Workflows und Web Services

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Types of E-Business

FACHBEREICH INFORMATIK

Business To Consumer (B2C)	**Business To Business (B2B)**	**Intra Business**
• Relation between enterprise and customers • Sales-related aspects are predominant, like product presentation, advertising, service advisory, shopping	• Relation between processes of different enterprises • Predominant are relation to suppliers, and customer relations to other enterprises like industrial consumers, retailers, Banks	• Electronic organization of internal business processes, like realization within workflow systems

B2B - Current Situation

- Traditional B2B has focused on well-defined, standard message formats and protocols (e.g., RosettaNet, cXML)
  - Ad hoc B2B occurs today via XML over HTTP
- How to publish business functions to customers, partners and suppliers?
  - E.g. access to reservation systems, quote systems
  - Programmatic access to a service, independent of underlying implementation and client software
- Technologies such as Corba, DCOM, EJBs, etc. barely present in this context

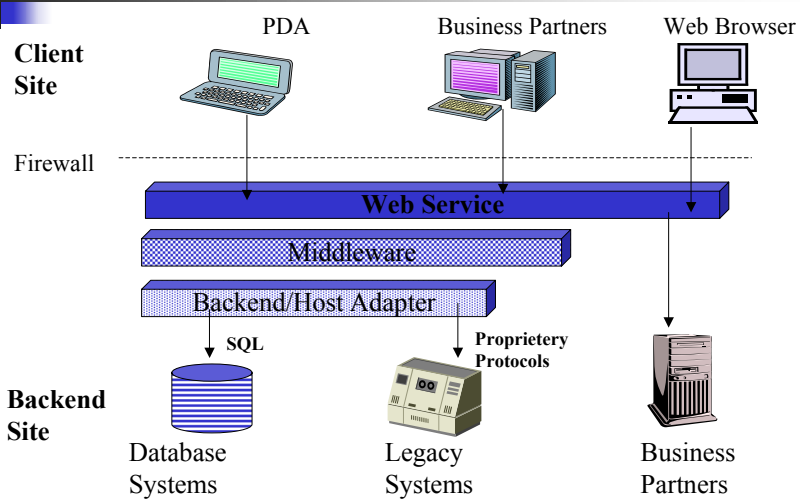
Web Services

- New distributed computing platform built on existing infrastructure including XML & HTTP
  - Web services are for B2B what browsers are for B2C
- Self-contained, self describing, modular service that can be published, located and invoked across the web
  - Refer to open standards and specifications:
    - component model (WSDL)
    - inter-component model communication (SOAP)
    - discovery (UDDI)
  - Platform- and implementation-independent access
  - Described, searches, and executed based on XML
  - E.g. credit card validation, airline schedules, rental car.
- Enable component-oriented applications
  - Loose coupling from client to service
  - Enable to integrate legacy systems into the web
  - Useful for other distributed computing frameworks such as Corba, DCOM, EJBs

Web Services: Examples

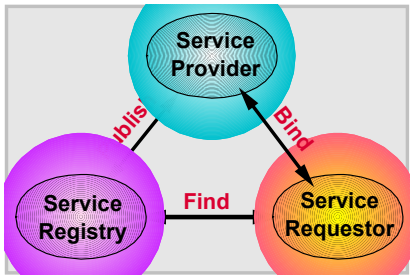
- Stock information
  - Current stock value of a particular stock within a protofolio application
- Proof reading
  - Proof reading for a certain document
- Order service
  - Automatic order for a given product ID and quantity
- Travel planning and organization
  - Services tor car rental, flight reservation, and hotel booking

Web Service System Architecture

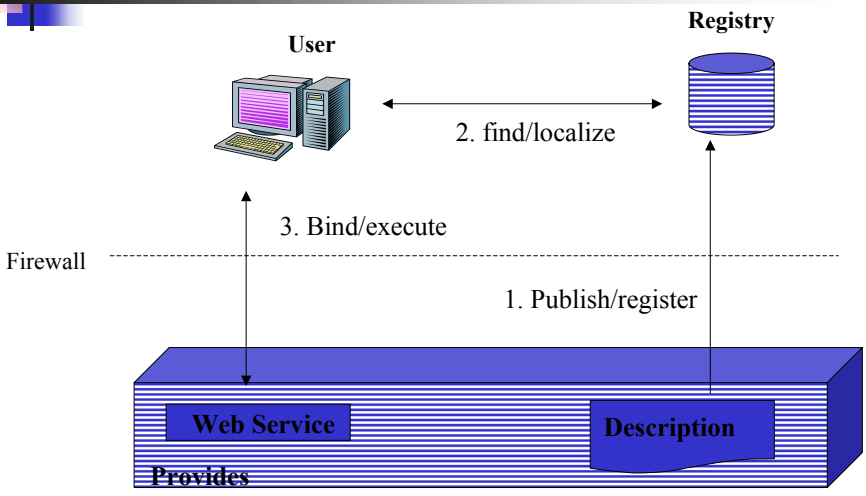


Service-Oriented Architecture (SOA)

- Service Requestor
  - Finds required services via Service Broker
  - Binds to services via Service Provider
- Service Provider
  - Provides e-business services
  - Publishes availability of these services through a registry
- Service Registry
  - Provides support for publishing and locating services
  - Like telephone yellow pages



