not be possible in some systems. For example, a classic linear broadcast system does not have any notion of a spontaneous placement opportunity. However, a non-live delivery of linear broadcast does allow for spontaneous placement opportunities.

Both planned and spontaneous placement opportunity expressions are supported by this specification using the @opportunityType attribute. Support for each placement opportunity type is optional and implementation dependent. Thus, all placement opportunity types may be supported and no one placement type shall be mandated.

A placement opportunity may have a placement decision owner. For example, a placement opportunity may be owned by a distributor, a provider, or a third party. Placement opportunity ownership determination is outside the scope of this specification. An example mechanism supporting this concept is the SCTE 35 [SCTE35] segmentation_descriptor() which may convey a placement opportunity ownership identifier. The supplied identifier value may assist in decision making or in selecting the appropriate PlacementRequest message ADS destination by matching a placement service registration.

The ADM shall deliver the placement opportunity to the appropriate registration-established placement service ADS.

A placement opportunity may be subdivided into an unrestricted number of subunits for refinement or constraint purposes. The individual subunit is referred to as a positional placement opportunity and implemented as an XML PlacementControl element. If, when, and how a placement opportunity is subdivided is outside the scope of this specification. The classic linear broadcast technologist may equate a positional placement opportunity to a slot. Figure 25 illustrates an example subdivision.
Positional subunits are identified by a position number with the first subunit being assigned the value one and each subsequent subunit incrementing the positional value by one. Specific positions with the placement opportunity may be identified in the XML document using the @position attribute.

Each positional placement opportunity may have a different duration and the granularity of a positional placement opportunity typically maps to the current (or planned) ad asset occupying the temporal location. For example, a single placement opportunity might be subdivided into four positional placement opportunities as illustrated in Figure 26. Each of these subunits might correspond to a 30-second ad with the entire placement opportunity having a two minute duration.
The ADS response to a placement opportunity is a placement decision implemented as an XML PlacementDecision element. A placement decision is formalized as zero or more placements. A placement, implemented as an XML Placement element, embodies a decisive action that may include a content binding and a constraint set. The placement action denotes a behavior to be performed such as fill (add), replace, delete, or fixed (do nothing). A content binding is a formal assignment of an ad asset to a temporal delivery position and this binding may include an ADS assigned tracking identifier. The tracking identifier, implemented as an XML Tracking element, facilitates ad placement reporting. The constraint set defines controls to be additionally applied to the placement. For the classic linear technologist, a placement generally equates to a spot.

Positional placement opportunities and placements represented by the PlacementControl and Placement elements respectively shall be processed consecutively per their document order (i.e., their XML document position/location top to bottom) except when either the @position attribute or the @placementControlRef attribute indicates a different or non-sequential ordering. Thus, for example, consecutive Placement elements contained in a PlacementDecision element shall be delivered in the listed document appearance order assuming no @position attribute or other order control. It is recommended that the listed document order always correlate to the expected display sequence for each placement opportunity, positional placement opportunity, placement decision and placement. For example, the first placement opportunity should always come first in the PlacementRequest message, followed by the second placement opportunity, etc. And the PlacementResponse message’s placement decisions should be ordered the same way. The individual placements should be listed in display order in the XML document as well.

Figure 27 illustrates the high-level XML construct relationships contained in the PlacementRequest and the PlacementResponse message. The diagram illustrates the PlacementOpportunity, PlacementControl, PlacementDecision and Placement elements with respect to the entertainment and ad content.
Placement Relationships

Entertainment Content

Pre-Roll
Placement Opportunity
Placement Control
Placement Decision
Placement
Ad Content

Mid-Roll
Placement Opportunity
Placement Control
Placement Decision
Placement
Ad Content

Pause
Placement Opportunity
Placement Control
Placement Decision
Placement
Ad Content

Mid-Roll
Placement Opportunity
Placement Control
Placement Decision
Placement
Ad Content

Post-Roll
Placement Opportunity
Placement Control
Placement Decision
Placement
Ad Content

PlacementRequest/PlacementResponse to Content Relationship

Figure 27: PlacementRequest/PlacementResponse to Content Relationship

The PlacementRequest message transports placement opportunities to an ADS using the PlacementOpportunity elements enabling the ADS to make its placement decisions. Each placement opportunity may be subdivided into positional placement opportunities described using the PlacementControl elements. Thus, a placement opportunity may contain zero or more PlacementControl elements.

Each placement opportunity within the PlacementRequest message shall be element unique by having a unique @id attribute. One or more PlacementOpportunity elements may be carried within the PlacementRequest message. The choice of how to partition and group placement opportunities are implementation decisions outside the scope of this specification. A wide variety of segmentation possibilities are supported by this specification.

Multiple PlacementRequest messages containing any number of PlacementOpportunity elements, which in turn may contain any number of PlacementControl elements, may be used to request ADS placement decisions.

An ADM communicates each positional placement opportunity, when known, in a PlacementControl element. Again, the choice of how to partition and cluster the PlacementControl element groups is an implementation decision outside the scope of
this specification. Though most segmentation schemes are supported by this specification, it is highly recommended that all PlacementOpportunity and PlacementControl elements for a single placement service registration be consolidated and transported together.

Once the ADS receives a PlacementRequest message, it proceeds to make the appropriate ad placement decisions based on the requirements, guidance, and targeting criteria provided in the ADM PlacementRequest message. The ADS returns its decisions using the PlacementResponse message and the ADS, under certain circumstances, may subsequently change the decision using the PlacementUpdateNotification message. See Section 12.2 for additional information.

The PlacementResponse message utilizes a similar design pattern as the PlacementRequest message. Each PlacementDecision element parallels the PlacementOpportunity element and the Placement element functions similarly to the PlacementControl element. The ADS uses the Placement element (rather than the PlacementControl element) to communicate the decided placement behavior, content binding and optional associated Tracking element.

The ADS returned PlacementResponse message (or the PlacementUpdateNotification message – see Section 12.2 for details) may alter a placement opportunity structure based upon the Placement element values. National, regional, and local scoped content may all be added, replaced, or deleted at any granularity level and it is possible to fully remove either a complete placement opportunity or a positional placement opportunity. When and to what extent an ADS may change the placement opportunity structure is outside the scope of this specification.

The Placement element’s @action attribute specifies the placement behavior. A few example @action attribute behavior verbs include: fixed (i.e., no change), fill (insert or add), delete, and replace. See Section 14.26 for the complete list. Each action is specific to a single (positional) placement. A few examples of possible placement decisions are as follows:

- Do nothing (fixed)
- Forms of fill
  - Add additional placements to the placement opportunity growing the total placement duration.
  - Add additional (positional) placements to the placement opportunity without growing the placement duration. (i.e., more ads each with a shorter duration and the total time remains the same as the original placement opportunity duration.)
  - Add additional placements to the placement opportunity and shrink the placement duration (use more but shorter ads).
  - Insert with new placements where none currently exist (i.e., create a new placement opportunity and fill it).
• Delete positional placement opportunities shortening the placement duration. An ADS may completely remove all positional placement opportunities, which deletes the entire placement opportunity.

• Replace the ad with another ad of the same or different characteristics, etc.

The ADM originated PlacementRequest message contains the following high-level items:

• An optional system context description containing refinements to the matching registered placement service description. For example, properties unique to a VOD session, zone context, or channel information.

• Optional placement service descriptions containing refinements to the matched registered placement service description. For example, placement ownership refinement.

• An optional entertainment content description for which all the placement opportunities are either surrounding, contained within, or relative to.

• An optional client description that includes placement refinement data (also known as addressability information or targeting criteria). For example, the client’s time of day, zip code or terminal address.

• An optional opaque data element, the ADMData element, which shall be returned by the ADS in the PlacementResponse message and any subsequent PlacementUpdateNotification messages if present in the PlacementRequest message. For example, the opaque data may support high resiliency features.

• A list of placement opportunities which each may be further subdivided into positional placement opportunities. Each placement opportunity may optionally contain an entertainment content description which, if present, is only applicable to the specific placement opportunity. The placement opportunity and the positional placement opportunity descriptions may include the desired ad type, characteristics such as min and max duration, min and max placement count, and desired placement scope. The positional placement opportunity may additionally include a description of the ad content currently occupying the position including the current ad type and the planned or recommended ADM placement action.

The placement response messages contain the following high-level items:

• An optional system context description containing refinements to the matching registered placement service description.

• Optional placement service descriptions containing refinements to the matched registered placement service description.

• An optional reference to all the original programming/entertainment content description.
• An optional opaque data element, the ADMData element, if present in the PlacementRequest message.

• An optional client description that again facilitates a self-describing response.

• A list of placement decisions each potentially containing a set of placements. Each placement decision may optionally contain an entertainment content description which, if present, is only applicable to the specific placement decision. A placement shall define the action (e.g., insertion, addition, replacement, deletion, etc.), and it may fully describe the ad including the ad type, a reference to the content, and a Tracking element for associated event reporting. It is via these placement decisions and the Placement elements which the ADS may change or alter the placement opportunity structure by using previously described verbs.

For some placement response message optional items, they may be included to facilitate a self-describing response.

Figure 28 provides a high-level representation of the major elements comprising the PlacementRequest and PlacementResponse messages. The figure illustrates the required element correspondences, or linkages, typically applicable to an element’s reference attribute. Note that Figure 28 does not illustrate all message elements (i.e., it is not comprehensive or all inclusive). See the individual schemas for further details.
Figure 28: Placement Message High-Level View (not comprehensive)

In Figure 28, the PlacementRequest and PlacementResponse messages utilize the base SCTE 130 message element design. The SystemContext, Service, Entertainment and Client elements are optional in both the PlacementRequest and PlacementResponse messages. These elements are typically used in the PlacementRequest message and are provided (or included) in the PlacementResponse message primarily for debug and message symmetry.

The Entertainment element identifies the entertainment or programming asset referential context and may be supplied at either the root message scope or the local element scope, i.e., within a specific PlacementOpportunity element (or PlacementDecision element when contained in the PlacementResponse message). The Entertainment element shall only be used in one of the two scopes (i.e., the inclusion locations are mutually exclusive). When supplied at the root message scope, as illustrated in Figure 28, the Element applies to all message contained PlacementOpportunity (or PlacementDecision) elements. When specified at the local
element scope, the value applies only to the specific including element. Consequently, multiple Entertainment assets may be referenced when contained in the PlacementOpportunity or PlacementDecision elements. Additionally, when using the local element scope, the same Entertainment element information shall be repeated in each PlacementOpportunity or PlacementDecision element as applicable. The Entertainment element shall not be included at both the root message scope and the local element scope within a single message.

If the PlacementRequest message supplied the optional ADMData element, the ADMData element shall be returned in the PlacementResponse message and any subsequent PlacementUpdateNotification message. See Section 14.2 for ADMData element details. An example ADM usage may be for providing high resiliency services.

In Figure 28, the ADM generated PlacementRequest message contains two PlacementOpportunity elements with each element uniquely identified by the individual PlacementOpportunity element’s @id attribute.

The first PlacementOpportunity element (proceeding top down in the figure) contains two PlacementControl elements and each element is uniquely identified by their @id attribute. Each PlacementControl element describes a single positional placement opportunity.

An ADM may optionally communicate its suggested or planned behavior using the @action attribute. For example, an ADM operating in a traditional linear environment may propose to replace the current positional placement opportunity with new ADS specified ad content. The proposed ADM behavior may be overridden by the ADS, but this is an implementation decision outside the scope of this specification. The ADS shall always respond with an @action attribute included in its Placement element. This action represents the ADS ad placement decision which, for this linear example, may be to confirm replacement.

The ADM may optionally describe the current ad content occupying the positional placement opportunity by using the core:Content element (assuming the ADM has this information). For example, the information may be conveyed via the SCTE-35 segmentation_descriptor(). See [SCTE35] for additional information. The PlacementControl element may also enumerate the position within the placement opportunity using the @position attribute. For example, the ADM may only ask for position number two to be filled in the placement opportunity if it is not modifying the first slot in a subdivided placement opportunity.

The second PlacementOpportunity element in Figure 28 contains only a single PlacementControl element describing an independent placement opportunity for the same entertainment content asset.

The PlacementResponse message element (or similarly the PlacementUpdateNotification message element) should typically contain the same
number of PlacementDecision elements as the original PlacementRequest message’s PlacementOpportunity element count. However, the PlacementResponse (or PlacementUpdateNotification) message may contain additional PlacementDecision elements if the ADS added additional PlacementDecision elements. There shall minimally be a one-to-one correspondence where every PlacementOpportunity element contained in the PlacementRequest message shall be referenced by at least one PlacementDecision element in the response or update message. The PlacementDecision element document order should typically match the PlacementOpportunity element order.

Placement opportunities contained in a PlacementRequest message shall only be for the recipient ADS. The same PlacementRequest message shall not be delivered to two or more ADS logical service registrants (i.e., two ADS each having a different @identity attribute value). For example, if an ADM determines that different portions of a placement opportunity are to be handled by different registered ADS, the ADM shall create two different PlacementRequest messages.

Each PlacementResponse message’s PlacementDecision element shall have an @placementOpportunityRef attribute value referencing an original PlacementOpportunity element’s @id attribute. In Figure 28, this pairing is illustrated via the lines connecting the PlacementOpportunity element’s @id attribute and PlacementDecision element’s @placementOpportunityRef attribute.

Within the PlacementDecision element, the ADS shall use Placement elements to communicate its individual positional placement decisions. Each Placement element may represent a single ad asset. Because the ADS may change the (positional) PlacementOpportunity structure, the Placement element should reference an original PlacementControl element via the @placementControlRef attribute if possible. Multiple Placement elements may refer to the same PlacementControl element. For example, this may occur when two or more placements are used to fill the positional placement opportunity currently occupied by a single ad asset.

If the placement decision or placement expires before the PlacementResponse (or PlacementUpdateNotification) message’s lifecycle ends, the ADM behavior is undefined and outside the scope of the specification.

The following sections detail the placement messaging schemas.

12.1.1 PlacementRequest Message Schema

Figure 29 illustrates the PlacementRequest message schema used to announce the ad placement opportunities and request ADS ad placement decisions.
Figure 29: PlacementRequest Message Schema
12.1.1.1 Semantic Definitions for the PlacementRequest Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous PlacementRequest message. The attribute’s value is the original message’s @messageId value. See [SCTE130-2] for additional information.

@updatesAllowed [Optional, xsd:boolean]—The value true indicates the ADM shall accept placement update message exchanges for this placement opportunity set. The value false, which is the default value if the attribute is omitted, indicates the ADM shall not accept placement update message exchanges for this placement request message. See Section 12.2 for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the PlacementResponse message. See [SCTE130-2] for additional information.

SystemContext [Optional]—System environment information that typically refines the placement service identification. See Section 14.52 for additional information.

Service [Optional]—Zero or more elements containing message local information typically refining the placement service registration match. See Section 14.44 for additional information.

Entertainment [Optional]—The entertainment (i.e., programming) content for which the placement opportunities are associated. See Section 14.11 for additional information. If this element is present, the Entertainment element contained within any child PlacementOpportunity shall not be used (i.e., the entertainment asset identification applies to all of this message’s PlacementOpportunity elements and its scope shall not be overridden). See Section 14.33 for details regarding a
PlacementOpportunity element referencing an individual entertainment content asset which enables a PlacementRequest message to reference multiple entertainment assets via the usage of multiple PlacementOpportunity elements.

**Client [Optional]**—A container for client specific placement focus refinements (i.e., targeting criteria). See Section 14.4 for additional information.

**ADMData [Optional]**—Private ADM information. If included, this element *shall* be returned by the ADS in the corresponding PlacementResponse message and any associated PlacementUpdateNotification messages. See Section 14.2 for additional information.

**PlacementOpportunity [Required]**—One or more placement opportunity descriptions. See Section 14.3 for additional information. See x for an additional illustration.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

Figure 28 illustrates the required attribute linkage between a PlacementOpportunity element and its placement service identifier which is provided during registration. Additionally, the figure illustrates how a message contained Service element is linked to and utilized to provide further refinements to a registration.
Figure 30: Service\@id Attribute Linkages

12.1.2 PlacementResponse Message Schema

Figure 31 illustrates the PlacementResponse message schema.
Figure 31: PlacementResponse Message Schema
A non-success status code **shall** terminate the placement message sequence. In this case, no placement update message exchange **shall** subsequently ensue specifically relating to this PlacementRequest message identifier (i.e., the PlacementRequest message’s @messageId attribute in the original message or the @resend attribute value in a retransmitted PlacementRequest message).

A placement update message exchange **shall not** be initiated until the PlacementResponse message is sent.

### 12.1.2.1 Semantic Definitions for the PlacementResponse Message

- **@messageId [Required, core:messageIdAttrType]**—The message identifier. See [SCTE130-2] for additional information.
- **@version [Required, core:versionAttrType]**—The ADM message interface version. See Section 9.1 for additional information.
- **@identity [Required, core:identityAttrType]**—The origin logical service identifier. See [SCTE130-2] for additional information.
- **@system [Optional, core:systemAttrType]**—The message origin identifier. See [SCTE130-2] for additional information.
- **@messageRef [Required, core:messageRefAttrType]**—A reference to the paired PlacementRequest message element initiating this message exchange. The value **shall** be the PlacementRequest message’s @messageId attribute value. See [SCTE130-2] for additional information.
- **@##any [Optional]**—Additional attributes from any namespace.
- **core:InitiatorData [Optional]**—The core:InitiatorData element **shall** be an exact copy of the PlacementRequest message’s core:InitiatorData element and **shall** only be present if found in the paired request message. See [SCTE130-2] for additional information.
- **core:StatusCode [Required]**—An applicable status code specific to the PlacementRequest message processing. See [SCTE130-2] and Appendix A for additional information.
- **SystemContext [Optional]**—System environment information that typically is a copy of the original information. See Section 14.52 for additional information.
- **Service [Optional]**—Zero or more elements containing message local information. Typically, this is a copy of the original information. See Section 14.44 for additional information.
**Entertainment [Optional]**—The entertainment (i.e., programming) content for which the placement opportunities are associated. See Section 14.11 for additional information. Typically, this is a copy of the original information. If this element is present, the Entertainment element contained within any child PlacementDecision element shall not be used (i.e., the entertainment asset identification applies to all of this message’s PlacementDecision elements and its scope shall not be overridden). See Section 14.31 for details regarding a PlacementDecision element referencing an individual entertainment content asset which enables a PlacementResponse message to reference multiple entertainment assets via the usage of multiple PlacementDecision elements.

**Client [Optional]**—A container for client specific placement focus refinements (i.e., targeting criteria). Typically, this is a copy of the original information. See Section 14.4 for additional information.

**ADMData [Optional]**—An identical copy of the ADMData element as it appeared in the PlacementRequest message. This element shall only be present if the ADMData element was present in the corresponding PlacementRequest message. See Section 14.2 for additional information.

**PlacementDecision [Optional]**—Zero or more PlacementDecision elements with each element containing one or more Placement elements. See Section 14.31 for additional information. The Placement elements define the individual positional placement decisions. Each PlacementDecision element typically should correspond to a PlacementOpportunity element. If a processing error occurred, no elements may be present.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

### 12.1.3 Placement Messaging Examples

Example 28 illustrates a VOD pre-roll and post-roll placement request and response (Example 29). The pre-roll placement opportunity is constrained by time and the second placement opportunity, the post-roll, is restricted by placement count. The pre-roll placement opportunity requires a telescoping ad placement. The request provides placement focus (targeting) criteria of ZipPlus4 and gender equal to male. The PlacementResponse (Example 29) returns one content binding for the first placement opportunity. The duration is not specified but is assumed to be compliant. Two placements are returned for the second placement opportunity.
Example 28
Example 29

12.2 Placement Update Messaging

Placement update messaging refers to an ADS PlacementUpdateNotification message communicating a revision to the active placement decisions delivered previously by either a PlacementResponse or PlacementUpdateNotification message. The ADM shall respond with a PlacementUpdateAcknowledgement message. The PlacementUpdateNotification message shall be sent to the address for placement update notification messages as indicated during registration. A PlacementUpdateNotification message shall only be sent if the ADM allowed it via the PlacementRequest message’s @updatesAllowed attribute being set to the value true.
Placement update messaging shall be initiated by an ADS. The PlacementUpdateNotification message’s placement decision set shall be based on the placement opportunity set specified in the accepted ADM PlacementRequest message (just like the PlacementResponse message). The accepted PlacementRequest message may be either the original message or the retransmitted message. Identification of the accepted PlacementRequest message shall be via the original message’s @messageId attribute or via the retransmitted PlacementRequest message’s @resend attribute value. The PlacementUpdateNotification message is the structural equivalent of the PlacementResponse message with similar syntax and semantics.

A PlacementUpdateNotification message shall not be sent if an ADM indicates it does not support placement update messaging for the placement message exchange (i.e., the PlacementRequest message’s @updatesAllowed attribute is set to the value false). Provided the ADM allows updates, indicated by the PlacementRequest message’s @updatesAllowed attribute set to the value true, the placement update message exchange may occur at any time after the corresponding PlacementResponse message is sent.

Multiple placement update message exchanges may occur at the discretion of the ADS.

The PlacementUpdateNotification message uses a design pattern similar to the PlacementResponse message. This allows the ADS to update any or all aspects of the prior active placement decisions. The elements of the PlacementUpdateNotification message shall conform to the rules outlined for the corresponding elements in the PlacementResponse message.

Each PlacementUpdateNotification message shall replace the entire original PlacementResponse message and all previous, successfully acknowledged PlacementUpdateNotification messages when the @updateAction is set to the value “replace”. The net effect at the ADM should be as if the PlacementUpdateNotification message was the original response to the PlacementRequest message. The implementation and transition to the update
The placement decision set is up to the ADM and is outside the scope of this specification (e.g., the ADM may have already cued for execution elements of the prior placement decision set and may not be able to recall them at the time of the update).

Effectively then, the ADS generates a new placement decision set based on the accepted PlacementRequest message and the current state of the campaign. The ADS may change any aspect of the original PlacementResponse message, or any intervening PlacementUpdateNotification message, including the structure and decision set.

The placement update message exchange may also be used by the ADS to cancel a placement decision set. The ADS shall cancel a placement decision set by setting the @updateAction attribute to the value “cancel” in a PlacementUpdateNotification message.

Once a placement update message exchange occurs with the @updateAction attribute set to the value ”cancel”, the ADS shall cease to initiate placement update message exchanges for the cancelled placement decision set and the ADM shall cease to use the cancelled placement decision set. However, the exact timing of when the ADM ceases to use the cancelled placement decision set is up to the ADM and is outside the scope of this specification (e.g., the ADM may have already cued for execution elements of the cancelled placement decision set and may not be able to recall them at the time of the update).

Placement update message exchange determination needs along with implementation of the updated placement decision sets are outside the scope this specification. This specification does not preclude or prefer any method or combination thereof.

An example usage is a VOD session placement decision set update. Upon startup of the VOD session, the ADM issues a PlacementRequest message for the specific entertainment content, client, and addressability parameters. The ADS responds with a PlacementResponse message which includes an airline ad for flights to Las Vegas. Prior to the VOD session completing, all of the near term Las Vegas seats are sold out and the airline decides to change the ad asset to a Florida destination commercial. The ADS issues a PlacementUpdateNotification message which changes the airline ad while leaving the other previous placement decisions intact. The ADM responds with a PlacementUpdateAcknowledgement indicating successful change acceptance.

Another example usage is the updating of a preload or default placement decision set. For example, a VOD system may request a default placement decision for a pre-roll placement opportunity associated with a specific entertainment content asset. The ADS returns a placement utilizing a rotation list populated with ten content elements. Sometime later, the campaign changes and a specific content asset should no longer be included. The ADS issues a PlacementUpdateNotification message to update the placement decision set specifying a new content rotation list containing only nine assets. The ADM responds with a PlacementUpdateAcknowledgement message
indicating update acceptance. Thus, the eliminated content asset is subsequently removed.

The following sections detail the placement update messaging schemas.

12.2.1 PlacementUpdateNotification Message Schema

Figure 33 illustrates the PlacementUpdateNotification message schema.
Figure 33: PlacementUpdateNotification Message Schema
12.2.1.1 Semantic Definitions for the PlacementUpdateNotification Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous PlacementUpdateNotification message. The attribute’s value is the original PlacementUpdateNotification message’s @messageId value. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the original PlacementRequest message element for which this update notification is being provided. See [SCTE130-2] for additional information. The value shall be the original PlacementRequest message’s @messageId attribute value or the retransmitted PlacementRequest message’s @resend attribute’s value.

@updateAction [Required, core:nonEmptyStringType]—The message command verb which is a value from Table 8. The attribute’s value shall appear exactly as in Table 8 and shall not be empty.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cancel</td>
<td>The referenced placement management sequence is terminated.</td>
</tr>
<tr>
<td>replace</td>
<td>The most recent PlacementResponse or PlacementUpdateNotification message shall be replaced in its entirety by this message.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The string shall be prefixed with the text “private:”.</td>
</tr>
</tbody>
</table>

Table 8: PlacementUpdateNotification/@updateAction Attribute Values

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the PlacementUpdateAcknowledgement message. See [SCTE130-2] for additional information.
core:StatusCode [Optional]—A status code value along with zero or more descriptive text elements. See [SCTE130-2] for additional information.

SystemContext [Optional]—System environment information that typically is a copy of the original information. See Section 14.52 for additional information.

Service [Optional]—Zero or more elements containing message local information. Typically, this is a copy of the original information. See Section 14.44 for additional information.

Entertainment [Optional]—The entertainment (i.e., programming) content for which the placement opportunities are associated. See Section 14.11 for additional information. Typically, this is a copy of the original information. If this element is present, the Entertainment element contained within any child PlacementDecision element shall not be used (i.e., the entertainment asset identification applies to all of this message’s PlacementDecision elements and its scope shall not be overridden). See Section 14.31 for details regarding a PlacementDecision element referencing an individual entertainment content asset which enables a PlacementUpdateNotification message to reference multiple entertainment assets via the usage of multiple PlacementDecision elements.

Client [Optional]—A container for client specific placement focus refinements (i.e., targeting criteria). Typically, this is a copy of the original information. See Section 14.4 for additional information.

ADMDData [Optional]—An identical copy of the ADMDData element as it appeared in the PlacementRequest message. This element shall only be present if the ADMDData element was present in the corresponding PlacementRequest message. See Section 14.2 for additional information.

PlacementDecision [Optional]—Zero or more PlacementDecision elements with each element containing one or more Placement elements. See Section 14.31 for additional information. The Placement elements define the individual positional placement decisions. Each PlacementDecision element typically should correspond to a PlacementOpportunity element. If a processing error occurred then no elements may be present. When the @updateAction attribute is set to the value ”cancel”, no PlacementDecision elements shall be included.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.
12.2.2 PlacementUpdateAcknowledgement Message Schema

Figure 34 illustrates the PlacementUpdateAcknowledgement message schema.

Figure 34: PlacementUpdateAcknowledgement Message Schema
12.2.2.1 Semantic Definitions for the PlacementUpdateAcknowledgement Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the paired PlacementUpdateNotification message element initiating this message exchange. The value shall be the PlacementUpdateNotification message’s @messageId attribute value. See [SCTE130-2] for additional information.

@#any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the PlacementUpdateNotification message’s core:InitiatorData element and shall only be present if found in the paired request message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the PlacementUpdateNotification message processing. See [SCTE130-2] and Appendix A for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

12.2.3 Placement Update Examples

Example: The Section 12.1.3 placement decision set (the Example 28 PlacementRequest message and the Example 29 PlacementResponse message) is replaced by this update message exchange (Example 30 notification and Example 31 successful acknowledgement).

```xml
<PlacementUpdateNotification messageId="5B8ECCED-979B-421E-8A6E-E2192B11516B" version="1.4" identity="ADSLogicalService_1170FEF4-C19B-450E-
```
Example 30

<PlacementUpdateAcknowledgement messageId="5B8ECCED-979B-421E-8A6E-E2192B115164" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="5B8ECCED-979B-421E-8A6E-E2192B11516B">
  <core:StatusCode class="0"/>
</PlacementUpdateAcknowledgement>

Example 31
12.3 Placement Status Messaging

The placement status message exchange shall be initiated by an ADM to facilitate ADM to ADS placement event reporting. The events, referred to as named event elements from hereon, shall provide placement decision fulfillment data and may include other events an ADM considers of interest to an ADS.

The PlacementStatusNotification message shall be sent to the ADS callback address supplied in the ADSRegistrationRequest message. The ADS shall confirm message receipt using the PlacementStatusAcknowledgement message. Figure 35 illustrates the placement status message exchange.

![Figure 35: Placement Status Message Exchange](image)

Named event elements are nested within PlayData elements reported to the ADS using the PlacementStatusNotification message. The PlacementStatusNotification message may contain any number of PlayData elements which wrap mixed sequences of named event elements. The Events element, which is a child element located any number of times within the PlayData element, contains the actual sequence of named event elements. This specification’s defined named event elements include the following:

- PlacementStatusEvent—Events related to placements, placement execution, and placement operations. For example, the start and end of ad content insertion, or the end of a PlacementRequest message being updatable.
- SessionEvent—Events related to a session. For example, start/end session and start/end entertainment content segment.
- SystemEvent—Global events, unrelated events and events not fitting into the other event elements.
- ViewerEvent—Events altering the viewer presentation (including click events). For example, a press (click) of the fast-forward, rewind, play, stop, or pause buttons, etc.

All specification defined named event elements share a common base definition described in Section 13.2.1. Each named event element shall have:

- An @type attribute communicating a specific event type within the named element classification.
o An @time attribute identifying the event occurrence time.

o An @identityADS attribute specifying the target ADS @identity attribute. (Note: This value may be specified in the PlayData element and consequently indirectly implies the value in the named event element).

The named event elements may optionally include any of the following:

o An @identityADM attribute specifying the originating ADM logical service identification.

o An @systemADM attribute providing the originating ADM system identification.

o An @messageRef attribute providing the @messageId attribute’s value for a message associated with the event.

o A core:StatusCode element for status and descriptive text carriage.

o A SystemContext element for system parameters of interest.

o A Client element for targeting and refinement criteria.
  ▪ Entertainment element for entertainment asset identification and play time reference or;
  ▪ A Spot element for ad content identification and play time reference or;

o Specific Event Elements, Entertainment or Spot scoped, for additional play position information that provides an overall play time reference typically the clock the viewer associates with a program or entertainment asset including ads.

o A core:Ext element for extensibility.

