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Digital Program Insertion–Advertising Systems Interfaces

Part 4

Content Information Service (CIS)

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Digital Program Insertion—Advertising Systems Interfaces

Part 4—Content Information Service (CIS)

1.0 SCOPE

This document, SCTE 130 Part 4, describes the Digital Program Insertion Advertising Systems Interfaces' Content Information Service (CIS) messaging and data type specification using XML, XML Namespaces, and XML Schema.

2.0 REFERENCES

2.1 Normative References

The following standards contain provisions that, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of the standards indicated below.

[SCTE130-1]	SCTE 130-1 2011: Digital Program Insertion—Advertising Systems Interfaces Part 1—Overview
[SCTE130-2]	SCTE 130-2 2008a: Digital Program Insertion—Advertising Systems Interfaces Part 2 - Core Data Elements
[SCTE130-7]	ANSI/SCTE 130-7 2009: Digital Program Insertion – Advertising Systems Interface Part 7 – Message Transport
[SCTE130-8]	SCTE 130-8 2011: Digital Program Insertion – Advertising Systems Interfaces Part 8 – General Information Service
[W3C - XSD]	XML Schema Part 1: Structures Second Edition

Table 1: Normative References

All normative references found in any of the Table 1 references are included and apply to this document. See the individual specifications for additional information.

2.1.1 Normative Reference Acquisition

2.1.1.1 SCTE Standards: United States of America

Society of Cable Telecommunications Engineers Inc., 140 Philips Road, Exton, PA 19341; Telephone 800-542-5040; Facsimile: 610-363-5898; E-mail: standards@scte.org; URL: <http://www.scte.org>.

2.1.1.2 W3C Standards

MIT, 32 Vassar Street, Room 32-G515, Cambridge, MA 02139, USA;
Telephone: +1.617.258.5999; <http://www.w3.org>..

3.0 COMPLIANCE NOTATION

“SHALL”	This word or the adjective “REQUIRED” means that the item is an absolute requirement of this specification.
“SHALL NOT”	This phrase means that the item is an absolute prohibition of this specification.
“SHOULD”	This word or the adjective “RECOMMENDED” means that there may exist valid reasons in particular circumstances to ignore this item, but the full implications should be understood and the case carefully weighted before choosing a different course.
“SHOULD NOT”	This phrase means that there may exist valid reasons in particular circumstances when the listed behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.
“MAY”	This word or the adjective “OPTIONAL” means that this item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because it enhances the product, for example; another vendor may omit the same item.

Table 2: Compliance Notice

4.0 DEFINITIONS

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

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

5.0 ABBREVIATIONS

All [SCTE130-2], [SCTE130-7] and [SCTE130-8] definitions are included herein. See [SCTE 130 -2], [SCTE130-7] and [SCTE130-8] for additional information. This interface is an advertising service of [SCTE130-8] and makes references accordingly.

CIS – Content information service

6.0 CONTENT INFORMATION SERVICE OVERVIEW (INFORMATIVE)

A CIS provides asset metadata query and notification services, including media availability if known, to service consumers. Using the interfaces defined in this specification, service consumers may retrieve detailed information about assets referenced by a CIS.

There are multiple use cases supported by this standard. A straightforward example is a VOD or linear delivery system with stored ad content. The advertising system queries the delivery system's available storage using the CIS interface to insure ad copy is available for placement.

A second CIS use is to inform an advertising system of available entertainment content or metadata for creating and directing campaigns. In this case, an advertising system may adjust dynamically to the arrival of new entertainment content, or metadata.

Figure 1 shows the location and possible clients of a CIS representing stored ad or entertainment content.

