
ebXML og webservice protokollernes rolle i den serviceorienterede arkitektur

Analyserapport



Videnskabsministeriet
November 2005

ebXML og webservice protokollernes
rolle i den serviceorienterede arkitektur -
Analyserapport

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Forord

Om rapporten

Denne rapport fra analysefirmaet CBDI Forum, som bortset fra dette forord er på engelsk, handler om, hvordan ebXML og webservice (ws) protokollerne understøtter e-business og generelt serviceorienteret arkitektur (SOA).

ebXML og ws protokollerne inkluderer et delvist overlappende sæt af standarder. På nogle områder er der også protokolmæssige forskelle, mens der på andre er sammenfald. Denne rapport fokuserer på områder, hvor der er overlap, og sammenligner ebXML og ws på basis af funktionalitet, standardmæssig status, bruger- og leverandørunderstøttelse samt forventet fremtidig udvikling.

Det er målet, at du, ved at læse denne rapport, kan få svar på eller hjælp til at vurdere hvilke dele af ebXML og webservice-standarderne, som du bør satse på i serviceorienterede løsninger.

Baggrunden for rapporten

*Hvidbog om IT-arkitektur*¹, som udstikker en lang række retningslinier for digital forvaltning, peger på, at offentlige it-systemer i fremtiden skal indrettes, så de overholder principperne for en serviceorienteret arkitektur (SOA).

Efterhånden som sektorområder og enkelte myndigheder lægger strategier og implementeringsplaner for, hvorledes man bevæger sig frem mod en serviceorienteret arkitektur, opstår der en række spørgsmål, som Hvidbogen ikke nødvendigvis giver svar på. Videnskabsministeriet er derfor i gang med at lave en samlet ramme for forskellige aktiviteter på dele af arkitekturområdet, som også er relevante for serviceorienteret arkitektur. I forbindelse med etableringen af denne ramme vil indsatsen på en række områder blive skærpet med henblik på at kunne give mere konkrete anbefalinger.

Eet initiativ har været at få udarbejdet analyserapporter, som kan understøtte det fællesoffentlige it-arkitekturarbejde ved at vurdere forskellige aspekter i forbindelse med indførelsen af en serviceorienteret arkitektur.

Det drejer sig om følgende rapporter på engelsk:

- E-Business Standards. The Role of ebXML and Web Service Protocols
- The Role of Ecosystems for SOA
- Infrastructure Services for SOA within the Public Sector
- SOA Reference Models

Videnskabsministeriet vurderer, at en stor del af indholdet i rapporterne også er af interesse for individuelle organisationer, og ministeriet offentliggør dem derfor på OIO.dk.

¹ Hvidbog om IT-arkitektur kan hentes på <http://www.oio.dk/arkitektur/publikationer/hvidbog>

Det er vigtigt at notere sig, at rapporterne er udarbejdet i oktober/november 2005, og at nogle af rapporterne, eller dele af dem, relativt hurtigt kan blive utidssvarende, hvis de beskæftiger sig med områder, der er i stærk udvikling.

Analysefirmaet CBDI Forum er ene og alene ansvarlig for vurderingerne og anbefalingerne i rapporterne, men Videnskabsministeriet tilslutter sig generelt rapporternes indhold.

CBDI Report

E-Business Standards. The Role of ebXML and Web Service Protocols

Abstract: This paper assesses ebXML and Web Service Protocols (WS-Protocols) in support of e-business. ebXML and WS-Protocols are overlapping sets of standards with differences in protocols in some areas, and common protocols in others.

This report focuses on the areas of overlap and makes comparison between the two on the basis of functional capability, the status of standards, user and vendor adoption, and anticipated directions.

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Independent Insight for Software Oriented Practice

CBDI Forum Report: E-Business Standards. The Role of ebXML and Web Service Protocols

1. Introduction

This paper assesses ebXML and Web Service Protocols (WS-Protocols) in support of e-business. ebXML and WS-Protocols are overlapping sets of standards with differences in protocols in some areas, and common protocols in others.

This report focuses on the areas of overlap and makes comparison between the two on the basis of functional capability, the status of standards, user and vendor adoption, and anticipated directions.

2. Requirements for e-business

Effective e-business requires that each participant share the following:

1. A common foundation for understanding of the shared business activity
 - Schemas to define messages exchanged between participants - the business documents. E.g. a Purchase Order
 - Process definitions to provide context for the message exchange - the specific business collaboration (which may be part of a broader business process). E.g. a Purchasing Process
 - Agreements between trading partners which might detail the collaboration between, and obligations on the participants which could be contractual obligations including technical, service level, or commercial contracts
2. A Common foundation for the Infrastructure to facilitate the shared business activity, including:
 - Messaging capability to facilitate message exchange. This may include
 - Reliable messaging to provide assurance of message delivery
 - Security to ensure message integrity, confidentiality, and to identify the sender
 - Transaction management to ensure integrity across participants
 - Orchestration and sequencing of services and message in more complex conversations
 - A Registry to enable Service Consumers to discover Service Providers and their Services
 - A mechanism to describe Services, messages, and their behavior.
 - Manageability is necessary so that
 - Participants can monitor the status and performance of B2B Services and exchanges – e.g. to monitor SLA compliance
 - Participants can dynamically manage Services and exchanges – e.g. to start/stop services, route messages to alternate endpoints, etc

