INTERNATIONAL STANDARD

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Information technology — Generic applications of ASN.1: Fast Web Services

Technologies de l'information — Applications génériques de ASN.1: Services web rapides

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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.

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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 24824-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems,* in collaboration with ITU-T. The identical text is published as ITU-T Rec. X.892.

ISO/IEC 24824 consists of the following parts, under the general title *Information technology — Generic applications of ASN.1*:

— *Part 1: Fast Infoset*

— *Part 2: Fast Web Services*

The following parts are under preparation:

— *Part 3: Fast Infoset security*

Introduction

This Recommendation | International Standard specifies the use of ASN.1 (see ITU-T Rec. X.680 | ISO/IEC 8824-1), its Packed Encoding Rules (see ITU-T Rec. X.691 | ISO/IEC 8825-2) and Fast Infoset (see ITU-T Rec. X.891 | ISO/IEC 24824-1) to provide Fast Web Services. (For a general tutorial on Fast Web Services, see Annex C).

Clause 6 specifies the architectural model and the conceptual steps of producing and processing SOAP messages encoded using ASN.1 binary encodings (called "ASN.1 SOAP messages").

Clauses 7 to 9 contain general provisions for the processing of ASN.1 SOAP messages. Clause 7 specifies the mapping of ASN.1 SOAP messages to W3C SOAP messages. Clause 8 specifies the mapping of W3C SOAP messages to ASN.1 SOAP messages. Clause 9 specifies the extended SOAP processing model for processing embedded ASN.1 encoded values present in W3C SOAP messages.

Clause 10 specifies the ASN.1 SOAP HTTP Binding for the transfer of ASN.1 SOAP messages using HTTP as the transport protocol. This binding uses the Multipurpose Internet Mail Extensions (MIME) media type specified in B.1.

Clause 11 specifies the use of the W3C SOAP HTTP Binding for the transfer of W3C SOAP messages encoded as fast infoset documents (fast infoset SOAP messages). This binding uses the Multipurpose Internet Mail Extensions (MIME) media type specified in B.2.

Clause 12 specifies SOAP-oriented service descriptions that support the ASN.1 SOAP binding interface and Fast Web Services.

Clause 13 specifies how a SOAP-oriented service description affects the exchange of ASN.1 SOAP messages that are mapped to and from W3C SOAP messages.

Annex A forms an integral part of this Recommendation | International Standard, and contains the full ASN.1 module for ASN.1 SOAP.

Annex B forms an integral part of this Recommendation | International Standard, and contains the specification of the "**application/fastsoap**" and "**application/soap+fastinfoset**" media types.

Annex C does not form an integral part of this Recommendation | International Standard, and provides tutorial material on Fast Web Services.

Annex D does not form an integral part of this Recommendation | International Standard, and provides tutorial material on the interoperation of Fast Web Services and XML Web services using features of the ASN.1 SOAP HTTP Binding.

Annex E does not form an integral part of this Recommendation | International Standard, and shows how the exchange of ASN.1 SOAP messages can be described by WSDL 1.1 [2] service descriptions.

INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – Generic applications of ASN.1: Fast Web Services

1 Scope

This Recommendation | International Standard specifies the messages and encodings that enable the use of Fast Web Services, together with the means of description of such services.

The protocol used to support these services satisfies the requirements of the SOAP processing model (see W3C SOAP Part 1, clause 2) and is based on the transfer of:

   a) ASN.1 SOAP messages that contain embedded ASN.1 encoded values and embedded fast infoset documents; and

   b) fast infoset SOAP messages.

This Recommendation | International Standard also specifies:

   – an ASN.1 module for ASN.1 SOAP that defines the **Envelope** type (a value of this type corresponds to an ASN.1 SOAP message);

   – a conceptual mapping between ASN.1 SOAP messages and W3C SOAP messages (defined as an instance of the XML Infoset, see W3C SOAP Part 1, clause 5);

   – an extension to the W3C SOAP processing model for the processing of embedded ASN.1 encoded values;

   – the ASN.1 SOAP HTTP Binding, which is a modification and extension of the W3C SOAP HTTP Binding (see W3C SOAP Part 2, clause 7), for the transfer of ASN.1 SOAP messages;

   – support for the transfer of W3C SOAP message infosets serialized as fast infoset documents (fast infoset SOAP messages) using the W3C SOAP HTTP Binding (see W3C SOAP Part 2, clause 7);

   – SOAP-oriented service descriptions that define the interface to and the semantics of Fast Web Services.

Two Multipurpose Internet Mail Extensions (MIME) media type names are allocated to identify:

   – ASN.1 SOAP messages encoded using Basic Aligned PER;

   – fast infoset SOAP messages.

2 Normative references

The following Recommendations and International Standards contain provisions which, through reference in this text, constitute provisions of this Recommendation | International Standard. At the time of publication, the editions indicated were valid. All Recommendations and Standards are subject to revision, and parties to agreements based on this Recommendation | International Standard are encouraged to investigate the possibility of applying the most recent edition of the Recommendations and Standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards. The Telecommunication Standardization Bureau of the ITU maintains a list of currently valid ITU-T Recommendations. The IETF maintains a list of RFCs, together with those that have been obsoleted by later RFCs.

The reference to a document within this Recommendation | International Standard does not give it, as a stand-alone document, the status of a Recommendation or International Standard.