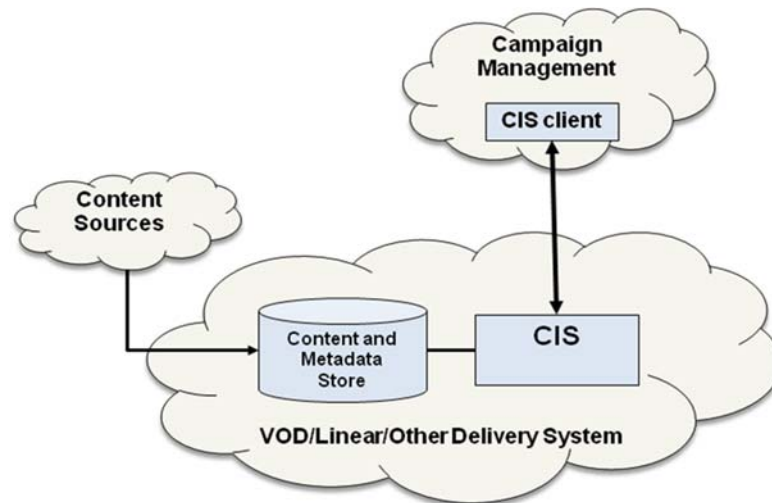


Figure 1 - CIS Content Storage

A third use case, referred to as 'forecasting' herein, has the advertising system or campaign manager include a CIS in order to provide information relative to ad and/or entertainment assets required by clients at the present time, or at some future time. Content information returned by a forecasting service does not necessarily reflect stored ad copy, but rather reflects current or upcoming ad and/or entertainment copy needs. The client of such a forecasting service could use the retrieved information to obtain, transcode and/or otherwise prepare ad and/or entertainment assets for current or future needs.

Note that all the use cases outlined above may exist in the same system. A delivery system may access a forecasting service to access and prepare ad copy. When the ad copy is available for placement, the delivery system may update or notify the advertising system that the available ad copy has changed and the advertising system may then begin to include the new advertisements in advertising decisions.

Figure 2 below illustrates this use of dual CIS services.

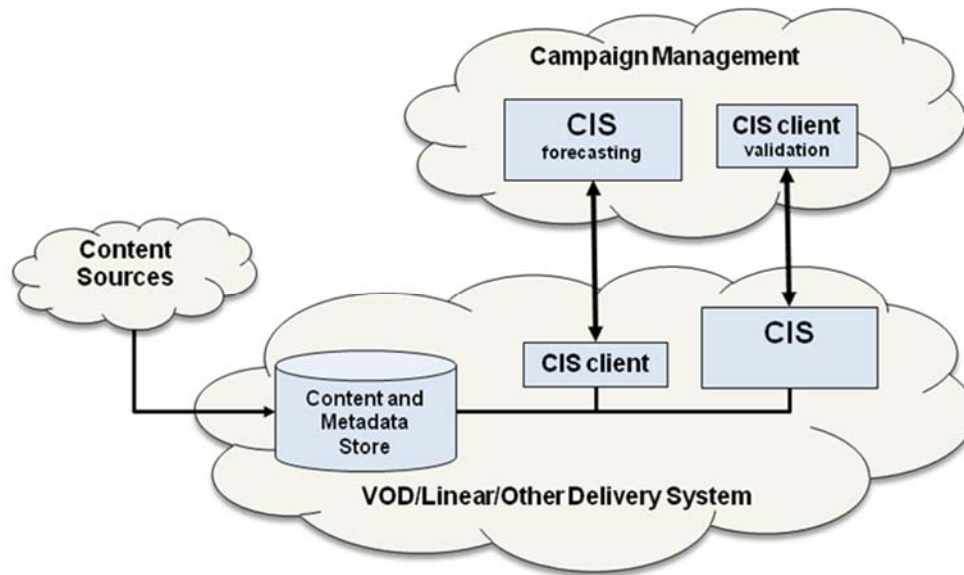


Figure 2 - CIS Forecasting

Part 4 facilitates the expression of CIS supported data models through the use of XML substitution groups. The inclusion of multiple data models is accomplished using a ‘connector schema’. Connector schemas conform to SCTE 130 Part 8 by extending the definition of the gis:BasicQueryResultAbstract, using XML substitution groups. These substitution groups may include references to additional namespaces and/or XML elements.

See Appendix E for and explanation of the generic format of a connector schema. Also see Appendices A, B and C for optional normative connectors defined by this standard.

7.0 NOTATIONAL CONVENTIONS

7.1 Normative XML Schema

SCTE 130 Part 4 employs the same notational conventions as [SCTE130-8]. Refer to [SCTE130-8] for an explanation of notational conventions.