The placement status message exchange minimally provides status events specific to the ADS placement decisions (i.e., the Placement elements contained within the PlacementDecision elements contained within either a PlacementResponse or PlacementUpdateNotification message). For each Placement element containing a content binding (i.e., the Placement element includes a core:Content element), the ADM should output the following event pairs as often as appropriate during placement delivery:

o A PlacementStatusEvent with the @type attribute set to the value startPlacement (referred to as simply the startPlacement event herein) when entering the content binding from any direction or position.

o A PlacementStatusEvent with the @type attribute set to the value endPlacement (referred to as simply the endPlacement event herein) when exiting an announced entered content binding (i.e., the matched startPlacement event).
If a startPlacement event is output, the ADM should output an endPlacement event. Thus, the two PlacementStatusEvent elements enumerated above should be output in pairs. Additionally, these events shall not be required to be collocated in the same Events element nor the same PlacementStatusNotification message (i.e., the startPlacement event may be contained in one message and the endPlacement event may be present in a separate message).

An ADM should generate a startPlacement event every time a Placement element’s content binding is entered and a startPlacement event for that Placement element is not currently outstanding. Entry into the Placement element’s content binding may mean crossing the core:Content element’s starting content boundary when streaming in the forward direction (i.e. forward play out such as normal play or fast-forward), crossing the content binding’s end boundary when streaming in the reverse direction (i.e., rewind), or entry into the middle of the content binding when seeking directly to an initial position within the content (i.e., jumping into the content). It is the NPT element in the Spot element which enables the entry position to be identified.

An endPlacement event should be generated once each time a Placement element’s content binding is exited following the output of the startPlacement event (i.e., the startPlacement event should generally always have an endPlacement event and the startPlacement shall always be output before an endPlacement event is output). An endPlacement event shall not be output without a corresponding startPlacement event. Thus, for each entry and exit of a Placement element’s content binding, a startPlacement and an endPlacement event should be generated assuming a startPlacement event is generated. While an “endEvents” placement operations event (see below) implies an endPlacement event, the ADM should issue explicit endPlacement events for each outstanding startPlacement event to avoid information loss inherent to an implied endPlacement. An implementation may output the endPlacement event before an “endEvents” notification.

For the two above enumerated PlacementStatusEvent events, the placement context shall be established via the use of the Spot element and any Tracking element(s) supplied in the corresponding Placement element. The Spot element shall be specified either indirectly within the SpotScopedEvents element or directly within the PlacementStatusEvent element. The Tracking element(s) shall be specified in the same scope(s) as in the corresponding Placement element. Additionally and when appropriate, the NPT element in a Spot element should be included in the PlacementStatusEvent element for the startPlacement and endPlacement events. Once a Spot element is specified for a given placement context, PlacementStatusEvent elements with NPT elements can be used as an alternative to a NPT element in a Spot element.

The following examples clarify the startPlacement and endPlacement event requirements should the ADM output the startPlacement event. References to NPT shall be implemented using the NPT element in a Spot element or just an NPT if the Spot element has been previously passed in a PlacementStatusEvent for this placement context.
If the ADM is streaming in the forward direction (either normal play time (NPT) or a fast-forward mode), the startPlacement event is output when the ad content is entered which has an ad content NPT value of zero and a positive @scale attribute value. When the ad content end boundary is crossed (i.e., the end of the ad), the endPlacement event is output having a non-zero NPT value and a positive @scale attribute value (i.e., the NPT is the ad’s ending NPT value). If a new ad immediately follows this exited ad (i.e., back-to-back ads where a different Placement element’s content binding is started), a new startPlacement event is output having an NPT of zero and a positive @scale attribute value.

If the ADM is streaming in the forward direction, the startPlacement event is output when the ad content is entered (just like the previous example). If the user reverses direction (i.e., the content streaming enters rewind mode or reverse play out) and the stream crosses the same ad start boundary in the reverse direction, an endPlacement event is output when the ad’s start boundary is crossed (i.e., the placement has been exited). The NPT value is again zero and the @scale attribute has a negative value.

If the ADM is streaming in the reverse direction (i.e., a negative @scale attribute value) and the ad content’s end boundary is crossed (i.e., entering the ad from its end boundary), a startPlacement event is output with the NPT value of the ad content’s end time. If streaming continues, when the ad content’s start boundary is encountered, an endPlacement event is generated. The NPT value is zero with a negative @scale attribute value. If the end of another ad is immediately entered (i.e., back-to-back ads) then a new startPlacement event is output having a non-zero NPT and negative @scale attribute value.

If the ADM is streaming in the reverse direction, the startPlacement event is output when the ad content’s end boundary is crossed (just like the previous example). If the user reverses direction (i.e., the content streaming enters normal play or fast-forward mode) and the streaming crosses the same ad end boundary, an endPlacement event is output when the placement is exited. The NPT value is again non-zero and the @scale attribute has a positive value.

If the ADM jumps into the middle of the Placement element’s content binding, a startPlacement event is output with a non-zero NPT. The @scale attribute reflects the play out direction. Exiting the Placement element’s content binding results in an endPlacement event. It does not matter whether the content’s start or end boundary is crossed. The NPT value indicates the exit point.

When core:Tracking elements are contained in the Placement element, they shall occupy the same relative position when reflected in the Spot element. That is to say, a core:Tracking element appearing at the Placement element scope shall be echoed back in the same relative position within the Spot element and a core:Tracking element appearing within the Placement element’s core:Content element shall appear
in the core:Content element within the Spot element. Figure 36 and Figure 37 illustrates these relationships.

![Figure 36: core:Tracking Element Relationships](image1)

Anytime an ADS supplies a core:Tracking element, it **shall** be contextually referenced by every event as related and appropriate. However, the exact event sequence an ADM **shall** output is left to the discretion of the ADM with the exception of the previously stated placement related message minimum.

![Figure 37: core:Tracking Element Replication in Spot Elements](image2)
Beyond startPlacement and endPlacement event reporting, a PlacementStatusEvent element should be used to indicate placement operations completion. Placement operations completion facilitates ADS resource conclusion management. For each PlacementRequest message, the ADM should output at least one placement status event. More than one event may be needed when completion signaling occurs in atomic units as signaled by the @type attribute values described below. The number of atomic events required shall equivalently sum to the value “endAll” described below.

When communicating placement operations completion, a PlacementStatusEvent element shall include the following attributes:

- An @type attribute having one of the following three values, which may be privately extended:
  - “endUpdates”—The PlacementRequest message’s placement decision set associated with the @messageRef attribute may no longer be altered even if the fulfillment process for the active placement decision set has not completed. Subsequent placement update messaging pertaining to the referenced PlacementRequest message shall not occur and the ADS is free to release resources associated with the placement decision set. If the PlacementRequest message’s @updatesAllowed attribute has the value false, this event signal is not required.
  
  - “endEvents”—The ADS should not expect to receive any additional named event elements with respect to the PlacementRequest message’s referenced placement decision. Any named event elements received following the receipt of this PlacementStatusEvent element may be ignored as the ADS is free to release resources associated with the identified PlacementRequest message.
  
  - “endAll”—Simultaneously indicates both “endUpdates” and “endEvents.”

- The @messageRef attribute shall reference the original PlacementRequest message which initiated the placement management exchange (i.e., the PlacementRequest message’s @messageId in an original transmission or the @resend attribute value in a retransmitted message). Consequently, each PlacementRequest message minimally requires a unique placement operations completion event.

The registration-established placement service ADS shall receive all required placement status events and an ADS shall be prepared to receive events other than the recommended minimum event element set. An ADM may send a PlacementStatusNotification message containing events for more than one ADS. The
ADM may group the events together in a per ADS targeted PlayData element or individual named event element may contain an ADS destination and this mixture may appear in an Events element.

In the case where the PlayData element contains all the events for a single ADS, the PlayData element’s @identityADS attribute shall be set to the destination ADS logical service and all event elements contained with the Events element shall only be for the specifically identified ADS. If an ADM alternatively mixes the named event elements within the Events element, then an ADM shall include the @identityADS attribute in each named event element (i.e., the @identityADS attribute shall be set in each PlacementStatusEvent, SessionEvent, SystemEvent and ViewerEvent element) and the PlayData element’s @identityADS attribute shall not be used. No matter which ADS identity method is used, the ADM shall include the @identityADS attribute value either in the PlayData element or in each individual named event element.

If the placement decision or placement expires before the PlacementResponse (or PlacementUpdateNotification) message’s lifecycle ends, the ADM should (is highly recommended to) perform a placement status message exchange for this and/or other similar conditions.

More information and additional named event elements may be included as part of placement status reporting beyond the above recommended minimum event reporting. This inclusion is outside of the scope of this specification.

The interpretation of the placement status event data is outside the scope of this specification.

Figure 38 provides a high-level representation of the major elements comprising the PlacementRequest, PlacementResponse and PlacementStatusNotification messages and it illustrates the event element relationships. Note that Figure 38 does not illustrate all the message elements (i.e., it is not comprehensive or all inclusive). See the individual schemas for additional information.
In Figure 38, the first event (working top down in the diagram) references the Entertainment element. Within the Entertainment element, the core:Content element values should be the same as the PlacementRequest, PlacementResponse, and PlacementUpdateNotification message’s Entertainment element.

The next two event elements reference the first Placement element in the PlacementResponse message. The event is specifically associated with the placement content binding and therefore it shall contain the Tracking element contained within the Placement element. Since the event references the ad content, it also references the ad’s core:Content element included via the Spot element.

The fourth event is required to contain both Tracking elements as it is referencing a specific content binding in a Placement element where the ADS supplied both Tracking elements. The fifth and sixth events serve to reinforce this relationship.

The following sections detail the placement status messaging schemas.
12.3.1 PlacementStatusNotification Message Schema

Figure 39 illustrates the PlacementStatusNotification message schema used to communicate placement status information.

12.3.1.1 Semantic Definitions for the PlacementStatusNotification Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.
@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.

@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@resend [Optional, core:resendAttrType]—The message is a retransmit of a previous PlacementStatusNotification message. The attribute’s value is the original message’s @messageId value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element contains implementation specific private data which shall be returned in the PlacementStatusAcknowledgement message. See [SCTE130-2] for additional information.

PlayData [Optional]—One or more containers of event reporting sequences. See Section 14.35 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

12.3.2 PlacementStatusAcknowledgement Message Schema

Figure 40 illustrates the PlacementStatusAcknowledgement Message Schema.
12.3.2.1 Semantic Definitions for the PlacementStatusAcknowledgement Message

@messageId [Required, core:messageIdAttrType]—The message identifier. See [SCTE130-2] for additional information.

@version [Required, core:versionAttrType]—The ADM message interface version. See Section 9.1 for additional information.

@identity [Required, core:identityAttrType]—The origin logical service identifier. See [SCTE130-2] for additional information.
@system [Optional, core:systemAttrType]—The message origin identifier. See [SCTE130-2] for additional information.

@messageRef [Required, core:messageRefAttrType]—A reference to the paired PlacementStatusNotification message element initiating this message exchange. The value shall be the PlacementStatusNotification message’s @messageId attribute value. See [SCTE130-2] for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:InitiatorData [Optional]—The core:InitiatorData element shall be an exact copy of the PlacementStatusNotification message’s core:InitiatorData element and shall only be present if found in the paired notification message. See [SCTE130-2] for additional information.

core:StatusCode [Required]—An applicable status code specific to the PlacementStatusNotification message processing. See [SCTE130-2] and Appendix A for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

12.3.3 Placement Status Examples

Example 32 illustrates a PlacementStatusNotification message reporting the start and end of the first placement and the start of the second placement using self-describing individual events. Note that the example illustrates one way to report events and is not an exhaustive or normative composition. Example 33 illustrates the positive (i.e., success) acknowledgement message.
13.0 SCTE 130 PART 3 ATTRIBUTE TYPES AND COMMON COMPLEX TYPES

The following sections detail the common ADM attributes and complex types utilized by the ADM interface. The common attribute types are detailed first followed by the individual common complex type definitions. These common attributes and complex types are incorporated by the ADM interface elements in subsequent document sections.

13.1 ADM Core Attribute Types

13.1.1 eventRangeEndDateDateTimeAttrType Attribute Type

eventRangeEndDateDateTimeAttrType [core:dateTimeTimezoneType]—This attribute type, typically referred to as the @eventRangeEndDateTime attribute, specifies a date and time value. The value shall be greater than or equal to the latest @time attribute value for any named event element within the container element. By using the @eventRangeStartDateTime and @eventRangeEndDateDateTime attributes, events may be grouped into specific, well-defined time intervals. See [SCTE130-2] for additional information.

13.1.2 eventRangeStartDateDateTimeAttrType Attribute Type

eventRangeStartDateDateTimeAttrType [core:dateTimeTimezoneType]—This attribute type, typically referred to as the @eventRangeStartDateTime attribute,
specifies a date and time value. The value shall be less than or equal to the earliest @time attribute value for any named event element within the container element. By using the @eventRangeStartDateTime and @eventRangeEndDateTime attributes, events may be grouped into specific, well-defined time intervals. See [SCTE130-2] for additional information.

13.1.3 eventTypeAttrType Attribute Type

eventTypeAttrType [core:nonEmptyStringType]—This attribute type, typically referred to as the @type attribute in an event element, contains a non-empty string identifying the specific event being reported using a named event element. See the individual event elements for additional details.

13.1.4 localServiceRefAttrType Attribute Type

localServiceRefAttrType [core:idAttrType]—This attribute type, typically referred to as the @localServiceRef attribute, contains a core:idAttrType identifying a message local Service element. The attribute provides a cross-reference or linkage identifying the specific Service element within the same message element (i.e., local to the message). The attribute’s value is the Service element’s @id attribute. See the individual elements including this attribute for additional details.

13.1.5 placementActionAttrType Attribute Type

placementActionAttrType [core:nonEmptyStringType]—This attribute type, typically referred to as the @action attribute, conveys the placement execution policy. See the individual including elements for additional details.

13.1.6 placementOpportunitiesExpectedAttrType Attribute Type

placementOpportunitiesExpectedAttrType [xsd:nonNegativeInteger]—This attribute type, typically referred to as the @opportunitiesExpected attribute, communicates the scheduled or planned placement opportunities count relative to the entertainment content. The value zero indicates the attribute’s non-usage.

13.1.7 placementOpportunityNumberAttrType Attribute Type

placementOpportunityNumberAttrType [xsd:nonNegativeInteger]—This attribute type, typically referred to as the @opportunityNumber attribute, supplies the placement opportunity identifier or index relative to the entertainment content. Typically, the first placement opportunity is associated with the value one and subsequent placement opportunities increment the index by one. The value zero indicates the attribute’s non-usage.
13.1.8 placementOpportunityTypeAttrType Attribute Type

placementOpportunityTypeAttrType [core:nonEmptyStringType]—This attribute type, typically referred to as the @opportunityType attribute, identifies the placement opportunity type. Typically, this is a location relative to the entertainment content for scheduled or planned placement opportunities, or the trigger type for spontaneous opportunities. For the later, pause is an example. The Table 9 values are defined and they shall appear in an XML document exactly as they appear in the table. Additional values may be extended by private agreement outside the scope of this specification.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>preRoll</td>
<td>Prior to the start of the entertainment content.</td>
</tr>
<tr>
<td>midRoll</td>
<td>Middle of the entertainment content.</td>
</tr>
<tr>
<td>postRoll</td>
<td>Post the end of the entertainment content.</td>
</tr>
<tr>
<td>interstitial</td>
<td>Between entertainment content.</td>
</tr>
<tr>
<td>pause</td>
<td>An opportunity occurring when a display endpoint interaction pauses the entertainment content viewing (e.g., the user pushes the pause button).</td>
</tr>
<tr>
<td>fastForward</td>
<td>An opportunity occurring when a display endpoint interaction fast-forwards the entertainment content viewing (e.g., the user pushes the fast-forward button).</td>
</tr>
<tr>
<td>rewind</td>
<td>An opportunity occurring when a display endpoint interaction rewinds the entertainment content viewing (e.g., the user pushes the rewind button).</td>
</tr>
<tr>
<td>startSession</td>
<td>At the commencement of the implementation defined session initiation boundary.</td>
</tr>
<tr>
<td>endSession</td>
<td>At the termination of the implementation defined session completion boundary.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The string shall be prefixed with the text “private:”.</td>
</tr>
</tbody>
</table>

Table 9: placementOpportunityTypeAttrType Attribute Values

13.1.9 positionAttrType Attribute Type

positionAttrType [xsd:nonNegativeInteger]—This attribute type, typically referred to as the @position attribute, identifies the temporal location of the element when the reference unit is subdivided. For example, the value may be either the positional placement opportunity’s location within a subdivided placement opportunity or a placement’s location within a placement decision. The value zero is reserved and shall not be used.

13.2 ADM Core Common Complex Types

This section defines the common XML complex type definitions used by multiple elements contained within this specification. These common definitions function as
the base element definitions for individual elements and are located here in order to facilitate a single normative definition location. Elements inheriting from these definitions shall reference back to these subsections as appropriate.

13.2.1 EventBaseType Complex Type

The EventBaseType complex type is the base definition for all named event elements.

13.2.1.1 EventBaseType Schema

Figure 41 illustrates the EventBaseType complex type’s schema.
Figure 41: EventBaseType Complex Type Schema
13.2.1.2 Semantic Definitions for EventBaseType Complex Type

@type [Required, eventTypeAttrType]—Event identification. See Section 13.1.3 for additional information.

@time [Required, core:dateTimeTimeZoneType]—The event occurrence date and time. See [SCTE130-2] for additional information.

@identityADM [Optional, core:identityAttrType]—The originating ADM logical service identifier. See [SCTE130-2] for additional information. This attribute is typically used when an ADS or other event receiver is aggregating events from multiple ADM sources and the value is needed in order to clearly identify the ADM event source. Generally, the ADM does not need to supply this value as the ADM PlacementStatusNotification message’s @identity attribute is adequate.

@systemADM [Optional, core:systemAttrType]—The originating ADM system identification. See [SCTE130-2] for additional information.

@identityADS [Optional, core:identityAttrType]—The ADS origin or target logical service identifier. See [SCTE130-2] for additional information. The target ADS identity shall be present in either the PlayData element or in each named event element and this attribute’s usage is mutually exclusive (i.e., either the PlayData element’s attribute or this attribute is used).

@messageRef [Optional, core:messageRefAttrType]—The @messageId attribute’s value for a message associated with this event. See [SCTE130-2] for additional information.

core:StatusCode [Optional]—An applicable status code and zero or more core:Note elements. The applicable status codes are defined in Appendix A. See [SCTE130-2] for additional information.

SystemContext [Optional]—Parameters describing the event’s system context. See Section 14.52 for additional information. If this element is present in a higher level scope element, it shall not be used in the named event element (i.e., it shall not appear in the named event element).

Client [Optional]—Addressability or targeting details. See Section 14.4 for additional information. If this element is present in a higher level scope element, it shall not be used in the named event element (i.e., it shall not appear in the named event element).

Entertainment [Optional Choice]—Entertainment content asset identification. See Section 14.11 for additional information. If this element is present in a higher level scope element, it shall not be used in the named event element (i.e., it shall not appear in the named event element).
element). If the Entertainment element is present in a higher level scope element and a time context relative to the higher level scope Entertainment element is desired, the NPT or UTC element shall be used instead.

**EntertainmentNPT [Optional Choice]**—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. An entertainment specific NPT value is provided using the NPTOffset element contained with the Entertainment element.

**Spot [Optional Choice]**—Ad content asset identification. See Section 14.49 for additional information. If this element is present in a higher level scope element, it shall not be used in the named event element (i.e., it shall not appear in the named event element). If the Spot element is present in a higher level scope element and an NPT relative to the higher level scope Spot element is desired, the NPT element shall be used instead.

**SpotNPT [Optional Choice]**—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. A spot specific NPT value is provided using the NPTOffset element contained with the Spot element.

**NPT [Optional Choice]**—A normal play time (NPT) value referenced to a stream absolute position relative to the beginning of a timeline. See Section 14.22 for additional information. The timeline is typically the clock the viewer associates with a program or entertainment asset including ads.

**UTC [Optional Choice]**—A UTC value referenced to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of live/realtime content.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The named event element’s value may be empty.
13.2.2 NormalPlayTimeType Complex Type

The normal play time (NPT) complex type indicates the stream absolute position relative to the beginning of the referenced content with the basis being adopted from RFC2326. See [RFC2326] for additional information. Typically, this is the clock the viewer associates with the referenced content stream.

13.2.2.1 NormalPlayTimeType Schema

Figure 42 illustrates the NormalPlayTimeType complex type’s schema.

![Figure 42: NormalPlayTimeType Complex Type Schema](image)

13.2.2.2 Semantic Definitions for the NormalPlayTimeType Complex Type

@scale [Required, xsd:decimal]—The scale value of 1 indicates normal play or record at the natural forward viewing rate. If the attribute is not the value of 1, the value corresponds to the rate with respect to the normal viewing rate. For example, a ratio of 2 indicates twice the natural viewing rate (i.e., “fast forward”) and a ratio of 0.5 indicates half the normal viewing rate (i.e., forward at ½ or “slow forward”). In other words, a ratio of 2 has normal playtime increase at twice the wallclock rate. For every second of elapsed (wallclock) time, 2 seconds of content is enumerated. A negative value indicates reverse direction (i.e., “rewind”). For example, the value “-5.0” indicates fives times the normal viewing rate in reverse.

@##any [Optional]—Additional attributes from any namespace.

The NormalPlayTimeType complex type’s value is of type core:nonEmptyStringType and it shall contain either a single NPT time value or a pair of NPT time values separated by a single hyphen with the later describing a range. A NPT time value shall consist of a decimal fraction with the part left of the decimal expressed in seconds and the part to the right of the decimal measuring fractions of a second. The beginning of the content corresponds to the value BOS (Beginning Of Stream) or 0.0 seconds. The end of the content corresponds to the value EOS (End Of Stream) or the specific number of seconds in the content. Negative values shall not be permitted and the NPT element’s value shall not be empty.
13.2.3 PlacementCountType Complex Type

The PlacementCountType complex type specifies a placement count.

13.2.3.1 PlacementCountType Complex Type Schema

Figure 43 illustrates the PlacementCountType complex type’s schema.

![PlacementCountType Complex Type Schema](image)

**Figure 43: PlacementCountType Complex Type Schema**

13.2.3.2 Semantic Definitions for the PlacementCountType Complex Type

@##any [Optional]—Additional attributes from any namespace.

The PlacementCountType complex type’s value is of type xsd:nonNegativeInteger. The value zero indicates no placements are desired.

14.0 SCTE 130 PART 3 ELEMENTS

The following sections detail the ADM elements utilized by the previously described ADM interface messages. The individual ADM elements *may* incorporate the previously defined common attribute and complex types in their individual element definitions. Elements utilizing those definitions *shall* reference back to those subsections as appropriate.

14.1 ADMCapabilities Element

The ADMCapabilities element allows an ADM to communicate any unique abilities or limitations.

14.1.1 ADMCapabilities Element Schema

Figure 44 illustrates the ADMCapabilities element’s schema.
Figure 44: ADMCapabilities Element Schema

14.1.1.1 Semantic Definitions for the ADMCapabilities Element

placementStatusOnlyRegistration [Optional, xsd:boolean] — The value true indicates the ADM supports PlacementStatusNotification message registration only. The value false indicates the ADM does not support PlacementStatusNotification only registration. The attribute’s default value is false and if the attribute is omitted, the default value shall be in effect. Thus, the ADM does not by default support the PlacementStatusNotification only registration.

@##any [Optional] — Additional attributes from any namespace.

NameSpaceVersion [Optional] — The NameSpaceVersion elements contain the list of namespace versions actually supported based on the namespaces included in the ListADMServicesResponse. See Section 14.20 for additional information.


14.1.2 ADMCapabilities Element Examples

Additional examples can be found under ListADMRegistrationResponse (See Section 11.2.3).
14.2 ADMData Element

The ADMData element provides carriage for privately defined attributes and elements that \textit{shall} be returned in a response or notification message exactly as received (i.e., echoed back). For example, this element \textit{may} be used to provide high resiliency services or other value added features.

14.2.1 ADMData Element Schema

Figure 45 illustrates the ADMData element’s schema.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{admdatatypes.png}
\caption{ADMData Element Schema}
\end{figure}

14.2.1.1 Semantic Definitions for the ADMData Element

@##any [Optional]—Additional attributes from any namespace.

The ADMData element’s value is of type \texttt{xsd:string}. The ADMData element’s content is private. If the ADMData element is present, it \textit{shall} be provided exactly as supplied. The ADMData element’s value \textit{may} be empty when all information is communicated using attributes.

14.2.2 ADMData Element Examples

\begin{verbatim}
<ADMData acme:secretSauce="true">Hidden secret sauce...</ADMData>
\end{verbatim}
14.3 Channel Element

The Channel element provides channel identification. For example, the Channel element may identify a specific combination of network and zone in a traditional linear model, or it may be a synonym for a DVB service or an MPEG-2 Transport Stream program.

14.3.1 Channel Element Schema

Figure 46 illustrates the Channel element’s schema.

![Channel Element Schema](image)

**Figure 46: Channel Element Schema**

14.3.1.1 Semantic Definitions for the Channel Element

@##any [Optional]—Additional attributes from any namespace.

The Channel element’s value is of type core:nonEmptyStringType and contains a channel identifier. The element’s value shall not be empty.

14.3.2 Channel Element Examples

```xml
<Channel>ESPN</Channel>
<Channel>7</Channel>
<Channel>FoxSportsWest</Channel>
```

14.4 Client Element

The Client element contains addressing or targeting criteria.

14.4.1 Client Element Schema

Figure 47 illustrates the Client element’s schema.
14.4.1.1 Semantic Definitions for the Client Element

@##any [Optional]—Additional attributes from any namespace.

core:CurrentDateTime [Optional]—The current client or end device date and time. The value shall be expressed in the client’s local time and it shall include the timezone indicator. See [SCTE130-2] for additional information.

TerminalAddress [Optional]—Client endpoint identification such as the set top box MAC address. See Section 14.55 for additional information.

TargetCode [Optional]—Zero or more TargetCode elements with each element containing addressability information (i.e., targeting criteria). See Section 14.54 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.
14.4.2 Client Element Examples

```xml
<Client>
  <core:CurrentDateTime>2007-01-05T12:30:36.0-8:00</core:CurrentDateTime>
  <TerminalAddress type="MAC">03-55-78-90-03-02</TerminalAddress>
  <TargetCode key="ZipPlus4">97363-8993</TargetCode>
  <TargetCode key="Gender">Female</TargetCode>
</Client>
```

14.5 ContentProvider Element

The ContentProvider element identifies a content source and optionally an associated content data model.

14.5.1 ContentProvider Element Schema

Figure 48 illustrates the ContentProvider element’s schema.

**Figure 48: ContentProvider Element Schema**

14.5.1.1 Semantic Definitions for the ContentProvider Element

@`providerID` [Required, core:NonEmptyStringType]—Content source identification. Typically, this is a CableLabs ADI providerID value.

@`##any` [Optional]—Additional attributes from any namespace.

`core:ContentDataModel` [Optional]—Content data model identification for the content source. See [SCTE130-2] for additional information.

The ContentProvider element's value may be empty.
14.5.2 ContentProvider Element Examples

```xml
<ContentProvider providerID="jumpthesharktv"/>
<ContentProvider providerID="mybettercontent.com">
  <core:ContentDataModel type="SCTE236">valid URI</core:ContentDataModel>
</ContentProvider>
```

14.6 ContentRotationList Element

The ContentRotationList element contains two or more core:Content elements used to fulfill a single placement decision. How the ADM utilizes the list is outside the scope of this specification.

14.6.1 ContentRotationList Element Schema

Figure 49 illustrates the ContentRotationList element’s schema.

![ContentRotationList Element Schema](image)

**Figure 49: ContentRotationList Element Schema**

14.6.1.1 Semantic Definitions for the ContentRotationList Element

@##any [Optional]—Additional attributes from any namespace.

core:Content [Required]—Two or more elements describing a set of content assets applicable to a single placement decision binding. See [SCTE130-2] for additional information.
14.6.2 ContentRotationList Element Examples

```xml
<ContentRotationList>
  <core:Content id="Ad 1">
    <core:AssetRef providerID="adco.com" assetID="ITEM1012345678901234"/>
    <core:Tracking>ContentTrackingID1</core:Tracking>
  </core:Content>
  <!--N more Content element entries.-->
  <core:Content id="Ad N">
    <core:AssetRef providerID="adco.com" assetID="ITEM2012345678901239"/>
    <core:Tracking>ContentTrackingIDN</core:Tracking>
  </core:Content>
</ContentRotationList>
```

14.7 DesiredDuration Element

The DesiredDuration element describes an ideal or targeted run-time in years, months, days, hours, minutes, seconds, and milliseconds. This element is typically used in conjunction with the MaxDuration and MinDuration elements as it allows the interface to express the ideal duration for the context. See Section 14.16 and Section 14.18 for additional information regarding the MaxDuration and MinDuration elements respectively.

An example usage is for a linear placement opportunity which ideally is two minutes in duration (i.e., four 30 second ads for example). However, the placement execution implementation may allow small variances since a perfect two minutes may be difficult to achieve. The two minute value is the target value for the ad decision service but the minimum and maximum time, specified using the MinDuration and MaxDuration elements, formally places constraints on the range bounds. Precise duration values are supplied using the Duration element. See [SCTE130-2] for additional information regarding the Duration element.

14.7.1 DesiredDuration Element Schema

Figure 50 illustrates the DesiredDuration element’s schema.
14.7.1.1 Semantic Definitions for the DesiredDuration Element

`@##any [Optional]`—Additional attributes from any namespace.

The DesiredDuration element’s value is of type `xsd:duration` where the format is `PnYnMnDTnHnMn.nnnS`.

14.7.2 DesiredDuration Element Examples

```
<DesiredDuration>PT30S</DesiredDuration> <!--30 seconds-->
<DesiredDuration>PT2M</DesiredDuration> <!--2 minutes-->
```

14.8 DesiredPlacementCount Element

The DesiredPlacementCount element specifies an ideal or targeted placement count. This element is typically used in conjunction with the MaxPlacementCount and MinPlacementCount elements as it allows the interface to express the ideal placement count for the context. See Section 14.17 and Section 14.19 for additional information regarding the MaxPlacementCount and MinPlacementCount elements respectively.

14.8.1 DesiredPlacementCount Element Schema

Figure 51 illustrates the DesiredPlacementCount element’s schema.

```
<DesiredPlacementCount>1</DesiredPlacementCount>
<DesiredPlacementCount>3</DesiredPlacementCount>
```

14.8.1.1 Semantic Definitions for the DesiredPlacementCount Element

The DesiredPlacementCount element inherits from the PlacementCountType complex type. See Section 13.2.3 for semantic definitions applicable to this element.

