

International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

J.380.3

(11/2011)

SERIES J: CABLE NETWORKS AND TRANSMISSION
OF TELEVISION, SOUND PROGRAMME AND OTHER
MULTIMEDIA SIGNALS

Digital transmission of television signals

**Digital program insertion – Advertising systems
interfaces – Management interface**

Recommendation ITU-T J.380.3



Recommendation ITU-T J.380.3

Digital program insertion – Advertising systems interfaces – Management interface

Summary

Recommendation ITU-T J.380.3 in conjunction with the SCTE 130-3 extensible markup language (XML) schema 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).

History

Edition	Recommendation	Approval	Study Group
1.0	ITU-T J.380.3	2011-11-13	9

FOREWORD

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Introduction

The ad management service (ADM) and the ad decision service (ADS) are core elements in a standardized ITU-T J.380 advanced advertising system. Both the ADM and the ADS shall be ITU-T J.380 compliant logical services implementing all messages and message semantics as defined in ITU-T J.380.2 and this Recommendation. See [ITU-T J.380.2] for additional 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 Recommendation. 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.

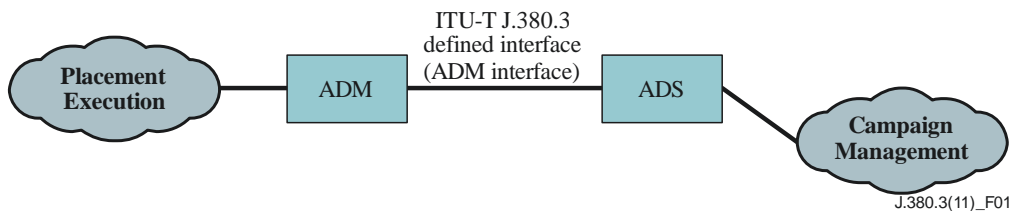


Figure 1 – A basic ITU-T J.380 advertising system

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 Recommendation. 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 Recommendation. The internal implementation and operation of both the ADM and the ADS are outside the scope of this Recommendation.

The ADM and the ADS may be clients of any ITU-T J.380 defined logical service as illustrated in Figure 2.

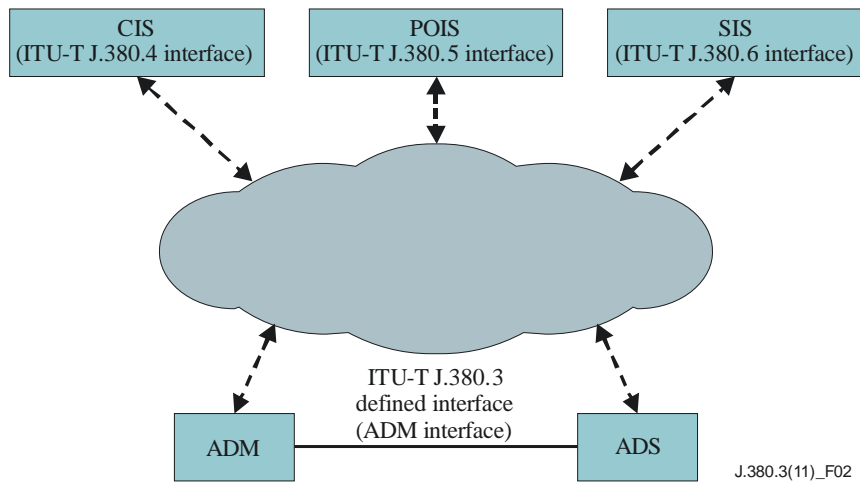


Figure 2 – ITU-T J.380 logical service relationships

The content information service (CIS) provides content asset metadata and availability information for both advertising and non-advertising content. See [b-ITU-T J.380.4] for additional information. The placement opportunity information service (POIS) may supply placement opportunity descriptions. See [ITU-T J.380.5] for additional information. The subscriber information service (SIS) may provide relevant subscriber information such as advertising focus refinement parameters. See [b-ITU-T J.380.6] 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 Recommendation.

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 4 illustrates a more sophisticated example [ITU-T J.380.x] advertising system leveraging multiple [ITU-T J.380.x] logical services. Figure 4 represents one possible configuration and many other combinations beyond the illustration are possible.

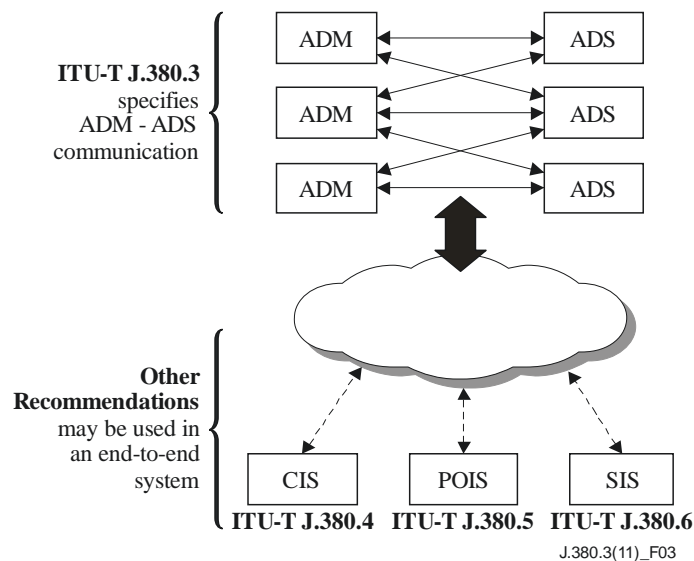


Figure 3 – ADM/ADS Interconnects

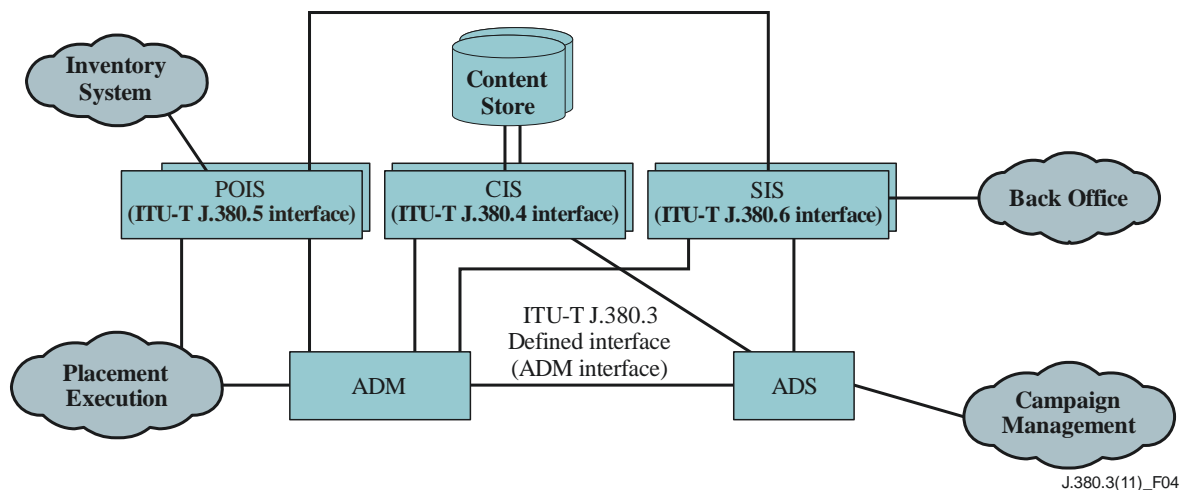


Figure 4 – ITU-T J.380 advertising system example

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 Recommendation.

Document organization

This document provides a structured, logical approach to the ADM interface for the [ITU-T J.380.x] series. Each subsequent clause focuses on a particular Recommendation aspect and this document's presentation order provides a top-down, conceptual introductory understanding necessary to implement the ADM interface.

Clause 5 explains this document's notational conventions and identifies the processing conventions. Clause 5 also defines the XML namespace usage and the applicable XML semantics. Clause 6 introduces the ADM interface messaging concepts.

Clause 7 defines the ADM interface logical service management messages and clause 8 defines the placement operations messages. Clause 7 and subsequent clauses often may reference XML attributes and elements defined later in this document. The reader may occasionally need to reference other document clauses or [ITU-T J.380.2] in order to find the complete explanation of a syntactic component.

Clause 9 presents the ADM interface's XML attributes and complex types followed by clause 10 which defines the Recommendation's individual XML elements. Attributes, complex types, and elements in clauses 9 and 10 are presented in alphabetical order. Annex A provides the normative status code values, their meanings, and their message usage applicability followed by Appendix I, which is an informative example.

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 Recommendation. 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 clause 10.45 and clause 10.37 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 clause 10.38 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 clause 9.2 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 clause 10.29 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 Recommendation defines the ADM interface.

Recommendation ITU-T J.380.3

Digital program insertion – Advertising systems interfaces – Management interface

1 Scope

This document in conjunction with the SCTE extensible markup language (XML) schema 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 SCTE schema document describe the auxiliary XML messages, elements, and attributes supporting the primary message exchanges.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- [ITU-T J.380.2] Recommendation ITU-T J.380.2 (2011), *Digital program insertion – Advertising systems interfaces – Core data elements.*
- [ITU-T J.380.5] Recommendation ITU-T J.380.5 (2011), *Digital program insertion – Advertising systems interfaces – Placement opportunity information service.*
- [ITU-T J.380.7] Recommendation ITU-T J.380.7 (2011), *Digital program insertion – Advertising systems interfaces – Message transport.*
- [ITU-T J.380.8] Recommendation ITU-T J.380.8 (2011), *Digital program insertion – Advertising systems interfaces – General information service.*
- [ITU-T J.380.x] Recommendation ITU-T J.380.x-series (2011), *Digital program insertion – Advertising systems interfaces.*
- [SCTE 130-3 Schema] SCTE 130-3 (2010), *Digital Program Insertion – Advertising Systems Interfaces Part 3 Ad Management Service (ADM) Interface, XML Schema.*
- [SCTE 130-3 ADM wsdl] SCTE 130-3 (2010), *Digital Program Insertion – Advertising Systems Interfaces Part 3 Ad Management Service (ADM) Interface, ad management service WSDL file.*
- [SCTE 130-3 ADS wsdl] SCTE 130-3 (2010), *Digital Program Insertion – Advertising Systems Interfaces Part 3 Ad Management Service (ADM) Interface, ad decision service WSDL file.*
- [SCTE 130-3 PODM] SCTE 130-3 (2010), *Digital Program Insertion – Advertising Systems Interfaces Part 3 Ad Management Service (ADM) Interface, placement opportunity data model file.*

[SCTE 130-3 PODM Query]	SCTE 130-3 (2010), <i>Digital Program Insertion – Advertising Systems Interfaces Part 3 Ad Management Service (ADM) Interface</i> , placement opportunity data model file query file.
[W3C-XSD]	W3C Recommendation (2004), <i>XML Schema Part 1: Structures Second Edition</i> . W3C Recommendation (2004), <i>XML Schema Part 2: Datatypes Second Edition</i> .
[XMLSchemaP1]	W3C Recommendation (2004), <i>XML Schema Part 1: Structures</i> .

3 Definitions

3.1 Terms defined elsewhere

All ITU-T J.380.2, ITU-T J.380.7 and ITU-T J.380.8 definitions are normatively included herein. See [ITU-T J.380.2], [ITU-T J.380.7] and [ITU-T J.380.8] for additional information.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 ADM interface: The ADM to ADS message communication link defined by ITU-T J.380.3.

3.2.2 interstitial: A placement opportunity occurring during the play out of an entertainment asset (also commonly referred to as a mid-roll).

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

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

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

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

3.2.7 placement status messaging: The PlacementStatusNotification/Placement Status Acknowledgement message exchange sequence.

3.2.8 placement update messaging: The PlacementUpdateNotification/Placement UpdateAcknowledgement message exchange sequence.

3.2.9 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 [SCTE 35] for linear video content; however, placement opportunity refers to address and time locations where content may be placed, regardless of platform.

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

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

3.2.12 pre-roll: A placement opportunity preceding an entertainment asset.

NOTE – Definition differs from SCTE 35. See [SCTE 35].

3.2.13 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 Recommendation refines the ITU-T J.380.2 definition by qualifying the registration as a placement service registration. See [ITU-T J.380.2] for the base definitions.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

All ITU-T J.380.2, ITU-T J.380.7 and ITU-T J.380.8 abbreviations are normatively included herein. See [ITU-T J.380.2], [ITU-T J.380.7] and [ITU-T J.380.8] for additional information.

This Recommendation additionally uses the following abbreviations:

- PODM Placement Opportunity Data Model
- VOD Video on Demand

5 Conventions

5.1 Notational conventions

5.1.1 Normative XML schema

See [ITU-T J.380.2] for information.

5.2 Document conventions

This Recommendation utilizes the same document conventions as Recommendation ITU-T J.380.2. See [ITU-T J.380.2] for conventions and XML schema illustration nomenclature explanations.

This Recommendation 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.

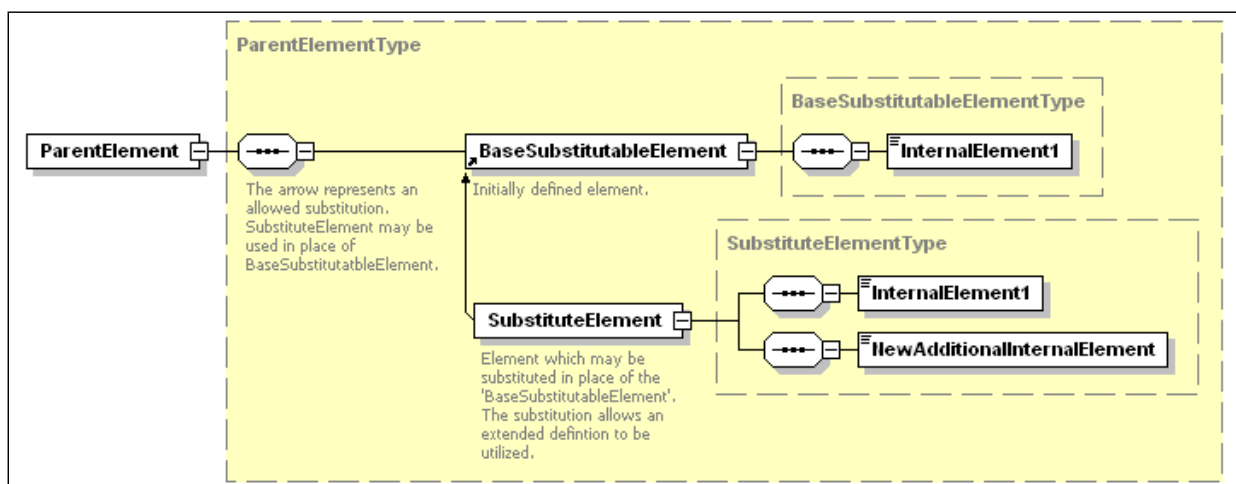


Figure 5-1 – Substitution group schema convention

In Figure 5-1, 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.

5.3 Processing conventions

Unknown/Unrecognized/Unsupported XML elements and attributes. See [ITU-T J.380.2] for information.

5.4 XML namespaces

This document uses the '*adm*' prefix for the interface associated with this Recommendation's XML namespace URI. This URI shall be used by all implementations applying this Recommendation. Table 1 lists the prefix, the corresponding namespace, and a description of the defining Recommendation.

Table 1 – XML namespace declarations

Prefix	Namespace	Description
core	http://www.scte.org/schemas/130.2/2008a/core	ITU-T J.380.2.
adm	http://www.scte.org/schemas/130-3/2008a/adm	ITU-T J.380.3 (this Recommendation).
admwsdl	http://www.scte.org/wsdl/130-3/2010/adm	Annex II.
adswsdl	http://www.scte.org/wsdl/130-3/2010/ads	Annex II.
podm	http://www.scte.org/schemas/130-3/2008a/adm/podm	Annex III.
xsd	http://www.w3.org/2001/XMLSchema	XML foundation. See [W3C-XSD].

5.4.1 @version attribute

For this Recommendation's defined messages, the message's @version attribute shall be set to the value "1.1" corresponding to this document's revision. For those messages defined by [ITU-T J.380.2], the @version value shall be set to the value defined and specified in [ITU-T J.380.2].

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

6 ADM interface message introduction

The following topics are covered by [ITU-T J.380.2] and this Recommendation, considers all aspects defined therein to be normative and applicable herein. See [ITU-T J.380.2] for information specific to this list and for expanded associated topics.

- Message format
- XML message carriage
- Transport mechanisms
- Message error handling
- High availability

The ADM interface defined herein shall include all messages defined in [ITU-T J.380.2] and all ADM interface messages shall be compliant with [ITU-T J.380.2]. 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 clause 5.4.1

Table 2 – ITU-T J.380.3 messages and message sources

Message	Source	Registration Required
ITU-T J.380.3-defined messages		
ListADMServicesRequest	ADS	
ListADMServicesResponse	ADM	
ADSRegistrationRequest	ADS	
ADSRegistrationResponse	ADM	
ListADSRegistrationRequest	ADS	
ListADSRegistrationResponse	ADM	
ADSDeregisterRequest	ADS	X
ADSDeregisterResponse	ADM	X
ADSDeregistrationNotification	ADM	X
ADSDeregistrationAcknowledgement	ADS	X
PlacementRequest	ADM	X
PlacementResponse	ADS	X
PlacementUpdateNotification	ADS	X
PlacementUpdateAcknowledgement	ADM	X
PlacementStatusNotification	ADM	X
PlacementStatusAcknowledgement	ADS	X
ITU-T J.380.2-defined messages		
core:ServiceStatusNotification	ADM or ADS	
core:ServiceStatusAcknowledgement	ADM or ADS	
core:ServiceCheckRequest	ADM or ADS	
core:ServiceCheckResponse	ADM or ADS	

Typically, a communication channel, referred to as the service channel (see [ITU-T J.380.2] 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 Recommendation'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 of this Recommendation.

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:

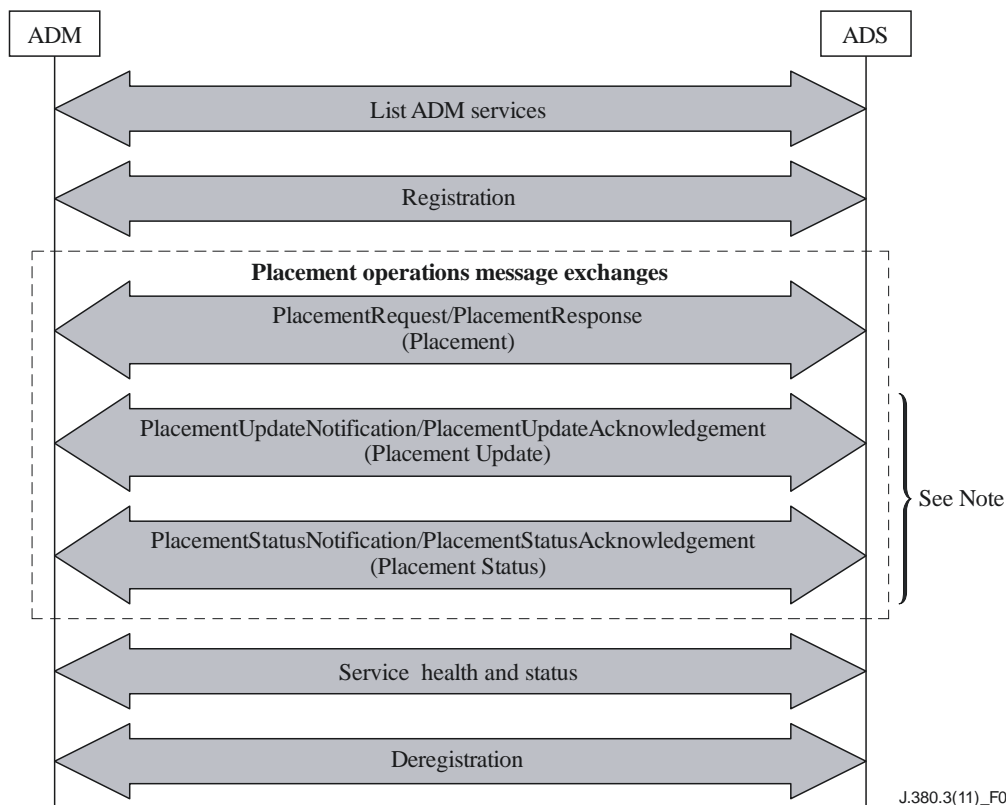
Logical service management which covers:

- 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 include:

- 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 6-1 illustrates a high-level overview of the typical message exchange sequences between an ADS and an ADM.



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NOTE – The placement message exchange may be followed by any number of placement update message exchanges. Additionally, there may be any number of placement status message exchanges and these message exchanges may occur at any time. Typically, the placement status exchanges commence following the initial placement message exchange and there is no guarantee to their relative interleaving with respect to the other message exchanges.

Figure 6-1 – 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 message exchanges describe placement opportunities, placement decisions, placement decision updates, and placement reporting for the placement decisions.

7 ADM interface – logical service management messages

Excluding placement operations messages, this Recommendation 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 ITU-T J.380.2 core:ServiceStatus and core:ServiceCheck message exchanges as defined therein. See [ITU-T J.380.2] for additional information.

The following clauses detail this Recommendation's logical service management messages.

7.1 ADM logical service discovery

Initial ADM logical service discovery is outside the scope of this Recommendation. ITU-T J.380.7 may provide details. See [ITU-T J.380.7] 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 clauses 9.2 and 10.1 for additional information.

7.2 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 any time. 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 7-1 illustrates the list ADM placement services message exchange.

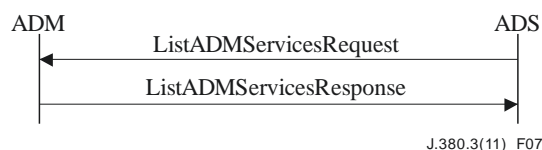


Figure 7-1 – List ADM placement services message exchange

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 Recommendation.

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 clauses.

7.2.1 ListADMServicesRequest message schema

Figure 7-2 illustrates the list ADM placement services request message schema.

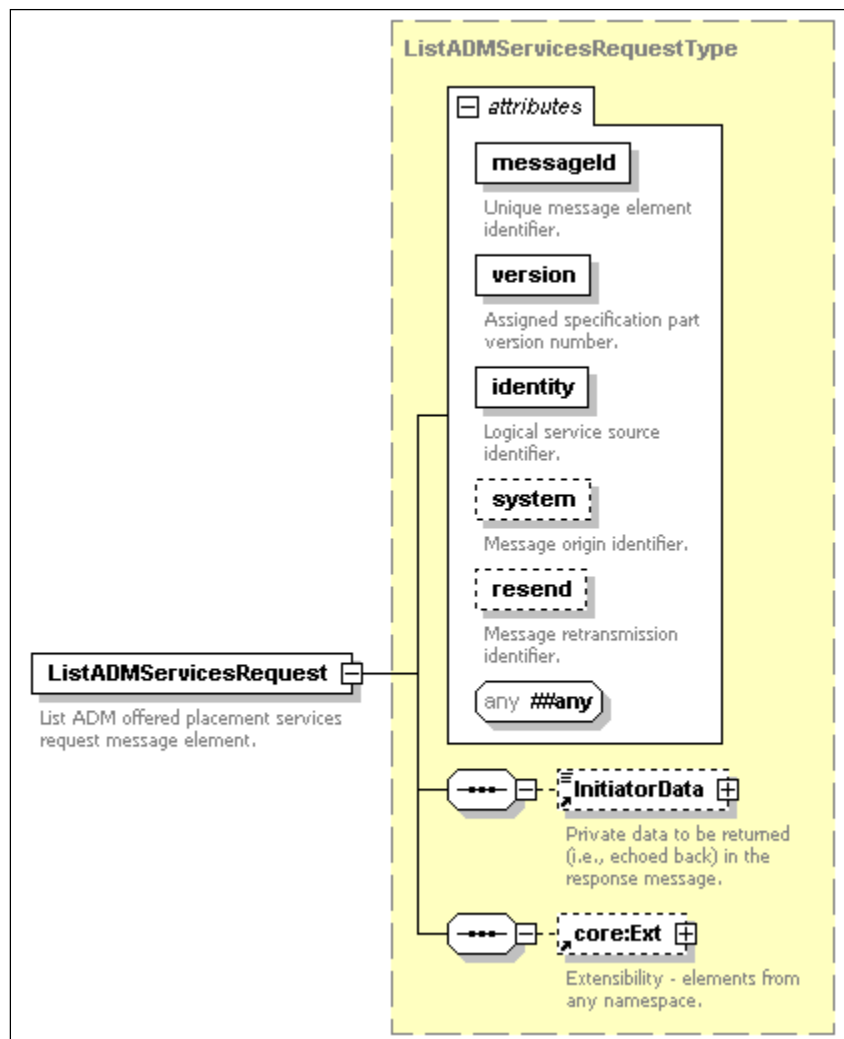


Figure 7-2 – ListADMServicesRequest message schema

7.2.1.1 Semantic definitions for the ListADMServicesRequest message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The ListADMServicesRequest element's value may be empty.

7.2.2 ListADMServicesResponse message schema

Figure 7-3 illustrates the list ADM placement services response message schema describing the placement services offered by the ADM.

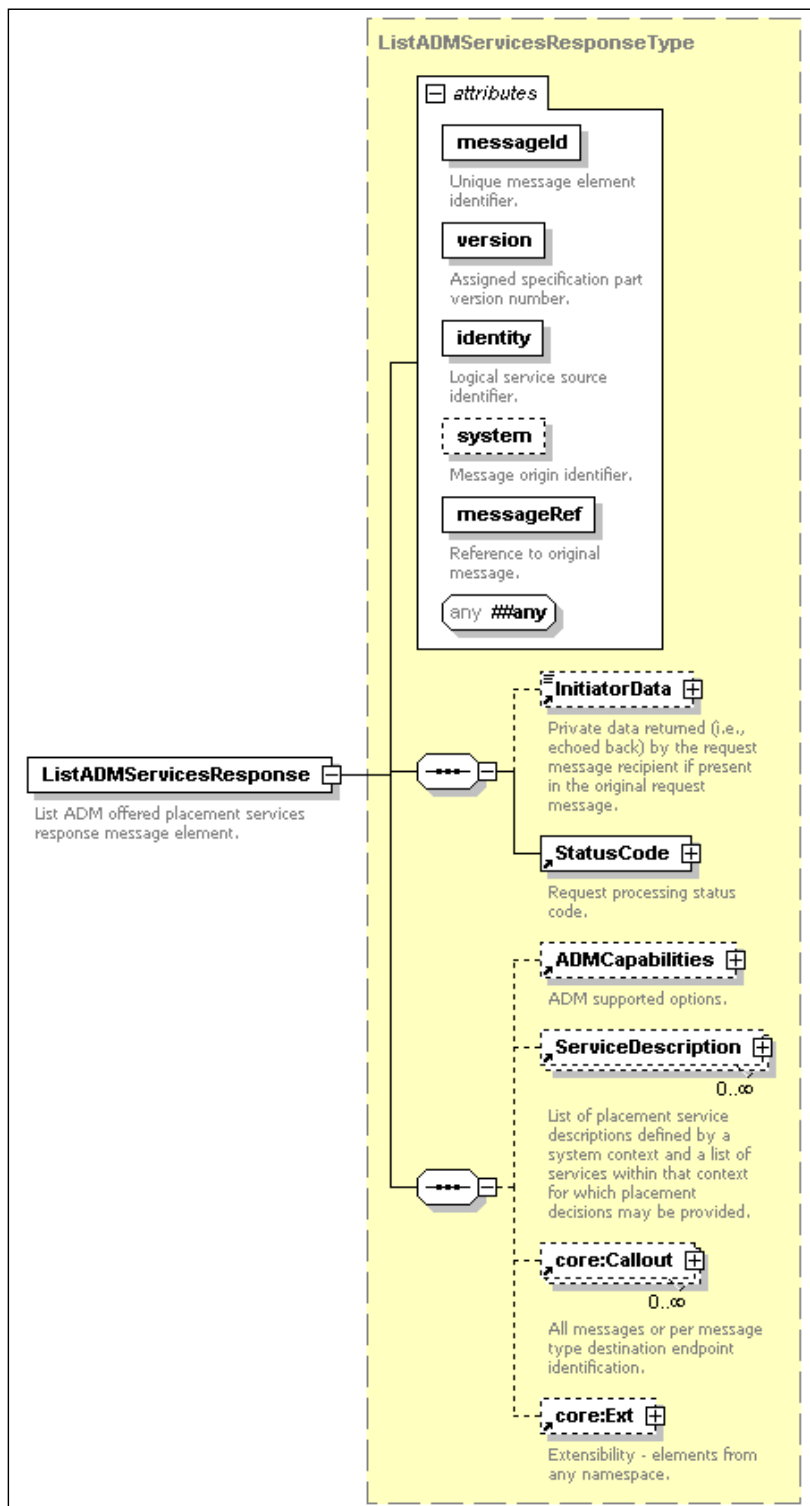


Figure 7-3 – ListADMServicesResponse message schema

7.2.2.1 Semantic definitions for the ListADMServicesResponse message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

@version [Required, core:versionAttrType] – The ADM message interface version. See clause 6 for additional information.

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the ListADMServicesRequest message processing. See [ITU-T J.380.2] and Annex 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 clause 10.1 for additional information.

ServiceDescription [Optional] – Zero or more ServiceDescription elements where each ServiceDescription element uniquely describes a collection of ADM offered placement services. See clause 10.38 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 [ITU-T J.380.2] 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 3 – ListADMServiceResponse/core:Callout/@Message attribute values

Value	Description
ServiceStatusNotification	Destination for ServiceStatusNotification messages.
ADSRegistrationRequest	Destination for ADSRegistrationRequest messages.
ADSDeregisterRequest	Destination for ADSDeregisterRequest messages.
ListADSRegistrationRequest	Destination for ListADSRegistrationRequest messages.
...	User defined message endpoints which are outside of this Recommendation's scope. The string shall be prefixed with the text "private:".

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 behaviour 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 ListADMServiceResponse message, the unlisted endpoints shall be discovered by a different, unspecified mechanism which is outside the scope of this Recommendation.

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 Recommendation.

Each core:Address element contained within the core:Callout element shall support the core:ServiceCheck message exchange as per [ITU-T J.380.2]. 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 [ITU-T J.380.2].

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

7.2.3 List ADM placement services examples

Figure 7-4 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 Recommendation'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.

```
<ListADMServiceRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A0" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"/>
```

Figure 7-4 – Example 1

Figure 7-5 declares the ADM capabilities and indicates the ADM is using a default endpoint for all message processing. This behaviour is indicated by the presence of a single core:Callout element and the core:Callout element omitting the @message attribute.

```

<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-
6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0"/>
  <ADMCapabilities placementStatusOnlyRegistration="false"/>
  <ServiceDescription>
    <SystemContext/>
    <Service id="All ADM Offered Services"/>
  </ServiceDescription>
  <core:Callout>
    <core:Address type="HTTP">http://173.35.23.33:80/J.380MessageProcessor/default</core:Address>
  </core:Callout>
</ListADMServicesResponse>

```

Figure 7-5 – Example 2

Figure 7-6 illustrates a successful response message, assuming the Figure 7-4 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.

```

<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-
6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0"/>
  <ADMCapabilities placementStatusOnlyRegistration="false"/>
  <ServiceDescription>
    <SystemContext>
      <ServiceGroup>Den</ServiceGroup>
    </SystemContext>
    <Service id="ServiceDen"/>
  </ServiceDescription>
  <core:Callout>
    <core:Address type="HTTP">http://173.35.23.33:80/J.380MessageProcessor/default</core:Address>
  </core:Callout>
  <core:Callout message="ADSRegistrationRequest">
    <core:Address
type="HTTP">http://173.35.23.33:80/J.380MessageProcessor/ADSRegistrationRequest</core:Address>
  </core:Callout>
  <core:Callout message="ADSDeregisterRequest">
    <core:Address
type="HTTP">http://173.35.23.33:80/J.380MessageProcessor/ADSDeregisterRequest</core:Address>
  </core:Callout>
</ListADMServicesResponse>

```

Figure 7-6 – Example 3

Figure 7-7 is a success response message, assuming the Figure 7-4 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.

```

<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-
6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0"/>
  <ADMCapabilities placementStatusOnlyRegistration="false"/>
  <ServiceDescription>
    <SystemContext/>
    <Service id="Service1" opportunityType="preRoll" decisionPolicy="interactive">
      <ContentProvider providerID="moviego.com">

```

```

    <core:ContentDataModel type="CLADI_2.0">URI</core:ContentDataModel>
  </ContentProvider>
</Service>
<Service id="Service2" opportunityType="postRoll" decisionPolicy="interactive">
  <ContentProvider providerID="moviego.com">
    <core:ContentDataModel type="CLADI_2.0">URI</core:ContentDataModel>
  </ContentProvider>
</Service>
<Service id="Service3" opportunityType="preRoll" decisionPolicy="default">
  <ContentProvider providerID="movies_r_us.com">
    <core:ContentDataModel type="CLADI_2.0">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>

```

Figure 7-7 – Example 4

Figure 7-8 is a successful response message, assuming the Figure 7-4 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.

```

<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-
6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0"/>
  <ADMCapabilities placementStatusOnlyRegistration="true"/>
  <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://175.33.53.33:380/ssn</core:Address>
  </core:Callout>
  <core:Callout message="ADSRegistrationRequest">
    <core:Address type="HTTP">http://175.33.53.33:7382/J.380/arr</core:Address>
  </core:Callout>
  <core:Callout message="ADSDeregisterRequest">
    <core:Address type="HTTP">http://175.33.53.33:7383/J.380/adr</core:Address>
  </core:Callout>
  <core:Callout message="ListADSRegistrationRequest">
    <core:Address type="HTTP">http://175.33.53.33:7384/J.380/larr</core:Address>
  </core:Callout>
</ListADMServicesResponse>

```

Figure 7-8 – Example 5

Figure 7-9 illustrates a failure response message, assuming the Figure 7-4 request message, for an ADM not currently offering any services.


```

<ListADMServicesResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.1"
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>

```

Figure 7-9 – Example 6

7.3 Registration

A registration-established service channel, as defined in clause 3 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 7-10 illustrates this message exchange.

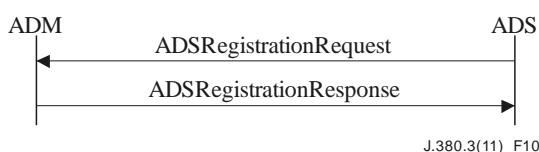


Figure 7-10 – Registration message exchange

During the registration request message processing, the ADM may optionally verify each ADS supplied endpoint via an ITU-T J.380.2 core:ServiceCheck message exchange before returning an ADSRegistrationResponse message. (See [ITU-T J.380.2] 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 Recommendation.

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 7-11. This figure is one possible example implementation with many other abstractions possible and not represented by this single illustration.

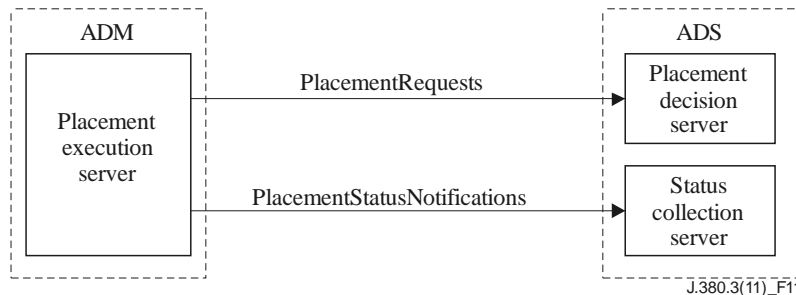


Figure 7-11 – ADS Registering Independent Endpoints

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 as per ITU-T J.380.2. See [ITU-T J.380.2] for additional information.

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

7.3.1 ADSRegistrationRequest message schema

Figure 7-12 illustrates the ADSRegistrationRequest message schema.

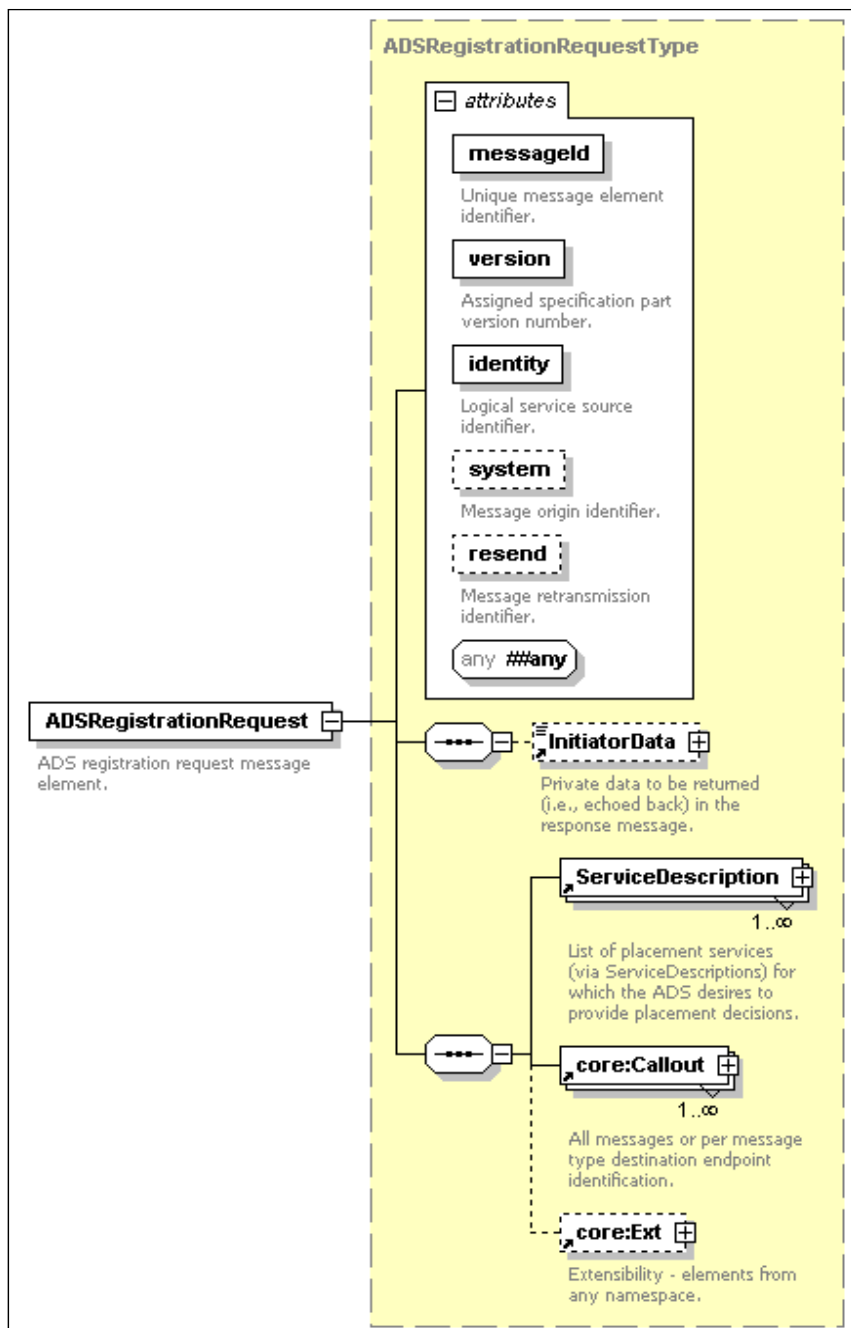


Figure 7-12 – ADSRegistrationRequest message schema

7.3.1.1 Semantic definitions for the ADSRegistrationRequest message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

@version [Required, core:versionAttrType] – The ADM message interface version. See clause 7 for additional information.

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 clause 7.2.2.

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/@opportunityBinding 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.

core:Callout [Required] – One or more core:Callout elements specifying the ADS message exchange endpoint(s). See [ITU-T J.380.2] 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 4 – ADSRegistrationRequest/core:Callout/@Message attribute values

Value	Description
ServiceStatusNotification	Destination for ServiceStatusNotification messages.
PlacementRequest	Destination for PlacementRequest messages.
PlacementStatusNotification	Destination for PlacementStatusNotification messages.
ADSDeregistrationNotification	Destination for ADSDeregistrationNotification messages.
...	User defined message endpoints which are outside of this Recommendation's scope. The string shall be prefixed with the text "private:"

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 Recommendation.

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 Recommendation.

Each core:Address element contained within the core:Callout element shall support the core:ServiceCheck message exchange as per [ITU-T J.380.2]. 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

7.3.2 ADSRegistrationResponse message schema

Figure 7-13 illustrates the ADSRegistrationResponse message schema.

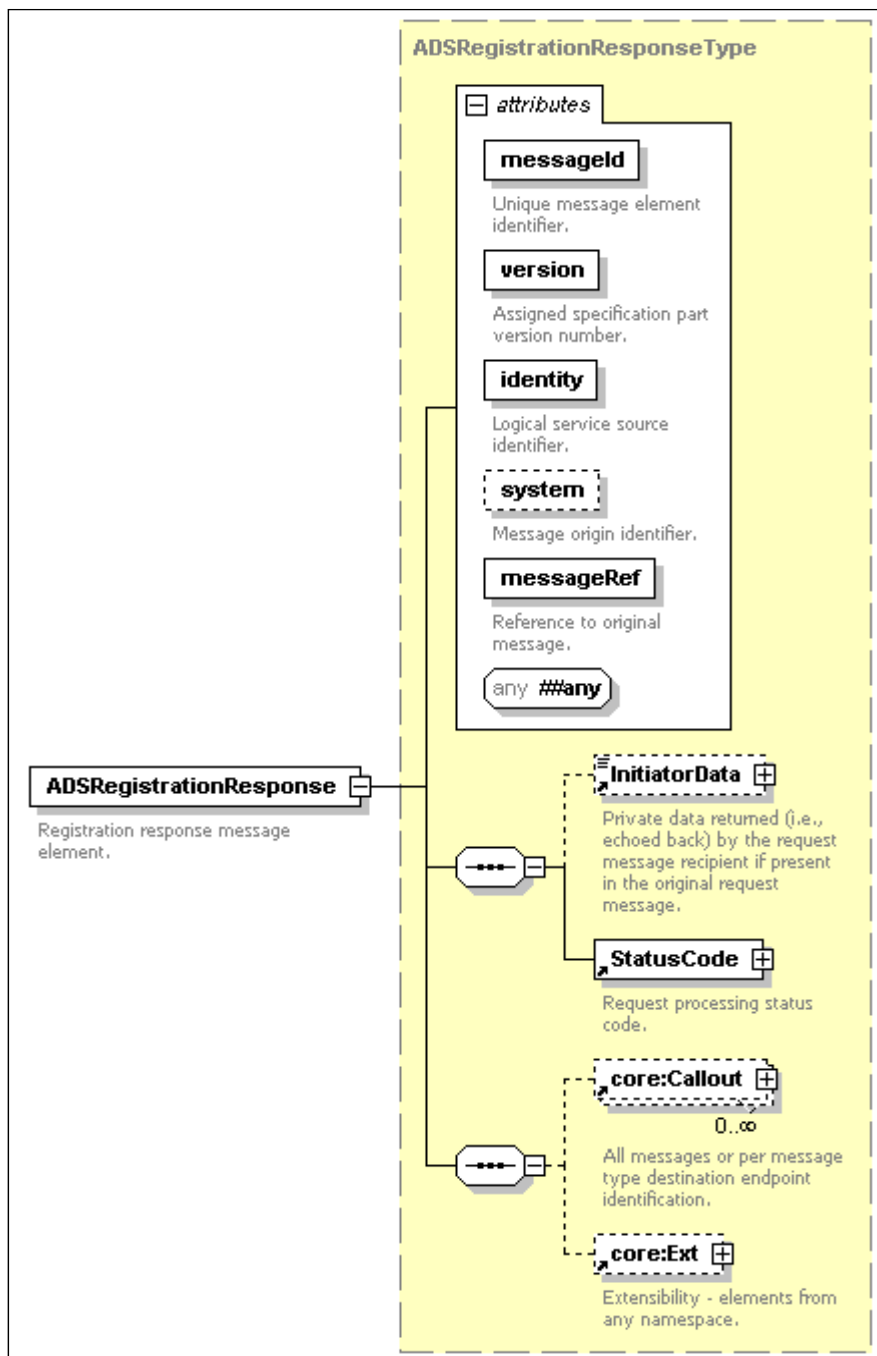


Figure 7-13 – ADSRegistrationResponse message schema

7.3.2.1 Semantic definitions for the ADSRegistrationResponse message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the ADSRegistrationRequest message processing. See [ITU-T J.380.2] and Annex 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 [ITU-T J.380.2] 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 5 – ADSRegistrationResponse/core:Callout/@Message attribute values

Value	Description
PlacementUpdateNotification	Destination for PlacementUpdateNotification messages.
...	User defined message endpoint outside of the scope of this Recommendation. The string shall be prefixed with the text "private:"

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 Recommendation.