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In delivering a common foundation, the following characteristics are desirable to encourage widespread e-business adoption

- Low cost. For e-business to become ubiquitous requires a low-cost of implementation (e.g. e-business software acquisition, and set up and operation costs), and a small technology footprint (e.g. hardware and operating platform scale and cost). That is, adoption of e-business solutions should be possible by the smallest of participants, using the minimum technology, and not be the province of large organizations only.
- Based on Open Standards. Compliance with open standards,
 - to ensure interoperability between all e-business participants.
 - by vendors, should reduce costs to users due to the effects of commoditization
- Protocol-based. Using open standard protocols to facilitate e-business exchanges (e.g. messages, process models) , rather than setting standards for the underlying technology platform is preferable as this removes
 - Technical, platform or product dependencies between participants (providing their platforms or products understand the protocols
 - Dependencies on specific implementations (applications)
 - The removal of dependencies (often referred to as Loose Coupling) by using Open Standard Protocols improves agility, enabling participants to enter new relationships (either with new business partners, or use of new technology, or new applications) more easily.

3. Brief Overview of e-business Standards

This is not meant to be detailed introduction or history of e-business standards, but to provide context for the report. Links to further reading are provided.

The emergence of EDI standards backed by UN/CEFACT¹ has been effective in standardizing some e-business activities, but has been primarily adopted only by large organizations as the cost and effort required has been a barrier to smaller businesses.

ebXML

ebXML² (electronic business XML) was subsequently also sponsored by UN/CEFACT with the objective of making standards-based e-business accessible to all sizes of organization by,

- enabling the use of the public internet, rather than more expensive Value Added Networks (VANs)
- leveraging XML to simplify construction and maintenance of messages, and remove dependencies between endpoints on fixed message formats that constrain change
- publishing open standard protocols to remove platform and technology dependencies between participants, or dependencies on specific transport technologies

The original aims of ebXML were to establish standards for both requirements 1 and 2 outlined above. The initiative was subsequently separated in two along the lines of these requirements, with responsibility for establishing standards for core common components as

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a basis for requirement 1 passing to UN/CEFACT, and responsibility for the infrastructure standards lying with OASIS³.

ebXML infrastructure is now a set of approved OASIS and ISO protocol standards that address both the common foundation for understanding of the shared business activity as well as the common foundation for the infrastructure.

The core specifications in ebXML are:

- ebXML Message Service Specification (ebMS) - Defines messaging protocol, including reliability and security
- ebXML Collaboration Protocol Profile and Agreement (ebXML CPPA) - Defines configuration information for exchanges with a specific partner, including quality-of-service (QOS).
- ebXML Business Process Specification Schema (ebXML BPSS) - Defines business activities, collaborations, and transactions, using CPP/A.
- ebXML Registry/Repository (ebXML Reg/Rep) - Provides a Provider and Service registry plus a repository mechanism for associated artifacts (e.g. BPSS and CPP/A)
- ebXML Core Components Technical Specification (ebXML CCTS) – Provides a framework for defining business semantics, including a meta-model and naming conventions used in constructing a data model for a specific purpose.

Web Service Protocols

Web Services as a term is somewhat misleading today, as the concept and the set of protocols that have been developed are not predicated on the use of web technology, such as requiring HTTP. The term is also used somewhat generically with ebXML may also be referred to as Web Services.

This report focuses on the specific set of related protocols that carry the Web Service prefix, such as Web Service Description Language⁴ (WSDL), or Web Service Security (WS-Security, or WSS), hence referred to as WS-Protocols.

WS-Protocols that have been developed with similar objectives to ebXML, though not specific to e-business. That is, WS-Protocols have more general applicability to a broader range of connectivity/integration scenarios.

ebXML and WS-Protocols are an overlapping set of standards with differences in protocols in some areas, and common protocols in others. This is discussed later.

Though not specific to the needs of e-business, WS-STAR (or WS-*) is a useful acronym that is sometimes used in reference to a subset of WS-Protocols defined by BEA, IBM, Microsoft and a core of other partners specific to the requirements to implement Secure, Transacted, Asynchronous, Reliable Web Services. This refers to usage of,

- WS-Security⁵
- WS-TX⁶, for transaction coordination
- WS-RX⁷ for reliable message exchange

Hence one comparison between ebXML and WS-Protocols might be specifically between ebMS and WS-STAR

UBL

Universal Business Language⁸ (UBL) is an OASIS standard that provides an XML format for business documents to address requirement 1. It provides a library of XML schemas for

- common data elements such as "Address" and "Payment"
- common business documents such as "Purchase Order" and "Invoice", built from the data elements

UBL is an implementation of ebXML CCTS. Though closely associated with ebXML, UBL based documents can be exchanged using WS-Protocols.

4. ebXML and WS-Protocol Comparison

This section is not a detailed technical comparison of ebXML and WS-Protocols, but to demonstrate where differences lie or where there is commonality.

Meeting Requirements

As can be seen from Table 1, ebXML provides greater coverage for full scope of e-business requirements than WS-Protocols, as the later does not address standard definitions of the business activity and focuses only on the infrastructure requirements.

