
**Information technology —
Telecommunications and information
exchange between systems — XML
Schema Definitions for Computer
Supported Telecommunications
Applications (CSTA) Phase III**

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*Technologies de l'information — Téléinformatique — Définitions de
schéma XML pour applications en télécommunications supportées par
ordinateur (CSTA) en phase III*

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Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 18056 was prepared by Ecma International (as ECMA-323) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by the national bodies of ISO and IEC.

This fifth edition cancels and replaces the fourth edition (ISO/IEC 18056:2010), which has been technically revised.

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Information technology — Telecommunications and information exchange between systems — XML Schema Definitions for Computer Supported Telecommunications Applications (CSTA) Phase III

1 Scope

This International Standard specifies an XML protocol for the services defined in ISO/IEC 18051. It provides an alternative protocol to the ASN.1 based protocol specified in ISO/IEC 18052.

In addition to the CSTA-specific protocol details, this International Standard describes the concepts underlying the request/response model, application association, notation and service, and describes the template used in this International Standard.

It also specifies the PICS for this International Standard and provides examples of CSTA XML encodings.

2 Conformance

A manufacturer may select any part of the CSTA protocol, as specified in this International Standard, for implementation on a system as long as it satisfies the minimum conformance requirements as specified in Clause 2 of ISO/IEC 18051:2010.

A Protocol Implementation Conformance Statement (PICS) shall be used to specify the operations which are provided by a particular implementation. A PICS shall also specify the parameter options which are used.

2.1 Static Requirements

To conform to this International Standard, a system shall support the syntax as defined by the XML 1.0 specification and the structures and data types as defined in the XML Schema Structure and XML Schema Data Types specifications for the purpose of generating and interpreting CSTA protocol information for the operations supported.

2.2 Dynamic Requirements

To conform to this International Standard, a system shall:

- a. follow the procedures as specified in this International Standard, and ISO/IEC 18051, relevant to each CSTA operation that the system claims to implement; and
- b. satisfy the definitions, as specified in ISO/IEC 18051, relevant to each CSTA service that the system claims to implement.

2.3 PICS Requirement

To conform to this International Standard, the following shall be stated by the implementer when defining a PICS corresponding to an application or implementation:

- a. which CSTA operations, as defined in ISO/IEC 18051, are supported by the system for the particular implementation; and
- b. which optional parameters are supported by each supported operations.

A PICS proforma is specified in Annex A of this International Standard.

2.4 XML Tag Options

To conform to this International Standard, a system shall support at least one of the XML tag options listed below.

ISO/IEC 18056:2012 (E)

2.4.1 ISO/IEC 18056 (ECMA-323) Specified Tags

Instance documents shall include the following URI for the namespace and conform to the schemas as specified in Clause 9 through 27 of this International Standard without transformations.

<http://www.ecma-international.org/standards/ecma-323/csta/ed6>

2.4.2 ISO/IEC 18056 (ECMA-323) Specified Short Tags

Instance documents shall include the following URI for the namespace and conform to the schemas as specified in Clause 9 through 27 of this International Standard with transformations as specified in Annex D.

urn:www.ecma-international.org/standards/ecma-323/csta/ed6/short_tags

2.4.3 Dynamic Transformations

Implementation claiming conformance to this option shall support XML schema transformations e.g. using `<?xml-stylesheet>` for the schemas specified in Clause 9 through 27.

2.5 CSTA Over SIP (uaCSTA) Transport Mechanism Option

An implementation that conforms to this International Standard can also claim conformance to the “CSTA Over SIP (uaCSTA Transport Mechanism Option” by implementing the SIP and CSTA procedures specified in Annex C.

