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Framework for energy market communications - Part 501: General guidelines for use of ebXML

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TECHNICAL REPORT

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Framework for energy market communications –

Part 501:
General guidelines for use of ebXML

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FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 501: General guidelines for use of ebXML

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 62325-501, which is a technical report, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The IEC 62325 series cancels and replaces IEC 62195 (2000) and its amendment (2002). It constitutes a technical revision.

IEC 62195 (2000) dealt with deregulated energy market communications at an early stage. Its amendment 1 (2002) points out important technological advancements which make it possible to use modern internet technologies based on XML for e-business in energy markets as an alternative to traditional EDI with EDIFACT and X12. The new IEC 62325 framework series for energy market communications currently consisting of IEC 62325-101, IEC 62325-102, IEC 62325-501, and IEC 62325-502 follows this direction and replaces IEC 62195 together with its amendment.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/706/DTR	57/723/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 62325 consists of the following parts, under the general title *Framework for energy market communications*:

Part 101: General guidelines

Part 102: Energy market model example

Part 201: Glossary [1]

Part 3XX: (Titles are still to be determined) [2]

Part 401: Abstract service model [3]

Part 501: General guidelines for use of ebXML

Part 502: Profile of ebXML

Part 503: Abstract service mapping to ebXML [3]

Part 601: General guidelines for use of web services [3]

Part 602: Profile of Web Services [3]

Part 603: Abstract service mapping to web services [3]

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual edition of this document may be issued at a later date.

1 Under consideration. Because the technologies have an inherent own glossary within their standard definitions, this glossary is a placeholder for a glossary for future parts indicated with [2)] including energy market specific terms and definitions.

2 Under consideration. These parts for business content are mentioned for completeness only with a number space as placeholder. They extend the original scope and require an agreed new work item proposal for further work based on an overall strategy how to proceed.

3 Under consideration. These technical parts are mentioned for completeness with provisional title. They extend the original scope and require an agreed new work item proposal for further work.

INTRODUCTION

With the transition of monopoly energy supply structures to deregulated energy markets, the function of the markets depends heavily on seamless e-business communication between market participants. Compared with global e-business, e-business in the energy market is only a small niche. Today EDIFACT or X12 messages, or proprietary HTML and XML solutions based on Internet technologies are being used.

The ‘electronic business Extensible Markup Language’ (ebXML) specification and architecture stems from UN/CEFACT and OASIS (see www.ebXML.org). The technical parts regarding the technical e-business infrastructure have now become the multipart ISO 15000 series “Electronic business eXtensible Markup Language (ebXML)” being complemented in future to cover all technical aspects of ebXML. ebXML is a complete set of specifications and standards to enable secure electronic business using proven, open standards such as TCP/IP, HTTP, SOAP, XML, and SOAP signature and encryption. ebXML is also evolutionary in nature, built on 25 years of EDI experience, designed to work with existing EDI solutions, or be used to develop an emerging class of internet-based electronic business applications based on XML. This means that existing EDI messages (EDIFACT, and X12) as well as XML messages can be exchanged.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 501: General guidelines for use of ebXML

1 Scope

This part of IEC 62325 provides general guidelines how to use the ebXML technology and architecture in energy markets based on the ISO 15000 ISO series “Electronic business eXtensible Markup Language (ebXML)” together with migration scenarios and an implementation example. For recommended profiles, see IEC 62325-502.

2 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.

ISO/IEC 14662, *Information Technology – Open-edi reference model*

ISO 7372, *Trade data interchange – Trade data elements directory*

ISO 9735 (all parts), *Electronic data interchange for administration, commerce and transport (EDIFACT)*

ISO/TS 15000-1:2004, *Electronic business eXtensible Markup Language (ebXML) – Part 1: Collaboration-protocol profile and agreement specification (ebCPP)*

ISO/TS 15000-2:2004, *Electronic business eXtensible Markup Language (ebXML) – Part 2: Message service specification (ebMS)*

ISO/TS 15000-3:2004, *Electronic business eXtensible Markup Language (ebXML) – Part 3: Registry information model specification (ebRIM)*

ISO/TS 15000-4:2004, *Electronic business eXtensible Markup Language (ebXML) – Part 4: Registry services specification (ebRS)*

ANSI ASC X12, Release 4040, December 2000

UN/EDIFACT, D.01A Directory, January 2001

UN/CEFACT *Modelling Methodology (UMM)*, NO90 R12 or higher

UN/CEFACT *ebXML Technical Architecture Specification*, v1.04 or higher

UN/CEFACT *ebXML Business Process Specification Schema*, v1.10 or higher

In this part of IEC 62325, RFCs (Request for comments) from the Internet Engineering Task Force (IETF) and recommendations from other Organisations such as the Word Wide Web Consortium (W3C) and the Organization for the Advancement of Structured Information Standards (OASIS) are mentioned which are not included here because these documents are referenced in the references above.