14.8.2 DesiredPlacementCount Element Examples
14.9 **EffectiveEndDateTime Element**

The EffectiveEndDateTime element is a date and time when the container element becomes invalid or cancelled. For example, the date and time when a placement decision expires. For a container element whose schema includes this element, if the element is omitted, the container never expires. An implementer should focus careful attention when implementing this element as it *may* be used to enforce business constraints.

14.9.1 **EffectiveEndDateTime Element Schema**

Figure 52 illustrates the EffectiveEndDateTime element’s schema.

![EffectiveEndDateTime Element Schema](image)

**Figure 52: EffectiveEndDateTime Element Schema**

14.9.1.1 **Semantic Definitions for the EffectiveEndDateTime Element**

@##any [Optional]—Additional attributes from any namespace.

The EffectiveEndDateTime element’s value is of type core:dateTimeTimeZoneType. See [SCTE130-2] for additional information.

14.9.2 **EffectiveEndDateTime Element Examples**

```
<EffectiveEndDateTime>2009-04-03T12:00:00.0Z</EffectiveEndDateTime>
```

14.10 **EffectiveStartDateTime Element**

The EffectiveStartDateTime element is a date and time when the container element becomes valid or active. For example, this element *may* accompany preloaded placement decisions to indicate when the decisions become active. For a container element whose schema includes this element, if the element is omitted, the container is active immediately. An implementer should focus careful attention when implementing this element as it *may* be used to enforce business constraints.

14.10.1 **EffectiveStartDateTime Element Schema**

Figure 53 illustrates the EffectiveStartDateTime element’s schema.
14.10.1 Semantic Definitions for the EffectiveStartDateTime Element

@##any [Optional]—Additional attributes from any namespace.

The EffectiveStartDateTime element’s value is of type core:dateTimeTimezoneType. See [SCTE130-2] for additional information.

14.10.2 EffectiveStartDateTime Element Examples

```xml
<EffectiveStartDateTime>2009-04-03T12:00:00.0Z</EffectiveStartDateTime>
```

14.11 Entertainment Element

The Entertainment element identifies the entertainment (programming) content using the core:Content element and it optionally contains a PlayPositions element. The PlayPositions element provides the ability to specify a start and/or end marker via a signal identifier, UTC time or NPT offset.

14.11.1 Entertainment Element Schema

Figure 54 illustrates the Entertainment element’s schema.
14.11.1.1 Semantic Definitions for the Entertainment Element

@##any [Optional] — Additional attributes from any namespace.


EntertainmentNPT [Optional] — This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. An entertainment specific NPT value is provided using the NPTOffset element contained with the PlayPositions element.

PlayPositions [Optional] — PlayPositions relative to the paired core:Content element. See Section 0 for additional information.

The Entertainment element may contain a PlayPositions element. This usage facilitates describing discrete points or a range within the entertainment content using a heterogenous mix of positional values.

14.11.2 Entertainment Element Examples

```xml
<Entertainment>
  <core:Content>
    <core:AssetRef providerID="provider.com"
        assetID="TNTA0000000000000000000"/>
  </core:Content>
  <PlayPositions>
    <PlayPositionStart>
      <!-- start play at 11am GMT. -->
      <UTC scale="1">2010-11-09T11:00:00-00:00</UTC>
    </PlayPositionStart>
    <PlayPositionEnd>
      <!-- Signal ID of the out point. -->
      <SignalId>SIGNAL:ISKQWoVaEeGB5Z8NCkgkAZs=</SignalId>
      <!-- UTC time of the out point. -->
      <UTC scale="1.0">2010-11-09T11:12:10.123Z</UTC>
    </PlayPositionEnd>
  </PlayPositions>
</Entertainment>
```

In the above Entertainment element example, the AssetRef element identifies the entertainment content asset. The PlayPositionStart element provides a wall clock date/time marker within the asset. The PlayPositionEnd element provides both a wall clock date/time marker and a signal ID within the asset.

This example shows one way to utilize the PlayPositionStart and PlayPositionEnd elements within live content that was recorded. While the signal IDs provide frame accurate positioning, the provided UTC time codes provide wall clock information to the ADM so an accurate progress bar can be calculated for the region of interest identified by the PlayPositions element.
The following example illustrates how the NPT range is represented using NPTOffset and PlayPositions.

```xml
<Entertainment>
  <core:Content>
    <core:AssetRef providerID="provider.com"
      assetID="TNTA00000000000000000000"/>
  </core:Content>
  <PlayPositions>
    <PlayPositionStart scale="1.0">
      <NPTOffset>15.539</NPTOffset>
    </PlayPositionStart>
    <PlayPositionEnd>
      <NPTOffset>150.714</NPTOffset>
    </PlayPositionEnd>
  </PlayPositions>
</Entertainment>
```

14.12 EntertainmentNPT Element (Eliminated)

The EntertainmentNPT element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. See the PlayPositions element in Section 0 for additional information on how to carry an Entertainment specific NPT value.

14.13 EntertainmentScopedEvents Element

The EntertainmentScopedEvents element reduces named event element size and information replication. This information reduction occurs by allowing the Entertainment element to be declared once and the subsequent named event elements contained within the Events and the SpotScopedEvents elements to indirectly reference the Entertainment element through this scoping.

14.13.1 EntertainmentScopedEvents Element Schema

Figure 55 illustrates the EntertainmentScopedEvents element’s schema.
Figure 55: EntertainmentScopedEvents Element Schema

14.13.1.1 Semantic Definitions for the EntertainmentScopedEvents Element

@eventRangeStartDateTime [Optional, eventRangeStartDateTimeAttrType]—An initial date and time relative to the named event elements contained within the Events and the SpotScopedEvents elements. See Section 13.1.2 for additional details.

@eventRangeEndDateTime [Optional, eventRangeEndDateTimeAttrType]—An ending date and time relative to the named event elements contained within the Events and the SpotScopedEvents elements. See Section 13.1.1 for additional details.

@##any [Optional]—Additional attributes from any namespace.

Entertainment [Required]—Entertainment content identification. See Section 14.11 for additional details. The Entertainment element may contain a PlayPositions element.

The choice sequence allows for one or more Events or SpotScopedEvents elements to be present and combined in any quantity and any order (i.e.,
the element count and mix is unspecified but at least one element shall be present). Any named event element contained within the Events or the SpotScopedEvents elements shall not contain an Entertainment element as the Entertainment element specified herein takes precedence.

Each named event element contained within the Events element may contain an NPT or UTC element.

Each named event element contained within the SpotScopedEvents element may contain an NPT or UTC element. See EventBaseType in Section 13.2.1 for additional information.

This usage facilitates describing a range of the entertainment or advertising content, for example a chapter within entertainment, while each named event references a specific timepoint within the range.

**Events [Choice]**—A container for named event elements. See Section 0 for additional information.

**SpotScopedEvents [Choice]**—A container for named event elements scoped by a Spot element. See Section 14.51 for additional information.

14.13.2 EntertainmentScopedEvents Element Examples

In this example, the entertainment content is static and two Events elements and one SpotScopedEvents element provide grouped sequences of named event elements which reference and are relative to the declared static Entertainment element.
<EntertainmentScopedEvents>
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com"
               assetID="BAAD9876543210987654"/>
    </core:Content>
  </Entertainment>
  <Events>
    <SessionEvent time="2007-01-31T01:59:59Z" type="startSession">
      <core:StatusCode class="3">
        <core:Note>Session start. </core:Note>
      </core:StatusCode>
    </SessionEvent>
  </Events>
</EntertainmentScopedEvents>

<SpotScopedEvents>
  <Spot>
    <core:Tracking>FFFFFDC7-6C60-0030-B2B7-B68DAF952C95</core:Tracking>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
               assetID="ADVR1000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
    </core:Content>
  </Spot>
  <Events>
    <PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
      <Spot>
        <PlayPositions scale="1">
          <PlayPositionStart>
            <NPTOffset>0</NPTOffset>
          </PlayPositionStart>
        </PlayPositions>
      </Spot>
    </PlacementStatusEvent>
    <PlacementStatusEvent time="2007-01-31T02:00:20Z" type="endPlacement">
      <Spot>
        <PlayPositions scale="1">
          <PlayPositionEnd>
            <NPTOffset>15</NPTOffset>
          </PlayPositionEnd>
        </PlayPositions>
      </Spot>
    </PlacementStatusEvent>
  </Events>
</SpotScopedEvents>
14.14 Events Element

The Events element is a sequence container for one or more different, individually defined named event elements with any element appearing as often as desired. There are no limitations to the number of events or the order of the individual events. Events typically should be listed in the order completed (i.e., when the event’s @time attribute becomes known.)

14.14.1 Events Element Schema

Figure 56 illustrates the Events element’s schema.
14.14.1.1 Semantic Definitions for the Events Element

@eventRangeStartDate [Optional, 
eventRangeStartDateAttrType]—An initial date and time for the named event elements contained within the choice sequence. See Section 13.1.2 for additional details.

@eventRangeEndDate [Optional, 
eventRangeEndDateAttrType]—An ending date and time for the named event elements contained within the choice sequence. See Section 13.1.1 for additional details.

@##any [Optional]—Additional attributes from any namespace.
**PlacementStatusEvent [Optional]**—A placement status specific report. See Section 14.34 for additional information.

**SessionEvent [Optional]**—A session specific report. See Section 14.48 for additional information.

**SystemEvent [Optional]**—A system specific report. See Section 14.53 for additional information.

**ViewerEvent [Optional]**—A viewer action report. See Section 14.57 for additional information.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.
14.14.2 Events Element Examples

```xml
<Events>
  <!-- Individual events are defined hereafter. There may be any number of events within. -->
  <SessionEvent type="endSession" time="2008-02-22T09:30:47Z"/>
</Events>

<Events>
  <SessionEvent time="2007-01-31T01:59:59Z" type="startSession">
    <core:StatusCode class="3">
      <core:Note>Session start.</core:Note>
    </core:StatusCode>
  </SessionEvent>
  <PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
    <Spot>
      <core:Content>
        <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789001"/>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
      </core:Content>
      <PlayPositions scale="1">
        <PlayPositionStart>
          <NPTOffset>0</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
    </Spot>
  </PlacementStatusEvent>
  <ViewerEvent time="2007-01-31T02:00:05Z" type="pause" eventSource="remote">
    <Spot>
      <core:Content>
        <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789001"/>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
      </core:Content>
      <PlayPositions scale="0">
        <PlayPosition>
          <NPTOffset>5</NPTOffset>
        </PlayPosition>
      </PlayPositions>
    </Spot>
  </ViewerEvent>
</Events>
```
14.15 LinearAvailBinding Element

The LinearAvailBinding element functions as a bridge for linear placement opportunity information (i.e., the traditionally termed avail or break). The element contains information specific to defining, refining, or labeling the placement opportunity. The PlacementRequest message operates in the define mode while the other placement management messages operate in the refinement manner. The element’s attributes and sub-elements are designed to directly map to an SCTE 35 splice_insert() command and its related descriptors. For example, the SCTE 35 avail_num bitfield maps to @opportunityNumber, the avails_expected bitfield maps to @opportunitiesExpected, and so on. See [SCTE35] for additional information.

14.15.1 LinearAvailBinding Element Schema

Figure 57 illustrates the LinearAvailBinding element’s schema.
14.15.1.1 Semantic Definitions for the LinearAvailBinding Element

@opportunityType [Optional, placementOpportunityTypeAttrType]—The placement opportunity type. See Section 13.1.8 for additional information. For example, in classic linear the typical value for this attribute is ‘interstitial.’

@opportunityNumber [Optional, placementOpportunityNumberAttrType]—The placement opportunity identification value relative to the entertainment content. See Section 13.1.7 for additional information.

@opportunitiesExpected [Optional, placementOpportunitiesExpectedAttrType]—The total number of
planned placement opportunities relative to the entertainment content. See Section 13.1.6 for additional information.

@spliceEventID [Optional, xsd:nonNegativeInteger]—The splice event identifier. Typically, this value is obtained from the SCTE 35 splice_insert() command’s field of the same approximate name. See [SCTE35] for additional information.

@##any [Optional]—Additional attributes from any namespace.

ProviderAvailID [Optional]—Zero or more elements that a receiving device may utilize to alter its behavior. See Section 14.42 for additional information.

Window [Optional]—The placement opportunity’s scheduled time range. See Section 14.58 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The LinearAvailBinding element’s value may be empty.

14.15.2 LinearAvailBinding Element Examples

```
<LinearAvailBinding opportunityType="interstitial" opportunityNumber="1" opportunitiesExpected="4"/>

<LinearAvailBinding opportunityType="interstitial" opportunityNumber="2" spliceEventID="83983">
  <ProviderAvailID>938</ProviderAvailID>
  <ProviderAvailID>2373</ProviderAvailID>
</LinearAvailBinding>

<LinearAvailBinding>
  <Window start="2007-06-03T09:30:47.0Z" end="2007-06-03T09:40:47.0Z"/>
</LinearAvailBinding>
```

The initial example LinearAvailBinding element is the first of four expected placement opportunities. The next example is placement opportunity number two in the series and it has an SCTE 35 splice event ID of 83938. The binding also has two associated provider identifiers. The third example binds the placement window to the placement opportunity.
14.16 MaxDuration Element

The MaxDuration element describes a maximum run-time in years, months, days, hours, minutes, seconds, and milliseconds.

14.16.1 MaxDuration Element Schema

Figure 58 illustrates the MaxDuration element’s schema.

![MaxDuration Element Schema](image)

**Figure 58: MaxDuration Element Schema**

14.16.1.1 Semantic Definitions for the MaxDuration Element

@##any [Optional]—Additional attributes from any namespace.

The MaxDuration element’s value is of type xsd:duration where the format is PnYnMnDTnHnMn.nnnS.

14.16.2 MaxDuration Element Examples

```xml
<MaxDuration>PT1M</MaxDuration>
<MaxDuration>PT60S</MaxDuration>
<MaxDuration>PT30.000S</MaxDuration>
<MaxDuration>PT1H5M23.666S</MaxDuration>
<MaxDuration>P1Y2M3DT10H30M</MaxDuration>
```

14.17 MaxPlacementCount Element

The MaxPlacementCount element specifies a maximum placement count.
14.17.1 MaxPlacementCount Element Schema

Figure 59 illustrates the MaxPlacementCount element’s schema.

![MaxPlacementCount Element Schema](image)

**Figure 59: MaxPlacementCount Element Schema**

14.17.1.1 Semantic Definitions for the MaxPlacementCount Element

The MaxPlacementCount element inherits from the PlacementCountType complex type. See Section 13.2.3 for semantic definitions applicable to this element.

14.17.2 MaxPlacementCount Element Examples

```
<MaxPlacementCount>5</MaxPlacementCount>
```

14.18 MinDuration Element

The MinDuration element describes a minimum run-time in years, months, days, hours, minutes, seconds, and milliseconds

14.18.1 MinDuration Element Schema

Figure 60 illustrates the MinDuration element’s schema.

![MinDuration Element Schema](image)

**Figure 60: MinDuration Element Schema**

14.18.1.1 Semantic Definitions for the MinDuration Element

@##any [Optional]—Additional attributes from any namespace.
The MinDuration element’s value is of type xsd:duration where the format is PnYnMnDTnHnMn.nnnS.

14.18.2 MinDuration Element Examples

```xml
<!-- 15 seconds -->
<MinDuration>PT15S</MinDuration>

<!-- Exactly 30 seconds -->
<MinDuration>PT30.000S</MinDuration>

<!-- One year, 2 months, 3 days, 10 hours, 30 minutes and zero seconds. -->
<MinDuration>P1Y2M3DT10H30M</MinDuration>
```

14.19 MinPlacementCount Element

The MinPlacementCount element specifies a minimum placement count.

14.19.1 MinPlacementCount Element Schema

Figure 61 illustrates the MinPlacementCount element’s schema.

```
Figure 61: MinPlacementCount Element Schema
```

14.19.1.1 Semantic Definitions for the MinPlacementCount Element

The MinPlacementCount element inherits from the PlacementCountType complex type. See Section 13.2.3 for semantic definitions applicable to this element.

14.19.2 MinPlacementCount Element Examples

```xml
<MinPlacementCount>0</MinPlacementCount>
<MinPlacementCount>2</MinPlacementCount>
```
14.20 NameSpaceVersion Element

The NameSpaceVersion element identifies namespaces and their versions. For example, in a ListADMServicesResponse one or more NameSpaceVersion elements may be supplied to enumerate namespaces and versions supported by the ADM. (e.g., SCTE 130 PODM).

14.20.1 NameSpaceVersion Element Schema

Figure 62 illustrates the NameSpaceVersion element’s schema.

![Diagram of NameSpaceVersion Element Schema](image)

Figure 62: NameSpaceVersion Element Schema

14.20.1.1 Semantic Definitions for the NameSpaceVersion Element

@namespace [Required core:NonEmptyStringType] – Namespace identification. This can be a URI or other valid string.

@version [Optional core:NonEmptyStringType] – Specify a version for the namespace.

@##any [Optional]—Additional attributes from any namespace.

14.20.2 NameSpaceVersion Element Examples

```xml
<NameSpaceVersion namespace="http://www.scte.org/schemas/130-3/2013/adm/podm" version="1.1"/>
<NameSpaceVersion namespace="http://www.scte.org/schemas/130-3/2013/adm/podm" version="1.2"/>
<NameSpaceVersion namespace="urn:cablelabs:md:xsd:placementopportunity:3.0"/>
```

In above NameSpaceVersion Element examples, two versions of the podm data model are illustrated along with the CableLabs metadata Placement Opportunity schema.
14.21 Network Element

The Network element facilitates network identification. For example, the Network element *may* identify the primary channel programming network in a traditional linear advertising context, or it *may* be the name of the original content programming source in the context of a delayed playback of a primary network feed.

14.21.1 Network Element Schema

Figure 63 illustrates the Network element’s schema.

![Network Element Schema Diagram]

**Figure 63: Network Element Schema**

14.21.1.1 Semantic Definitions for the Network Element

@##any [Optional]—Additional attributes from any namespace.

The Network element’s value is of type core:nonEmptyStringType and *shall not* be empty.

14.21.2 Network Element Examples

```xml
<Network>ABC</Network>
<Network>154</Network>
```

14.22 NPT Element

The normal play time (NPT) element indicates the stream absolute position relative to the beginning of the referenced content with the basis being adopted from RFC2326. See [RFC2326] for additional information.

14.22.1 NPT Element Schema

Figure 64 illustrates the NPT element’s schema.
14.22.1.1 Semantic Definitions for the NPT Element

The NPT element inherits from the NormalPlayTimeType complex type. See Section 13.2.2 for semantic definitions applicable to this element.
14.22.2 NPT Element Examples

```xml
<!-- "Normal" play from content start.-->
<NPT scale="1.0">0.0</NPT>
<NPT scale="1">0</NPT>

<!-- Pause/stop at content start. -->
<NPT scale="0">0</NPT>

<!--Pause at 5 seconds-->
<NPT scale="0.0">5</NPT>

<!-- Pause at point in content.-->
<NPT scale="0">333.3</NPT>

<!--"Normal" play speed at 123.45 seconds into content.-->
<NPT scale="1.0">123.45</NPT>

<!--Fast-forward at 2x starting 10.333 seconds into content.-->
<NPT scale="2.0">10.333</NPT>
<NPT scale="2">10.333</NPT>

<!--Fast-rewind at 6x starting 30 seconds into content.-->
<NPT scale="-6.0">30.0</NPT>

<!--Range-->
<NPT scale="1.0">123.45-125</NPT>

<!--Rewind at 2x for the range.-->
<NPT scale="-2">130.0-87.5</NPT>

<!--Fast forward at 1/2 speed starting at one second-->
<NPT scale="0.5">1</NPT>
```

14.23 NPTOffset Element

The normal play time (NPT) offset element indicates the stream absolute position relative to the beginning of the referenced (entertainment/spot) content with the basis being adopted from RFC2326. See [RFC2326] for additional information.

14.23.1 NPTOffset Element Schema

Figure 64 illustrates the NPTOffset element’s schema.
14.23.1 Semantic Definitions for the NPTOffset Element

The NPTOffset element inherits from the NormalPlayTimeType complex type. See Section 13.2.2 for semantic definitions applicable to this element.

14.23.2 NPTOffset Element Examples

```
<NPTOffset>5</NPTOffset>
<NPTOffset>55.9</NPTOffset>
```

14.24 OpportunityBinding Element

The OpportunityBinding element contains information specific to defining, refining, or labeling the placement opportunity. The PlacementRequest message operates in the define mode while the other placement management messages operate in the refinement manner.

14.24.1 OpportunityBinding Element Schema

Figure 66 illustrates the OpportunityBinding element’s schema.
Figure 66: OpportunityBinding Element Schema

14.24.1.1 Semantic Definitions for the OpportunityBinding Element

@opportunityType [Optional, placementOpportunityTypeAttrType]—The placement opportunity type. See Section 13.1.8 for additional information.

@opportunityNumber [Optional, placementOpportunityNumberAttrType]—The placement opportunity identification value relative to the entertainment content. See Section 13.1.7 for additional information.

@opportunitiesExpected [Optional, placementOpportunitiesExpectedAttrType]—The total number of planned placement opportunities relative to the entertainment content. See Section 13.1.6 for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The OpportunityBinding element’s value may be empty.
14.24.2 OpportunityBinding Element Examples

```
<OpportunityBinding opportunityType="preRoll"/>
<OpportunityBinding opportunityNumber="2" opportunitiesExpected="5"/>
<OpportunityBinding opportunityType="postRoll" opportunityNumber="3" opportunitiesExpected="3"/>
```

The first example OpportunityBinding element indicates the placement opportunity type as a pre-roll meaning the ad content comes before the entertainment content.

The second example does not describe the opportunity type only that it is opportunity number two of five expected. It is likely that the registration-established service details implied the placement opportunity type.

The final example signals a post-roll opportunity identified as opportunity number three relative to the entertainment content and this opportunity is the last of the expected opportunities.

14.25 OpportunityConstraints Element

The OpportunityConstraints element defines placement opportunity restrictions and limitations applicable to the container element’s scope (i.e., the higher level scope element that “wraps” this element). The OpportunityConstraints element may be included in a PlacementRequest message as part of the ADM communicating details regarding the placement opportunities. If the OpportunityConstraints element is located within the PlacementOpportunity element, the constraints apply to the entire opportunity. If the OpportunityConstraints element is contained within the PlacementControl element, the limits apply to the PlacementControl element’s positional scope. The OpportunityConstraints element may be included in both scopes simultaneously and in the event of a conflict, the PlacementOpportunity element scoped values take precedence.

The ADS placement decisions should meet the supplied constraints and the ADM should verify response conformance. Verification and error handling are outside the scope of this specification.

An ADS is allowed to alter the opportunity structures within the ADM presented opportunity constraints. The ADM is ultimately responsible for placement decision fulfillment and therefore, validating the placement decision set correctly adheres to the constraints. How the ADM accomplishes this validation is outside the scope of this specification.
14.25.1 OpportunityConstraints Element Schema

Figure 67 illustrates the OpportunityConstraints element’s schema.
Figure 67: OpportunityConstraints Element Schema
14.25.1.1 Semantic Definitions for the OpportunityConstraints Element

In this semantic definition section, a reference to a placement opportunity may also apply to a positional placement opportunity dependent on the OpportunityConstraints element’s location in the XML document. The text uses placement opportunity to cover both the placement opportunity and the positional placement opportunity cases.

@##any [Optional]—Additional attributes from any namespace.

core:AdType [Optional]—Zero or more elements specifying specific ad types that shall satisfy the placement opportunity. See [SCTE130-2] for additional information.

MaxDuration [Optional Choice]—An element specifying the maximum total placement opportunity duration. The total placement set duration shall not exceed this value but may be less than this value. If an exact duration is required, the Duration element shall be used. See Section 14.16 for additional information.

MinDuration [Optional Choice]—An element providing the minimum total placement opportunity duration. The total placement set duration shall not be less than this value. If an exact duration requirement is desired, the Duration element shall be used. See Section 14.18 for additional information.

DesiredDuration [Optional Choice]—An element specifying the ideal (or desired) total placement opportunity duration. The total placement set duration should match this value but may range within the tolerance specified by the MaxDuration and the MinDuration elements. If an exact duration is required, the Duration element shall be used. See Section 14.7 for additional information.

core:Duration [Optional Choice]—An element indicating a required total placement opportunity duration for which the placement decision set duration shall match. See [SCTE130-2] for additional information.

MaxPlacementCount [Optional Choice]—An element specifying the maximum Placement element count that may be defined to fulfill the placement opportunity. If an exact requirement is necessary, the PlacementCount element shall be used. See Section 14.17 for additional information.

MinPlacementCount [Optional Choice]—An element specifying the minimum Placement element count that may be defined to fulfill the placement opportunity. If an exact requirement is necessary, the PlacementCount element shall be used. See Section 14.19 for additional information.
**DesiredPlacementCount [Optional Choice]**—An element specifying the ideal (or desired) Placement element count that *may* be defined to fulfill the placement opportunity. The total placement set duration should match this value but *may* range within the tolerance specified by the MaxPlacementCount and the MinPlacementCount elements. If an exact requirement is necessary, the PlacementCount element *shall* be used. See Section 14.8 for additional information.

**PlacementCount [Optional Choice]**—An element indicating the exact number of Placement elements that *shall* be defined in the placement decision set. See Section 14.29 for additional information.

**EffectiveStartDateTime [Optional]**—An element identifying when the placement opportunity information becomes active. If the element is omitted, active immediately is implied. See Section 14.10 for additional information.

**EffectiveEndDateTime [Optional]**—An element identifying when the placement opportunity information becomes inactive or cancelled. If the element is omitted, active infinitely is implied. See Section 14.9 for additional information.

**Scope [Optional]**—Zero or more elements specifying the fulfillment scope. See Section 14.43 for additional information.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The OpportunityConstraints element’s value *may* be empty.
14.25.2 OpportunityConstraints Element Examples

```xml
<OpportunityConstraints>
  <MaxDuration>PT30S</MaxDuration>
</OpportunityConstraints>

<OpportunityConstraints>
  <core:AdType>Graphic Overlay</core:AdType>
  <MaxPlacementCount>3</MaxPlacementCount>
  <EffectiveStartDate>2007-12-10T12:00:00Z</EffectiveStartDate>
  <EffectiveEndDate>2008-01-10T12:00:00Z</EffectiveEndDate>
  <Scope>Local</Scope>
  <Scope>Regional</Scope>
</OpportunityConstraints>
```

The first example OpportunityConstraints element specifies the placement opportunity has a maximum duration of thirty seconds. Thus, the ADS may provide any combination of ads that have a total play out time not exceeding thirty seconds. The ADS may respond with an empty decision (i.e., no ad content).

The second example OpportunityConstraints element specifies that up to three graphic overlay ads may be returned. The effective start and end date define a time period of 31 days and the ads may be of either local or regional scope.

14.26 Placement Element

The Placement element contains a specific ADS placement decision in response to a placement decision request (i.e., a PlacementRequest message). Within the Placement element, the ADS behavior decision or action is specified using the @action attribute. The Placement element may include a content binding which pairs a content asset with the placement, an ADS assigned tracking identifier, and a set of placement constraints.

14.26.1 Placement Element Schema

Figure 68 illustrates the Placement element’s schema.
14.26.1.1 Semantic Definitions for the Placement Element

@id [Required, core:idAttrType]—An element unique identifier attribute which shall be exclusive within the scope of the encompassing container element. See [SCTE130-2] for additional information.

@action [Required, placementActionAttrType]—The ADS specified behavior that the ADM shall carry out for this placement. See Section 13.1.5 for additional information. Table 10 defines attribute values and
behaviors which may be extended by private agreement outside the scope of this specification. The attribute’s value shall appear exactly as shown in Table 10.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>delete</td>
<td>The associated placement opportunity or positional placement opportunity shall be removed. This value alters the placement structure removing the placement opportunity or positional placement opportunity. No ad content shall be output and any existing ad content occupying this location shall be removed. No core:Content or ContentRotationList element shall appear in the Placement element.</td>
</tr>
<tr>
<td>fill</td>
<td>The placement opportunity or positional placement opportunity shall be added to or inserted at this location. This value may alter the placement opportunity structure. Either a core:Content or ContentRotationList element shall be present in the Placement element.</td>
</tr>
<tr>
<td>fixed</td>
<td>The placement opportunity or positional placement opportunity shall not be changed or altered. No core:Content or ContentRotationList element shall appear in the Placement element.</td>
</tr>
<tr>
<td>replace</td>
<td>The currently occupying placement opportunity or positional placement opportunity content shall be replaced by the supplied content bindings. Either a core:Content or ContentRotationList element shall be present in the Placement element.</td>
</tr>
<tr>
<td></td>
<td>User defined and outside the scope of this specification. The string shall be prefixed with the text “private:“.</td>
</tr>
</tbody>
</table>

Table 10: Placement Element’s @action Attribute Values

@placementControlRef [Optional, core:idAttrType]—A reference to a PlacementRequest message’s PlacementControl element. This attribute shall be included if the original PlacementRequest contained a PlacementControl element being fulfilled by this Placement element. This attribute shall be omitted if there is no PlacementControl element available to reference. The reference facilitates ADM verification of the ADS decision and it enables positional references for non-consecutive placements.

@position [Optional, positionTypeAttr]—Placement location within the placement decision set. See Section 13.1.9 for additional information. Typically, this attribute should be included when the placement is not consecutive.

@##any [Optional]—Additional attributes from any namespace.
**core:Tracking [Optional]**—A placement identification element typically supplied by an ADS. See [SCTE130-2] for additional information. The Tracking element, if present, *shall* be placed into all reporting events associated with this placement. See Section 12.3 for references to the appropriate events where this element *shall* be echoed.

**core:Content[Optional Choice]**—A content binding occupying this placement position. See [SCTE130-2] for additional information.

**ContentRotationList [Optional Choice]**—A sequence of content bindings used to satisfy the placement and its usage is outside the scope this specification. See Section 14.6 for additional information.

**PlacementConstraints [Optional]**—The specific limitations that *shall* be applied to the placement. See Section 14.27 for additional information.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.26.2 Placement Element Examples

Example 34 deletes the corresponding placement opportunity.

```xml
<Placement id="DeletePosition1Decision" action="delete" position="1"/>
```

**Example 34**

Example 35 replaces the single positional placement opportunity using the supplied content binding.

```xml
<Placement id="ReplacePostion1Decision" action="replace" placementControlRef="PCtrlSlot1">
  <!--Placement decision tracking.-->  
  <core:Tracking>Placement tracking tag1</core:Tracking>
  <!--Content binding.-->  
  <core:Content>
    <core:AssetRef providerID="contentco.com" assetID="CNCO8899663683678632"/>
  </core:Content>
</Placement>
```

**Example 35**

Example 36 replaces the single positional placement opportunity using the supplied content rotation list. The PlacementConstraints element makes the
placement exactly 30 seconds in duration. The placement is assigned a cancellation date and time and is marked as a locally scoped placement.