7.2 Document Conventions

SCTE 130 Part 4 employs the same document conventions as [SCTE130-8]. Refer to [SCTE130-8] for an explanation of document conventions.

8.0 PROCESSING CONVENTIONS

8.1 Unknown/Unrecognized/Unsupported XML Elements and Attributes

See [SCTE130-2] for information.

9.0 XML NAMESPACES

This specification uses the ‘cis’ prefix, as described in Table 3, for the interface associated with the specific XML namespace URI that shall be used by all implementations. Table 3 lists the prefix, the corresponding namespace, and a description of the defining specification used herein.

Prefix	Namespace	Description
core	http://www.scte.org/schemas/130-2/2008a/core	See [SCTE130-2]
gis	http://www.scte.org/schemas/130-8/2011/gis	See [SCTE130-8]
cis	http://www.scte.org/schemas/130-4/2011/cis	SCTE 130 Part 4
query	http://www.scte.org/schemas/130-4/2011/cis/query	SCTE 130 Part 4
wsdl	http://www.scte.org/wsdl/130-4/2011/cis	SCTE 130 Part 4
xsd	http://www.w3.org/2001/XMLSchema	See [W3C-XSD]

Table 3: XML Namespace Declarations

Unless otherwise stated, all references to XML elements illustrated in this document are from the ‘cis’ namespace. Elements from other namespaces will be prefixed with the name of the external namespace, e.g. <core:XXXX>.

10.0 DATA MODEL AND QUERY SUPPORT

For query and response messages limited to basic query support, CIS implementations shall support the exchange of name/value pairs, referred to as qualifiers. See [SCTE130-8]. Additionally, a CIS may support any number of external data models and an appropriate connector schema should be defined for each supported data model.

CIS implementations are not required to support any specific data model. All data models and connector schemas described herein are optional. CIS implementations choosing to support one or more data models described in Appendices A, B or C, shall implement the connector schema as described in the respective normative section.

11.0 CIS MESSAGES

This specification includes a query and a notification model for CIS to endpoint messaging. The model includes associated notification management functions such as registration, deregistration and active registration listing.

The following topics are covered by [SCTE130-8].

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

This specification considers all aspects defined therein to be normative and applicable herein. See [SCTE130-2] and [SCTE130-8] for additional information.

The CIS message interface shall include the messages defined in [SCTE130-2]. Table 4 identifies additional SCTE 130 Part 4 CIS specific messages.

Message	Description
CISListSupportedFeaturesRequest	Request to retrieve a list of CIS supported features
CISListSupportedFeaturesResponse	Response to CISListSupportedFeaturesRequest
CISListQualifiersRequest	Request to list basic query qualifier information
CISListQualifiersResponse	Response to CISListQualifiersRequest
CISListNotificationRegistrationRequest	Request to list existing registrations
CISListNotificationRegistrationResponse	Response to CISListNotificationRegistrationRequest
CISNotificationRegistrationRequest	Registration request for content notification
CISNotificationRegistrationResponse	Response to CISNotificationRegistrationRequest
CISNotification	Notification message indicating asset status change

CISNotificationAcknowledgement	Response to CISNotification
CISCreateCursorRequest	Request to create a cursor
CISCreateCursorResponse	Response to CISCreateCursorRequest
CISCancelCursorRequest	Request to cancel an existing cursor
CISCancelCursorResponse	Response to CISCancelCursorRequest
CISQueryRequest	Request to acquire records from the CIS
CISQueryResponse	Response to CISQueryRequest
CISNotificationDeregisterRequest	Request to de-register a previously accepted registration
CISNotificationDeregisterResponse	Response to CISNotificationDeregisterRequest
CISDeregistrationNotification	Deregistration notification
CISDeregistrationAcknowledgement	Deregistration notification acknowledgement

Table 4: CIS Top Level Messages

11.1 @version Attribute

For all SCTE 130 Part 4 messages defined herein (i.e., those messages prefix with the string “CIS”), the @version attribute shall be set to the value “2.0” for this document’s revision. For messages defined by the core namespace, for example core:ServiceStatus and core:ServiceNotification, their @version attribute shall contain the value defined by the normatively referenced specification (e.g., “1.1”). See [SCTE130-2] for additional information.

