

Web Services and ebXML – What is Available Today?

Business Managers as well as IT Managers are watching developments in the Business-to-Business Integration space with increasing awareness. The ebXML initiative in particular, has made significant progress over the past two years. As it stands today, ebXML will be the only B2B infrastructure left on the table, since RosettaNet has adopted ebXML and many industry groups have standardized on ebXML. Over time, implementations of ebXML specifications are becoming available, not only opening up perspectives for inter-enterprise integration, but also for intra-enterprise integration. In addition, Web Services technology appears on the scene, providing a means to achieve technical interoperability with business service implementations.

Technology based on accepted public standards will eventually lead to bringing down the license fees for enabling technology, particularly middleware. There is reason to expect that ebXML infrastructure will be inexpensive, flexible, scalable and interoperable. Execution environments will become available in the \$10,000 range. Most important, existing investments in legacy systems can be exploited and integrated with Web services. Moreover, the implementation of ebXML specifications will lead to a significant productivity boost, thus enabling companies to reuse public business process definitions as well as business document type definitions (e.g. document types defined by industry groups, such as RosettaNet, Open Applications Group, Open Travel Alliance, and so on).

Several vendors have already made available ebXML Registry and Repository implementations, ebXML Message Service implementations, and Business Process Execution Engines (capable of interpreting ebXML Business Process Specifications (BPSs)). As of today, to my knowledge no single vendor can provide an implementation of the entire ebXML stack, thus offering a coherent platform solution. However, this will only be so for a short period of time.

IT Managers are beginning to give serious thought to ebXML-based platforms for a good reason: B2B platforms can be used for inter-enterprise and intra-enterprise integration (e.g. integration of different functional areas), whereas it is not possible to use an intra-enterprise platform for inter-enterprise integration.

What Constitutes an ebXML-compliant Platform?

By definition, a B2B infrastructure platform is about the coupling of enterprise-internal business processes (i.e. private processes) through public business processes. A public process is accepted by all collaborating

business partners, defining their responsibilities. A private process, however, is not visible to any business partner.

The ebXML-style business collaboration, resulting in the interaction of public and private processes meets a critical requirement: the "loose coupling" of applications by exchanging XML-encoded business documents. This means in technical terms that no business partner will be able to lock resources on another partner's system, nor will it be possible to control the state of any resource on another system. As a side mark, this has proven to be a virtually unsolvable problem in distributed workflow systems.

The ebXML collaboration model is an electronic representation of current practices. Companies collaborate by following an often implicitly agreed on pattern. For example, company A acts in the role of a buyer and sends a physical purchase order form by mail to company B that acts in the role of a seller. The purchase order form is the business document that both parties must be able to interpret unambiguously. In the ebXML collaboration model, company A acts in the role of a buyer and sends an electronic purchase order business document over the wire to company B, which acts in the role of a seller. Although this is a simplified example, the basic ideas become apparent.

As two or more companies intend to collaborate, they pass through three stages:

- Design
- Negotiation
- Execution

During the first stage, business partners need to design public processes (i.e. business collaborations). A business process describes in detail how business partners take on roles, relationships and responsibilities. The interaction between roles takes place as a choreographed set of business transactions. A business transaction is an atomic unit of work and cannot be decomposed into lower-level business transactions. Each business transaction is expressed as an exchange of electronic business documents, i.e. one or two predefined business document flows. A business process is defined in a Business Process Specification (BPS), which is instantiated at run time.

In addition, each business partner sets up a Collaborative Protocol Profile (CPP). A CPP defines what each business partner supports, the components necessary to conduct electronic business, such as data communications, security, processes, document types, telephone contacts, etc.

In the negotiation stage, business partners negotiate a Collaborative Protocol Agreement (CPA), which is an agreement for business interaction between two parties. Basically, it consists of technical specifications (message service requirements, application requirements) and references (CPPs as well as legal terms and conditions). One business partner would draft a CPA and send it to the other partner for review and approval. When both parties have agreed, the CPA forms the basis for the execution of a business process.