Example 36

14.27 PlacementConstraints Element

The PlacementConstraints element contains ADS supplied placement restrictions and limitations applicable to a placement decision set or to an individual placement. The PlacementConstraints element’s applicability is relative to the containing element’s scope. For example, if the PlacementConstraints element is located within the PlacementDecision element, the constraints apply to the entire placement decision including all its positional placements. If the PlacementConstraints element is contained within the Placement element (i.e., the positional placement decision), the limits apply only to the subunit’s positional scope.

If PlacementConstraints are located at both XML element levels and there is a conflict, then the PlacementConstraints scoped to the outer level, (i.e., the PlacementDecision element) shall take precedence.

14.27.1 PlacementConstraints Element Schema

Figure 69 illustrates the PlacementConstraints element’s schema.
14.27.1.1 Semantic Definitions for the PlacementConstraints Element

@##any [Optional]—Additional attributes from any namespace.

core:Duration [Optional]—The total placement duration. The placement implementation shall pad or cut the content asset as necessary and appropriate to meet this duration. See [SCTE130-2] for additional information.

EffectiveStartDate [Optional]—A date and time when the placement information becomes active. If the element is omitted, active immediately is implied. See Section 14.10 for additional information.

EffectiveEndDate [Optional]—A date and time when the placement information becomes inactive. If the element is omitted then active infinitely is implied. See Section 14.9 for additional information.
Scope [Optional]—A sequence of fulfillment scopes. See Section 14.43 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The PlacementConstraints element’s value may be empty if the constraints are supplied using only attributes from other namespaces.

14.27.2 PlacementConstraints Element Examples

```xml
<PlacementConstraints>
<!--Make the placement last exactly 30 seconds.-->
<core:Duration>PT30.000S</core:Duration>
<!--Commencement and cancellation date and time.-->
<EffectiveStartDateTime>2009-04-02T12:00:00Z</EffectiveStartDateTime>
<EffectiveEndDateTime>2009-04-03T12:00:00.0Z</EffectiveEndDateTime>
<!--Placement scope-->
<Scope>Local</Scope>
</PlacementConstraints>
```

14.28 PlacementControl Element

The PlacementControl element describes an individual positional placement opportunity subunit within a placement opportunity description. The PlacementControl element may be included in a PlacementRequest message as part of the ADM communicating details regarding the positional placement opportunity. See Section 12.1 for additional information.

14.28.1 PlacementControl Element Schema

Figure 70 illustrates the PlacementControl element’s schema.
14.28.1.1 Semantic Definitions for the PlacementControl Element

@id [Required, core:idAttrType]—An element unique identifier. See [SCTE130-2] for additional information.

@action [Optional, placementActionAttrType]—The behavior planned to be executed by the ADM. See Section 13.1.5 for additional information. Table 11 lists the defined values, which may be extended by private agreement outside the scope of this specification. The attribute’s value shall appear exactly as shown in Table 11.
<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>delete</td>
<td>The positional placement opportunity and its currently associated ad content are planned to be removed. Confirmation of this value by the ADS <em>shall</em> alter the placement structure removing the positional placement opportunity. No currently occupying ad content associated with this positional placement opportunity <em>shall</em> be output and any existing ad <em>shall</em> be removed.</td>
</tr>
<tr>
<td>fill</td>
<td>The positional placement opportunity is currently unoccupied and the placement decision’s content bindings are planned to be added or inserted into this location.</td>
</tr>
<tr>
<td>fixed</td>
<td>The positional placement opportunity and its associated content <em>shall not</em> be altered or changed. The element is providing information only.</td>
</tr>
<tr>
<td>replace</td>
<td>The currently occupying ad content is planned to be replaced by the supplied content bindings.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The string <em>shall</em> be prefixed with the text “private:”.</td>
</tr>
</tbody>
</table>

Table 11: PlacementControl Element’s @action Attribute Values

@position [Optional, positionTypeAttr]—Positional placement opportunity subunit within the placement opportunity subdivision. See Section 13.1.9 for additional information. Typically, this attribute should be included when the positional placement opportunity is not the first or consecutive element within the positional placement opportunity sequence.

@##any [Optional]—Additional attributes from any namespace.

core:Content [Optional]—Identification and details regarding the current content asset occupying this placement opportunity position. See [SCTE130-2] for additional information.

OpportunityConstraints [Optional]—Information detailing specific limitations or requirements applicable to the placement opportunity. See Section 14.25 for additional information.

PlacementDateTime [Optional]—The expected or calculated date and time when this positional placement opportunity subunit *shall* be viewed. See Section 14.30 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.
14.28.2 PlacementControl Element Examples

Example 37 illustrates a minimum PlacementControl element which identifies by name the positional placement opportunity. This creates one positional placement opportunity within the placement opportunity context.

```xml
<PlacementControl id="MinimumDescription"/>
```

**Example 37**

Example 38 is a positional placement opportunity with a planned action of “replace” and located in the first position (i.e., the start of the placement opportunity). The ad content is to be 30 seconds in duration.

```xml
<!--Example positional placement opportunity.-->  
<PlacementControl id="Slot1" action="replace" position="1">  
  <core:Content>  
    <!--Current ad content occupying this position.-->  
    <core:SpotRef trafficId="8989" spotId="Spot1"/>  
  </core:Content>  
  <OpportunityConstraints>  
    <!--A 30 second ad is required.--->  
    <core:Duration>PT30S</core:Duration>  
  </OpportunityConstraints>  
</PlacementControl>
```

**Example 38**

Example 39 is a placement opportunity requiring a specific ad type to “replace” the content in the second ad position.

```xml
<!--Placement opportunity for a specific ad type.--->  
<PlacementControl id="Slot2" action="replace" position="2">  
  <OpportunityConstraints>  
    <!--Want an ad of this specific type.--->  
    <core:AdType>Telescoping</core:AdType>  
  </OpportunityConstraints>  
</PlacementControl>
```

**Example 39**

Example 40 is a positional placement opportunity requiring at least one ad and up to eight ads to be added. The total ad duration for this position shall not exceed two minutes.
<!--Placement opportunity providing guidance and requirements.-->
<!--One ad required and up to 8 may be provided.-->
<!--Total ad time shall not exceed 2 minutes.-->
<PlacementControl id="Slot3" action="fill">
  <OpportunityConstraints>
    <MaxDuration>PT2M</MaxDuration>
    <MaxPlacementCount>8</MaxPlacementCount>
    <MinPlacementCount>1</MinPlacementCount>
  </OpportunityConstraints>
</PlacementControl>

Example 40

14.29 PlacementCount Element

The PlacementCount element specifies a specific Placement element count that shall be contained within an associated PlacementDecision element.

14.29.1 PlacementCount Element Schema

Figure 71 illustrates the PlacementCount element’s schema.

![PlacementCount Element Schema](image)

Figure 71: PlacementCount Element Schema

14.29.1.1 Semantic Definitions for the PlacementCount Element

The PlacementCount element inherits from the PlacementCountType complex type. See Section 13.2.3 for semantic definitions applicable to this element.

14.29.2 PlacementCount Element Examples

<PlacementCount>0</PlacementCount>
<PlacementCount>2</PlacementCount>
14.30 PlacementDateTime Element

The PlacementDateTime element supplies the anticipated or calculated start date and time for a placement opportunity or a placement opportunity subdivision depending on the PlacementDateTime element’s usage. The Placement date and time value are based upon the entertainment content asset and the client time.

14.30.1 PlacementDateTime Element Schema

Figure 72 illustrates the PlacementDateTime element’s schema.

![PlacementDateTime Element Schema](image)

**Figure 72: PlacementDateTime Element Schema**

14.30.1.1 Semantic Definitions for the PlacementDateTime Element

@##any [Optional] — Additional attributes from any namespace.

The PlacementDateTime element’s value is of type core:dateTimeTimezoneType. See [SCTE130-2] for additional information.

14.30.2 PlacementDateTime Element Examples

```xml
<PlacementDateTime>2007-09-07T05:35:32.0Z</PlacementDateTime>
```

14.31 PlacementDecision Element

The PlacementDecision element conveys the ADS placement decisions. The element is the PlacementResponse or PlacementUpdateNotification message’s parallel structure to the PlacementRequest message’s PlacementOpportunity element. The element functions as a container for the individual placement decisions supplied as Placement elements. See Section 12.1 for additional information.

The PlacementDecision element **shall** identify its associated placement opportunity via the @placementOpportunityRef attribute. The PlacementDecision element **may** assign content bindings to each placement subdivision along with constraints applicable to the placement decision set.
The PlacementDecision element *may* identify the Entertainment asset for which this decision is applicable. If the Entertainment element contained within this element is used, the Entertainment element located at the message root level *shall not* be used (i.e., the elements are mutually exclusive).

14.31.1 PlacementDecision Element Schema

Figure 73 illustrates the PlacementDecision element’s schema.
Figure 73: PlacementDecision Element Schema
14.31.1.1 Semantic Definitions for the PlacementDecision Element

@id [Required, core:idAttrType]—A element unique attribute identifying this PlacementDecision element. See [SCTE130-2] for additional information.

@placementOpportunityRef [Required, core:idAttrType]—A cross-reference to a PlacementOpportunity element. The @placementOpportunityRef attribute contains the value for the corresponding PlacementOpportunity element’s @id attribute.

@localServiceRef [Optional, localServiceRefAttrType]—A cross-reference to a message local Service element providing message specific registration refinement. The value is the message local Service element’s @id attribute. See Section 12.1 and Section 13.1.4 for additional information.

@##any [Optional]—Additional attributes from any namespace.

Entertainment [Optional]—The entertainment (i.e., programming) content for which this placement decision is associated. If this element is present, the Entertainment element specified within the root message element shall not be used (i.e., the entertainment asset identification applies to only this PlacementDecision element). For details regarding a PlacementResponse or a PlacementUpdateNotification message’s usage of a single Entertainment element for all message contained PlacementDecision elements, see Section 12.1.2 and Section 12.2.1 respectively. See Section 14.11 for additional information on the Entertainment element.

OpportunityBinding [Optional Choice]—Information specific to defining the placement opportunity relative to the entertainment content. See Section 14.24 for additional information.

LinearAvailBinding [Optional Choice]—Information specific to a linear placement opportunity. See Section 14.15 for additional information.

PlayPositionsAvailBinding [Optional Choice]—Information specific to defining the placement opportunity relative to the entertainment content using a mix of positional information. See Section 14.40 for additional information.

PlacementConstraints [Optional]—The specific limitations that shall be applied to all placements. See Section 14.27 for additional information.
Placement [Optional]—Zero or more Placement elements describing the individual ADS placement decisions which may include a content binding. Each Placement element represents a positional subpart of the placement decision set. See Section 14.26 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.31.2 PlacementDecision Element Examples

In Example 41, the ADS is not altering the current placement arrangement. This fulfills the requirement to reference every placement opportunity.

```
<!--No changes or no applicable decision.-->
<PlacementDecision id="Break1" placementOpportunityRef="Op1"/>
```

**Example 41**

Example 42 illustrates the placement decision correlated to an existing placement opportunity where two placements are supplied. The first placement is active immediately and the second one replaces the first at the effective start date and time.

```
<PlacementDecision id="Break2" placementOpportunityRef="AC1">
  <Placement id="Slot1 of Break2 active immediately" action="replace">
    <!--Placement decision details...-->
  </Placement>
</PlacementDecision>
<PlacementDecision id="Break2b" placementOpportunityRef="AC1">
  <PlacementConstraints>
    <EffectiveStartDateDateTime>2007-05-31T12:00:00.0Z</EffectiveStartDateDateTime>
  </PlacementConstraints>
  <Placement id="Slot1 of Break2 superseding the previous placement decision at the supplied time" action="replace">
    <!--Placement decision details...-->
  </Placement>
</PlacementDecision>
```

**Example 42**

Example 43 is a new placement opportunity created by the ADS.
Example 43

```xml
<PlacementDecision id="Break3 - New avail added by ADS"
placementOpportunityRef="AC1">
  <OpportunityBinding opportunityNumber="3"/>
  <PlacementConstraints>
    <Scope>Local</Scope>
  </PlacementConstraints>
  <Placement id="New spot 1" action="fill">
    <core:Content>
      <core:SpotRef trafficId="897" spotId="spot1"/>
      <core:Tracking>ADSAssignedTrackingID1</core:Tracking>
    </core:Content>
  </Placement>
  <Placement id="New spot 2" action="fill">
    <core:Content>
      <core:SpotRef trafficId="6533" spotId="spot2"/>
      <core:Tracking>ADSAssignedTrackingID2</core:Tracking>
    </core:Content>
  </Placement>
</PlacementDecision>
```
Example 44 is another new placement opportunity created by the ADS. In this case a post roll is defined starting at NPT 120.829 and ending at EOS. Specific Placement’s are included in the PlacementDecision.

```xml
<PlacementDecision id="Post-Roll - New avail added by ADS" placementOpportunityRef="AC1">
    <PlayPositionsAvailBinding>
        <PlayPositionStart scale="1.0">
            <NPTOffset>120.829</NPTOffset>
        </PlayPositionStart>
        <PlayPositionEnd scale="1.0">
            <NPTOffset>EOS</NPTOffset>
        </PlayPositionEnd>
    </PlayPositionsAvailBinding>
    <PlacementConstraints>
        <Scope>Local</Scope>
    </PlacementConstraints>
    <Placement id="New spot 1" action="fill">
        <core:Content>
            <core:SpotRef trafficId="897" spotId="spot1"/>
            <core:Tracking>ADSAssignedTrackingID1</core:Tracking>
        </core:Content>
    </Placement>
    <Placement id="New spot 2" action="fill">
        <core:Content>
            <core:SpotRef trafficId="6533" spotId="spot2"/>
            <core:Tracking>ADSAssignedTrackingID2</core:Tracking>
        </core:Content>
    </Placement>
</PlacementDecision>
```

### Example 44

14.32 PlacementDecisionOwner Element

The PlacementDecisionOwner identifies the placement opportunity decision ownership.

14.32.1 PlacementDecisionOwner Element Schema

Figure 74 illustrates the PlacementDecisionOwner element’s schema.
14.32.1.1 Semantic Definitions for the PlacementDecisionOwner Element

@##any [Optional]—Additional attributes from any namespace.

The PlacementDecisionOwner element’s value is of type core:nonEmptyStringType and shall not be empty. The value identifies ownership of the placement decision.

14.32.2 PlacementDecisionOwner Element Examples

```
<PlacementDecisionOwner>CableCo</PlacementDecisionOwner>
<PlacementDecisionOwner>ESPN</PlacementDecisionOwner>
<PlacementDecisionOwner>Walt</PlacementDecisionOwner>
```

14.33 PlacementOpportunity Element

The ADM uses the PlacementOpportunity element in a PlacementRequest message to communicate details regarding a placement opportunity. The PlacementOpportunity element describes the individual placement opportunities associated with an entertainment content asset. The PlacementOpportunity element cross-references and may optionally refine the original ADS registration. This refinement is useful for providing additional details regarding the placement opportunity for broad placement service registrations. Additionally, the element may contain opportunity specific information including constraints applicable to the entire placement opportunity and it may include a calculated placement start time estimate.

The placement opportunity may be subdivided and each subunit (referred to as a positional placement opportunity) is described using the PlacementControl element. See Section 12.1 for additional information. PlacementControl elements may describe the current content binding (i.e., the ad currently located in the position) and any applicable limitations (i.e., constraints).

The PlacementOpportunity element may identify the Entertainment asset for which this opportunity is applicable. If the Entertainment element contained within this

---

**Figure 74: PlacementDecisionOwner Element Schema**

![Diagram of PlacementDecisionOwner Element Schema](image)
element is used, the Entertainment element located at the message root level shall not be used (i.e., the elements are mutually exclusive).

14.33.1 PlacementOpportunity Element Schema

Figure 75 illustrates the PlacementOpportunity element’s schema.
Figure 75: PlacementOpportunity Element Schema
14.33.1.1 Semantic Definitions for the PlacementOpportunity Element

@id [Required, core:idAttrType]—A element unique placement opportunity identifier. See [SCTE130-2] for additional information.

@serviceRegistrationRef [Optional, core:idAttrType]—A cross-reference to the registration-established placement service that was “matched” facilitating the message delivery to a specific ADS. When present the value shall be the Service element’s @id attribute’s value of the matched placement service (i.e., the ServiceDescription element’s Service element @id attribute). The registration reference may be refined using other elements contained in the PlacementRequest message. See Section 12.1 and [SCTE130-2] for additional information.

@localServiceRef [Optional, localServiceRefAttrType]—A cross-reference to a message local Service element providing message specific registration refinement (i.e., a cross-reference to a Service element local to the message which provides a message specific registration refinement). The value is the message local Service element’s @id attribute. See Section 12.1 and Section 13.1.4 for additional information.

@##any [Optional]—Additional attributes from any namespace.

Entertainment [Optional]—The entertainment (i.e., programming) content for which this placement opportunity is associated. If this element is present, the Entertainment element specified within the root message element shall not be used (i.e., the entertainment asset identification applies to only this PlacementOpportunity element). For details regarding a PlacementRequest message’s usage of a single Entertainment element for all message contained PlacementOpportunity elements, see Section 12.1.1. See Section 14.11 for additional information on the Entertainment element.

OpportunityBinding [Optional Choice]—Information specific to defining the placement opportunity relative to the entertainment content. See Section 14.24 for additional information.

LinearAvailBinding [Optional Choice]—Information specific to a linear placement opportunity. See Section 14.15 for additional information.

PlayPositionsAvailBinding [Optional Choice]—Information specific to defining the placement opportunity relative to the entertainment content using a mix of positional information. See Section 14.40 for additional information.
OpportunityConstraints [Optional]—Information detailing specific limitations or requirements applicable to the placement opportunity. See Section 14.25 for additional information.

PlacementDateTime [Optional]—Estimated placement date and time. See Section 14.30 for additional information.

PlacementControl [Optional]—Zero or more positional placement opportunity descriptions which further refine the placement opportunity. See Section 14.28 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.33.2 PlacementOpportunity Element Examples

Example 45 is a minimum placement opportunity description. The description contains the mandatory identifier and optional correlation to a matching registration-established placement service.

```xml
<PlacementOpportunity id="AC0" serviceRegistrationRef="MatchingRegRef1"/>
```

Example 45

Example 46 illustrates two placement opportunities one for a pre-roll and one for a post-roll. The pre-roll opportunity is unconstrained while the post-roll opportunity requires locally scoped placements which are being added (via the “fill” @action attribute value). The post-roll opportunity further constrains the first positional placement being the specified ad type.

```xml
<PlacementOpportunity id="Break1" serviceRegistrationRef="ServiceRef1">
  <OpportunityBinding opportunityType="preRoll"/>
</PlacementOpportunity>

<PlacementOpportunity id="Break2" serviceRegistrationRef="ServiceRef1">
  <OpportunityBinding opportunityType="postRoll" opportunityNumber="1"/>
  <OpportunityConstraints>
    <Scope>Local</Scope>
  </OpportunityConstraints>
  <PlacementControl id="PC1" action="fill">
    <OpportunityConstraints>
      <core:AdType>Telescoping</core:AdType>
    </OpportunityConstraints>
  </PlacementControl>
</PlacementOpportunity>
```

Example 46
Example 47 describes a linear replacement placement opportunity.

```
<PlacementOpportunity id="ADifferenBreak1" serviceRegistrationRef="serviceRef3">
  <LinearAvailBinding opportunityType="interstitial">
    <ProviderAvailID>893</ProviderAvailID>
  </LinearAvailBinding>
</PlacementOpportunity>
```

Example 47

Example 48 describes a linear replacement placement opportunity with associated signalId’s at the beginning and end of the PO. The provided UTC time codes provide wall clock information to the ADM so an accurate progress bar can be calculated in the case where replacement ad durations do not match the duration of the underlying advertisements.

```
<PlacementOpportunity id="LinearBreak1" serviceRegistrationRef="serviceRef1">
  <PlayPositionsAvailBinding>
    <PlayPositionStart>
      <SignalId>SIGNAL:DH1h4oVbEeG7r3ULSCQBmw==</SignalId>
      <!-- UTC time of the in point -->
      <UTC scale="1.0">2010-11-09T11:13:10.123Z</UTC>
    </PlayPositionStart>
    <!-- Signal ID associated with the next out point -->
    <PlayPositionEnd>
      <SignalId>SIGNAL:N6t2mBpHTO6ZsZmzpsDVMg==</SignalId>
      <!-- UTC time of the out point -->
      <UTC scale="1.0">2010-11-09T11:41:19.456Z</UTC>
    </PlayPositionEnd>
  </PlayPositionsAvailBinding>
</PlacementOpportunity>
```

Example 48

14.34 PlacementStatusEvent Element

The PlacementStatusEvent element provides reporting details regarding an individual placement related happening which the ADM system considers of interest. Each event should only specify a single occurrence of the fact of interest.

14.34.1 PlacementStatusEvent Element Schema

Figure 76 illustrates the PlacementStatusEvent element’s schema.
Figure 76: PlacementStatusEvent Element Schema
14.34.1.1 Semantic Definitions for the PlacementStatusEvent Element

@type [Required, eventTypeAttrType]—Placement status event type identifier as defined in Section 13.2.1. Table 12 lists the defined values for this element that may be extended by private agreement outside the scope of this specification. The attribute’s value shall appear exactly as shown in Table 12.
<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>The event contains placement status related status information. The event should contain a core:StatusCode element and zero or more Note elements.</td>
</tr>
<tr>
<td>startPlacement</td>
<td>The event indicates an entrance to Placement element’s content binding. Either this event element or a higher-level scope element shall contain a Spot element.</td>
</tr>
<tr>
<td>endPlacement</td>
<td>The event indicates an exit from a Placement element’s content binding. Either this event element or a higher-level scope element shall contain a Spot element.</td>
</tr>
<tr>
<td>endPlacementAll</td>
<td>Simultaneously indicates both “endPlacementUpdates” and “endPlacementsEvents” for a Placement element’s content binding. Either this event element or a higher-level scope element shall contain a Spot element.</td>
</tr>
<tr>
<td>endPlacementEvents</td>
<td>The ADS should not expect to receive any additional named event elements with respect to the Placement element’s content binding with the @tracking attribute. Any named event elements received following the receipt of this PlacementStatusEvent element may be ignored as the ADS is free to release resources associated with the identified Placement element. Either this event element or a higher-level scope element shall contain a Spot element.</td>
</tr>
<tr>
<td>endPlacementUpdates</td>
<td>The Placement element’s content binding with the @tracking attribute no longer may be altered even if the fulfillment process for the active placement decision set containing the Placement element has not completed. Subsequent placement update messaging pertaining to the referenced Placement element shall not occur and the ADS is free to release resources associated with the Placement element. If the PlacementRequest message’s @updatesAllowed attribute has the value false, this event signal is not required. Either this event element or a higher-level scope element shall contain a Spot element.</td>
</tr>
<tr>
<td>endUpdates</td>
<td>The PlacementRequest message’s placement decision set associated with the @messageRef attribute no longer may be altered even if the fulfillment process for the active placement decision set has not completed. Subsequent placement update messaging pertaining to the referenced PlacementRequest message shall not occur and the ADS is free to release resources associated with the placement decision set. If the PlacementRequest message’s @updatesAllowed attribute has the value false, this event signal is not required. The PlacementStatusEvent element shall include the @messageRef attribute and shall include the @identityADS attribute either in the higher-level scope PlayData element or in this element.</td>
</tr>
</tbody>
</table>
endEvents

The ADS should not expect to receive any additional named event elements with respect to the PlacementRequest message’s referenced placement decision. Any named event elements received following the receipt of this PlacementStatusEvent element may be ignored as the ADS is free to release resources associated with the identified PlacementRequest message. The PlacementStatusEvent element shall include the @messageRef attribute and shall include the @identityADS attribute either in the higher-level scope PlayData element or in this element.

endAll

Simultaneously indicates both “endUpdates” and “endEvents”. The PlacementStatusEvent element shall include the @messageRef attribute and shall include the @identityADS attribute either in the higher-level scope PlayData element or in this element.

... User defined and outside the scope of this specification. The value shall be preceded by the string “private:”.

Table 12: PlacementStatusEvent @type Attribute Values

<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>PlayPosition</th>
<th>PlayPositionStart</th>
<th>PlayPositionEnd</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>startPlacement</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>endPlacement</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>endPlacementAll</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>endPlacementEvents</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>endPlacementUpdates</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>endUpdate</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>endEvents</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>endAll</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 13: PlacementStatusEvent @type Attribute Position Element Usage

@time [Required, core:dateTimeTimezoneType]—The event occurrence date and time. See Section 13.2.1 for additional information.

@identityADM [Optional, core:identityAttrType]—The origin ADM logical service identifier. See Section 13.2.1 for additional information.

@systemADM [Optional, core:systemAttrType]—The originating ADM system identification. See Section 13.2.1 for additional information.
@identityADS [Optional, core:identityAttrType]—The ADS origin or target logical service identifier. See Section 13.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType]—The message associated with this event. See Section 13.2.1 for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:StatusCode [Optional]—An applicable status code as defined in Appendix A. See Section 13.2.1 for additional information.

SystemContext [Optional]—Parameters describing the event’s system context. See Section 13.2.1 for additional information.

Client [Optional]—Addressability or targeting details. See Section 13.2.1 for additional information.

Entertainment [Optional Choice]—Entertainment content asset identification. See Section 13.2.1 for additional information.

EntertainmentNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. An entertainment specific NPT value is provided using the NPTOffset element contained with the Entertainment element.

Spot [Optional Choice]—Ad content asset identification. See Section 13.2.1 for additional information.

SpotNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. A spot specific NPT value is provided using the NPTOffset element contained with the Spot element.

NPT [Optional Choice]—Viewer perceived NPT. See Section 13.2.1 for additional information.

UTC [Optional Choice]—A UTC value referenced to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.
**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.34.2 PlacementStatusEvent Element Examples

Example 49 illustrates a PlacementStatusEvent for a startPlacement event. The event is self describing and the ADS included a core:Tracking element in the original Placement element core:Content element (not shown). Thus, the core:Tracking element is echoed in the same relative position.

```xml
<PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
                        assetID="ADVR1000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
    </core:Content>
    <PlayPositions scale="1">
      <PlayPositionStart>
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>
```

**Example 49**

Example 50 illustrates a PlacementStatusEvent for an endPlacement event. The event is self describing and the ADS included a core:Tracking element in the original Placement element’s scope (not shown). Thus, the core:Tracking element is echoed in the Spot element scope.
<PlacementStatusEvent time="2007-01-31T02:30:00Z" type="endPlacement">
  <Spot>
    <core:Tracking>FFFFDC7-6C60-0030-B2B7-B68DAF952C83</core:Tracking>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789002"/>
    </core:Content>
    <PlayPositions scale="1">
      <PlayPositionEnd>
        <NPTOffset>30</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>

Example 50

Example 51 illustrates the startPlacement and endPlacement events which may be contained in a SpotScopedEvents element (not shown) and contain a minimum information set.

<PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionStart>
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>

<PlacementStatusEvent time="2007-01-31T02:30:00Z" type="endPlacement">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionEnd>
        <NPTOffset>30</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>

Example 51

Example 52 illustrates a PlacementStatusEvent for a startPlacement event. The event is self describing and it references the container entertainment asset. The
event also includes an NPT element indicating the event occurred at 5 minutes and 10.3 seconds into the viewer experience timeline.

```xml
<PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com"
        assetID="BAAD9876543210987654"/>
    </core:Content>
  </Entertainment>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
        assetID="ADVR1000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart>
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
  <NPT scale="1">310.3</NPT>
</PlacementStatusEvent>
```

Example 52

Example 53 illustrates a PlacementStatusEvent for an endPlacementAll event. The event is self describing and it references the container Spot asset. The event also includes an NPT element indicating the event occurred at the end of the referenced Spot asset.
<PlacementStatusEvent time="2007-01-31T02:00:00Z" type="endPlacementAll">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
          assetID="ADVR1000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionEnd>
        <NPTOffset>EOS</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>

Example 53

14.35 PlayData Element

The PlayData element functions as a top level container for collections of named event elements. The named event elements may be organized in several different ways. For example, each named event may be self describing and all the events may be in a single Events element. (See Section 0 for additional information on the Events element.)

Alternatively, an ADM implementation may desire to minimize the named event data size and consequently, may choose to use the EntertainmentScopedEvents element and SpotScopedEvents element to reduce the data replication. See Section 14.13 and Section 14.51 for additional information regarding the EntertainmentScopedEvents and SpotScopedEvents elements respectively. In this approach, static data is output in a higher level scoped element and the named events are then interpreted in the context of the higher level scoped element’s applicable data.

14.35.1 PlayData Element Schema

Figure 77 illustrates the PlayData element’s schema.
Figure 77: PlayData Element Schema
When the @identityADM, the @systemADM, the @identityADS, the SystemContext element and the Client element are included in the PlayData element, the information shall apply to all elements contained in any child event sequences. Additionally, if the SystemContext or Client elements appear at this scope, the elements shall not appear in any child element.

14.35.1.1 Semantic Definitions for the PlayData Element

@identityADM [Optional, core:identityAttrType]—The ADM origin logical service identifier. All events contained within this PlayData element originated from this specific ADM. See [SCTE130-2] for additional information.

@systemADM [Optional, core:systemAttrType]—The originating ADM system identification applicable to all events contained within this PlayData element. See [SCTE130-2] for additional information.

@identityADS [Optional, core:identityAttrType]—The ADS origin or target logical service identifier. All events contained within this PlayData element are applicable to the listed ADS. See [SCTE130-2] for additional information.

@eventRangeStartDateTime [Optional, eventRangeStartDateTimeAttrType]—An initial date and time for the named event elements contained within this PlayData element. See Section 13.1.2 for additional details.

@eventRangeEndDateTime [Optional, eventRangeEndDateTimeAttrType]—An ending date and time for the named event elements contained within this PlayData element. See Section 13.1.1 for additional details.

@##any [Optional]—Additional attributes from any namespace.

SystemContext [Optional]—The system environment applicable to all listed events. See Section 14.52 for additional information. If present, this element shall not appear in any child element.