WS-Protocol initiatives did not set out to address business document or process standards as WS-Protocols are not designed to be specific to e-business.

Ideally, e-business standards should provide a layered architecture (along the lines of the rows in Table 1) that minimizes dependencies across layers. This would permit standard business documents to be exchanged using either ebXML or WS-Protocol infrastructure. Though ebMS is independent of other ebXML specifications and could be used in scenarios beyond e-business, the ebXML BPSS protocol that provides for transactions and orchestration has dependencies on the ebXML CPPA protocol for collaboration agreements. In the specific context of e-business this may not be seen as an issue.

E-Business Standards. The Role of ebXML and Web Service Protocols

| Requirement | ebXML | WS-Protocols |
|---|-------|--------------|
| A common foundation for shared understanding of the shared business activity | | |
| Message/Document schemas | Yes | |
| Process definitions | Yes | |
| Trading Partner Collaboration Agreements | Yes | |
| A Common foundation for the Infrastructure to facilitate the shared business activity, including: | | |
| Messaging | | |
| <ul style="list-style-type: none"> • Reliable messaging | Yes | Yes |
| <ul style="list-style-type: none"> • Message Security | Yes | Yes |
| <ul style="list-style-type: none"> • Transaction management | Yes | Yes |
| <ul style="list-style-type: none"> • Orchestration | Yes | Yes |
| Description | Yes | Yes |
| Registry | Yes | Yes |
| Manageability | | Yes |
| Desirable Characteristics | | |
| Open Standards | Yes | Yes |
| Protocol Based | Yes | Yes |

Table 1 – Meeting e-business Requirements

In comparison, WS-Protocols are a more general purpose infrastructure that addresses a broad range of connectivity/integration scenarios. The consequence is that WS-Protocols will be adopted on a wider scale, and organizations that adopt ebXML for e-Business will still need to use WS-Protocols to support other requirements. This can lead to duplication of both effort and infrastructure investments. This is discussed later in the section on adoption.

Current ebXML and WS-Protocols Specification Comparison (as at September 2005)

A comparison of the current overlap between ebXML and WS-Protocols is shown in Table 2.

Key differences can be seen in the following areas

Reliable Messaging

As well as ebMS, there are currently two alternative Web Service based reliable messaging protocols. These are WS-Reliability which is already an OASIS standard, and WS-RX which is emerging as its replacement.

Though there are differences in the details of these protocols, the approach can be seen as similar as the mechanisms for reliable messaging are well understood. All are extensions to

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SOAP. As such, the similarities should provide a basis for future convergence, though changes may not be backwards compatible.

The capabilities/behavior offered by the WS-Reliability or WS-RX protocols is not in itself a reason to replace ebMS or vice versa.

Message Security

Both ebXML and WS-Protocols have the same aim to provide mechanisms for,

- authentication of the signed sender of a message
- privacy and integrity of messages using encryption

ebMS V 2.0 provides for use of XML Signature and XML Encryption.

Similarly, WS-Security builds on XML Signature and XML Encryption. WS-Security extends on these by providing a further “sub-stack” of security protocols to cover federation, secure conversations and other capabilities that are of benefit to e-business scenarios.

Again the common use of SOAP, XML Signature and XML Encryption should provide a basis for convergence.

Transactions and Orchestration

ebXML BPSS is used to define e-business processes and transactions and is designed specifically work with ebXML CCPA. Whereas WS-Protocols, namely BPEL and WS-TX, define a more generic framework that is not specific to e-business scenarios.

There are currently a diversity of protocols for both orchestration and the coordination of distributed applications. Business Process Modeling Language (BPML) is another alternative to BPSS and BPEL for business process modeling and orchestration. Whilst Business Transaction Protocol (BTP) and Web Services Composite Application Framework (WS-CAF) are possible alternatives to WS-TX.

WS-TX is a recently announced OASIS TC to develop protocols for coordination of distributed applications. It will take as its starting point the following protocols submitted by BEA, IBM and Microsoft,

- WS-Coordination describes an extensible framework for providing protocols that coordinate the actions of distributed applications. Current coordination types are
 - WS-AtomicTransaction – protocol for defining atomic transactions
 - WS-BusinessActivity – protocol for defining coordination of business activity, sometimes referred to as long-running transactions

WS-AtomicTransaction and WS-BusinessActivity supersede an earlier specification, WS-Transaction (which covered both coordination types).

WS-CAF is very similar in structure to WS-TX. There are areas of overlap where the protocols are very similar.

Greater effort has taken place in WS-STAR to ensure the set of protocols work together. For example, WS-TX specifies how WS-Security should be used to secure transaction messages. Whereas WS-CAF could use WS-Security, but no work has taken place to describe exactly how this would be done, leaving it open to interpretation.

Registry

UDDI⁹ and ebXML Registry are both alternative specifications for a services directory that can be used to discover Service Providers and their Services.

ebXML Registry Services (RS) provides the specification of the Services offered by the registry. The Registry Service Interface enables an ebXML Registry to interact with other registries such as UDDI.

The ebXML Registry Information Model (RIM) enables an ebXML Registry to also act as a repository or ebXML artifacts such as ebXML CCP/A and BPSS.