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 Recommendation.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

7.3.3 Registration examples

Figure 7-14 illustrates an ADSRegistrationRequest message and Figure 7-15 illustrates a successful ADSRegistrationResponse message. Figure 7-14 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 Recommendation.

In Figure 7-14, the ADS decided to identify this registration-established placement service as "All Services." This value is ADS determined and was developed specifically for this example only. This Recommendation'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="1.1" system="ads"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
  <ServiceDescription>
    <SystemContext/>
    <Service id="All Services"/>
  </ServiceDescription>
  <core:Callout>
    <core:Address type="HTTP">http://192.168.201.7:80/J.380Msgs</core:Address>
    <core:Address type="HTTP">http://192.168.208.9:80/J.380Msgs</core:Address>
  </core:Callout>
</ADSRegistrationRequest>
```

Figure 7-14 – Example 7

In Figure 7-15, the ADM accepts the registration and responds with a duplicate default endpoint as Figure 7-5. Consequently, all message exchanges are routed through this message exchange endpoint.

```
<ADSRegistrationResponse messageId="35EC24A4-9D72-11DB-96CA-005056C00002" version="1.1"
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/J.380MessageProcessor/default</core:Address>
  </core:Callout>
</ADSRegistrationResponse>
```

Figure 7-15 – Example 8

Figure 7-16 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.


```

<ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00006" version="1.1"
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>
  <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>

```

Figure 7-16 – Example 9

Figure 7-17 illustrates the ADM response where the ADM specifies a message exchange endpoint specific for PlacementUpdateNotification messages.

```

<ADSRegistrationResponse messageId="35EC24A4-9D72-11DB-96CA-005056C00112" version="1.1"
identity="ADMLogicalService_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/J.380api/PUN</core:Address>
  </core:Callout>
</ADSRegistrationResponse>

```

Figure 7-17 – Example 10

Figure 7-18 illustrates a registration request which has errantly attempted to register for the same placement services as in Figure 7-16. The response message (Figure 7-19) 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 behaviour is outside the scope of this Recommendation.

```

<ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00006" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads">
  <ServiceDescription>
    <SystemContext/>
    <Service id="Service3" opportunityType="preRoll">
      <Scope>Local</Scope>
    </Service>
    <Service id="Service4" opportunityType="postRoll">
      <Scope>Local</Scope>
    </Service>
  </ServiceDescription>
  <core:Callout>
    <core:Address>adselector1.ads.com</core:Address>
    <core:Address>adselector2.ads.com</core:Address>
  </core:Callout>
</ADSRegistrationRequest>

```

Figure 7-18 – Example 11

```

<ADSRegistrationResponse messageId="35EC24A4-9D72-11DB-96CA-005056C00008" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="35EC24A4-
9D72-11DB-96CA-005056C00006">
  <core:StatusCode class="1" detail="3">
    <core:Note>Registration overlap.</core:Note>
    <core:Note>The resource is already in use.</core:Note>
  </core:StatusCode>
</ADSRegistrationResponse>

```

Figure 7-19 – Example 12

7.4 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 7-20 illustrates the list ADS registration request and response message exchange and the individual message schema descriptions follow in subsequent clauses.

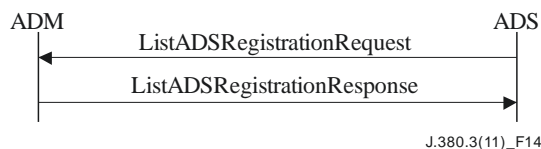


Figure 7-20 – ADM Registration status message exchange

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 ITU-T J.380.2 list registration requirements. See [ITU-T J.380.2] for additional information.

7.4.1 ListADSRegistrationRequest message schema

Figure 7-21 illustrates the ListADSRegistrationRequest message schema.

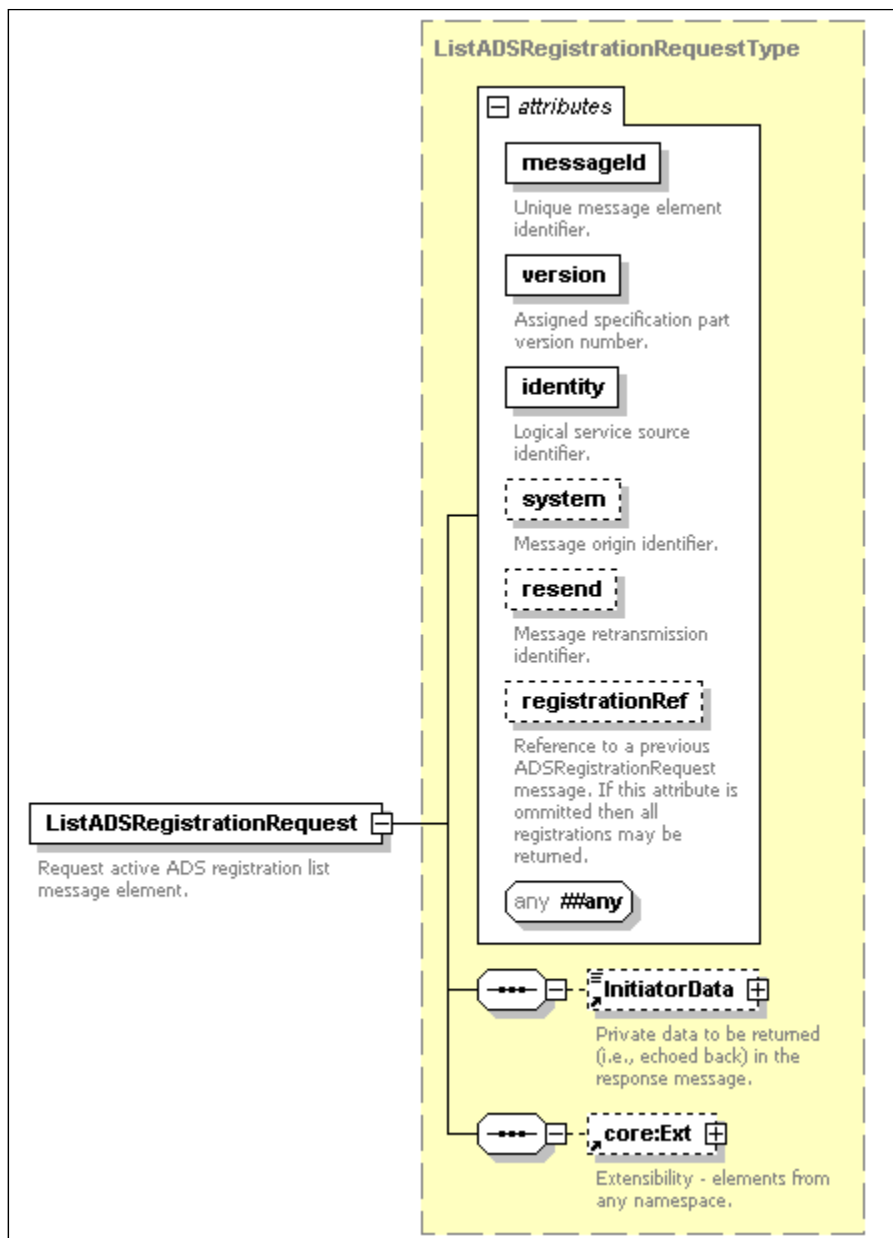


Figure 7-21 – ListADSRegistrationRequest message schema

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

@identity	@registrationRef	Description	Access restrictions permitted
Included	Omitted	All registrations for matching the supplied @identity value.	Yes
Included	Included	A specific registration matching the @identity and @registrationRef values.	No

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

7.4.1.1 Semantic definitions for the ListADSRegistrationRequest message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

@version [Required, core:versionAttrType] – The ADM message interface version. See clause 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 [ITU-T J.380.2] along with Table 6 for supplementary usage details

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The ListADSRegistrationRequest element's value may be empty.

7.4.2 ListADSRegistrationResponse message schema

Figure 7-22 illustrates the ListADSRegistrationResponse element schema describing the active ADS service channel registrations.

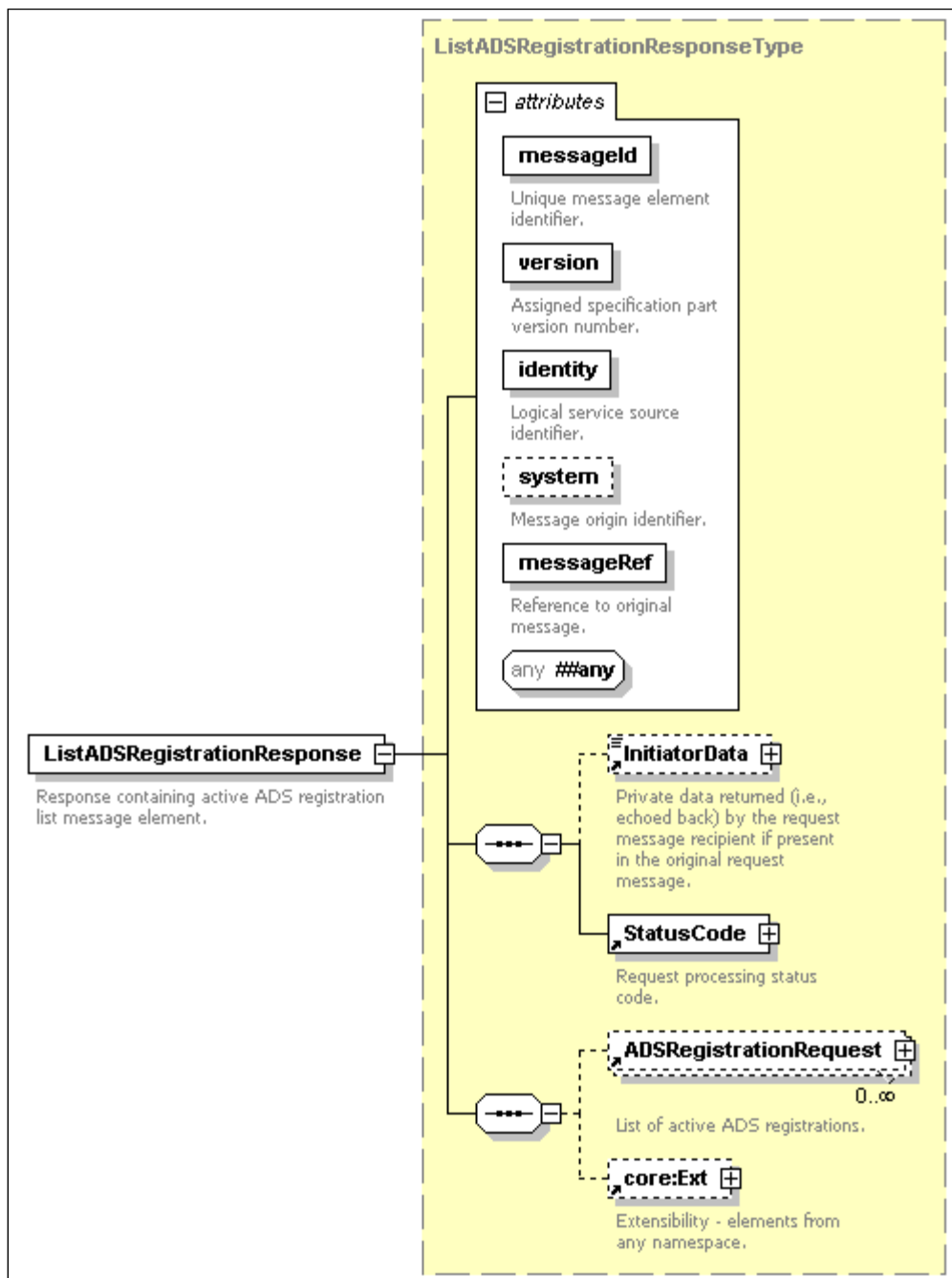


Figure 7-22 – ListADSRegistrationResponse message schema

7.4.2.1 Semantic definitions for the ListADSRegistrationResponse message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the ListADSRegistrationRequest message processing. See [ITU-T J.380.2] and Annex 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 [ITU-T J.380.2] for compliance requirements and clause 7.3.1 for additional details regarding the ADSRegistrationRequest message schema.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

7.4.3 ADS registration status examples

Figures 7-23 and 7-24 illustrate the list all ADS registrations request and response messages respectively, when there are no active ADS registrations.

```
<ListADSRegistrationRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A0" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"/>
```

Figure 7-23 – Example 13

```
<ListADSRegistrationResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A5" version="1.1"
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>
```

Figure 7-24 – Example 14

Figure 7-25 assumes Figure 7-23's list all request message was issued. The returned data includes the ADS Registration clause's Figure 7-16 and Figure 7-14 messages, assuming the two messages are the only active registrations. The included element order carries no meaning.

```

<ListADSRegistrationResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A5" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-
6E81-4A5B-A1F6-8544AA7F29A0">
  <core:StatusCode class="0"/>
  <ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00006" version="1.1"
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>
    <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>
  <ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00000" version="1.1"
system="ads" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
    <ServiceDescription>
      <SystemContext/>
      <Service id="All Services"/>
    </ServiceDescription>
    <core:Callout>
      <core:Address type="HTTP">http://192.168.201.7:80/J.380Msgs</core:Address>
      <core:Address type="HTTP">http://192.168.208.9:80/J.380Msgs</core:Address>
    </core:Callout>
  </ADSRegistrationRequest>
</ListADSRegistrationResponse>

```

Figure 7-25 – Example 15

Figure 7-26 illustrates a list request message for a single registration message. The example requests the ADS registration clause's Figure 7-14 registration. The response message provided in Figure 7-27 contains the ADS registration clause's Figure 7-14 ADSRegistrationRequest message.

```

<ListADSRegistrationRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A1" version="1.1"
system="ads" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5"
registrationRef="35EC24A4-9D72-11DB-96CA-005056C00000"/>

```

Figure 7-26 – Example 16

```

<ListADSRegistrationResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A5" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="29D61093-
6E81-4A5B-A1F6-8544AA7F29A1">
  <core:StatusCode class="0"/>
  <ADSRegistrationRequest messageId="35EC24A4-9D72-11DB-96CA-005056C00000" version="1.1"
system="ads" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
    <ServiceDescription>
      <SystemContext/>
      <Service id="All Services"/>
    </ServiceDescription>
    <core:Callout>
      <core:Address type="HTTP">http://192.168.201.7:80/J.380Msgs</core:Address>
      <core:Address type="HTTP">http://192.168.208.9:80/J.380Msgs</core:Address>
    </core:Callout>
  </ADSRegistrationRequest>
</ListADSRegistrationResponse>

```

Figure 7-27 – Example 17

Figure 7-28 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 Figure 7-29. An ADM implementation may accept this request and then return the appropriate data. This implementation specific behaviour is outside the scope of this Recommendation.

```

<ListADSRegistrationRequest messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A3" version="1.1"
system="ads" identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5"/>

```

Figure 7-28 – Example 18

```

<ListADSRegistrationResponse messageId="29D61093-6E81-4A5B-A1F6-8544AA7F29A4" version="1.1"
identity="ADMLogicalService" system="adm" messageRef="29D61093-6E81-4A5B-A1F6-8544AA7F29A3">
  <core:StatusCode class="1" detail="13">
    <core:Note>Not authorized.</core:Note>
    <core:Note>The ADM does not allow list functionality using the identity attribute
only.</core:Note>
  </core:StatusCode>
</ListADSRegistrationResponse>

```

Figure 7-29 – Example 19

7.5 Deregistration

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 7-30 illustrates this message exchange followed by the schema descriptions.

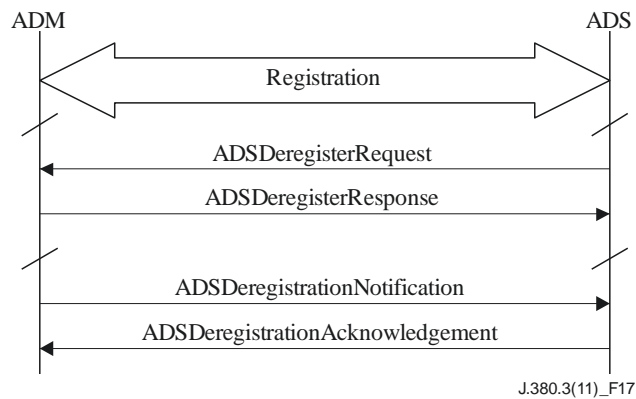


Figure 7-30 – Deregistration message exchange

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. [ITU-T J.380.7] 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.

The deregistration message schemas are described in the following clauses.

7.5.1 ADSDeregisterRequest message schema

Figure 7-31 illustrates the ADSDeregisterRequest element schema.

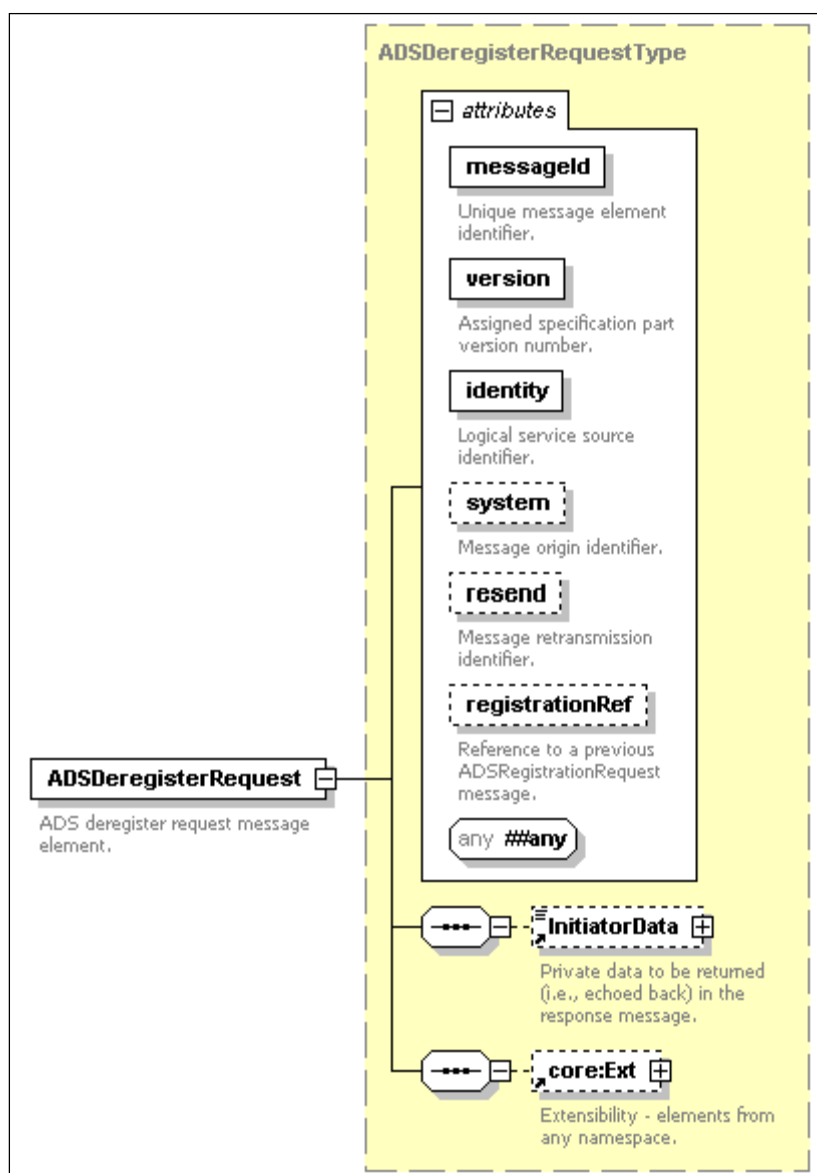


Figure 7-31 – ADSDeregisterRequest message schema

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

@identity	@registrationRef	Description	Access restrictions permitted
Included	Omitted	All registrations matching the supplied @identity value.	Yes
Included	Included	A specific registration matching the @identity and @registrationRef values.	No

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

7.5.1.1 Semantic definitions for the ADSDeregisterRequest message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

@version [Required, core:versionAttrType] – The ADM message interface version. See clause 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 [ITU-T J.380.2] along with Table 7 for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The ADSDeregisterRequest element's value may be empty.

7.5.2 ADSDeregisterResponse message schema

Figure 7-32 illustrates the ADSDeregisterResponse element schema.

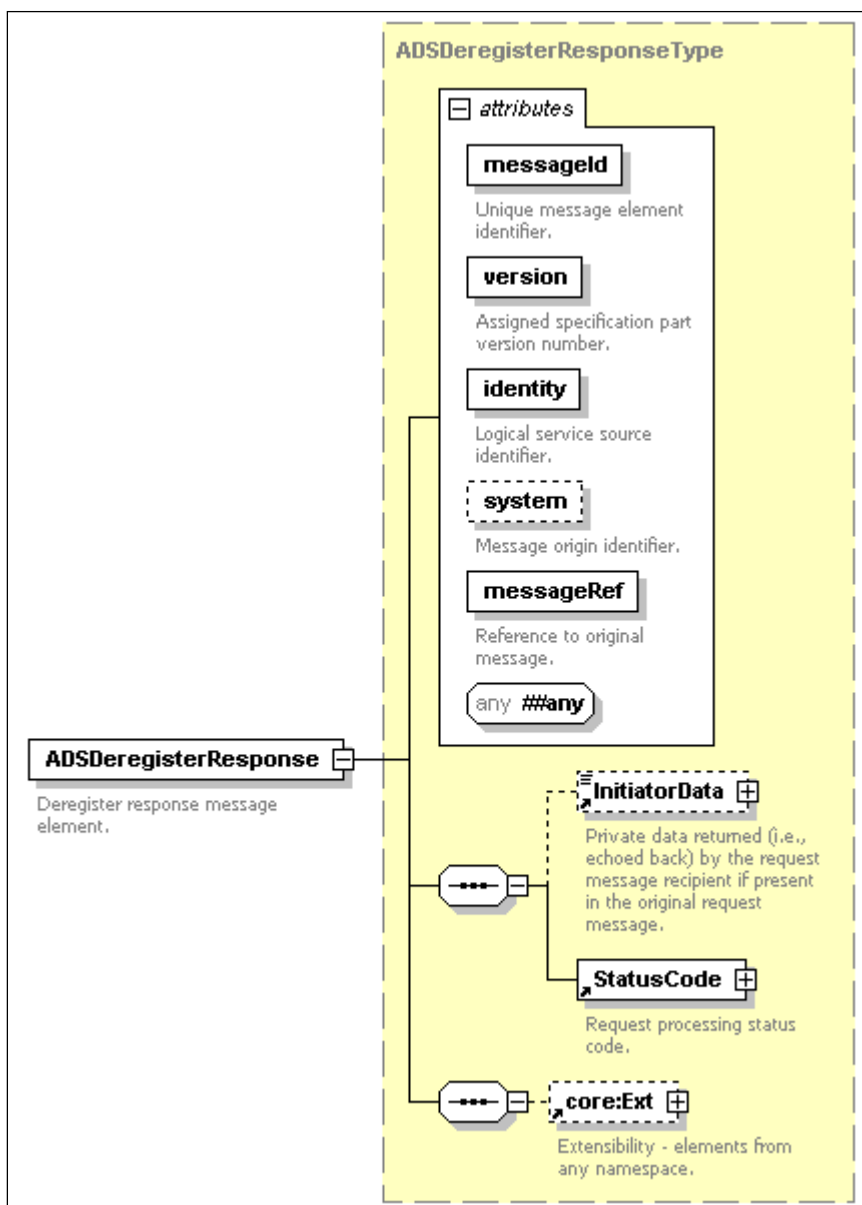


Figure 7-32 – ADSDeregisterResponse message schema

7.5.2.1 Semantic definitions for the ADSDeregisterResponse message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the ADSDeregisterRequest message processing. See [ITU-T J.380.2] and Annex A for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

7.5.3 ADS deregistration Request/Response examples

Figure 7-33 illustrates an attempt to deregister a logical service source via the @identity attribute. Figure 7-34 shows the ADM rejecting the request from Figure 7-33. 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 behaviour is outside the scope of this Recommendation.

```
<ADSDeregisterRequest messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF0" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"/>
```

Figure 7-33 – Example 20

```
<ADSDeregisterResponse messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF5" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="8F34DD15-
3A3C-4F2C-923A-DE7DA3665FF0">
  <core:StatusCode class="1" detail="13">
    <core:Note>Not authorized. The ADM does not allow deregistration by the identity attribute
only.</core:Note>
  </core:StatusCode>
</ADSDeregisterResponse>
```

Figure 7-34 – Example 21

Figure 7-35 illustrates a successful deregistration of a specific active ADSRegistrationRequest message. Figure 7-36 shows the response message.

```
<ADSDeregisterRequest messageId="8F34DD15-3A3C-4F2C-923A-DE7DA36655F0" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads"
registrationRef="35EC24A4-9D72-11DB-96CA-005056C0000"/>
```

Figure 7-35 – Example 22

```
<ADSDeregisterResponse messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF5" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="8F34DD15-
3A3C-4F2C-923A-DE7DA3665FF0">
  <core:StatusCode class="0"/>
</ADSDeregisterResponse>
```

Figure 7-36 – Example 23

Figure 7-37 illustrates an unsuccessful attempt to deregister a logical service source via the @identity attribute only. Figure 7-38 shows the response message where the ADM allows the action but was unable to locate any matching registrations.

```
<ADSDeregisterRequest messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665EF0" version="1.1"
identity="BigGun" system="ads"/>
```

Figure 7-37 – Example 24

```
<ADSDeregisterResponse messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF5" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="8F34DD15-
3A3C-4F2C-923A-DE7DA3665EF0">
  <core:StatusCode class="1" detail="5">
    <core:Note>Ambiguous details.</core:Note>
    <core:Note> Failed to locate any active registrations with the identity="BigGun".</core:Note>
  </core:StatusCode>
</ADSDeregisterResponse>
```

Figure 7-38 – Example 25

7.5.4 ADSDeregistrationNotification message schema

Figure 7-39 illustrates the ADSDeregistrationNotification element's schema.

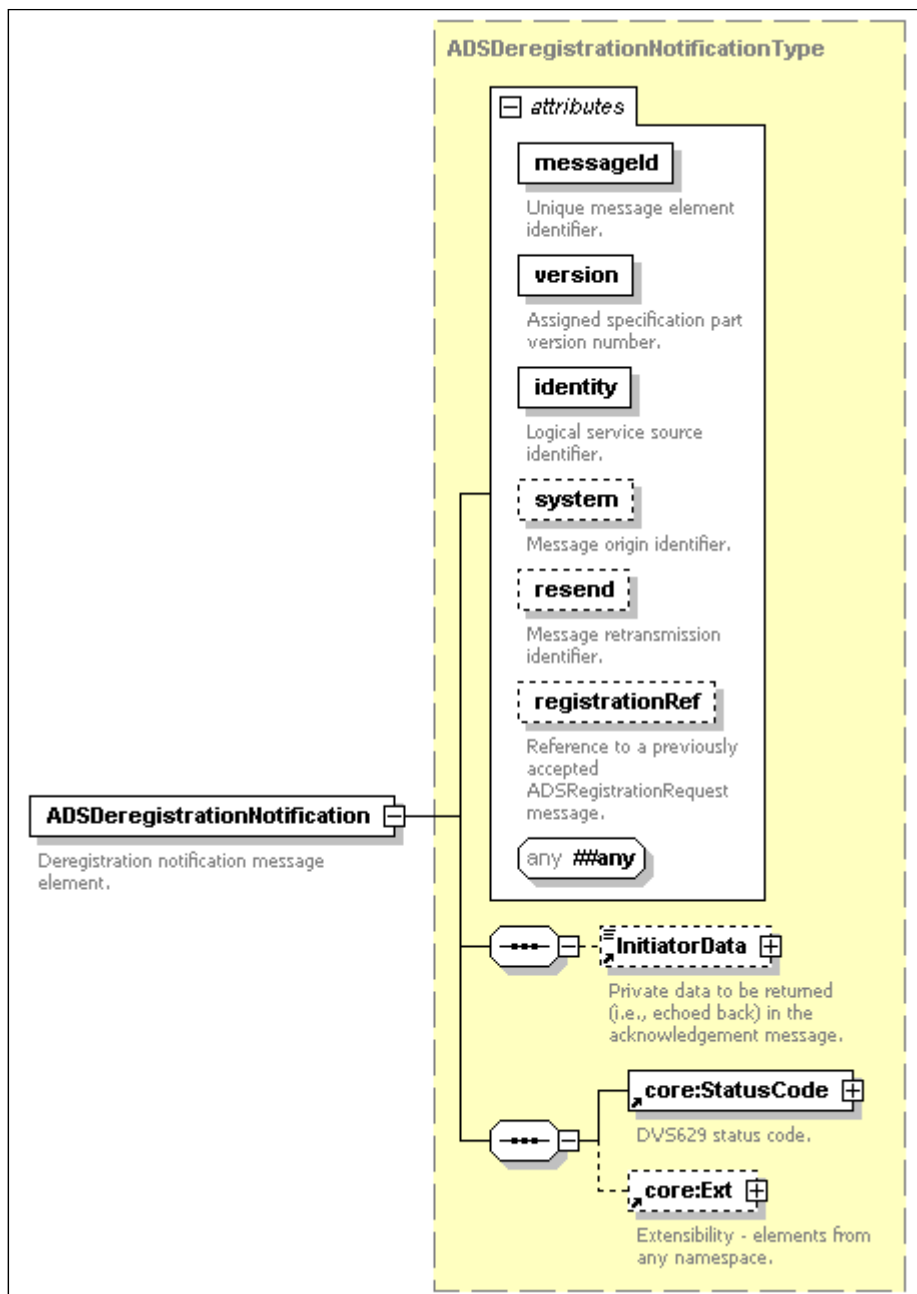


Figure 7-39 – ADSDeregistrationNotification message schema

7.5.4.1 Semantic definitions for the ADSDeregistrationNotification message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the ADSDeregistrationNotification message's purpose. See [ITU-T J.380.2] and Annex A for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

7.5.5 ADSDeregistrationAcknowledgement message schema

Figure 7-40 illustrates the ADSDeregistrationAcknowledgement element's schema.

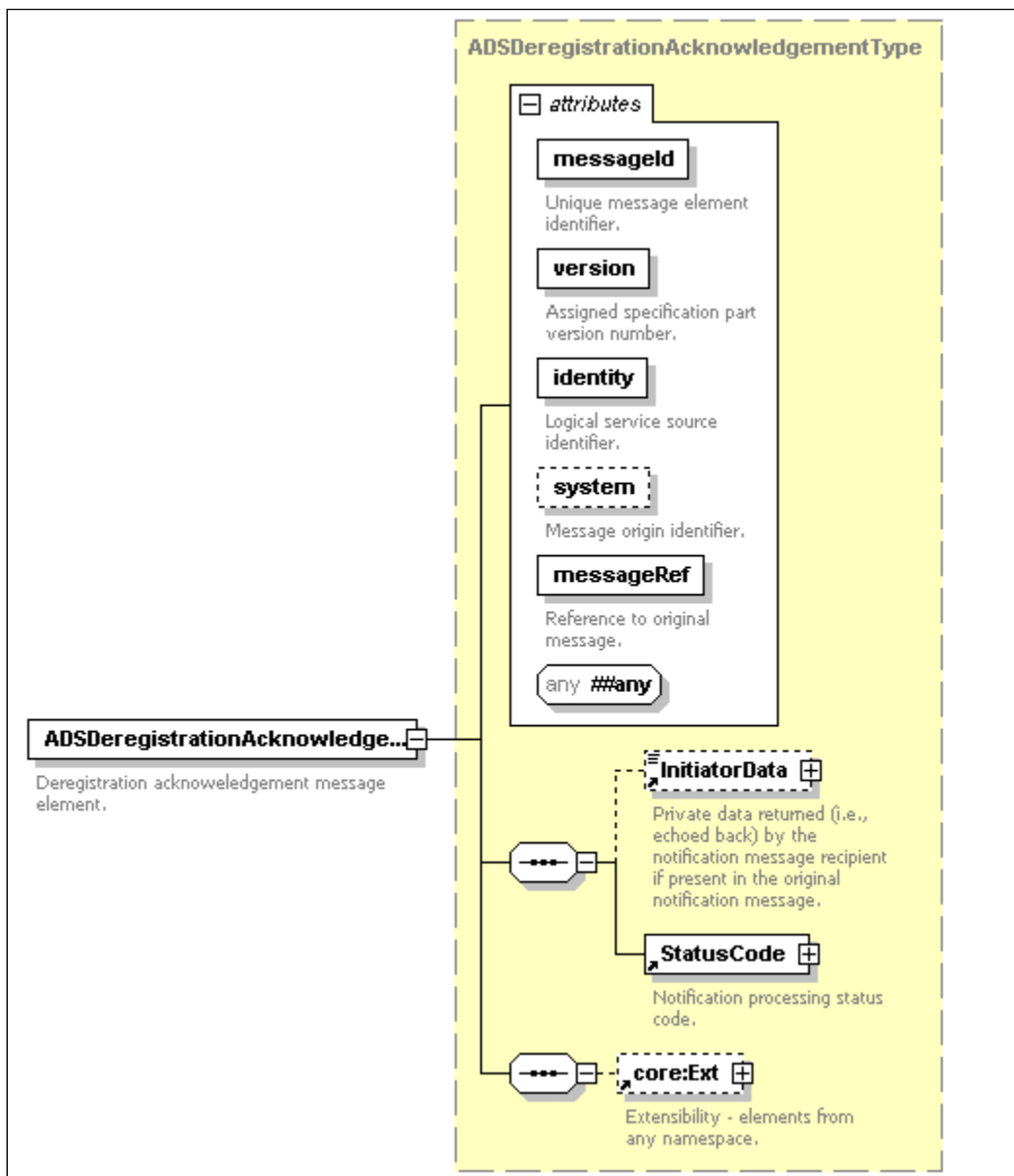


Figure 7-40 – ADSDeregistrationAcknowledgement message schema

7.5.5.1 Semantic definitions for the ADSDeregistrationAcknowledgement message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the ADSDeregistrationAcknowledgement message processing. See [ITU-T J.380.2] and Annex A for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

7.5.6 ADS deregistration Notification/Acknowledgment examples

Figure 7-41 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. Figure 7-41 is the notification message and Figure 7-42 is the acknowledgement message.

```
<ADSDeregistrationNotification messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF5" version="1.1"
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>
```

Figure 7-41 – Example 26

