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Digital Program Insertion–Advertising Systems Interfaces
Part 7 – Message Transport

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Digital Program Insertion—Advertising Systems Interfaces

Part 7 - Message Transport

1.0 SCOPE

This document describes the Digital Program Insertion Advertising Systems Interfaces' transport protocols required for the exchange of messages defined in the individual parts of the SCTE 130 specification.

Note: Security issues surrounding the transport protocols defined herein have been purposely omitted and are considered outside of the scope of this document.

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.

[SCTE130-2]	SCTE 130-2 2008a: Digital Program Insertion—Advertising Systems Interfaces Part 2 - Core Data Elements
[SCTE130-3]	SCTE 130-3 2009: Digital Program Insertion—Advertising Systems Interfaces Part 3 – Ad Management Service (ADM) Interface
[SCTE130-4]	SCTE 130-4 2009: Digital Program Insertion – Advertising Systems Interfaces Part 4 – Content Information Service (CIS) Interface
[W3C – SOAP1.1]	W3C Ref: Simple Object Access protocol (SOAP) 1.1
[W3C – SOAP1.2]	W3C Ref: SOAP Version 1.2 Part 1: Messaging Framework (Second Edition). April 27 th , 2007
IETF STD05	(Originally RFC791) Internet Protocol. September 1981. DARPA Internet Program Protocol Specification.
IETF STD07	(Originally RFC793) Transmission Control Protocol. September 1981. DARPA Internet Program Protocol Specification.

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.w3c.org>.

2.1.1.3 IETF

IETF Secretariat (c/o NeuStar, Inc.), 45000 Center Oak Plaza, Sterling, VA, 20166, Phone: 1.571.434.3500; Facsimile: 1.571.343.3535; E-mail: ietf-info@ietf.org; URL: <http://www.ietf.org>.

2.2 Informative References

The following documents may provide valuable information to the reader but are not required when complying with this standard.

[SCTE130-5]	SCTE 130-5: Digital Program Insertion – Advertising Systems Interfaces Part 5 – Placement Opportunity Information Service (POIS) Interface (Work in progress)
[SCTE130-6]	SCTE 130-6: Digital Program Insertion – Advertising Systems Interfaces Part 6 – Subscriber Information Service (SIS) Interface (Work in progress)
[SCTE130-8]	SCTE 130-8: Digital Program Insertion – Advertising Systems Interfaces Part 8 – General Information Service (GIS) Interface (Work in progress)
[W3C – SOAP Part 0]	W3C Ref: SOAP Version 1.2 Part 0: Primer.
[W3C – WSDL]	W3C Ref: Web Services Description Language (WSDL) Version 1.1.
[W3C – DOM]	W3C Ref: Document Object Model (DOM) Level 3 Core.
[W3C – URI]	W3C Ref: URIs, URLs and URNs: Clarifications and Recommendations 1.0.
[WS-I – Basic Profile 1.1]	Web Services Interoperability Organization. Basic Profile Version 1.1.

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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>.

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Telephone: +1.617.258.5999; <http://www.w3c.org>.

2.2.1.3 WS-I Organization

Web Services Interoperability Organization; <http://www.ws-i.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.

4.0 DEFINITIONS AND ACRONYMS

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] definitions are included herein. See [SCTE130-2] for additional information.

HTTP: (Hypertext Transfer Protocol). The underlying protocol used by the World Wide Web. HTTP defines how messages are formatted and transmitted, and what actions Web Servers and browsers should take in response to various commands.

HTTPS: (HTTP over SSL or HTTP Secure) is the use of Secure Socket Layer (SSL) or Transport Layer Security (TLS) as a sublayer under regular HTTP application layering.

IP: (Internet Protocol). A protocol by which data is sent from one computer to another computer over a network.

RPC: (Remote Procedure Call). A protocol that one program can use to request a service from a program located in another computer in a network without having to understand network details.

SOAP: (Simple Object Access Protocol / Service Oriented Architecture Protocol). A way for a program executing in one kind of operating system to communicate with a program executing in the same or another kind of operating system by using the World Wide Web's Hypertext Transfer Protocol (HTTP) and its Extensible Markup Language (XML) as the mechanisms for information exchange.

TCP: (Transmission Control Protocol). A set of rules used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet.

WSDL: (Web Services Description Language). A XML based general purpose language for describing interfaces, protocol bindings, and deployment details of network services.

5.0 ABBREVIATIONS

All [SCTE130-2] abbreviations are included herein. See [SCTE130-2] for additional information.

CDATA: (Character **DATA**). XML data that is not parsed. CDATA carries markup examples that would otherwise be interpreted as XML because of the tags.

DII: (Dynamic Invocation Interface). A method of accessing web service resources through low level application programming interface (API) functions.

DOM: (Document Object Model). A specification for a programming interface (API) from the W3C that allows programs and scripts to update the content, structure and style of HTML and XML documents.