Again, the ebXML Registry has been designed primarily to meet the demands of e-business, whereas UDDI provides a generic Service registry for any connectivity scenario (e.g. a computer could use UDDI to discover the Services offered by a printer)

A registry is not the only mechanism by which to discover Web Services. WS-Discovery is protocol by which Web Services can be discovered by polling endpoints without requiring a (central) registry somewhere on the network through which Services are published and discovered. This approach is suitable for ad hoc networks where Service Providers and Consumers might join on a temporary basis. An example scenario might be a wireless enabled laptop computer that can discover available printing services when it connects to a wireless network. As the laptop is moved to different locations, it continues to discover the closest available printer.

This approach may be less suitable in an e-business context where one might expect more formal, durable contracts in place between provider/consumer, and discovery to be a more formal process.

E-Business Standards. The Role of ebXML and Web Service Protocols

| Specification Area | ebXML | WS-Protocol | Overlap |
|--|-----------------------|--|-----------|
| Core Common Components | ebXML CCTS | | No |
| Business Language | UBL | UBL can be used | Common |
| Trading Partner Collaboration Agreements | ebXML CPPA | | No |
| Messaging | ebXML MSG (ebMS) | Composable Stack of protocols that extend SOAP | Different |
| <ul style="list-style-type: none"> • Envelope | SOAP | | Common |
| <ul style="list-style-type: none"> • Reliable Messaging | ebXML MSG (ebMS) | WS-Reliability or WS-RX | Different |
| <ul style="list-style-type: none"> • Security | ebXML MSG (ebMS) | WS-Security | Different |
| <ul style="list-style-type: none"> • Transactions | ebXML BPSS | WS-TX or WS-CAF | Different |
| <ul style="list-style-type: none"> • Orchestration | ebXML BPSS | BPEL | Different |
| Registry | ebXML RS ebXML RIM | UDDI | Different |
| Service Description | WSDL | | Common |
| Manageability | | WSDM-MOWS/MOWS | No |

Table 2 - Current ebXML and WS-Protocol Specification Comparison (as at Sept 2005)

5. Protocol Status and Directions

The current status of ebXML and WS-Protocols is shown in Table 4 and Table 4.

Organizations that are only willing to set their own policies based on standards approved by a recognized industry body cannot currently recommend all of the WS-Protocol stack. They can only recommend some of these as possible future standards for consideration.

It should be noted that an expectation that standards bodies set a single standard that attracts universal adoption is not always realistic, particularly during a period of change when several alternative specifications are competing for standardization. Observe that

- WS-Protocols are not administered by a single body.
- There is duplication in some WS-Protocols between, and even within standards bodies which has lead to delays in convergence
- Vendors may take specifications to a different standards body simply to avoid conflict with existing overlapping initiatives.

E-Business Standards. The Role of ebXML and Web Service Protocols

ebXML Status

With V2.0 of ebXML specifications approved and V3.0 in development, ebXML might be considered a mature standard.

The original schedule for ebXML MSG V3.x has slipped from the dates originally published in the feature preview. They now plan that a committee draft is completed during autumn 2005, and the review process thereafter, which would take until spring 2006

ebXML MSG TC are currently working on finishing the draft of security extensions including support for WS-Security. They plan either to support both Web Service Reliability protocols equally, or perhaps one as mandatory to implement and one as optional.

| Protocol | Approved Standards | Candidates | Notes and Directions |
|---------------------------------------|--|---------------------------------|---|
| ebXML Messaging ebMS | ebXML MSG V2.0 | ebXML MSG V3.x expected 2006 | Plans ¹⁰ for ebMS V3.x to support WS-Reliability and/or WS-RX, and SOAP V1.2 |
| ebXML Registry Services | ebXML RS V2.0 & V3.0 | | |
| ebXML Repository Information Model | ebXML RIM V2.0 & V3.0 | | |
| ebXML Security | ebXML MSG V2.0 – use of XML Encryption and XML Signature | ebXML MSG V3.x expected 2006 | Plans for ebMS V3.x to support WS-Security |
| ebXML Core Components | ebXML CCTS V1.0 | | |
| CPA/CPP | ebXML CPPA V2.0 | | |
| UBL | UBL V1.0 UBL NDR V1.0 | | |

Table 3 - ebXML Status and Direction (as at Oct 2005)

WS-Protocol Status

Several elements of WS-Protocols are not approved standards.

- Whilst WS-Reliability is an OASIS standard, it is expected this will be superseded by WS-RX. The WS-RX TC which includes members from the WS-Reliability TC has taken the WS-ReliableMessaging specification from BEA Systems, IBM, Microsoft, and TIBCO Software as input.
- WS-TX which includes transaction protocols has only recently been announced as an OASIS TC
- BPEL is currently an OASIS Committee Draft
- WSDL V1.0 is a de facto standard, but was not published as a W3C Recommendation. WSDL V2.0 should become a recommendation.

E-Business Standards. The Role of ebXML and Web Service Protocols

Manageability is another domain in which there is overlapping WS-Protocols. Whilst WSDM which is backed by CA, HP, IBM and others is an OASIS standard, WS-Management is an alternative protocol backed by Intel and Microsoft.

