“A Hybrid Architecture for Enabling Electronic Transactions Among Enterprises and Governmental Bodies”

Workshop on "Enterprise Software Application Interoperability for Businesses and Governments"

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Introduction

Constantly growing number of e-transaction infrastructure adopters

Expected potential business value
- Reaching wider market
- Saving time, costs
- …

today’s discussion is about “How to implement the transactional infrastructure to achieve the biggest possible benefits”

Several constraints imposed by possible architectures
- Peer-to-Peer (P2P) and Server-based
- Adoption of standards
Agenda

• Brief state of the art review

• Evaluation of P2P and Server-based architectures

• A hybrid of P2P and Server-based architecture

• Implementation roadmap towards a real life platform
State of the art review

1st Point-to-point solutions
- Mainframe architectures
- Proprietary standards

Harmonization approaches
- UN/EDIFACT
- Still point-to-point
- Messages only

Client-server paradigm, XML
- E-Business frameworks
- EAI Infrastructures
- RosettaNet

SotA e-Business technologies
- UN/CEFACT e-Business stack
- Different commercial e-Business platforms
- ebXML framework
# Evaluation of pure P2P and server-based approaches

<table>
<thead>
<tr>
<th>Pure server-based advantages</th>
<th>Pure P2P advantages</th>
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<tbody>
<tr>
<td>Single point of complexity</td>
<td>synchronous msg. exchange</td>
</tr>
<tr>
<td>Central set-up and control of bus. Relationship</td>
<td>Autonomously negotiation/establishment of business relations</td>
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<tr>
<td>maturity</td>
<td>Democratic user participation, censorship resistance</td>
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<table>
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<tr>
<th>disadvantages</th>
<th>disadvantages</th>
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<tr>
<td>Possible high workload</td>
<td>Sophisticated technology</td>
</tr>
<tr>
<td>Single point of failure</td>
<td>Distributed complexity</td>
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<tr>
<td>Limited scalability</td>
<td>immaturity</td>
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A hybrid architecture for e-Transactions

Server
- Partner Lookup
- Document Transformation Schemas
- Transaction Workflow Definition
- Rules Matching

Repository
- Data Components
- Process Models
- Rules

Adapter

Process Choreography
Document / Message Exchange

Data Schemas
Workflow
Rules

Hybrid Components
Information flow among the architectural components

BPMN Process Models

Creation of BPEL Code

Implementation of Service Workflows by the Adapters’ BPEL Execution Engines
# Functionalities of main architectural components

<table>
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<tr>
<th>Implementation roadmap</th>
<th>Repository</th>
<th>Server</th>
<th>Adapter</th>
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</table>
| **Stage 1**            | • static process models  
 • generic document models | • provides BPEL code  
 • based on static models | • implements BPEL engine  
 • incorporates business and transformation logic |
| **Stage 2**            | • static process models  
 • generic document models  
 • business information entities | • provides BPEL code  
 based on static models  
 • provides mapping for business documents | • implements BPEL engine  
 • implements business logic  
 • Implements transformation engine |
| **Stage 3**            | • business and legal rules  
 • dynamically customized models for each partner  
 • business information entities | • provides customized BPEL code  
 • provides mapping for business documents | • implements BPEL engine  
 • implements transformation engine |
Conclusion and summary

• Incorporation of both P2P and server-based approaches:
  – Effective support of e-transactions
  – To be easily implemented by SME

• GENESIS project test-bed
  – Implementation and real-life application
  – Following the proposed implementation roadmap
Thanks for your attention!

Questions?