Agenda

- XML and Application Server Technology
- XML Message Oriented Middleware (MOM) Frameworks
- Web Services
Part I

XML and Application Server Technology

XML and OMG’s CORBA 3 OMA
- CORBA
  - creating distributed object systems on heterogeneous platforms
- XML
  - conveying structured data in a portable way
- CORBA Component Model (CCM)
  - http://ditec.um.es/~dsevilla/ccm/
  - CORBA equivalent of Enterprise JavaBeans for the Java server-side component framework
- CCM components submission uses XML for software package descriptors
  - Based on Open Software Description (OSD)
- XML Metadata Interchange (XMI)
  - Interchange of meta data between modeling tools using the Unified Modeling Language (UML) and meta data repositories based on the Meta Object Facility (MOF) standard
- IDL over IIOP vs. XML over HTTP (XIOP)
XML and J2EE

- XML data representation and exchange
  - JAXP 1.1
  - EJB persistence service
- XML MOM via JMS
  - JMS API’s `TextMessage`
  - Custom JMS extensions
    - BEA’s WebLogic `XMLMessage` subclass
  - Sun’s Java API for XML Messaging (JAXM)
  - XML-RPC, SOAP, ebXML
- User Interface & Presentation
  - Java Server Pages (JSPs) and Servlets

XML and Microsoft DNA

- DNA XML Resource Kit
  - Tools to send data across the Internet to other applications or browsers.
- DNA replaced by Microsoft .NET
Part II

**XML Message-Oriented Middleware (MOM) Frameworks**

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**MOM Application Development Tools**

- Serializing Java objects into XML using reflection
  - Sims Computing lightweight XML messaging framework (based on JMS)
  - xmlBlaster Message Oriented Middleware project
    - MOM platform that uses XML for the message meta-data and quality of service information
    - Messages can be filtered using XPath expressions which match against the XML header document
  - Developing MOM applications using the SAX/DOM APIs
B2Bi: B2B commerce and Enterprise Application Integration (EAI)

- B2Bi is based on the transformation and routing of XML documents
- B2Bi patterns:
  - Direct Application Integration
  - Data Exchange
  - Closed Process Integration
  - Open Process Integration
- Existing Frameworks:
  - WebMethods B2Bi EAI framework
  - MQSI (MQSeries Integrator)
- See STP/T+1 in Sub-Topic 1/2 Presentation
**B2Bi Direct Application Integration**

**Requirements**

- Ability to interact directly with application APIs
- Integration brokers with built-in support for adapters, transformations, and asynchronous content-based routing
- Same Integration Broker on both ends
- Secure transport, component authentication, and user authorizations
- Federated security control

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**Data Exchange B2Bi**

**Architecture**
Data Exchange B2Bi

Requirements

- Translation of data native to an application into a common document format, and transmission via a gateway
- No constraints on the presence of Integration Brokers
- B2B transactions enabled via a common data exchange format

Closed Process Integration B2Bi

Architecture
Closed Process Integration B2Bi

Requirements

- Principal participant responsible for managing processes
- Other participants are secondary, and do not have visibility into the entire process
- Requires the introduction of business process integration (BPI) services
  - B2Bi product offerings are beginning to incorporate BPI as an essential component
  - In this case, B2Bi enables the integration of logical business process elements expressed as activities rather than data

Closed Process Integration B2Bi

Architecture
Closed Process Integration B2Bi

Requirements

- Introduces the notion of shared processes rather than operating from a centralized master process manager model
- Each participant is actively managing business processes within its domain
- The BPI layer must support fine-grained control of managed processes

EAI Frameworks and XML

- XML complements EAI technology
  - Powerful meta language
  - Simplicity
  - Separation of content and presentation format
  - Common open standard
- EAI Frameworks must address the limitations of XML
  - Limited Semantics Interpretation
  - Lack of data transformation facilities
  - Inefficiencies of text-based documents
  - Absence of component-based routing
EAI Provides Data Transformations

Efficiency: Binary Objects on the Wire
Content, Discovery, Universal access, and Intelligent Software Agents

- UDDI: Universal Description, Discovery, and Integration
  - Industry-wide effort to bring a common standard for business-to-business (B2B) integration
  - Set of standard interfaces for accessing a database of web services
  - See UDDI Browser at http://www.soapclient.com/uddisearch.html
  - jUDDI (pronounced "Judy") is an open source Java-based implementation of a UDDI registry
  - Also see
    - http://www.oasis-open.org/cover/uddi.html
    - http://www.itpapers.com/cgi/SubcatIT.pl?scid=436

- Intelligent Software Agents: ATLAS, Aglets, etc.
XML-Based e-Services Protocols and Architectures

- XML-RPC and Peer-to-Peer Computing
  - [http://xml.coverpages.org/xml-rpc.html](http://xml.coverpages.org/xml-rpc.html)
- Simple Object Application Protocol (SOAP)
  - [http://soap.develop.com/xmlrpc/](http://soap.develop.com/xmlrpc/)
- Universal Description, Discovery, and Integration (UDDI)
- Web Service Definition Language (WSDL)
  - [http://www.w3.org/TR/wsd1](http://www.w3.org/TR/wsd1)
- Pervasive devices
- Resource Description Framework (RDF)
  - Platform for Internet Content Selection (PICS)
  - Platform for Privacy Preferences (P3P)
  - Channel Definition Format (CDF)
  - Rich Site Summary (RSS)
  - Blocks Extensible Exchange Protocol (BXXP)

XML-Based e-Services Protocols and Architectures (continued)

- XML Protocol (XMLP): XML-Based Messaging Systems
  - Standardized application to application XML messaging (via HTTP, and MQSeries)
- XML and User Identification/Security
- XML and Databases
  - XML and JDBC
  - XML Extensions and Tools for Oracle, Informix, IBM DB2, and Microsoft SQL Server
- Transaction Authority Markup Language (XAML)
  - Coordinated processing of transaction-supporting web services between internal fulfillment services and external services
XML-Based e-Services Protocols and Architectures (continued)

- Sun’s Open Net Environment (ONE)
- HP’s NetAction/e-speak platform
- Oracle’s Dynamic Services platform
- Microsoft .NET platform
- IBM WebSphere Architecture (WSA) platform

Microsoft .NET Platform
Smart Devices + Windows XP + Web Services

- http://www.microsoft.com/net
- First set of Microsoft Web Services
Summary

- XML complements application server technology by conveying structured data in a portable way.
- XML complements EAI technology, but future EAI framework still need to address XML’s limitations.
- Web services platforms provide a shift from traditional enterprise distributed object computing technology to P2P computing with support for pervasive devices, discovery and intelligent agent capabilities.