11.2 Request Base Message

All CIS top level **request** messages are derived from the gis:Msg_RequestBaseType abstract base message type.

11.2.1 Request Base Message Attributes

All request Base Message Attributes are consistent with those listed in [SCTE130-8].

11.2.2 Request Base Message Elements

All Request Base Message Elements are consistent with those listed in [SCTE130-8]

11.3 Response Base Message

All CIS top level **response** messages are derived from the gis:Msg_ResponseBaseType abstract base message type.

11.3.1 Base Response Message Attributes

All Response Base Message Attributes are consistent with those listed in [SCTE130-8]

11.3.2 Base Response Message Elements

All Response Base Message Elements are consistent with those listed in [SCTE130-8], except those elements listed below in this section.

11.4 Notification Base Message

All CIS top level **notification** messages are derived from the `gis:Msg_NotificationBaseType` abstract base message type. See the [SCTE130-8] document for details on the attributes and elements contained in this base message.

11.4.1 Notification Base Message Attributes

All Notification Base Message Attributes are consistent with those listed in [SCTE130-8].

11.4.2 Notification Base Message Elements

All Notification Base Message Elements are consistent with those listed in [SCTE130-8].

11.5 Acknowledgement Base Message

All CIS top level **acknowledgement** messages are derived from the `gis:Msg_AcknowledgementBaseType` abstract base message type. See the [SCTE130-8] document for details on the attributes and elements contained in this base message.

11.5.1 Acknowledgement Base Message Attributes

All Acknowledgement Base Message Attributes are consistent with those listed in [SCTE130-8].

11.5.2 Acknowledgement Base Message Elements

All Acknowledgement Base Message Elements are consistent with those listed in [SCTE130-8].

11.6 Messages Requiring Notification Registration

Registration is required for `CISNotification`, `CISNotificationDeregisterRequest` and `CISDeregistrationNotification` message exchanges. All other CIS messages do not require registration and may be sent at any time.

11.7 CIS Message Exchange

The following diagram illustrates a typical message exchange between a CIS client and the CIS.



Figure 3 - CIS Message Exchange

Figure 3 illustrates all of the message exchanges that are specific to the CIS. The core:ServiceCheck and core:ServiceStatus message exchanges are not depicted in this illustration.

11.8 CISListSupportedFeaturesRequest and Response

The CISListSupportedFeatures request and response messages allow clients to inquire about CIS supported data models and advanced query languages.

11.8.1 CISListSupportedFeaturesRequest Message

The CISListSupportedFeatures request message allows a CIS client to inquire about the data models and advanced query languages supported by a CIS. Advanced query language support is optional and thus, the response message may or may not contain information regarding advanced query languages.

The XML schema definition for this message is illustrated in Figure 4.