```
<ADSDeregistrationAcknowledgement messageId="8F34DD15-3A3C-4F2C-923A-DE7DA3665FF0" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads" messageRef="8F34DD15-
3A3C-4F2C-923A-DE7DA3665FF5">
  <core:StatusCode class="0"/>
</ADSDeregistrationAcknowledgement>
```

Figure 7-42 – Example 27

7.6 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 ITU-T J.380.2. See [ITU-T J.380.2] for additional information.

7.7 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 ITU-T J.380.2. See [ITU-T J.380.2] for additional information.

8 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 clause 7.3 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 signalling (i.e., cancellation). Placement event reporting is accomplished via the placement status message exchanges.

The following clauses detail the individual placement operations message exchanges.

8.1 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 Recommendation. This Recommendation does not preclude or prefer any method or combination thereof.

Figure 8-1 illustrates the basic placement message exchange sequence and a high-level overview of the possible subsequent message exchanges.

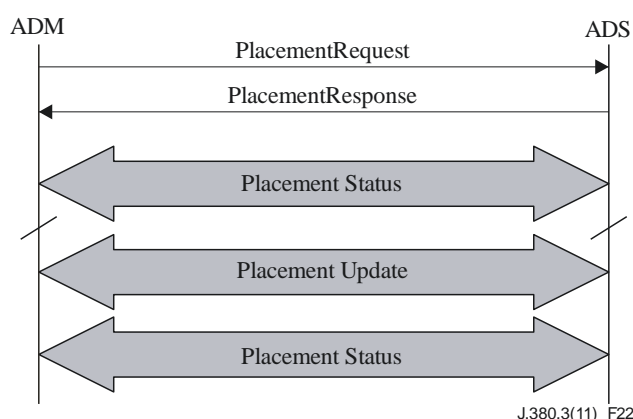


Figure 8-1 – Placement messaging message exchange

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 [SCTE 35] for additional information. Alternatively, in an on-demand system, the ITU-T J.380.5 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 four traditional content relative placement opportunity locations as illustrated in Figure 8-2.

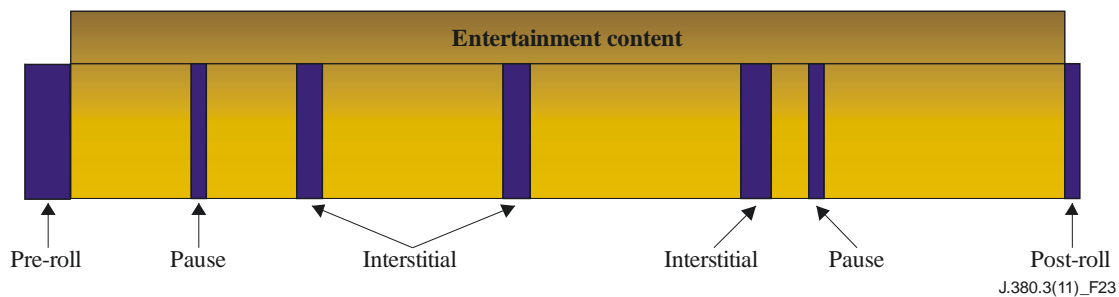


Figure 8-2 – Traditional placement opportunity locations

The pre-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.

An interstitial placement opportunity occurs within the context of the entertainment content. Traditionally, an interstitial placement opportunity has been associated with classic linear broadcast. However, this placement opportunity type is not limited to this context.

Typically, pre-roll, post-roll, and interstitial placement opportunity existence is predetermined. An interstitial 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 Recommendation 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 Recommendation. An example mechanism supporting this concept is the SCTE 35 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 Recommendation. The classic linear broadcast technologist may equate a positional placement opportunity to a slot. Figure 8-3 illustrates an example subdivision.

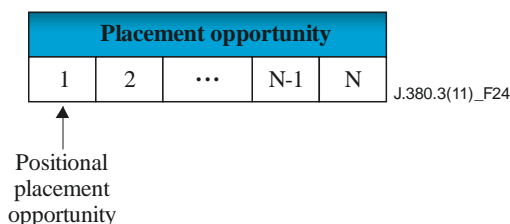


Figure 8-3 – Placement opportunity positional subdivision

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 8-4. Each of these subunits might correspond to a 30-second ad with the entire placement opportunity having a two minute duration.

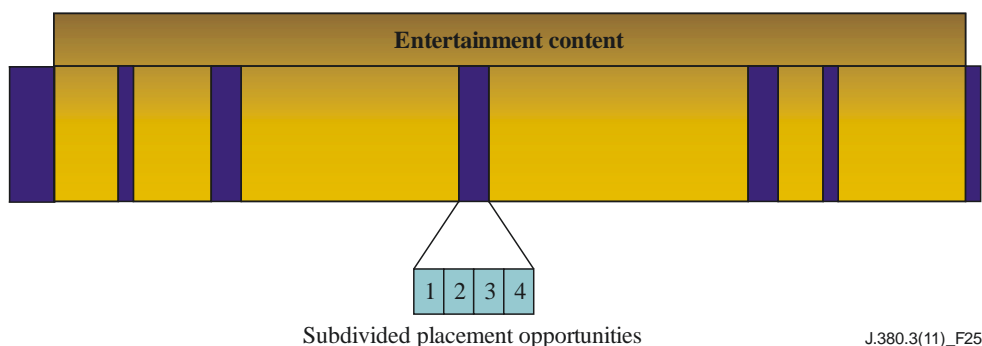


Figure 8-4 – Subdivided placement opportunity

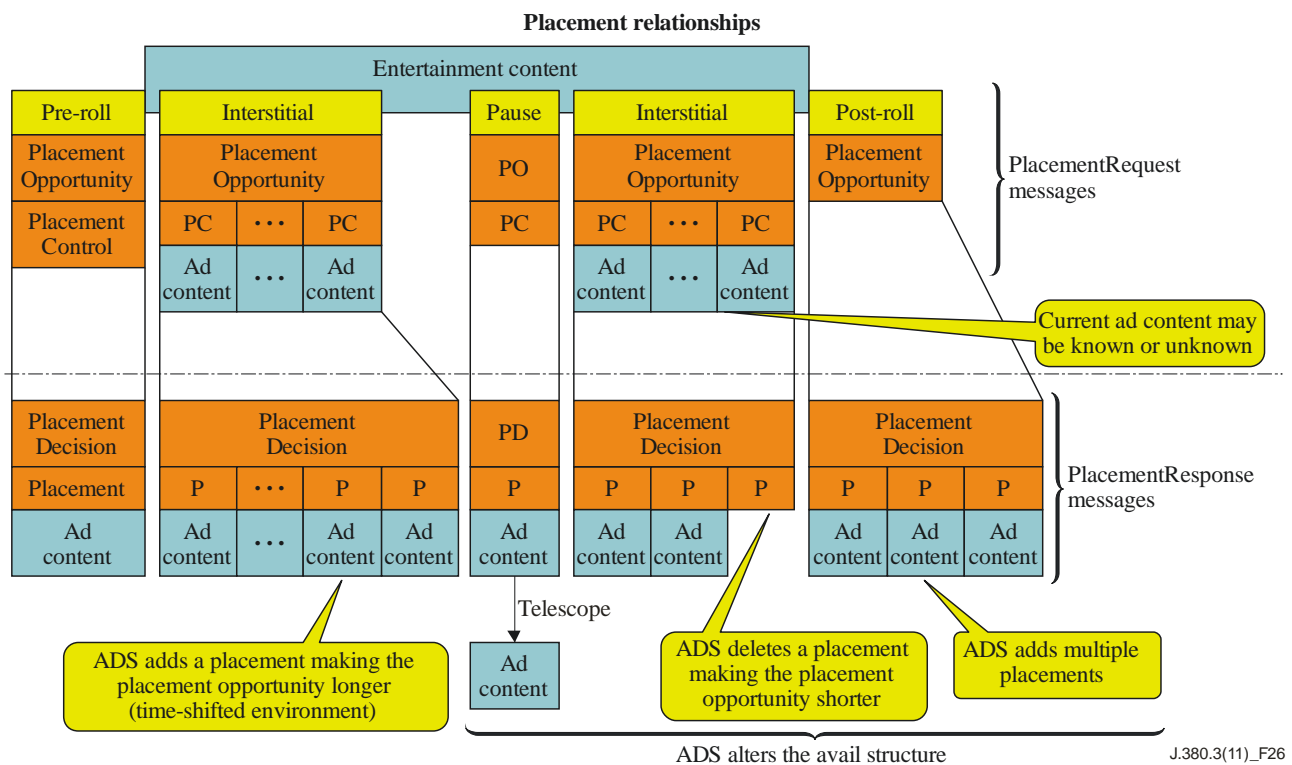
The positional placement opportunity provides the capability to identify the content currently occupying the location. The content boundaries, for example, may be identified using the SCTE 35 segmentation_descriptor() or some alternate means. See [SCTE 35] for additional information. Determination of currently occupying content and its identification within an entertainment asset are outside the scope of this Recommendation.

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 behaviour 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 8-5 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.



PO == PlacementOpportunity element
 PC = PlacementControl element
 PD = PlacementDecision element
 P = Placement element

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Figure 8-5 – 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 Recommendation. A wide variety of segmentation possibilities are supported by this Recommendation.

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 Recommendation. Though most segmentation schemes are supported by this Recommendation, 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 clause 8.2 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 behaviour, content binding and optional associated Tracking element.

The ADS returned PlacementResponse message (or the PlacementUpdateNotification message – see clause 8.2 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 Recommendation.

The Placement element's @action attribute specifies the placement behaviour. A few example @action attribute behaviour verbs include: fixed (i.e., no change), fill (insert or add), delete, and replace. See clause 10.24.2 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:

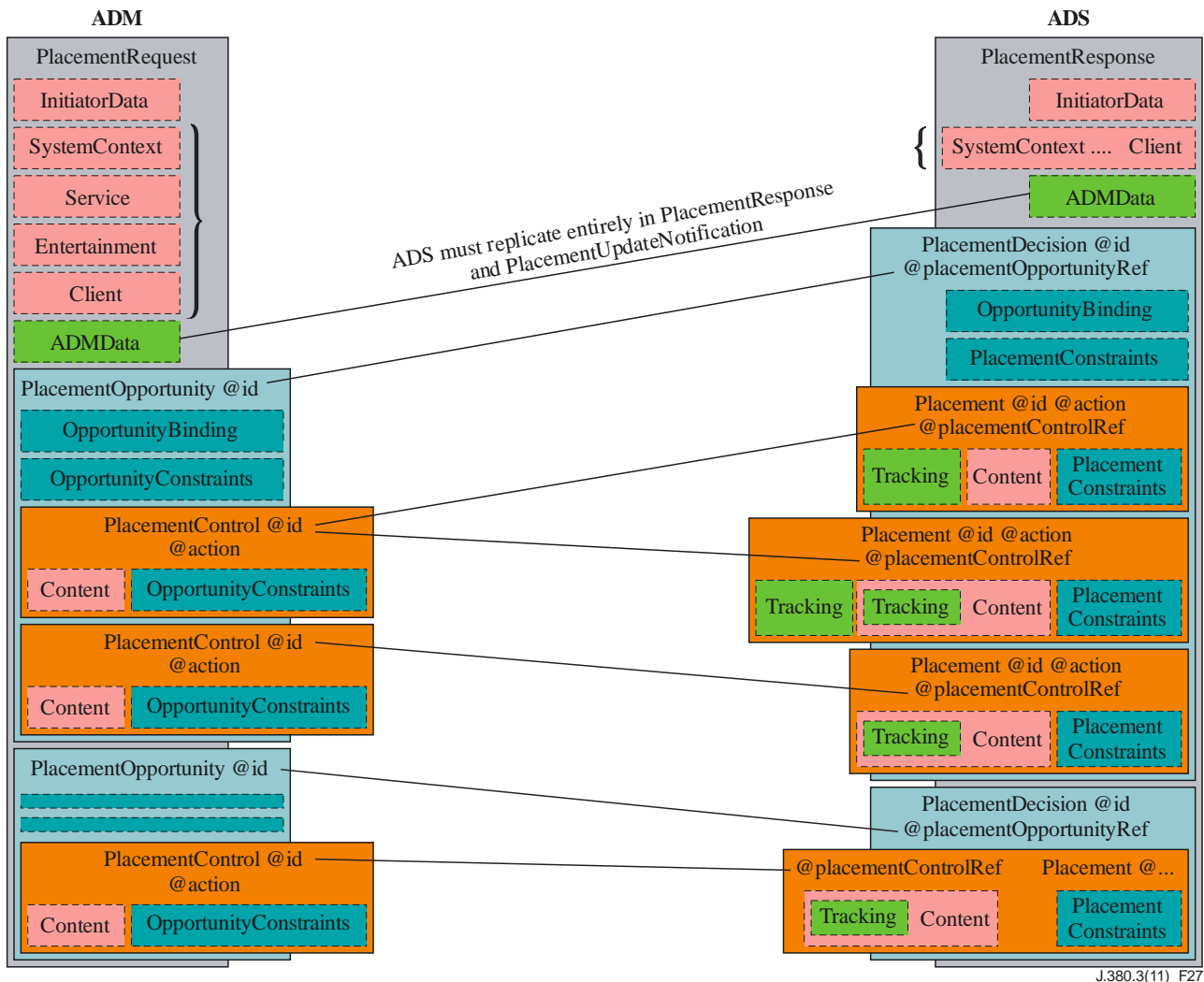
- An optional system context description containing refinements to the matching registered placement service description. For example, properties unique to a VOD session, zone context, or channel information.
- Optional placement service descriptions containing refinements to the matched registered placement 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 ADMDData 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 ADMDData 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 8-6 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 8-6 does not illustrate all message elements (i.e., it is not comprehensive or all inclusive). See the individual schemas for further details.



NOTE – The PlacementUpdateNotification message is semantically similar to the PlacementResponse message.

Figure 8-6 – Placement message high-level view (not comprehensive)

In Figure 8-6, the PlacementRequest and PlacementResponse messages utilize the base ITU-T J.380 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 8-6, 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 clause 10.2 for ADMData element details. An example ADM usage may be for providing high resiliency services.

In Figure 8-6, 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 behaviour 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 behaviour may be overridden by the ADS, but this is an implementation decision outside the scope of this Recommendation. 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 [SCTE 35] 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 8-6 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) as the registration-established placement service reference included via the PlacementOpportunity element's @serviceRegistrationRef are different (i.e., they are unique to each ADS logical service). 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 8-6, 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 behaviour is undefined and outside the scope of the Recommendation.

The following clauses detail the placement messaging schemas.

8.1.1 PlacementRequest message schema

Figure 8-7 illustrates the PlacementRequest message schema used to announce the ad placement opportunities and request ADS ad placement decisions.

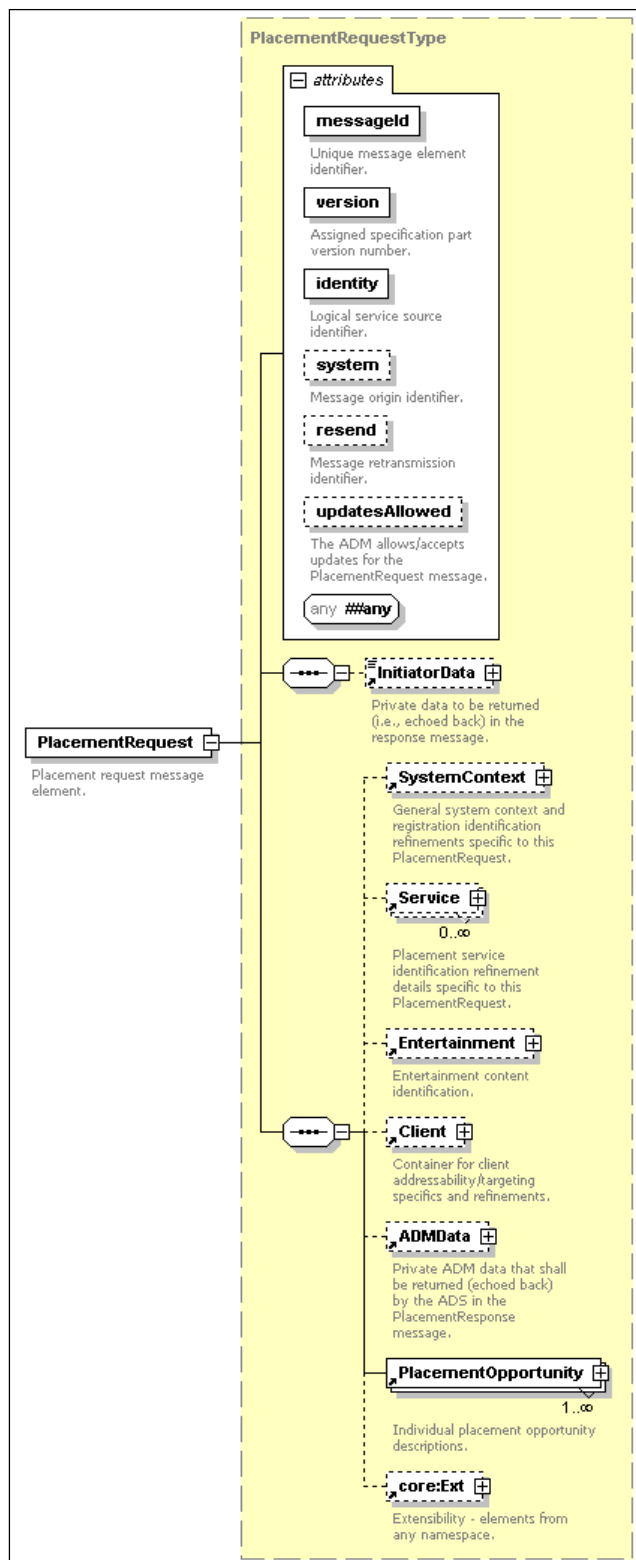


Figure 8-7 – PlacementRequest message schema

8.1.1.1 Semantic definitions for the PlacementRequest message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 clause 8.2 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 [ITU-T J.380.2] for additional information.

SystemContext [Optional] – System environment information that typically refines the placement service identification. See clause 10.45 for additional information.

Service [Optional] – Zero or more elements containing message local information typically refining the placement service registration match. See clause 10.37 for additional information.

Entertainment [Optional] – The entertainment (i.e., programming) content for which the placement opportunities are associated. See clause 10.11 for additional information. If this element is present, the Entertainment element contained within any child PlacementOpportunity element 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 clause 10.31 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 clause 10.4 for additional information.

ADMDData [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 clause 10.2 for additional information.

PlacementOpportunity [Required] – One or more placement opportunity descriptions. See clause 10.31 for additional information. See x for an additional illustration.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

Figure 8-8 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.

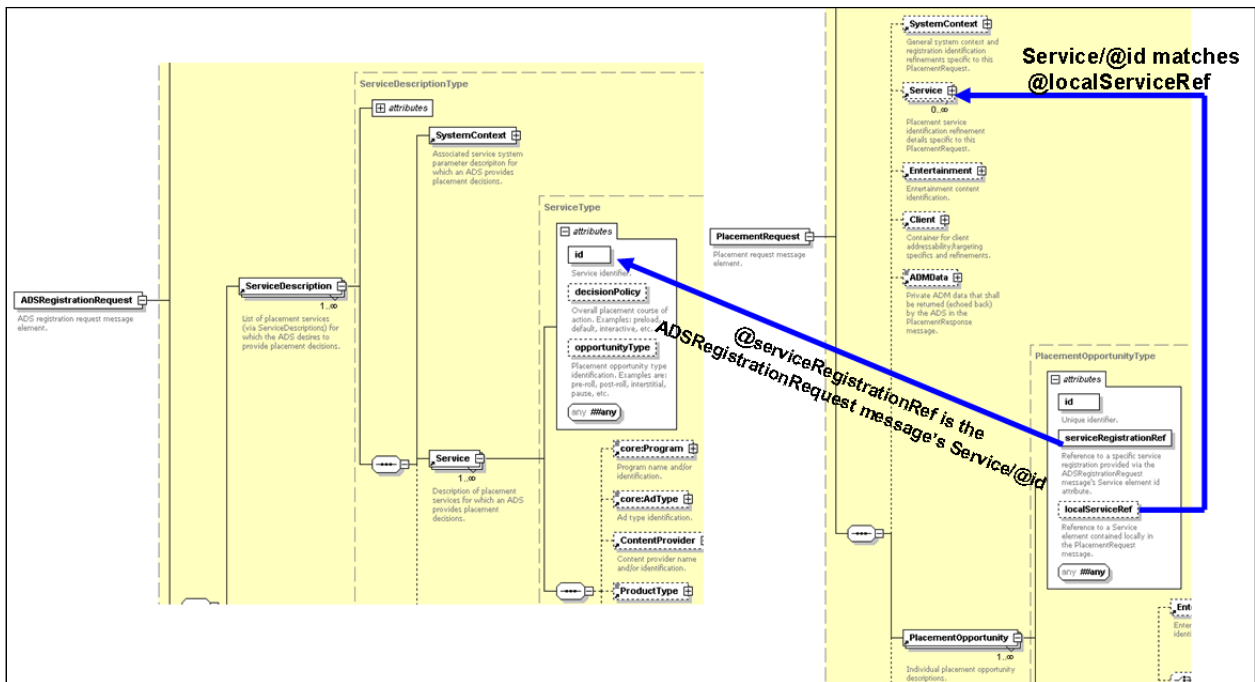


Figure 8-8 – Service/@id attribute linkages

8.1.2 PlacementResponse message schema

Figure 8-9 illustrates the PlacementResponse message schema.

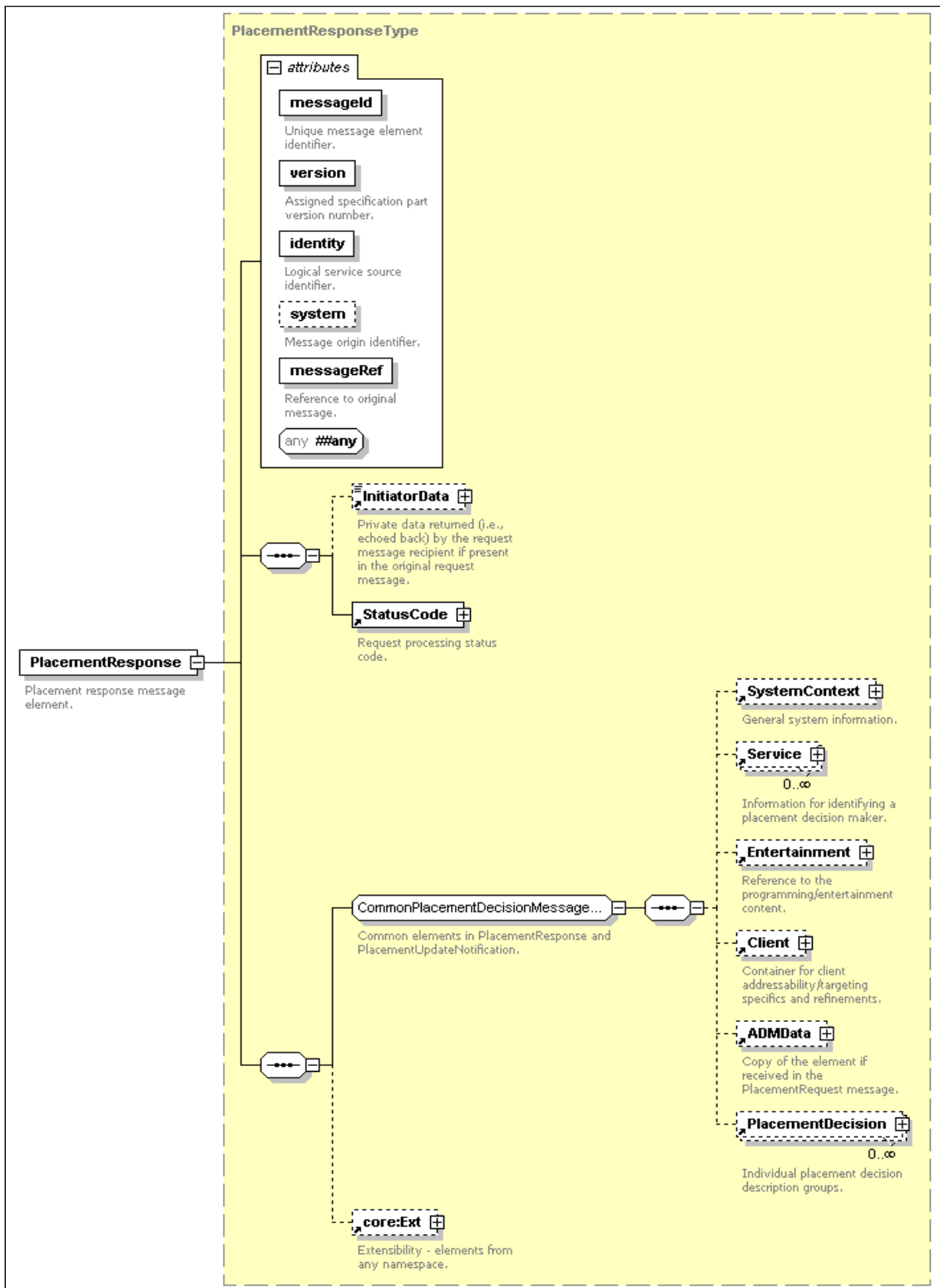


Figure 8-9 – PlacementResponse message schema

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.

8.1.2.1 Semantic definitions for the PlacementResponse message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the PlacementRequest message processing. See [ITU-T J.380.2] and Annex A for additional information.

SystemContext [Optional] – System environment information that typically is a copy of the original information. See clause 10.45 for additional information.

Service [Optional] – Zero or more elements containing message local information. Typically, this is a copy of the original information. See clause 10.37 for additional information.

Entertainment [Optional] – The entertainment (i.e., programming) content for which the placement opportunities are associated. See clause 10.11 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 clause 10.29 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 clause 10.4 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 clause 10.2 for additional information.

PlacementDecision [Optional] – Zero or more PlacementDecision elements with each element containing one or more Placement elements. See clause 10.29 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 [ITU-T J.380.2] for additional information.

8.1.3 Placement messaging examples

Figure 8-10 illustrates a VOD pre-roll and post-roll placement request and response (Figure 8-11). 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 (Figure 8-11) 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.

```
<PlacementRequest messageId="5B8ECCED-979B-421E-8A6E-E2192B115160" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm"
updatesAllowed="true">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="entertainment.com" assetID="ABCD0123456789012345"/>
    </core:Content>
  </Entertainment>
  <Client>
    <TargetCode key="ZipPlus4">12345-6789</TargetCode>
    <TargetCode key="Gender">Male</TargetCode>
  </Client>
  <ADMData><!--Hidden secret sauce--></ADMData>
  <PlacementOpportunity id="5B8ECCED-979B-421E-8A6E-E2192B115162"
serviceRegistrationRef="ServiceRef1">
    <OpportunityBinding opportunityType="preRoll"/>
    <OpportunityConstraints>
      <Scope>Local</Scope>
    </OpportunityConstraints>
    <PlacementControl id="5B8ECCED-979B-421E-8A6E-E2192B115163" action="fill">
      <OpportunityConstraints>
        <core:AdType>Telescoping</core:AdType>
        <MaxDuration>PT60S</MaxDuration>
        <MinDuration>PT15S</MinDuration>
        <DesiredDuration>PT30S</DesiredDuration>
      </OpportunityConstraints>
    </PlacementControl>
  </PlacementOpportunity>
  <PlacementOpportunity id="5B8ECCED-979B-421E-8A6E-E2192B115164"
serviceRegistrationRef="ServiceRef1">
    <OpportunityBinding opportunityType="postRoll"/>
    <PlacementControl id="5B8ECCED-979B-421E-8A6E-E2192B115165" action="fill">
      <OpportunityConstraints>
        <MaxPlacementCount>3</MaxPlacementCount>
        <MinPlacementCount>1</MinPlacementCount>
      </OpportunityConstraints>
    </PlacementControl>
  </PlacementOpportunity>
</PlacementRequest>
```

Figure 8-10 – Example 28

```

<PlacementResponse messageId="5B8ECCED-979B-421E-8A6E-E2192B11516A" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads" messageRef="5B8ECCED-
979B-421E-8A6E-E2192B115160">
  <core:StatusCode class="0"/>
  <ADMDATA><!--Hidden secret sauce--></ADMDATA>
  <PlacementDecision id="PD1" placementOpportunityRef="5B8ECCED-979B-421E-8A6E-E2192B115162">
    <Placement id="PD1_P1" action="fill" placementControlRef="5B8ECCED-979B-421E-8A6E-E2192B115163">
      <core:Content>
        <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012345"/>
        <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
      </core:Content>
    </Placement>
  </PlacementDecision>
  <PlacementDecision id="PD2" placementOpportunityRef="5B8ECCED-979B-421E-8A6E-E2192B115164">
    <Placement id="PD2_P1" action="fill" placementControlRef="5B8ECCED-979B-421E-8A6E-E2192B115165">
      <core:Content>
        <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012346"/>
        <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516D</core:Tracking>
      </core:Content>
    </Placement>
    <Placement id="PD2_P2" action="fill" placementControlRef="5B8ECCED-979B-421E-8A6E-E2192B115165">
      <core:Content>
        <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012347"/>
        <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516E</core:Tracking>
      </core:Content>
    </Placement>
  </PlacementDecision>
</PlacementResponse>

```

Figure 8-11 – Example 29

8.2 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.

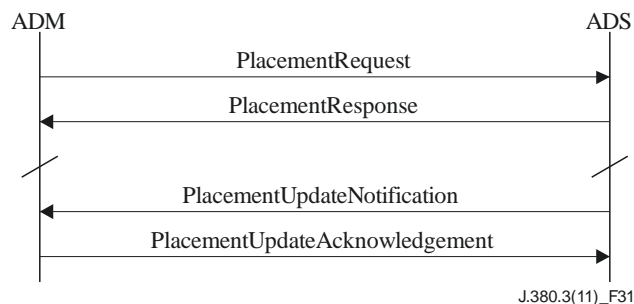


Figure 8-12 – Placement update message exchange sequence

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 placement decision set is up to the ADM and is outside the scope of this Recommendation (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 Recommendation (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 Recommendation. This Recommendation does not preclude or prefer any method or combination thereof.

An example usage is a VOD session placement decision set update. Upon start-up 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 clauses detail the placement update messaging schemas.

8.2.1 PlacementUpdateNotification message schema

Figure 8-13 illustrates the PlacementUpdateNotification message schema.

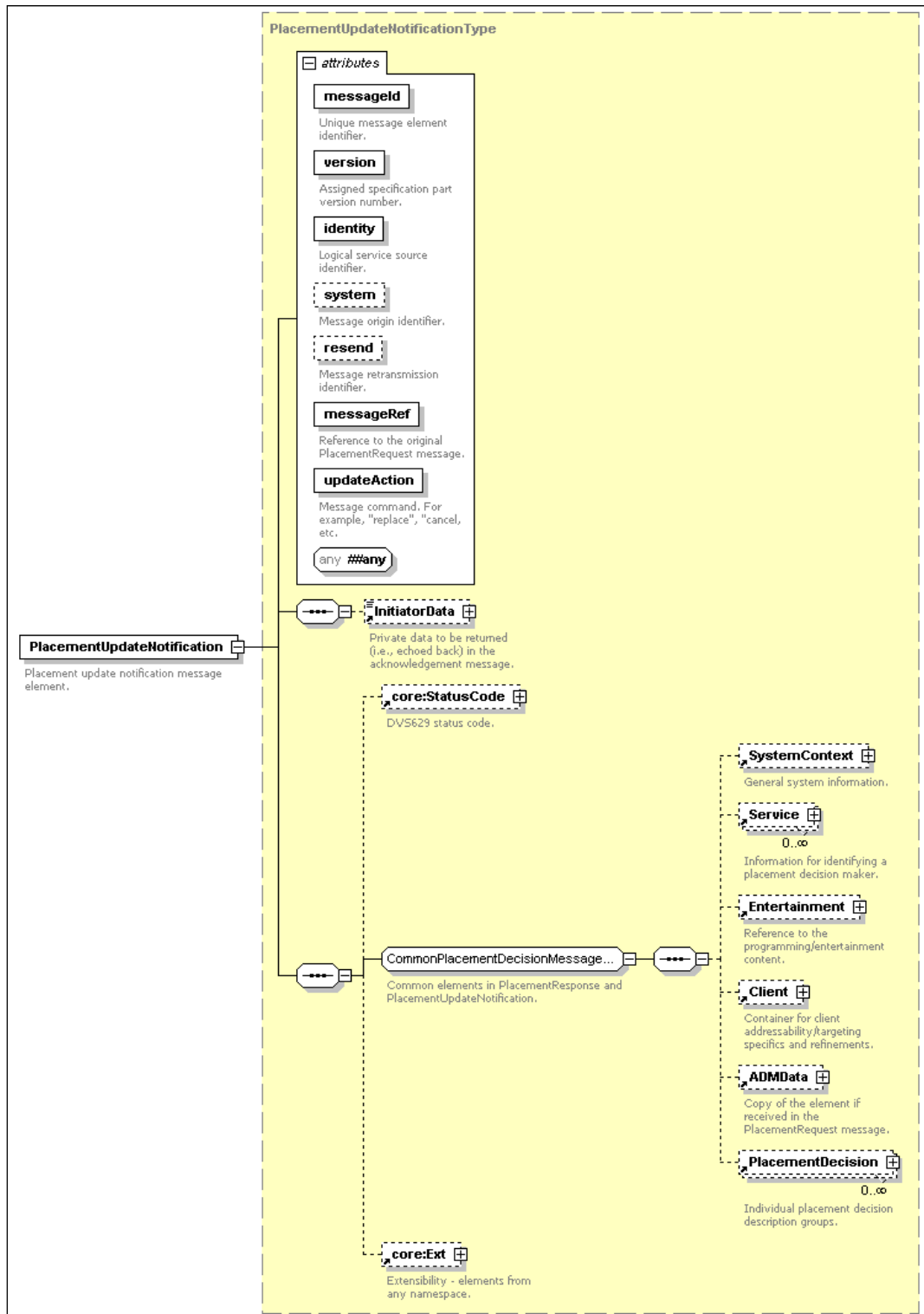


Figure 8-13 – PlacementUpdateNotification message schema

8.2.1.1 Semantic definitions for the PlacementUpdateNotification message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

@messageRef [Required, core:messageRefAttrType] – A reference to the original PlacementRequest message element for which this update notification is being provided. See [ITU-T J.380.2] 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 8 – PlacementUpdateNotification/@updateAction attribute values

Value	Description
cancel	The referenced placement management sequence is terminated.
replace	The most recent PlacementResponse or PlacementUpdateNotification message shall be replaced in its entirety by this message.
...	User defined and outside the scope of this Recommendation. The string shall be prefixed with the text "private:".

@##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 [ITU-T J.380.2] for additional information.

core:StatusCode [Optional] – A status code value along with zero or more descriptive text elements. See [ITU-T J.380.2] for additional information.

SystemContext [Optional] – System environment information that typically is a copy of the original information. See clause 10.45 for additional information.

Service [Optional] – Zero or more elements containing message local information. Typically, this is a copy of the original information. See clause 10.37 for additional information.

Entertainment [Optional] – The entertainment (i.e., programming) content for which the placement opportunities are associated. See clause 10.11 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 clause 10.29 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 clause 10.4 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 clause 10.2 for additional information.

PlacementDecision [Optional] – Zero or more PlacementDecision elements with each element containing one or more Placement elements. See clause 10.29 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 [ITU-T J.380.2] for additional information.

The PlacementUpdateNotification element's value may be empty (e.g., when @updateAction is set to the value "cancel").

8.2.2 PlacementUpdateAcknowledgement message schema

Figure 8-14 illustrates the PlacementUpdateAcknowledgement message schema.

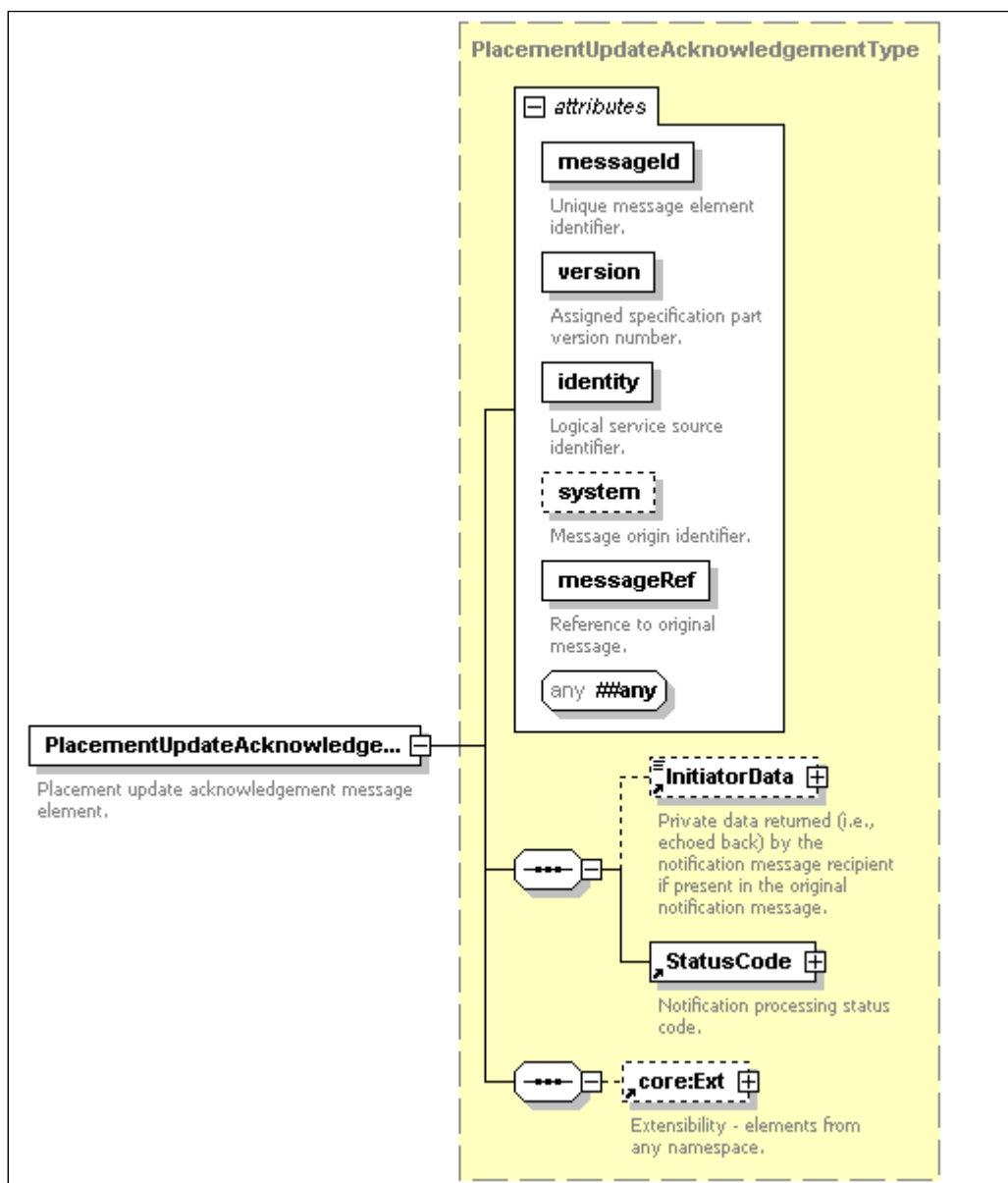


Figure 8-14 – PlacementUpdateAcknowledgement message schema

8.2.2.1 Semantic definitions for the PlacementUpdateAcknowledgement message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the PlacementUpdateNotification message processing. See [ITU-T J.380.2] and Annex A for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

8.2.3 Placement Update examples

Example: The clause 8.1.3 placement decision set (the Figure 8-10 PlacementRequest message and the Figure 8-11 PlacementResponse message) is replaced by this update message exchange (Figure 8-15 notification and Figure 8-16 successful acknowledgement).

```
<PlacementUpdateNotification messageId="5B8ECCED-979B-421E-8A6E-E2192B11516B" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads" messageRef="5B8ECCED-
979B-421E-8A6E-E2192B115160" updateAction="replace"
  <core:StatusCode class="0"/>
  <ADMDData><!--Hidden secret sauce--></ADMDData>
  <PlacementDecision id="PD1" placementOpportunityRef="5B8ECCED-979B-421E-8A6E-E2192B115162">
    <Placement id="PD1_P1" action="fill" placementControlRef="5B8ECCED-979B-421E-8A6E-E2192B115163">
      <core:Content>
        <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012345"/>
        <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
      </core:Content>
    </Placement>
  </PlacementDecision>
  <PlacementDecision id="PD2" placementOpportunityRef="5B8ECCED-979B-421E-8A6E-E2192B115164">
    <Placement id="PD2_P1" action="fill" placementControlRef="5B8ECCED-979B-421E-8A6E-E2192B115165">
      <core:Content>
        <core:AssetRef providerID="adCreativeWorld.com" assetID="ABCD0123456789876543"/>
        <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11634F</core:Tracking>
      </core:Content>
    </Placement>
    <Placement id="PD2_P2" action="fill" placementControlRef="5B8ECCED-979B-421E-8A6E-E2192B115165">
      <core:Content>
        <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012347"/>
        <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516E</core:Tracking>
      </core:Content>
    </Placement>
  </PlacementDecision>
</PlacementUpdateNotification>
```

Figure 8-15 – Example 30

```
<PlacementUpdateAcknowledgement messageId="5B8ECCED-979B-421E-8A6E-E2192B115164" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm" messageRef="5B8ECCED-
979B-421E-8A6E-E2192B11516B">
  <core:StatusCode class="0"/>
</PlacementUpdateAcknowledgement>
```

Figure 8-16 – Example 31

8.3 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 fulfilment 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 8-17 illustrates the placement status message exchange.

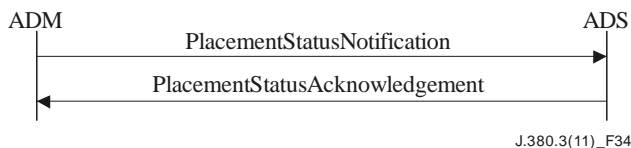


Figure 8-17 – Placement status message exchange

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 Recommendation'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 Recommendation defined named event elements share a common base definition described in clause 9.2.1. Each named event element shall have:

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

- An @identityADM attribute specifying the originating ADM logical service identification.
- An @systemADM attribute providing the originating ADM system identification.
- An @messageRef attribute providing the @messageId attribute's value for a message associated with the event.
- A core:StatusCode element for status and descriptive text carriage.
- A SystemContext element for system parameters of interest.
- A Client element for targeting and refinement criteria.
- Either an Entertainment element for entertainment asset identification and play time reference or an EntertainmentNPT element for the play time reference within the scope of a higher level scope Entertainment element.

- Either a Spot element for ad content identification and play time reference or a SpotNPT element for the play time reference within the scope of a higher level scope Spot element.
- A NPT element for providing an overall play time reference typically the clock the viewer associates with a program or entertainment asset including ads.
- 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 residing in 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:

- 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.
- 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 SpotNPT 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 SpotNPT element should be included in the PlacementStatusEvent element for the startPlacement and endPlacement events.

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 SpotNPT element.

- 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. Figures 8-18 and 8-19 illustrates these relationships.

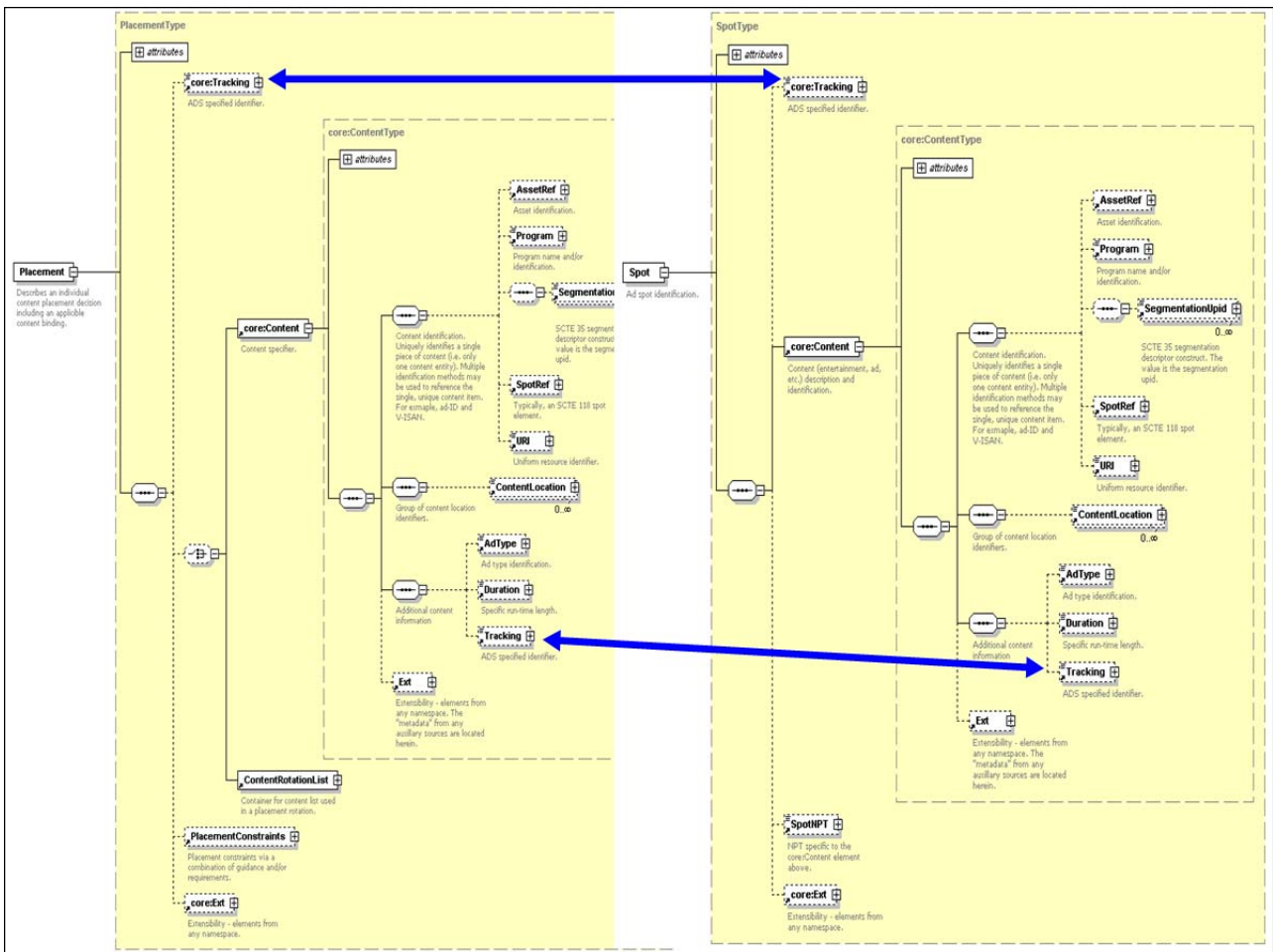
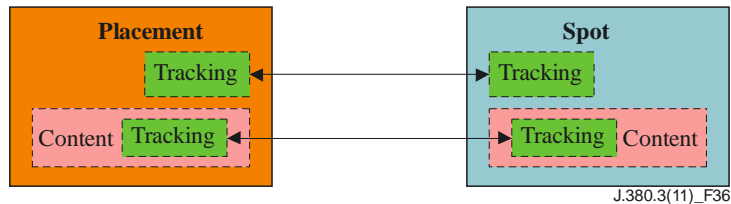


Figure 8-18 – core:Tracking element relationships



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Figure 8-19 – core:Tracking Element replication in Spot elements

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.

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 signalling occurs in atomic units as signalled 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 fulfilment 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 within 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 Recommendation.

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

Figure 8-20 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 8-20 does not illustrate all the message elements (i.e., it is not comprehensive or all inclusive). See the individual schemas for additional information.

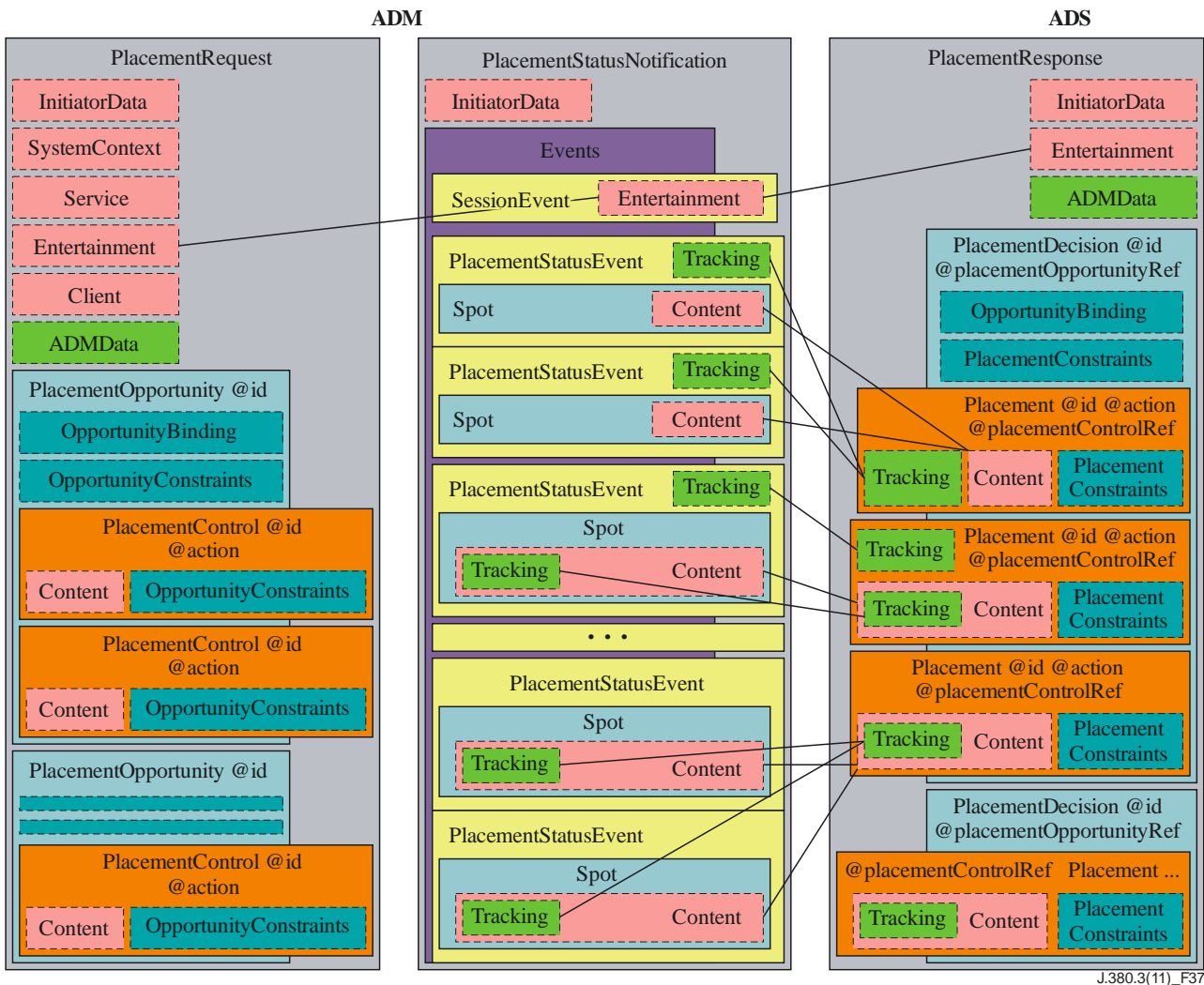


Figure 8-20 – Placement status high-level view (not comprehensive)

In Figure 8-20, 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 clauses detail the placement status messaging schemas.

8.3.1 PlacementStatusNotification message schema

Figure 8-21 illustrates the PlacementStatusNotification message schema used to communicate placement status information.

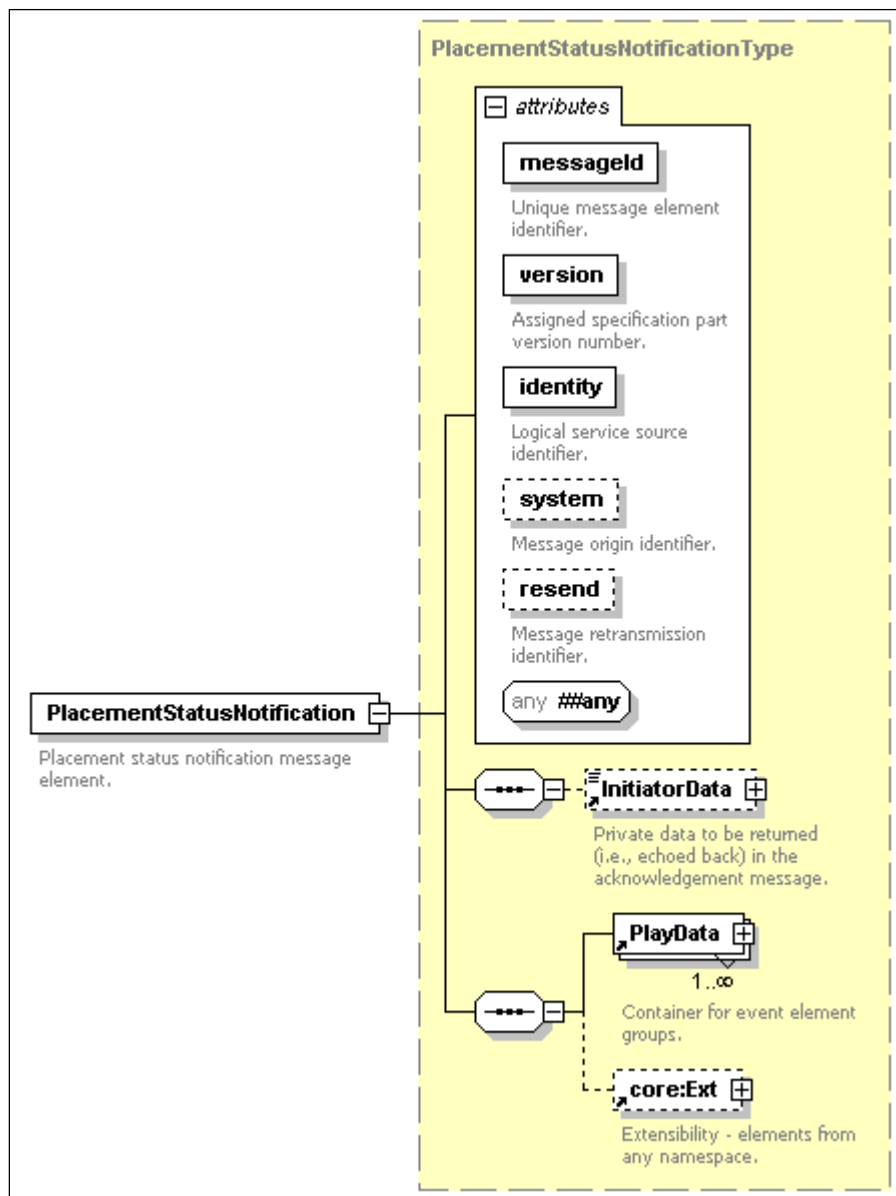


Figure 8-21 – PlacementStatusNotification message schema

8.3.1.1 Semantic definitions for the PlacementStatusNotification message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

PlayData [Optional] – One or more containers of event reporting sequences. See clause 9.2.1.2 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

8.3.2 PlacementStatusAcknowledgement message schema

Figure 8-22 illustrates the PlacementStatusAcknowledgement message schema.

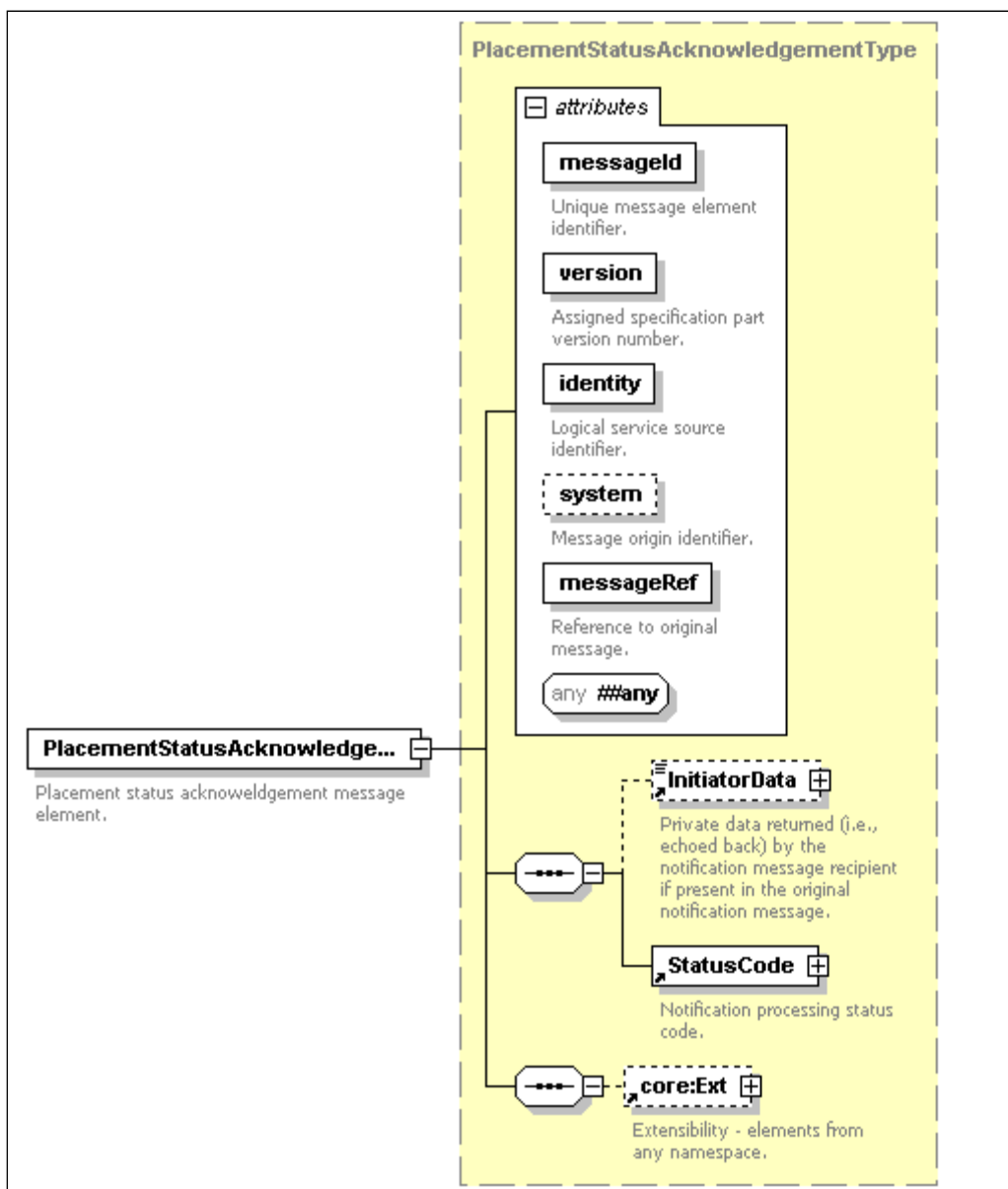


Figure 8-22 – PlacementStatusAcknowledgement message schema

8.3.2.1 Semantic definitions for the PlacementStatusAcknowledgement message

@messageId [Required, core:messageIdAttrType] – The message identifier. See [ITU-T J.380.2] for additional information.

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

@identity [Required, core:identityAttrType] – The origin logical service identifier. See [ITU-T J.380.2] for additional information.

@system [Optional, core:systemAttrType] – The message origin identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Required] – An applicable status code specific to the PlacementStatusNotification message processing. See [ITU-T J.380.2] and Annex A for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

8.3.3 Placement status examples

Figure 8-23 illustrates a PlacementStatusNotification message that reports 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. Figure 8-24 illustrates the positive (i.e., success) acknowledgement message.

