

Chapter 14 - E-Business Coordination, Collaboration, and Integration



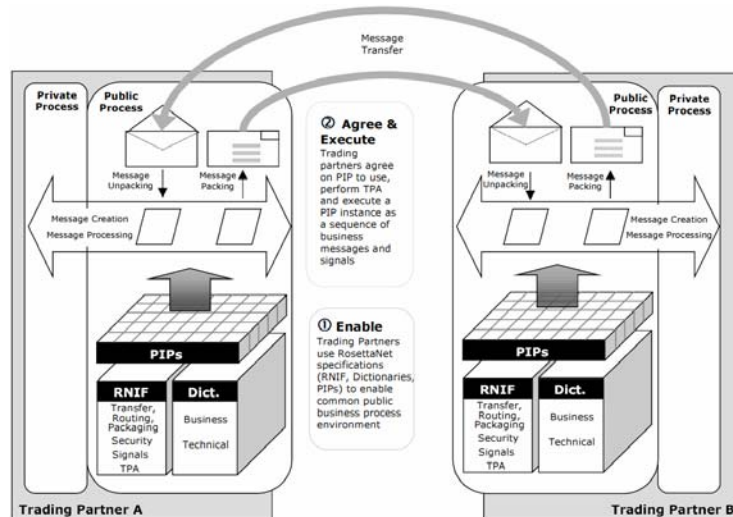
Middleware for Heterogenous and Distributed Information Systems - WS04/05

RosettaNet

- Goal: Develop standard e-commerce interfaces to align the processes between IT supply chain partners
 - consortium founded in 1998
 - "vertical" coordination protocols
 - more than 3000 documented production implementations by 2004
- Main standardization areas
 - (Public) Business processes
 - coordination protocols for trading partners
 - Partner Interface Processes (PIPs)
 - business documents, vocabulary, choreography of message exchanges
 - Data format
 - establishment of a common vocabulary
 - business directory
 - technical dictionary
 - Message services
 - RosettaNet Implementation Framework
 - reliable, secure execution of the protocol specifications
 - transfer, routing, packaging of encrypted and authenticated messages between business partners



RosettaNet Trading Partner Implementation



[source: RosettaNet Implementation Framework Core Specification]



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PIP Definitions

- Standardized PIP definitions are arranged into clusters, further broken down into segments
- Clusters:
 1. RosettaNet Support
 - administrative functionality
 2. Partner Product and Service Review
 - collect, maintain, distribute product or service information
 - account setup, product info subscription, ...
 3. Product Information
 - distribute, update product information
 - query technical product info, ...
 4. Order Management
 - request quote, request purchase order, query order status, ...
 5. Inventory Management
 - distribute inventory report, ...
 6. Marketing Information Management
 - exchange of marketing information
 7. Service and Support
 - request warranty claim, ...
 8. Manufacturing
 - "virtual manufacturing"
 - notify of manufacturing work order, ...



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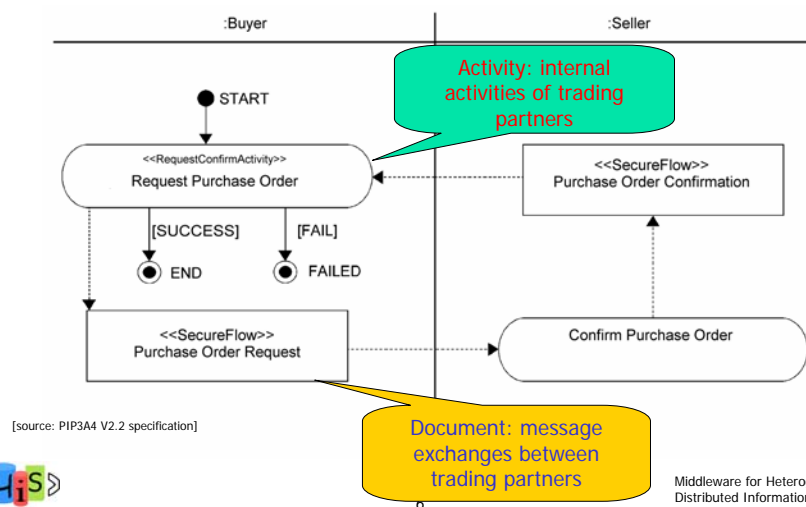
Partner Interface Process (PIP) Specifications

- Describes how to implement a collaborative coordination protocol
 - technical dictionary describes components that are exchanged
 - message guideline document
 - business actions, business signals (ack receipt of action message)
- Major PIP specification sections
 - Business Operational View (aka Action Layer)
 - flow of business interactions, based on
 - partner roles
 - partner role interactions
 - Functional Service View (aka Transaction Layer)
 - derived from the business operational view
 - business transactions between entities in the form of message exchanges
 - coordination protocols
 - message control information
 - time limits for acknowledgements
 - security requirements
 - Implementation Framework View (aka Service Layer)
 - based on functional service and business operational views
 - defines communication protocol and message format requirements
 - e.g., SSL, encryption, XML DTDs for messages, ...