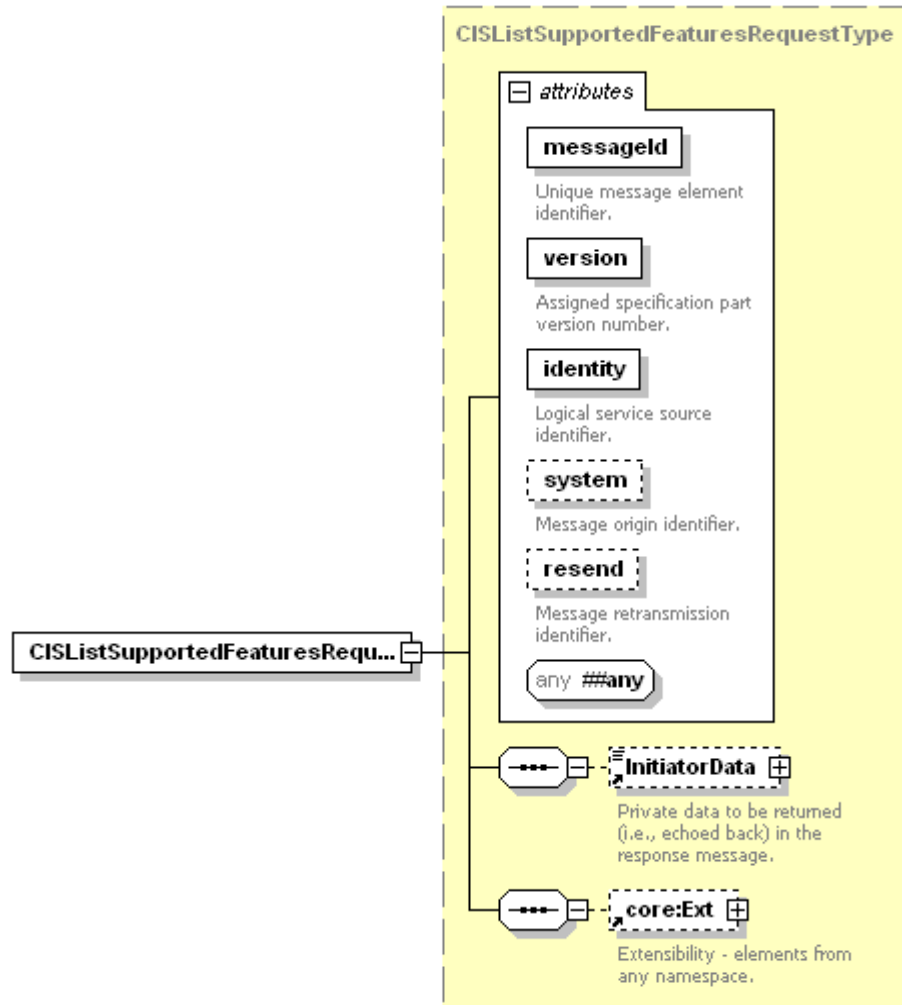


Figure 4 – CISListSupportedFeaturesRequest XML Schema

This CIS interface adds only a single core:Ext to the gis:ListSupportedFeaturesRequestType defined by [SCTE130-8]. See [SCTE130-8] for additional information.

11.8.2 CISListSupportedFeaturesResponse Message

A successful return status in the CISListSupportedFeaturesResponse message indicates the message shall contain at a minimum the following elements.

- A single core:Callout element containing one or more core:Address element(s) supplying an endpoint for additional services as specified by Table 5. See [SCTE130-2] and [SCTE130-8] for additional information.
- One or more gis:ServiceDataModelProfile elements describing a data model supported by a CIS. CIS supported data models are outside the scope of this specification.

The XML schema definition for this message is illustrated in Figure 5.