Client [Optional]—A container element describing the client context applicable to all listed events. See Section 14.4 for additional information. If present, this element shall not appear in any child element.

The choice sequence allows for zero or more EntertainmentScopedEvents or SpotScopedEvents elements to be present and combined in any quantity and any order (i.e., the element count and mix is unspecified).
EntertainmentScopedEvents [Optional Choice]—A container for named event elements scoped by an Entertainment element. See Section 14.13 for additional information.

SpotScopedEvents [Optional Choice]—A container for named event elements scoped by a Spot element. See Section 14.51 for additional information.

Events [Optional]—A container for named event elements describing individual events. See Section 0 for additional information. Named events contained within this element are all self describing.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.35.2 PlayData Element Examples

The PlayData element in Example 54 shows how a sequence of self-describing named event elements is carried. The PlayData element’s @identityADS values highlights that all the events are for the same ADS.
Example 54

Example 55 illustrates a PlayData element containing named event elements in the Events element which each identify a unique destination ADS. Consequently, the PlayData element’s @identityADS attribute is not used.
Example 55

Example 56 shows how information may be reduced using the EntertainmentScopedEvents and SpotScopedEvents elements.
<PlayData
    identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
    <SystemContext>
        <Session>ExampleSession1</Session>
    </SystemContext>
    <EntertainmentScopedEvents>
        <Entertainment>
            <core:Content>
                <core:AssetRef providerID="videobus.com"
                    assetID="BAAD9876543210987654"/>
            </core:Content>
        </Entertainment>
    </EntertainmentScopedEvents>
    <Events>
        <!-- Session creation. Informational note only. -->
        <SessionEvent time="2007-01-31T01:59:59Z" type="startSession">
            <core:StatusCode class="3">
                <core:Note>Session start.</core:Note>
            </core:StatusCode>
        </SessionEvent>
    </Events>
    <SpotScopedEvents>
        <Spot>
            <core:Content>
                <core:AssetRef providerID="advertiser1.com"
                    assetID="ADVR1000123456789001"/>
                <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
            </core:Content>
        </Spot>
        <Events>
            <PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
                <Spot>
                    <core:Content/>
                    <PlayPositions scale="0">
                        <PlayPositionStart>
                            <NPTOffset>0</NPTOffset>
                        </PlayPositionStart>
                    </PlayPositions>
                </Spot>
                <ViewerEvent time="2007-01-31T02:00:05Z" type="pause"
                    eventSource="remote">
<NPTOffset>5</NPTOffset>
</PlayPosition>
</PlayPositions>
</Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:00:10Z" type="play"
    eventSource="remote">
    <Spot>
        <core:Content/>
        <PlayPositions scale="1">
            <PlayPositionStart>
                <NPTOffset>5</NPTOffset>
            </PlayPositionStart>
            <PlayPositionEnd>
                <NPTOffset>15</NPTOffset>
            </PlayPositionEnd>
        </PlayPositions>
    </Spot>
</ViewerEvent>
<PlacementStatusEvent time="2007-01-31T02:00:20Z"
    type="endPlacement">
    <Spot>
        <core:Content/>
        <PlayPositions scale="1.0">
            <PlayPositionEnd>
                <NPTOffset>15</NPTOffset>
            </PlayPositionEnd>
        </PlayPositions>
    </Spot>
</PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<Events>
    <PlacementStatusEvent time="2007-01-31T02:00:20Z" type="status">
        <core:StatusCode class="1" detail="11">
            <core:Note>Resource not found.</core:Note>
        </core:StatusCode>
        <Spot>
            <core:Content>
                <core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789001"/>
                <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C93</core:Tracking>
            </core:Content>
        </Spot>
    </PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<Spot>
    <core:Content>
    </Spot>
</Events>
</SpotScopedEvents>
<Events>
  <PlacementStatusEvent time="2007-01-31T02:00:20Z" type="startPlacement">
    <Spot>
      <core:Content/>
      <PlayPositions scale="1">
        <PlayPositionStart>
          <NPTOffset>0</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
      </Spot>
  </PlacementStatusEvent>
  <ViewerEvent time="2007-01-31T02:00:35Z" type="fastForward" eventSource="remote">
    <Spot>
      <core:Content/>
      <PlayPositions scale="1">
        <PlayPositionEnd>
          <NPTOffset>15</NPTOffset>
        </PlayPositionEnd>
      </PlayPositions>
      </Spot>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:00:36Z" type="fastForward" eventSource="remote">
    <Spot>
      <core:Content/>
      <PlayPositions scale="2">
        <PlayPositionStart>
          <NPTOffset>16</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
      </Spot>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:00:37Z" type="fastForward" eventSource="remote">
    <Spot>
      <core:Content/>
      <PlayPositions scale="4">
        <PlayPositionStart>
          <NPTOffset>18</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
      </Spot>
  </ViewerEvent>
</Events>
Example 56

14.36 PlayPosition Element

The PlayPosition element provides the ability to specify a position based on a signal identifier, a UTC time or an NPTOffset element. While more than one position element can be supplied in a PlayPosition element, the interpretation by an implementation is out of scope of this standard.
14.36.1 PlayPosition Element Schema

Figure 78 illustrates the PlayPositionType element’s schema.

![Diagram of PlayPosition Element Schema]

Figure 78: PlayPosition Element Schema

14.36.1.1 Semantic Definitions for the PlayPosition Element

@scale [Optional, xsd:decimal]—The scale value of 1 indicates normal play or record at the natural forward viewing rate. If the attribute is not the value of 1, the value corresponds to the rate with respect to the normal viewing rate. For example, a ratio of 2 indicates twice the natural viewing rate (i.e., "fast forward") and a ratio of 0.5 indicates half the normal viewing rate (i.e., forward at ½ or "slow forward"). In other words, a ratio of 2 has normal playtime increase at twice the wallclock rate. For every second of elapsed (wallclock) time, 2 seconds of content is enumerated. A negative value indicates reverse direction (i.e., “rewind”). For example, the value “-5” indicates five times the normal viewing rate in reverse.

@##any [Optional]—Additional attributes from any namespace.

SignalId [Optional] – This element provides a signal identifier value reference to a stream within content. The content may be live/realtime or a stored asset. Signal identifiers may be carried within the stream in an SCTE 35 segmentation descriptor (See [SCTE35]) or described via external metadata (See [SCTE236]).
**UTC [Optional]** – This element provides a UTC value reference to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.

**NPTOffset [Optional]** – This element provides an NPT relative to a previously specified Entertainment element that was declared within a higher-level scope element’s context. See Section 0 for additional information.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

### 14.36.2 PlayPosition Element Examples

The following are usage examples for the PlayPosition element. The first and third examples each contain a single positional element. The second example illustrates 2 positional elements, signal ID and UTC. As stated above, the precise behavior of an implementation when more than one element is supplied is out of scope of this standard (See 0).

```xml
<PlayPosition>
  <!-- Play at normal forward speed at 11am GMT. -->
  <UTC scale="1">2010-11-09T11:00:00-00:00</UTC>
</PlayPosition>

<PlayPosition>
  <!-- Signal ID of a point of interest. -->
  <SignalId>SIGNAL:ISKQWoVaEeGB5Z8NCkgkAZs=</SignalId>
  <!-- UTC time of the point of interest. -->
  <UTC scale="1.0">2010-11-09T11:12:10.123Z</UTC>
</PlayPosition>

<PlayPosition>
  <!-- 2X play at NPT position 120.383. -->
  <NPTOffset>120.383</NPTOffset>
</PlayPosition>
```

### 14.37 PlayPositionEnd Element

The PlayPositionEnd element provides the ability to specify an end position based on a signal identifier, a UTC time or an NPTOffset element. While more than one
position element *may* be supplied in a PlayPosition element, the interpretation by an implementation is out of scope of this standard.

### 14.37.1 PlayPositionEnd Element Schema

Figure 78 illustrates the PlayPositionEnd element’s schema.

![PlayPositionEnd element schema diagram](image)

**Figure 79: PlayPositionEnd Element Schema**

#### 14.37.1.1 Semantic Definitions for the PlayPositionEnd Element

@scale [Optional, xsd:decimal]—The scale value of 1 indicates normal play or record at the natural forward viewing rate. If the attribute is not the value of 1, the value corresponds to the rate with respect to the normal viewing rate. For example, a ratio of 2 indicates twice the natural viewing rate (i.e., "fast forward") and a ratio of 0.5 indicates half the normal viewing rate (i.e., forward at ½ or “slow forward”). In other words, a ratio of 2 has normal playtime increase at twice the wallclock rate. For every second of elapsed (wallclock) time, 2 seconds of content is enumerated. A negative value indicates the reverse direction (i.e., “rewind”). For example, the value “-5” indicates fives times the normal viewing rate in reverse.

@##any [Optional]—Additional attributes from any namespace.

**SignalId [Optional]**—This element provides a signal identifier value reference to a stream within content. The content *may* be live/realtime or
a stored asset. Signal identifiers may be carried within the stream using an SCTE 35 segmentation descriptor (see [SCTE35]) or described via external metadata (see [SCTE236]).

UTC [Optional]—This element provides a UTC value reference to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.

NPTOffset [Optional]—This element provides an NPT relative to a previously specified content element declared within a higher-level scope element’s context. See Section 0 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.37.2 PlayPositionEnd Element Examples

The following are usage examples for the PlayPositionEnd element. As stated above, the precise behavior of an implementation when more than one element is supplied is out of scope of this standard (See 0).

```xml
<PlayPositionEnd>
  <UTC>2010-11-09T11:12:10.123Z</UTC>
  <NPTOffset>22.333</NPTOffset>
</PlayPositionEnd>
```

14.38 PlayPositionStart Element

The PlayPositionStart element provides the ability to specify a start position based on a signal identifier, a UTC time or an NPTOffset element. While more than one position element may be supplied in a PlayPosition element, the interpretation by an implementation is out of scope of this standard.

14.38.1 PlayPositionStart Element Schema

Figure 78 illustrates the PlayPositionStart element’s schema.
Figure 80: PlayPositionStart Element Schema

14.38.1.1 Semantic Definitions for the PlayPositionStart Element

@scale [Optional, xsd:decimal] — The scale value of 1 indicates normal play or record at the natural forward viewing rate. If the attribute is not the value of 1, the value corresponds to the rate with respect to the normal viewing rate. For example, a ratio of 2 indicates twice the natural viewing rate (i.e., "fast forward") and a ratio of 0.5 indicates half the normal viewing rate (i.e., forward at ½ or "slow forward"). In other words, a ratio of 2 has normal playtime increase at twice the wallclock rate. For every second of elapsed (wallclock) time, 2 seconds of content is enumerated. A negative value indicates the reverse direction (i.e., "rewind"). For example, the value "-5" indicates fives times the normal viewing rate in reverse.

@##any [Optional] — Additional attributes from any namespace.

SignalId [Optional] — This element provides a signal identifier value reference to a stream within content. The content may be live/realtime or a stored asset. Signal identifiers may be carried within the stream using an SCTE 35 segmentation descriptor (see [SCTE35]) or described via external metadata (see [SCTE236]).

UTC [Optional] — This element provides a UTC value reference to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer
associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.

**NPTOffset [Optional]**—This element provides an NPT relative to a previously specified content element declared within a higher-level scope element’s context. See Section 0 for additional information.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.38.2 PlayPositionStart Element Examples

The following are usage examples for the PlayPositionStart element. As stated above, the precise behavior of an implementation when more than one element is supplied is out of scope of this standard (See 0).

```xml
<PlayPositionStart scale="1">
  <NPTOffset>0</NPTOffset>
</PlayPositionStart>
```

14.39 PlayPositions Element

The PlayPositions element provides the capability to specify a position, a start and/or an end position within an asset.

14.39.1 PlayPositions Element Schema

Figure 81 illustrates the PlayPositions element’s schema.
Figure 81: PlayPositions Element Schema

14.39.1.1 Semantic Definitions for the PlayPositions Element

@##any [Optional]—Additional attributes from any namespace.

PlayPosition [Optional Choice]—This element identifies a position within content that typically is not a start or end location. See 0 for additional information.

PlayPositionStart [Optional Choice]—This element identifies a start position within content. See 0 for additional information.

PlayPositionEnd [Optional Choice]—This element identifies an end position within content. See 0 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.39.2 PlayPositions Element Examples

Example 57 illustrates the basic usage of the PlayPositions Element.
Example 57

Example 58 illustrates a more complete usage of the PlayPositions Element. This use case illustrates a DVR based PlacementResponse based on a PlacementRequest for content recorded on 11/9/2010 at 11 GMT for 1 hour. This example uses a combination of PlayPosition elements to fully express the playback sequence of the recording.

The first PlayPosition element contains a PlayPostionStart with a UTC value of 11/9/2010 at 11 GMT. This is the start of the recorded content. The PlayPositionEnd Element has both a Signal ID and UTC time for the first Out Point during the recorded interval.

The second PlayPosition element contains a PlayPositionStart and PlayPositionEnd that includes both a Signal ID and UTC time. The Signal ID in the PlayPositionStart references the In Point. The Signal ID in the PlayPositionEnd refereces the next Out Point in the recorded interval.

The last PlayPosition element contains a PlayPostionStart with both a Signal ID and UTC time for the second In Point during the recorded interval. The PlayPositionEnd Element has a UTC value of 11/9/2010 at 12 GMT. This is the end of the recorded content.

The UTC times allows an implementation to properly construct a progress bar based on the UTC time deltas for each PlayPosition element plus the core:Duration values for each Placement.
<core:StatusCode class="0"/>
</SystemContext>
<PlacementDecision placementOpportunityRef="528573CD-1485-13A6-56B778222E2B2936" id="1f87463c-9f60-4d60-ab00-f18daf50a786">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="provider.com" assetID="TNTA0000000000000000"/>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart>
        <!-- Start play at 11am GMT -->
        <UTC scale="1">2010-11-09T11:00:00-00:00</UTC>
      </PlayPositionStart>
      <PlayPositionEnd>
        <!-- Signal ID of the out point -->
        <SignalId>SIGNAL:ISKQWoVaEeGB5Z8NCkgkAZs=</SignalId>
        <!-- UTC time of the out point -->
        <UTC scale="1.0">2010-11-09T11:12:10.123Z</UTC>
      </PlayPositionEnd>
    </PlayPositions>
  </Entertainment>
</PlacementDecision>
<PlacementDecision placementOpportunityRef="528573CD-1485-13A6-56B778222E2B2936" id="d61038af-a2d9-4270-bded-2bc2f2caf6bd">
  <Placement action="fill" id="d457c56c-143b-425f-a718-96e27cb88f10">
    <core:Content>
      <core:AssetRef assetID="000CNFF4630" providerID="spotlight.com"/>
      <core:Duration>PT30S</core:Duration>
      <core:Tracking>b9f3dcbd-d37f-4d45-a53a-39423957e2a5</core:Tracking>
    </core:Content>
  </Placement>
  <Placement action="fill" id="e3fb3eb8-c3d8-4c5d-9678-a34a59d955a4">
    <core:Content>
      <core:AssetRef assetID="0000C183427" providerID="spotlight.com"/>
      <core:Duration>PT30S</core:Duration>
      <core:Tracking>6856a857-bc8c-403a-a13e-3d0ff7839eb8</core:Tracking>
    </core:Content>
  </Placement>
</PlacementDecision>
<PlacementDecision placementOpportunityRef="528573CD-1485-13A6-56B778222E2B2936" id="a5cd4554-46cc-4167-a7d3-322115367769">
    <Entertainment>
        <core:Content>
            <core:AssetRef providerID="provider.com" assetID="TNTA000000000000000000"/>
        </core:Content>
        <PlayPositions>
            <!-- Signal ID associated with the in point -->
            <PlayPositionStart>
                <SignalId>SIGNAL:DH1h4oVbEeG7r3ULSCQBmw==</SignalId>
                <!-- UTC time of the in point -->
                <UTC scale="1.0">2010-11-09T11:13:10.123Z</UTC>
            </PlayPositionStart>
            <!-- Signal ID associated with the next out point -->
            <PlayPositionEnd>
                <SignalId>SIGNAL:N6t2mBpHTO6ZsZmzpsDVMg==</SignalId>
                <!-- UTC time of the out point -->
                <UTC scale="1.0">2010-11-09T11:41:19.456Z</UTC>
            </PlayPositionEnd>
        </PlayPositions>
    </Entertainment>
</PlacementDecision>

<PlacementDecision placementOpportunityRef="528573CD-1485-13A6-56B778222E2B2936" id="443778a4-dab9-4849-ac2b-cad678651671">
    <Placement action="fill" id="fc914c63-9f29-4fc7-8096-6e85113fe90a">
        <core:Content>
            <core:AssetRef assetID="000CNAF2530" providerID="spotlight.com"/>
            <core:Duration>PT30S</core:Duration>
            <core:Tracking>09e6c50d-58d9-48cc-98d9-1a6378c0db83</core:Tracking>
        </core:Content>
    </Placement>
    <Placement action="fill" id="6545d81a-2e46-4269-baa7-efcc04e5b60b">
        <core:Content>
            <core:AssetRef assetID="000CNAF2230" providerID="spotlight.com"/>
            <core:Duration>PT30S</core:Duration>
            <core:Tracking>13a51d1a-fd13-4a9e-8579-1e4b5af13309</core:Tracking>
        </core:Content>
    </Placement>
    <Placement action="fill" id="2963d905-95a3-424c-8b5b-eb38e6fb2565">
        <core:Content>
            <core:AssetRef assetID="0000C182608" providerID="spotlight.com"/>
            <core:Duration>PT30S</core:Duration>
        </core:Content>
    </Placement>
</PlacementDecision>
14.40 PlayPositionsAvailBinding Element

The PlayPositionsAvailBinding element provides a capability to define a placement opportunity based on a heterogeneous mix of start and/or end points and positional designators. The element contains information specific to defining, refining, or labeling a placement opportunity.

14.40.1 PlayPositionsAvailBinding Element Schema

Figure 82 illustrates the PlayPositionsAvailBinding element’s schema.
Figure 82: PlayPositionsAvailBinding Element Schema

14.40.1.1 Semantic Definitions for the PlayPositionsAvailBinding Element

@opportunityType [Optional, placementOpportunityTypeAttrType]—The placement opportunity type. See Section 13.1.8 for additional information. For example, in classic linear the typical value for this attribute is ‘interstitial.’

@opportunityNumber [Optional, placementOpportunityNumberAttrType]—The placement opportunity identification value relative to the entertainment content. See Section 13.1.7 for additional information.

@opportunitiesExpected [Optional, placementOpportunitiesExpectedAttrType]—The total number of planned placement opportunities relative to the entertainment content. See Section 13.1.6 for additional information.

@##any [Optional]—Additional attributes from any namespace.

PlayPosition [Optional Choice]—This element identifies a position within content that typically is not a start or end location. See 0 for additional information.

PlayPositionStart [Optional]—Optional element to identify the start position. See Section 0 for additional information.
PlayPositionEnd [Optional]—Optional element to identify the end position. See Section 0 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.40.2 PlayPositionsAvailBinding Element Examples

```xml
<PlayPositionsAvailBinding>
  <PlayPositionStart>
    <!-- Signal ID associated with the start point. -->
    <SignalId>SIGNAL:E03WjIVbEeGajYILSCQBmw==</SignalId>
    <!-- UTC time of the start point. -->
    <UTC scale="1.0">2010-11-09T11:43:19.456Z</UTC>
  </PlayPositionStart>
  <PlayPositionEnd>
    <!-- End position at NOON GMT. -->
    <UTC scale="1">2010-07-20T12:00:00-00:00</UTC>
  </PlayPositionEnd>
</PlayPositionsAvailBinding>

<PlayPositionsAvailBinding>
  <PlayPositionStart scale="1">
    <!-- NPT of BOS for the start point -->
    <NPTOffset>BOS</NPTOffset>
  </PlayPositionStart>
</PlayPositionsAvailBinding>
```

14.41 ProductType Element

The ProductType element provides product identification.

14.41.1 ProductType Element Schema

Figure 83 illustrates the ProductType element’s schema.
14.41.1 Semantic Definitions for the ProductType Element

@##any [Optional]—Additional attributes from any namespace.

The ProductType element’s value is of type core:nonEmptyStringType and shall not be empty.

14.41.2 ProductType Element Examples

```xml
<ProductType>MOD</ProductType>
<ProductType>FOD</ProductType>
```

14.42 ProviderAvailID Element

The ProviderAvailID element allows an authorization identifier to be associated with the placement opportunity. Typically, this value is supplied via the SCTE 35 avail_descriptor() provider_avail_id field. See [SCTE35] for additional information.

14.42.1 ProviderAvailID Element Schema

Figure 84 illustrates the ProviderAvailID element’s schema.

```xml
<ProviderAvailID>MOD</ProviderAvailID>
<ProviderAvailID>FOD</ProviderAvailID>
```
The ProviderAvailID element’s value is of type xsd:nonNegativeInteger.

### 14.42.2 ProviderAvailID Element Examples

```
<ProviderAvailID>893</ProviderAvailID>
```

### 14.43 Scope Element

The Scope element supplies a range fulfillment advisory.

#### 14.43.1 Scope Element Schema

Figure 85 illustrates the Scope element’s schema.

![Figure 85: Scope Element Schema](image)

#### 14.43.1.1 Semantic Definitions for the Scope Element

`@##any [Optional]`—Additional attributes from any namespace.

The Scope element’s value is of type core:nonEmptyStringType and **shall not** be empty. Table 14 lists the defined values which **may** be extended by private agreement outside the scope of this specification. The value **shall** exactly match the appearance in Table 14.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>Not regional or local.</td>
</tr>
<tr>
<td>Regional</td>
<td>Not national or local.</td>
</tr>
<tr>
<td>Local</td>
<td>Not national or regional.</td>
</tr>
<tr>
<td>Provider</td>
<td>Not distributor. See [SCTE35].</td>
</tr>
<tr>
<td>Distributor</td>
<td>Not provider. See [SCTE35].</td>
</tr>
<tr>
<td>…</td>
<td>Defined outside the scope of this specification and the value <strong>shall</strong> start with the string “private:”.</td>
</tr>
</tbody>
</table>

**Table 14: Scope Element Values**
14.43.2 Scope Element Examples

```
<Scope>National</Scope>
<Scope>Regional</Scope>
<Scope>Local</Scope>
<Scope>Provider</Scope>
<Scope>Distributor</Scope>
<Scope>private:Zoned</Scope>
```

14.44 Service Element

The Service element is a placement service identification component included by an ADS when identifying itself as a placement decision owner. The element is a named information collection and one or more Service elements are included in the ServiceDescription element as part of the ADSRegistrationRequest message. Inclusion facilitates placement service matching for determining the correct ADS in order to send the placement operations messages. The element may also be used to provide additional information when refining a service description match (via inclusion in the PlacementRequest message).

14.44.1 Service Element Schema

Figure 86 illustrates the Service element’s schema.
14.44.1.1 Semantic Definitions for the Service Element

@id [Required, core:idAttrType]—Service identifier specified by the ADS. The identifier is service channel unique (i.e., scoped by the message’s @identity attribute) when included in an
ADSRegistrationRequest message and element unique when included in a PlacementRequest or ListADMServicesResponse message. See [SCTE130-2] for additional information.

@decisionPolicy [Optional, core:nonEmptyStringType]—Table 15 lists the defined values, which *may* be extended by private agreement outside the scope of this specification. The value *shall* exactly match the appearance in Table 15 and the value *shall not* be empty.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>The ADS placement decisions <em>shall</em> be used only under extraordinary circumstances and these decisions are not expected to be part of the normal ADM placement execution. During normal operation, an ADS should not expect these decisions to be used. The ADM <em>shall</em> signal if updates are allowed as part of the PlacementRequest message requesting the default placement decision set.</td>
</tr>
<tr>
<td>interactive</td>
<td>The ADM <em>shall</em> perform a placement message exchange requesting the placement decision set. The response decision set <em>shall</em> only be applied a single time. The ADM <em>shall</em> signal if updates are allowed as part of the PlacementRequest message.</td>
</tr>
<tr>
<td>preload</td>
<td>Placement decisions <em>shall</em> be requested in advance, typically using a single PlacementRequest message, and these decisions <em>shall</em> be applied as often as applicable thereafter. The ADM <em>shall not</em> perform a placement message exchange before applying these decisions. The ADM <em>shall</em> signal if updates are allowed as part of the PlacementRequest message when acquiring the preload placement decision set.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The string <em>shall</em> be prefixed with the text “private:”.</td>
</tr>
</tbody>
</table>

Table 15: Service/@decisionPolicy Attribute Values

@opportunityType [Optional, placementOpportunityTypeAttrType]—Placement opportunity type identifier to match. See Section 13.1.8 for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:Program [Optional]—The Program identifier value to match or that was matched. See [SCTE130-2] for additional information.

core:AdType [Optional]—The ad type identifier value to match or that was matched. See [SCTE130-2] for additional information.
ContentProvider [Optional]—The content source identifier value to match or that was matched. See Section 14.5 or additional information.

ProductType [Optional]—The product type identifier value to match or that was matched. See Section 0 for additional information.

PlacementDecisionOwner [Optional]—The placement decision owner value to match or that was matched. See Section 14.32 for additional information.

Scope [Optional]—The service scope value to match or that was matched. See Section 14.43 for additional information.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.44.2 Service Element Examples

Example 59 is a minimal Service element that may be interpreted as “all placement services”. Note that the string “All Services” is an arbitrary name which is not a standard mandate or standard preferred identifier.

```xml
<Service id="All Services"/>

Example 59
```

Example 60 illustrates a placement service being identified in part using the @uniqueProgramID value.

```xml
<Service id="Service1">
  <core:Program uniqueProgramID="345"/>
</Service>
<Service id="Service1" decisionPolicy="interactive">
  <core:Program uniqueProgramID="345"/>
</Service>
```

Example 60

Example 61 illustrates a placement service being identified in part as ad type matching the string “Telescoping” and being owned by identifier “Walt.”

```xml
<Service id="Service2" decisionPolicy="default">
  <core:AdType>Telescoping</core:AdType>
  <PlacementDecisionOwner>Walt</PlacementDecisionOwner>
</Service>
```

Example 61
Example 62 is a placement service for the pause opportunity type.

```
<Service id="Service5" opportunityType="pause" decisionPolicy="interactive"/>
```

**Example 62**

Example 63 is placement service with a fine grained placement service matching criteria.

```
<Service id="Very Precise" opportunityType="interstitial" decisionPolicy="interactive">
  <core:Program>Ugly Betty</core:Program>
  <core:AdType>Overlay</core:AdType>
  <ContentProvider providerID="ABC"/>
  <ProductType>nPVR</ProductType>
  <PlacementDecisionOwner>Corey's Ad Shop</PlacementDecisionOwner>
  <Scope>Local</Scope>
</Service>
```

**Example 63**

14.45 ServiceDescription Element

The `ServiceDescription` element is a placement service identification component included by an ADS when identifying itself as a placement decision producer. The element is a container for describing a named placement service via the `SystemContext` and `Service` elements. Inclusion facilitates placement service matching for determining the correct ADS in order to send the placement operations message exchanges. The element is a cornerstone of the registration-established placement service.

14.45.1 ServiceDescription Element Schema

Figure 87 illustrates the `ServiceDescription` element’s schema.
14.45.1.1 Semantic Definitions for the ServiceDescription Element

@##any [Optional]—Additional attributes from any namespace.

SystemContext [Required]—System parameters identifying the placement decision service. The parameters apply to all Service elements included in the ServiceDescription. See Section 14.52 for additional information.

Service [Required]—One or more elements each identifying a service relative to the SystemContext parameters. See Section 14.44 for additional information. Services requiring a unique SystemContext shall be described using multiple ServiceDescription elements.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.45.2 ServiceDescription Element Examples

Example 64 illustrates the placement service definition which may be interpreted as all placement services. Note that the string “All Services” is an arbitrary name which is not a standard mandate or standard preferred identifier.
Example 64

Example 65 illustrates a placement service identified primarily using the SystemContext element.

Example 65

Example 66 illustrates a placement service identified primarily using the Service element.

Example 66

Example 67 illustrates a placement service identified using a combination of the SystemContext and Service elements.

Example 67
14.46 ServiceGroup Element

The ServiceGroup element provides collection association identification. Traditionally, this organization identifies physical grouping aspects based on the fulfillment delivery systems. However, the group organization is not limited to this dimension and may be significantly more arbitrary. Group organization is outside of the scope of this specification.

14.46.1 ServiceGroup Element Schema

Figure 88 illustrates the ServiceGroup element’s schema.

![ServiceGroup Element Schema](image)

**Figure 88: ServiceGroup Element Schema**

14.46.1.1 Semantic Definitions for the ServiceGroup Element

@##any [Optional]—Additional attributes from any namespace.

The ServiceGroup element’s value is of type core:nonEmptyStringType and shall not be empty.

14.46.2 ServiceGroup Element Examples

```
<ServiceGroup>IceHockeyLovers</ServiceGroup>
<ServiceGroup>83983</ServiceGroup>
```

14.47 Session Element

The Session element provides session identification typically associated, but not limited to, a resource set in the fulfillment system.

14.47.1 Session Element Schema

Figure 89 illustrates the Session element’s schema.
14.47.1.1 Semantic Definitions for the Session Element

@##any [Optional]—Additional attributes from any namespace.

The Session element’s value is a core:nonEmptyStringType and shall not be empty.

14.47.2 Session Element Examples

```xml
<Session>SharksWinIn2008</Session>
<Session>GuysSession</Session>
<Session>38793893</Session>
<Session>8FA2C7BD-2751-4D18-A2C6-372D8CE5F100</Session>
```

14.48 SessionEvent Element

The SessionEvent element provides reporting details regarding a single session event which the ADM system considers of interest. Each event should only specify a single occurrence of the fact of interest.

14.48.1 SessionEvent Element Schema

Figure 90 illustrates the SessionEvent element’s schema.
Figure 90: SessionEvent Element Schema
14.48.1.1 Semantic Definitions for the SessionEvent Element

@type [Required, eventTypeAttrType]—Session event type identifier as defined in Section 13.2.1. Table 16 lists the defined values for this element that may be extended by private agreement outside the scope of this specification. The attribute’s value shall appear exactly as shown in Table 16.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>The event contains session related status information. The event should contain a core:StatusCode element and zero or more Note elements.</td>
</tr>
<tr>
<td>startSegment</td>
<td>The event indicates an entry into an entertainment content binding which is not specifically referenced by a Placement element. Placement element content indications shall use a PlacementStatusEvent element. Either this event element or a higher-level scoped element should contain an Entertainment element.</td>
</tr>
<tr>
<td>endSegment</td>
<td>The event indicates an exit from an entertainment content binding which is not specifically referenced by a Placement element. Placement element content indications shall use a PlacementStatusEvent element. Either this event element or a higher-level scoped element should contain an Entertainment element.</td>
</tr>
<tr>
<td>startSession</td>
<td>The event indicates the session start. Either this event element or a higher-level scoped element should contain a Session element.</td>
</tr>
<tr>
<td>endSession</td>
<td>The event indicates the session end. Either this event element or a higher-level scoped element should contain a Session element.</td>
</tr>
<tr>
<td>resumeSession</td>
<td>The event indicates a session resume. Either this event element or a higher-level scoped element should contain a Session element. The Session element should match a Session element from a previous startSession SessionEvent.</td>
</tr>
</tbody>
</table>
| …             | User defined and outside the scope of this specification. The value shall be preceded by the string “private:”.