6.0 TRANSPORT OVERVIEW (INFORMATIVE)

This document describes implementation details for the Digital Program Insertion Advertising Systems Interfaces' message transport. Two transport mechanisms are described herein. Only one of the two transport mechanisms defined in this document is required for implementing SCTE 130 compliant services. The second transport protocol defined herein is optional, but is a highly recommended second choice for all implementations.

6.1 Document Organization

This document provides a detailed description of two (2) separate transport mechanisms. Each subsequent section focuses on the description of a particular

transport mechanism, and provides links to concrete implementation examples in the document appendices.

Section 7.0 explains this document's notational conventions and Section 8.0 identifies the processing conventions. Section 9.0 defines the XML namespace usage and the applicable XML semantics. Section 10.0 introduces reliable network delivery and section 11.0 introduces the SCTE 130 transport protocols followed by Appendix A and B, which contain non-normative information regarding the SOAP and TCP transport types.

7.0 NOTATIONAL CONVENTIONS

7.1 Normative XML Schema

See [SCTE130-2] for information.

7.2 Document Conventions

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

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 'trans' prefix, as described in **Error! Reference source not found.**, for the interface associated with the specific XML namespace URI that shall be used by all implementations. **Error! Reference source not found.** 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]
trans	http://www.scte.org/schemas/629-7/2008/trans	SCTE 130 Part 7
env	http://schemas.xmlsoap.org/soap/envelope	See [W3C – SOAP1.1]
soap-env	http://www.w3.org/2003/05/soap-envelope	See [W3C – SOAP1.2]
xsd	http://www.w3.org/2001/XMLSchema	See [XMLSchemaP1] and [XMLSchemaP2] from [SCTE130-2]

Table 1: XML Namespace Declarations

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

10.0 RELIABLE MESSAGE DELIVERY

Message delivery, as defined in [SCTE130-2], describes the concept of reliable message acquisition through the use of positive message acknowledgement with the possibility of message retransmission. Each SCTE 130 top level request and/or notification message has a corresponding response and/or acknowledgement message. In addition, the specification allows for the concept of message retransmission via the @resend attribute.

When combined with a communication protocol such as TCP, truly reliable message delivery between cooperating services can be achieved. Figure 1 illustrates the conceptual layering of services involved in reliable message delivery using TCP, with an additional layer for packet definition and routing.

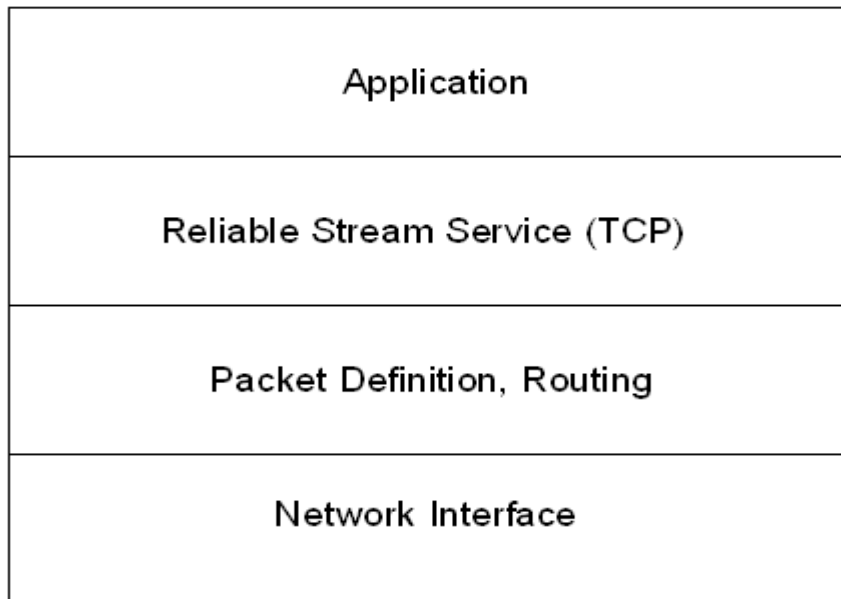


Figure 1: Network Layering

Each of the transport mechanisms described herein depend on the use of the reliable stream service (TCP) at some layer within their transport implementation. Thus, the use of TCP, or more specifically, TCP along with IP for packet definition and routing, becomes the de facto standard for message delivery within this specification.

11.0 SCTE 130-7 MESSAGE TRANSPORT TYPES

The following sections describe three SCTE 130-7 specified transport types for message delivery between cooperating SCTE 130 services.

SCTE 130 service implementations shall implement the SOAP protocol, described in section 11.2, and should implement the TCP protocol described in section 11.3.

11.1 Transport Types

The core:Address element described in [SCTE130-2] may contain an @type attribute that identifies the transport type associated with the specified address. The @type attribute shall be used and shall appear exactly as it does in Table 2 for the application selected transport protocol.