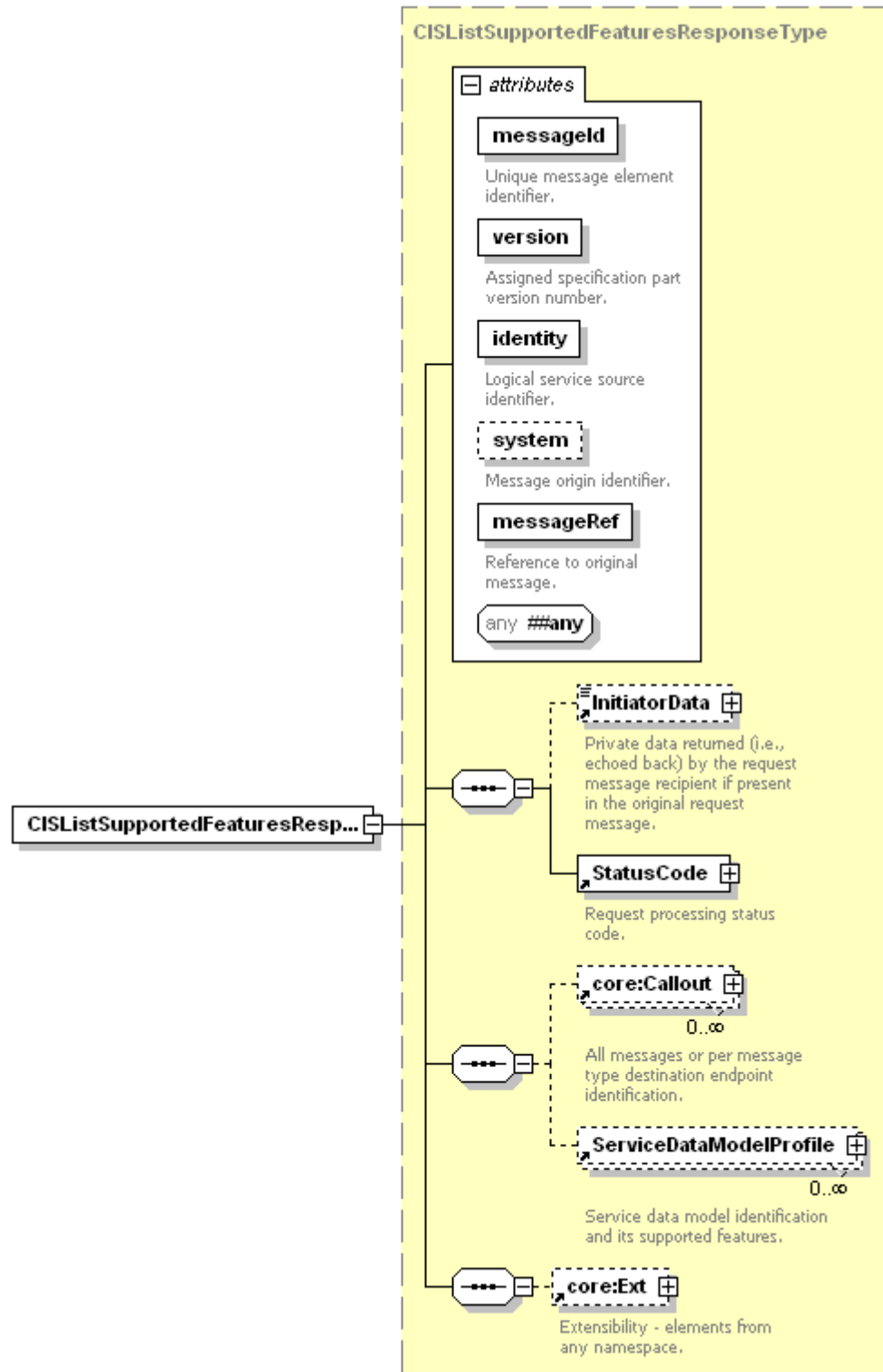


Figure 5 – CISListSupportedFeaturesResponse XML Schema

This CIS interface adds only a single core:ext to the gis:CISListSupportedFeaturesResponseType defined by [SCTE130-8]. See [SCTE130-8] for additional information.

Table 5 contains the values for the @message attribute of the core:Callout element. Values for the @message attribute should be used exactly as defined in this table.

Value	Description
CISNotificationRegistrationRequest	Destination endpoint for message.
CISNotificationDeregisterRequest	Destination endpoint for message.
CISListQualifiersRequest	Destination endpoint for message.
CISListNotificationRegistrationRequest	Destination endpoint for message.
CISCreateCursorRequest	Destination endpoint for message.
CISCancelCursorRequest	Destination endpoint for message.
CISContentQueryRequest	Destination endpoint for message.
ServiceStatusNotification	Destination endpoint for message.
...	User defined address endpoint outside of the scope of this specification. The string shall be prefixed with the text "private".

Table 5: ListSupportedFeatures core:Callout @message values

All message values listed in Table 5 and not present in the CISListSupportedFeaturesRequest message's core:Callout XML element sequence shall be available through the default endpoint, if present. The default endpoint is identified by a core:Callout element not having the @message attribute. See [SCTE130-2] for additional information.

11.9 CISListQualifiersRequest and Response Messages

The CISListQualifiersRequest and CISListQualifiersResponse messages allow clients to discover the asset metadata identifiers associated with a CIS implementation's service data models, which may be queried with the basic query interface.

11.9.1 CISListQualifiersRequest Message

The CISListQualifiersRequest message allows a CIS consumer to inquire about the qualifier names used by a service data model available for query using the basic query interface.

Figure 6 illustrates the CISListQualifiersRequest message's schema.