```

<PlacementStatusNotification messageId="738BE483-4234-4878-8A21-F6B62E1B56D0" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm">
  <PlayData identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
    <Events>
      <PlacementStatusEvent type="startPlacement" time="2007-01-09T14:20:00.0Z">
        <Spot>
          <core:Content>
            <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012345"/>
            <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
          </core:Content>
          <SpotNPT scale="1">0</SpotNPT>
        </Spot>
      </PlacementStatusEvent>
      <PlacementStatusEvent type="endPlacement" time="2007-01-09T14:20:30.0Z">
        <Spot>
          <core:Content>
            <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012345"/>
            <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
          </core:Content>
          <SpotNPT scale="1">30</SpotNPT>
        </Spot>
      </PlacementStatusEvent>
      <PlacementStatusEvent type="startPlacement" time="2007-01-09T14:22:30.0Z">
        <Spot>
          <core:Content>
            <core:AssetRef providerID="adsrus.com" assetID="ZXYW0123456789012346"/>
            <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516D</core:Tracking>
          </core:Content>
          <SpotNPT scale="1">0</SpotNPT>
        </Spot>
      </PlacementStatusEvent>
    </Events>
  </PlayData>
</PlacementStatusNotification>

```

Figure 8-23 – Example 32

```

<PlacementStatusAcknowledgement messageId="87648E84-9D5E-11DB-96CA-005056C0000a" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" system="ads" messageRef="738BE483-
4234-4878-8A21-F6B62E1B56D0" >
  <core:StatusCode class="0"/>
</PlacementStatusAcknowledgement>

```

Figure 8-24 – Example 33

9 ITU-T J.380.3 attribute types and Common complex types

The following clauses 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 clauses.

9.1 ADM core attribute types

9.1.1 eventRangeEndDateTimeAttrType attribute type

eventRangeEndDateTimeAttrType [**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 @eventRangeEndDateTime attributes, events may be grouped into specific, well-defined time intervals. See [ITU-T J.380.2] for additional information.

9.1.2 eventRangeStartDateTimeAttrType attribute type

eventRangeStartDateTimeAttrType [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 [ITU-T J.380.2] for additional information.

9.1.3 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.

9.1.4 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.

9.1.5 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.

9.1.6 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.

9.1.7 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.

9.1.8 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 latter, 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 Recommendation.

Table 9 – placementOpportunityTypeAttrType attribute values

Value	Description
preRoll	Prior to the start of the entertainment content.
postRoll	Post the end of the entertainment content.
interstitial	Anywhere within the entertainment content.
pause	An opportunity occurring when a display endpoint interaction pauses the entertainment content viewing (e.g., the user pushes the pause button).
fastForward	An opportunity occurring when a display endpoint interaction fast-forwards the entertainment content viewing (e.g., the user pushes the fast-forward button).
rewind	An opportunity occurring when a display endpoint interaction rewinds the entertainment content viewing (e.g., the user pushes the rewind button).
startSession	At the commencement of the implementation defined session initiation boundary.
endSession	At the termination of the implementation defined session completion boundary.
...	User defined and outside the scope of this Recommendation. The string shall be prefixed with the text "private:".

9.1.9 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.

9.2 ADM core common complex types

This clause defines the common XML complex type definitions used by multiple elements contained within this Recommendation. 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 clauses as appropriate.

9.2.1 EventBaseType complex type

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

9.2.1.1 EventBaseType schema

Figure 9-1 illustrates the EventBaseType complex type's schema.

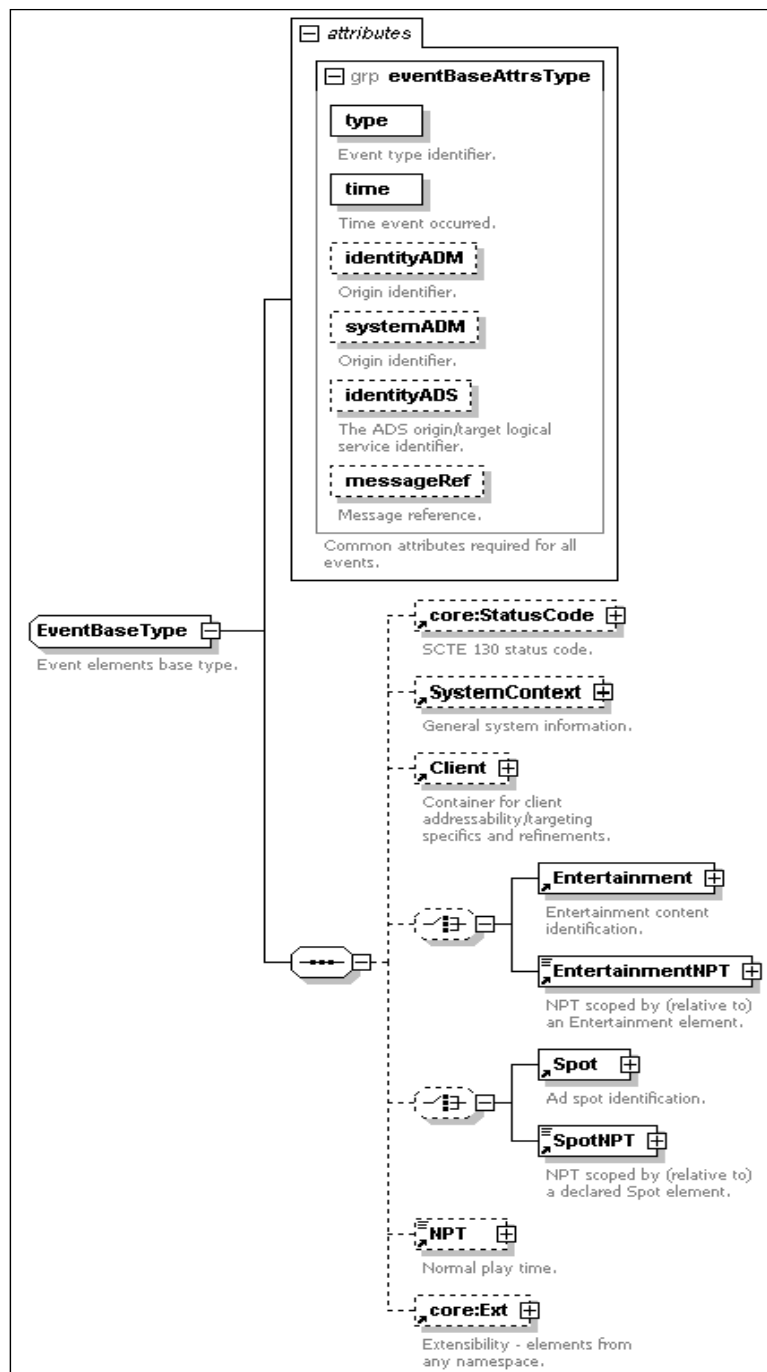


Figure 9-1 – EventBaseType complex type Schema

9.2.1.2 Semantic definitions for EventBaseType complex type

@type [Required, eventTypeAttrType] – Event identification. See clause 9.1.3 for additional information.

@time [Required, core:dateTimeTimezoneType] – The event occurrence date and time. See [ITU-T J.380.2] for additional information.

@identityADM [Optional, core:identityAttrType] – The originating ADM logical service identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

@identityADS [Optional, core:identityAttrType] – The ADS origin or target logical service identifier. See [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

core:StatusCode [Optional] – An applicable status code and zero or more core:Note elements. The applicable status codes are defined in Annex A. See [ITU-T J.380.2] for additional information.

SystemContext [Optional] – Parameters describing the event's system context. See clause 10.45 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 clause 10.4 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 clause 10.11 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). If the Entertainment element is present in a higher level scope element and an NPT relative to the higher level scope Entertainment element is desired, the EntertainmentNPT element shall be used instead.

EntertainmentNPT [Optional Choice] – This element provides an NPT relative to a previously specified Entertainment element that was declared within a higher level scope element's context. See clause 10.12 for additional information. If the Entertainment element is present in the named event element, this element shall not be used and the Entertainment element's EntertainmentNPT should be used.

Spot [Optional Choice] – Ad content asset identification. See clause 10.42 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 SpotNPT element shall be used instead.

SpotNPT [Optional Choice] – This element provides an NPT relative to a previously specified Spot element that was declared within a higher level scope element's context. See clause 10.43 for additional information. If the Spot element is present in the named event element, this element shall not be used and the Spot element's SpotNPT should be used.

NPT [Optional] – A normal play time (NPT) value referenced to a stream absolute position relative to the beginning of a timeline. See clause 10.21 for additional information. The timeline is typically the clock the viewer associates with a program or entertainment asset including ads.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The named event element's value may be empty.

9.2.2 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 [IETF RFC 2326]. Typically, this is the clock the viewer associates with the referenced content stream.

9.2.2.1 NormalPlayTimeType schema

Figure 9-2 illustrates the NormalPlayTimeType complex type's schema.

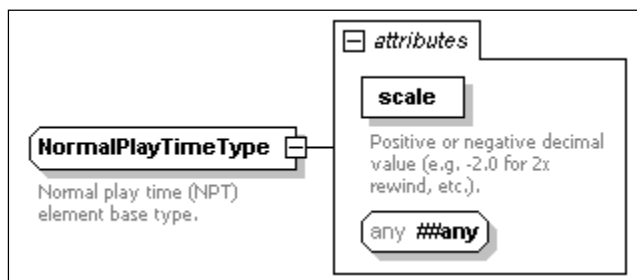


Figure 9-2 – NormalPlayTimeType complex type schema

9.2.2.2 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 wall-clock rate. For every second of elapsed (wall-clock) 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 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. An 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 0.0 seconds. Negative values shall not be permitted and the NPT element's value shall not be empty.

9.2.3 PlacementCountType complex type

The PlacementCountType complex type specifies a placement count.

9.2.3.1 PlacementCountType complex type schema

Figure 9-3 illustrates the PlacementCountType complex type's schema.

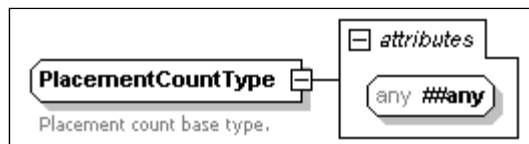


Figure 9-3 – PlacementCountType complex type schema

9.2.3.2 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.

10 ITU-T J.380.3 elements

The following clauses 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 clauses as appropriate.

10.1 ADMCapabilities element

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

10.1.1 ADMCapabilities element schema

Figure 10-1 illustrates the ADMCapabilities element's schema.

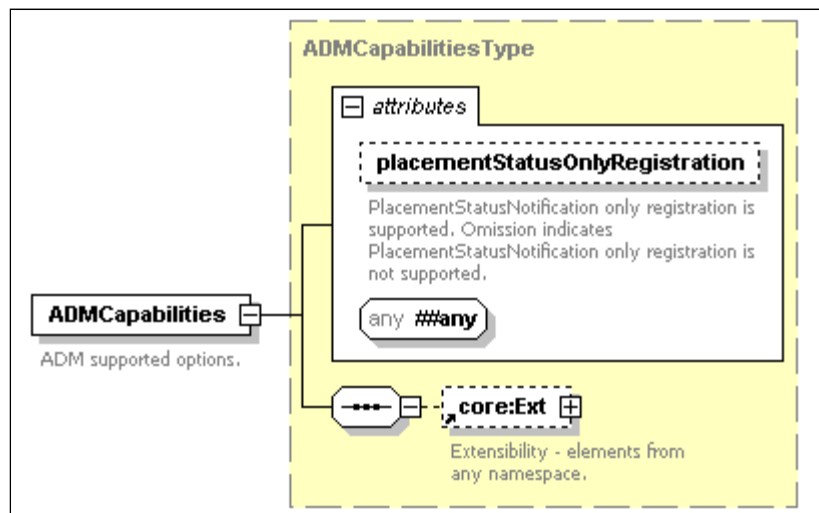


Figure 10-1 – ADMCapabilities element schema

10.1.1.1 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.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.1.2 ADMCapabilities element examples

```
<ADMCapabilities placementStatusOnlyRegistration="false"/>
<ADMCapabilities placementStatusOnlyRegistration="true"/>
```

10.2 ADMDData element

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

10.2.1 ADMData element schema

Figure 10-2 illustrates the ADMData element's schema.

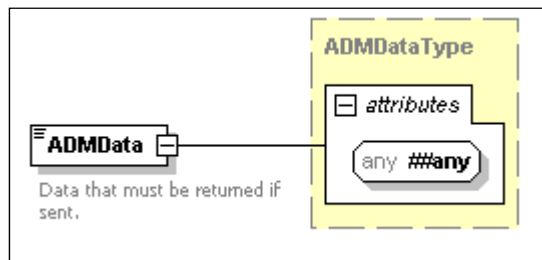


Figure 10-2 – ADMData element schema

10.2.1.1 Semantic definitions for the ADMData element

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

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

10.2.2 ADMData element examples

```
<ADMData acme:secretSauce="true">Hidden secret sauce...</ADMData>
```

10.3 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.

10.3.1 Channel element schema

Figure 10-3 illustrates the Channel element's schema.

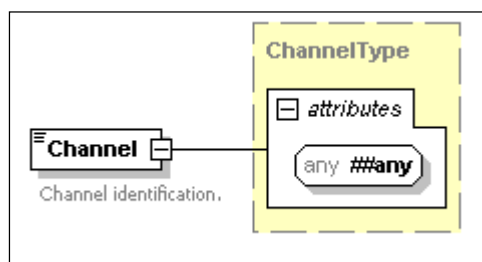


Figure 10-3 – Channel element schema

10.3.1.1 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.

10.3.2 Channel element examples

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

10.4 Client element

The Client element contains addressing or targeting criteria.

10.4.1 Client element schema

Figure 10-4 illustrates the Client element's schema.

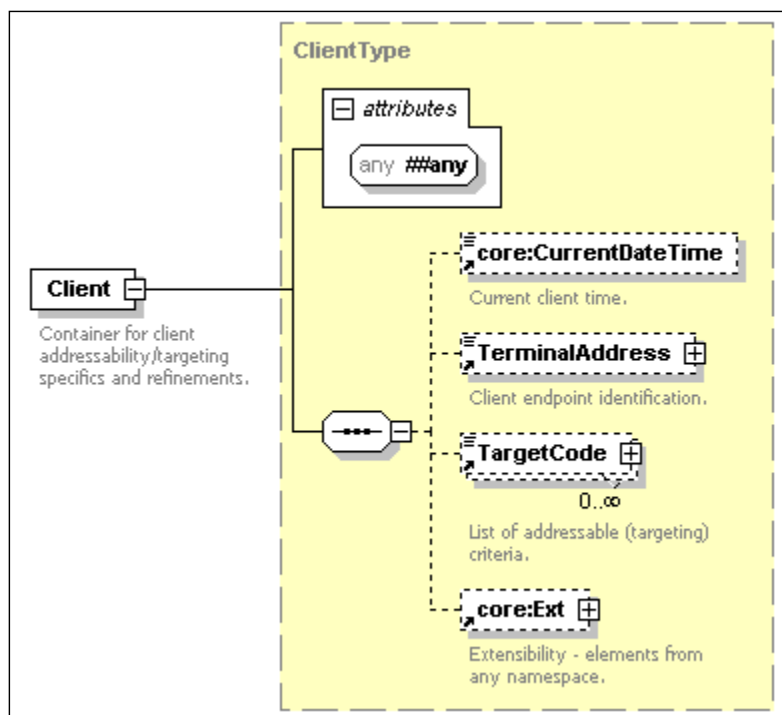


Figure 10-4 – Client element schema

10.4.1.1 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 time zone indicator. See [ITU-T J.380.2] for additional information.

TerminalAddress [Optional] – Client endpoint identification such as the set top box MAC address. See clause 10.48 for additional information.

TargetCode [Optional] – Zero or more TargetCode elements with each element containing addressability information (i.e., targeting criteria). See clause 10.47 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.4.2 Client element examples

```

<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>

```

10.5 ContentProvider element

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

10.5.1 ContentProvider element schema

Figure 10-5 illustrates the ContentProvider element's schema.

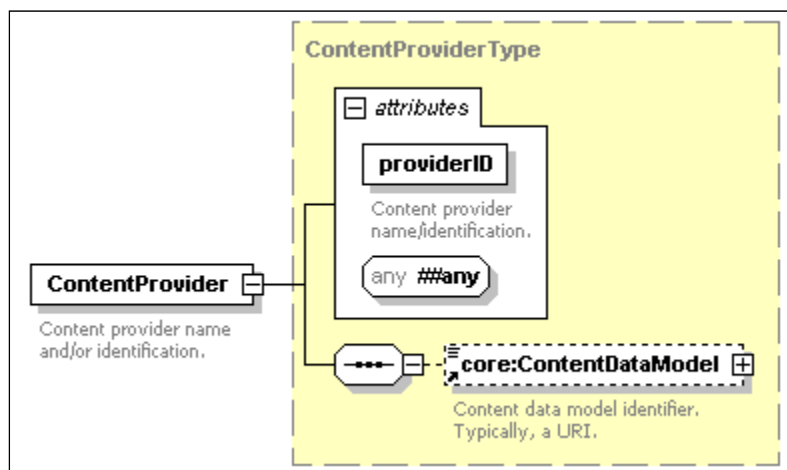


Figure 10-5 – ContentProvider element schema

10.5.1.1 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 [ITU-T J.380.2] for additional information.

The ContentProvider element's value may be empty.

10.5.2 ContentProvider element examples

```

<ContentProvider providerID="jumpthesharktv"/>

<ContentProvider providerID="mybettercontent.com">
  <core:ContentDataModel type="CLADI_2.0">valid URI</core:ContentDataModel>
</ContentProvider>

```

10.6 ContentRotationList element

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

10.6.1 ContentRotationList element schema

Figure 10-6 illustrates the ContentRotationList element's schema.

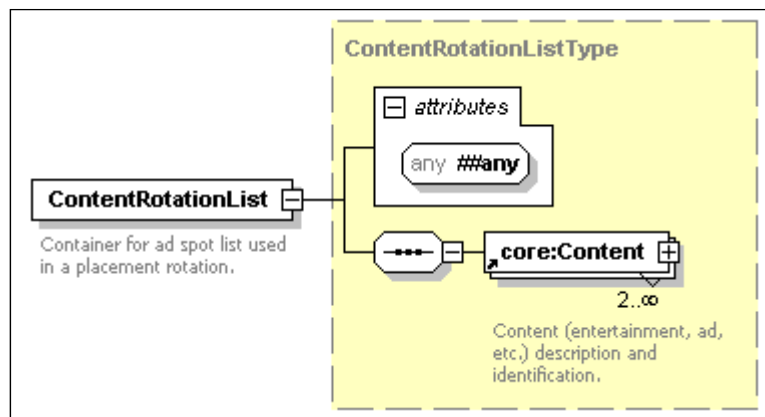


Figure 10-6 – ContentRotationList element schema

10.6.1.1 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 [ITU-T J.380.2] for additional information.

10.6.2 ContentRotationList element examples

```

<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>

```

10.7 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 clause 10.16 and clause 10.18 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 [ITU-T J.380.2] for additional information regarding the Duration element.

10.7.1 DesiredDuration element schema

Figure 10-7 illustrates the DesiredDuration element's schema.

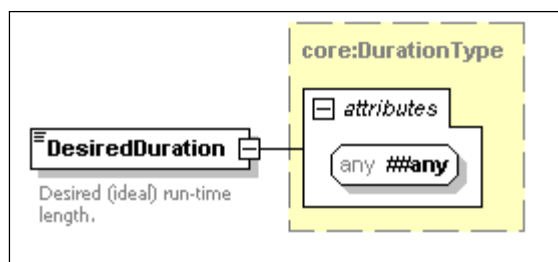


Figure 10-7 – DesiredDuration element schema

10.7.1.1 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.

10.7.2 DesiredDuration element examples

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

10.8 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 clause 10.17.1 and clause 10.19 for additional information regarding the MaxPlacementCount and MinPlacementCount elements respectively.

10.8.1 DesiredPlacementCount element schema

Figure 10-8 illustrates the DesiredPlacementCount element's schema.

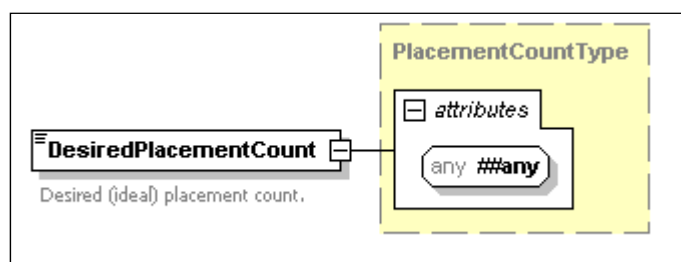


Figure 10-8 – DesiredPlacementCount element schema

10.8.1.1 Semantic definitions for the DesiredPlacementCount element

The DesiredPlacementCount element inherits from the PlacementCountType complex type. See clause 9.2.3 for semantic definitions applicable to this element.

10.8.2 DesiredPlacementCount element examples

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

10.9 EffectiveEndTime element

The EffectiveEndTime 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.

10.9.1 EffectiveEndTime element schema

Figure 10-9 illustrates the EffectiveEndTime element's schema.

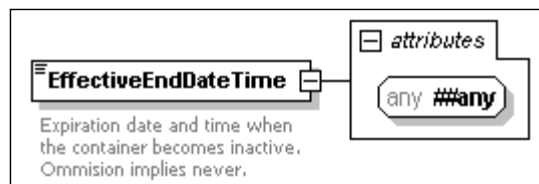


Figure 10-9 – EffectiveEndTime element schema

10.9.1.1 Semantic definitions for the EffectiveEndTime element

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

The EffectiveEndTime element's value is of type core:dateTimeTimezoneType. See [ITU-T J.380.2] for additional information.

10.9.2 EffectiveEndTime element examples

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

10.10 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.

10.10.1 EffectiveStartDateTime element schema

Figure 10-10 illustrates the EffectiveStartDateTime element's schema.

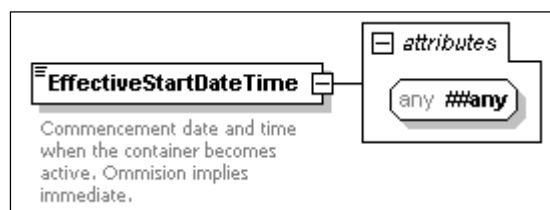


Figure 10-10 – EffectiveStartDateTime element schema

10.10.1.1 Semantic definitions for the EffectiveStartDateTime element

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

The EffectiveStartDateTime element's value is of type core:dateTimeTimezoneType. See [ITU-T J.380.2] for additional information.

10.10.2 EffectiveStartTime element examples

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

10.11 Entertainment element

The Entertainment element identifies the entertainment (programming) content using the core:Content element and it optionally contains an EntertainmentNPT element providing a time marker or a time range relative to the entertainment asset.

10.11.1 Entertainment element schema

Figure 10-11 illustrates the Entertainment element's schema.

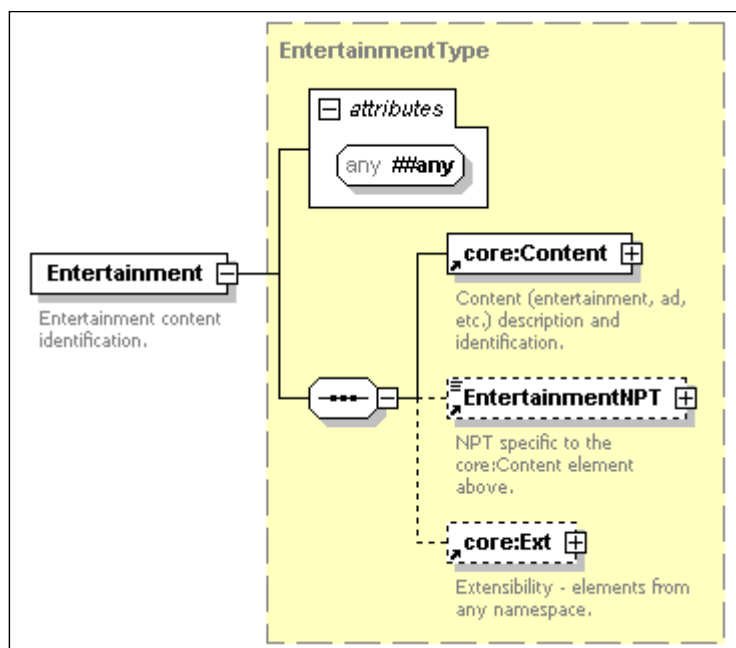


Figure 10-11 – Entertainment element schema

10.11.1.1 Semantic definitions for the Entertainment element

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

core:Content [Required] – Entertainment content identification. See [ITU-T J.380.2] for additional information.

EntertainmentNPT [Optional] – A play time reference or a time range relative to the paired core:Content element. See clause 10.12 for additional information.

The Entertainment element may contain an EntertainmentNPT element and each named event element contained within the Events element may also contain an EntertainmentNPT element. This usage facilitates describing a range of the entertainment content, for example a chapter, while each named event references a specific time point within the range.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.11.2 Entertainment element examples

```

<Entertainment>
  <core:Content>
    <core:URI>ftp://sharkTank.choke/SharksWinTheStanelyCup-NOT</core:URI>
  </core:Content>
  <EntertainmentNPT scale="1.0">2.33</EntertainmentNPT><!--.2.33 seconds-->
</Entertainment>

```

In the above Entertainment element example, the URI element identifies the entertainment content asset. The EntertainmentNPT element provides a time marker relative to the asset. In this case, the value is 2.33 seconds into the entertainment content.

10.12 EntertainmentNPT

The entertainment normal play time element (EntertainmentNPT) indicates the stream absolute position relative to the beginning of the referenced content. This element inherits from the NormalPlayTimeType complex type defined in clause 9.2.2.

10.12.1 EntertainmentNPT element schema

Figure 10-12 illustrates the EntertainmentNPT element's schema.

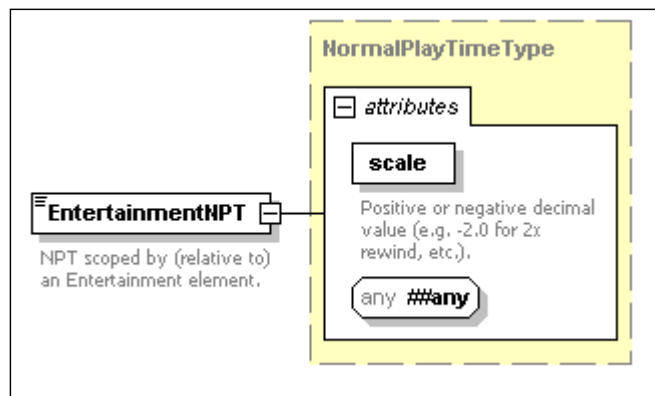


Figure 10-12 – EntertainmentNPT element schema

10.12.1.1 Semantic definitions for the EntertainmentNPT

The EntertainmentNPT element inherits from the NormalPlayTimeType complex type. See clause 9.2.2 for semantic definitions applicable to this element.

10.12.2 EntertainmentNPT element examples

```

<!--Normal play i.e., 1x speed) at 2.33 seconds-->
<EntertainmentNPT scale="1">2.33</EntertainmentNPT>

<!--Normal play i.e., 1x speed) at 2.33 seconds-->
<EntertainmentNPT scale="1.0">2.33</EntertainmentNPT>

<!--Pause/stopped at 2.33 seconds-->
<EntertainmentNPT scale="0">2.33</EntertainmentNPT>

<!--Rewind at 10x from the 15 second mark.-->
<EntertainmentNPT scale="-10">15</EntertainmentNPT>

```

10.13 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.

10.13.1 EntertainmentScopedEvents element schema

Figure 10-13 illustrates the EntertainmentScopedEvents element's schema.

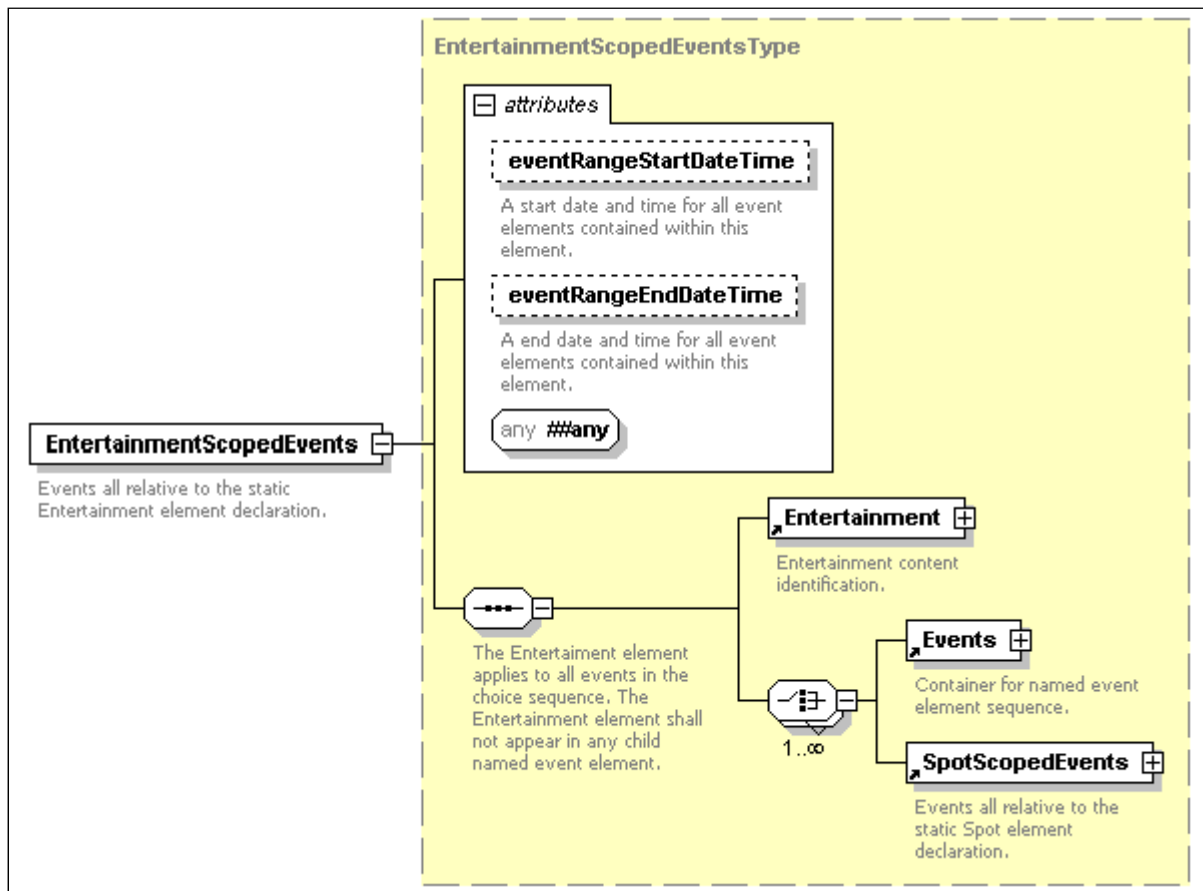


Figure 10-13 – EntertainmentScopedEvents element schema

10.13.1.1 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 clause 9.1.2 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 clause 9.1.1 for additional details.

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

Entertainment [Required] – Entertainment content identification. See clause 10.11 for additional details.

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.

The Entertainment element may contain an EntertainmentNPT element and each named event element contained within the Events element or the SpotScopedEvents element may also contain an EntertainmentNPT element but no such named event element shall contain an Entertainment element. This usage facilitates describing a range of the entertainment content, for example a chapter, while each named event references a specific time point within the range.

Events [Choice] – A container for named event elements. See clause 10.14 for additional information.

SpotScopedEvents [Choice] – A container for named event elements scoped by a Spot element. See clause 10.44 for additional information.

10.13.2 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>
  <SpotScopedEvents>
    <Spot>
      <core:Tracking>FFFFFFDC7-6C60-0030-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">
        <SpotNPT scale="1">0</SpotNPT>
      </PlacementStatusEvent>
      <PlacementStatusEvent time="2007-01-31T02:00:20Z" type="endPlacement">
        <SpotNPT scale="1">15</SpotNPT>
      </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>
</EntertainmentScopedEvents>
```

10.14 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.)

10.14.1 Events element schema

Figure 10-14 illustrates the Events element's schema.

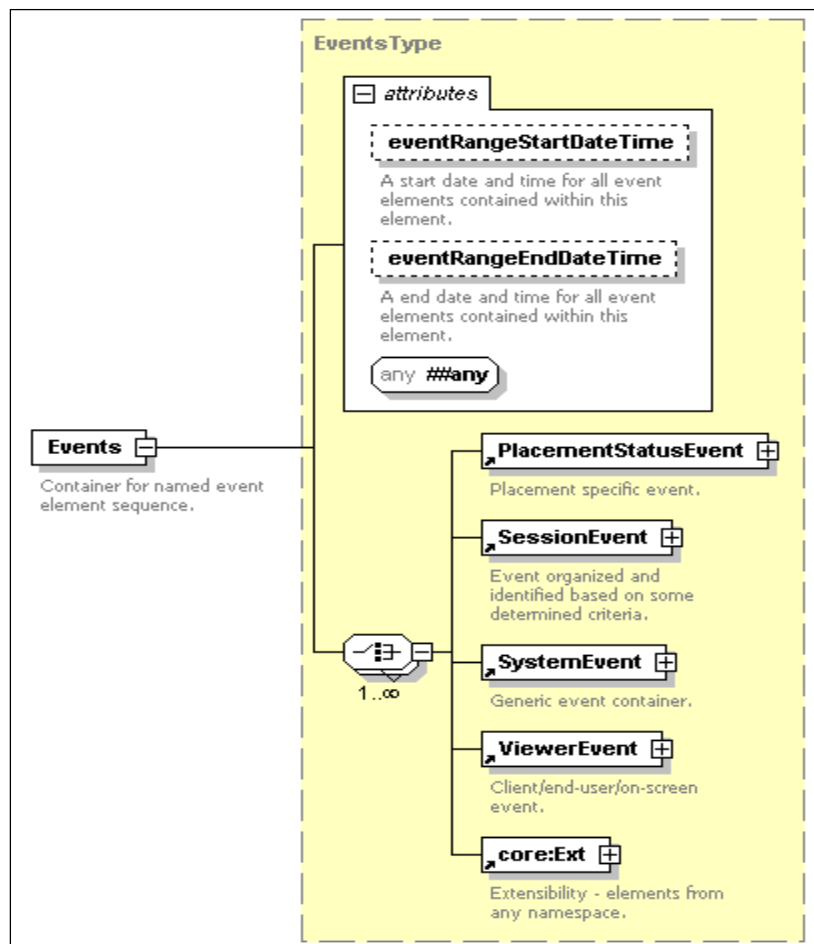


Figure 10-14 – Events element schema

10.14.1.1 Semantic definitions for the Events element

@eventRangeStartDateTime [Optional, eventRangeStartDateTimeAttrType] – An initial date and time for the named event elements contained within the choice sequence. See clause 9.1.2 for additional details.

@eventRangeEndDateTime [Optional, eventRangeEndDateTimeAttrType] – An ending date and time for the named event elements contained within the choice sequence. See clause 9.1.1 for additional details.

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

PlacementStatusEvent [Optional] – A placement status specific report. See clause 10.32 PlacementStatusEvent element for additional information.

SessionEvent [Optional] – A session specific report. See clause 10.41 for additional information.

SystemEvent [Optional] – A system specific report. See clause 10.46 for additional information.

ViewerEvent [Optional] – A viewer action report. See clause 10.49 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.14.2 Events element examples

```

<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>
      <SpotNPT scale="1">0</SpotNPT>
    </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>
      <SpotNPT scale="0">5</SpotNPT>
    </Spot>
  </ViewerEvent>
</Events>

```

10.15 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 labelling 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 [SCTE 35] for additional information.

10.15.1 LinearAvailBinding element schema

Figure 10-15 illustrates the LinearAvailBinding element's schema.