The execution stage requires at least two CPPs, one CPA and one BPS to exist. When a business process is instantiated, a sound technical infrastructure must be in place to enable actual collaboration. In particular, the following components are required:

- ebXML Registry and Repository: Defines the access interfaces, security and information storage format for any information that needs to be widely, yet securely shared among trading partners or potential trading partners. An ebXML Repository holds various entities, such as CPPs, BPSs, and Classification and Categorization Schemas.
- ebXML Messaging Service: A reliable, secure XML messaging service is required to enforce the rules of engagement in the CPA. The message service is defined transport independent and extends SOAP messages with attachments. This way it addresses topics beyond SOAP, namely reliability, security, and delivery options.
- Business Process Engine: Orchestrates business collaborations and maintains state for a public business process (collaboration level). It delegates execution of business transactions to the Business Service Interface (BSI) layer and the execution of an activity to an application, which of course, can be wrapped as a Web service.

What is Already There?

As of today, several vendors have already released parts of the ebXML stack. I group the solutions by stage, as above:

Design: BindStudio (Bind Systems) lets you define business collaborations and generate BPSs, CPPs and CPAs. It is a purpose-built modeling tool using UML syntax, as mandated by the UMM (Unified Modeling Methodology), a modeling methodology defined by the UN/CEFACT.

Negotiation: This is a blank spot. There is no product that I know of, that helps with CPA negotiation. The "work-around" is to create a CPA from a template and use an editor for customizing.

Execution: There are several implementations of the ebXML Registry and Repository specification, some of them based on version 2 of the specification. By mid April, even an open source implementation will become available. The Java API for XML Registries (JAXR) enables clients to discover and query various business registries. Currently, JAXR is in Public Draft 2. The reference implementation is available through the Java Web Services Pack. Right now, it supports UDDI 2.0 and by May 2002 it will support ebXML 2.0.

The number of ebXML Message Service version 2 implementations is coming close to 10. Some vendors (bTrade, Cyclone Commerce, Sterling Commerce, and Sybase) have already passed the ebXML Messaging Interoperability Pilot. The ebXML Message Service compensates for some of SOAP's weaknesses, such as routing, reliability and security.

There are a few Business Process Engine implementations, particularly Xeco (zenAptix) and eXcelon Business Process Manager (BPM). BindPartner (Bind Systems) is one of the products that have not made it to general availability.

Web Services technology plays a major role with all BPE vendors. Business activities are implemented as applications, which may be wrapped as Web services. When business activity implementations reside within the enterprise boundaries, the current weaknesses and limitations of the SOAP protocol are easier to cope with. Then, SOAP could even sit on top of a reliable message queuing protocol.

A cursory look at current implementations reveals that vendors are jumping on the ebXML bandwagon. Several startup companies have accepted the challenge of developing an ebXML-compliant solution platform. Without any doubt, industry leaders such as IBM, Sun Microsystems and Oracle will follow, let alone leading vendors in the EAI field, such as webMethods, SeeBeyond and Tibco.

What can you do today?

You can reap some of the benefits of ebXML based technology immediately with relatively little effort. In the first step, standardized business document types (a.k.a. business object types) can be adopted, gradually replacing custom business document types. Many industries have already defined XML-encoded business document types, such as "Invoice" or "Purchase Request". Business document types form the lowest common denominator when it comes to exchanging data between two parties, regardless of whether a party is an external partner (e.g. supplier) or an internal functional unit (e.g. warehouse). A party is represented by an application.

XML-encoded business documents can travel as message payload over SOAP as well as be the payload of an ebXML message, and as the payload of a message queuing protocol. By exchanging data between applications through business documents, a significant contribution is made towards the decoupling of applications.

In step 2, which, of course, can overlap step 1, public processes can be defined and/or adopted from industry bodies, such as RosettaNet. In essence, public business processes define the collaboration of two parties in terms of business transactions and the business document types that are exchanged in a business transaction. Of course, public processes can be generally used, be it to do business with an external business partner (e.g. a logistics provider) or to "link" two internal functional units (e.g. Financial Department and Sales Department).

The result of this simple two-step approach will manifest itself in significant productivity gains and improved business agility. There is little risk that such a strategy will fail, since public processes are highly static by nature and settling on standard business document types is in line with cross-industry momentum. The next step, implementing an ebXML-based business collaboration solution will then be a snap.

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