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3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

3.1 ISO Standards and Technical Reports

- | | |
|------------------------------|--|
| ISO/IEC 18051:2012 | Information technology - Telecommunications and information exchange between systems - Services for Computer Supported Telecommunications Applications (CSTA) Phase III |
| ISO/IEC 18052:2011 | Information technology - Telecommunications and information exchange between systems - Protocol for Computer Supported Telecommunications Applications (CSTA) Phase III |
| ISO/IEC TR 18053:2000 | Information technology - Telecommunications and information exchange between systems - Glossary of definitions and terminology for Computer Supported Telecommunications Applications (CSTA) Phase III |

3.2 World Wide Web Consortium Specifications

- | | |
|--------------------------|---|
| XML 1.0 | XML 1.0. W3C Recommendation February 1998 (revised October 2000) |
| XML Schema Part 1 | XML Schema Language Part 1: Structures. W3C Recommendation 2 May 2001 |
| XML Schema Part 2 | XML Schema Language Part 2: Datatypes. W3C Recommendation 2 May 2001 |

4 Terms, definitions and abbreviations

For the purposes of this document, the terms, definitions and abbreviations given in ISO/IEC TR 18053 apply.

5 CSTA Service Definition Model

CSTA services specified in ISO/IEC 18051 are modeled as a request/response interaction.

Typically, one entity requests that a particular operation be performed; the other entity attempts to perform the operation and responds to the requestor.

5.1 Request/Response Interactions

CSTA services consist of the following types of request/response interactions:

- Services which specify a response in case of success or failure. The protocol description for these services includes a response element that represents the success (i.e. positive acknowledgement). In case of service failure, a fault element is used to provide the failure information (i.e. negative acknowledgement).
- Services which only specify a response in case of failure. The protocol description for these services do not include a response element. A fault element is used to provide the failure information (i.e. negative acknowledgement).

For CSTA event reports, no response is generated.

5.2 Request/Response Protocol Requirements

This International Standard specifies CSTA-specific XML-encoded content for messages that are sent across a CSTA Service boundary. Typically this CSTA-specific XML is enveloped by a request/response protocol that provides a mechanism for correlating a CSTA request with a CSTA response, manages faults, defines header information, etc.

This International Standard does not mandate that a specific request/response protocol be used. However, this International Standard provides examples of how the CSTA-specific XML can be used with several industry request/response protocols and transports such as SOAP (Simple Object Access Protocol), HTTP, and TCP. These examples are provided beginning in Annex H.

5.3 Cross Referencing of Event Reports

The Monitor Cross Reference Identifier in CSTA event reports is used to correlate events to an earlier Monitor Start service request (see 6.7.2.1 of ISO/IEC 18051:2010).

5.4 Handling of Private Data

If an entity receives CSTA Private Data in a CSTA message, and it can not recognize the information contained, the CSTA Private Data shall be discarded, and the rest of the message shall be processed.

6 Interconnection service boundary

The protocol in this International Standard is an OSI Application Layer protocol that assumes certain services are provided by the underlying layers, and these services are also assumed by the protocol for CSTA.

This protocol also provides a mechanism for secure transmission of CSTA messages as defined in this International Standard.

7 Association Management

The protocol in this International Standard operates in the context of an application association as specified in ISO/IEC 18051:2012 Clause 7. This application association can be achieved by:

- an implicit association achieved via off-line agreement; or
- an explicit association that is achieved dynamically.

7.1 Implicit association

An a-priori agreement exists between switching and computing functions: the application context is implicit, dynamic negotiation is not possible. See ISO/IEC 18051:2012 7.1 and 7.2 for more information.

7.2 Explicit association

An explicit application association is established by a process of exchanging messages that define the application context for the association.

This International Standard does not require that a particular standard be used as part of the application association establishment procedure.

When ACSE (ISO/IEC 8649) is used to establish an application association per 7.3 of ISO/IEC 18051:2012, the CSTA Association Information includes CSTA Version information that indicates the CSTA protocol versions supported by an implementation.

The protocol defined in this International Standard is indicated by setting the following bit in the CSTAVersion parameter of the CSTA Association Information as defined in 8.2.2 of ISO/IEC 18052:2011.