WS-STAR Status

| Protocol | Approved Standards | Candidates | Notes and Directions |
|--------------------|--|-----------------|--|
| SOAP | SOAP V1.2 | | |
| WSDL | <i>WSDL V1.0 is not a W3C Recommendation, but is a de facto standard</i> | WSDL V2.0 | WSDL V2.0 is currently a W3C "Last Call" Working Draft |
| Registry | UDDI V2 & V3.0.2 | | |
| Security | WS-Security V1.0 | | |
| Reliable Messaging | WS-Reliability V1.1 | WS-RX | WS-RX OASIS TC recently formed. WS-RX should supersede WS-Reliability |
| Transactions | | WS-TX WS-CAF | WS-TX OASIS TC recently announced. WS-TX and WS-CAF will likely merge overlapping protocols. |
| Orchestration | | WSBPEL | OASIS Committee Draft |
| Manageability | WSDM-MOWS V1.0 WSDM-MUWS V1.0 | WS-Management | |

Table 4 - WS-Protocol Status and Direction (as at Oct 2005)

WS-RX and WS-TX which are key components of the WS-STAR are not approved standards.

Though WS-Reliability could be used, this is expected to be superseded by WS-RX.

Though WS-CAF has progressed further than WS-TX in the standards process, it has not been backed by BEA, IBM, Microsoft and partners. The recent formation of the WS-TX TC which is backed both by BEA, IBM, Microsoft and by members of the WS-CAF TC should lead to a convergence in areas of overlap between WS-TX and WS-CAF. The WS-CAF TC will continue and focus on providing extensions to WS-TX, such as support for additional coordination types.

The expectation of IBM and Microsoft is that WS-RX and WS-TX should be approved as standards by 4Q2006.

Microsoft anticipates that they will be approved by the time of Windows Vista commercial availability in 4Q2006. Windows Communications Framework (WCF) which is part of Windows Vista and available for Windows XP implements WS-STAR. Whilst availability of these products/capabilities is not predicated on the approval of standards, it is nevertheless desirable for Microsoft to ensure that WS-STAR protocols are standardized by that date.

E-Business Standards. The Role of ebXML and Web Service Protocols

IBM and Ford have recently published Reliable Asynchronous Message Profile¹¹ (RAMP). RAMP is an extension of the Web Service Interoperability¹² (WS-I) organization's Basic Profile 1.1, Simple Soap Binding Profile 1.0, and Basic Security Profile 1.0.

IBM believes that RAMP provides functional equivalence to ebMS in terms of supporting the requirements for e-business, by providing a common foundation of interoperability for secure, reliable messaging between business partners. IBM expects to deploy RAMP in 2006. However it is not clear how this might be approved as a standard, as it has not currently been submitted to WS-I or equivalent organization.

Convergence

Convergence between ebXML and WS-Protocols can be expected. As further WS-Protocols are approved as standards, market forces and a rational desire to have a single standard where possible will drive the ebXML community to adopt WS-Protocols in areas of overlap.

However, there is little evidence of the trend happening in the other direction. That is, the WS-Protocol community adopting overlapping ebXML protocols.

Though convergence will occur, it seems apparent that this will come as a factor of ebXML endorsement of WS-Protocol standards rather than some joint initiative to blend respective protocols.

Convergence should be straightforward in areas such as reliable messaging and security because of similarities, or the level of modularity and decoupling easing the process.

However, where the differences are greater, of dependencies exist on other protocols is may be more difficult.

Consequently, whilst the ebXML MSG TC has published plans for convergence of messaging protocols, the ebXML BPSS and Registry TC's are not so advanced.

E-Business Standards. The Role of ebXML and Web Service Protocols

| Specification Area | Convergent Position | Remaining Differences |
|--|--|-----------------------|
| Core Common Components | ebXML CCTS | |
| Business Language | UBL | |
| Trading Partner Collaboration Agreements | | ebXML CPPA |
| Messaging | ebXML MSG adopts further WS-Protocols | |
| • Envelope | SOAP V1.2 | |
| • Reliable Messaging | ebXML MSG V3.x permits use of WS-Reliability and WS-RX | |
| • Security | ebXML MSG V3.x adopts WS-Security | |
| • Transactions | | ebXML BPSS WS-TX |
| • Orchestration | | ebXML BPSS BPEL |
| Registry | | ebXML RS/RIM UDDI |
| Service Description | WSDL V2.0 | |
| Manageability | WSDM-MOWS/MOWS | |

Table 5 - Emerging Position (4Q 2006)

Specific assessment with regard to Table 4

- **ebXML CCTS** – This can be used as the basis for business semantics regardless of infrastructure used
- **Business Language** - UBL is not predicated on other parts of the ebXML specification besides CCTS and can be used as the basis for business semantics with a WS-Protocol infrastructure.
- **Reliable Messaging** – Given that it appears WS-RX will supersede WS-Reliability, this should be reflected in ebXML MSG V3.x
- **Orchestration and Transactions** - Dependencies between CPPA and BPSS mean these are unlikely to be used with the WS-Protocol stack. BPSS convergence with WS-TX and/or WSBPEL appears unlikely in near future.
- **Registry** - Interoperability between UDDI and ebXML registries is possible and already demonstrated today as well as supported by registry products that support both specification. However, convergence of specifications is unlikely in near future

6. Adoption and support of ebXML and WS-Protocols

Adoption by End-user Organizations

It is difficult to find accurate statistics of ebXML and Web Service protocol usage by end-user organizations. Challenges include,