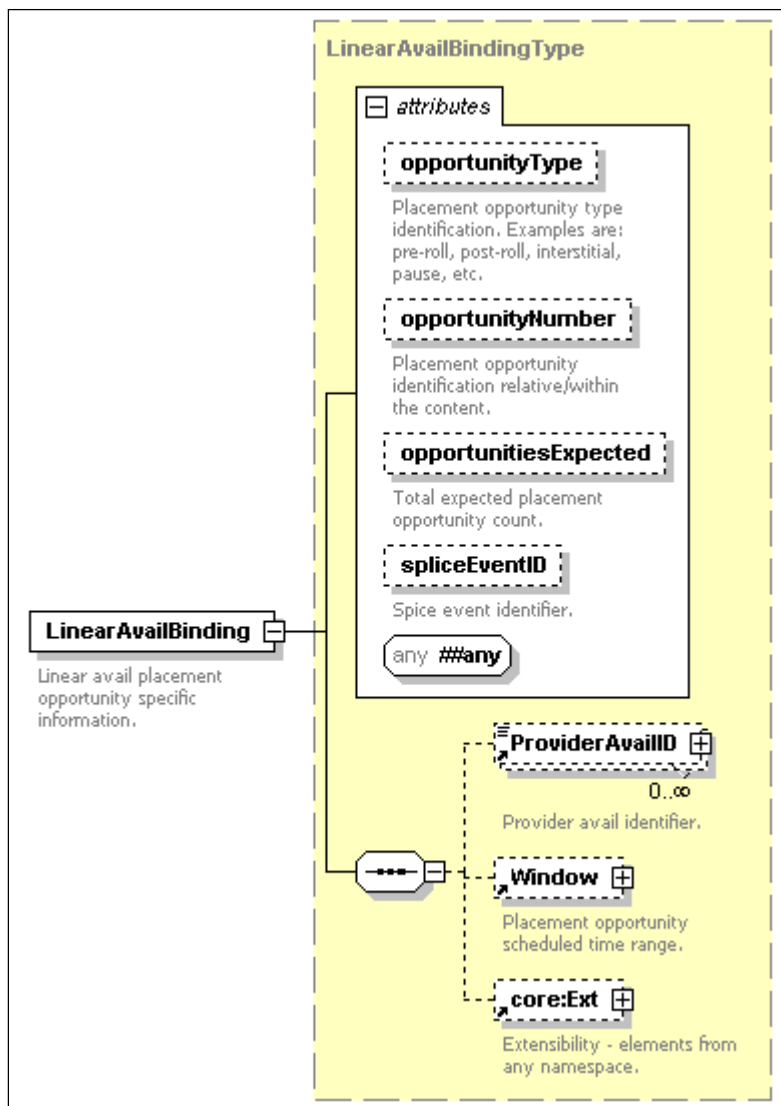


Figure 10-15 – LinearAvailBinding element schema

10.15.1.1 Semantic definitions for the LinearAvailBinding element

@opportunityType [Optional, placementOpportunityTypeAttrType] – The placement opportunity type. See clause 9.1.8 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 clause 9.1.7 for additional information.

@opportunitiesExpected [Optional, placementOpportunitiesExpectedAttrType] – The total number of planned placement opportunities relative to the entertainment content. See clause 9.1.6 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 [SCTE 35] 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 behaviour. See clause 10.35 for additional information.

Window [Optional] – The placement opportunity's scheduled time range. See clause 10.50 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The LinearAvailBinding element's value may be empty.

10.15.2 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.

10.16 MaxDuration element

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

10.16.1 MaxDuration element schema

Figure 10-16 illustrates the MaxDuration element's schema.

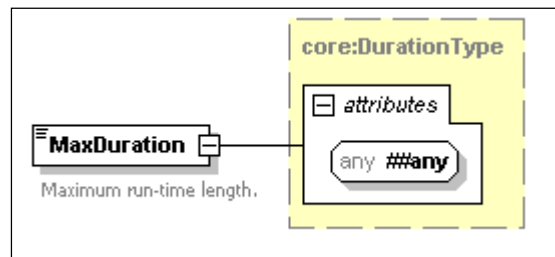


Figure 10-16 – MaxDuration element schema

10.16.1.1 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.

10.16.2 MaxDuration element examples

```

<!--One minute-->
<MaxDuration>PT1M</MaxDuration>
<MaxDuration>PT60S</MaxDuration>

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

<!--One hour, 5 minutes, 23 seconds and 666 milliseconds-->
<MaxDuration>PT1H5M23.666S</MaxDuration>

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

```

10.17 MaxPlacementCount element

The MaxPlacementCount element specifies a maximum placement count.

10.17.1 MaxPlacementCount element schema

Figure 10-17 illustrates the MaxPlacementCount element's schema.

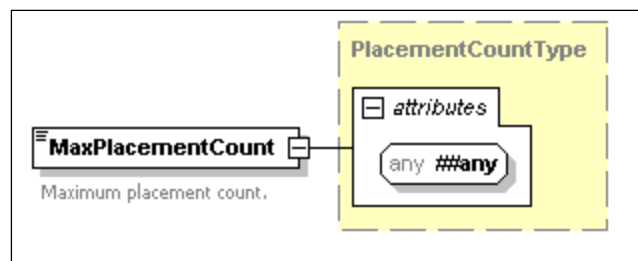


Figure 10-17 – MaxPlacementCount element schema

10.17.1.1 Semantic definitions for the MaxPlacementCount element

The MaxPlacementCount element inherits from the PlacmentCountType complex type. See clause 9.2.3 for semantic definitions applicable to this element.

10.17.2 MaxPlacementCount element examples

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

10.18 MinDuration element

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

10.18.1 MinDuration element schema

Figure 10-18 illustrates the MinDuration element's schema.

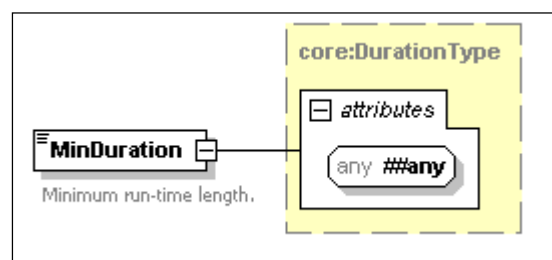


Figure 10-18 – MinDuration element schema

10.18.1.1 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`.

10.18.2 `MinDuration` element examples

```
<!--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>
```

10.19 `MinPlacementCount` element

The `MinPlacementCount` element specifies a minimum placement count.

10.19.1 `MinPlacementCount` element schema

Figure 10-19 illustrates the `MinPlacementCount` element's schema.

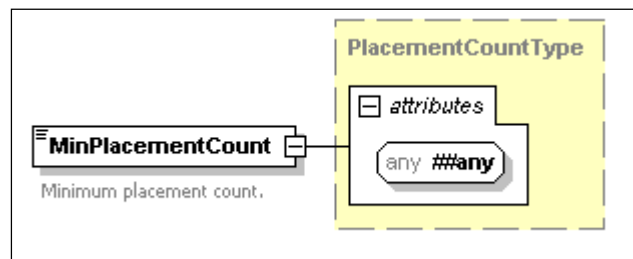


Figure 10-19 – `MinPlacementCount` element schema

10.19.1.1 Semantic definitions for the `MinPlacementCount` element

The `MinPlacementCount` element inherits from the `PlacmentCountType` complex type. See clause 9.2.3 for semantic definitions applicable to this element.

10.19.2 `MinPlacementCount` element examples

```
<MinPlacementCount>0</MinPlacementCount>
<MinPlacementCount>2</MinPlacementCount>
```

10.20 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.

10.20.1 Network element schema

Figure 10-20 illustrates the `Network` element's schema.

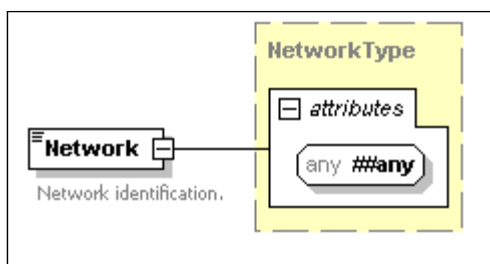


Figure 10-20 – Network element schema

10.20.1.1 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.

10.20.2 Network element examples

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

10.21 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 [IETF RFC2326].

10.21.1 NPT element schema

Figure 10-21 illustrates the NPT element's schema.

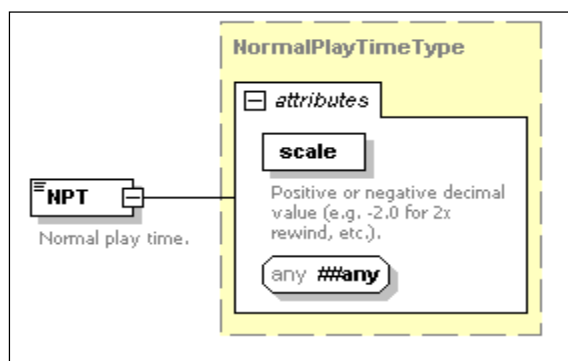


Figure 10-21 – NPT element schema

10.21.1.1 Semantic definitions for the NPT element

The NPT element inherits from the NormalPlayTimeType complex type. See clause 9.2.2 for semantic definitions applicable to this element.

10.21.2 NPT element examples

```
<!-- "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>
```

10.22 OpportunityBinding element

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

10.22.1 OpportunityBinding element schema

Figure 10-22 illustrates the OpportunityBinding element's schema.

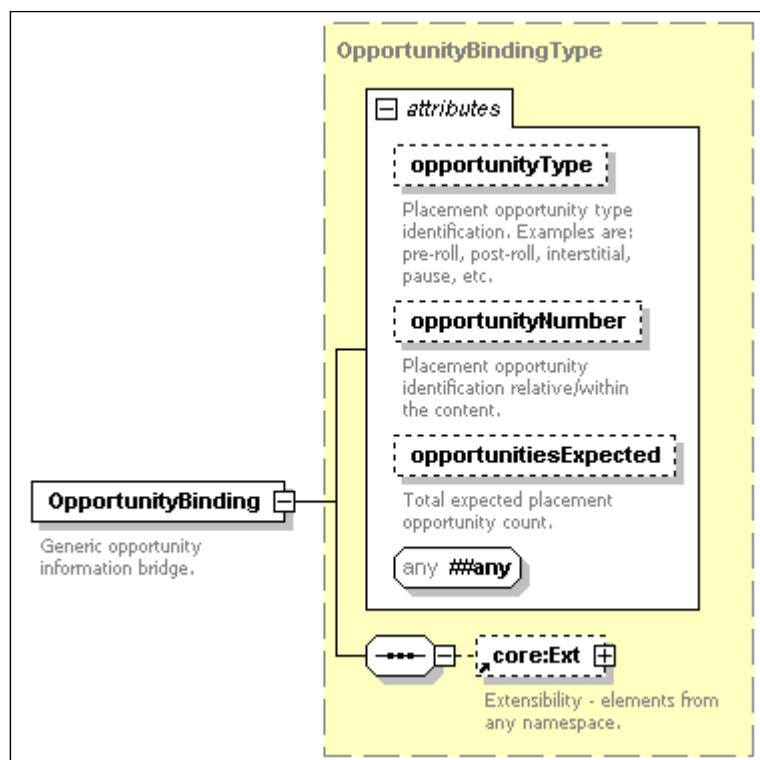


Figure 10-22 – OpportunityBinding element schema

10.22.1.1 Semantic definitions for the OpportunityBinding element

@opportunityType [Optional, placementOpportunityTypeAttrType] – The placement opportunity type. See clause 9.1.8 for additional information.

@opportunityNumber [Optional, placementOpportunityNumberAttrType] – The placement opportunity identification value relative to the entertainment content. See clause 9.1.7 for additional information.

@opportunitiesExpected [Optional, placementOpportunitiesExpectedAttrType] – The total number of planned placement opportunities relative to the entertainment content. See clause 9.1.6 for additional information.

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

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The OpportunityBinding element's value may be empty.

10.22.2 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.

10.23 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 Recommendation.

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

10.23.1 OpportunityConstraints element schema

Figure 10-23 illustrates the OpportunityConstraints element's schema.

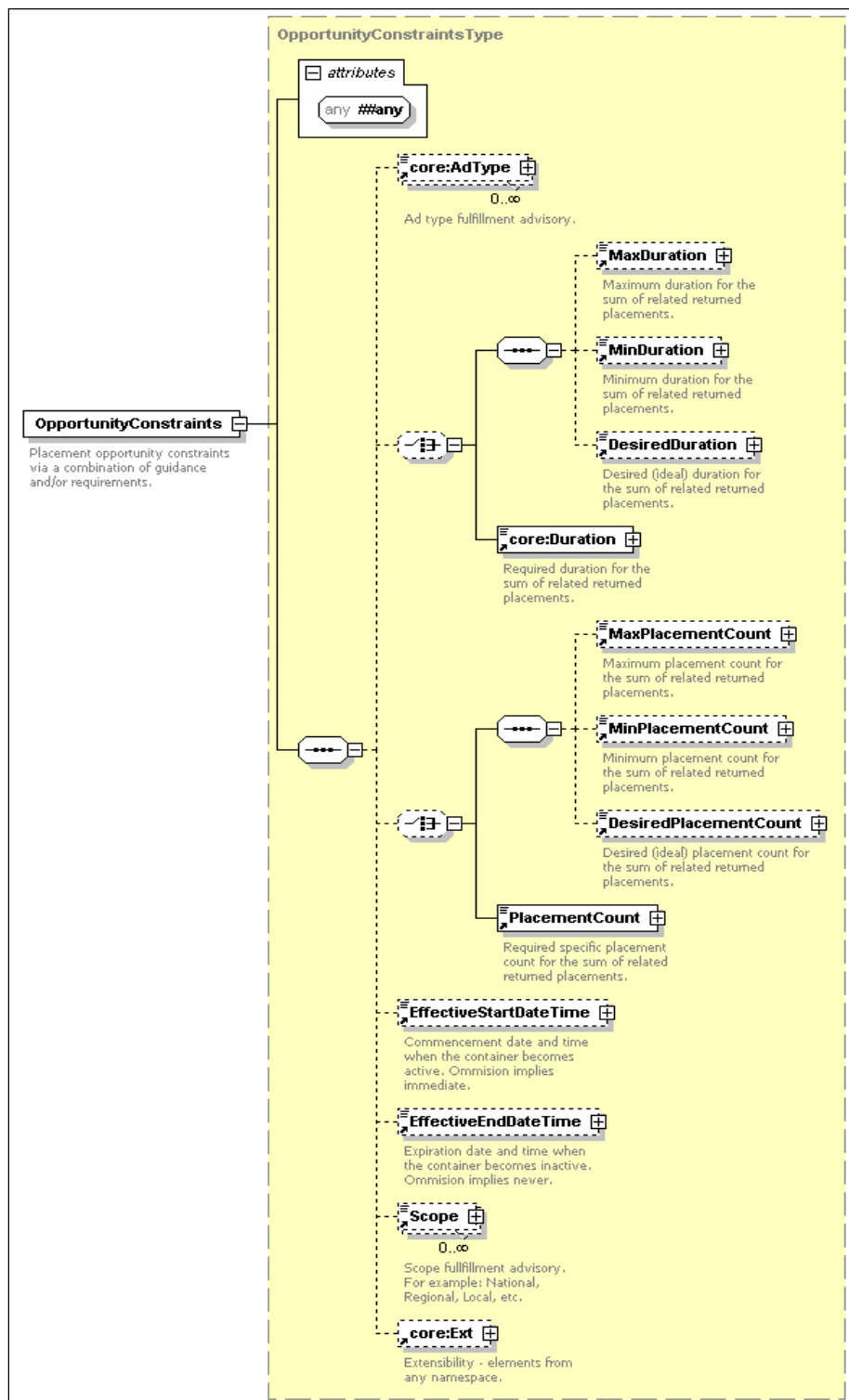


Figure 10-23 – OpportunityConstraints element schema

10.23.1.1 Semantic definitions for the OpportunityConstraints element

In this semantic definition clause, 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 [ITU-T J.380.2] 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 clause 10.16 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 clause 10.18 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 clause 10.7 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 [ITU-T J.380.2] for additional information.

MaxPlacementCount [Optional Choice] – An element specifying the maximum Placement element count that may be defined to fulfil the placement opportunity. If an exact requirement is necessary, the PlacementCount element shall be used. See clause 10.17 for additional information.

MinPlacementCount [Optional Choice] – An element specifying the minimum Placement element count that may be defined to fulfil the placement opportunity. If an exact requirement is necessary, the PlacementCount element shall be used. See clause 10.19 for additional information.

DesiredPlacementCount [Optional Choice] – An element specifying the ideal (or desired) Placement element count that may be defined to fulfil 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 clause 10.8 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 clause 10.27 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 clause 10.10 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 clause 10.9 for additional information.

Scope [Optional] – Zero or more elements specifying the fulfilment scope. See clause 10.36 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The OpportunityConstraints element's value may be empty.

10.23.2 OpportunityConstraints element examples

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

<OpportunityConstraints>
  <core:AdType>Graphic Overlay</core:AdType>
  <MaxPlacementCount>3</MaxPlacementCount>
  <EffectiveStartDateTime>2007-12-10T12:00:00Z</EffectiveStartDateTime>
  <EffectiveEndDateTime>2008-01-10T12:00:00Z</EffectiveEndDateTime>
  <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.

10.24 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 behaviour 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.

10.24.1 Placement element schema

Figure 10-24 illustrates the Placement element's schema.

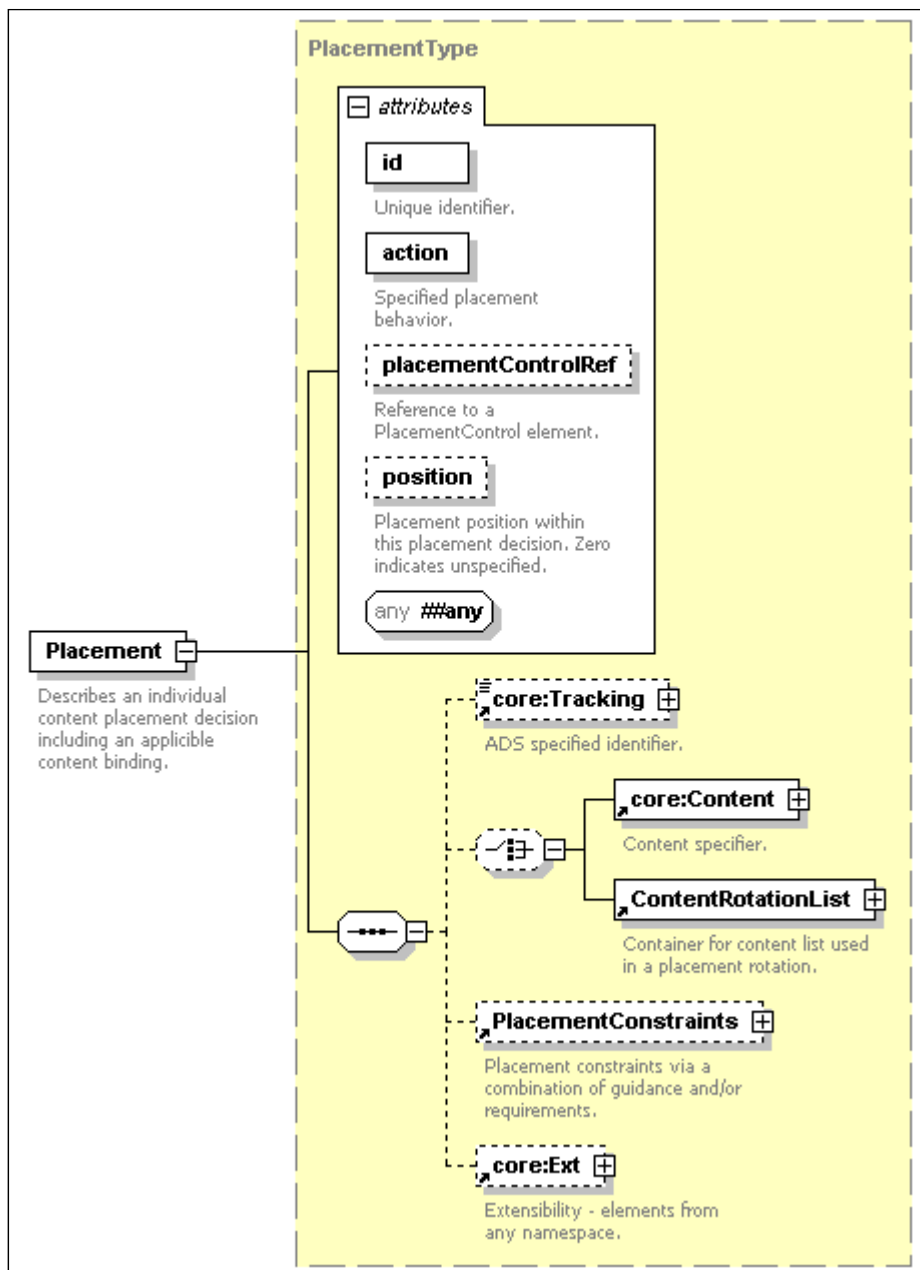


Figure 10-24 – Placement element schema

10.24.1.1 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 [ITU-T J.380.2] for additional information.

@action [Required, placementActionAttrType] – The ADS specified behaviour that the ADM shall carry out for this placement. See clause 9.1.5 for additional information. Table 10 defines attribute values and behaviours which may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 10.

Table 10 – Placement Element's @action attribute values

Value	Description
delete	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.
fill	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.
fixed	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.
replace	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.
...	User defined and outside the scope of this Recommendation. The string shall be prefixed with the text "private:".

@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 clause 9.1.9 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 [ITU-T J.380.2] for additional information. The Tracking element, if present, shall be placed into all reporting events associated with this placement. See clause 10.3 for references to the appropriate events where this element shall be echoed.

core:Content [Optional Choice] – A content binding occupying this placement position. See [ITU-T J.380.2] for additional information.

ContentRotationList [Optional Choice] – A sequence of content bindings used to satisfy the placement and its usage is outside the scope this Recommendation. See clause 10.6 for additional information.

PlacementConstraints [Optional] – The specific limitations that shall be applied to the placement. See clause 10.25 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.24.2 Placement element examples

Figure 10-25 deletes the corresponding placement opportunity.

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

Figure 10-25 – Example 34

Figure 10-26 replaces the single positional placement opportunity using the supplied content binding.

```
<Placement id="ReplacePosition1Decision" action="replace" placementControlRef="PCtrlSlot1">
  <!--Placement decision tracking.-->
  <core:Tracking>Placement tracking tag1</core:Tracking>
  <!--Content binding.-->
  <core:Content>
    <core:AssetRef providerID="contentco.com" assetID="CNC08899663683678632"/>
  </core:Content>
</Placement>
```

Figure 10-26 – Example 35

Figure 10-27 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.

```
<Placement id="ReplacePosition1Decision" action="replace" placementControlRef="PCtrlSlot1">
  <ContentRotationList>
    <core:Content>
      <!--Content tracking and binding.-->
      <core:AssetRef providerID="contentco.com" assetID="CNC08899663683678632"/>
      <core:Tracking>Placement content tracking tag1</core:Tracking>
    </core:Content>
    <core:Content>
      <!--Content tracking and binding.-->
      <core:AssetRef providerID="contentco.com" assetID="CNC08899663683678633"/>
      <core:Tracking>Placement content tracking tag2</core:Tracking>
    </core:Content>
  </ContentRotationList>
  <!--Constraints on the placement-->
  <PlacementConstraints>
    <!--Make exactly 30 seconds.-->
    <core:Duration>PT30.000S</core:Duration>
    <!--Cancellation date and time.-->
    <EffectiveEndDateTime>2009-04-03T12:00:00.0Z</EffectiveEndDateTime>
    <Scope>Local</Scope>
  </PlacementConstraints>
</Placement>
```

Figure 10-27 – Example 36

10.25 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.

10.25.1 PlacementConstraints element schema

Figure 10-28 illustrates the PlacementConstraints element's schema.

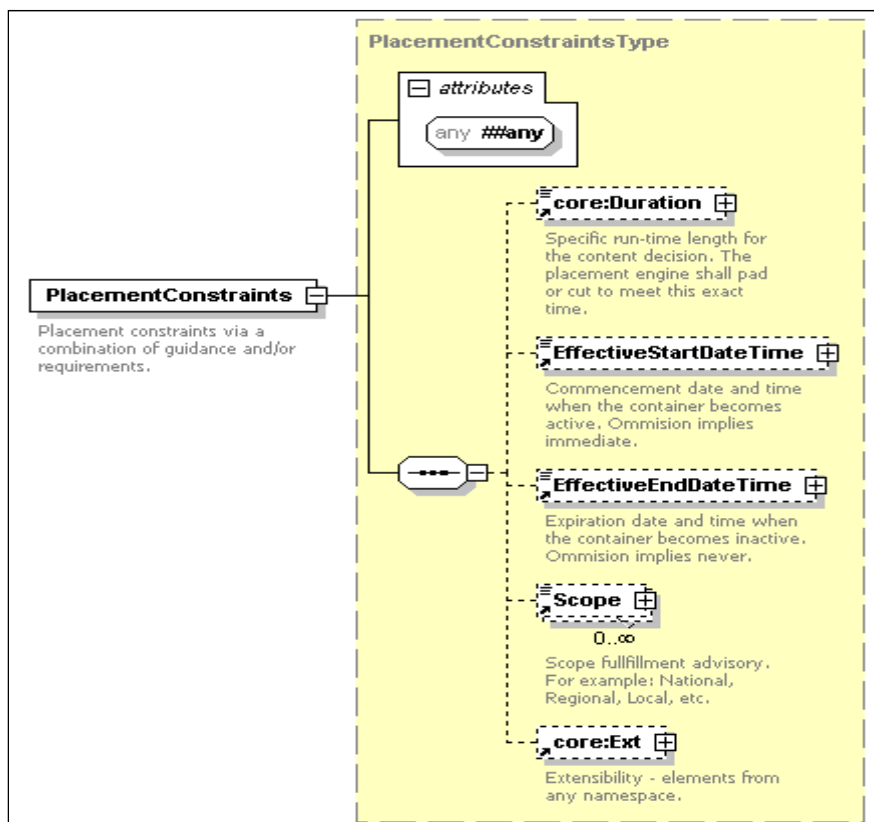


Figure 10-28 – PlacementConstraints element schema

10.25.1.1 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 [ITU-T J.380.2] for additional information.

EffectiveStartDateTime [Optional] – A date and time when the placement information becomes active. If the element is omitted, active immediately is implied. See clause 10.10 for additional information.

EffectiveEndDateTime [Optional] – A date and time when the placement information becomes inactive. If the element is omitted then active infinitely is implied. See clause 10.9 for additional information.

Scope [Optional] – A sequence of fulfilment scopes. See clause 10.36 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

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

10.25.2 PlacementConstraints element examples

```
<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.OZ</EffectiveEndDateTime>
  <!--Placement scope-->
  <Scope>Local</Scope>
</PlacementConstraints>
```

10.26 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 clause 10.1 for additional information.

10.26.1 PlacementControl element schema

Figure 10-29 illustrates the PlacementControl element's schema.

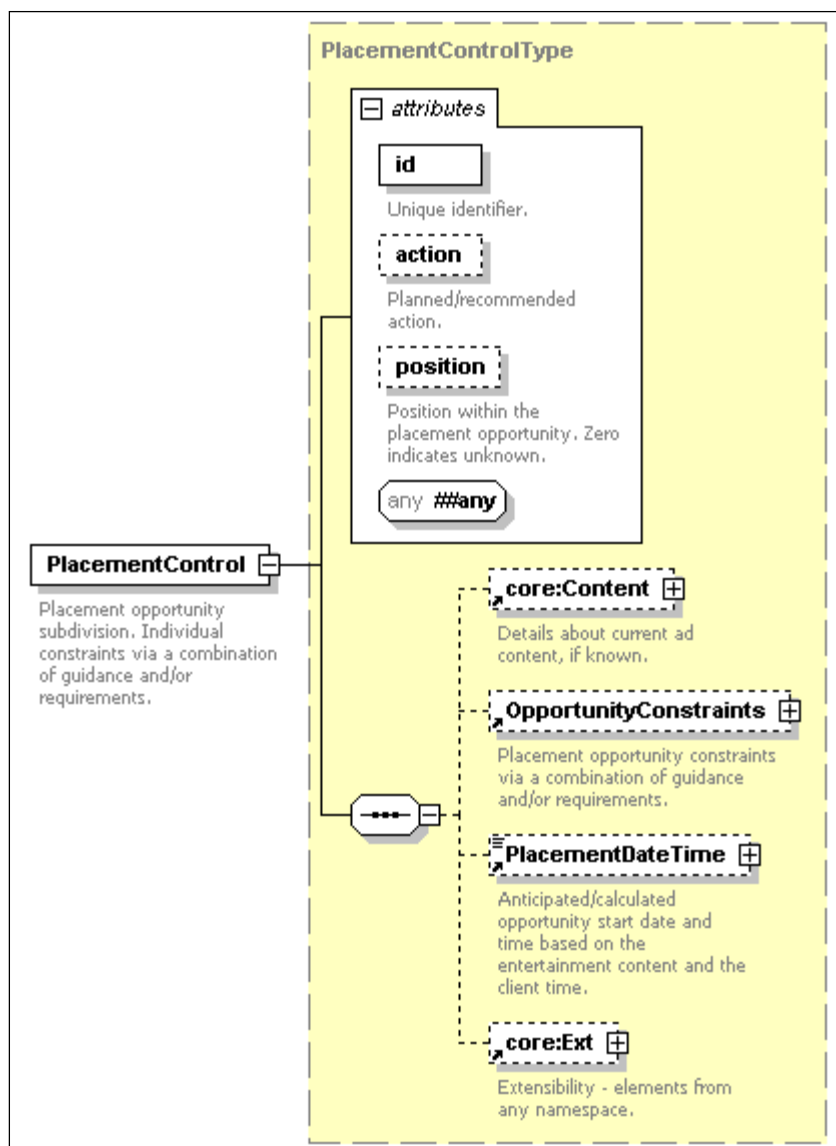


Figure 10-29 – PlacementControl element schema

10.26.1.1 Semantic definitions for the PlacementControl element

@id [Required, core:idAttrType] – An element unique identifier. See [ITU-T J.380.2] for additional information.

@action [Optional, placementActionAttrType] – The behaviour planned to be executed by the ADM. See clause 9.1.5 for additional information. Table 11 lists the defined values, which may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 11.

Table 11 – PlacementControl Element's @action attribute values

Value	Description
delete	The positional placement opportunity and its currently associated ad content are planned to be removed. Confirmation of this value by the ADS shall alter the placement structure removing the positional placement opportunity. No currently occupying ad content associated with this positional placement opportunity shall be output and any existing ad shall be removed.
fill	The positional placement opportunity is currently unoccupied and the placement decision's content bindings are planned to be added or inserted into this location.
fixed	The positional placement opportunity and its associated content shall not be altered or changed. The element is providing information only.
replace	The currently occupying ad content is planned to be replaced by the supplied content bindings.
...	User defined and outside the scope of this Recommendation. The string shall be prefixed with the text "private:".

@position [Optional, positionTypeAttr] – Positional placement opportunity subunit within the placement opportunity subdivision. See clause 9.1.9 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 [ITU-T J.380.2] for additional information.

OpportunityConstraints [Optional] – Information detailing specific limitations or requirements applicable to the placement opportunity. See clause 10.23 for additional information.

PlacementDateTime [Optional] – The expected or calculated date and time when this positional placement opportunity subunit shall be viewed. See clause 10.28 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.26.2 PlacementControl element examples

Figure 10-30 illustrates a minimum PlacementControl element which identifies by name the positional placement opportunity. This creates one positional placement opportunity within the placement opportunity context.

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

Figure 10-30 – Example 37

Figure 10-31 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.

```

<!--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>

```

Figure 10-31 – Example 38

Figure 10-32 is a placement opportunity requiring a specific ad type to "replace" the content in the second ad position.

```

<!--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>

```

Figure 10-32 – Example 39

Figure 10-33 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>

```

Figure 10-33 – Example 40

10.27 PlacementCount element

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

10.27.1 PlacementCount element schema

Figure 10-34 illustrates the PlacementCount element's schema.

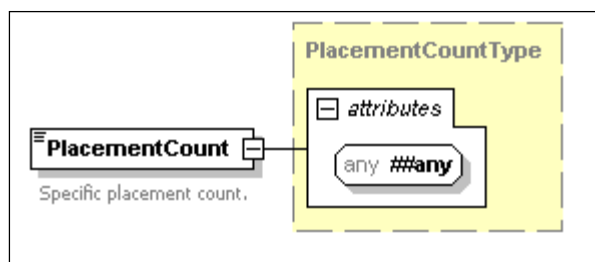


Figure 10-34 – PlacementCount element schema

10.27.1.1 Semantic definitions for the PlacementCount element

The PlacementCount element inherits from the PlacementCountType complex type. See clause 9.2.3 for semantic definitions applicable to this element.

10.27.2 PlacementCount Element examples

```
<PlacementCount>0</PlacementCount>
<PlacementCount>2</PlacementCount>
```

10.28 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.

10.28.1 PlacementDateTime element schema

Figure 10-35 illustrates the PlacementDateTime element's schema.

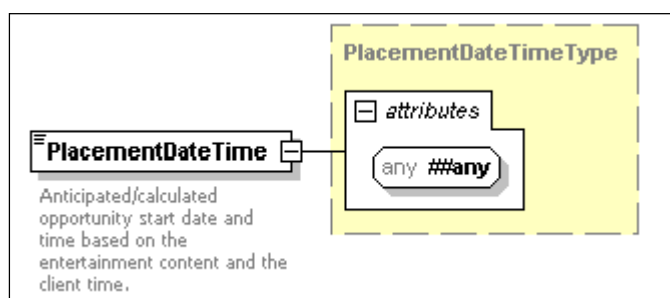


Figure 10-35 – PlacementDateTime element schema

10.28.1.1 Semantic definitions for the PlacementDateTime element

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

The PlacementDateTime element's value is of type core:dateTimeTimezoneType. See [ITU-T J.380.2] for additional information.

10.28.2 PlacementDateTime element examples

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


10.29 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 clause 10.1 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).

10.29.1 PlacementDecision element schema

Figure 10-36 illustrates the PlacementDecision element's schema.

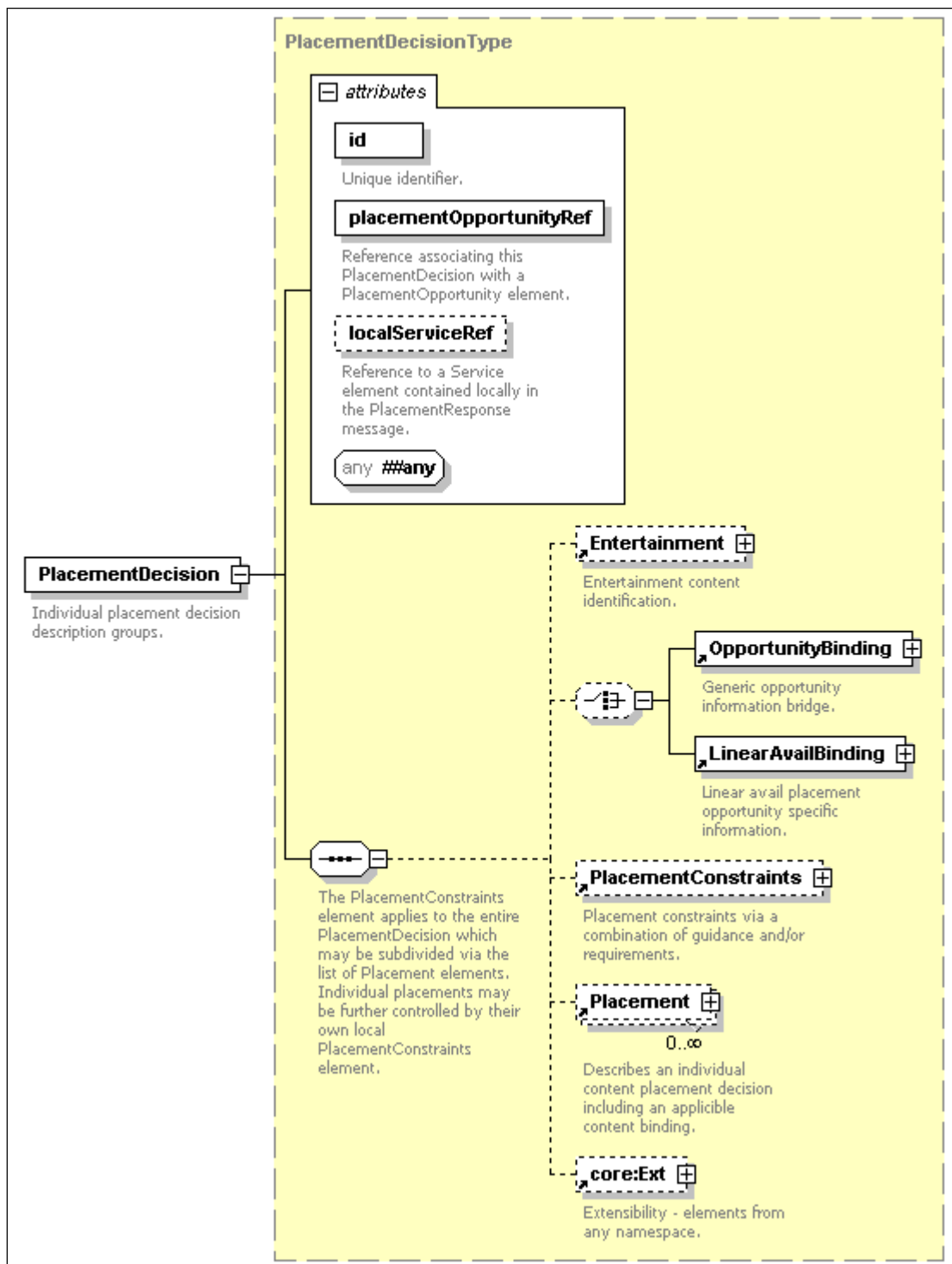


Figure 10-36 – PlacementDecision element schema

10.29.1.1 Semantic definitions for the PlacementDecision element

@id [Required, core:idAttrType] – A element unique attribute identifying this PlacementDecision element. See [ITU-T J.380.2] 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 clause 10.1 and clause 9.1.4 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 clause 10.1.2 and clause 8.2.1 respectively. See clause 10.11 for additional information on the Entertainment element.

OpportunityBinding [Optional Choice] – Information specific to defining the placement opportunity relative to the entertainment content. See clause 10.22 for additional information.

LinearAvailBinding [Optional Choice] – Information specific to a linear placement opportunity. See clause 10.15 for additional information.

PlacementConstraints [Optional] – The specific limitations that shall be applied to all placements. See clause 10.25 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 clause 10.24 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.29.2 PlacementDecision Element Examples

In Figure 10-37, the ADS is not altering the current placement arrangement. This fulfils the requirement to reference every placement opportunity.

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

Figure 10-37 – Example 41

Figure 10-38 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>
    <EffectiveStartDateTime>2007-05-31T12:00:00.0Z</EffectiveStartDateTime>
  </PlacementConstraints>
  <Placement id="Slot1 of Break2 superseding the previous placement decision at the supplied time"
action="replace">
    <!--Placement decision details....-->
  </Placement>
</PlacementDecision>
```

Figure 10-38 – Example 42

Figure 10-39 is a new placement opportunity created by the ADS.

```
<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>
```

Figure 10-39 – Example 43

10.30 PlacementDecisionOwner element

The PlacementDecisionOwner identifies the placement opportunity decision ownership.

10.30.1 PlacementDecisionOwner element schema

Figure 115 illustrates the PlacementDecisionOwner element's schema.

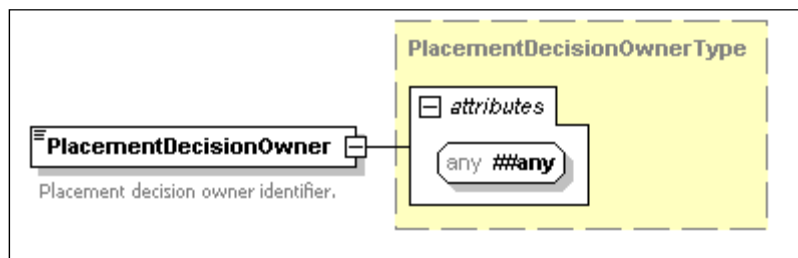


Figure 10-40 – PlacementDecisionOwner element schema

10.30.1.1 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.

10.30.2 PlacementDecisionOwner element examples

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

10.31 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 clause 8.1 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 element is used, the Entertainment element located at the message root level shall not be used (i.e., the elements are mutually exclusive).

10.31.1 PlacementOpportunity element schema

Figure 10-41 illustrates the PlacementOpportunity element's schema.

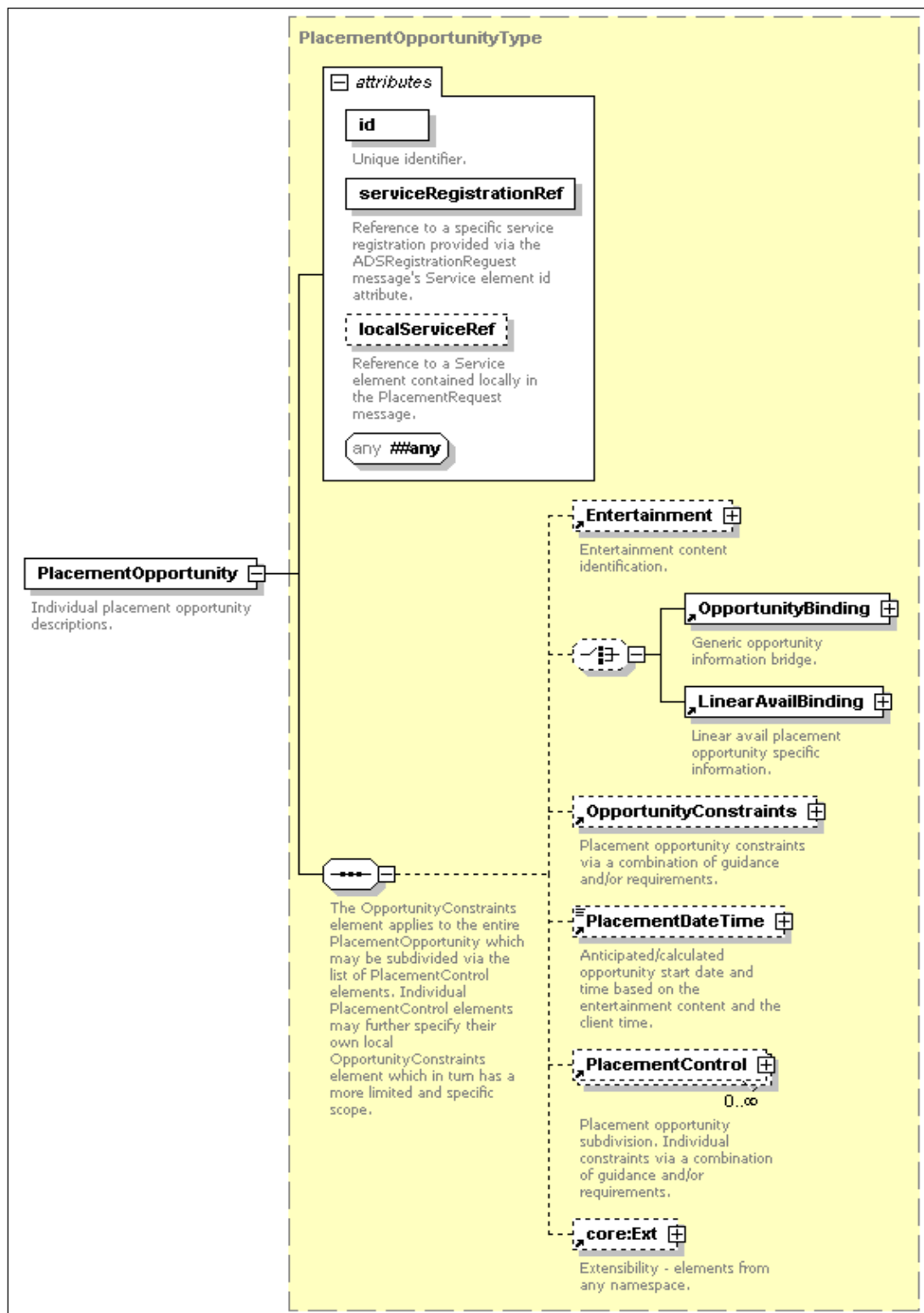


Figure 10-41 – PlacementOpportunity element schema

10.31.1.1 Semantic definitions for the PlacementOpportunity element

@id [Required, core:idAttrType] – A element unique placement opportunity identifier. See [ITU-T J.380.2] for additional information.