Table 16: SessionEvent @type Attribute Values

startSegment and endSegment shall be used in the same manner as startPlacement and endPlacement as described in Section 12.3 with the difference being StartSegment and endSegment refer to Entertainment element content bindings not Placement element content bindings.

Table 17 identifies which PlayPosition elements may be used with each of the @type attribute values.
<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>PlayPosition</th>
<th>PlayPositionStart</th>
<th>PlayPositionEnd</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>startSegment</td>
<td>No</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>endSegment</td>
<td>No</td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>startSession</td>
<td>No</td>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>endSession</td>
<td>No</td>
<td></td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>resumeSession</td>
<td>Yes</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 17: SessionEvent @type Attribute Position Element Usage

@time [Required, core:dateDateTimeTimezoneType]—The event occurrence date and time. See Section 13.2.1 for additional information.

@identityADM [Optional, core:identityAttrType]—The origin ADM logical service identifier. See Section 13.2.1 for additional information.

@systemADM [Optional, core:systemAttrType]—The originating ADM system identification. See Section 13.2.1 for additional information.

@identityADS [Optional, core:identityAttrType]—The ADS origin or target logical service identifier. See Section 13.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType]—The message associated with this event. See Section 13.2.1 for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:StatusCode [Optional]—An applicable status code as defined in Appendix A. See Section 13.2.1 for additional information.

SystemContext [Optional]—Parameters describing the event’s system context. See Section 13.2.1 for additional information.

Client [Optional]—Addressability or targeting details. See Section 13.2.1 for additional information.

Entertainment [Optional Choice]—Entertainment content asset identification. See Section 13.2.1 for additional information.

EntertainmentNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. An entertainment specific NPT value is provided using the NPTOffset element contained with the Entertainment element.
Spot [Optional Choice]—Ad content asset identification. See Section 13.2.1 for additional information.

SpotNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. A spot specific NPT value is provided using the NPTOffset element contained with the Spot element.

NPT [Optional Choice]—User perceived NPT. See Section 13.2.1 for additional information.

UTC [Optional Choice]—A UTC value referenced to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

14.48.2 SessionEvent Element Examples

```xml
<SessionEvent type="startSession" time="2007-01-05T12:01:01.0Z">
  <SystemContext>
    <Session>ExampleSessionID 399383</Session>
  </SystemContext>
</SessionEvent>

<SessionEvent type="startSession" time="2007-01-05T12:01:01.0Z"/>

<SessionEvent type="endSegment" time="2007-01-05T12:03:33.0Z">
  <Entertainment>
    <core:Content>
      <core:SegmentationUpid type="2">8583</core:SegmentationUpid>
    </core:Content>
  </Entertainment>
</SessionEvent>
```
14.49 Spot Element

The Spot element identifies the ad content referenced in a named event element. The element contains a core:Content element identifying the ad content asset and it may optionally contain a correlated NPT element.

The element shall also include any core:Tracking elements provided in a Placement element. See Section 12.3 for additional information.

14.49.1 Spot Element Schema

Figure 91 illustrates the Spot element’s schema.

![Spot Element Schema Diagram]

Figure 91: Spot Element Schema

14.49.1.1 Semantic Definitions for the Spot Element

@##any [Optional]—Additional attributes from any namespace.

core:Tracking [Optional]—An ADS assigned core:Tracking element. See [SCTE130-2] for additional information. This element corresponds to...
a PlacementResponse or PlacementUpdateNotification message’s Placement element containing a core:Tracking element.

**core:Content [Required]**—Placement content identification. See [SCTE130-2] for additional information. If the ADS returned a Tracking element in the Placement element’s corresponding core:Content element, the Tracking element **shall** be repeated within this element.

**SpotNPT [Optional Choice]**—This element **shall not** be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It **shall not** be used in messages having an @version attribute of "1.4" or later. A spot specific NPT value is provided using the NPTOffset element contained with the Spot element.

**PlayPositions [Optional Choice]**—PlayPositions relative to the paired core:Content element. See Section 0 for additional information.

The Spot element may contain a PlayPositions element. This usage facilitates describing discrete points or a range within the ad creative content using a heterogenous mix of positional values.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

### 14.49.2 Spot Element Examples

```
<Spot>
  <core:Tracking>999ECCED-979B-421E-8A6E-E2192B11515D</core:Tracking>
  <core:Content>
    <core:AssetRef providerID="adco.com"
      assetID="ABCD0123456789012345"/>
    <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
  </core:Content>
  <PlayPositions>
    <PlayPosition>
      <NPTOffset>26</NPTOffset>
    </PlayPosition>
  </PlayPositions>
</Spot>
```

### 14.50 SpotNPT Element (Eliminated)

The SpotNPT element **shall not** be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may
appear. It *shall not* be used in messages having an @version attribute of "1.4" or later. See the PlayPositions element in Section 0 for additional information on how to carry a Spot specific NPT value.

14.51 SpotScopedEvents Element

The SpotScopedEvents element reduces named event element size and data replication. The Spot element *shall* be declared once and subsequent named event elements contained within the Events elements imply reference to this Spot element through this scoping.

14.51.1 SpotScopedEvents Element Schema

Figure 92 illustrates the SpotScopedEvents element’s schema

Figure 92: SpotScopedEvents Element Schema

14.51.1.1 Semantic Definitions for the SpotScopedEvents Element

@eventRangeStartDateTime [Optional, eventRangeStartDateTimeAttrType]—An initial date and time relative to the named event elements contained within the Events element. See Section 13.1.2 for additional details.
@eventRangeEndDateTime [Optional, eventRangeEndDateTimeAttrType]—An ending date and time relative to the named event elements contained within the Events element. See Section 13.1.1 for additional details.

@##any [Optional]—Additional attributes from any namespace.

Spot [Required]—Spot content identification. See Section 14.49 for additional details.

Events [Required]—A container for named event elements. See Section 0 for additional information.

The Spot element may contain a NPT element and each named event element contained within the Events element may also contain an NPT element but no named event element shall contain a Spot element. This usage facilitates describing a range of the spot content while each named event references a specific timepoint within the range.
14.51.2 SpotScopedEvents Element Examples

```xml
<SpotScopedEvents>
  <Spot>
    <core:Content>
      <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
    </core:Content>
  </Spot>
  <Events>
    <PlacementStatusEvent time="2007-01-31T02:00:00Z"
                           type="startPlacement">
      <Spot>
        <core:Content/>
        <PlayPositions scale="1.0">
          <PlayPositionStart>
            <NPTOffset>0</NPTOffset>
          </PlayPositionStart>
        </PlayPositions>
      </Spot>
    </PlacementStatusEvent>
    <PlacementStatusEvent time="2007-01-31T02:00:30Z"
                           type="endPlacement">
      <Spot>
        <core:Content/>
        <PlayPositions scale="1.0">
          <PlayPositionEnd>
            <NPTOffset>30</NPTOffset>
          </PlayPositionEnd>
        </PlayPositions>
      </Spot>
    </PlacementStatusEvent>
  </Events>
</SpotScopedEvents>
```

14.52 SystemContext Element

The SystemContext element is a container for the system and environment specific elements.

14.52.1 SystemContext Element Schema

Figure 93 illustrates the SystemContext element’s schema.
14.52.1.1 Semantic Definitions for the SystemContext Element

@##any [Optional]—Additional attributes from any namespace.


Channel [Optional]—Channel identification. See Section 14.3 for additional information.

Zone [Optional]—Zone identification. See Section 14.59 for additional information.

Session [Optional]—Session identification. See Section 14.47 for additional information.
**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The SystemContext element *may* be empty (typically as part of a ServiceDescription element).

### 14.52.2 SystemContext Element Examples

```xml
<SystemContext/>
<SystemContext>
  <ServiceGroup>Den</ServiceGroup>
  <Network>SharksNet</Network>
  <Zone>5</Zone>
  <Session>Session123</Session>
</SystemContext>
```

### 14.53 SystemEvent Element

The SystemEvent element provides reporting details regarding a single happening which the ADM system considers of interest. Each event should only specify a single occurrence of the fact of interest. The SystemEvent facilitates a general event reporting element which *may* be used when the other defined event elements (PlacementStatusEvent, SessionEvent, or ViewerEvent) *may* be inappropriate.

#### 14.53.1 SystemEvent Element Schema

Figure 94 illustrates the SystemEvent element’s schema.
Figure 94: SystemEvent Element Schema
14.53.1.1 Semantic Definitions for the SystemEvent Element

@type [Required, eventTypeAttrType]—The event identifier. See Section 13.2.1 for additional information. Table 18 lists the defined values for this element which may be extended by private agreement outside the scope of this specification. The attribute’s value shall appear exactly as shown in Table 18.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>The event contains related status information. The event should contain a core:StatusCode element and zero or more Note elements.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The value shall be preceded by the string “private:”.</td>
</tr>
</tbody>
</table>

Table 18: SystemEvent @type Attribute Values

Table 19 identifies which PlayPosition elements may be used with each of the @type attribute values.

<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>PlayPosition</th>
<th>PlayPositionStart</th>
<th>PlayPositionEnd</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 19: SystemEvent @type Attribute Position Element Usage

@time [Required, core:dateTimeTimeZoneType]—The event occurrence date and time. See Section 13.2.1 for additional information.

@identityADM [Optional, core:identityAttrType]—The origin ADM logical service identifier. See Section 13.2.1 for additional information.

@systemADM [Optional, core:systemAttrType]—The originating ADM system identification. See Section 13.2.1 for additional information.

@identityADS [Optional, core:identityAttrType]—The ADS origin or target logical service identifier. See Section 13.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType]—The message associated with this event. See Section 13.2.1 for additional information.

@##any [Optional]—Additional attributes from any namespace.

core:StatusCode [Optional]—An applicable status code as defined in Appendix A. See Section 13.2.1 for additional information.
SystemContext [Optional]—Parameters describing the event’s system context. See Section 13.2.1 for additional information.

Client [Optional]—Addressability or targeting details. See Section 13.2.1 for additional information.

Entertainment [Optional Choice]—Entertainment content asset identification. See Section 13.2.1 for additional information.

EntertainmentNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. An entertainment specific NPT value is provided using the NPTOffset element contained with the Entertainment element.

Spot [Optional Choice]—Ad content asset identification. See Section 13.2.1 for additional information.

SpotNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. A spot specific NPT value is provided using the NPTOffset element contained with the Spot element.

NPT [Optional Choice]—User perceived NPT. See Section 13.2.1 for additional information.

UTC [Optional Choice]—A UTC value referenced to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.

core:Ext [Optional]—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.
14.53.2 SystemEvent Element Examples

```xml
<SystemEvent time="2007-04-01T01:03:03.0Z" type="status">
    <core:StatusCode class="3">
        <core:Note>Go San Jose Sharks!</core:Note>
    </core:StatusCode>
</SystemEvent>

<SystemEvent time="2007-04-02T01:03:55.1Z" type="status">
    <core:StatusCode class="2" detail="11">
        <core:Note>Resource not found.</core:Note>
    </core:StatusCode>
    <core:Tracking>PlacementResponse-Placement tracking tag #1</core:Tracking>
    <Spot>
        <core:Content>
            <core:AssetRef providerID="adco.com" assetID="lostad1"/>
        </core:Content>
    </Spot>
</SystemEvent>
```

14.54 TargetCode Element

The TargetCode element facilitates specific targeting criteria description by the use of a key/value pair.

14.54.1 TargetCode Element Schema

Figure 95 illustrates the TargetCode element’s schema.
14.54.1.1 Semantic Definitions for the TargetCode Element

@key [Required, core:nonEmptyStringType]—The key portion of a key/value pair. The value portion of a key/value pair is the element’s actual value.

@##any [Optional]—Additional attributes from any namespace.

The TargetCode element’s value may be of any type, i.e., the type is xsd:anyType, and it may be empty. Note: The xsd:anyType has the unique characteristic where it may function as a complex and a simple type definition. Thus, the TargetCode element’s value may be mixed content which allows any combination of elements and/or simple types.
14.54.2 TargetCode Element Examples

```xml
<TargetCode key="ZipPlus4">94053-8332</TargetCode>
<TargetCode key="MyKeyName">MyKeyValue</TargetCode>
<TargetCode key="Gender">Male</TargetCode>
<TargetCode key="Clowns">Left handed</TargetCode>

<TargetCode key="Embedded element example">
  <core:ContentLocation>My content location</core:ContentLocation>
  <core:Address>22 Easy street</core:Address>
</TargetCode>

<TargetCode key="Mixed type example">
  <core:AdType>My ad type</core:AdType>
  Mixed content string.
  <core:Note>See the string following the element above? Any mix of elements and basic
  types is allowed here.</core:Note>
</TargetCode>
```

14.55 TerminalAddress Element

The TerminalAddress element identifies a client endpoint.

14.55.1 TerminalAddress Element Schema

Figure 96 illustrates the TerminalAddress element’s schema.

![Diagram of TerminalAddress Element Schema]

**Figure 96: TerminalAddress Element Schema**

14.55.1.1 Semantic Definitions for the TerminalAddress Element

@type [Optional, core:nonEmptyStringType]—Interpretation identification for the element. Table 20 lists the defined values which may
be extended by private agreement outside the scope of this specification. The attribute’s value *shall* appear exactly as shown in Table 20.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IP</strong></td>
<td>An IP version 4 (IPv4) address or an IP version 6 (IPv6) address and the address <em>may</em> optionally include a port identifier. The TerminalAddress element’s value <em>shall</em> be an IPv4 or IPv6 address conformant with the addressing formats defined in SCTE 130 Part 2. See [SCTE130-2] for additional information.</td>
</tr>
<tr>
<td><strong>MAC</strong></td>
<td>A 6 byte IEEE MAC address. The TerminalAddress element’s value <em>shall</em> be a MAC address conformant with the addressing formats defined in SCTE 130 Part 2. See [SCTE130-2] for additional information.</td>
</tr>
<tr>
<td><strong>DEVICEID</strong></td>
<td>A nonemptystring identifying the device. The Device Identifier element’s value should be a globally unique value.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The value <em>shall</em> be preceded by the string “private:”.</td>
</tr>
</tbody>
</table>

**Table 20: TerminalAddress Element’s @type Attribute Values**

@##any [Optional]—Additional attributes from any namespace.

The TerminalAddress element’s value is of type core:nonEmptyStringType and is the endpoint identifier. The element’s value *shall not* be empty.

### 14.55.2 TerminalAddress Element Examples

```xml
<TerminalAddress type="IP">53.192.83.105</TerminalAddress>

<TerminalAddress type="IP">2001:0DB8:0000:0000:0000:0000:1428:57AB</TerminalAddress>

<TerminalAddress type="MAC">02-90-95-43-55-73</TerminalAddress>
```

### 14.56 UTC Element

The UTC Element indicates the stream absolute position relative to a date/time and an optional viewing rate.

#### 14.56.1 UTC Element Schema

Figure 97 illustrates the UTC element’s schema.
14.56.1.1 Semantic Definitions for the UTC Element

@scale [Optional, xsd:decimal]—The scale value of 1 indicates normal play or record at the natural forward viewing rate. If the attribute is not the value of 1, the value corresponds to the rate with respect to the normal viewing rate. For example, a ratio of 2 indicates twice the natural viewing rate (i.e., "fast forward") and a ratio of 0.5 indicates half the normal viewing rate (i.e., forward at ½ or "slow forward"). In other words, a ratio of 2 has normal playtime increase at twice the wallclock rate. For every second of elapsed (wallclock) time, 2 seconds of content is enumerated. A negative value indicates reverse direction (i.e., “rewind”). For example, the value “-5.0” indicates five times the normal viewing rate in reverse.

@##any [Optional]—Additional attributes from any namespace.

The UTC element’s value is of type core:dateTimeTimezoneType. The element’s value shall not be empty.

14.56.2 UTC Element Examples

```
<UTC scale="1">2010-11-09T11:00:00-00:00</UTC>
<UTC scale="1.0">2010-11-09T11:12:10.123Z</UTC>
<UTC>2010-11-09T11:12:10.123Z</UTC>
```

14.57 ViewerEvent Element

The ViewerEvent element provides user presentation reporting details regarding a single happening which the ADM system considers of interest. Each change in a presentation event should only specify a single occurrence of the event of interest.
14.57.1 ViewerEvent Element Schema

Figure 98 illustrates the ViewerEvent element’s schema.
Figure 98: ViewerEvent Element Schema
14.57.1.1 Semantic Definitions for the ViewerEvent Element

@type [Required, eventTypeAttrType]—Event identification. See Section 13.2.1 for additional information. Table 21 lists the defined values for this element which may be extended by private agreement outside the scope of this specification. The attribute’s value shall appear exactly as shown in Table 21.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>The event contains viewer event related status information. The event should contain a core:StatusCode element and zero or more Note elements.</td>
</tr>
<tr>
<td>fastForward</td>
<td>The event indicates a fast-forward (FF) event.</td>
</tr>
<tr>
<td>play</td>
<td>The event indicates a play event.</td>
</tr>
<tr>
<td>pause</td>
<td>The event indicates a pause event.</td>
</tr>
<tr>
<td>rewind</td>
<td>The event indicates a rewind (RW) event.</td>
</tr>
<tr>
<td>stop</td>
<td>The event indicates a stop event.</td>
</tr>
<tr>
<td>overlayPresented</td>
<td>The event indicates an overlay or other image (banner ad, etc.) was made visible.</td>
</tr>
<tr>
<td>overlayRemoved</td>
<td>The event indicates an overlay or other image (banner ad, etc.) is no longer visible.</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The value shall be preceded by the string “private:”.</td>
</tr>
</tbody>
</table>

Table 21: ViewerEvent @type Attribute Values

Table 23 identifies which PlayPosition elements may be used with each of the @type attribute values.

<table>
<thead>
<tr>
<th>Element</th>
<th>Value</th>
<th>PlayPosition</th>
<th>PlayPositionStart</th>
<th>PlayPositionEnd</th>
</tr>
</thead>
<tbody>
<tr>
<td>status</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>fastForward</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>play</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>pause</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>rewind</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>stop</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>overlayPresented</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>overlayRemoved</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Table 22: ViewerEvent @type Attribute Position Element Usage

@time [Required, core:dateTimeTimeZoneType]—The event occurrence date and time. See Section 13.2.1 for additional information.
@identityADM [Optional, core:identityAttrType]—The origin ADM logical service identifier. See Section 13.2.1 for additional information.

@systemADM [Optional, core:systemAttrType]—The originating ADM system identification. See Section 13.2.1 for additional information.

@identityADS [Optional, core:identityAttrType]—The ADS origin or target logical service identifier. See Section 13.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType]—The message associated with this event. See Section 13.2.1 for additional information.

@eventSource [Optional, core:nonEmptyStringType]—Event generation source identifier. Table 23 lists the defined values for this element which may be extended by private agreement outside the scope of this specification.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>remote</td>
<td>A button on the (subscriber) remote control was pressed.</td>
</tr>
<tr>
<td>software</td>
<td>A software application initiated event (for example, a software timer expiration).</td>
</tr>
<tr>
<td>…</td>
<td>User defined and outside the scope of this specification. The value shall be preceded by the string “private:”.</td>
</tr>
</tbody>
</table>

Table 23: ViewerEvent Element @eventSource Attribute Values

@###any [Optional]—Additional attributes from any namespace.

core:StatusCode [Optional]—An applicable status code as defined in Appendix A. See Section 13.2.1 for additional information.

SystemContext [Optional]—Parameters describing the event’s system context. See Section 13.2.1 for additional information.

Client [Optional]—Addressability or targeting details. See Section 13.2.1 for additional information.

Entertainment [Optional Choice]—Entertainment content asset identification. See Section 13.2.1 for additional information.

EntertainmentNPT [Optional Choice]—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. An
entertainment specific NPT value is provided using the NPTOffset element contained with the Entertainment element.

**Spot [Optional Choice]**—Ad content asset identification. See Section 13.2.1 for additional information.

**SpotNPT [Optional Choice]**—This element shall not be used and remains for backward compatibility only. In messages having a @version attribute of "1.3" or prior, this element may appear. It shall not be used in messages having an @version attribute of "1.4" or later. A spot specific NPT value is provided using the NPTOffset element contained with the Spot element.

**NPT [Optional Choice]**—User perceived NPT. See Section 13.2.1 for additional information.

**UTC [Optional Choice]**—A UTC value referenced to a stream absolute position within live/realtime content. See Section 14.56 for additional information. The UTC is typically the clock the viewer associates with a live/realtime program or entertainment asset including ads that are delivered as part of a live/realtime asset.

**core:Ext [Optional]**—A container holding additional attributes and elements from any namespace. See [SCTE130-2] for additional information.

The ViewerEvent element’s value may be empty.

14.57.2 ViewerEvent Element Examples

The following examples are all self describing ViewerEvent elements.
<ViewerEvent time="2007-03-19T02:30:47.0Z" type="pause">
  <SystemContext>
    <Session>Session0068</Session>
  </SystemContext>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="adco.com" assetID="ADCO123456789012345"/>
      <core:AdType>Telescoping</core:AdType>
      <core:Duration>PT30S</core:Duration>
      <core:Tracking>AssignedTrackingId1</core:Tracking>
    </core:Content>
  </Spot>
</ViewerEvent>

<ViewerEvent time="2007-03-19T02:30:57.0Z" type="fastForward">
  <SystemContext>
    <Session>Session0068</Session>
  </SystemContext>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="adco.com" assetID="ADCO123456789012345"/>
      <core:AdType>Telescoping</core:AdType>
      <core:Duration>PT30S</core:Duration>
      <core:Tracking>AssignedTrackingId1</core:Tracking>
    </core:Content>
  </Spot>
</ViewerEvent>

<ViewerEvent time="2007-03-19T02:31:10.0Z" type="status">
  <core:StatusCode class="1" detail="5">
    <core:Note>Ambiguous details. Unrecognized button press.</core:Note>
  </core:StatusCode>
  <SystemContext>
    <Session>Session0068</Session>
  </SystemContext>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="adco.com" assetID="ADCO123456789012345"/>
      <core:AdType>Telescoping</core:AdType>
      <core:Duration>PT30S</core:Duration>
      <core:Tracking>AssignedTrackingId1</core:Tracking>
    </core:Content>
  </Spot>
</ViewerEvent>
The first example ViewerEvent element identifies a pause button event for a specific session and asset. The Content element provides as much information as is known about the ad asset including the ADS assigned Tracking element. The Tracking element contains the ADS assigned tracking value which was returned in the Placement element.

The second example is a fast forward button event. The final example ViewerEvent element supplies information about an unrecognized button event relative to the same ad asset.

### 14.58 Window Element

The Window element contains a start and end date and time typically from a schedule. The values provide a range for when the placement opportunity is scheduled.

#### 14.58.1 Window Element Schema

Figure 99 illustrates the Window element’s schema.

![Figure 99: Window Element Schema](image)

#### 14.58.1.1 Semantic Definitions for the Window Element

@start [Required, core:dateTimeTimezoneType]—Range commencement date and time. See [SCTE130-2] for additional information.

@end [Required, core:dateTimeTimezoneType]—Range termination date and time. See [[SCTE130-2]] for additional information.

@##any [Optional]—Additional attributes from any namespace.

The Window element’s value shall be empty.
14.58.2 Window Element Examples

```xml
<Window start="2007-06-06T03:33:43.0Z" end="2007-06-06T03:43:43.0Z"/>
```

14.59 Zone Element

The Zone element facilitates zone identification which traditionally has been a geographical area in a fulfillment delivery system. This specification does not restrict, limit or curb the definition in any way.

14.59.1 Zone Element Schema

Figure 100 illustrates the Zone element’s schema.

![Zone Element Schema](image)

**Figure 100: Zone Element Schema**

14.59.1.1 Semantic Definitions for the Zone Element

@##any [Optional]—Additional attributes from any namespace.

The Zone element’s value is of type core:nonEmptyStringType and **shall not** be empty.

14.59.2 Zone Element Examples

```xml
<Zone>123</Zone>
<Zone>Den</Zone>
```
APPENDIX A. MESSAGE STATUS CODES (NORMATIVE)

In the ensuing sections, the tables contain applicable values for the StatusCode element’s @detail attribute where a checkmark (✓) in the table column indicates when the code *may* be used.

A.1 Message Column Acronyms Used In Subsequent Tables

The following acronyms are used as table column headings in the subsequent sections.
- SCR=ServiceCheckResponse
- SSN=ServiceStatusNotification
- SSA=ServiceStatusAcknowledgement
- LSR=ListADMServicesResponse
- RR=ADSRegistrationResponse
- LRR=ListADSRegistrationResponse
- DR=ADSDeregisterResponse
- DRN=ADSDeregistrationNotification
- DRA=ADSDeregistrationAcknowledgement
- PRS=PlacementResponse
- PUN=PlacementUpdateNotification
- PUA=PlacementUpdateAcknowledgement
- PSA=PlacementStatusAcknowledgement
- E=any named event (i.e., PlacementStatusEvent, SessionEvent, SystemEvent, ViewerEvent, etc.)
A.2 SCTE 130 Part 2 StatusCode Element @detail Attribute Values Applied

| Description                              | S | C | S | N | A | L | S | R | L | R | R | D | R | A | P | P | U | N | P | U | S | A |
| Reserved                                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Incomplete message                       | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Message validation failed                 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Registration overlap                      | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Query failed                              |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Ambiguous details                         | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Unsupported protocol                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Network address does not exist            | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Network address/port in use               | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Duplicate message id                      | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Network connection lost                   | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Resource not found                        | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Not supported                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Not authorized                            |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Unknown message reference                 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Resend forced abandonment                 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Out of resources                          | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Timeout                                   | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| General error                             | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
### A.3 SCTE 130 Part 3 StatusCode Element @detail Attribute Values Defined and Applied

| @detail Value | Description                                           | S | C | S | S | A | L | R | L | R | D | R | A | P | R | S | P | U | N | P | S | A | E |
| 3000          | Reserved                                               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3001          | Placement duration exceeded request                    | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3002          | Placement duration does not match asset length         | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3003          | Content failed analysis                                |   |   | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3004          | Abnormal termination of play out                       |   |   |   |   | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3005          | Abnormal transition between segments                   |   |   |   |   |   | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3006          | Resumed from pause                                     |   |   |   |   |   |   | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3007          | Session terminated on pause                            |   |   |   |   |   |   |   | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3008          | Session terminated by user                             |   |   |   |   |   |   |   |   | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3009          | Session resource unavailable                           |   |   |   |   |   |   |   |   |   | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 3010          | Session inadequate resources                           |   |   |   |   |   |   |   |   |   |   | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |   |   |
| 3011          | Placement not executed                                 |   |   |   |   |   |   |   |   |   |   |   |   | ✓ | ✓ |   |   |   |   |   |   |   |   |   |   |
APPENDIX B. VIDEO ON DEMAND EXAMPLE (INFORMATIVE)

The following example is a simple video on demand session that assumes the appropriate registration has already taken place. A single PlacementRequest message is sent on session initiation requesting the pre-roll and post-roll placement decisions. How the ADM determined the pre-roll and post-roll placement opportunities is outside the example scope.

The entertainment content is from videobus.com and is twenty minutes in duration.

The ADS responds with placement decisions for both the pre-roll and post-roll positions as follows:

- Pre-roll ad #1 is from advertiser1.com and is 15 seconds duration
- Pre-roll ad #2 is from advertiser2.com and is 15 seconds duration
- Pre-roll ad #3 is from advertiser3.com and is 30 seconds duration.
- Post-roll ad #1 is from advertiser1.com and is 60 seconds in duration
- Post-roll ad #2 is from advertiser2.com and is 60 seconds in duration
- Post-roll ad #3 is from advertiser3.com and is 60 seconds in duration

Example 68 illustrates a PlacementRequest message.
Example 68

Example 69 illustrates a PlacementResponse message.
421B23F525F5" system="ads" messageRef="5B8ECCED-979B-421E-8A6E-E2192B115160">
  <core:StatusCode class="0"/>
  <ADMData>Hidden secret sauce</ADMData>
  <PlacementDecision id="5B8ECCED-979B-421E-8A6E-E2192B115162" placementOpportunityRef="1B8ECCED-979B-421E-8A6E-E2192B115161">
    <OpportunityBinding opportunityType="preRoll"/>
    <Placement id="5B8ECCED-979B-421E-8A6E-E2192B115163" action="fill">
      <core:Content>
        <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789001"/>
        <core:Duration>PT15S</core:Duration>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
      </core:Content>
    </Placement>
    <Placement id="5B8ECCED-979B-421E-8A6E-E2192B115163" action="fill">
      <core:Content>
        <core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789001"/>
        <core:Duration>PT15S</core:Duration>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C93</core:Tracking>
      </core:Content>
    </Placement>
    <Placement id="5B8ECCED-979B-421E-8A6E-E2192B115163" action="fill">
      <core:Content>
        <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
        <core:Duration>PT30.000S</core:Duration>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
      </core:Content>
    </Placement>
  </PlacementDecision>
  <PlacementDecision id="5B8ECCED-979B-421E-8A6E-E2192B115164" placementOpportunityRef="1B8ECCED-979B-421E-8A6E-E2192B115162">
    <OpportunityBinding opportunityType="postRoll"/>
    <Placement id="5B8ECCED-979B-421E-8A6E-E2192B115165" action="fill">
      <core:Content>
        <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789002"/>
        <core:Duration>PT60.000S</core:Duration>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
      </core:Content>
    </Placement>
    <Placement id="5B8ECCED-979B-421E-8A6E-E2192B115165" action="fill">
      <core:Content>
Example 69

Example 70 and Example 71 illustrate the same PlacementStatusNotification messages elements using two different styles. Example 70 uses self-describing events and Example 71 uses data minimization. The two messages are identical in meaning and they illustrate two possible ADM implementation choices. Additionally, there are numerous other element combinations which would equate to the same meaning. These messages are examples only and should not be considered the only correct XML documents.