- Surveys that typically invite response may be unrepresentative as those organizations using the protocols are most likely to respond, resulting in apparently higher percentage of usage than may be reality.
- Many usage statistics are little more than approximations often by interested parties who may show bias to further their own aims.
- In the current scenario where adoption of SOA is growing rapidly, many statistics may become rapidly out of date. The approval of a protocol as a standard, or the availability of an implementation of a protocol in a popular platform can cause a rapid step change in adoption figures even where the protocol is not an approved standard.
- Responses are also primarily from larger organizations who have the professional developers able to track emerging technologies, then initiate and support their use in projects. Given that the goal is to facilitate e-business across all sizes of business both large and small, the current usage across ALL businesses is likely to be smaller.
- Furthermore, usage within those organizations may to be limited to specific projects. Few organizations mandate any of these protocols must be used on all applicable projects.

However, the larger the sample size the more useful the results are at least in making a comparison between the use of different protocols amongst the respondents. A 2005 Systinet sponsored survey¹³ had over 900 global respondents. This survey is therefore recent, and a good indication of usage across a large number of organizations. Figure 1 taken from this report indicate that

- Base WS-Protocols are widely adopted. ebXML users will also be using SOAP and WSDL.
- Usage of both WS-Reliable Messaging and BPEL is higher than expected, given they are not standard. This indicates they are already becoming a de facto approach and that standardization will increase further
- Figures on ebXML usage are not fine grained enough. That is, it doesn't indicate the level to which individual ebXML protocols are used. However, by definition use of an individual protocol will not exceed this figure. The 11% usage figure is similar to that provided by OASIS, who indicate that ebXML usage is in the low teens.
- UDDI usage appears to exceed possible ebXML Registry usage by a significant amount, but reflects it is being used for other requirements besides e-business.

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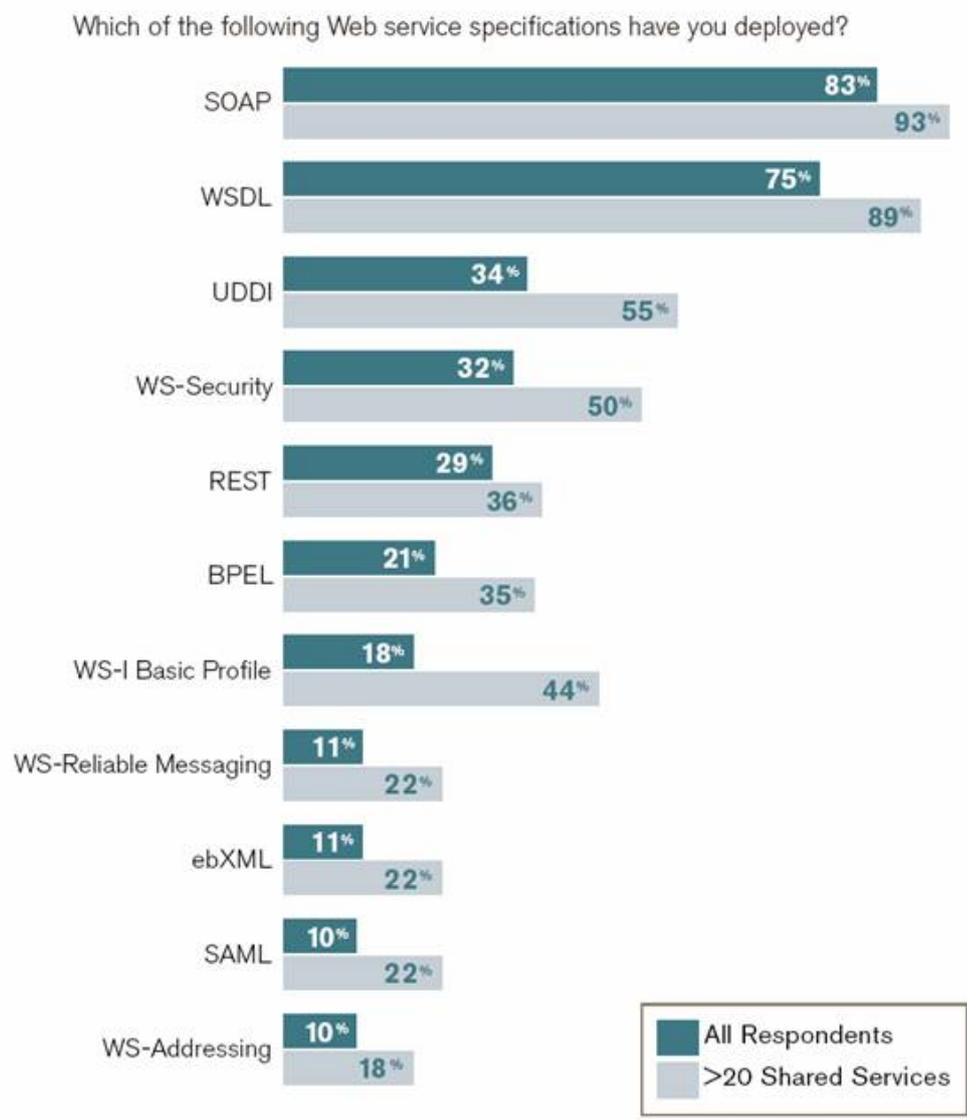