@serviceRegistrationRef [Required, core:idAttrType] – A cross-reference to the registration-established placement service that was "matched" facilitating the message delivery to a specific ADS. 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 clause 10.1 and [ITU-T J.380.2] 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 clause 10.1 and clause 9.1.4 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 clause 8.1.1. See clause 10.11 for additional information on the Entertainment element.

OpportunityBinding [Optional Choice] – Information specific to defining the placement opportunity relative to the entertainment content. See clause 10.22 for additional information.

LinearAvailBinding [Optional Choice] – Information specific to a linear placement opportunity. See clause 10.15 for additional information.

OpportunityConstraints [Optional] – Information detailing specific limitations or requirements applicable to the placement opportunity. See clause 10.23 for additional information.

PlacementDateTime [Optional] – Estimated placement date and time. See clause 10.28 for additional information.

PlacementControl [Optional] – Zero or more positional placement opportunity descriptions which further refine the placement opportunity. See clause 10.26 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.31.2 PlacementOpportunity element examples

Figure 10-42 is a minimum placement opportunity description. The description contains the mandatory identifier and correlation to a matching registration-established placement service.

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

Figure 10-42 – Example 44

Figure 10-43 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.

```

<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>

```

Figure 10-43 – Example 45

Figure 10-44 describes a linear replacement placement opportunity.

```

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

```

Figure 10-44 – Example 46

10.32 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.

10.32.1 PlacementStatusEvent element schema

Figure 10-45 illustrates the PlacementStatusEvent element's schema.

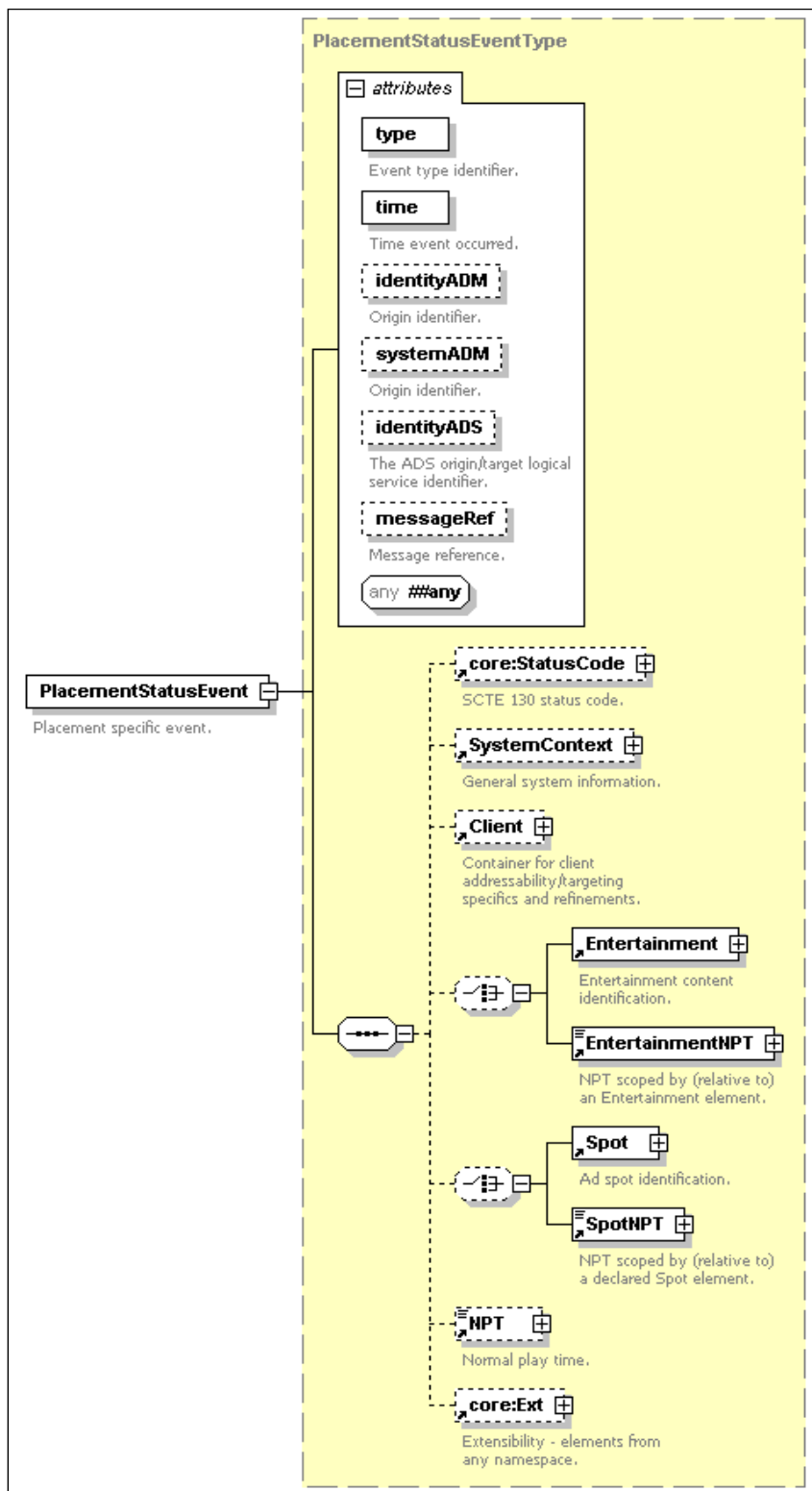


Figure 10-45 – PlacementStatusEvent element schema

10.32.1.1 Semantic definitions for the PlacementStatusEvent element

@type [Required, eventTypeAttrType] – Placement status event type identifier as defined in clause 9.2.1. Table 12 lists the defined values for this element that may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 12.

Table 12 – PlacementStatusEvent @type attribute values

Value	Description
status	The event contains placement status related status information. The event should contain a core:StatusCode element and zero or more Note elements.
startPlacement	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.
endPlacement	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.
endUpdates	The PlacementRequest message's placement decision set associated with the @messageRef attribute no longer may be altered even if the fulfilment 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.
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 Recommendation. The value shall be preceded by the string "private:".

@time [Required, core:dateTimeTimezoneType] – The event occurrence date and time. See clause 9.2.1 for additional information.

@identityADM [Optional, core:identityAttrType] – The origin ADM logical service identifier. See clause 9.2.1 for additional information.

@systemADM [Optional, core:systemAttrType] – The originating ADM system identification. See clause 9.2.1 for additional information.

@identityADS [Optional, core:identityAttrType] – The ADS origin or target logical service identifier. See clause 9.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType] – The message associated with this event. See clause 9.2.1 for additional information.

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

core:StatusCode [Optional] – An applicable status code as defined in Annex A. See clause 9.2.1 for additional information.

SystemContext [Optional] – Parameters describing the event's system context. See clause 9.2.1 for additional information.

Client [Optional] – Addressability or targeting details. See clause 9.2.1 for additional information.

Entertainment [Optional Choice] – Entertainment content asset identification. See clause 9.2.1 for additional information.

EntertainmentNPT [Optional Choice] – Entertainment NPT scoped by a higher level Entertainment element. See clause 9.2.1 for additional information.

Spot [Optional Choice] – Ad content asset identification. See clause 9.2.1 for additional information.

SpotNPT [Optional Choice] – Ad spot NPT scoped by a higher level Spot element. See clause 9.2.1 for additional information.

NPT [Optional] – Viewer perceived NPT. See clause 9.2.1 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.32.2 PlacementStatusEvent element examples

Figure 10-46 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.

```
<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>
    <SpotNPT scale="1">0</SpotNPT>
  </Spot>
</PlacementStatusEvent>
```

Figure 10-46 – Example 47

Figure 10-47 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>
    <SpotNPT scale="1">30</SpotNPT>
  </Spot>
</PlacementStatusEvent>
```

Figure 10-47 – Example 48

Figure 10-48 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">
  <SpotNPT scale="1">0</SpotNPT>
</PlacementStatusEvent>
<PlacementStatusEvent time="2007-01-31T02:30:00Z" type="endPlacement">
  <SpotNPT scale="1">30</SpotNPT>
</PlacementStatusEvent>

```

Figure 10-48 – Example 49

Figure 10-49 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.

```

<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>
    <SpotNPT scale="1">0</SpotNPT>
  </Spot>
  <NPT scale="1">310.3</NPT>
</PlacementStatusEvent>

```

Figure 10-49 – Example 50

10.33 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 clause 10.14 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 clause 10.13 and clause 10.44 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.

10.33.1 PlayData element schema

Figure 10-50 illustrates the PlayData element's schema.

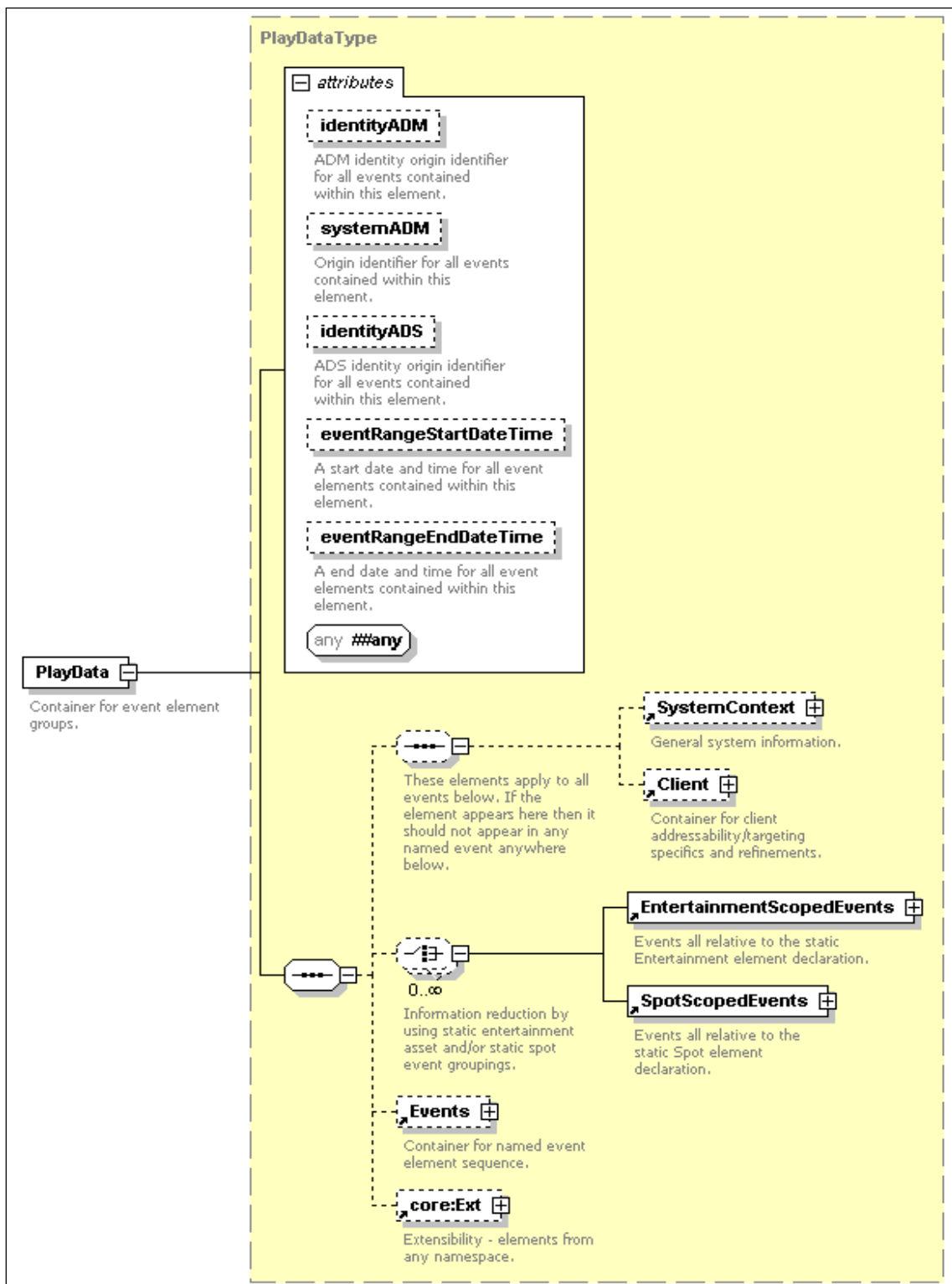


Figure 10-50 – PlayData element schema

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.

10.33.1.1 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 [ITU-T J.380.2] for additional information.

@systemADM [Optional, core:systemAttrType] – The originating ADM system identification applicable to all events contained within this PlayData element. See [ITU-T J.380.2] 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 [ITU-T J.380.2] for additional information.

@eventRangeStartDateTime [Optional, eventRangeStartDateTimeAttrType] – An initial date and time for the named event elements contained within this PlayData element. See clause 9.1.2 for additional details.

@eventRangeEndDateTime [Optional, eventRangeEndDateTimeAttrType] – An ending date and time for the named event elements contained within this Playdata element. See clause 9.1.1 for additional details.

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

SystemContext [Optional] – The system environment applicable to all listed events. See clause 10.45 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 clause 10.4 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 clause 10.13 for additional information.

SpotScopedEvents [Optional Choice] – A container for named event elements scoped by a Spot element. See clause 10.44 for additional information.

Events [Optional] – A container for named event elements describing individual events. See clause 10.14 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 [ITU-T J.380.2] for additional information.

10.33.2 PlayData element examples

The PlayData element in Figure 10-51 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.

```

<PlayData identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5"
eventRangeStartDateTime="2007-01-31T02:00:00Z" eventRangeEndDateTime="2007-01-31T02:00:30Z">
  <Events>
    <PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
      <Spot>
        <core:Content>
          <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
        </core:Content>
        <SpotNPT scale="1">0</SpotNPT>
      </Spot>
    </PlacementStatusEvent>
    <!--N more events.-->
    <PlacementStatusEvent time="2007-01-31T02:00:30Z" type="endPlacement">
      <Spot>
        <core:Content>
          <core:Tracking>5B8ECCED-979B-421E-8A6E-E2192B11516C</core:Tracking>
        </core:Content>
        <SpotNPT scale="1">30</SpotNPT>
      </Spot>
    </PlacementStatusEvent>
  </Events>
</PlayData>

```

Figure 10-51 – Example 51

Figure 10-52 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.

```

<PlayData>
  <Events>
    <SessionEvent identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5"
type="startSession" time="2008-02.22T09:30:47Z">
      <SystemContext>
        <Session>SessionID98398938</Session>
      </SystemContext>
    </SessionEvent>
    <SessionEvent identityADS="ADS_FFFFEF4-C19B-450E-B624-421B23F52FFF" type="endSession"
time="2008-02.22T09:30:48Z">
      <SystemContext>
        <Session>ID9837464</Session>
      </SystemContext>
    </SessionEvent>
  </Events>
</PlayData>

```

Figure 10-52 – Example 52

Figure 10-53 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>
  </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>

```

```

    </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">
      <SpotNPT scale="1">0</SpotNPT>
    </PlacementStatusEvent>
    <ViewerEvent time="2007-01-31T02:00:05Z" type="pause" eventSource="remote">
      <SpotNPT scale="0">5</SpotNPT>
    </ViewerEvent>
    <ViewerEvent time="2007-01-31T02:00:10Z" type="play" eventSource="remote">
      <SpotNPT scale="1">5</SpotNPT>
    </ViewerEvent>
    <PlacementStatusEvent time="2007-01-31T02:00:20Z" type="endPlacement">
      <SpotNPT scale="1">15</SpotNPT>
    </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>
      <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">
      <SpotNPT scale="1">0</SpotNPT>
    </PlacementStatusEvent>
    <ViewerEvent time="2007-01-31T02:00:35Z" type="fastForward" eventSource="remote">
      <SpotNPT scale="1">15</SpotNPT>
    </ViewerEvent>
    <ViewerEvent time="2007-01-31T02:00:36Z" type="fastForward" eventSource="remote">
      <SpotNPT scale="2">16</SpotNPT>
    </ViewerEvent>
    <ViewerEvent time="2007-01-31T02:00:37Z" type="fastForward" eventSource="remote">
      <SpotNPT scale="4">18</SpotNPT>
    </ViewerEvent>
    <PlacementStatusEvent time="2007-01-31T02:00:40Z" type="endPlacement">
      <SpotNPT scale="4">30</SpotNPT>
    </PlacementStatusEvent>
  </Events>
</SpotScopedEvents>
<Events>
  <!--Start of the entertainment asset with the subscriber still being in 4x fast forward
mode.-->
  <SessionEvent time="2007-01-31T02:00:40Z" type="startSegment">
    <EntertainmentNPT scale="4">0</EntertainmentNPT>
  </SessionEvent>
</Events>
</EntertainmentScopedEvents>
</PlayData>

```

Figure 10-53 – Example 53

10.34 ProductType element

The ProductType element provides product identification.

10.34.1 ProductType element schema

Figure 129 illustrates the ProductType element's schema.

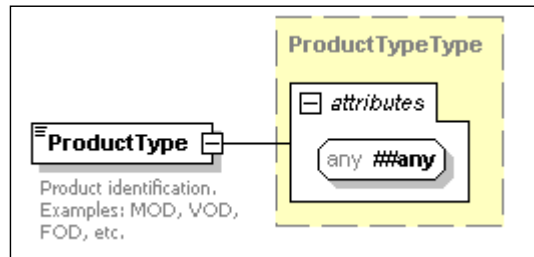


Figure 10-54 – ProductType element schema

10.34.1.1 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.

10.34.2 ProductType element examples

```
<ProductType>MOD</ProductType>  
<ProductType>FOD</ProductType>
```

10.35 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 [SCTE 35] for additional information.

10.35.1 ProviderAvailID element schema

Figure 10-55 illustrates the ProviderAvailID element's schema.

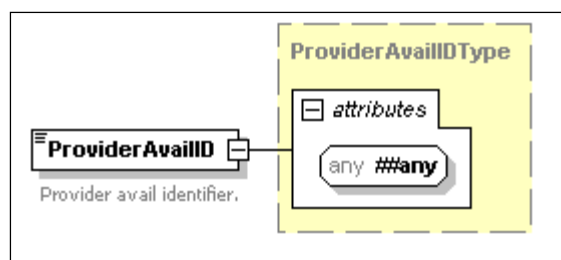


Figure 10-55 – ProviderAvailID element schema

10.35.1.1 Semantic definitions for the ProviderAvailID element

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

The ProviderAvailID element's value is of type xsd:nonNegativeInteger.

10.35.2 ProviderAvailID element examples

```
<ProviderAvailID>893</ProviderAvailID>
```

10.36 Scope element

The Scope element supplies a range fulfilment advisory.

10.36.1 Scope element schema

Figure 10-56 illustrates the Scope element's schema.

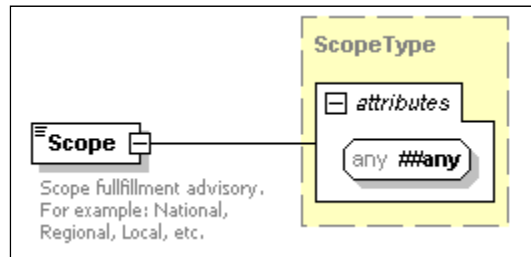


Figure 10-56 – Scope element schema

10.36.1.1 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 13 lists the defined values which may be extended by private agreement outside the scope of this Recommendation. The value shall exactly match the appearance in Table 13.

Table 13 – Scope element values

Value	Description
National	Not regional or local.
Regional	Not national or local.
Local	Not national or regional.
Provider	Not distributor. See [SCTE 35].
Distributor	Not provider. See [SCTE 35].
...	Defined outside the scope of this Recommendation and the value shall start with the string "private:".

10.36.2 Scope element examples

```
<Scope>National</Scope>
<Scope>Regional</Scope>
<Scope>Local</Scope>
<Scope>Provider</Scope>
<Scope>Distributor</Scope>
<Scope>private:Zoned</Scope>
```

10.37 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).

10.37.1 Service element schema

Figure 10-57 illustrates the Service element's schema.

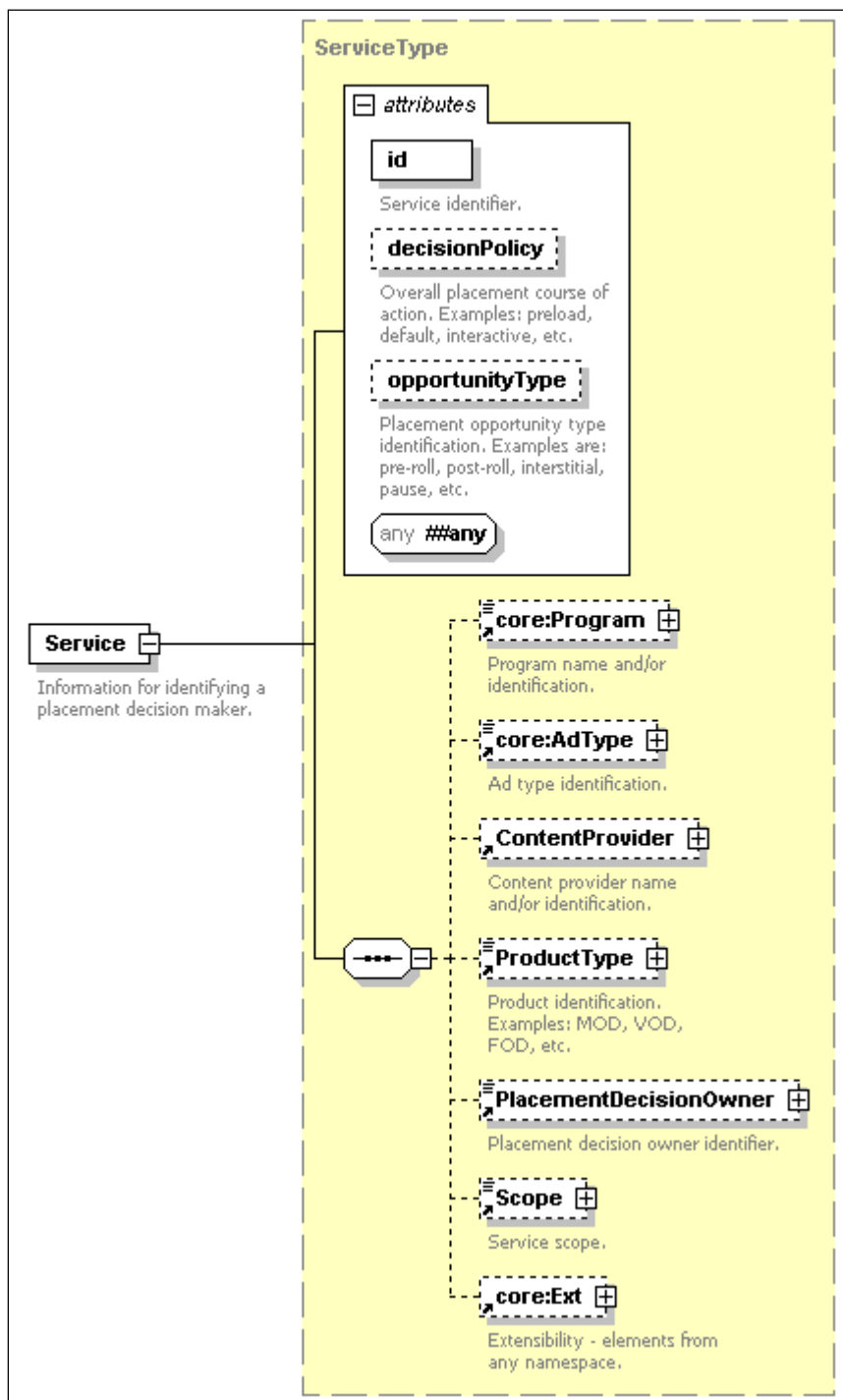


Figure 10-57 – Service element schema

10.37.1.1 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 [ITU-T J.380.2] for additional information.

@decisionPolicy [Optional, core:nonEmptyStringType] – Table 14 lists the defined values, which may be extended by private agreement outside the scope of this Recommendation. The value shall exactly match the appearance in Table 14 and the value shall not be empty.

Table 14 – Service/@decisionPolicy attribute values

Value	Description
default	The ADS placement decisions shall 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 shall signal if updates are allowed as part of the PlacementRequest message requesting the default placement decision set.
interactive	The ADM shall perform a placement message exchange requesting the placement decision set. The response decision set shall only be applied a single time. The ADM shall signal if updates are allowed as part of the PlacementRequest message.
preload	Placement decisions shall be requested in advance, typically using a single PlacementRequest message, and these decisions shall be applied as often as applicable thereafter. The ADM shall not perform a placement message exchange before applying these decisions. The ADM shall signal if updates are allowed as part of the PlacementRequest message when acquiring the preload placement decision set.
...	User defined and outside the scope of this Recommendation. The string shall be prefixed with the text "private:".

@opportunityType [Optional, placementOpportunityTypeAttrType] – Placement opportunity type identifier to match. See clause 9.1.8 for additional information.

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

core:Program [Optional] – The Program identifier value to match or that was matched. See [ITU-T J.380.2] for additional information.

core:AdType [Optional] – The ad type identifier value to match or that was matched. See [ITU-T J.380.2] for additional information.

ContentProvider [Optional] – The content source identifier value to match or that was matched. See clause 10.5 for additional information.

ProductType [Optional] – The product type identifier value to match or that was matched. See clause 10.34 for additional information.

PlacementDecisionOwner [Optional] – The placement decision owner value to match or that was matched. See clause 10.30 for additional information.

Scope [Optional] – The service scope value to match or that was matched. See clause 10.36 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.37.2 Service element examples

Figure 10-58 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.

```
<Service id="All Services"/>
```

Figure 10-58 – Example 54

Figure 10-59 illustrates a placement service being identified in part using the @uniqueProgramID value.

```
<Service id="Service1">
  <core:Program uniqueProgramID="345"/>
</Service>
<Service id="Service1" decisionPolicy="interactive">
  <core:Program uniqueProgramID="345"/>
</Service>
```

Figure 10-59 – Example 55

Figure 10-60 illustrates a placement service being identified in part as ad type matching the string "Telescoping" and being owned by identifier "Walt."

```
<Service id="Service2" decisionPolicy="default">
  <core:AdType>Telescoping</core:AdType>
  <PlacementDecisionOwner>Walt</PlacementDecisionOwner>
</Service>
```

Figure 10-60 – Example 56

Figure 10-61 is a placement service for the pause opportunity type.

```
<Service id="Service5" opportunityType="pause" decisionPolicy="interactive"/>
```

Figure 10-61 – Example 57

Figure 10-62 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>
```

Figure 10-62 – Example 58

10.38 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.

10.38.1 ServiceDescription element schema

Figure 10-63 illustrates the ServiceDescription element's schema.

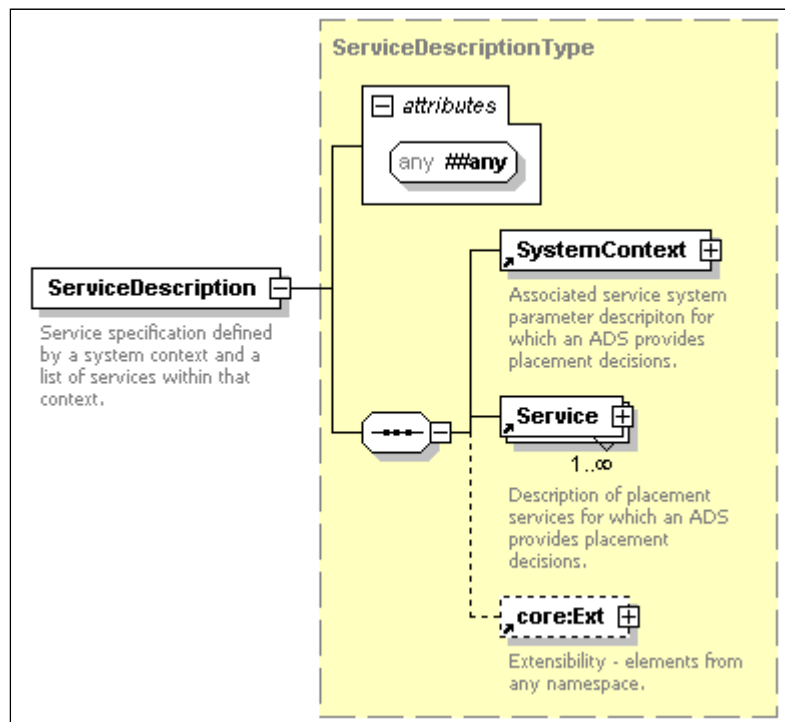


Figure 10-63 – ServiceDescription element schema

10.38.1.1 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 clause 10.45 for additional information.

Service [Required] – One or more elements each identifying a service relative to the SystemContext parameters. See clause 10.37 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 [ITU-T J.380.2] for additional information.

10.38.2 ServiceDescription Element Examples

Figure 10-64 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.

```
<ServiceDescription>
  <SystemContext/>
  <Service id="All Services"/>
</ServiceDescription>
```

Figure 10-64 – Example 59

Figure 10-65 illustrates a placement service identified primarily using the SystemContext element.

```
<ServiceDescription>
  <SystemContext>
    <Zone>ESPNWest</Zone>
  </SystemContext>
  <Service id="EspnWestZone"/>
</ServiceDescription>
```

Figure 10-65 – Example 60

Figure 10.66 illustrates a placement service identified primarily using the Service element.

```
<ServiceDescription>
  <SystemContext/>
  <Service id="AvailTypeOnly" opportunityType="pause"/>
</ServiceDescription>
```

Figure 10-66 – Example 61

Figure 10-67 illustrates a placement service identified using a combination of the SystemContext and Service elements.

```
<ServiceDescription>
  <SystemContext>
    <Network>ESPN</Network>
    <Channel>ESPN 8</Channel>
  </SystemContext>
  <Service id="The Ocho">
    <core:AdType>Telescoping</core:AdType>
    <Scope>Provider</Scope>
  </Service>
</ServiceDescription>
```

Figure 10-67 – Example 62

10.39 ServiceGroup element

The ServiceGroup element provides collection association identification. Traditionally, this organization identifies physical grouping aspects based on the fulfilment 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 Recommendation.

10.39.1 ServiceGroup element schema

Figure 10-68 illustrates the ServiceGroup element's schema.

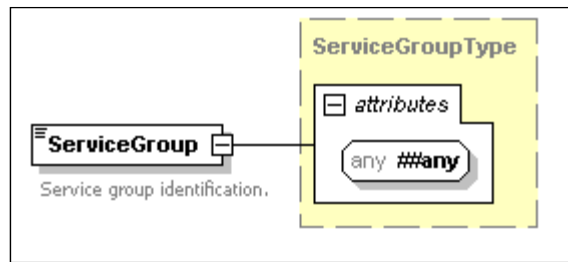


Figure 10-68 – ServiceGroup element schema

10.39.1.1 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.

10.39.2 ServiceGroup element examples

```
<ServiceGroup>IceHockeyLovers</ServiceGroup>
<ServiceGroup>83983</ServiceGroup>
```

10.40 Session element

The Session element provides session identification typically associated, but not limited to, a resource set in the fulfilment system.

10.40.1 Session element schema

Figure 10-69 illustrates the Session element's schema.

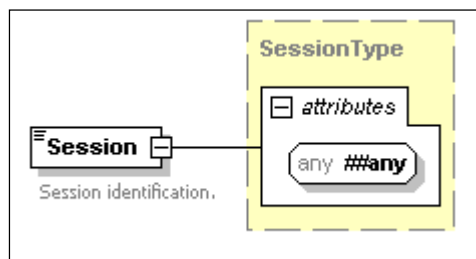


Figure 10-69 – Session element schema

10.40.1.1 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.

10.40.2 Session element examples

```
<Session>SharksWinIn2008</Session>
<Session>GuysSession</Session>
<Session>38793893</Session>
<Session>8FA2C7BD.2751-4D18-A2C6-372D8CE5F100</Session>
```


10.41 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.

10.41.1 SessionEvent element schema

Figure 10-70 illustrates the SessionEvent element's schema.

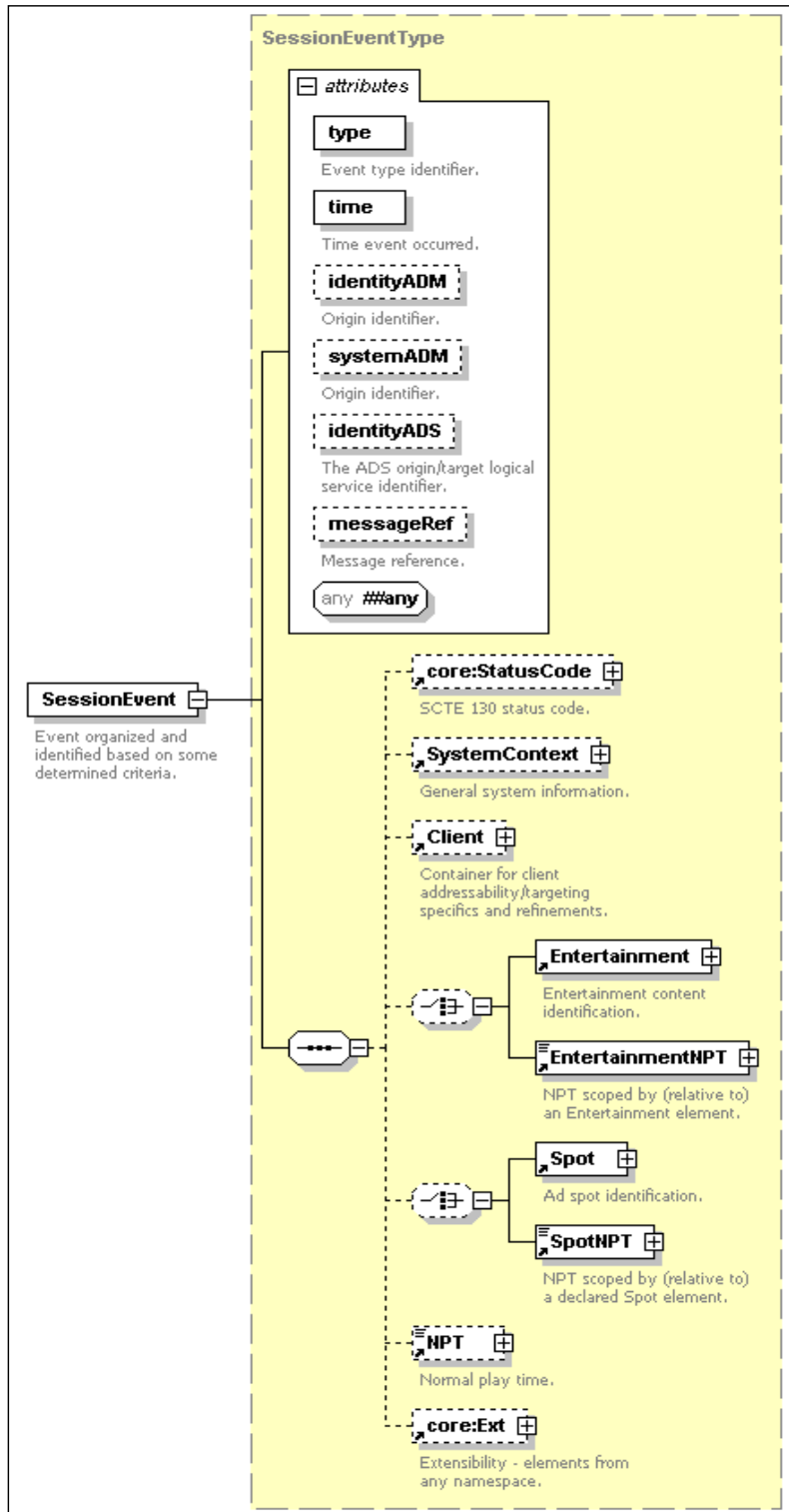


Figure 10-70 – SessionEvent element schema

10.41.1.1 Semantic definitions for the SessionEvent element

@type [Required, eventTypeAttrType] – Session event type identifier as defined in clause 9.2.1. Table 15 lists the defined values for this element that may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 15.

Table 15 – SessionEvent @type attribute values

Value	Description
status	The event contains session related status information. The event should contain a core:StatusCode element and zero or more Note elements.
startSegment	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.
endSegment	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.
startSession	The event indicates the session start. Either this event element or a higher level scoped element should contain a Session element.
endSession	The event indicates the session end. Either this event element or a higher level scoped element should contain a Session element.
...	User defined and outside the scope of this Recommendation. The value shall be preceded by the string "private:".

startSegment and endSegment shall be used in the same manner as startPlacement and endPlacement as described in clause 8.3 with the difference being StartSegment and endSegment refer to Entertainment element content bindings not Placement element content bindings.

@time [Required, core:dateTimeTimezoneType] – The event occurrence date and time. See clause 9.2.1 for additional information.

@identityADM [Optional, core:identityAttrType] – The origin ADM logical service identifier. See clause 9.2.1 for additional information.

@systemADM [Optional, core:systemAttrType] – The originating ADM system identification. See clause 9.2.1 for additional information.

@identityADS [Optional, core:identityAttrType] – The ADS origin or target logical service identifier. See clause 9.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType] – The message associated with this event. See clause 9.2.1 for additional information.

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

core:StatusCode [Optional] – An applicable status code as defined in Annex A. See clause 9.2.1 for additional information.

SystemContext [Optional] – Parameters describing the event's system context. See clause 9.2.1 additional information.

Client [Optional] – Addressability or targeting details. See clause 9.2.1 for additional information.

Entertainment [Optional Choice] – Entertainment content asset identification. See clause 9.2.1 for additional information.

EntertainmentNPT [Optional Choice] – Entertainment NPT scoped by a higher level Entertainment element. See clause 9.2.1 for additional information.

Spot [Optional Choice] – Ad content asset identification. See clause 9.2.1 for additional information.

SpotNPT [Optional Choice] – Ad spot NPT scoped by a higher level Spot element. See clause 9.2.1 for additional information.

NPT [Optional] – User perceived NPT. See clause 9.2.1 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.41.2 SessionEvent element examples

```
<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>
```

10.42 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 SpotNPT element.

The element shall also include any core:Tracking elements provided in a Placement element. See clause 10.3 for additional information.

10.42.1 Spot element schema

Figure 10-71 illustrates the Spot element's schema.

