Enterprise Application Integration using MQSeries and Web services

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Definitions

- A Forrester report defines EAI as the “integration of multiple, independently developed, managed and maintained applications that may normally use incompatible technologies and platforms”
- Enables transfer of information between applications
- Automates flow of data between applications that make up the business process flow
Application Integration at 3 levels

- Information is sent directly from one application to another
  - Logic and formatting of data is with the applications
- Intelligent routing and message transformation is done independently of the applications
- The business process is represented as a flow.
  - Applications don’t need to know the process
  - Human intervention is allowed

MQSeries

- Messaging system based on queues
- Applications can exchange messages asynchronously
- “once-only” message delivery is always assured
- Transactional messaging
- APIs on multiple platforms
MQSeries Architecture

MQSeries Queue Manager

Application “A”

MQSeries Queue

... 

Application “B”

MQSeries API

MQSeries API

MQSeries Integrator Builder

- Message transformation & routing
- Message flow
  - Visual representation of how a message is transformed while “traveling” between queues
  - Message processing nodes
  - Connections
  - Nested message flows
- Provided nodes include
  - Filtering, Decision, Transformation, Database...
  - Customers can implement plug-in nodes

IBM Software Group
MQSeries Integrator Builder Architecture

MQSeries Workflow

- Business process automation system
- Uses an event-driven model
- Manage people, data, applications throughout the organization

- Workflow
  - Activities
  - Connections (data, control)
  - Organization (staff, programs, resources)

- Easy to evolve!
MQSeries Workflow functions

- **Process definition**
  - Model the business processes graphically
  - Define staff, data structures, and topology

- **Control function**
  - Runtime navigates the flow
  - Notifies staff & writes audit trails
  - Invokes attached applications

- **Interfaces**
  - Enable users to perform actions

MQSeries WorkFlow Architecture
Example

- Opening a bank account
  - Collect customer info
  - Check credit history
  - Get approvals
  - Provide a debit card
  - Print and mail cheques
Web Services and Business Process Management

- Web services are suitable for business process integration within and across enterprises
- Standards
  - Business Process Execution Language (BPEL)
    - IBM, Microsoft, BEA
  - Web Service Choreography Interface (WSCI)
    - Sun, SAP, BEA
Web Services

- Standard components
  - Well defined interfaces and message formats

- XML (Extensible Markup Language)
- SOAP (Simple Object Access Protocol)
- WSDL (Web Services Description Language)
- UDDI (Universal Description, Discovery, and Integration)

Service Oriented Architecture

- Requestor - Provider
  - WSDL to describe the service
  - SOAP to exchange info over the internet

- Directory
  - UDDI based
  - Taxonomies of services
  - Search capabilities
Simple scenario

Figure 2  Looking for business partners

Figure 3  Order really matters!

Web Services with flows

Figure 7  Flow models and Web services
Challenges

- Need for a runtime
  - Open standard for defining the business process
  - Multiple runtime implementations that conform to the standard

- Tools
  - Management
  - Execution monitor
  - Problem determination

- Public vs. Private processes
Thoughts on the flow runtime design

- J2EE platform
  - Transactions
  - Persistence
  - Queuing systems (JMS)
  - Message formats (XML)
  - Programming languages (Java, scripts?, C)
  - Scalability

- Open source runtime coming soon?