Figure 1 - Protocol Usage (Source: Systinet. SOA Today – Adoption Research Report. August 2005)

CBDI Forum's view, based on discussions with end-user organizations, vendors, and public sources of information such as the Systinet Survey and others is that,

- Any significant adoption of these protocols for e-business on a production rather than exploratory basis, when measured by number of organizations may be in single figure percentages (i.e. <10%)
- Though use of WS-Protocols is growing more rapidly, ebXML adoption is still growing. Notably in the government/public sector. Though the numbers may be small, they are nevertheless often influential users such as government organizations who can drive adoption in an industry domain or geography
- As already explained, organizations that adopt ebXML will also need to adopt WS-Protocols, and will need to use WS-STAR.
- Many organizations, including government bodies that might be expected to drive standards adoption, will avoid the issue by incorporating both ebXML and WS-STAR in their standards recommendations. Many organizations will have plenty of

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precedent, for example having “standardized” on multiple distributed computing technologies.

- CBDI Forum would expect the rate of adoption of WS-STAR to outpace ebMS in 2006 as the remaining WS-STAR protocols are approved as standards
- Our experience is that many organizations are not using the public nodes of the UDDI Registry, but are using a private registry which has controlled access for business partners or is used exclusively for internal requirements. The public nodes of the UDDI suffer from lack of governance over the submission process resulting in many invalid entries.
- UBL usage is currently limited. The focus to date of many organizations has been on adoption of infrastructure standards to improve technical interoperability, not business standards. Most organizations are using WS-Protocols as an infrastructure for exchange of existing business documents and to wrap existing interfaces.

Vendor compliance

WS-Protocol support

WS-Protocols have been promoted enthusiastically by the major platform and infrastructure/middleware vendors who are embedding them in their products.

Support for base WS-Protocols (SOAP/WSDL) can be considered universal with tools and products from a large range of vendors in a broad range of domains covering packaged applications ranging from ERP to desktop productivity, development tools, middleware, database management systems, and operating platforms.

WS-STAR will start to form part of the major operational infrastructure with support for security and reliable messaging protocols provided during 2005/2006, and transactions following later. This will provide de facto support as customers upgrade to latest versions of those platforms. For example

- Major platform vendors
 - Microsoft Web Services Extensions (WSE) 3.0 available Nov 2005 provides advanced support for WS-Security and WS-Reliable Messaging (basis for WS-RX)
 - Microsoft Windows Communications Foundation for Windows XP and Windows Vista. Now in beta, will supersede WSE in late 2006
 - BEA Aqualogic Service Bus
 - IBM WebSphere ESB
 - Cisco AON adds WS-Security and WS-Reliable Messaging support to Cisco-based Network
 - Sun (*awaiting response*)
 - Oracle Fusion (*awaiting response*)
- The Apache Axis¹⁴ initiative is also working to provide Open Source Software (OSS) support for WS-STAR
 - Major vendors have specific programs to embed WS-STAR support into their platforms.

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- WS-STAR support is also likely to start to appear in packaged applications from vendors such as SAP – though they are equally likely to remain protocol “neutral” and support ebXML too.
- Availability of WS-STAR in platforms will drive adoption by other vendors in 2006. IBM and Microsoft are already encouraging ISV’s to take advantage of WS-STAR implementations in their platforms.

Though various tools and products can accelerate the use of WS-STAR by developers to justify investment in those tools, the fact that WS-STAR is becoming embedded in the latest platforms and middleware means that WS-STAR support is effectively free (apart of course from the cost of upgrading to those platforms). That is, use of WS-STAR will not require the purchase of dedicated WS-STAR tools and products, but it may be more efficient and cost effective to do so.

ebXML support

ebXML support from vendors is provided today from

- BEA, Oracle and Sun provide an ebXML adaptors to their integration products
- Sun also provide an ebXML Registry implementation
- Integration and middleware vendors also provide ebXML adaptors to their B2B and EAI messaging products, such as TIBCO, Vitria, and WebMethods.
- Specialist e-business and EDI vendors
- A number of Open Source Software (OSS) implementations. ebXML does not have a central focus for OSS in the way that Apache Axis provides a focus for WS-Protocols

It should be noted that the OASIS list of ebXML Tools¹⁵ is out of date.

Growth in the number of vendors supporting ebXML is not significant.

Support for ebXML is often provided as an adaptor to integration products. This is a valid approach as ebXML protocols are unlikely to be embedded within the underlying platform and middleware (as with WS-Protocols) as ebXML is specific to a particular need (e-business) and not so generic that it demands platform level support.

IBM and Microsoft Position on ebXML

A key challenge to the ebXML community has been the lack of support from IBM and Microsoft. Despite their enthusiasm and evangelism of e-business, neither provides support for ebXML even within their integration products, apart from supporting those protocols within ebXML that are common with WS-Protocols. However, third parties do provide ebXML adaptors for IBM and Microsoft’s middleware and integration products.