- versionTwelve when using the ISO/IEC 18056 Specified Tag option (see 2.4.1)
- versionThirteen when using the ISO/IEC 18056 Specified Short Tag option (see 2.4.2)
- versionFourteen when using the Dynamic Transformation option (see 2.4.3)

Note that the ACSE messages are ASN.1 encoded while the CSTA messages are XML encoded as defined by this International Standard.

ISO/IEC 22534, Application Session Services can also be used to establish an application association per 7.4 of ISO/IEC 18051:2010. When this International Standard is used with ISO/IEC 22534 the following namespace is provided in the requestedProtocolVersions element of the Start Application Session service:

- <http://www.ecma-international.org/standards/ecma-323/csta/ed6> when using the ISO/IEC 18056 Specified Tag option (see 2.4.1)
- [url:www.ecma-international.org/standards/ecma-323/csta/ed6/short_tags](http://www.ecma-international.org/standards/ecma-323/csta/ed6/short_tags) when using the ISO/IEC 18056 Specified Short Tag option (see 2.4.2)
- http://www.ecma-international.org/standards/ecma-323/csta/ed6/dynamic_transformations when using the Dynamic Transformation option (see 2.4.3)

8 XML Template Description

This Clause describes the template format used to describe the XML schemas for CSTA services, events, and parameter types as specified in ISO/IEC 18051.

The template consists of the following parts:

- XML header - this consists of the text “<?xml version="1.0" encoding="UTF-8"?>” which identifies the XML version used.
- XML Schema header - this identifies the start of an XML schema and provides information such as:
 - the target namespace. In this edition of the Standard the target namespace is defined as “http://www.ecma-international.org/standards/ecma-323/csta/ed6”. *Note that this URL uniquely identifies the namespace for the 6th Edition of ECMA-323.*
 - the csta namespace is the same as the target namespace. XML names that refer to names in the CSTA namespace are prefixed with “csta:”.
 - the xsd namespace. This identifies the XML Schema. XML names that refer to names in the XML Schema namespace are prefixed with “xsd:”.
 - the element form default is specified as “qualified” which requires that all element names must be prefixed with a namespace (csta: or xsd:)
- documentation - this provides a comment that indicates the CSTA specific service, event report, or data-type set.
- included schemas - this provides a list of other CSTA schemas that are referenced by the service, event, or data type set.
- CSTA specific XML:
 - for CSTA services, this consists of a service request element and a service response element. (A comment is provided in some cases where a service response is not specified per ISO/IEC 18051.). This is followed, in some cases, by service-specific XML types that are referenced in the previous elements.
 - for CSTA event reports, this consists of an event report element followed, in some cases, by event-specific XML type definitions that are referenced in the event report element.
 - for CSTA data types, this consists of the data types that are referenced (included) by other CSTA XML schemas.
- XML Schema end tag - indicates the end of the schema.

Note that in general, each parameter defined in ISO/IEC 18051 is represented as an XML element and each parameter type in ISO/IEC 18051 is represented as an XML simple or complex type.

9 CSTA parameter types

9.1 Switching function objects

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<xsd:schema targetNamespace="http://www.ecma-international.org/standards/ecma-323/csta/ed6"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:csta="http://www.ecma-international.org/standards/ecma-323/csta/ed6"
elementFormDefault="qualified" attributeFormDefault="unqualified">
```

```
<xsd:annotation>
<xsd:documentation>CSTA-switching-function-objects</xsd:documentation>
</xsd:annotation>
```

```
<xsd:include schemaLocation="device-identifiers.xsd"/>
<xsd:include schemaLocation="call-connection-identifiers.xsd"/>
```

```
<xsd:complexType name="CSTAObject">
<xsd:choice>
<xsd:element name="deviceObject" type="csta:DeviceID"/>
<xsd:element name="callObject" type="csta:ConnectionID"/>
```