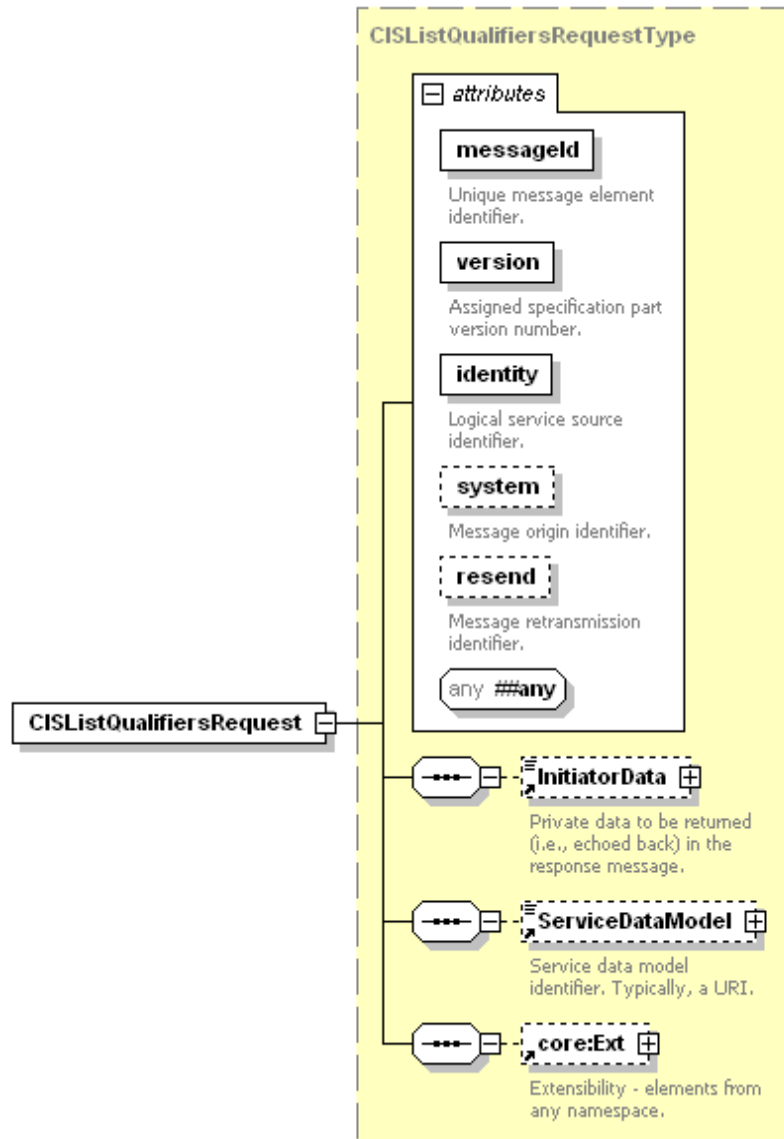


Figure 6 – CISListQualifiersRequest XML Schema

The CIS interface adds only a single core:Ext to the gis:ListQualifiersRequestType defined by [SCTE130-8]. See [SCTE130-8] for additional information.

11.9.2 CISListQualifiersResponse Message

If the CIS implementation supports the service data model specified in the CISListQualifiersRequest message's ServiceDataModel element, the CISListQualifiersResponse message shall contain, at a minimum, a single gis:BasicQueryDataModelDescription element. See [SCTE130-8] for additional information on the gis:BasicQueryDataModelDescription element.

If the CIS implementation does not support the service data model contained in the CISListQualifiersRequest/ServiceDataModel element, no

gis:BasicQueryDataModelDescription element shall be returned and the StatusCode element's @detailCode shall be set to core:ResourceNotFound.

The XML schema definition for the CISListQualifiersResponse message is illustrated in Figure 7.