2.1 Identical Recommendations | International Standards

   – ITU-T Recommendation X.660 (2004) | ISO/IEC 9834-1:2005, *Information technology – Open Systems Interconnection – Procedures for the operation of OSI Registration Authorities: General procedures and top arcs of the ASN.1 Object Identifier tree.*

   – ITU-T Recommendation X.680 (2002) | ISO/IEC 8824-1:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation.*

- ITU-T Recommendation X.681 (2002) | ISO/IEC 8824-2:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Information object specification.*

- ITU-T Recommendation X.682 (2002) | ISO/IEC 8824-3:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Constraint specification.* †

- ITU-T Recommendation X.683 (2002) | ISO/IEC 8824-4:2002, *Information technology – Abstract Syntax Notation One (ASN.1): Parameterization of ASN.1 specifications.* †

- ITU-T Recommendation X.690 (2002) | ISO/IEC 8825-1:2002, *Information technology – ASN.1 encoding Rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER), and Distinguished Encoding Rules (DER).* †

- ITU-T Recommendation X.691 (2002) | ISO/IEC 8825-2:2002, *Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER).*

- ITU-T Recommendation X.692 (2002) | ISO/IEC 8825-3:2002, *Information technology – ASN.1 encoding rules: Specification of Encoding Control Notation (ECN).* †

- ITU-T Recommendation X.693 (2001) | ISO/IEC 8825-4:2002, *Information technology – ASN.1 encoding rules: XML Encoding Rules (XER)* plus Amendment 1: XER Encoding Instructions and EXTENDED-XER. †

- ITU-T Recommendation X.694 (2004) | ISO/IEC 8825-5:2004, *Information technology – ASN.1 encoding rules: Mapping W3C XML Schema Definitions into ASN.1.*

- ITU-T Recommendation X.891 (2005) | ISO/IEC 24824-1:2005, *Information technology – Generic Applications of ASN.1: Fast Infoset.*

    NOTE – The complete set of ASN.1 Recommendations | International Standards are listed above, as they can all be applicable in particular uses of this Recommendation | International Standard. Where these are not directly referenced in the body of this Recommendation | International Standard, a † symbol is added to the reference.

2.2   Additional references

- W3C SOAP:2003, *SOAP Version 1.2 Part 1: Messaging Framework, W3C Recommendation, Copyright © [24 June 2003] World Wide Web Consortium (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/2003/REC-soap12-part1-20030624.*

- W3C SOAP:2003, *SOAP Version 1.2 Part 2: Adjuncts, W3C Recommendation, Copyright © [24 June 2003] World Wide Web Consortium, (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/2003/REC-soap12-part2-20030624.*

- W3C XML 1.0:2004, *Extensible Markup Language (XML) 1.0 (Third Edition), W3C Recommendation, Copyright © [4 February 2004] World Wide Web Consortium (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/2000/REC-xml-20040204/.*

- W3C XML Information Set:2004, *XML Information Set (Second Edition), W3C Recommendation, Copyright © [04 February 2004] World Wide Web Consortium (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/2004/REC-xml-infoset-20040204/.*

- W3C XML Namespaces 1.0:1999, Namespaces in XML, W3C Recommendation, Copyright © [14 January 1999] World Wide Web Consortium (*Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/1999/REC-xm-lnames-19990114/.*

- W3C XML Schema:2001, *XML Schema Part 1: Structures, W3C Recommendation, Copyright © [2 May 2001] World Wide Web Consortium (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/.*

- W3C XML Schema:2001, *XML Schema Part 2: Datatypes, W3C Recommendation, Copyright © [2 May 2001] World Wide Web Consortium (Massachusetts Institute of Technology, Institut National de Recherche en Informatique et en Automatique, Keio University), http://www.w3.org/TR/2001/REC-xmlschema-2-20010502/.*

    NOTE – When the reference "W3C XML Schema" is used in this Recommendation | International Standard, it refers to W3C XML Schema Part 1 and W3C XML Schema Part 2.

- IETF RFC 2045 (1996), *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies.*

–   IETF RFC 2616 (1999), *Hypertext Transfer Protocol – HTTP/1.1*.

3   Definitions

For the purposes of this Recommendation | International Standard, the following definitions apply.

3.1   Imported definitions

3.1.1   This Recommendation | International Standard uses the following terms defined in ITU-T Rec. X.680 | ISO/IEC 8824-1:

    a)   abstract value;

    b)   module;

    c)   object identifier;

    d)   relative object identifier;

    e)   type.

3.1.2   This Recommendation | International Standard also uses the following terms defined in W3C XML Schema:

    a)   **complex type definition**;

    b)   **element declaration**;

    c)   schema;

    d)   schema component;

    e)   **simple type definition**.

3.1.3   This Recommendation | International Standard also uses the following terms defined in W3C XML Information Set:

    a)   abstract information item;

    b)   character information item;

    c)   element information item;

    d)   information item;

    e)   namespace information item;

    f)   property (of an information item).

3.1.4   This Recommendation | International Standard also uses the following terms defined in W3C SOAP Part 1, 1.5.1:

    a)   SOAP;

    b)   SOAP binding;

    c)   SOAP message exchange pattern (MEP);

    d)   SOAP node.

3.1.5   This Recommendation | International Standard also uses the following terms defined in ITU-T Rec. X.891 | ISO/IEC 24824-1:

    a)   Base64;

    b)   fast infoset document;

    c)   XML infoset.

3.2   Additional definitions

3.2.1   **ASN.1 SOAP interface binding**: A concrete interface of a service description (see 12.4) that specifies the semantics of a Fast Web Service that is to be provided through the exchange of ASN.1 SOAP messages.

3.2.2   **ASN.1 SOAP endpoint**: A network location of a Fast Web Service identified in a service description.

3.2.3   **ASN.1 SOAP header block**: A value of the `HeaderBlock` type (see Annex A).

3.2.4   **ASN.1 SOAP HTTP binding**: A binding of SOAP to HTTP for the transmission of ASN.1 SOAP messages.