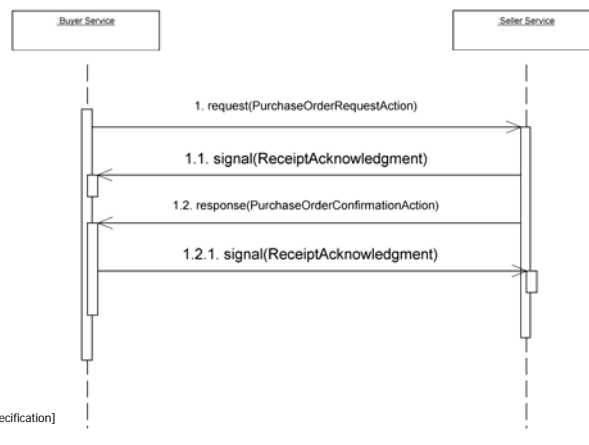
Business Operational View - Example

- Business Process Diagram for PIP3A4: Request Purchase Order



Functional Service View – Example

- Business Transaction Dialog Specification for PIP3A4: Request Purchase Order



[source: PIP3A4 V2.2 specification]



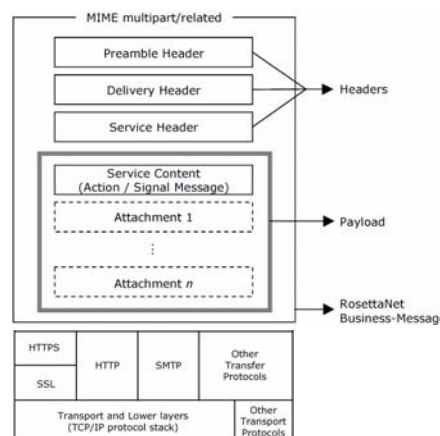
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RosettaNet Implementation Framework

- Defines
 - Business Message
 - packaging payload (incl. attachments), headers, ...
 - uses MIME, S/MIME
 - Protocol Stack
 - transport-independent
 - reliable messaging
 - support for HTTP, SMTP, ...
 - Security Mechanism
 - based on encryption, digital signatures
 - supports authentication, authorization, encryption, non-repudiation
- Designed before the time of SOAP
 - May likely be replaced by SOAP-based web service infrastructure in the future



[source: RosettaNet Implementation Framework Core Specification]



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BPEL – Abstract Processes

- Abstract Process = Role-specific view of a protocol
 - only public information
 - no private, implementation-specific aspects
 - branching conditions, activity realization, ...
 - not executable
 - can be used by a conversation controller to ensure protocol compliance (see chapter 5)
- Properties of BPEL abstract processes
 - handle only protocol-relevant data
 - message properties
 - variables
 - do not need to be fully initialized
 - variables for inbound or outbound messages may be omitted from invoke, receive, reply, if the intent is to just constrain the sequence of activities
 - opaque assignments
 - can correspond to creating a unique value for correlation properties
 - hide private behavior for providing the values



Implementing Business Protocols

- Suggested path
 - protocol specification as a starting point
 - derive role-specific views of the protocol
 - includes all the message exchanges that involve a certain role
 - define abstract process for role-specific view
 - model interactions using receive, invoke, reply
 - represent additional public information, such as branching situations, parallelism
 - turn abstract process into an executable process to implement it



Implementing RosettaNet PIPs

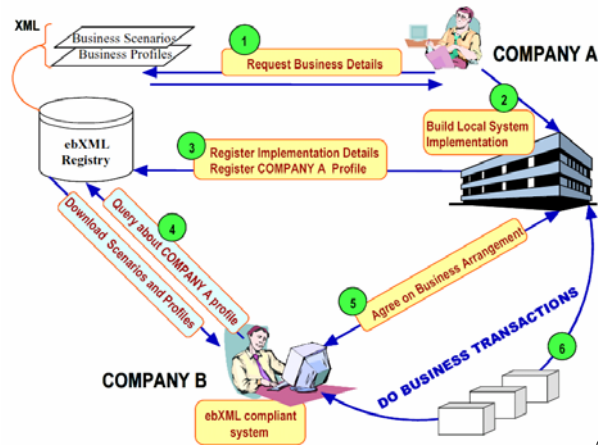
- Involves mapping PIP to WSDL, BPEL
 - types in message definitions -> types in WSDL
 - DTDs to XML Schema
 - message definitions -> WSDL message definitions
 - PIP actions -> operations in WSDL
 - PIP partner roles -> BPEL partners
 - PIP choreography: follow the "suggested path" on previous chart
- Additional aspects
 - realize time-outs, etc. using BPEL events and fault handlers
 - additional requirements regarding security need to be resolved
 - WS-Security support, not integrated in BPEL

ebXML

- Supported by UN/CEFACT, OASIS
- Vision
 - single global electronic marketplace
 - based on exchange of XML messages
- ebXML architecture covers:
 - definition of business processes and their associated messages and content
 - registry and discovery of business process sequences with related message exchanges
 - definition of company profiles
 - definition of trading partner agreements
 - uniform message transport layer
- ebXML advantages
 - goes beyond generic protocols and specifications
 - e.g., ebXML registry is much more detailed than UDDI
 - captures the logic behind e-commerce exchanges
 - e.g., business arrangements
 - specifies how e-commerce exchanges should be specified, documented, conducted

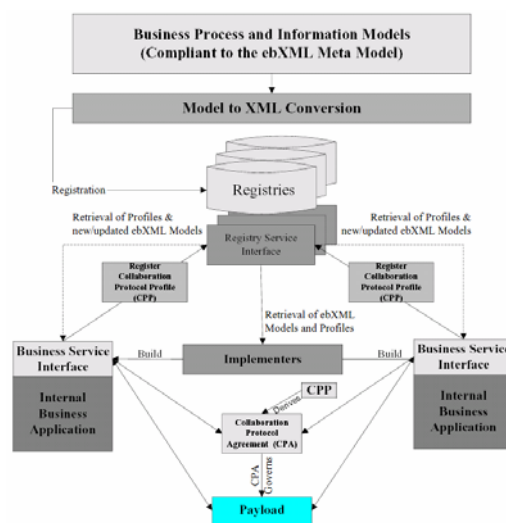
Collaboration with ebXML

■ Example



(source: ebXML Technical Architecture Specification)

Technical Architecture



(source: ebXML Technical Architecture Specification)

How Do These Standards Relate?