3 Terms, definitions and abbreviations

3.1 Terms and definitions

None.

3.2 Abbreviations

A2A	Application-to-Application
AES	Advanced Encryption Standard
B2B	Business-to-Business
BDS	Business Document Specification (instance)
BDSS	Business Document Specification Schema
BIE	Business Information Entity
BOV	Business Operational View
BPMS	Business Process Management System
BPSS	Business Process Specification Schema (or instance)
BSI	Business Service Interface
CC	Core Component (based on BIE)
CIM	Common Information Model
CPA	Collaboration Protocol Agreement
CPP	Collaboration Protocol Profile
DSO	Distribution System Operator (of power system
DUNS	Data Universal Numbering System (North America)
EAN	European Article Number (Europe)
ebMS	ebXML Messaging Service
ebXML	electronic business XML
EDI	Electronic Data Exchange
EIA	Enterprise Application Integration
EMS	Energy Management Systems
ERP	Enterprise Resource Planning
FOV	Functional Service View
FTP	File Transfer Protocol
HTTP	Hypertext Transport Protocol
ICT	Information and Communication Technology
ISO	Independent System Operator
IT	Information Technology
MIME	Secure/Multipurpose Internet Mail Extensions
MIS	Market Identification Schema
MOM	Message-oriented middleware
MSH	Message Service Handler
PKI	Public Key Infrastructure
QoS	Quality of Service
RPC	Remote Procedure Call
RR	Registry/Repository

SAML	Security Assertion Mark-up Language
SCADA	Supervision, Control, and Data Acquisition
SMTP	Simple Mail Transfer Protocol
SO	System Operator (of power system)
SOAP	Simple Object Access Protocol
TLS	Transport Layer Security
TSO	Transmission System Operator (of power system)
UML	Unified Modelling Language
UMM	UN/CEFACT Modelling Methodology
VPN	Virtual Private Network
WS	Web Services
WSDL	Web Services Definition Language
XML	eXtensible Markup Language
XKMS	XML Key Management Specification

4 Generic technical architecture

4.1 General

The following text is mainly based on the public description of the ebXML initiative (http://www.ebxml.org/) and is intended to provide a basic understanding of the technology. For details, refer to the ebXML implementation framework specification and the ebXML architecture document of the initiative.

4.2 Architecture

4.2.1 General

The vision of ebXML is to create a single global electronic marketplace where enterprises of any size and in any geographical location can meet and conduct business with each other through the exchange of XML based messages. ebXML is a complete set of specifications to enable secure, global, electronic business using proven, open standards such as TCP/IP, HTTP, SOAP, and XML. ebXML is also evolutionary in nature, built on 25 years of EDI experience, designed to work with existing EDI solutions, or be used to develop an emerging class of internet based electronic business applications based on XML.

Since systems integration and software interoperability are the cornerstones of any successful IT infrastructure, ebXML is built on an infrastructure that ensures electronic interoperability. This is accomplished by providing an open semantics framework that allows enterprises to find each other, agree to become trading partners, and conduct business. The evolution of many new business models will be enabled by ebXML, through business process patterns and the 'commoditization' of such business processes.

The electronic business infrastructure provided by ebXML is broad in scope and well integrated. And perhaps most importantly, ebXML is platform and vendor neutral, providing an industry solution based on open standards, designed through a collaborative and open process.

ebXML is a set of specifications that together enable a modular, yet complete electronic business framework for using the Internet. The ebXML architecture provides:

- A way to define business processes and their associated messages and content.
- A way to register and discover business process sequences with related message exchanges.

- A way to define company profiles.
- A way to define trading partner agreements.
- A uniform message transport layer.

The ebXML framework is designed for electronic interoperability, allowing businesses to find each other, agree to become trading partners and conduct business. All of these operations can be performed automatically, minimising, and in most cases completely eliminating the need for human intervention. This streamlines electronic business through a low cost, open, standard mechanism.

