ServiceGlobe: Distributing E-Services Across the Internet

Markus Keidl, Stefan Seltzsam, Konrad Stocker, and Alfons Kemper

Universität Passau
Fakultät für Mathematik und Informatik
94030 Passau
<last name>@db.fmi.uni-passau.de
What is ServiceGlobe?

- Platform for mobile e-services/Web services
- Implemented in Java Release 2
- Based on standards (XML, SOAP, UDDI,...)
- Features:
  - Services are mobile code
  - Dynamic deployment of services
  - Supports development of flexible and reliable services
  - Security system
  - Transaction system
Basic Components of ServiceGlobe

- **Service Host**: standard Internet server additionally running the ServiceGlobe runtime engine
- **Code Repository**: storage for executables of services which are loaded on demand
- **Adaptor**: service used to integrate existing services or applications into ServiceGlobe
- **Simple Service**: service not using any other service
- **Composite Service**: higher value service assembled from other services (called basis services)
- **UDDI Server**: used to store metadata about services
- **External/Internal Service**: Service not provided/provided by ServiceGlobe itself
Demonstrated Features

- Dynamic Service Selection
  - Runtime selection of services using UDDI’s notion of a tModel → ‘calling tModels’ instead of ‘calling services’
  - Several modes: one/some/all
  - Modes are customizable using constraints
  - Flexible and reliable service execution

- Runtime Service Loading
  - Dynamic distribution of services to service hosts at runtime
  - Runtime security system to deal with security issues of mobile code
  - Enables load balancing and parallelization
  - Flexible and reliable service execution
The E-Procurement Scenario

- Usage of a restricted tire dealer scenario to ease the understanding of the demonstration
- Task: purchase tires and employ a forwarding agency for delivery
- Details:
  - Invite offers from available tire dealers
  - Invite offers for the delivery of tires
  - Calculate cheapest combined offer
  - Place purchase orders
- Task is split into two services:
  - tire purchasing service
  - negotiator service
  - pushing negotiator services to service hosts close to tire dealers
  - all negotiator services are executed in parallel
Graphical Representation of the Services

**Tire Purchasing Service:**
- get bindings of tire dealers
- ask for service hosts near tire dealer (manual optimization)
- execute negotiator on service host
- wait for results
- conclude contracts with participants

**Negotiator Service:**
- get offer from tire dealer
- fork (forwarding agency bindings)
- wait for results
- determine cheapest offers
- calculate total costs

get bindings of forwarding agencies near tire dealer
get offer from forwarding agency
Graphical Representation of the E-Procurement Scenario