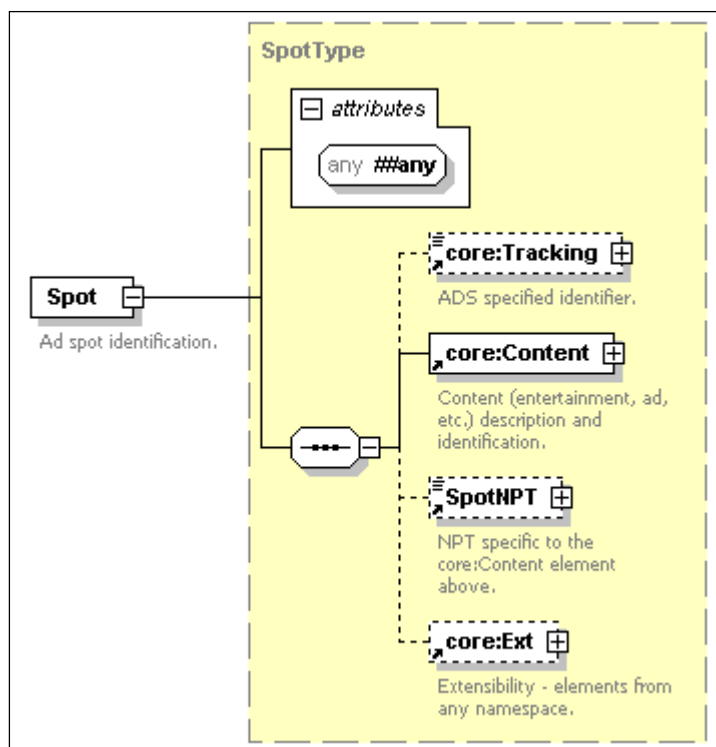


Figure 10-71 – Spot element schema

10.42.1.1 Semantic definitions for the Spot element

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

core:Tracking [Optional] – An ADS assigned core:Tracking element. See [ITU-T J.380.2] 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 [ITU-T J.380.2] 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] – Play time reference relative to the core:Content element contained within this Spot element. See clause 10.43 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.42.2 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>
  <SpotNPT scale="1.0">26</SpotNPT>
</Spot>
```

10.43 SpotNPT element

The spot normal play time element (SpotNPT) indicates the stream absolute position relative to the beginning of the referenced ad spot content. This element inherits from the NormalPlayTimeType complex type defined in clause 9.2.2.

10.43.1 SpotNPT element schema

Figure 10-72 illustrates the SpotNPT element's schema

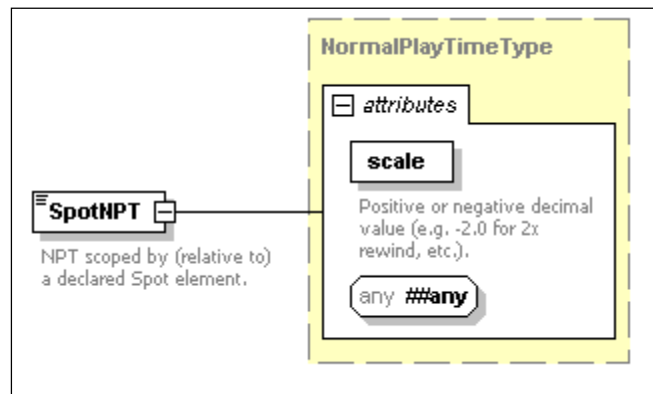


Figure 10-72 – SpotNPT element schema

10.43.1.1 Semantic definitions for the SpotNPT

The SpotNPT element inherits from the NormalPlayTimeType complex type. See clause 9.2.2 for semantic definitions applicable to this element.

10.43.2 SpotNPT element examples

```
</SessionEvent> <!--Rewind at 2x speed at the 30 second mark.-->
<SpotNPT scale=".2">30.0</SpotNPT>

<!--Normal play speed (i.e., 1x) at the 26 second mark.-->
<SpotNPT scale="1.0">26</SpotNPT>

<!--Normal play speed (i.e., 1x) at the 30.33 second mark.-->
<SpotNPT scale="1">30.33</SpotNPT>
```

10.44 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.

10.44.1 SpotScopedEvents element schema

Figure 10-73 illustrates the SpotScopedEvents element's schema.

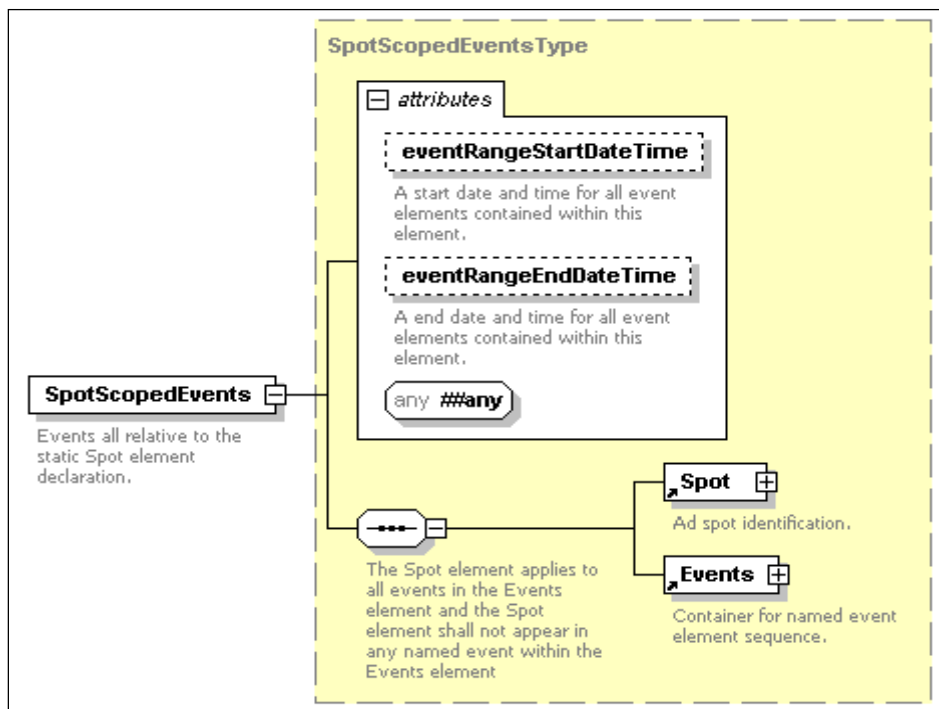


Figure 10-73 – SpotScopedEvents element schema

10.44.1.1 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 clause 9.1.2 for additional details.

@eventRangeEndDateTime [Optional, eventRangeEndDateTimeAttrType] – An ending date and time relative to the named event elements contained within the Events element. See clause 9.1.1 for additional details.

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

Spot [Required] – Spot content identification. See clause 10.42 for additional details.

Events [Required] – A container for named event elements. See clause 10.14 for additional information.

The Spot element may contain a SpotNPT element and each named event element contained within the Events element may also contain a SpotNPT 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 time point within the range.

10.44.2 SpotScopedEvents element examples

```
<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">
      <SpotNPT scale="1">0</SpotNPT>
    </PlacementStatusEvent>
    <PlacementStatusEvent time="2007-01-31T02:00:30Z" type="endPlacement">
      <SpotNPT scale="1">30</SpotNPT>
    </PlacementStatusEvent>
  </Events>
</SpotScopedEvents>
```

10.45 SystemContext element

The SystemContext element is a container for the system and environment specific elements.

10.45.1 SystemContext element schema

Figure 10-74 illustrates the SystemContext element's schema.

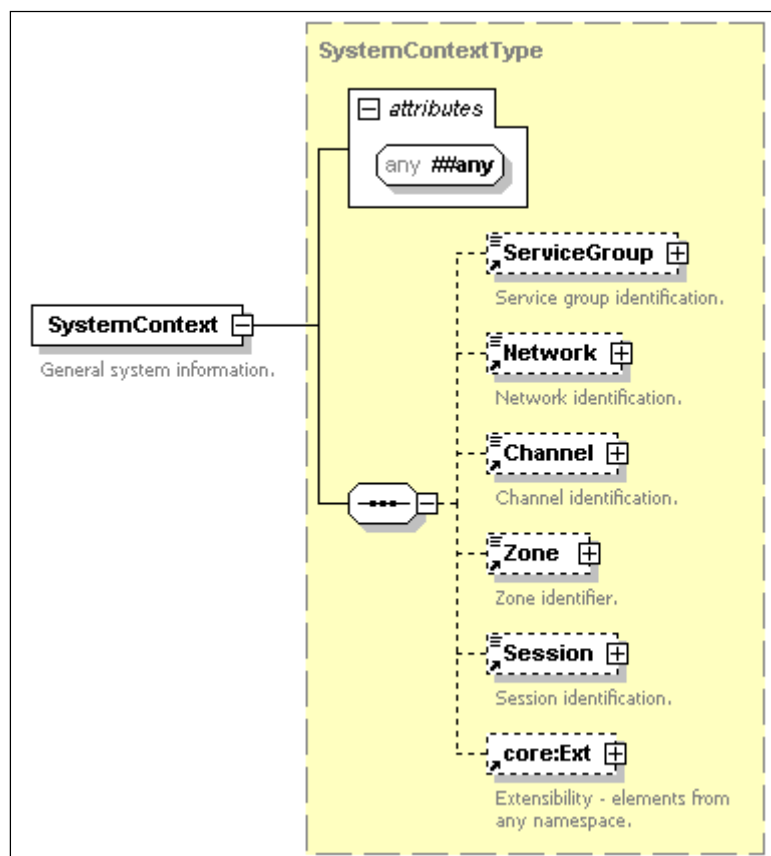


Figure 10-74 – SystemContext element schema

10.45.1.1 Semantic definitions for the SystemContext element

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

ServiceGroup [Optional] – Service group identification. See clause 10.39 for additional information.

Network [Optional] – Network identification. See clause 10.20 for additional information.

Channel [Optional] – Channel identification. See clause 10.3 for additional information.

Zone [Optional] – Zone identification. See clause 10.51 for additional information.

Session [Optional] – Session identification. See clause 10.40 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The SystemContext element may be empty (typically as part of a ServiceDescription element).

10.45.2 SystemContext element examples

```
<SystemContext>
  <ServiceGroup>Den</ServiceGroup>
  <Network>SharksNet</Network>
  <Zone>5</Zone>
  <Session>Session123</Session>
</SystemContext>
```

10.46 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.

10.46.1 SystemEvent element schema

Figure 10-75 illustrates the SystemEvent element's schema.

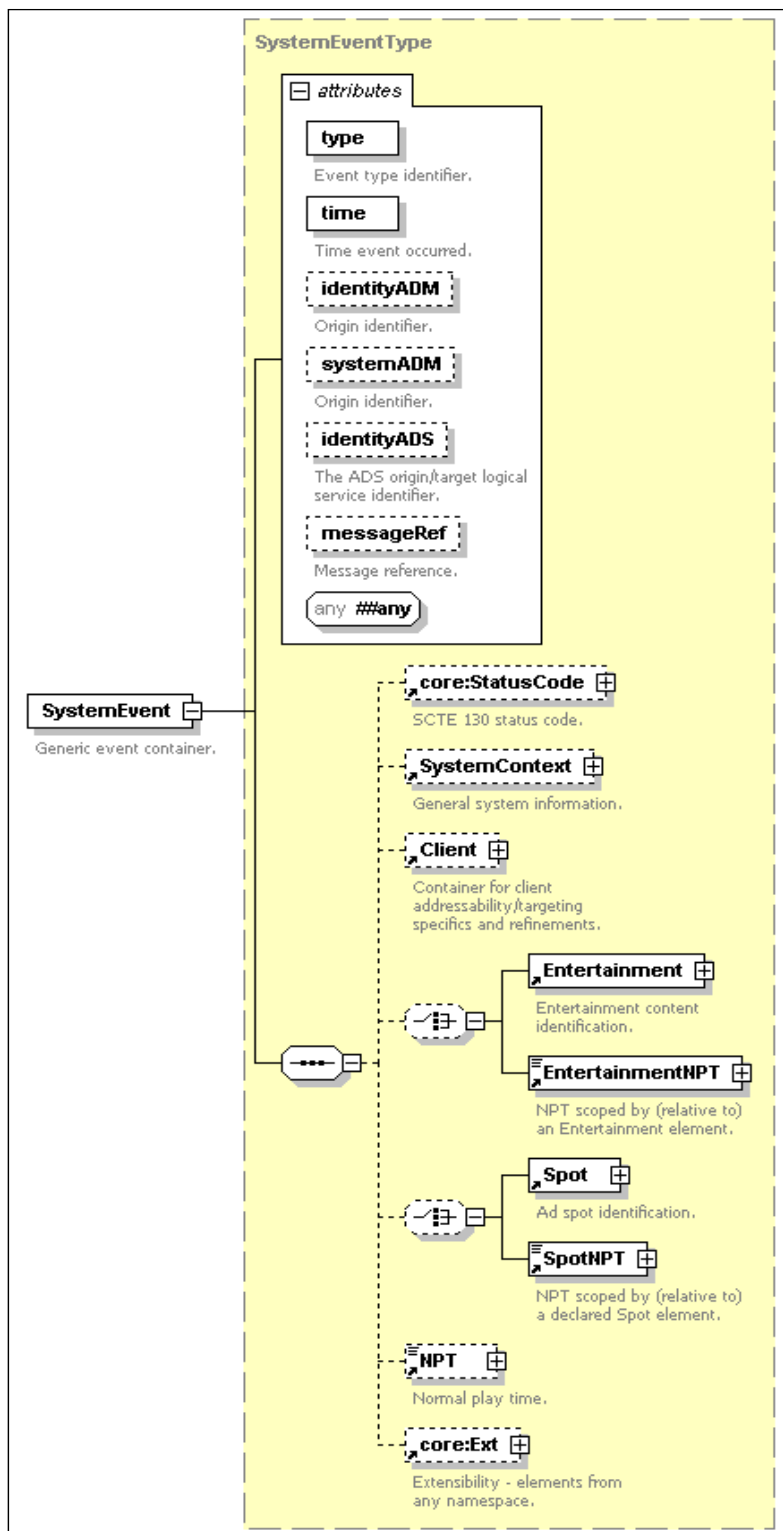


Figure 10-75 – SystemEvent element schema

10.46.1.1 Semantic definitions for the SystemEvent element

@type [Required, eventTypeAttrType] – The event identifier. See clause 9.2.1 for additional information. Table 16 lists the defined values for this element which may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 16.

Table 16 – SystemEvent @type attribute values

Value	Description
status	The event contains related status information. The event should contain a core:StatusCode element and zero or more Note elements.
...	User defined and outside the scope of this Recommendation. The value shall be preceded by the string "private:".

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

@identityADM [Optional, core:identityAttrType] – The origin ADM logical service identifier. See clause 9.2.1 for additional information.

@systemADM [Optional, core:systemAttrType] – The originating ADM system identification. See clause 9.2.1 for additional information.

@identityADS [Optional, core:identityAttrType] – The ADS origin or target logical service identifier. See clause 9.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType] – The message associated with this event. See clause 9.2.1 for additional information.

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

core:StatusCode [Optional] – An applicable status code as defined in Annex A. See clause 9.2.1 for additional information.

SystemContext [Optional] – Parameters describing the event's system context. See clause 9.2.1 for additional information.

Client [Optional] – Addressability or targeting details. See clause 9.2.1 for additional information.

Entertainment [Optional Choice] – Entertainment content asset identification. See clause 9.2.1 for additional information.

EntertainmentNPT [Optional Choice] – Entertainment NPT scoped by a higher level Entertainment element. See clause 9.2.1 for additional information.

Spot [Optional Choice] – Ad content asset identification. See clause 9.2.1 for additional information.

SpotNPT [Optional Choice] – Ad spot NPT scoped by a higher level Spot element. See clause 9.2.1 for additional information.

NPT [Optional] – User perceived NPT. See clause 9.2.1 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

10.46.2 SystemEvent element examples

```
<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>
```

10.47 TargetCode element

The TargetCode element facilitates specific targeting criteria description by the use of a key/value pair.

10.47.1 TargetCode element schema

Figure 10-76 illustrates the TargetCode element's schema.

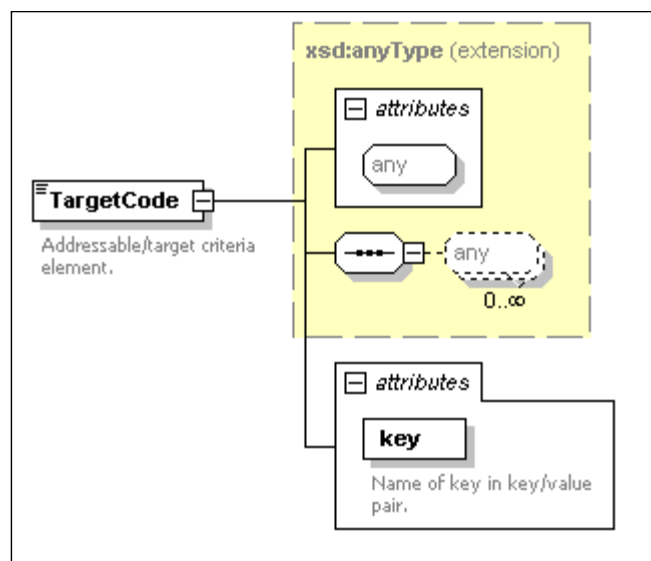


Figure 10-76 – TargetCode element schema

10.47.1.1 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.

10.47.2 TargetCode element examples

```
<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>
```

10.48 TerminalAddress element

The TerminalAddress element identifies a client endpoint.

10.48.1 TerminalAddress element schema

Figure 10-77 illustrates the TerminalAddress element's schema.

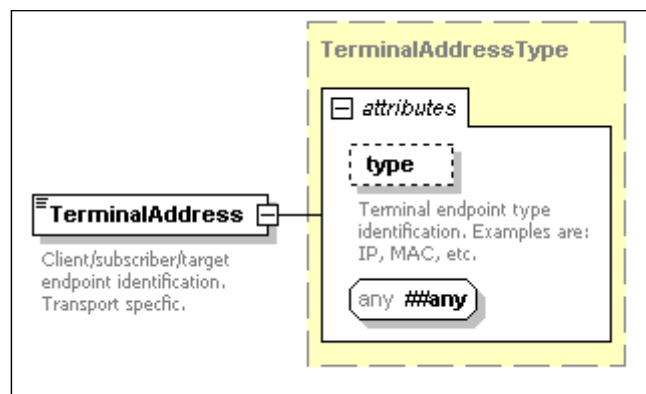


Figure 10-77 – TerminalAddress element schema

10.48.1.1 Semantic definitions for the TerminalAddress element

@type [Optional, core:nonEmptyStringType] – Interpretation identification for the element. Table 17 lists the defined values which may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 17.

Table 17 – TerminalAddress Element's @type attribute values

Value	Description
IP	An IP version 4 (IPv4) address or an IP version 6 (IPv6) address and the address may optionally include a port identifier. The TerminalAddress element's value shall be an IPv4 or IPv6 address conformant with the addressing formats defined in [ITU-T J.380.2]. See [ITU-T J.380.2] for additional information.
MAC	A 6 byte IEEE MAC address. The TerminalAddress element's value shall be a MAC address conformant with the addressing formats defined in ITU-T J.380.2. See [ITU-T J.380.2] for additional information.
...	User defined and outside the scope of this Recommendation. The value shall be preceded by the string "private:".

@##any [Optional] Table 17 – TerminalAddress Element's @type attribute values 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.

10.48.2 TerminalAddress element examples

```
<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>
```

10.49 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.

10.49.1 ViewerEvent element schema

Figure 10-78 illustrates the ViewerEvent element's schema.

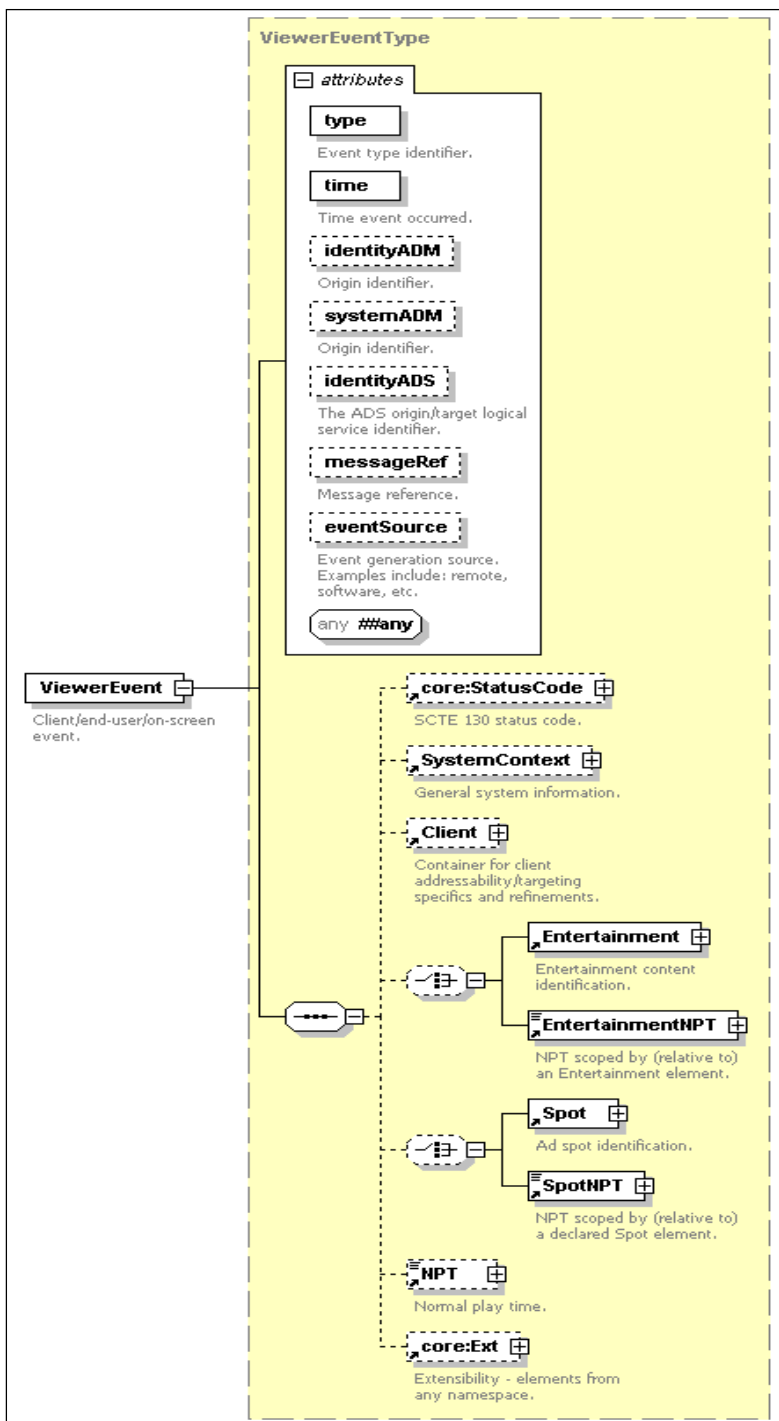


Figure 10-78 – ViewerEvent element schema

10.49.1.1 Semantic definitions for the ViewerEvent element

@type [Required, eventTypeAttrType] – Event identification. See clause 9.2.1 for additional information. Table 18 lists the defined values for this element which may be extended by private agreement outside the scope of this Recommendation. The attribute's value shall appear exactly as shown in Table 18.

Table 18 – ViewerEvent @type attribute values

Value	Description
status	The event contains viewer event related status information. The event should contain a core:StatusCode element and zero or more Note elements.
fastForward	The event indicates a fast-forward (FF) event.
play	The event indicates a play event.
pause	The event indicates a pause event.
rewind	The event indicates a rewind (RW) event.
stop	The event indicates a stop event.
overlayPresented	The event indicates an overlay or other image (banner ad, etc.) was made visible.
overlayRemoved	The event indicates an overlay or other image (banner ad, etc.) is no longer visible.
...	User defined and outside the scope of this Recommendation. The value shall be preceded by the string "private:".

@time [Required, core:dateTimeTimezoneType] – The event occurrence date and time. See clause 9.2.1 for additional information.

@identityADM [Optional, core:identityAttrType] – The origin ADM logical service identifier. See clause 9.2.1 for additional information.

@systemADM [Optional, core:systemAttrType] – The originating ADM system identification. See clause 9.2.1 for additional information.

@identityADS [Optional, core:identityAttrType] – The ADS origin or target logical service identifier. See clause 9.2.1 for additional information.

@messageRef [Optional, core:messageRefAttrType] – The message associated with this event. See clause 9.2.1 for additional information.

@eventSource [Optional, core:nonEmptyStringType] – Event generation source identifier. Table 19 lists the defined values for this element which may be extended by private agreement outside the scope of this Recommendation.

Table 19 – ViewerEvent Element @eventSource attribute values

Value	Description
remote	A button on the (subscriber) remote control was pressed.
software	A software application initiated event (for example, a software timer expiration).
...	User defined and outside the scope of this Recommendation. The value shall be preceded by the string "private:".

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

core:StatusCode [Optional] – An applicable status code as defined in Annex A. See clause 9.2.1 for additional information.

SystemContext [Optional] – Parameters describing the event's system context. See clause 9.2.1 for additional information.

Client [Optional] – Addressability or targeting details. See clause 9.2.1 for additional information.

Entertainment [Optional Choice] – Entertainment content asset identification. See clause 9.2.1 for additional information.

EntertainmentNPT [Optional Choice] – Entertainment NPT scoped by a higher level Entertainment element. See clause 9.2.1 for additional information.

Spot [Optional Choice] – Ad content asset identification. See clause 9.2.1 for additional information.

SpotNPT [Optional Choice] – Ad spot NPT scoped by a higher level Spot element. See clause 10.43 for additional information.

NPT [Optional] – User perceived NPT. See clause 10.21 for additional information.

core:Ext [Optional] – A container holding additional attributes and elements from any namespace. See [ITU-T J.380.2] for additional information.

The ViewerEvent element's value may be empty.

10.49.2 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="ADC0123456789012345"/>
      <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="ADC0123456789012345"/>
      <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="ADC0123456789012345"/>
      <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**.

10.50 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.

10.50.1 Window element schema

Figure 10-79 illustrates the Window element's schema.

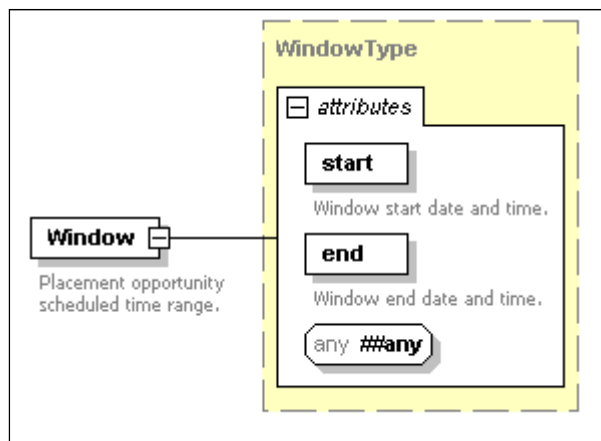


Figure 10-79 – Window element schema

10.50.1.1 Semantic definitions for the Window element

@start [Required, core:dateTimeTimezoneType] – Range commencement date and time. See [ITU-T J.380.2] for additional information.

@end [Required, core:dateTimeTimezoneType] – Range termination date and time. See [ITU-T J.380.2] for additional information.

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

The Window element's value shall be empty.

10.50.2 Window element examples

```
<Window start="2007-06-06T03:33:43.0Z" end="2007-06-06T03:43:43.0Z"/>
```

10.51 Zone element

The Zone element facilitates zone identification which traditionally has been a geographical area in a fulfilment delivery system. This Recommendation does not restrict, limit or curb the definition in any way.

10.51.1 Zone element schema

Figure 10-80 illustrates the Zone element's schema.

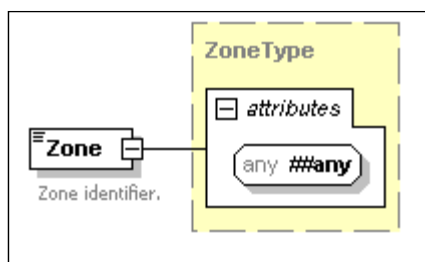


Figure 10-80 – Zone element schema

10.51.1.1 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.

10.51.2 Zone element examples

```
<Zone>123</Zone>
<Zone>Den</Zone>
```

Annex A

Message status codes

(This annex forms an integral part of this Recommendation.)

In the ensuing clauses, 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 clauses.

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.)

Table A.1 – ITU-T J.380.2 StatusCode element @detail attribute values applied

Description	S C R	S S N	S S A	L S R	R R	L R R	D R	D R N	D R A	P R S	P U N	P U A	P S A	E
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	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	

Table A.1 – ITU-T J.380.2 StatusCode element @detail attribute values applied

Description	S C R	S S N	S S A	L S R	R R	L R R	D R	D R N	D R A	P R S	P U N	P U A	P S A	E
Network connection lost	✓	✓		✓	✓	✓	✓		✓	✓		✓	✓	
Resource not found	✓	✓												✓
Not supported												✓		
Not authorized						✓	✓							
Unknown message reference	✓		✓	✓	✓	✓	✓		✓	✓		✓	✓	
Resend forced abandonment	✓		✓	✓	✓	✓	✓		✓	✓		✓	✓	
Out of resources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Timeout	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
General error	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table A.2 – ITU-T J.380.3 StatusCode element @detail attribute values defined and applied

@detail Value	Description	S C R	S S N	S S A	L S R	R R	L R R	D R	D R N	D R A	P R S	P U N	P U A	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														✓

Annex B

WSDL

(This annex forms an integral part of this Recommendation.)

Recommendation ITU-T J.380.3 refers to two separate WSDL documents ([SCTE 130-3 ADM wsd] and [SCTE 130-3 ADS wsd]) 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 'adswsd'. Recommendation ITU-T J.380.7 provides additional WSDL specification details. See [ITU-T J.380.7] for more information. See [SCTE 130-3 ADM wsd] and [SCTE 130-3 ADS wsd] for all other details.

Annex C

The placement opportunity data model

(This annex forms an integral part of this Recommendation.)

C.1 Scope (Normative)

This annex defines the placement opportunity data model (PODM) consistent with other parts of [ITU-T J.380.x]. 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 ITU-T J.380 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 [ITU-T J.380.5], the placement opportunity information service (POIS). An implementation may choose not to use this data model.

C.2 Overview of the placement opportunity data model (Informative)

C.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 Recommendation 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 Recommendation 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.

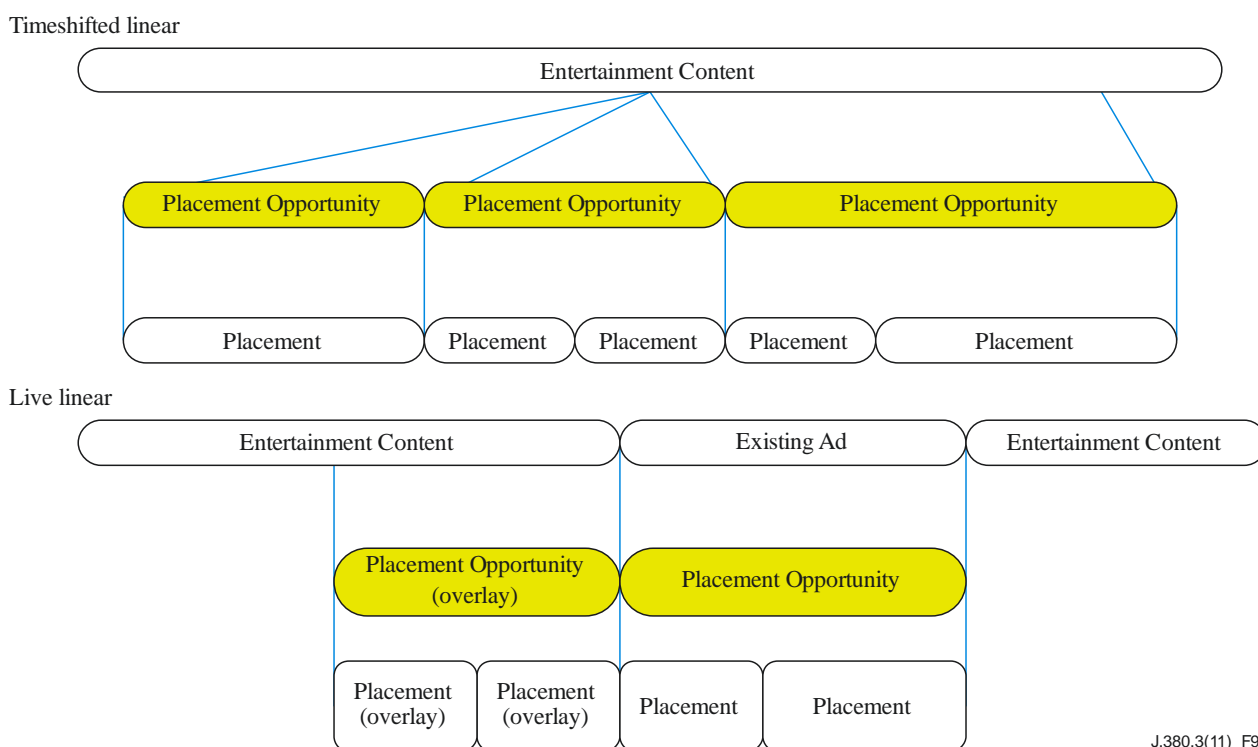
The existence of a placement opportunity does not imply physical presence of referenced content assets, or that such streams are guaranteed to exist. Placement opportunities may be localized. As such, placement opportunities in one geographic area, demographic group, day part, window, or other dimension, 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 C.1 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.



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Figure C.1 – Visual representation of placement opportunities

C.3 XML namespaces (Normative)

This annex 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 Recommendation differ, the PODM elements shall take precedence.

C.4 Messages containing the placement opportunity data model (Normative)

Any ITU-T J.380 message interface may utilize the PODM. The message interfaces utilizing the PODM are outside the scope of this Recommendation. Refer to the individual messaging Recommendations for additional information.

C.4.1 @version attribute

The placement opportunity data model shall not have a @version attribute associated with it as the PODM is not a new message set. The data model's revision shall be reflected by the PODM XML namespace specified in clause C.3. However, to support auto detection of an endpoint's enhanced capability, the @version attribute shall be set to the value "1.2" for ITU-T J.380.3 defined messages being exchanged between an ADM/ADS pair supporting this enhanced placement opportunity data model. The messages defined by the core: XML namespace, such as core:ServiceCheck and core:ServiceStatus message pairs, shall carry their defining specification's @version attribute value (i.e., "1.1"). The following statements further refine the interface pairing operational characteristics where references to "1.1" and "1.2" are to the ITU-T J.380.3 specific messages.

A "1.2" capable ADS signals its facilities and determines an ADM endpoint's operating ability by sending a ListADMServiceRequest message with the @version attributes set to the value "1.2". The ADM responds in one of the following ways and the ADS/ADM pair shall operate as defined:

The ADM responds with an error and a core:StatusCode/@detail attribute having the value core:UnsupportedProtocol or the ADM responds with a successful ListADMServiceResponse 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 "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 (i.e., the PlacementOpportunityV2 element or any other element defined within this annex) shall not be included in any message.

The ADM responds with a successful ListADMServiceResponse message having the @version attribute set to the value "1.2" indicating the ADM is operating as a "1.2" ADM. 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 Recommendation. The ADM or ADS supplied endpoints, i.e., the core:Address elements, contain endpoints capable of handling version "1.2" messages and elements.)

The PODM (i.e., the PlacementOpportunityV2 element or any other element defined within this annex) may be included in any message as allowed by the normative schema and semantics defined herein.

A "1.1" capable ADS, signalled by the @version attribute having a value of "1.1", communicating with a "1.2" 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 "1.1" capable.

When a "1.2" ADM accepts a "1.1" ADS registration, the ADM shall guarantee the message exchanges with the ADS do not use the PODM (i.e., the PlacementOpportunityV2 element or any other element defined within this annex) in any message. How a "1.2" ADM handles this translation is outside the scope of this Recommendation.

C.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 Recommendation.

C.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 Recommendation.

C.5.2 unitsIdentificationAttrType attribute type

The unitsIdentificationAttrType is a core:nonEmptyStringType identifier which may have one of the values from Table C.1. The supplied string provides measurement context for specified quantitative measured values.

Table C.1 – unitsIdentificationAttrType values

Value	Description
pixels	Measurement units defined as display resolution location pixels.
percentage	Measurement units defined as a resolution independent percentage of space.
...	User defined measurement units that are outside of this Recommendation's scope. The string shall be prefixed with the text "private:".

C.6 PODM element details (Normative)

The PODM leverages a subset of elements from several ITU-T J.380 Recommendations along with new elements in defining the data model composition. The new PODM elements are listed in Table C.2 and are detailed in subsequent document clauses.

Table C.2 – PODM elements

Element	Description
ContentGroupFilter	Generic means of describing an asset set using a gis:BasicQueryFilter or gis:AdvancedQueryFilter element.
Interactive	Provides an extension for interactive specific information.
LinearAvailBindingV2	The ITU-T J.380.3 LinearAvailBinding element extended to supply additional functionality.
MenuCategory	Displayable menu folder identifier.
OpportunityBindingV2	The ITU-T J.380.3 OpportunityBinding element extended to supply additional functionality.

Table C.2 – PODM elements

Element	Description
OpportunityConstraintsV2	The rights and constraints of the placements within this placement opportunity. This element is an extension of the adm:OpportunityConstraints element.
PlacementOpportunityTerms	The business terms relevant to the placement opportunity.
PlacementOpportunityV2	The ITU-T J.380.3 placement opportunity definition extended to supply new and additional functionality. This element is an extension of the adm:PlacementOpportunity element.
Plane	Visibility details relevant to a placement opportunity's screen real estate.
Programming	The referenced content stream containing the placement opportunity.
Size	Screen real estate space identification.
SpatialPosition	Screen real estate consumable by a placement opportunity.
TopCorner	Coordinate details specific identifying a spatial position.

C.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:

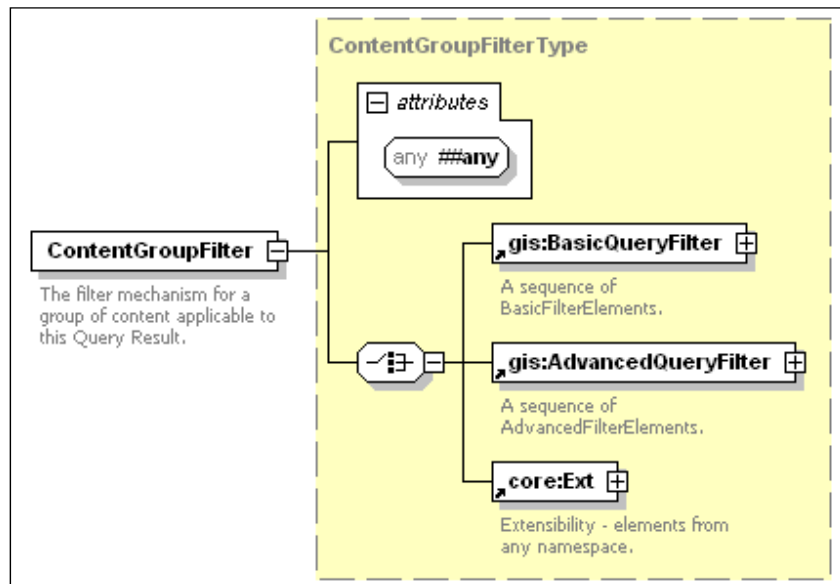


Figure C.2 – ContentGroupFilter element schema

The ContentGroupFilter element semantics are as follows:

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

gis:BasicQueryFilter [Choice] – Describes the set of content using a gis:BasicQueryFilter element. See [ITU-T J.380.8] for additional information.

gis:AdvancedQueryFilter [Choice] – Describes the set of content using the gis:AdvancedQueryFilter element. See [ITU-T J.380.8] for additional information.

core:Ext [Choice] – Any elements from other namespaces. See [ITU-T J.380.2] for additional information.

C.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:

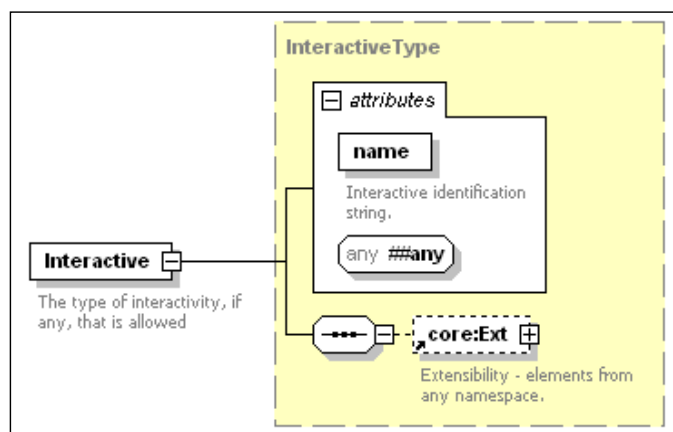


Figure C.3 – Interactive element schema

The Interactive element semantics are as follows:

@name [Required, core:nonEmptyStringType] – An identification string for this interactive element. See [ITU-T J.380.2] for additional information.

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

core:Ext [Optional] – Any elements from any namespace. See [ITU-T J.380.2] for additional information.

C.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 C.4.

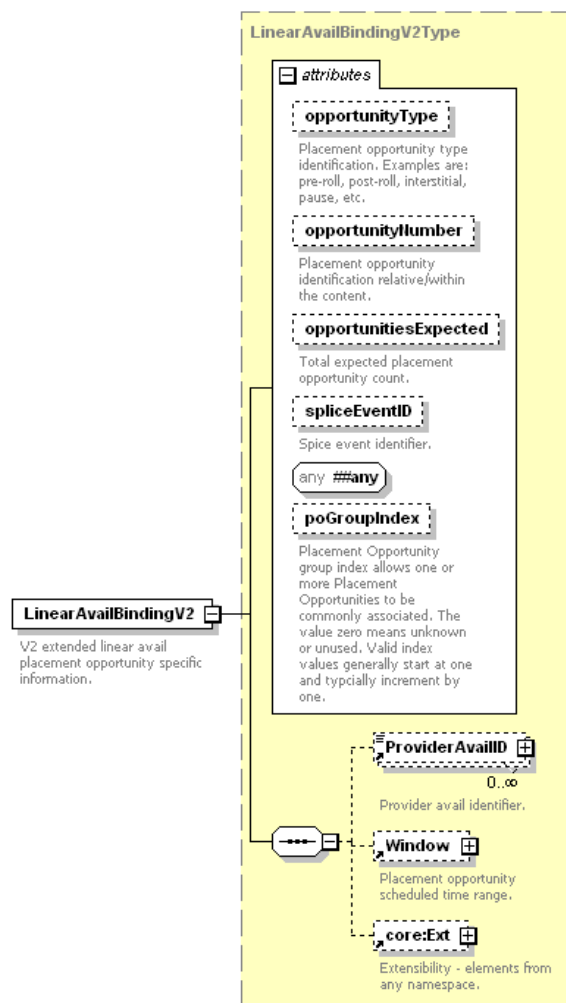


Figure C.4 – LinearAvailBindingV2 element schema

Beyond the adm:LinearAvailBinding element's original definition, see [ITU-T J.380.3] 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 clause C.5.1 for additional information.

C.6.4 MenuCategory

The MenuCategory element contains a displayable menu folder identifier.

The XML schema diagram for this element is as follows:

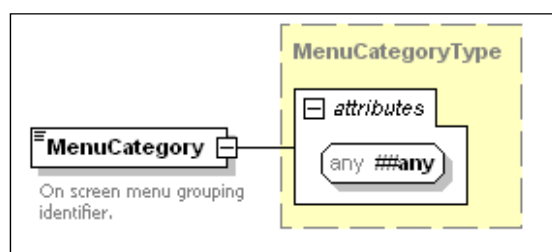


Figure C.5 – MenuCategory element schema

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.

C.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 C.6.

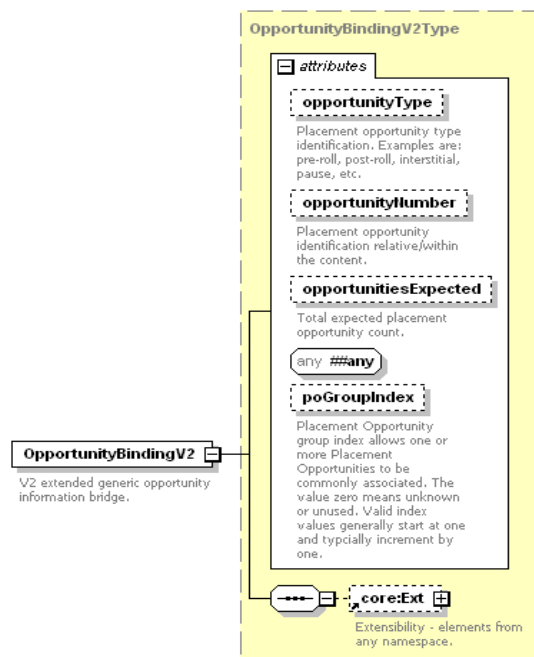


Figure C.6 – OpportunityBindingV2 element schema

Beyond the adm:OpportunityBinding element's original definition, see [ITU-T J.380.3] 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 clause C.5.1 for additional information.

C.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:

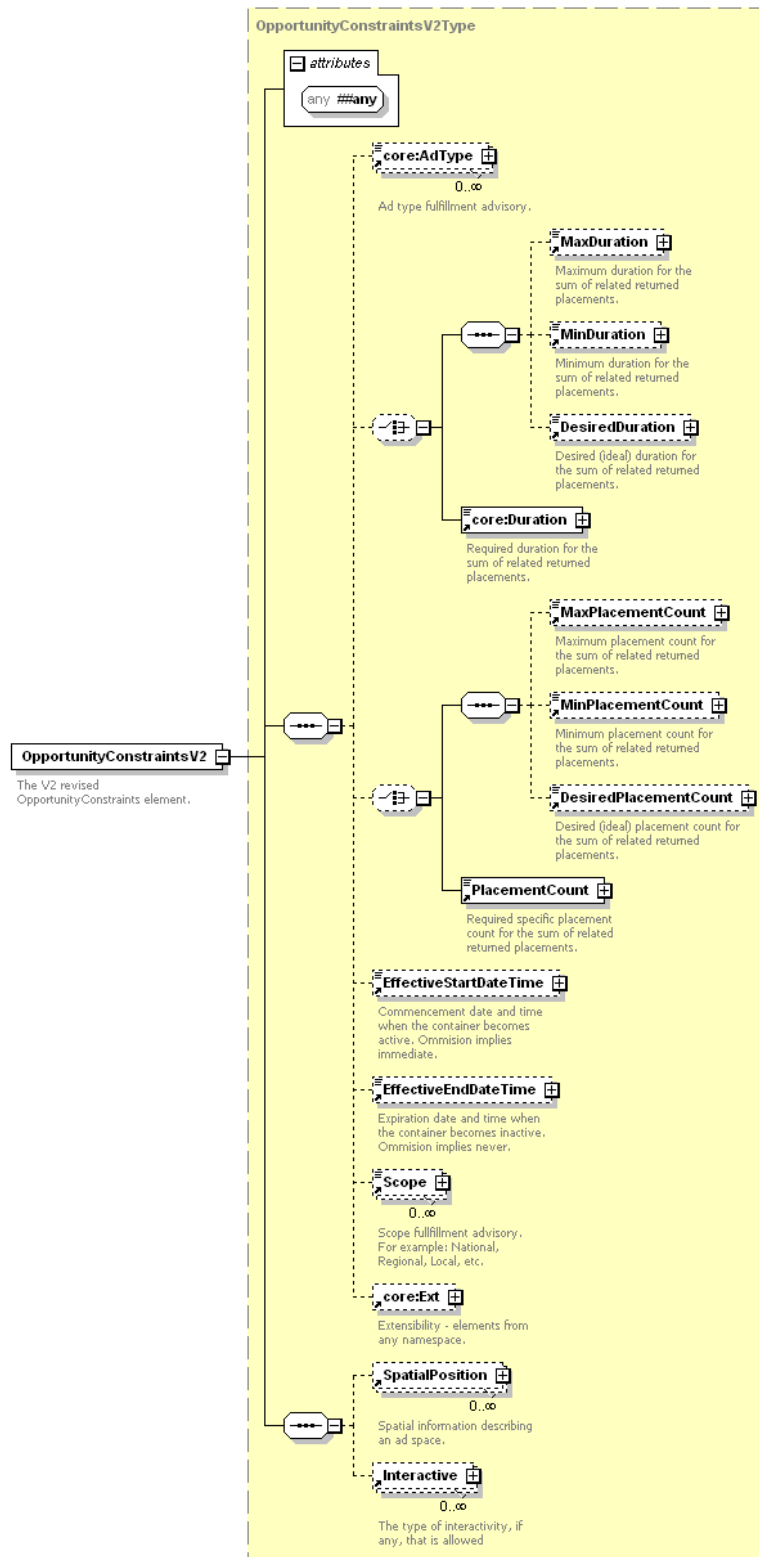


Figure C.7 – OpportunityConstraintsV2 element schema

Beyond the `adm:OpportunityConstraints` element's original definition, see [ITU-T J.380.3] for additional information, 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 clause C.6.12 for additional information.

Interactive [Optional] – Zero or more interactive characteristic descriptions. See clause C.6.2 for additional information.

C.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:

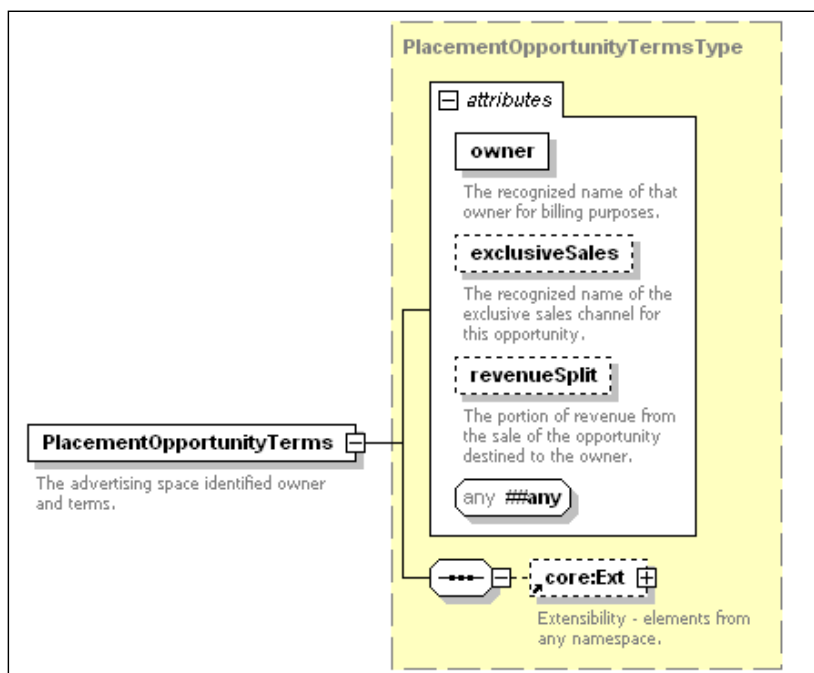


Figure C.8 – PlacementOpportunityTerms element schema

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.

core:Ext [Optional] – Any elements from any namespaces. See [ITU-T J.380.2] for additional information.

C.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 C.9.

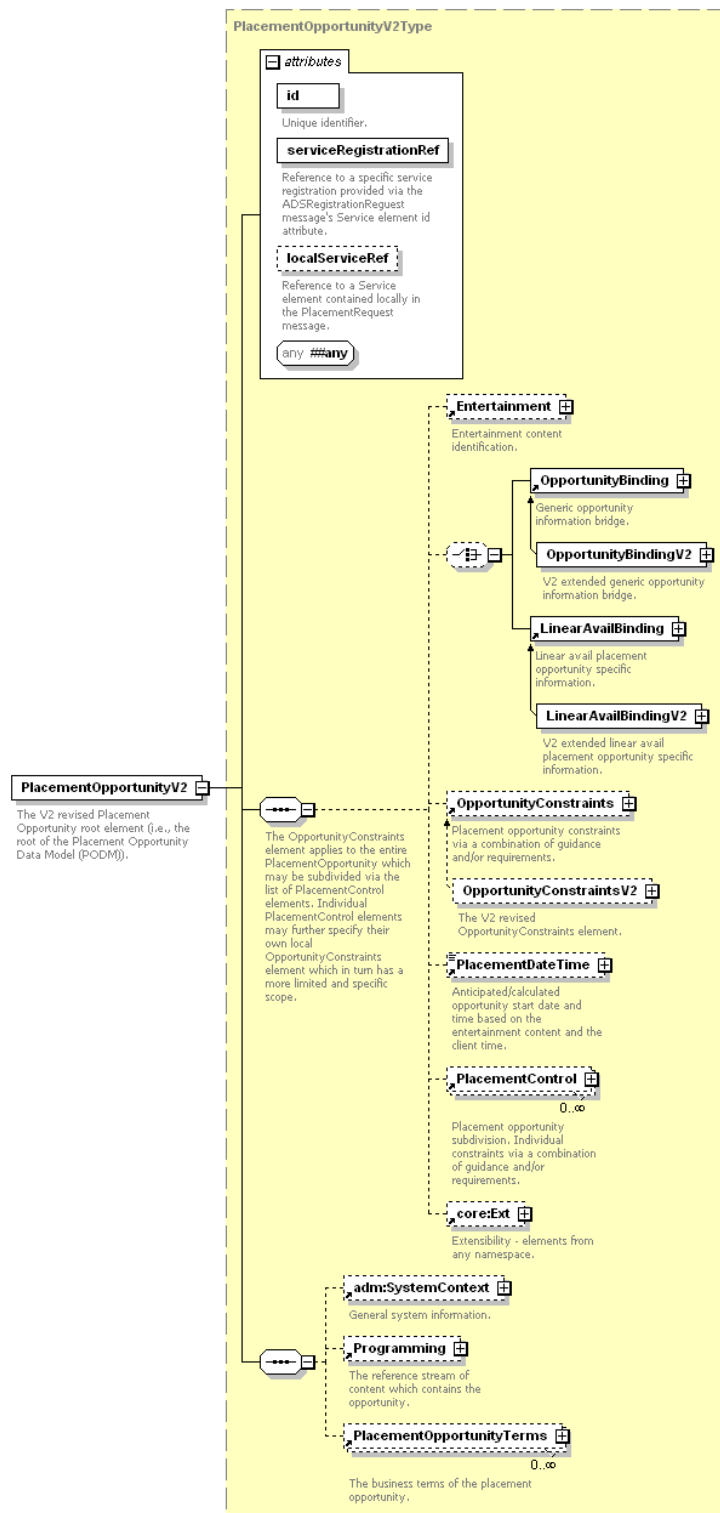


Figure C.9 – PlacementOpportunityV2 element schema

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 [ITU-T J.380.3] for additional information.

@serviceRegistrationRef [Required, core:idAttrType] – For ADM/ADS message exchanges, this attribute shall contain the value as defined by [ITU-T J.380.3]. For other message exchanges where this attribute has insufficient context, the attribute's value shall be "-". See [ITU-T J.380.3] for additional information.

@localServiceRef [Optional, core:idAttrType] – For ADM/ADS message exchanges, this attribute shall contain the value as defined by [ITU-T J.380.3]. For other message exchanges where this attribute has insufficient context, the attribute shall not be used. See [ITU-T J.380.3] 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 [ITU-T J.380.3] for additional information.

adm:OpportunityBinding [Optional] – The relative position and existence of the placement opportunity. See [ITU-T J.380.3] for additional information.

OpportunityBindingV2 [Optional] – This enhanced version of the adm:OpportunityBinding element may only be present in the PlacementOpportunityV2 element. See clause C.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 [ITU-T J.380.3] for additional information.

LinearAvailBindingV2 [Optional] – This enhanced version of the adm:LinearAvailBinding element may only be present in the PlacementOpportunityV2 element. See clause C.6.3 for additional information.

adm:OpportunityConstraints [Optional] – The original SCTE-130 defined element. See [ITU-T J.380.3] 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 clause C.6.6 for additional information.

adm:PlacementDateTime [Optional] – For ADM/ADS message exchanges, this element shall contain the value as defined by [ITU-T J.380.3]. For other message exchanges where this element has insufficient context, the element shall not be used. See [ITU-T J.380.3] for additional information.

adm:PlacementControl [Optional] – This element includes relative positioning of specific placement opportunities within a stream. The element's usage shall be as defined by [ITU-T J.380.3]. See [ITU-T J.380.3] for additional information.

core:Ext [Optional] – Any elements from any namespaces. See [ITU-T J.380.2] for additional information.

adm:SystemContext [Optional] – System environment information typically refining the placement service identification. The element's usage shall be as defined by [ITU-T J.380.3] 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 a adm:PlacementRequest message. The parent element shall always take precedence when there is a conflict. See [ITU-T J.380.3] 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 clause shall be utilized and this element shall be omitted. See clause C.6.10 for additional information.

PlacementOpportunityTerms [Optional] – The placement opportunity business terms. See clause C.6.7 for additional information.

C.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:

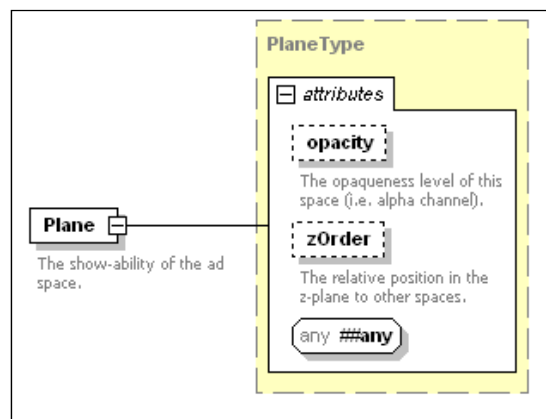


Figure C.10 – Plane element schema

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.

C.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 C.3 defines how these elements shall be employed based on the reference streams present.

Table C.3 – Placement opportunity reference stream identification

Reference streams present	Placement opportunities reference stream
Single, video	The adm:Entertainment element under the PlacementOpportunityV2 element
Single, non-video	The Programming element
Multiple streams	The Programming element

The XML schema diagram for this element is as indicated in Figure C.11.

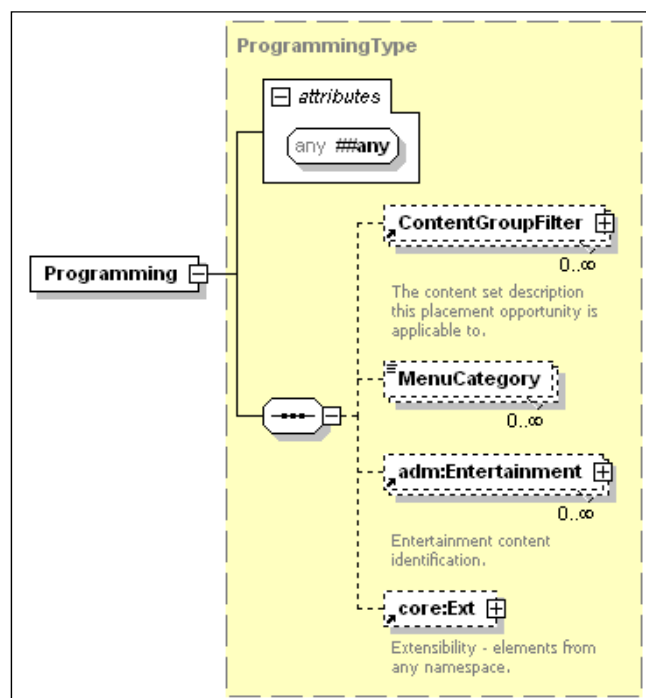


Figure C.11 – Programming element schema

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 clause C.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 clause C.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 [ITU-T J.380.3] for additional information.

core:Ext [Optional] – Any elements from namespaces. See [ITU-T J.380.2] for additional information.

C.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:

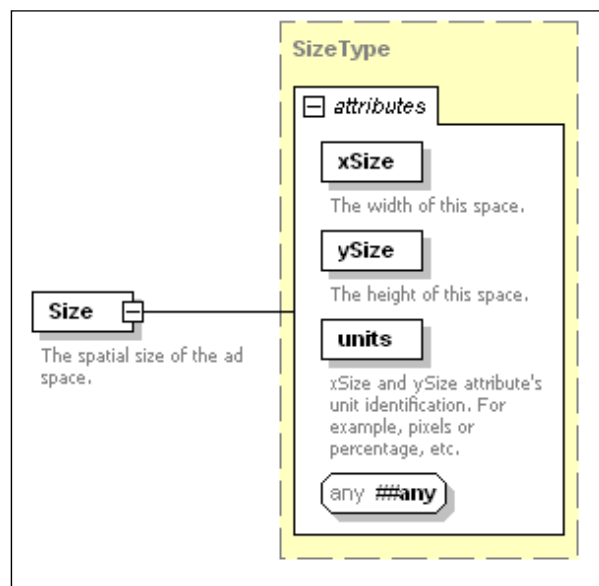


Figure C.12 – Size element schema

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 clause C.5.2 for additional information.

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

C.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:

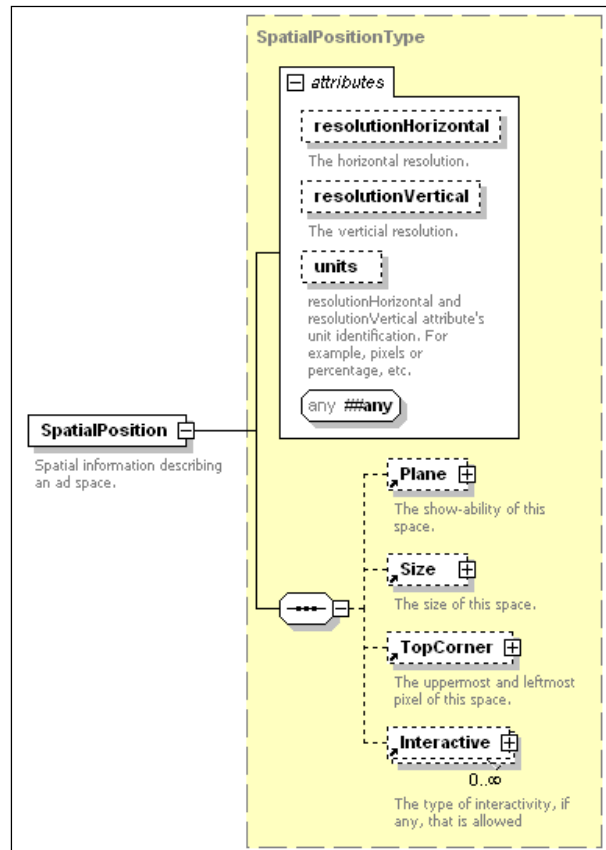


Figure C.13 – SpatialPosition element schema

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 clause C.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 clause C.6.9 for additional information.

Size [Optional] – The size of this space. See C.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 clause C.6.13 for additional information.

Interactive [Optional] – Zero or more elements describing the interactivity characteristics of this space. See clause C.6.2 for additional information.

C.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:

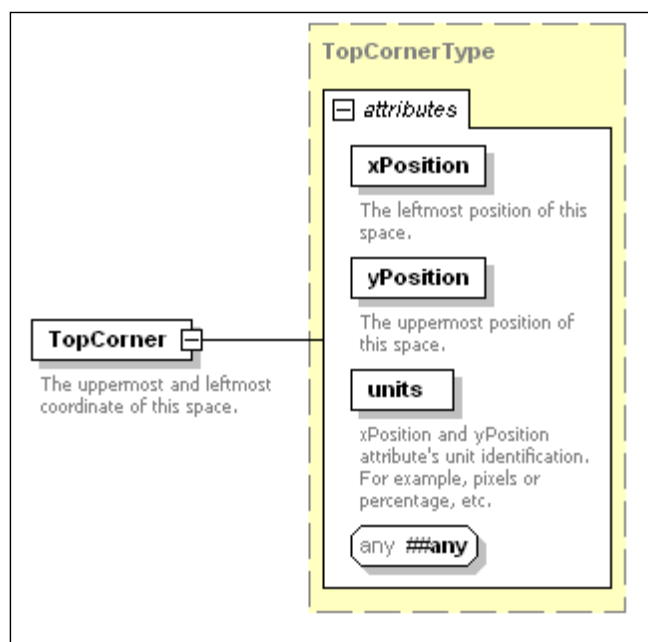


Figure C.14 – TopCorner element schema

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 clause C.5.2 for additional information.

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

Annex D

PODM and information service queries

(This annex forms an integral part of this Recommendation.)

D.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 [ITU-T J.380.8].

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 clauses herein.

D.2 Data model and query support

D.2.1 PODM identification

The PODM shall be identified (or referenced) using the XML namespace stipulated in Table 1 (e.g., <http://www.scte.org/schemas/130-8/2008a/adm/podm>). Consequently, the `gis:ServiceDataModel` element's value (i.e., the URI) shall be the PODM XML namespace from Table 1. Figure D.1 illustrates this.