In order for enterprises to conduct electronic business with each other, they should:

- Discover each other and the products and services they have to offer.
- Determine which shared business processes, and associated document exchanges, to use for obtaining products or services from each other.
- Determine the contact points and form of communication for the exchange of information.
- Agree on the contractual terms on the above chosen processes and associated information.
- They can then: exchange information and services in an automated fashion in accordance with these agreements.

ebXML is designed to meet these needs and is built on three basic concepts: provide an infrastructure that ensures data communication interoperability; provide a semantics framework that ensures commercial interoperability; and provide a mechanism that allows enterprises to find each other, agree to become trading partners and conduct business with each other. The infrastructure to ensure data communication interoperability is provided through:

- A standard message transport mechanism with a well defined interface, packaging rules, and a predictable delivery and security model.
- A 'business service interface' that handles incoming and outgoing messages at either end of the transport.
- A semantic framework to ensure commercial interoperability is provided through a meta model for defining business process and information models.
- A set of re-useable business logic based on core components that reflect common business processes and XML vocabularies.
- A process for defining actual message structures and definitions as they relate to the activities in the Business Process model.
- A mechanism to allow enterprises to find each other, agree to establish business relationships, and conduct business, is provided through shared repository where enterprises can register and discover each other's business services via partner profile information.
- A process for defining and agreeing to a formal Collaboration Protocol Agreement (CPA), if so desired or where required.
- A shared repository for company profiles, business process models and related message structures.

The ebXML implementation framework defines the ebXML Technical Architecture. The technical architecture is composed of five main area of emphasis: Business Process and Information Model, Collaboration Protocol Profiles Company Profiles, Messaging Services, Registry and Repository, Collaborative Partner Agreements.

4.2.2 Business process description

The Business Process models define how business processes are described. Business Processes represent the "verbs" of electronic business and can be represented using modelling tools. The specification for business process definition enables an organisation to express its business processes so that they are understandable to other organisations. This enables the integration of business processes within a company, or between companies.

Figure 1 shows the graphical presentation of the BPSS (Business Process Specification Schema) process specification to provide a basic understanding of the technology. The main elements are multiparty collaborations and binary collaborations. Both include (reference) business transactions, which govern the business document flow.

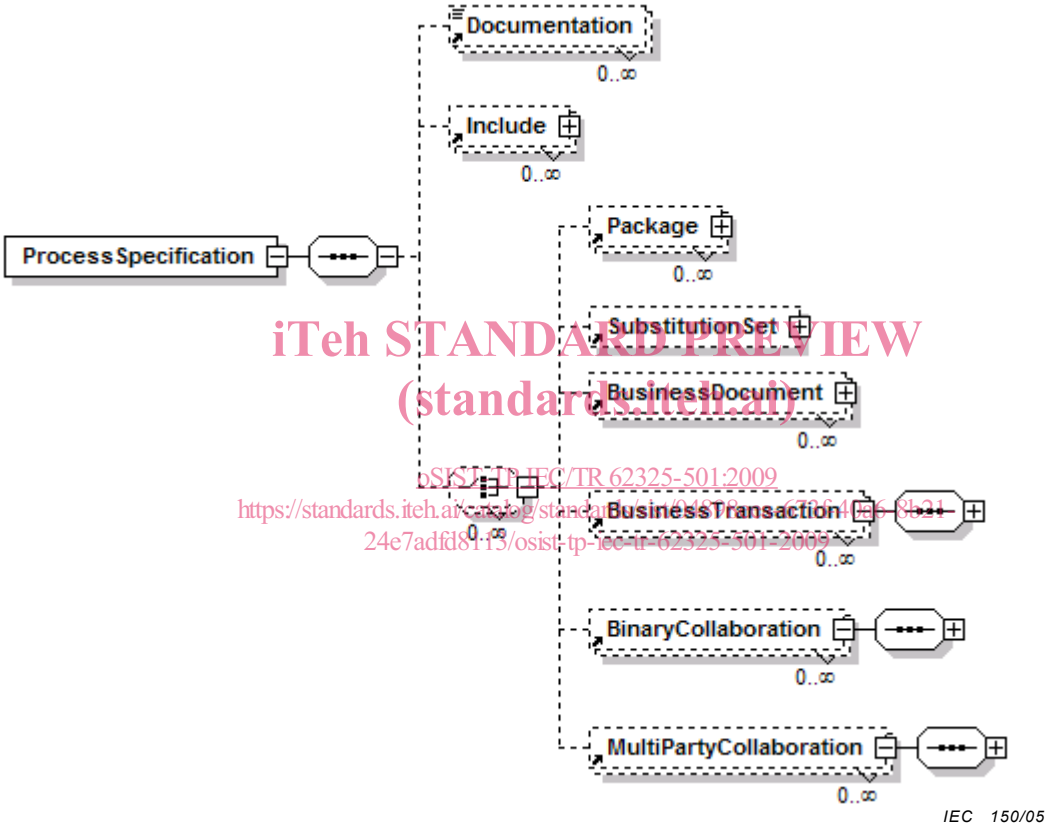

Figure 1 – Process specification

Figure 2 shows the graphical presentation of the business transaction from the Business Process Specification Schema (BPSS).

The business transaction consists of a requesting business activity and a responding business activity each associated with a document envelope (which includes the business documents and attachments).