Transport Type	Description
SOAP1.1	SOAP transport protocol identifier for [W3C – SOAP1.1]
SOAP1.2	SOAP transport protocol identifier for [W3C – SOAP1.2]
TCP	TCP transport protocol identifier
...	User defined and outside the scope of this specification. The string shall be prefixed with the text “private:”.

Table 2: Address Types

```
<core:Callout>
  <core:Address type="SOAP1.1">http://10.250.32.50/scte130</core:Address>
</core:Callout>
```

Example 1: Address Type Usage

Example 1 illustrates the use of the @type attribute within an core:Address element. In this example, the SOAP1.1 transport type has been specified as the protocol to be used when communicating with the URI contained within the core:Address element.

```
<core:Callout>
  <core:Address type="private:HTTP">http://10.250.30.22/scte130</core:Address>
</core:Callout>
```

Example 2: Private Address Type

Example 2 illustrates the use of the ‘private’ keyword within the @type attribute value to allow for the use of an additional transport type other than those defined in Table 2.

A description of the private:HTTP transport type or any other private transport protocol is outside the scope of this document.

11.2 SOAP Transport

Web services, and SOAP in particular, cover a very broad range of implementation styles and techniques. SOAP originally stood for *Simple Object Access Protocol*, and

more recently *Service Oriented Architecture Protocol*, but is now simply SOAP. The original acronym was dropped with version 1.2 of the standard, which became a W3C recommendation on June 24, 2003, as it was considered to be misleading.

All SCTE 130 Part-7 implementations shall implement [W3C – SOAP1.1] and should implement [W3C – SOAP1.2].

Each interface described in the SCTE 130 specification is supported by WSDL definitions. Information Service oriented SCTE 130 services, like the CIS, SIS and POIS, shall contain two (2) port sections within a single WSDL document. This separation of port definitions within information service WSDLs allows for the separation of client side service endpoints from the server side service endpoints. An example of this includes the cis:ContentNotification service endpoint, which may be implemented by [SCTE130-4] clients but not by CIS servers.

Other SCTE 130 services that are not information service oriented shall use a single WSDL port definition to define the services available at a particular service endpoint.

See Appendix A.2.1 for a brief description of WSDL file components.

SCTE 130 web-service implementations shall use the Document/Literal binding style for all SOAP bindings, as outlined in the [WS-I - Basic Profile 1.1]. See Appendix A.1.4 for additional information on the advantages of the Document/Literal binding style, and for a detailed description of all available binding styles.

11.2.1 WSDL Target Namespace URI Format

This document defines the WSDL target namespace URI format for the SOAP transport service interfaces associated with the SCTE 130 specification. This URI format shall be used by all implementations applying this specification.

WSDL target namespace URIs shall have the following structure:

[<prefix>/<part-#>/<version>/<interface name>]

The WSDL target namespace URIs for the separate parts within the SCTE 130 specification shall contain the following elements separated by the standard URI path separation character ‘/’.

<prefix> – The prefix element for all WSDL target namespaces shall contain the URI fragment [http://www.scte.org/wsdl].

<part-#> - The part number element shall contain a reference to the SCTE 130 part number for which the namespace has been defined.

<version> - The version number element shall contain a value which indicates the particular version of the WSDL target namespace.

<interface name> - The interface name element shall contain a reference to the particular interface of the SCTE 130 specification for which the WSDL target namespace has been defined.

The interface name element is a refinement of the <part-#> element and is used to identify individual interfaces within the same SCTE 130 specification part.

An example of the WSDL target namespace URI for [SCTE130-4] is illustrated in Example 3.

<http://www.scte.org/wsd/130-4/2008a/cis>

Example 3: Part-4 WSDL Target Namespace URI

Example 4 illustrates the WSDL target namespace URIs for [SCTE130-3].

<http://www.scte.org/wsd/130-3/2008a/adm>
<http://www.scte.org/wsd/130-3/2008a/ads>

Example 4: WSDL URI Target Namespaces for [SCTE130-3]

In Example 4, the part number of the two WSDL target namespace URIs are both the same since each target namespace comes from [SCTE130-3]. The interface name for each namespace is different and identifies the separate interfaces within [SCTE130-3]. This separation allows for separate implementations for the ADM and ADS to be built from the same specification.

11.2.2 Fault Notification

SOAP fault messages are the mechanism by which SOAP applications report errors ‘upstream’ to nodes earlier in the message path. The intended use of SOAP faults within this specification is for errors that are unique to the SOAP stack implementation only.

Errors that occur at the application level shall use the core:StatusCode element as described in [SCTE130-2] and not the SOAP fault mechanism described herein to communicate errors.

11.2.3 SOAP 1.1 Fault Message

The XML schema for the SOAP 1.1 Fault message is illustrated in Figure 2.