```
<gis:ServiceDataModel>http://www.scte.org/schemas/130-3/2008a/adm/podm</gis:ServiceDataModel>
```

Figure D.1 – Example 63

D.2.2 PODM unique qualifiers

Table D.1 lists the mandatory ITU-T J.380.3 placement opportunity data model (PODM) unique qualifier set that 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). Figure D.2 illustrates this. 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.

```
<gis:UniqueQualifierDeclaration uniqueQualifierName="P3-PODM">  
...  
</gis:UniqueQualifierDeclaration>
```

Figure D.2 – Example 64

The PODM unique qualifiers are listed in Table D.1 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 D.1 – PODM unique qualifiers

Unique qualifier identifier	PODM syntax mapping	Type	Description
poid	PlacementOpporunity V2/@id	string	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 ITU-T J.380.3 placement opportunity data model.

D.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 clause D.2.1 and clause D.2.2. The primary motivation is forward compatibility as this Recommendation evolves.

D.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 @uniqueQualiferName is set to a value specified in clause D.2.2, the expanded results are returned using the PODMBasicQueryResult element specified in Annex D clause D.3.1. See Annex D clause D.3.1 for additional information.

D.2.5 Advanced query language support

An information service implementing the PODM should support advanced query language processing as defined in [ITU-T J.380.8].

D.3 PODM information service elements

Table D.2 identifies the additional elements added by this Recommendation beyond those defined by a typical information service.

Table D.2 – PODM element details

Element	Description
PODMBasicQueryResult	A substitutable element for the gis:BasicQueryResultAbstract element which includes the podm:PlacementOpporunityV2 element.

D.3.1 PODMBasicQueryResult

When a basic query is issued against the PODM and signalled as specified in clause D.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 D.3.

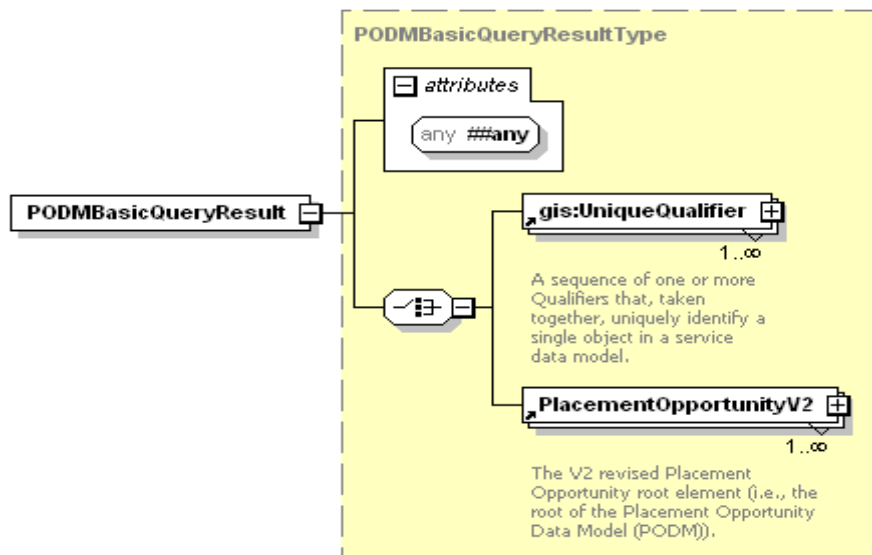


Figure D.3 – PODMBasicQueryResult element XML schema

The PODMBasicQueryResult element contains the following attributes and elements:

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

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 clause D.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 D.3 defines the possible result behaviours when the gis:QueryRequest element contains a gis:UniqueQualifier element.

Table D.4 defines the possible result behaviours when the gis:QueryRequest element contains a gis:BasicQueryFilter sequence.

Table D.5 defines the possible result behaviours when the gis:QueryRequest element contains a gis:AdvancedQueryFilter sequence.

Table D.3 – gis:UniqueQualifier query result behaviours

gis:Query element			gis:QueryResult element		
					The PBQR element shall be present within the gis:QueryResult element when @resultsSetSize is non-zero.
@expand Output	@result SetSize Only	@unique Qualifier NameRef	@total Result Set Size	@result SetSize	Elements present within the PBQR element when @resultsSetSize is non-zero.
N/A	TRUE	Note 1	0 or 1	0	No elements shall be present.
FALSE	FALSE	Note 1	NP	0 or 1	A UniqueQualifier element whose contents conform to clause D.2.2.
TRUE	FALSE	Note 1	NP	0 or 1	A podm:PlacementOpportunityV2 element.

NOTE 1 – The value should be (is highly recommend to be) the value specified in clause D.2.2 (i.e., "P3-PODM").

Legend:

N/A = Not applicable (ignored if present)

NP = Not present (shall not be returned)

AQR = gis:AdvancedQueryResult

PBQR = PODMBasicQueryResult element

Table D.4 – gis:BasicQueryFilter query result behaviours

gis:Query element			gis:QueryResult element		
					The PBQR element shall be present within the gis:QueryResult element when @resultsSetSize is non-zero.
@expand Output	@result SetSize Only	@unique Qualifier NameRef	@total Result Set Size	@result SetSize	Elements present within the PBQR element when @resultsSetSize is non-zero.
N/A	TRUE	Note 1	0 to UB (Note 1)	0	No elements shall be present.
FALSE	FALSE	Note 1	NP	0 to UB (Note 2)	One to unbounded UniqueQualifier elements as defined by clause D.2.2.
TRUE	FALSE	Note 1	NP	0 to UB	One to unbounded podm:PlacementOpportunityV2 elements.

NOTE 1 – The value should be (is highly recommend to be) the value specified in clause D.2.2 (i.e., "P-PODM").

NOTE 2 – If the same query had @expandOutput set to "true", the value shall be the number of podm:PlacementOpportunityV2 elements returned.

Legend:

N/A = Not applicable (ignored if present)

PBQR = PODMBasicQueryResult element

NP = Not present (shall not be returned)

Table D.5 – Advanced qualifier query result behaviours

gis:Query element			gis:QueryResult element		
					The AQR element shall be present within the gis:QueryResult element when @resultsSetSize is non-zero.
@expand Output	@result SetSize Only	@unique Qualifier NameRef	@total Result Set Size	@result SetSize	Elements present within the AQR element when @resultsSetSize is non-zero.
FALSE	TRUE	Note 1	0 to UB	0	No elements shall be present.
TRUE	TRUE	Note 1	0 to UB		
FALSE	FALSE	Note 1	NP	0 to UB	1 to unbounded UniqueQualifier elements using the @uniqueQualifierNameRef identified unique qualifier
TRUE	FALSE	Note 1	NP	0 to UB (Note 2)	1 to unbounded AdvancedQueryResultData elements

NOTE 1 – The value should be (is highly recommend to be) the value specified in clause D.2.2 (i.e., "P3-PODM").

NOTE 2 – If non-zero, the value shall be the number of AdvancedQueryResultData elements contained in the AdvancedQueryResult element.

Legend:

NP = Not present (shall not be returned)

AQR = gis:AdvancedQueryResult

Appendix I

Video on demand example

(This appendix does not form an integral part of this Recommendation)

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

Figure I.1 illustrates a PlacementRequest message.

```
<PlacementRequest messageId="5B8ECCED-979B-421E-8A6E-E2192B115160" version="1.1"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="adm"
updatesAllowed="false">
  <SystemContext>
    <Session>ExampleSession1</Session>
  </SystemContext>
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
      <core:Duration>PT20M</core:Duration>
    </core:Content>
  </Entertainment>
  <Client>
    <core:CurrentDateTime>2007-01-31T01:59:59+05:00</core:CurrentDateTime>
    <TargetCode key="ZipPlus4">12345-6789</TargetCode>
    <TargetCode key="Gender">Male</TargetCode>
  </Client>
  <ADMDData>Hidden secret sauce</ADMDData>
  <PlacementOpportunity id="1B8ECCED-979B-421E-8A6E-E2192B115161"
serviceRegistrationRef="ServiceRef1">
    <OpportunityBinding opportunityType="preRoll"/>
  </PlacementOpportunity>
  <PlacementOpportunity id="1B8ECCED-979B-421E-8A6E-E2192B115162"
serviceRegistrationRef="ServiceRef1">
    <OpportunityBinding opportunityType="postRoll"/>
  </PlacementOpportunity>
</PlacementRequest>
```

Figure I.1 – Example 65

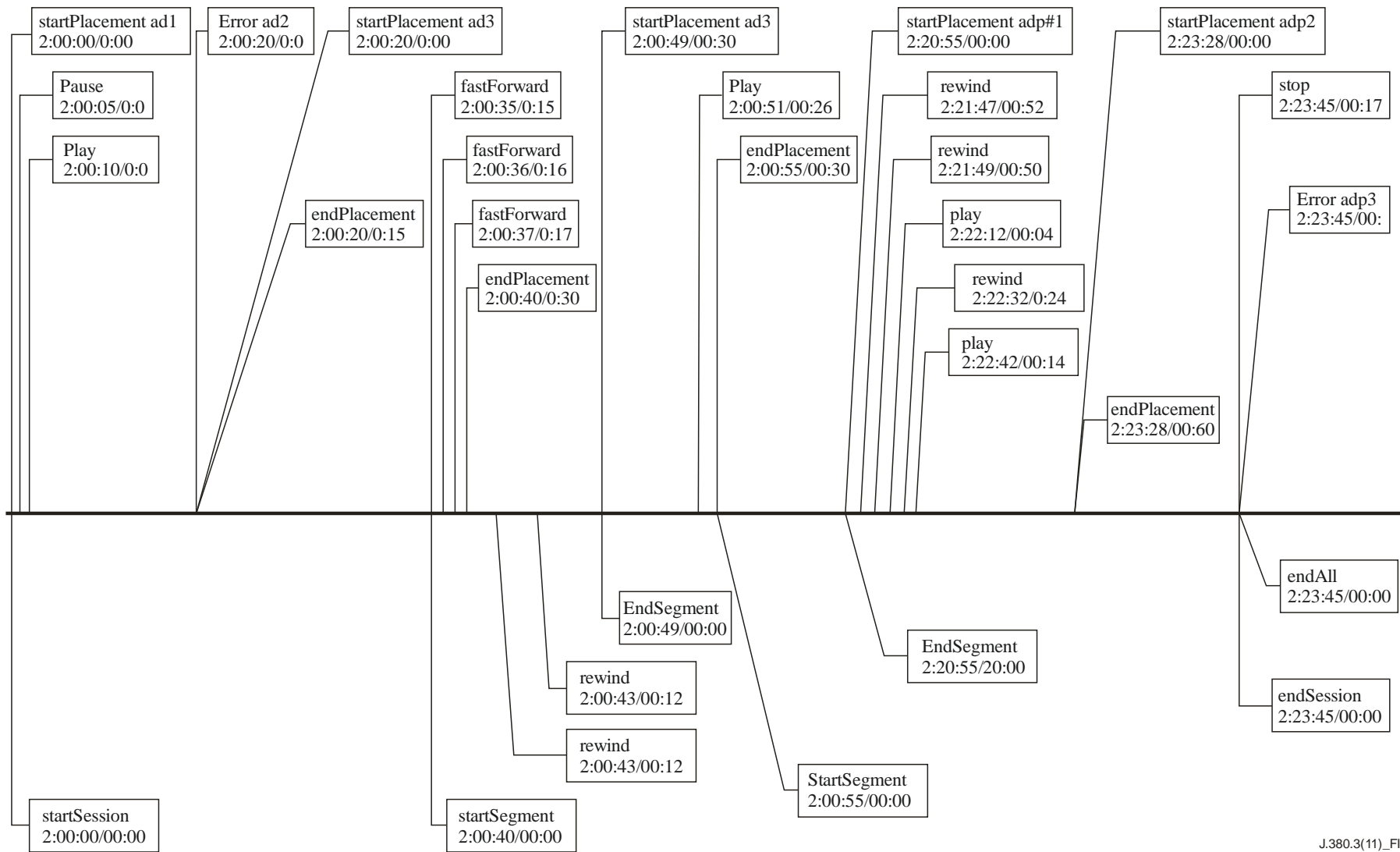
Figure I.2 illustrates a PlacementResponse message.

```
<PlacementResponse messageId="5B8ECCED-979B-421E-8A6E-E2192B11516A" version="1.1"
identity="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5" 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>
        <core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789002"/>
        <core:Duration>PT01M00.000S</core:Duration>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C97</core:Tracking>
      </core:Content>
    </Placement>
    <Placement id="5B8ECCED-979B-421E-8A6E-E2192B115165" action="fill">
      <core:Content>
        <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789002"/>
        <core:Duration>PT60.000S</core:Duration>
        <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C98</core:Tracking>
      </core:Content>
    </Placement>
  </PlacementDecision>
</PlacementResponse>
```

Figure I.2 – Example 66

Figures I.4 and I.5 illustrate the same PlacementStatusNotification messages elements using two different styles. Figure I.4 uses self-describing events and Figure I.5 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:



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Figure I.3 – Event sequence for the PlacementStatusNotification message

```

<?xml version="1.0" encoding="UTF-8"?>
<PlacementStatusNotification messageId="3EE278EC-A61F-D080.2D5C-62806A8D146F"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="ADM01" version="1.1">
  <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>
          <SpotNPT scale="1">0</SpotNPT>
        </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>
          <SpotNPT scale="0">5</SpotNPT>
        </Spot>
      </ViewerEvent>
      <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>
          <SpotNPT scale="1">5</SpotNPT>
        </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>
          <SpotNPT scale="1">15</SpotNPT>
        </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>
        </Spot>
      </PlacementStatusEvent>
      <!--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>
          <SpotNPT scale="1">0</SpotNPT>
        </Spot>
      </PlacementStatusEvent>
    </Events>
  </PlayData>
</PlacementStatusNotification>

```

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</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>
    <SpotNPT scale="1">15</SpotNPT>
  </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>
    <SpotNPT scale="2">16</SpotNPT>
  </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>
    <SpotNPT scale="4">18</SpotNPT>
  </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>
    <SpotNPT scale="4">30</SpotNPT>
  </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>
    <EntertainmentNPT scale="4">0</EntertainmentNPT>
  </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).-->
<ViewerEvent time="2007-01-31T02:00:43Z" type="rewind" eventSource="remote">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
    </core:Content>
    <EntertainmentNPT scale="-1">12</EntertainmentNPT>
  </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>
    <EntertainmentNPT scale=".2">12</EntertainmentNPT>
  </Entertainment>
</ViewerEvent>
<SessionEvent time="2007-01-31T02:00:49Z" type="endSegment">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
    </core:Content>
    <EntertainmentNPT scale=".2">0</EntertainmentNPT>
  </Entertainment>
</SessionEvent>
<PlacementStatusEvent time="2007-01-31T02:00:49Z" type="startPlacement">
  <Spot>

```



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    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789001"/>

      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C94</core:Tracking>
    </core:Content>
    <SpotNPT scale=".2">30</SpotNPT>
  </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>
    <SpotNPT scale="1">26</SpotNPT>
  </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>
    <SpotNPT scale="1">30</SpotNPT>
  </Spot>
</PlacementStatusEvent>
<SessionEvent time="2007-01-31T02:00:55Z" type="startSegment">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
    </core:Content>
    <EntertainmentNPT scale="1">0</EntertainmentNPT>
  </Entertainment>
</SessionEvent>
<SessionEvent time="2007-01-31T02:20:55Z" type="endSegment">
  <Entertainment>
    <core:Content>
      <core:AssetRef providerID="videobus.com" assetID="BAAD9876543210987654"/>
    </core:Content>
    <EntertainmentNPT scale="1">1200</EntertainmentNPT>
  </Entertainment>
</SessionEvent>
<!--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>
    <SpotNPT scale="1">0</SpotNPT>
  </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>
    <SpotNPT scale="-1">52</SpotNPT>
  </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>
    <SpotNPT scale=".2">50</SpotNPT>
  </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>

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```

    </core:Content>
    <SpotNPT scale="1">4</SpotNPT>

</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>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
    </core:Content>
    <SpotNPT scale="-1">24</SpotNPT>
  </Spot>
</ViewerEvent>
<ViewerEvent time="2007-01-31T02:22:42Z" 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>
    <SpotNPT scale="1">14</SpotNPT>
  </Spot>
</ViewerEvent>
<PlacementStatusEvent time="2007-01-31T02:23:28Z" type="endPlacement">
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
    </core:Content>
    <SpotNPT scale="1">60</SpotNPT>
  </Spot>
</PlacementStatusEvent>
<!--Post-roll 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>
    <SpotNPT scale="1">0</SpotNPT>
  </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>
    <SpotNPT scale="1">17</SpotNPT>
  </Spot>
</ViewerEvent>
<!-- Post-roll ad #3 did not play since the session is terminated. -->
<!--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="2007-01-31T02:23:45Z" type="status">
  <core:StatusCode class="1" detail="3011">
    <core:Note>Placement not executed.</core:Note>
    <core:Note>Asset not played. Session ended before playout.</core:Note>
  </core:StatusCode>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C98</core:Tracking>
    </core:Content>
  </Spot>
</PlacementStatusEvent>
</Events>
</PlayData>
<PlayData identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
  <Events>
    <!--The ADM implementation decided to put this event is a separate PlayData
element. This not required and it could have immediately followed the

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    last PlacementStatusEvent above.-->
    <PlacementStatusEvent time="2007-01-31T02:23:50Z" type="endAll" messageRef="5B8ECCED-979B-
421E-8A6E-E2192B11516A"/>
  </Events>
</PlayData>
</PlacementStatusNotification>

```

Figure I.4 – Example 67

Figure I.4 illustrates the data minimized PlacementStatusNotification message.

```

<PlacementStatusNotification messageId="3EE278EC-A61F-D080.2D5C-62806A8D146F"
identity="ADMLogicalService_1170FEF4-C19B-450E-B624-421B23F525F4" system="ADM01" version="1.1">
  <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>
      <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>
        <Events>
          <PlacementStatusEvent time="2007-01-31T02:00:00Z" type="startPlacement">
            <SpotNPT scale="1">0</SpotNPT>
          </PlacementStatusEvent>
          <ViewerEvent time="2007-01-31T02:00:05Z" type="pause" eventSource="remote">
            <SpotNPT scale="0">5</SpotNPT>
          </ViewerEvent>
          <ViewerEvent time="2007-01-31T02:00:10Z" type="play" eventSource="remote">
            <SpotNPT scale="1">5</SpotNPT>
          </ViewerEvent>
          <PlacementStatusEvent time="2007-01-31T02:00:20Z" type="endPlacement">
            <SpotNPT scale="1">15</SpotNPT>
          </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>
        </PlacementStatusEvent>
      </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 occurring 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">
    <SpotNPT scale="1">0</SpotNPT>
  </PlacementStatusEvent>
  <ViewerEvent time="2007-01-31T02:00:35Z" type="fastForward" eventSource="remote">
    <SpotNPT scale="1">15</SpotNPT>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:00:36Z" type="fastForward" eventSource="remote">
    <SpotNPT scale="2">16</SpotNPT>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:00:37Z" type="fastForward" eventSource="remote">
    <SpotNPT scale="4">18</SpotNPT>
  </ViewerEvent>
  <PlacementStatusEvent time="2007-01-31T02:00:40Z" type="endPlacement">
    <SpotNPT scale="4">30</SpotNPT>
  </PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<Events>
  <!--Start of the entertainment asset with the subscriber still being in 4x fast forward
mode.-->
  <SessionEvent time="2007-01-31T02:00:40Z" type="startSegment">
    <EntertainmentNPT scale="4">0</EntertainmentNPT>
  </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).-->
  <ViewerEvent time="2007-01-31T02:00:43Z" type="rewind" eventSource="remote">
    <EntertainmentNPT scale="-1">12</EntertainmentNPT>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:00:43Z" type="rewind" eventSource="remote">
    <EntertainmentNPT scale=".2">12</EntertainmentNPT>
  </ViewerEvent>
  <SessionEvent time="2007-01-31T02:00:49Z" type="endSegment">
    <EntertainmentNPT scale=".2">0</EntertainmentNPT>
  </SessionEvent>
</Events>
</SpotScopedEvents>
<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="2007-01-31T02:00:49Z" type="startPlacement">
    <SpotNPT scale=".2">30</SpotNPT>
  </PlacementStatusEvent>
  <ViewerEvent time="2007-01-31T02:00:51Z" type="play" eventSource="remote">
    <SpotNPT scale="1">26</SpotNPT>
  </ViewerEvent>
  <PlacementStatusEvent time="2007-01-31T02:00:55Z" type="endPlacement">
    <SpotNPT scale="1">30</SpotNPT>
  </PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<Events>
  <SessionEvent time="2007-01-31T02:00:55Z" type="startSegment">
    <EntertainmentNPT scale="1">0</EntertainmentNPT>
  </SessionEvent>
  <SessionEvent time="2007-01-31T02:20:55Z" type="endSegment">
    <EntertainmentNPT scale="1">1200</EntertainmentNPT>
  </SessionEvent>
</Events>
</SpotScopedEvents>
<Spot>
  <core:Content>
    <core:AssetRef providerID="advertiser1.com" assetID="ADVR1000123456789002"/>
    <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C96</core:Tracking>
  </core:Content>

```

```

</Spot>
<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">
    <SpotNPT scale="1">0</SpotNPT>
  </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">
    <SpotNPT scale="-1">52</SpotNPT>
  </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">
    <SpotNPT scale=".2">50</SpotNPT>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:22:12Z" type="play" eventSource="remote">
    <SpotNPT scale="1">4</SpotNPT>
  </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">
    <SpotNPT scale="-1">24</SpotNPT>
  </ViewerEvent>
  <ViewerEvent time="2007-01-31T02:22:42Z" type="play" eventSource="remote">
    <SpotNPT scale="1">14</SpotNPT>
  </ViewerEvent>
  <PlacementStatusEvent time="2007-01-31T02:23:28Z" type="endPlacement">
    <SpotNPT scale="1">60</SpotNPT>
  </PlacementStatusEvent>
</Events>
</SpotScopedEvents>
<SpotScopedEvents>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser2.com" assetID="ADVR2000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C97</core:Tracking>
    </core:Content>
  </Spot>
  <Events>
    <!--Post-roll ad #2: The ad was started and then the session was stopped.-->
    <PlacementStatusEvent time="2007-01-31T02:23:28Z" type="startPlacement">
      <SpotNPT scale="1">0</SpotNPT>
    </PlacementStatusEvent>
    <ViewerEvent time="2007-01-31T02:23:45Z" type="stop" eventSource="remote">
      <SpotNPT scale="1">17</SpotNPT>
    </ViewerEvent>
  </Events>
</SpotScopedEvents>
<!-- 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="2007-01-31T02:23:45Z" type="status">
    <core:StatusCode class="1" detail="3011">
      <core:Note>Placement not executed.</core:Note>
      <core:Note>Asset not played. Session ended before playout.</core:Note>
    </core:StatusCode>
  <Spot>
    <core:Content>
      <core:AssetRef providerID="advertiser3.com" assetID="ADVR3000123456789002"/>
      <core:Tracking>6F05FDC7-6C60-0030-B2B7-B68DAF952C98</core:Tracking>
    </core:Content>
  </Spot>
  </PlacementStatusEvent>
</Events>
</EntertainmentScopedEvents>
</PlayData>
<PlayData identityADS="ADSLogicalService_1170FEF4-C19B-450E-B624-421B23F525F5">
  <Events>
    <!--The ADM implementation decided to put this event is a separate PlayData
    element. This not required and it could have immediately followed the

```

```
last PlacementStatusEvent above.-->
```

```
<PlacementStatusEvent time="2007-01-31T02:23:50Z" type="endAll" messageRef="5B8ECCED-979B-421E-8A6E-E2192B11516A"/>  
</Events>  
</PlayData>  
</PlacementStatusNotification>
```

Figure I.5 – Example 68

Appendix II

Placement opportunity data model examples

(This appendix does not form an integral part of this Recommendation.)

II.1 Basic substitution example

Figure II.1 illustrates an original ITU-T J.380.3 adm:PlacementRequest message containing three adm:PlacementOpportunity elements.

```
<?xml version="1.0" encoding="UTF-8"?>
<PlacementRequest messageId="admmsg1" version="1.1" identity="ADMLogicalService_1170FEF4-C19B-450E-
B624-421B23F525F4" system="adm" updatesAllowed="false"
xmlns="http://www.scte.org/schemas/130-3/2008a/adm"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:core="http://www.scte.org/schemas/130.2/2008a/core"
>
  <!--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" opportunitiesExpected="3"/>
    <OpportunityConstraints>
      <DesiredDuration>PT60S</DesiredDuration>
      <Scope>National</Scope>
    </OpportunityConstraints>
  </PlacementOpportunity>
  <PlacementOpportunity id="Op2" serviceRegistrationRef="RegisteredServiceMatchRef2">
    <OpportunityBinding opportunityType="midRoll" opportunityNumber="2" opportunitiesExpected="3"/>
    <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" opportunitiesExpected="3"/>
    <OpportunityConstraints>
      <MaxDuration>PT60S</MaxDuration>
      <MinDuration>PT5S</MinDuration>
      <DesiredDuration>PT10S</DesiredDuration>
      <Scope>Local</Scope>
    </OpportunityConstraints>
  </PlacementOpportunity>
</PlacementRequest>
```

Figure II.1 – Example 69

Figure II.2 re-implements Figure II.1 and extends it using the PODM defined Placement OpportunityV2 element and the OpportunityConstraintsV2 element.

```

<?xml version="1.0" encoding="UTF-8"?>
<PlacementRequest messageId="admmmsg1" version="1.1" identity="ADMLogicalService_1170FEF4-C19B-450E-
B624-421B23F525F4" system="adm" updatesAllowed="false" xmlns="http://www.scte.org/schemas/130-
3/2008a/adm"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:core="http://www.scte.org/schemas/130.2/2008a/core"
xmlns:podm="http://www.scte.org/schemas/130-3/2008a/adm/podm"
>
  <!--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>
  <podm:PlacementOpportunityV2 id="Op1" serviceRegistrationRef="RegisteredServiceMatchRef1">
    <OpportunityBinding opportunityType="preRoll" opportunityNumber="1" opportunitiesExpected="3"/>
    <podm:OpportunityConstraintsV2>
      <DesiredDuration>PT60S</DesiredDuration>
      <Scope>National</Scope>
      <podm:Interactive name="BadMamboJamboInteractiveContent">
        <core:Ext>
          <core:Content>
            <core:AssetRef providerID="mambo.com" assetID="MAMB0334455667788991"/>
          </core:Content>
        </core:Ext>
      </podm:Interactive>
    </podm:OpportunityConstraintsV2>
  </podm:PlacementOpportunityV2>
  <podm:PlacementOpportunityV2 id="Op2" serviceRegistrationRef="RegisteredServiceMatchRef2">
    <OpportunityBinding opportunityType="midRoll" opportunityNumber="2" opportunitiesExpected="3"/>
    <OpportunityConstraints>
      <MaxDuration>PT31S</MaxDuration>
      <MinDuration>PT29S</MinDuration>
      <DesiredDuration>PT30S</DesiredDuration>
      <Scope>Local</Scope>
    </OpportunityConstraints>
  </podm:PlacementOpportunityV2>
  <PlacementOpportunity id="Op3" serviceRegistrationRef="RegisteredServiceMatchRef3">
    <OpportunityBinding opportunityType="postRoll" opportunityNumber="3" opportunitiesExpected="3"/>
    <podm:OpportunityConstraintsV2>
      <MaxDuration>PT60S</MaxDuration>
      <MinDuration>PT5S</MinDuration>
      <DesiredDuration>PT10S</DesiredDuration>
      <Scope>Local</Scope>
    </podm:OpportunityConstraintsV2>
  </PlacementOpportunity>
</PlacementRequest>

```

Figure II.2 – Example 70

Figure II.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.

Figure II.2 also illustrates a PlacementOpportunityV2 element may use either an adm:OpportunityConstraints element or a podm:OpportunityConstraintsV2 element inside its context.

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