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Electronic business eXtensible Markup Language (ebXML) —

Part 1: Messaging service core specification

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by the OASIS ebXML (Electronic business eXtensible Markup Language) Messaging Services Committee (as “OASIS ebXML Messaging Services Version 3.0”) and drafted in accordance with its editorial rules. It was assigned to Technical Committee ISO/TC 154, *Processes, data elements and documents in commerce, industry and administration* and adopted under the "fast-track procedure".

This first edition incorporates content from ISO/TS 15000-2:2004 and ISO/TS 15000-1:2004, which have been withdrawn.

The main changes compared to ISO/TS 15000-2:2004 and ISO/TS 15000-1:2004 are as follows:

- The original ISO/TS 15000-2:2004 specification for the ebXML Messaging Service (ebMS) has been updated and refactored into multiple parts, including this document, the “Core” specification for ebMS, resubmitted to become this document.
- A separate “AS4 Profile of ebMS 3.0 Version 1.0” is submitted separately to ISO/TC 154. It provides a select limited profile of the ebMS3 specification sufficient for Web Services business-to-business messaging applications over the HTTP transport protocol, and is to become ISO 15000-2.
- This document defines the basic (and some optional) features necessary for reliable electronic messaging and the transactional interactions that support such messaging.
- This document noted the availability of several newer methodologies, represented by normative references and informative references included here, that were not available as of the 2004 version.

A list of all parts in the ISO 15000 series can be found on the ISO website.

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Introduction

This document describes a communication-protocol neutral method for exchanging electronic business messages. It defines specific enveloping constructs supporting reliable, secure delivery of business information. Furthermore, the specification defines a flexible enveloping technique, permitting messages to contain payloads of any format type. This versatility ensures that legacy electronic business systems employing traditional syntaxes (i.e. UN/EDIFACT, ASC X12, or HL7) can leverage the advantages of the ebXML infrastructure along with users of emerging technologies.

The prime objective of the ebXML messaging service (ebMS) is to facilitate the exchange of electronic business messages within an XML framework that leverages common Internet standards, without making any assumption on the integration and consumption model these messages will follow on the back-end. These messages may be consumed in different ways that are out of scope of this document: they may bind to a legacy application, to a service, be queued, enter a message workflow process, be expected by an already-running business process, be batched for delayed processing, be routed over an Enterprise Service Bus (ESB) before reaching their consumer application, or be dispatched based on header data or payload data, etc.

It is becoming critical for broad adoption among all partners – large or small - of a supply-chain, to handle differences in message flow capacity, intermittent connectivity, lack of static IP addresses or firewall restrictions. Such new capabilities played an important role in the motivation that led to ebMS 3.0, along with the need to integrate and profile the emerging SOAP-based QoS-supporting standards. The message header profiling that provided, in ebMS 2.0, a standard business-level header, has also been extended to better address the diversity of back-end binding models, as well as the emerging trend in business activity monitoring, the eBusiness side of which a message handler should be able to support.

The ebXML messaging framework is not a restrictive one: business messages, identified as the 'payloads' of ebXML messages, are not limited to XML documents. Traditional EDI formats may also be transported by ebMS. These payloads can take any digital form–XML, ASC X12, HL7, AIAG E5, database tables, binary image files, etc. Multiple payloads, possibly of different MIME types, can be transported in a single ebMS message. An objective of ebXML Messaging protocol is to be capable of being carried over any available transfer protocol. This version of the specification provides bindings to HTTP and SMTP, but other protocols to which SOAP may bind can also be used. The choice of an XML framework rather reflects confidence in a growing XML-based Web infrastructure and development tools infrastructure, the components of which can be leveraged and reused by developers.

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Electronic business eXtensible Markup Language (ebXML) —

Part 1: Messaging service core specification

1. Scope

This document provides a communication-protocol neutral method for exchanging electronic business messages. It defines specific enveloping constructs supporting reliable, secure delivery of business information. Furthermore, this document defines a flexible enveloping technique, permitting messages to contain payloads of any format type.

It specifies each of the following:

- Messaging model
- Message pulling and partitioning
- Processing modes
- Message packaging
- Error handling
- Security module
- Reliable messaging module

This document is applicable to all types of organizations (e.g., commercial enterprises, government agencies, not-for-profit organizations) that exchange documents or data electronically using messaging.

2. Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

INTERNET ASSIGNED NAMES AUTHORITY (IANA). *MIME Media Types*, Available from http://www.iana.org/assignments/media-types/.

INTERNET ENGINEERING TASK FORCE (IETF). RFC 2045. *Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies*, 1996. Edited by N Freed, et al. Available from http://www.ietf.org/rfc/rfc2045.txt.

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WORLD WIDE WEB CONSORTIUM. *XML Encryption Syntax and Processing*, 2002. Edited by D. Eastlake, et al. Available from http://www.w3.org/TR/xmlenc-core/.

WORLD WIDE WEB CONSORTIUM. *Namespaces in XML*, 1999. Edited by Tim Bray, et al. Available from http://www.w3.org/TR/REC-xml-names/.

3. Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
ebMS error generation
Operation of creating an *ebMS error* (3.14) based on some failure or warning condition

3.2
ebMS error reporting
Operation of communicating an *ebMS error* (3.14) to some other entity

3.3
ebMS message
SOAP message (3.29) that contains SOAP header(s) qualified with the ebMS namespace and that conforms to this document

3.4
ebMS message exchange pattern
ebMS MEP
Choreography of *ebMS user messages* (3.11) which are all related through the use of the referencing feature (`eb:RefToMessageId`)

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3.5
ebMS MEP transport channel binding
Binding of an *ebMS message exchange pattern* (3.4) that defines how the ebMS MEP maps abstractly to the channels allowed by an underlying transport protocol

3.6
ebMS MEP transport protocol binding
Binding of an *ebMS message exchange pattern* (3.4) that defines further how an *ebMS MEP transport channel binding* (3.5) is implemented over a specific underlying transport protocol

3.7
ebMS message unit
Logical unit of data that is a subset of an *ebMS Message* (3.3)

3.8
ebMS messaging service handler
ebMS MSH
Entity that is able to generate or process *ebMS messages* (3.3) that conform to this document

3.9
ebMS user message unit
ebMS message unit (3.7) that is represented by the XML infoset `eb:Messaging/eb:UserMessage`, together with any referenced payload items

Note 1 to entry: This is the part of the ebMS message that is submitted by a producer (via the "submit" operation) and that is subject to delivery to a consumer.

3.10
ebMS signal message unit
ebMS message unit (3.7) that is represented by the XML infoset `eb:Messaging/eb:SignalMessage`

Note 1 to entry: Its role is to activate a specific function in the receiving MSH. It is not intended to be delivered to a message consumer.

3.11
ebMS user message
ebMS message (3.3) that contains an *ebMS user message unit* (3.9)

3.12
ebMS signal message
ebMS message (3.3) that contains an *ebMS signal message unit* (3.10)

3.13
ebMS pull signal message
ebMS signal message (3.12) that contains an `eb:PullRequest` element

3.14
ebMS error
Particular case of *Error* (3.15) that is generated by the ebMS module in conformity with this document

3.15
Error
Object representing some failure or warning condition that originates in one of the defined modules (ebMS module, reliability module, security module)

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3.16
Escalated ebMS error
ebMS error (3.14) that originates in a module other than the ebMS Module (i.e. security module, or reliability module)

3.17
Fault
Object representing some failure or warning condition that originates in SOAP processing

Note 1 to entry. It shall be generated and processed according to the W3C SOAP 1.1 or SOAP 1.2 specifications.

3.18
Message consumer
Entity that interacts with a receiving *ebMS MSH* (3.8) (i.e. an MSH in the receiving role) to consume data from a received *ebMS user message* (3.11)

3.19
Message partition channel
Mechanism to partition the flow of messages from a sending MSH to a receiving MSH into several flows that can be controlled separately and consumed differently

3.20
Message producer
Entity that interacts with a sending *ebMS MSH* (3.8) (i.e. an MSH in the sending role) to initiate the sending of an *ebMS user message* (3.11)

3.21
Message-in-error
Flawed message causing an *Error* (3.15) of some kind

3.22
One-Way message exchange pattern
one-way MEP
Exchange of a single *ebMS user message unit* (3.9) unrelated to other user messages

3.23
Processing mode
P-Mode
Contextual information that governs the processing of a particular *ebMS message* (3.3)

Note 1 to entry: A P-Mode is not provided on a per-message basis, but is common to a set of messages exchanged between or among parties. It may be interpreted as configuration data for a deployed MSH.

3.24
Processing mode operation set
Set of all *P-Modes* (3.23) that are supported by an *ebMS MSH* (3.8) during operation

3.25
Pull channel binding
ebMS MEP transport channel binding (3.5) in which the transfer of an *ebMS message* (3.3) is initiated by the receiver

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3.26
Push channel binding
ebMS MEP transport channel binding (3.5) in which the transfer of an *ebMS message* (3.3) is initiated by the sender

3.27
Reliability error
Error (3.15) generated by the reliability module

3.28
Security error
Error (3.15) generated by the security module

3.29
SOAP message
Message that conforms to the SOAP 1.1 or SOAP 1.2 W3C specifications

3.30
Two-way message exchange pattern
two-way MEP
Exchange of two *ebMS user message units* (3.9) in opposite directions, in which the first one to occur is labeled "request" and the second one "reply".

4. Relevant messaging concepts

4.1. Web services and their role in an eBusiness messaging framework

A major design choice in ebMS 3 is the specification of the MSH and its associated processing rules using Web Services (WS) standards. The intent is to make use of other relevant Web Services specifications that fulfill certain messaging requirements, and build upon that base by adding what is necessary for a complete and coherent eBusiness messaging service. ebMS 3 brings this all together into a single, coherent framework.

In order to achieve this, message security and reliability requirements are met through the use of other Web Services standards and their implementations. The message SOAP body has been freed for business payload. The ebMS header is just a SOAP extension among others. As a result, ebMS 3 is significantly more compliant than ebMS 2 with the SOAP processing model, and apt at composing Web services standards that are defined as SOAP extensions. Compliance of ebMS 3 implementations with the latest version of WS-I profiles - once approved as final material by the organization - will be addressed in the definition of conformance profiles that are adjunct to this document (see Annex G). A compatibility mapping from ebMS 2 to ebMS 3 is provided in Annex F.

Compliance with Web services standards does not remove the rationale behind an Internet-based messaging middleware. Often, document-centric eBusiness and eGovernment exchanges need to clearly dissociate messaging functions from the way these messages are consumed on the back-end. Such consumption may take place according to various models. The use of SOAP message header elements that represent standard business metadata (user or company ID, business conversation, business service and action, etc.), is a key feature for supporting a decoupled binding with back-end business processes. At the same time, experience has demonstrated that the messaging layer needs to be more supportive of business transactions: messages are parts of basic choreographies that map to higher-level business exchanges between partners. To this end, ebMS 3 supports a notion of message exchange pattern (MEP) the properties of which (reliability, security, binding to underlying transport, error handling, and other quality of service aspects such as timing, etc.) are controlled in a contract-based manner by the message producer and consumer layers.

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