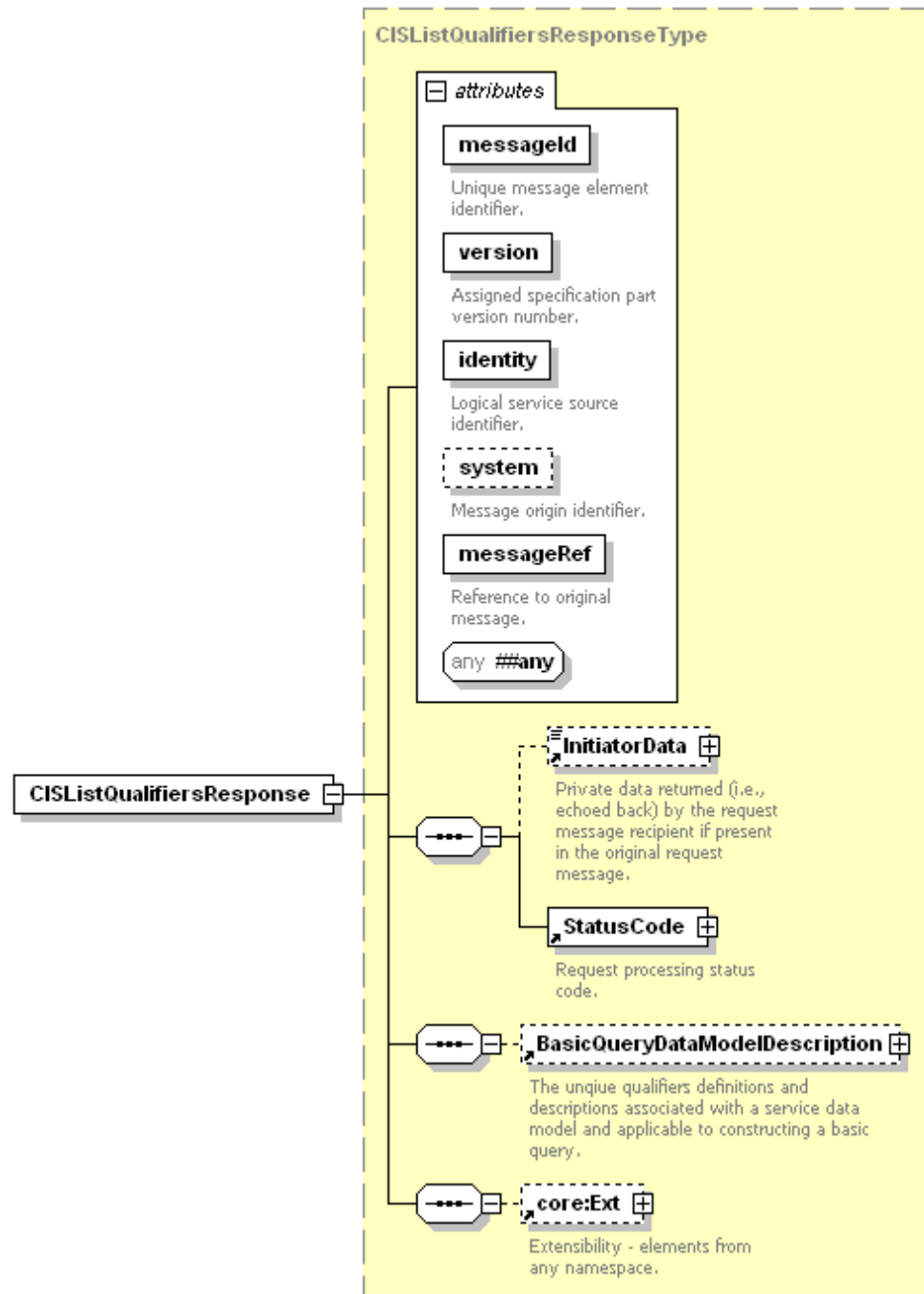


Figure 7 – CISListQualifiersResponse XML Schema

The CIS interface adds only a single core:Ext to the `gis:ListQualifiersResponseType` defined by [SCTE130-8]. See [SCTE130-8] for additional information.

11.10 CISListNotificationRegistrationRequest and Response

A CIS client may inquire about current registrations by using the `CISListNotificationRegistrationRequest` message. The CIS shall respond to the `CISListNotificationRegistrationRequest` message with a `CISListNotificationRegistrationResponse` message. This allows a CIS client to discover the active notification queries that were previously installed by one or more `CISNotificationRegistrationRequest` messages.

11.10.1 CISListNotificationRegistrationRequest Message

The `CISListNotificationRegistrationRequest` message may be issued to a CIS to retrieve information about active `CISNotificationRegistrationRequest` messages.

The XML schema definition for this message is illustrated in Figure 8.