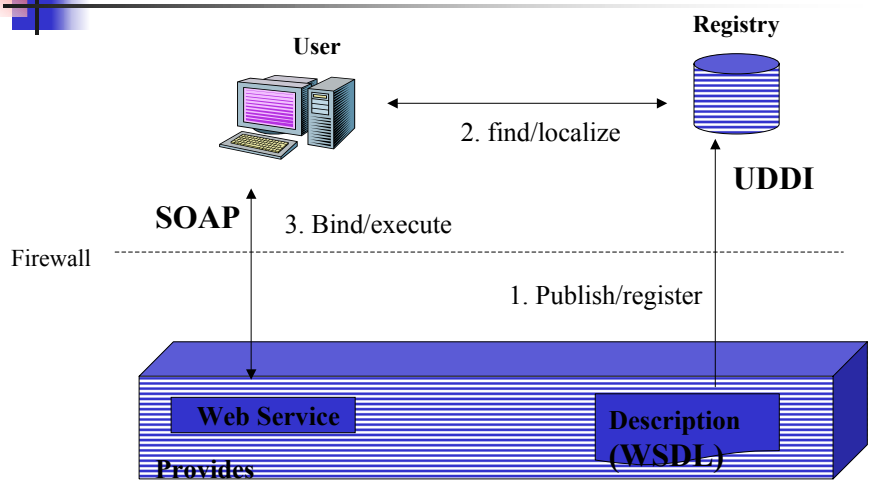
Web Service Model



Standards

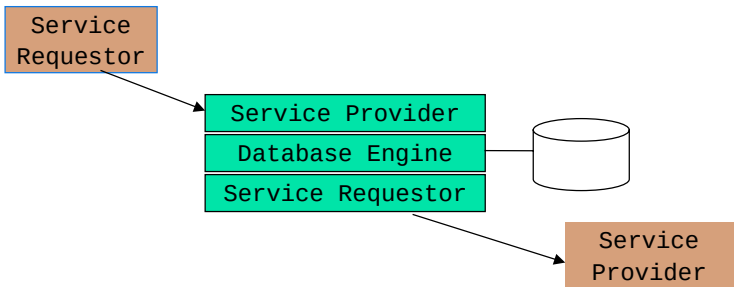
- UDDI
  - Universal Description, Discovery and Integration
  - Registry of and search for web services
  - Predefined schemas
- SOAP
  - Simple Object Access Protocol
  - Communication protocol
- WSDL
  - Web Services Description Language
  - Description of a service's functionality
- XML
  - eXtensible Markup Language
  - Underlying basic representation approach

Web Service Model (cont.)



Databases and Web Services

- Information Integration and dissemination
- Database as web service requestor
  - Invoking web services on my data
- Database as web service provider
  - Offering my data as service (making it easy)

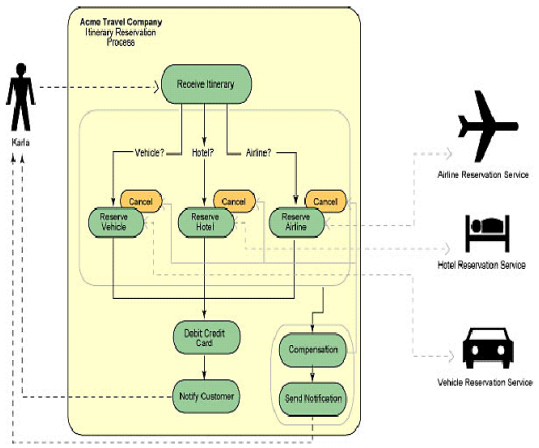


Web Services Today

- Web services are becoming real, real fast!
  - Intranet usage is much wider than Internet usage
  - See http://www.xmethods.net for sample Internet services
- Recent extensions or work in progress
  - Web Services Security
  - XML Digital Signature
  - XML Encryption
  - Authentication
  - Transaction management
- Workflows/Business Process Modeling
  - Orchestration of web services
  - Vital for B2B integration
  - Recent specifications proposed by Microsoft, IBM, BEA

Web Services & Business Processes

- Business process making use of web services
- Business process externalized as a web service
- Long-running transactions
- Compensation
- Correlation
- Dynamic Binding of business partners and web services



Course Outline (Draft)

1. Motivation
2. XML Basics for Web Services
   - Core
   - Namespaces
   - DTD, XML Schema
   - DOM, XSLT
3. Web Services Foundations
   - Service Oriented Architecture
   - Invocation (SOAP, …)
   - Description (WSDL, …)
   - Discovery (UDDI, …)
4. Web Services Advanced Topics
   - Security
   - Variations on invocation, description, discovery
   - Data Access
   - Interoperability

Course Outline (2)

5. Web Services Support in Middleware Platforms
   - J2EE
   - .NET
6. Business Processes
   - Workflow introduction
   - Business engineering
   - Workflow Management Basics
   - Components and Business Processes
7. Web Services & Business Processes
   - Web Services Composition
   - Stateful Web Services
   - Transactions

Books

- Cerami, Ethan
  Web Services Essentials
  O'Reilly, 2002
- Graham, Steve et.al
  Building Web Services with Java
  Sams Publishing, 2002
- Leymann, Frank; Roller, Dieter
  Production Workflow – Concepts and Techniques
  Prentice Hall, 2000
- Newcomer, Eric
  Understanding Web Services
  Addison Wesley Professional, 2002

Additional References will be given for each chapter