Moreover, both IBM and Microsoft actively counsel their customers to use WS-Protocols and WS-STAR in preference to an ebXML-based infrastructure.

ebXML and WS-Protocols Support

Middleware products for connectivity and integration such as an Enterprise Service Bus (ESB) are most likely to support both ebXML and WS-Protocols including WS-STAR in parallel. Such products are usually predicated on the ability to mediate between different platforms. Vendors in this space that provide ebXML support normally also provide support for WS-Protocols and can be expected to support WS-STAR. Given that both IBM and

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Microsoft are leading vendors in this space and justify their products on the basis of mediation across multiple protocols it is surprising that neither provides directly support for ebXML.

Connectivity/Integration products that support both ebXML and WS-STAR would be a very useful tool for organizations that are faced with addressing the requirements of different business partners some of whom use ebXML whilst others use WS-STAR.

Sun and Infravio provide registries that support both ebXML Registry and UDDI specifications. This enables for example a Service registered in UDDI to point to artifacts in the ebXML Repository. Hence, a UDDI registry can be used for the general purpose registry, whilst the ebXML Registry can be used to better serve the specific needs of e-business by holding further information such as collaboration profiles.

7. CBDI Forum Recommendations

In view of the above, CBDI Forum makes the following recommendations

1. For the remainder of 2005 and early into 2006, there are no immediate needs to change existing standards positions with regards to ebXML and WS-Protocols
2. Later in 2006, standards should be reviewed to accommodate
 - a. Standards approval of
 - i. WS-RX protocols
 - ii. WS-TX
 - iii. WSBPEL
 - b. Adoption by ebXML MSG V3.x of WS-RX and WS-Security
3. Selection/Recommendation of a single standard for e-business (either ebXML or WS-Protocols/WS-STAR) is too early in the adoption lifecycle. Even with standards approval of remaining WS-Protocols that might render differences between ebXML MSG and WS-STAR irrelevant, usage of other ebXML specifications may still continue to grow. Though ebXML MSG V3.x will permit use of WS-STAR, existing ebXML MSG protocols will continue to supported as a standard, and growth in usage may continue.
4. Ideally, ebXML will further converge with WS-Protocols in the Registry and Business Process Specification areas. This is not a near term outcome however and organizations should consider a co-existence strategy whereby they support both relevant ebXML and WS-Protocols. Whilst this is straightforward for Registry, it is more complex for business processes.
5. Organizations face a difficult decision in terms of deciding whether to pursue a dual standards strategy (that is, recommending both ebXML and WS-STAR), or to select one in preference to the other.
 - a. The recommendation of one can be expected to reduce demand for the other. However, this might be
 - i. An unpopular decision politically, with accusations of bias in the current standards scenario.

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- ii. Difficult to justify to those organizations who participate on an international or cross business domain basis, who might be called to support alternative standards in different geographies or domains.
 - b. The recommendation of both is likely to result in a status quo where neither appears to prevail. The result is increased cost and effort to support both standards
 - c. Note our earlier observation that many organizations will avoid the issue by permitting use of both ebXML and WS-STAR
6. In a global economy, organizations and national government bodies may look to a higher authority for guidance and/or leadership such as the EU for European organizations, the US Federal Government, or the United Nations. Mandating standards compliance on a national basis is difficult when many organizations will be participating in e-business on an international basis.
7. It is CBDI Forum's view that where they are duplicate or overlapping WS-Protocols, those backed by IBM, Microsoft and their partners will prevail in the marketplace. IBM and Microsoft's strategy of ensuring that the relative market leaders in each domain participate in their protocol specification development means they effectively present a de facto position with each protocol.
 - a. The decision of Sun to join with IBM and Microsoft in these protocols is another major factor that should see any existing duplication and overlap of protocols be gradually removed.
 - b. The recent formation of OASIS TC for WS-RX and WS-TX should see these adopted as standards in 2006, and in that process will supersede WS-Reliability and WS-CAF respectively

Links

Not every Web Service protocol in this report is individually referenced. References can be found at

- CBDI Forum Web Services Roadmap <http://roadmap.cbdiforum.com/reports/protocols/summary.php>
- OASIS Web Service Technical Committees http://www.oasis-open.org/committees/tc_cat.php?cat=ws
- W3C Web Services Activity <http://www.w3.org/2002/ws/>

About CBDI

CBDI Forum is an independent industry analyst and consultancy company. CBDI Forum provides a focus for the industry on best practice in business software creation, reuse and management, specializing in Service- and Component-based approaches including Service Oriented Architecture (SOA).

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¹ UN/CEFACT <http://www.unece.org/cefact/>

² ebXML <http://www.ebxml.org/>

³ OASIS <http://www.oasis-open.org/>

⁴ WSDL <http://www.w3.org/2002/ws/desc/>

⁵ WS-Security http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wss

⁶ WS-TX http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=ws-tx

⁷ WS-RX http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=ws-rx

⁸ UBL http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=ubl

⁹ UDDI <http://www.uddi.org>

¹⁰ <http://www.oasis-open.org/committees/download.php/4383/ebMSv3FeaturePreview.pdf>

¹¹ <ftp://www6.software.ibm.com/software/developer/library/ws-ramp.pdf>

¹² www.ws-i.org

¹³ http://www.systinet.com/dl/Systinet_SOA_Today_-_Adoption_Research_Report_Aug05.pdf

¹⁴ <http://ws.apache.org/>

¹⁵ <http://www.ebxml.org/tools/index.htm>