The event sequence encompassed in the PlacementStatusNotification messages is illustrated as follows:
Figure 101: Placement Status Timeline
<PlacementStatusNotification messageID="3EE278EC-A61F-D080-2D5C-62806A8D146F"
    identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4"
    system="ADM01" version="1.4">
    <PlayData
        identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
        <SystemContext>
            <Session>ExampleSession1</Session>
        </SystemContext>
        <Events>
            <!--Session creation. Informational note only.-->
            <SessionEvent time="2007-01-31T02:00:00Z" type="startSession">
                <core:StatusCode class="3">
                    <core:Note>Session start.</core:Note>
                </core:StatusCode>
            </SessionEvent>
            <!--Pre-roll ad #1: The ad is played from start to finish in normal play time
                with exactly one 5-second pause at the 5-second point. The ad's duration is
                15 seconds.-->
            <PlacementStatusEvent time="2007-01-31T02:00:00Z"
                type="startPlacement">
                <Spot>
                    <core:Content>
                        <core:AssetRef providerID="advertiser1.com"
                            assetID="ADVR1000123456789001"/>
                        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
                    </core:Content>
                    <PlayPositions>
                        <PlayPositionStart scale="1">
                            <NPTOffset>0</NPTOffset>
                        </PlayPositionStart>
                    </PlayPositions>
                </Spot>
            </PlacementStatusEvent>
            <ViewerEvent time="2007-01-31T02:00:05Z" type="pause"
                eventSource="remote">
                <Spot>
                    <core:Content>
                        <core:AssetRef providerID="advertiser1.com"
                            assetID="ADVR1000123456789001"/>
                        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
                    </core:Content>
                    <PlayPositions>
                        <PlayPosition scale="0">
                        </PlayPosition>
                    </PlayPositions>
                </Spot>
            </ViewerEvent>
        </Events>
    </PlayData>
</PlacementStatusNotification>
<ViewerEvent time="2007-01-31T02:00:10Z" type="play" eventSource='remote'>
<Spot>
<core:Content>
<core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789001"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
</core:Content>
<PlayPositions>
<PlayPositionStart scale="1">
<NPTOffset>5</NPTOffset>
</PlayPositionStart>
</PlayPositions>
</Spot>
</ViewerEvent>
<PlacementStatusEvent time="2007-01-31T02:00:20Z" type="endPlacement">
<Spot>
<core:Content>
<core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789001"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
</core:Content>
<PlayPositions>
<PlayPositionEnd scale="1">
<NPTOffset>15</NPTOffset>
</PlayPositionEnd>
</PlayPositions>
</Spot>
</PlacementStatusEvent>
<!-- Pre-roll ad #2: The 15 second ad did not play due to an error.-->
<PlacementStatusEvent time="2007-01-31T02:00:20Z" type="status">
<core:StatusCode class="1" detail="11">
<core:Note>Resource not found.</core:Note>
</core:StatusCode>
<Spot>
<core:Content>
<core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789001"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C93</core:Tracking>
</core:Content>
<!--Pre-roll ad #3: A 30-second ad is played half way, then is fast forwarded to the end. The FF speed is eventually 4x. However, the user "cranks-up" from 1x FF, to 2x FF, to 4x FF. This takes three button presses each occurring one second apart. Consequently, the ad's remaining 15 seconds play in 5 seconds.-->

<PlacementStatusEvent time="2007-01-31T02:00:20Z" type="startPlacement">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>

<ViewerEvent time="2007-01-31T02:00:35Z" type="fastForward" eventSource="remote">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>15</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>

<ViewerEvent time="2007-01-31T02:00:36Z" type="fastForward" eventSource="remote">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="2">
        <NPTOffset>30</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>
<NPTOffset>16</NPTOffset>
</PlayPositionStart>
</PlayPositions>
</Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:00:37Z" type="fastForward"
    eventSource='remote'>
    <Spot>
        <core:Content>
            <core:AssetRef providerID="advertiser3.com"
                assetID="ADVR3000123456789001"/>
            <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
        </core:Content>
        <PlayPositions>
            <PlayPositionStart scale="4">
                <NPTOffset>18</NPTOffset>
            </PlayPositionStart>
        </PlayPositions>
    </Spot>
</ViewerEvent>
<PlacementStatusEvent time="2007-01-31T02:00:40Z"
    type="endPlacement">
    <Spot>
        <core:Content>
            <core:AssetRef providerID="advertiser3.com"
                assetID="ADVR3000123456789001"/>
            <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
        </core:Content>
        <PlayPositions>
            <PlayPositionEnd scale="4">
                <NPTOffset>30</NPTOffset>
            </PlayPositionEnd>
        </PlayPositions>
    </Spot>
</PlacementStatusEvent>
<!-- Start of the entertainment asset with the subscriber still being in 4x fast forward mode.-->

<SessionEvent time="2007-01-31T02:00:40Z" type="startSegment">
    <Entertainment>
        <core:Content>
            <core:AssetRef providerID="videobus.com"
                assetID="BAAD9876543210987654"/>
        </core:Content>
        <PlayPositions>
            <PlayPositionStart scale="4">
                <NPTOffset>0</NPTOffset>
            </PlayPositionStart>
        </PlayPositions>
    </Entertainment>
</SessionEvent>
The user stops the fast forward after 3 seconds (which is 12 seconds into content).
The user rewinds back by cranking up to 2x. Thus, there are two button pushes that are "instantaneous" given the clock granularity in this example. The user travels back 8 seconds which lands 4 seconds back into the ad. The user then starts playing at normal speed for the duration of the entertainment asset (which is 20 minutes in duration).

```xml
<ViewerEvent time="2007-01-31T02:00:43Z" type="rewind" eventSource="remote">
    <Entertainment>
        <core:Content>
            <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
        </core:Content>
        <PlayPositions>
            <PlayPositionStart scale="-1">
                <NPTOffset>12</NPTOffset>
            </PlayPositionStart>
        </PlayPositions>
    </Entertainment>
</ViewerEvent>

<ViewerEvent time="2007-01-31T02:00:43Z" type="rewind" eventSource="remote">
    <Entertainment>
        <core:Content>
            <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
        </core:Content>
        <PlayPositions>
            <PlayPositionStart scale="-2">
                <NPTOffset>12</NPTOffset>
            </PlayPositionStart>
        </PlayPositions>
    </Entertainment>
</ViewerEvent>

<SessionEvent time="2007-01-31T02:00:49Z" type="endSegment">
    <Entertainment>
        <core:Content>
            <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
        </core:Content>
        <PlayPositions>
            <PlayPositionEnd scale="-2">

```
<PlacementStatusEvent time="2007-01-31T02:00:49Z" type="startPlacement">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="-2">
        <NPTOffset>30</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>

<ViewerEvent time="2007-01-31T02:00:51Z" type="play" eventSource="remote">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>26</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>

<PlacementStatusEvent time="2007-01-31T02:00:55Z" type="endPlacement">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionEnd scale="1">
        <NPTOffset>30</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>
<!--Post-roll ad #1: The 60 second ad was played from start to finish with 2 rewinds inside of the ad. The rewinds never exit the ad. The first rewind occurs 52 seconds into the ad.-->

<PlacementStatusEvent time="2007-01-31T02:20:55Z" type="startPlacement">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
        assetID="ADVR1000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>
<!--Begin rewinding at 1x speed for 2 seconds going back 2 seconds in 1x play time. The user then goes to the 2x rewind speed.-->

<ViewerEvent time="2007-01-31T02:21:47Z" type="rewind"
  eventSource="remote">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
        assetID="ADVR1000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="-1">
        <NPTOffset>52</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>

<!--Rewind at 2x speed for 23 seconds going back 46 seconds in 1x play time.-->

<ViewerEvent time="2007-01-31T02:21:49Z" type="rewind"
  eventSource="remote">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
        assetID="ADVR1000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="-2">
        <NPTOffset>50</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>

<ViewerEvent time="2007-01-31T02:22:12Z" type="play"
  eventSource="remote">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com"
        assetID="ADVR1000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
    </core:Content>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>4</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>
After playing for 20 seconds, rewind at 1x speed for 10 seconds going back 10 seconds in 1x play time and then play for the remainder of the ad.
<NPTOffset>60</NPTOffset>
</PlayPositionEnd>
</PlayPositions>
</Spot>
</PlacementStatusEvent>
<!--[Postroll ad #2: The ad was started and then the session was stopped.-->
<PlacementStatusEvent time="2007-01-31T02:23:28Z" type="startPlacement">
<Spot>
<core:Content>
<core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789002"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C97</core:Tracking>
</core:Content>
<PlayPositions>
<PlayPositionStart scale="1">
<NPTOffset>0</NPTOffset>
</PlayPositionStart>
</PlayPositions>
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:23:45Z" type="stop" eventSource="remote">
<Spot>
<core:Content>
<core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789002"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C97</core:Tracking>
</core:Content>
<PlayPositions>
<PlayPosition>
<NPTOffset>17</NPTOffset>
</PlayPosition>
</PlayPositions>
</Spot>
</ViewerEvent>
<!--[Postroll ad #3 did not play since the session is terminated. -->
<SessionEvent time="2007-01-31T02:23:45Z" type="endSession">
<core:StatusCode class="3" detail="3008">
<core:Note>Session terminated by user.</core:Note>
</core:StatusCode>
</SessionEvent>
<!--[Postroll ad #3 did not play and the ADM in cleaning up the session notifies the ADS.
This notification is not required and this is an ADM implementation choice.-->

Example 70

Example 71 illustrates the data minimized PlacementStatusNotification message.
<PlacementStatusNotification messageId="3EE278EC-A61F-D080-2D5C-62806A8D146F"
    identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4"
    system="ADM01" version="1.4">

<PlayData
    identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
    <SystemContext>
        <Session>ExampleSession1</Session>
    </SystemContext>
    <EntertainmentScopedEvents>
        <Entertainment>
            <core:Content>
                <core:AssetRef providerID="videobus.com"
                    assetID="BAAD9876543210987654"/>
            </core:Content>
        </Entertainment>
    </EntertainmentScopedEvents>

    <Events>
        <!---Session creation. Informational note only.--->
        <SessionEvent time="2007-01-31T02:00:00Z" type="startSession">
            <core:StatusCode class="3">
                <core:Note>Session start.</core:Note>
            </core:StatusCode>
        </SessionEvent>
    </Events>

    <SpotScopedEvents>
        <!---Pre-roll ad #1: The ad is played from start to finish in normal play time
             with exactly one 5-second pause at the 5-second point. The ad's duration is
             15 seconds.--->
        <Spot>
            <core:Content>
                <core:AssetRef providerID="advertiser1.com"
                    assetID="ADVR1000123456789001"/>
                <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C92</core:Tracking>
            </core:Content>
        </Spot>
    </SpotScopedEvents>

    <Events>
        <PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
            <Spot>
                <core:Content/>
                <PlayPositions>
                    <PlayPositionStart scale="1">
                        <NPTOffset>0</NPTOffset>
                    </PlayPositionStart>
                </PlayPositions>
            </Spot>
        </PlacementStatusEvent>
    </Events>

</PlayData>
<PlayPositions/>
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:00:05Z" type="pause"
    eventSource="remote">
    <Spot>
        <core:Content/>
        <PlayPositions>
            <PlayPosition scale="0">
                <NPTOffset>5</NPTOffset>
            </PlayPosition>
        </PlayPositions>
    </Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:00:10Z" type="play"
    eventSource="remote">
    <Spot>
        <core:Content/>
        <PlayPositions>
            <PlayPositionStart scale="1">
                <NPTOffset>5</NPTOffset>
            </PlayPositionStart>
        </PlayPositions>
    </Spot>
</ViewerEvent>
<PlacementStatusEvent time="2007-01-31T02:00:20Z"
    type="endPlacement">
    <Spot>
        <core:Content/>
        <PlayPositions>
            <PlayPositionEnd scale="1">
                <NPTOffset>15</NPTOffset>
            </PlayPositionEnd>
        </PlayPositions>
    </Spot>
</PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<Events>
!---Pre-roll ad #2: The 15 second ad did not play due to an error.-->
<PlacementStatusEvent time="2007-01-31T02:00:20Z" type="status">
    <core:StatusCode class="1" detail="11">
        <core:Note>Resource not found.</core:Note>
    </core:StatusCode>
    <Spot>
        <core:Content>
<core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789001"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C93</core:Tracking>
</core:Content>
</Spot>
</Events>
</SpotScopedEvents>
<!--Pre-roll ad #3: A 30-second ad is played half way, then is fast forwarded to the end. The FF speed is eventually 4x. However, the user "cranks-up" from 1x FF, to 2x FF, to 4x FF. This takes three button presses each occuring one second apart. Consequently, the ad's remaining 15 seconds play in 5 seconds.-->

<Spot>
<core:Content>
<core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>
<core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
</core:Content>
</Spot>
</Events>
<PlacementStatusEvent time="2007-01-31T02:00:20Z" type="startPlacement">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:00:35Z" type="fastForward" eventSource="remote">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionStart scale="1">
        <NPTOffset>15</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:00:36Z" type="fastForward" eventSource="remote">
  <Spot>
<SessionEvent time="2007-01-31T02:00:40Z" type="startSegment">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionStart scale="54">
        <NPTOffset>0</NPTOffset>
      </PlayPositionStart>
      <PlayPositionEnd scale="54">
        <NPTOffset>0</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</SessionEvent>

<!--Start of the entertainment asset with the subscriber still being in 4x fast forward mode.-->

<!--The user stops the fast forward after 3 seconds (which is 12 seconds into content).-->
The user rewinds back by cranking up to 2x. Thus, there are two button pushes that are "instantaneous" given the clock granularity in this example. The user travels back 8 seconds which lands 4 seconds back into the ad. The user then starts playing at normal speed for the duration of the entertainment asset (which is 20 minutes in duration).

```
<ViewerEvent time="2007-01-31T02:00:43Z" type="rewind"
           eventSource="remote">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionStart scale="-1">
        <NPTOffset>12</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>
```

```
<ViewerEvent time="2007-01-31T02:00:43Z" type="rewind"
           eventSource="remote">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionStart scale="-2">
        <NPTOffset>12</NPTOffset>
      </PlayPositionStart>
    </PlayPositions>
  </Spot>
</ViewerEvent>
```

```
<SessionEvent time="2007-01-31T02:00:49Z" type="endSegment">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionEnd scale="-2">
        <NPTOffset>0</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</SessionEvent>
```

```
<SpotScopedEvents>
  <Spot>
    <core:Content/>
    <core:AssetRef providerID="advertiser3.com"
          assetID="ADVR3000123456789001"/>
    <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
  </Spot>
</SpotScopedEvents>
```
<Events>
  <PlacementStatusEvent time="2007-01-31T02:00:49Z" type="startPlacement">
    <Spot>
      <core:Content/>
      <PlayPositions>
        <PlayPositionStart scale="-2">
          <NPTOffset>30</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
    </Spot>
  </PlacementStatusEvent>
  <ViewerEvent time="2007-01-31T02:00:51Z" type="play" eventSource="remote">
    <Spot>
      <core:Content/>
      <PlayPositions>
        <PlayPositionStart scale="1">
          <NPTOffset>26</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
    </Spot>
  </ViewerEvent>
  <PlacementStatusEvent time="2007-01-31T02:00:55Z" type="endPlacement">
    <Spot>
      <core:Content/>
      <PlayPositions>
        <PlayPositionEnd scale="1">
          <NPTOffset>30</NPTOffset>
        </PlayPositionEnd>
      </PlayPositions>
    </Spot>
  </PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<Events>
  <SessionEvent time="2007-01-31T02:00:55Z" type="startSegment">
    <Spot>
      <core:Content/>
      <PlayPositions>
        <PlayPositionStart scale="1">
          <NPTOffset>0</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
    </Spot>
  </SessionEvent>
</Events>
<SessionEvent time="2007-01-31T02:20:55Z" type="endSegment">
  <Spot>
    <core:Content/>
    <PlayPositions>
      <PlayPositionEnd scale="1">
        <NPTOffset>1200</NPTOffset>
      </PlayPositionEnd>
    </PlayPositions>
  </Spot>
</SessionEvent>

<Events>
  <!-- Post-roll ad #1: The 60 second ad was played from start to finish with 2 rewinds inside of the ad. The rewinds never exit the ad. The first rewind occurs 52 seconds into the ad. -->
  <PlacementStatusEvent time="2007-01-31T02:20:55Z" type="startPlacement">
    <Spot>
      <core:Content/>
      <PlayPositions>
        <PlayPositionStart scale="1">
          <NPTOffset>0</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
    </Spot>
  </PlacementStatusEvent>

  <!-- Begin rewinding at 1x speed for 2 seconds going back 2 seconds in 1x play time. The user then goes to the 2x rewind speed. -->
  <ViewerEvent time="2007-01-31T02:21:47Z" type="rewind" eventSource="remote">
    <Spot>
      <core:Content/>
      <PlayPositions>
        <PlayPositionStart scale="-1">
          <NPTOffset>-52</NPTOffset>
        </PlayPositionStart>
      </PlayPositions>
    </Spot>
  </ViewerEvent>
</Events>

<SpotScopedEvents>
  <Spot>
    <core:Content/>
    <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789002"/>
    <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
  </Spot>
</SpotScopedEvents>
<!--Rewind at 2x speed for 23 seconds going back 46 seconds in 1x play time.-->
<ViewerEvent time="2007-01-31T02:21:49Z" type="rewind"
    eventSource="remote">
</Spot>
</ViewerEvent>
<!--After playing for 20 seconds, rewind at 1x speed for 10 seconds going
back 10 seconds in 1x play time and then play for the remainder of the ad.-->
<ViewerEvent time="2007-01-31T02:22:32Z" type="rewind"
    eventSource="remote">
</Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:22:42Z" type="play"
    eventSource="remote">
</Spot>
</ViewerEvent>
<Spot>
<core:Content/>
<PlayPositions>
<PlayPositionStart scale="-2">
    <NPTOffset>50</NPTOffset>
</PlayPositionStart>
</PlayPositions>
</Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:21:49Z" type="rewind"
    eventSource="remote">
</Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:22:12Z" type="play"
    eventSource="remote">
</Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:22:42Z" type="play"
    eventSource="remote">
</Spot>
</ViewerEvent>
<PlayPositions/>
</Spot>
</ViewerEvent>
<PlacementStatusEvent time="2007-01-31T02:23:28Z"
type="endPlacement">
</Spot>
</PlacementStatusEvent>
</Events>
</SpotScopedEvents>
</SpotScopedEvents>
<Spot>
<core:Content/>
<PlayPositions>
<PlayPositionEnd scale="1">
<NPTOffset>60</NPTOffset>
</PlayPositionEnd>
</PlayPositions>
</Spot>
</PlacementStatusEvent>
</Events>
<!--Post-roll ad #2: The ad was started and then the session was stopped.-->
<PlacementStatusEvent time="2007-01-31T02:23:28Z"
type="startPlacement">
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:23:45Z" type="stop"
eventSource="remote">
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:23:45Z" type="stop"
eventSource="remote">
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:23:45Z" type="stop"
eventSource="remote">
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:23:45Z" type="stop"
eventSource="remote">
</Spot>
</PlacementStatusEvent>
<ViewerEvent time="2007-01-31T02:23:45Z" type="stop"
eventSource="remote">
<!-- Post-roll ad #3 did not play since the session is terminated. -->
<Events>
  <!---End of session notification.-->
  <SessionEvent time="2007-01-31T02:23:45Z" type="endSession">
    <core:StatusCode class="3" detail="3008">
      <core:Note>Session terminated by user.</core:Note>
    </core:StatusCode>
  </SessionEvent>
  <!---Post-roll ad #3 did not play and the ADM in cleaning up the session notifies the ADS.

  This notification is not required and this is an ADM implementation choice.-->
  <PlacementStatusEvent time="2007-01-31T02:23:50Z" type="endAll" messageRef="5B8ECCED-979B-421E-8A6E-E2192B11516A"/>
</Events>
</PlayData>
</PlacementStatusNotification>

Example 71
APPENDIX C. WSDL (NORMATIVE)

SCTE 130 Part 3 (this document) includes two separate WSDL document for the ADM and the ADS interfaces. See the individual WSDL document for details regarding the wsdl:portType definitions for the service endpoints along with the service definitions, binding types, and input/output parameter mappings. Table 1 specifies the normative WSDL XML namespace using the prefixes ‘admwsdl’ and ‘adswsdl’. SCTE 130 Part 7 provides additional WSDL specification details. See [SCTE130-7] for more information. See the normative Part 3 WSDL documents for all other details.
APPENDIX D. THE PLACEMENT OPPORTUNITY DATA MODEL (NORMATIVE)

D.1 Scope (NORMATIVE)

This appendix defines the Placement Opportunity Data Model (PODM) consistent with other parts of SCTE 130 Digital Program Insertion—Advertising Systems Interfaces specifications. The PODM defines a concrete representation of a Placement Opportunity (typically used in association with advertisements) and expressed as XML elements and attributes exchangeable by collaborating SCTE 130 logical services.

The PODM expresses the features, the attributes and the constraints for each Placement Opportunity, appropriate for the platform, the rights, and the policies including those of the content in which it exists. These Placement Opportunities may or may not be content specific and, in such cases, attributes and constraints may vary by network, geographic region, or other content distribution dimension.

The PODM defines a standardized data model for accessing Placement Opportunity information and this data model may be used in conjunction with a messaging interface, such as SCTE 130 Part 5, [SCTE130-5] the Placement Opportunity Information Service (POIS). An implementation may choose not to use this data model.

D.2 Overview of the Placement Opportunity Data Model (INFORMATIVE)

D.2.1 What is a Placement Opportunity?

A Placement Opportunity is a potentially constrained location — relative to digital content — where ad placement or content alterations may occur. The alterations may include insertions, replacements, or deletions of content, and may be whole or partial for both media stream duration or presentation characteristics and effects on the media stream such as a graphical overlay. The locations contain the opportunity for content insertion, traditionally referred to as avails [see SCTE 35] for linear video content. The new term “Placement Opportunity” was chosen to capture a more broadly defined concept including classic linear avails but also Video On Demand (VOD) bumper ads, banner images, overlay images, Barker ads on user guides and generally any opportunity to advertise. This information may be tightly associated to content, or more generally stipulated for particular cable or network systems.

This specification provides a generic and extensible framework for Placement Opportunities and provides details on specific well-known use cases such as classic linear advertising, VOD advertising, interactive and graphical overlays. In these particular use cases and for future extensions, the specification provides for Placement Opportunities to contain the following subcomponents:

- Some description of the entertainment content. In classic linear, this concept is the underlying broadcast channel. In VOD, this notion is the requested movie or content. Other examples may contain interactive applications, games.
• Some description of the location for the advertisement. The location may be
temporal, e.g. classic linear, or spatial, e.g. graphical overlays.

• Some description of other opportunity constraints such as the duration of the
advertisement or the number of advertisements that can be grouped together.

A break in entertainment content provides an opportunity for placements that require
specification. For non-linear content, the opportunity may be to expand or contract (in
the case of replacement or removal) the timeline by inserting or removing content
between segments. Multiple Placement Opportunities may be available between the
two segments of non-linear entertainment content. For both linear and non-linear
content, the Placement Opportunity may be to replace or overlay content already
present. Each of these Placement Opportunities may allow for certain interactive,
addressable, or other types of placement.

The existence of a Placement Opportunity does not imply physical presence of
referenced content assets, or that such streams are guaranteed to exist. Placement
Opportunities may be localized. As such, Placement Opportunities in one geographic
area, demographic group, day part, window, or other dimension, may be different
even for the same content.

A Placement Opportunity may have multiple owners, rights and business terms
dictating the types of placements that may occur, and identifying the systems making
such decisions. Some Placement Opportunities may be split, that is, multiple
placements may be made within a single opportunity. Placement Opportunities may or
may not need to be filled. Also, Placement decisions may result in additional
Placement Opportunities.

A Placement Opportunity contains the required information for placement decisions.
The placement decision may place content (e.g., advertisement) that complies with
the described Placement Opportunity and its restrictions, if any, and should be
available for validation at decision time.

How the Placement Opportunity information is obtained is outside the scope of this
document.

The upper portion of Figure 102 depicts Placement Opportunities relative to
entertainment content. The lower half of the image shows the same capabilities, but
this time within a rigid linear entertainment content break.
Figure 102: Visual Representation of Placement Opportunities

D.3 XML NAMESPACES (NORMATIVE)

This appendix uses the ‘podm’ prefix, as described in Table 1, for the interface associated with the specific XML namespace URI that shall be used by all implementations. Table 1 lists the prefix, the corresponding namespace, and a description of the defining specification used herein.

Unless otherwise stated, all references to XML elements illustrated in this document are from the ‘podm’ namespace. Elements from other namespaces will be prefixed with the name of the external namespace, e.g. <core:XXXX>.

The PODM specified herein leverages multiple XML namespaces. Where this document and any other specification differ, the PODM elements shall take precedence.
D.4 Messages Containing The Placement Opportunity Data Model (NORMATIVE)

Any SCTE 130 message interface may utilize the PODM. The message interfaces utilizing the PODM are outside the scope of this specification. Refer to the individual messaging specifications for additional information.

D.4.1 PODM NameSpaceVersion

The Placement Opportunity Data Model shall be communicated via the NameSpaceVersion Element. The NameSpaceVersion@namespace shall be set to “http://www.scte.org/schemas/130-3/2013/adm/podm” and the specific PODM version shall be passed in NameSpaceVersion@version. (See Section 14.20). The PODM version numbers are listed in Table 24: PODM Version Numbers.

<table>
<thead>
<tr>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>This identifies a pre-PODM release of SCTE 130-3.</td>
</tr>
<tr>
<td>1.2</td>
<td>This identifies the PODM data model described in this section.</td>
</tr>
</tbody>
</table>

Table 24: PODM Version Numbers

A ”1.4” capable ADS signals its facilities and determines an ADM endpoint’s operating ability by sending a ListADMServicesRequest message with the @version attribute set to “1.4”. The ADM responds in one of the following ways and the ADS/ADM pair shall operate as defined:

- A “1.1” capable ADM responds with an error and a core:StatusCode/@detail attribute having the value core:UnsupportedProtocol or the ADM responds with a successful ListADMServicesResponse message having the @version attribute set to the value “1.1”, which indicates the ADM is operating as a “1.1” ADM only. These scenarios indicate the ADM is a “1.1” ADM only and does not support SCTE 130-3 version “1.4”, “1.3” or PODM “1.2” or greater message exchanges. All messages exchanges shall set the @version attribute to “1.1” and shall comply with the 1.1 version of this specification. The PODM “1.2” (i.e., the PlacementOpportunityV2 element or any other element defined within this appendix) shall not be included in any message.

- A “1.2” capable ADM responds with an error and a core:StatusCode/@detail attribute having the value core:UnsupportedProtocol or the ADM responds with a successful ListADMServicesResponse message having the @version attribute set to the value “1.2” indicating the ADM is operating as a “1.2” ADM and “1.2” PODM. All message exchanges shall use the value “1.2” for the @version attribute. (Note: This return value should not be interpreted to mean the ADM is simultaneously operating as both a “1.1” AND “1.2” ADM.
The dual version operating characteristic is optional, implementation specific and outside the scope of this specification. The ADM or ADS supplied endpoints, i.e., the core:Address elements, contain endpoints capable of handling version “1.2” messages and elements.) The “1.2” PODM (i.e., the PlacementOpportunityV2 element or any other element defined within this appendix) may be included in any message as allowed by the normative schema and semantics defined herein.

- A “1.3” capable ADM responds with a successful ListADMServicesResponse message having the @version attribute set to the value “1.3” indicating the ADM is operating as a “1.3” ADM. All message exchanges shall use the value “1.3” for the @version attribute. The ADM shall also return a NameSpaceVersion Element for PODM with NameSpaceVersion@version attribute set to the value of “1.1” or “1.2” indicating the ADM’s PODM’s capabilities. A ListADMServicesResponse message may return a NameSpaceVersion Element for each of version “1.1” and “1.2”. All future messages carrying PODM elements and/or attributes shall be compliant with the PODM NameSpaceVersion@version value passed in the ADSRegistrationRequest message. See section 11.3 for additional information.

- A ”1.4” capable ADM responds similarly to a ”1.3” capable ADM regarding PODM. In addition, a ”1.4” capable ADM indicates it shall not use the eliminated EntertainmentNPT element nor shall it use the eliminated SpotNPT element. Instead, it shall use the PlayPositions element and its children.

A “1.1” capable ADS, signaled by the @version attribute having a value of “1.1”, communicating with a “1.3” or greater capable ADM may observe the following:

- An ADM response or acknowledgement message indicating an error as the core:StatusCode/@detail attribute is set to the value core:UnsupportedProtocol. This detail code indicates the ADM or the queried ADM endpoint does not support “1.1” messages (i.e., the ADM or the ADM endpoint is a “1.2” or greater interface).

- Any successful ADM response message which contains core:Address elements shall restrict the endpoints listed to those which are PODM “1.1” capable.

When a “1.3” or greater ADM accepts a “1.1” ADS registration, the ADM shall guarantee the message exchanges with the ADS do not use the PODM “1.2” (i.e., the PlacementOpportunityV2 element or any other element defined within this appendix) in any message. How a “1.3” ADM handles this translation is outside the scope of this standard. In addition, a ”1.4” ADM shall not use the EntertainmentNPT or SpotNPT and it shall use the replacement PlayPositions element and its children.
A “1.2” capable ADS, signaled by the @version attribute having a value of “1.2”, communicating with a “1.3” or greater capable ADM may observe the following:

- An ADM response or acknowledgement message indicating an error as the core:StatusCode/@detail attribute is set to the value core:UnsupportedProtocol. This detail code indicates the ADM or the queried ADM endpoint does not support “1.2” messages (i.e., the ADM or the ADM endpoint is a “1.3” or greater interface).

- Any successful ADM response message which contains core:Address elements shall restrict the endpoints listed to those which are PODM “1.2” capable.

When a “1.3” ADM accepts a “1.2” ADS registration, the ADM shall guarantee the message exchanges with the ADS use the PODM “1.2” (i.e., the PlacementOpportunityV2 element or any other element defined within this appendix) in any message. In addition, a "1.4" ADM shall not use the EntertainmentNPT or SpotNPT and it shall use the replacement PlayPositions element and its children.

D.5 PODM Attributes Types and Common Types (NORMATIVE)

The PODM includes all attribute types and common types as defined by the normatively included reference specifications. Additionally, the following are defined by this specification.

