

ebXML Transport Requirements

This paper describes the requirements for Transport, Routing and Packaging for ebXML.

The initial purpose of this paper is to be used as the criteria for evaluating standards/protocol or initiatives that exist or are under development that may be used to meet the requirements of ebXML.

The remainder of this paper contains descriptions of each requirement. (*Phrases in italics between round brackets like this are used to identify the original, typically one-line definition of the requirement developed during the ebXML workshop on November 17-19, 1999*). Some additional requirements have been provided.

PLEASE COMMENT AND ADD WHERE YOU THINK ITEMS ARE MISSING.

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1 Envelope for business documents

- 1) Documents, expressed in XML, must be able to be wrapped inside a container document for transporting between the parties involved in an eCommerce transaction.
- 2) Multiple documents, whether related or not, must be transportable as a single entity whether related or not (*related messages in a collection*)
- 3) The destination for a document must be expressible as either a physical address (e.g. a URL) or as a logical address (e.g. a DUNS number). (*Physical and/or logical addressing of destination for messages*)
- 4) Support for multiple different transport protocols (e.g. HTTP, SMTP, etc) (*support for multiple transport protocols*) with mapping to the wire format provided (*wire format mapping*)

2 Reliable Messaging

- 1) Documents must be capable of being sent to another party so that:
 - a) delivery occurs once and only once (*you need to know the document got there exactly once*)
 - b) failure to deliver a document is notified to the original sender of the document
 - c) delivery is to an application running at a location rather than to a server (*application level not transport level needed*)

3 Message Routing

- 1) Messages can be sent using a variety of methods (*routing of messages to single or multiple destination, publish & subscribe (content and subject based), broadcast messages, streaming*):
 - a) to a single destination, e.g. by specifying a URL
 - b) to multiple destination, e.g. by specifying a list of URLs
 - c) using a publish & subscribe process. This involves ... (*help with a definition please*)
 - d) broadcast messages where ... (*help with a definition please*)
 - e) streaming where ... (*help with a definition please*)

4 Security

- 1) For non-repudiation and authentication purposes the following are requirements (*Security and use of digital signatures for non-repudiation*):
 - a) Documents can be digitally signed

- b) The signature over the documents must be independent of the transport protocol used¹
- c) A single digital signatures may be used to bind together documents either:
 - i) within the same message
 - ii) in a another message²
 - iii) somewhere else (for example at a URL)³
- 2) For privacy and confidentiality purposes (*Security and use of digital signatures for ... confidentiality/encryption*):
 - a) all or part of document may be encrypted prior to sending
 - b) documents may be encrypted during transportation

5 Audit Trails

(*Audit trails and traceability/trackability of transactions/documents*)

- 1) The set of related document instances that support a transaction must be capable of being:
 - a) identified, and
 - b) related to one another
- 2) Two or more transactions that a related to one another must be capable of linked together
- 3) A trace or path through the processes or services through which documents are passed must be identifiable and analysable after the event (*traceability/trackability*)
- 4) Digital signatures can be used to bind the documents and transactions in the sequence in which they were used.

6 Quality of service

In the following, "Quality of Service" involves the ability to vary and negotiate (*Level of service negotiation*) the following factors when carrying out a transaction (i.e. an instance of the execution of a business process):

- 1) (*Session based and/or long term transactions*)
 - a) A session based transaction is where a business document is sent to a party which results in an immediate response of another business document. These are synchronous in nature.
 - b) Long Term Transaction is where a business document is sent to a party and, possibly, a simple acknowledgement is sent back immediately. The business document that is the "business" response to the original document is then sent some time later
- 2) Response Time. This is the time within which a document/message is sent back to another party in response to the sending of an earlier document/message (*Processes/transactions complete within required time*). Requirements include the ability to:
 - a) announce a response time (either by server or business process)

¹ The rational behind this is that:

- we need to be able to support multiple transport protocols and therefore reliance on transport level protocols would meant that transport specific signature handling would be required
- we need to be able to persist the signature for later checking or re-use, after the message has been received

²The can be used, for example, to bind one message to an earlier message and therefore provide an audit trail

³An example of where this might be used is to bind together an Invoice send in a message with the terms and conditions held somewhere in an HTML file on the web

- b) request a response time when a document is sent,
 - c) track the response times actually taken
 - d) take appropriate action if a response time is not met
 - e) negotiate the response times that will be used in an instance
- 3) (*Service availability checking*). The ability to be able to check, in advance of sending a message, if a business process that can process that message is able to accept and process messages
 - 4) (*Transaction Status Inquiry*). The ability to be able to check on the current status of the processing of a document that has been sent to another server, service, or business process.⁴
 - 5) (*Non-transaction Vs transaction, exactly once behavior*) ... (*not sure what this means*)

7 (Platform Independent Interoperability)

- 1) Servers/systems that support the transport of documents can be treated as "black boxes"
- 2) The method used to transport documents is completely independent of:
 - a) the hardware used by the server/services at each end
 - b) the software or systems architecture of the server/services at each.
- 3) Support for a business process by a server or service can be expressed solely in terms of the type and sequence in which business documents (and their envelopes) can be exchanged
- 4) The approach must be suitable for implementation on hardware that varies from a simple PC to a large multi-processor/system complex (*Scalable from SMEs to large companies*)

8 (Restart and recovery)

- 1) If a server or system that should receive a document is temporarily out of service it must be possible to recover from the failure and deliver the document once the server is available
- 2) If the delivery of a message is considered not possible by the original intended method, then
 - a) alternative methods of delivering the document may be used⁵ if available, and/or
 - b) the end state of the of that transaction must be capable of rollback to a consistent state. (*backup/rollback of business transactions*)

9 (Workflow of business documents)

Workflow is concerned with the sequence in which business documents are exchanged. Requirements include:

- 1) Specifying the documents required to support a business process and the sequence in which they may be validly exchanged
- 2) Combining reusable common sequences for exchanging business documents to define the processing of more complex processes
- 3) How to report technical (e.g. invalid document structure) and business errors or problems.
- 4) Making the completion of one business process dependent on the completion state of earlier process(es)

10 Topics not covered

The following were included in the original requirements list, but have not been included since I don't think that they are really requirements ...

⁴ This is particularly relevant if Asynchronous processing is being used

⁵ An example would be delivery by SMTP if HTTP was not possible

- 1) *(Scenarios*
 - a) *Product catalog*
 - b) *Requisition to pay*
 - c) *... more to come*
- 2) *Define a small initial scope but extensible to add new things in later versions)*