D.5.1 poGroupIndexAttrType Attribute Type

The poGroupIndexAttrType, a xsd:unsignedInteger typically referred to as the poGroupIndex attribute, allows one or more Placement Opportunities to be identified as members of a related or common group. The value zero indicates not used or no group. The index value typically starts at one and increment by one. Placement Opportunity grouping criteria are outside the scope of this specification.

D.5.2 unitsIdentificationAttrType Attribute Type

The unitsIdentificationAttrType is a core:nonEmptyStringType identifier which may have one of the values from Table 3. The supplied string provides measurement context for specified quantitative measured values.

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pixels</td>
<td>Measurement units defined as display resolution location pixels.</td>
</tr>
<tr>
<td>percentage</td>
<td>Measurement units defined as a resolution independent percentage of space.</td>
</tr>
</tbody>
</table>
User defined measurement units that are outside of this specification’s scope. The string **shall** be prefixed with the text “private:”.

**Table 25: unitsIdentificationAttrType Values**

### D.6 PODM Element Details (NORMATIVE)

The PODM leverages a subset of elements from several SCTE 130 specifications along with new elements in defining the data model composition. The new PODM elements are listed in Table 26 and are detailed in subsequent document sections.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ContentGroupFilter</td>
<td>Generic means of describing an asset set using a gis:BasicQueryFilter or gis:AdvancedQueryFilter element.</td>
</tr>
<tr>
<td>Interactive</td>
<td>Provides an extension for interactive specific information.</td>
</tr>
<tr>
<td>LinearAvailBindingV2</td>
<td>The revised SCTE 130-3 LinearAvailBinding element extended to supply additional functionality.</td>
</tr>
<tr>
<td>MenuCategory</td>
<td>Displayable menu folder identifier.</td>
</tr>
<tr>
<td>OpportunityBindingV2</td>
<td>The revised SCTE 130-3 OpportunityBinding element extended to supply additional functionality.</td>
</tr>
<tr>
<td>OpportunityConstraintsV2</td>
<td>The rights and constraints of the placements within this Placement Opportunity. This element is an extension of the adm:OpportunityConstraints element.</td>
</tr>
<tr>
<td>PlacementOpportunityTerms</td>
<td>The business terms relevant to the Placement Opportunity.</td>
</tr>
<tr>
<td>PlacementOpportunityV2</td>
<td>The revised SCTE 130-3 Placement Opportunity definition extended to supply new and additional functionality. This element is an extension of the adm:PlacementOpportunity element.</td>
</tr>
<tr>
<td>Plane</td>
<td>Visibility details relevant to a Placement Opportunity’s screen real estate.</td>
</tr>
<tr>
<td>Programming</td>
<td>The referenced content stream containing the Placement Opportunity.</td>
</tr>
<tr>
<td>Size</td>
<td>Screen real estate space identification.</td>
</tr>
<tr>
<td>SpatialPosition</td>
<td>Screen real estate consumable by a Placement Opportunity.</td>
</tr>
<tr>
<td>TopCorner</td>
<td>Coordinate details specific identifying a spatial position.</td>
</tr>
</tbody>
</table>
Table 26: PODM Elements

D.6.1 ContentGroupFilter

The ContentGroupFilter element provides a generic means of describing a set of assets, feeds, or other form of content. It may use either the gis:BasicQueryFilter or the gis:AdvancedQueryFilter as a means of describing the set. If this element is present, the containing Placement Opportunity is available as described for all content in the set description. If a service endpoint were to query for content within this set, the described Placement Opportunity may be present in the result set.

The XML schema diagram for this element is as follows:

Figure 103: ContentGroupFilter Element Schema

The ContentGroupFilter element semantics are as follows:

@##any [Optional] — Additional attributes from any namespace.


D.6.2 Interactive

The Interactive element is an extension point for all definitions of interactive rights, if any, that are allowed. Such examples may include “telescope”, “rfi”, and
“bookmark”. Constructs may be used to specify “pause ads” or restricted trick play. All such definitions are intentionally left to the implementation.

The XML schema diagram for this element is as follows:

![Interactive Element Schema](image)

**Figure 104: Interactive Element Schema**

The Interactive element semantics are as follows:

- **@name [Required, core:nonEmptyStringType]** — An identification string for this interactive element. See [SCTE130-2] for additional information.

- **@#any [Optional]** — Additional attributes from any namespace.


**D.6.3 LinearAvailBindingV2**

The LinearAvailBindingV2 element extends the adm:LinearAvailBindingType by including the @poGroupIndex attribute enabling Placement Opportunities to be associated with the index value acting as the group identifier.

The XML schema diagram for the LinearAvailBindingV2 element is illustrated in Figure 105.
Beyond the adm:LinearAvailBinding element’s original definition, see Section 14.15 for additional information, the LinearAvailBindingV2 element may contain the following attribute:

@poGroupIndex [Optional, poGroupIndexAttrType] — Placement Opportunity group index allows one or more Placement Opportunities to be identified as associated. See Section D.5.1 for additional information.

D.6.4 MenuCategory

The MenuCategory element contains a displayable menu folder identifier.

The XML schema diagram for this element is as follows:
Figure 106: MenuCategory Element Schema

The MenuCategory element semantics are as follows:

@##any [Optional] — Additional attributes from any namespace.

The MenuCategory element’s value is a core:nonEmptyStringType containing the displayable menu folder identifier.

D.6.5 OpportunityBindingV2

The OpportunityBindingV2 element extends the adm:OpportunityBindingType by including the @poGroupIndex attribute enabling Placement Opportunities to be associated with the index value acting as the group identifier.

The XML schema for the OpportunityBindingV2 element is illustrated in Figure 107.
Beyond the adm:OpportunityBinding element’s original definition, see Section 14.24 for additional information, the OpportunityBindingV2 element *may* contain the following attribute:

@poGroupIndex [Optional, poGroupIndexAttrType] — Placement Opportunity group index allows one or more Placement Opportunities to be identified as associated. See Section D.5.1 for additional information.

D.6.6 OpportunityConstraintsV2

The OpportunityConstraintsV2 element contains the rights and constraints of placements within a Placement Opportunity. This element extends the adm:OpportunityConstraintsType.

The XML schema diagram for this element is as follows:
Figure 108: OpportunityConstraintsV2 Element Schema
Beyond the adm:OpportunityConstraints element’s original definition (Section 14.25), the OpportunityConstraintsV2 element may contain one or more of the following elements:

**SpatialPosition [Optional]** — Zero or more descriptions of the position and portion of the opportunity relative to screen real estate. See Section D.6.12 for additional information.

**Interactive [Optional]** — Zero or more interactive characteristic descriptions. See Section D.6.2 for additional information.

### D.6.7 PlacementOpportunityTerms

The PlacementOpportunityTerms element contains the business terms for how this Placement Opportunity should be billed, what, if any, revenue splits are, and who may have exclusive rights to sell the opportunity.

The XML schema diagram for this element is as follows:

![Figure 109: PlacementOpportunityTerms Element Schema](image)

The following are the PlacementOpportunityTerms element’s semantics.

@**owner** [Required, core:nonEmptyString] — The recognized owner name for billing purposes.

@**exclusiveSales** [Optional, xsd:boolean] — Set to true if the @owner attribute specified entity has exclusive rights to sell this Placement Opportunity. If the attribute is omitted, the default value shall be false.
@revenueSplit [optional, xsd:nonNegativeInteger] — The percentage portion of sale revenue for the opportunity destined to the owner identified by the @owner attribute. The attributes range is 0 to 100. If the attribute is omitted, the default value shall be 100 (or all revenue).

@##any [Optional] — Additional attributes from any namespace.


D.6.8 PlacementOpportunityV2

The PlacementOpportunityV2 element is the PODM root element. This element defines the space and is the lead for all static and dynamic rules of what a placement may be, where in the stream it can exist, and what can be done within that opportunity. In effect, it defines the space and the capabilities for a given potential content stream. The PlacementOpportunityV2 element may be substituted for the adm:PlacementOpportunity element as it extends the currently defined adm:PlacementOpportunity element.

The XML schema diagram for this element is illustrated in Figure 110.
Figure 110: PlacementOpportunityV2 Element Schema
The following are the PlacementOpportunityV2 element’s semantics:

@id [Required, core:idAttrType] — The @id attribute, also known as a Placement Opportunity identifier or POID, uniquely identifies the Placement Opportunity within the scope of the @identity attribute from the enclosing top level parent messaging element, and shall not be empty. See Section 14.26.1.1 and [SCTE130-2] for additional information.

@ServiceRegistrationRef [Optional, core:idAttrType] — When present in ADM/ADS message exchanges, this attribute shall contain the value as defined by this document. For other message exchanges where this attribute has insufficient context, the attribute may be omitted; if included in such cases, the attribute’s value shall be “–“. See Section 12.1 and [SCTE130-2] for additional information.

@localServiceRef [Optional, core:idAttrType] — For ADM/ADS message exchanges, this attribute shall contain the value as defined by this document. For other message exchanges where this attribute has insufficient context, the attribute shall not be used. See Section 12.1 and Section 13.1.4 for additional information.

@##any [Optional] — Additional attributes from any namespace.

adm:Entertainment [Optional] — The reference stream of content containing the Placement Opportunity. This element shall be used when only one core:Content element is present. If more than one core:Content element is required, the adm:Entertainment elements under the Programming element shall be utilized and this element shall be omitted. In the event both this adm:Entertainment element and the adm:Entertainment elements under the Programming element are present, this element shall take precedence. See Section 13.2.1 for additional information.


OpportunityBindingV2 [Optional] — This enhanced version of the adm:OpportunityBinding element may only be present in the PlacementOpportunityV2 element. See Section D.6.5 for additional information.

adm:LinearAvailBinding [Optional] — The relative position and existence of the Placement Opportunity. This element shall be present when the Placement Opportunity applies to linear content. See Section 14.15 for additional information.

LinearAvailBindingV2 [Optional] — This enhanced version of the adm:LinearAvailBinding element may only be present in the PlacementOpportunityV2 element. See Section D.6.3 for additional information.

adm:OpportunityConstraints [Optional] — The original SCTE-130 defined element. See Section 14.25 for additional information. OpportunityConstraintsV2 [Optional] — This enhanced version of the adm:OpportunityConstraints element may only be present in the PlacementOpportunityV2 element. This element extends the current adm:OpportunityConstraints element by defining additional placement
rights and constraints within this Placement Opportunity. See Section D.6.6 for additional information.

adm:PlacementDateTime [Optional] — For ADM/ADS message exchanges, this element shall contain the value as defined by this document. For other message exchanges where this element has insufficient context, the element shall not be used. See Section 14.30 for additional information. adm:PlacementControl [Optional] — This element includes relative positioning of specific Placement Opportunities within a stream. See Section 14.28 for additional information.


adm:SystemContext [Optional] — System environment information typically refining the placement service identification. The element’s usage shall be as defined by [SCTE 130-3] and the element shall only be present when the containing element’s schema does not offer this element (i.e., any parent element does not contain the adm:SystemContext element). For example, this element shall not be present when the PlacementOpportunityV2 element is contained in an adm:PlacementRequest message. The parent element shall always take precedence when there is a conflict. See Section 14.52 for additional information. Programming [Optional] — A container holding references to content streams containing this Placement Opportunity. This element shall be used when more than one core:Content element is needed. If only one core:Content element is required, the standalone adm:Entertainment element previously described in this semantics section shall be utilized and this element shall be omitted. See Section D.6.10 for additional information.


D.6.9 Plane

This element contains the relevant details on how “show-able” an area of a screen is. As multiple spaces may be defined for a single Placement Opportunity, or multiple Placement Opportunities may exist simultaneously, some spaces may intersect. This defines where one space exists relative to another in the z plane, and the level of translucence or opacity.

The XML schema diagram for this element is as follows:
The Plane element contains the following semantics:

@opacity [optional, xsd:nonNegativeInteger] — The level of opaqueness of the space (i.e. alpha channel). A value of 100 is completely opaque, and a value of 0 is completely transparent. If the attribute is missing, the default value shall be 100 (i.e., completely opaque).

@zOrder [optional, xsd:nonNegativeInteger] — The relative position in the z-plane to other spaces. The @zOrder attribute value specifies the bottom-to-top stacking order of the spaces and the attributes minimum value shall be 1. The value 0, which shall be reserved, indicates the bottom of the stack and spaces are stacked bottom-to-top in order of increasing @zOrder attribute value. Spaces with identical @zOrder attribute values have unspecified relative stacking order. If the attribute is omitted, the default @zOrder attribute value shall be 1. Video essence assumes a @zOrder attribute value of 0 (making it the bottom of the stack).

@##any [Optional] — Additional attributes from any namespace.

D.6.10 Programming

The Programming element describes the content reference stream containing the Placement Opportunity if there is more than one reference stream or if the stream is non-video. If there is more than one reference stream or if the stream is non-video, the Programming element shall be used to describe the content reference stream containing the Placement Opportunity (and the adm:Entertainment element shall not be used). If there is only one reference stream and it is video, the adm:Entertainment element under the PlacementOpportunityV2 element shall describe the reference content stream. If neither the adm:Entertainment under PlacementOpportunityV2 element or the Programming element are recognized by the content delivery system, the Placement Opportunity does not exist with respect to said content delivery system. Table 27 defines how these elements shall be employed based on the reference streams present.
<table>
<thead>
<tr>
<th>Reference Streams Present</th>
<th>Placement Opportunities Reference Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single, video</td>
<td>The adm:Entertainment element under the PlacementOpportunityV2 element</td>
</tr>
<tr>
<td>Single, non-video</td>
<td>The Programming element</td>
</tr>
<tr>
<td>Multiple streams</td>
<td>The Programming element</td>
</tr>
</tbody>
</table>

**Table 27: Placement Opportunity Reference Stream Identification**

The XML schema diagram for this element is as follows:

![Diagram of Programming Element Schema](image)

**Figure 112: Programming Element Schema**

The Programming element semantics are defined as follows:

@##any [Optional] — Additional attributes from any namespace.

**ContentGroupFilter [Optional]** — The set description of content to which this Placement Opportunity is applicable. See Section D.6.1 for additional information.

**MenuCategory [Optional]** — The category in the on screen guide where the Placement Opportunity may be constrained (i.e., this Placement Opportunity only exists for content available within this category). See Section D.6.4 for additional information.

**adm:Entertainment [Optional]** — The content this Placement Opportunity may exist within, before, or after. This element shall only be used if more than one adm:Entertainment element is required. If a single adm:Entertainment element is
required, the adm:Entertainment element under the PlacementOpportunityV2 element **shall** be used. See [SCTE130-3] for additional information.


### D.6.11 Size

The Size element contains the relevant details about the size of the Placement Opportunity space.

The XML schema diagram for this element is as follows:

![Size Element Schema](image)

**Figure 113: Size Element Schema**

The Size element semantics are as follows:

- **@xSize [required, xsd:nonNegativeInteger]** — The width of this space in the units specified by the @units attribute.

- **@ySize [required, xsd:nonNegativeInteger]** — The height of this space in the units specified by the @units attribute.

- **@units [required, unitsIdentificationAttrType]** — Identification of the measurement unit system for which @xSize and @ySize attributes values are referencing. Typical examples are pixels or percentage. See Section D.5.2 for additional information.

- **@##any [Optional]** — Additional attributes from any namespace.
D.6.12 SpatialPosition

The SpatialPosition element identifies the screen real estate that may be consumed by a Placement Opportunity. This position may be occupied by an overlay within a larger Placement Opportunity, or a Placement Opportunity over the entertainment content. The absence of a SpatialPosition element indicates the Placement Opportunity shall have access to the entire screen.

The XML schema diagram for this element is as follows:

![Figure 114: SpatialPosition Element Schema](image)

The SpatialPosition element semantics are as follows:

@resolutionHorizontal [optional, xsd:nonNegativeInteger] — The expected width of the screen for this SpatialPosition element in the units specified by the @units attribute.

@resolutionVertical [optional, xsd:nonNegativeInteger] — The expected width of the screen for this SpatialPosition element in the units specified by the @units attribute.

@units [optional, unitsIdentificationAttrType] — Identification of the measurement unit system for which @resolutionHorizontal and @resolutionVertical
attributes values are referencing. Typical examples are pixels or percentage. See Section D.5.2 for more information and the default value if the attribute is omitted.

@##any [Optional] — Additional attributes from any namespace.

Plane [Optional] — The show-ability of this space. See Section D.6.9 for additional information.

Size [Optional] — The size of this space. See D.6.11 for additional information. The Size element’s @xPosition attribute value shall not exceed the maximum value of the @resolutionHorizontal attribute if present. The Size element’s @yPosition attribute values shall not exceed the maximum value of the @resolutionVertical attribute if present.

TopCorner [Optional] — The uppermost and leftmost identification of this space. See Section D.6.13 for additional information.

Interactive [Optional] — Zero or more elements describing the interactivity characteristics of this space. See Section D.6.2 for additional information.

D.6.13 Top Corner

The TopCorner element contains the relevant details on where a spatial position exists on the screen.

The XML schema diagram for this element is as follows:

![Figure 115: TopCorner Element Schema](https://example.com/image.jpg)

The TopCorner element semantics are as follows:
@xPosition [required, xsd:nonNegativeInteger] — The leftmost position of this space in the units specified by the @units attribute.

@yPosition [required, xsd:nonNegativeInteger] — The uppermost position of this space in the units specified by the @units attribute.

@units [required, unitsIdentificationAttrType] — Identification of the measurement unit system for which @xSize and @ySize attributes values are referencing. Typical examples are pixels or percentage. See Section D.5.2 for additional information.

@##any [Optional] — Additional attributes from any namespace.
APPENDIX E. PLACEMENT OPPORTUNITY DATA MODEL EXAMPLES (INFORMATIVE)

E.1 Basic Substitution Example

Example 72 illustrates an original SCTE130-3 adm:PlacementRequest message containing three adm:PlacementOpportunity elements.

```xml
<PlacementRequest messageId="admmsg1" version="1.4" identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B2F525F4" system="adm" updatesAllowed="false">
  <!--System context supplies information such as session identification, etc.-->
  <SystemContext>
    <Session>SessionID1</Session>
  </SystemContext>
  <!--Entertainment content reference.-->
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="moviecompany.com" assetID="MVIE0123456789012345"/>
    </core:Content>
  </Entertainment>
  <Client>
    <!--The Client element contains the targeting information.-->
    <TerminalAddress type="MAC">01-02-03-04-05-06</TerminalAddress>
    <TargetCode key="ZipPlus4">12345-6789</TargetCode>
    <TargetCode key="Gender">Male</TargetCode>
  </Client>
  <PlacementOpportunity id="Op1" serviceRegistrationRef="RegisteredServiceMatchRef1">
    <OpportunityBinding opportunityType="preRoll" opportunityNumber="1">
      <OpportunityConstraints>
        <DesiredDuration>PT60S</DesiredDuration>
        <Scope>National</Scope>
      </OpportunityConstraints>
    </PlacementOpportunity>
    <PlacementOpportunity id="Op2" serviceRegistrationRef="RegisteredServiceMatchRef2">
      <OpportunityBinding opportunityType="midRoll" opportunityNumber="2">
        <OpportunityConstraints>
          <MaxDuration>PT31S</MaxDuration>
          <MinDuration>PT29S</MinDuration>
          <DesiredDuration>PT30S</DesiredDuration>
          <Scope>Local</Scope>
        </OpportunityConstraints>
      </PlacementOpportunity>
      <PlacementOpportunity id="Op3" serviceRegistrationRef="RegisteredServiceMatchRef3">
        <OpportunityBinding opportunityType="postRoll" opportunityNumber="3">
          <OpportunityConstraints>
            <MaxDuration>PT60S</MaxDuration>
            <MinDuration>PT5S</MinDuration>
            <DesiredDuration>PT10S</DesiredDuration>
            <Scope>Local</Scope>
          </OpportunityConstraints>
        </PlacementOpportunity>
    </PlacementOpportunity>
  </PlacementRequest>
```

Example 73 re-implements Example 1 and extends it using the PODM defined PlacementOpportunityV2 element and the OpportunityConstraintsV2 element.
Example 73

Example 2 illustrates how the adm:PlacementOpportunity and the podm:PlacementOpportunityV2 element may simultaneously be carried in a adm:PlacementRequest message which has the XML namespaces declared correctly.

Example 2 also illustrates a PlacementOpportunityV2 element may use either an adm:OpportunityConstraints element or a podm:OpportunityConstraintsV2 element inside its context.
APPENDIX F. PODM AND INFORMATION SERVICE QUERIES (NORMATIVE)

F.1 Introduction

The PODM by itself does not constitute an information service, as it does not define any messaging XML elements. Any information service may include or utilize the PODM with a Placement Opportunity Information Service (POIS) implementation being a common candidate information service. The information service is expected to advertise PODM availability using the standard listing mechanisms as defined in [SCTE130-8].

The Placement Opportunity Data Model has been defined separately from the information service query elements allowing the data model to be used independently of the information service inquiry syntax and semantics. Consequently, there are two XML schema files (i.e. XSD files). One schema file is for the data model and one file defines a strongly typed basic query result element. The PODM specific query semantics and basic query result element are defined herein. Also, the data model and the query semantics share the same common XML namespace as defined in Table 1. Thus, they are related and separated only by the schema file.

Any information service including the PODM as a supported data model shall follow the semantics defined in the pursuant sections herein.

F.2 Data Model and Query Support

F.2.1 PODM Identification

The PODM shall be identified (or referenced) using the XML namespace stipulated in Table 1. Consequently, the gis:ServiceDataModel element’s value (i.e., the URI) shall be the PODM XML namespace from Table 1. Example 74 illustrates.

Example 74

F.2.2 PODM Unique Qualifiers

Table 5 lists the mandatory SCTE 130 Part 3 Placement Opportunity Data Model (PODM) unique qualifier set an information service shall implement for the PODM data model basic query. An information service may implement other unique qualifier sets. However, these differences require separate gis:UniqueQualifierDeclaration elements identified by alternate @uniqueQualifierName attributes.

The @uniqueQualifierName attribute value for the PODM unique qualifier set shall be the string “P3-PODM” (without the quotes). Example 75 illustrates. For forward compatibility associated with this standard evolving, the @uniqueQualifierName attribute should be (i.e., is highly recommended to be) included in all elements where the attribute may optionally be included.

Example 75
Example 75

The PODM unique qualifiers are listed in Table 5 and shall appear exactly as they appear in the Unique Qualifier Identifier column. These values are used in the following schema locations:

- UniqueQualifierDeclaration/QualifierDeclaration/@name
- QualifierDescription/@name
- UniqueQualifier/Qualifier/@name

<table>
<thead>
<tr>
<th>Unique Qualifier Identifier</th>
<th>PODM Syntax Mapping</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>poid</td>
<td>PlacementOpportunityV2/@id</td>
<td>string</td>
<td>Placement Opportunity Identifier. The poid corresponds to the Placement Opportunity @id attribute defined to be an identity unique identifier for the Placement Opportunity within the SCTE 130 Part 3 Placement Opportunity Data Model.</td>
</tr>
</tbody>
</table>

Table 28: PODM Unique Qualifiers

F.2.3 PODM Basic Query Requests

When querying the PODM using a basic query, the Query element should (i.e., is highly recommended to) include both the gis:ServiceDataModel element and the @uniqueQualifierName attribute with the values specified in Section F.2.1 and Section F.2.2. The primary motivation is forward compatibility as this specification evolves.

F.2.4 PODM Basic Query Results

When a basic query is issued referencing the PODM as the gis:ServiceDataModel and the gis:ServiceDataModel element’s @uniqueQualifierName is set to value specified in Section F.2.2, the expanded results are returned using the PODMBasicQueryResult element specified in Section F.3.1. See Section F.3.1 for additional information.

F.2.5 Advanced Query Language Support

An information service implementing the PODM should support advanced query language processing as defined in [SCTE130-8].
F.3 PODM Information Service Elements

Table 29 identifies the additional elements added by this specification beyond those defined by a typical information service.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PODMBasicQueryResult</td>
<td>A substitutable element for the gis:BasicQueryResultAbstract element which includes the podm:PlacementOpportunityV2 element.</td>
</tr>
</tbody>
</table>

Table 29: PODM Element Details

F.3.1 PODMBasicQueryResult

When a basic query is issued against the PODM and signaled as specified in Section F.2, the results **shall** be returned to the calling client encapsulated within a PODMBasicQueryResult element. This element **shall** be substituted for the gis:BasicQueryResultAbstract element under the gis:QueryResult element and it **shall** contain the immediate result set for the paired query. The gis:BasicQueryResult element **shall not** be used.

The XML schema for PODMBasicQueryResult is illustrated in Figure 116.

![Figure 116: PODMBasicQueryResult Element XML Schema](image)

The PODMBasicQueryResult element contains the following attributes and elements:

gis:UniqueQualifier [Required by Choice] — One or more gis:UniqueQualifier elements are returned as a response to a gis:Query element containing one or more gis:BasicFilterElement elements and the gis:Query element has the @expandOutput attribute set to the value "false". The gis:UniqueQualifier element shall contain the sequence of gis:Qualifier elements specified in Section F.2.2.

podm:PlacementOpportunityV2 [Required by Choice] — One or more podm:PlacementOpportunityV2 elements are returned as a response to a basic query when the originating gis:Query element contains either of the following:

- A gis:UniqueQualifier element.
- A sequence of gis:BasicFilterElement element in conjunction with gis:Query element’s @expandOutput attribute being set to the value “true”.

When the initiating gis:Query element contains a gis:UniqueQualifier element, only one podm:PlacementOpportunityV2 element shall be returned. If the inquiry result count evaluated to more than one, the query should be failed and a core:StatusCode element shall indicate the error condition using the value 8003 (Malformed Unique Qualifier). [Note: By definition, a unique qualifier shall resolve to one and only one object in the service data model. Thus, more than one result is considered an error.]

One or more podm:PlacementOpportunityV2 elements shall be returned when the gis:Query element contains a gis:BasicFilterElement and the gis:Query element’s @expandOutput attribute is set to the value “true.”

The following tables further refine the results dependent upon the initiating query’s data.
Table 30 defines the possible result behaviors when the gis:QueryRequest element contains a gis:UniqueQualifier element.

<table>
<thead>
<tr>
<th>gis:Query Element</th>
<th>gis:QueryResult Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>@expand Output</td>
<td>The PBQR element <em>shall</em> be present within the gis:QueryResult element when @resultsSetSize is non-zero.</td>
</tr>
<tr>
<td>@result SetSize</td>
<td>Elements present within the PBQR element when @resultsSetSize is non-zero.</td>
</tr>
<tr>
<td>Only</td>
<td></td>
</tr>
<tr>
<td>@unique NameRef</td>
<td></td>
</tr>
<tr>
<td>@total Result</td>
<td></td>
</tr>
<tr>
<td>Set Size</td>
<td></td>
</tr>
<tr>
<td>@result SetSize</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N/A</th>
<th>TRUE</th>
<th>Note 1</th>
<th>0 or 1</th>
<th>0</th>
<th>No elements <em>shall</em> be present.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FALSE</td>
<td>FALSE</td>
<td>Note 1</td>
<td>NP</td>
<td>0 or 1</td>
<td>A UniqueQualifier element whose contents conform to Section F.2.2.</td>
</tr>
<tr>
<td>TRUE</td>
<td>FALSE</td>
<td>Note 1</td>
<td>NP</td>
<td>0 or 1</td>
<td>A podm:PlacementOpportunityV2 element.</td>
</tr>
</tbody>
</table>

**Table 30: gis:UniqueQualifier Query Result Behaviors**

1. Note 1: The value should be (is highly recommend to be) the value specified in Section F.2.2 (i.e., “P3-PODM”).
2. N/A = Not Applicable (ignored if present)
3. NP = Not present (*shall not* be returned)
4. PBQR = PODMBasicQueryResult element
5. AQR = gis:AdvancedQueryResult
Table 31 defines the possible result behaviors when the gis:QueryRequest element contains a gis:BasicQueryFilter sequence.

<table>
<thead>
<tr>
<th>gis:Query Element</th>
<th>gis:QueryResult Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>@expand Output</td>
<td>@result SetSize Only</td>
</tr>
<tr>
<td>N/A</td>
<td>TRUE</td>
</tr>
<tr>
<td>FALSE</td>
<td>FALSE</td>
</tr>
<tr>
<td>TRUE</td>
<td>FALSE</td>
</tr>
</tbody>
</table>

**Table 31: gis:BasicQueryFilter Query Result Behaviors**

6. Note 1: The value should be (is highly recommend to be) the value specified in Section F.2.2 (i.e., “P3-PODM”).
7. Note 2: If the same query had @expandOutput set to “true”, the value shall be the number of podm:PlacementOpportunityV2 elements returned.
8. N/A = Not Applicable (ignored if present)
9. NP = Not present (shall not be returned)
10. PBQR = PODMBasicQueryResult element
Table 32 defines the possible result behaviors when the gis:QueryRequest element contains a gis:AdvancedQueryFilter sequence.

<table>
<thead>
<tr>
<th>gis:Query Element</th>
<th>gis:QueryResult Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>The AQR element shall be present within the gis:QueryResult element when @resultsSetSize is non-zero.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>@expand</th>
<th>@result</th>
<th>@unique</th>
<th>@total</th>
<th>@result</th>
<th>Elements present within the AQR element when @resultsSetSize is non-zero.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>SetSize Only</td>
<td>Qualifier NameRef</td>
<td>Result Set Size</td>
<td>Result Set Size</td>
<td></td>
</tr>
<tr>
<td>FALSE</td>
<td>TRUE</td>
<td>Note 1</td>
<td>0 to UB</td>
<td>0</td>
<td>No elements shall be present.</td>
</tr>
<tr>
<td>TRUE</td>
<td>TRUE</td>
<td>Note 1</td>
<td>0 to UB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALSE</td>
<td>FALSE</td>
<td>Note 1</td>
<td>NP</td>
<td>0 to UB</td>
<td>1 to unbounded UniqueQualifier elements using the @uniqueQualifierNameRef identified unique qualifier</td>
</tr>
<tr>
<td>TRUE</td>
<td>FALSE</td>
<td>Note 1</td>
<td>NP</td>
<td>0 to UB</td>
<td>1 to unbounded AdvancedQueryResultData elements (Note 2)</td>
</tr>
</tbody>
</table>

Table 32: Advanced Qualifier Query Result Behaviors

11. Note 1: The value should be (is highly recommend to be) the value specified in Section F.2.2 (i.e., “P3-PODM”).
12. Note 2: If non-zero, the value shall be the number of AdvancedQueryResultData elements contained in the AdvancedQueryResult element.
13. NP = Not present (shall not be returned)
14. AQR = gis:AdvancedQueryResult
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