Semantic Mediation between Business Partners –
A SWS-Challenge Solution using DIANE Service Descriptions

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Agenda

- Introduction to DIANE project approach
- Introduction to SWS-Challenge Mediation Scenario
- Solution to Mediation Scenario Version 1
  - Architecture
  - Data mediation
- Changes to switch to Mediation Scenario Version 2
- Discussion
What is DIANE and DSD?

- **DIANE project**: complete efficient automation of discovery and invocation

- **Basic Services**:
  - atomic, state-less black boxes
  - two-phase choreography
    (n stateless estimation steps, 1 execution step)

- **DSD language**:
  - lightweight **ontology language** (object oriented)
  - **special constructs** to describe services
  - Keep **efficient matching** in mind
Motivation: Dynamic Service Binding

BPEL based order management process:

- ReceiveOrderFromCustomer
- PrepareMessages
- PrepareOrderShipmentsMessage
- CallShipmentsService
- ProcessResults...
- Flow

Semantic request descriptions
- external Shipment provider
- Semantic Middleware
- (statically bound)
- indirect dynamic binding
- dynamic discovery and binding

Semantic offer descriptions
- discovered and bound)

Semantic matchmaking
SWS-Challenge Mediation Scenario (V1)

Buyer Service (Blue)

request (PurchaseOrderRequestAction)

signal (ReceiptAcknowledgment)

response (PurchaseOrderConfirmationAction)

signal (ReceiptAcknowledgment)

Seller Service (Moon Mediator)

Web Service implemented by organizers
http://www.sws-challenge.org/moon/services/RNetService?wsdl

Web Service – must be implemented by participants
SWS-Challenge Mediation Scenario (V1)

- Web Service implemented by organizers
  http://www.sws-challenge.org/moon/services/CRMService?WSDL

- Web Service implemented by organizers
  http://www.sws-challenge.org/moon/services/OMService?WSDL

- Web Service – must be implemented by participants and registered with a system
  (http://YOUR_HOST:4444/services/PRResponse?WSDL)
Moon's Business Logic! What's the advertised functionality?
Excerpt from Moon's offer description

```
upper
MoonServiceOffer : Service
  presents
  upper.profile
    : ServiceProfile
      effect
        Owned
          entity
            IN,x1, OUT,x1
              ItemSet
                belongsTo
                  Order
                    shipTo
                      Address
                        contact
                          Customer
                            businessName
                              String
```

Item
```
Mediation Scenario 1 - Architecture

Blue

DIANE

Moon

RosettaNet System(s)

Rosetta - DSD Translator

DSD Service Request

DIANE Middleware

Request Agent

Matcher Agent

Offer Repository

Execution Agent

SOAP Handler

XMLDSD Converter

DSD Service Description

WSDL Grounding

DSD Service

BPEL-Process

Moon CRM System

Moon OM System

DIANE
Indirect Data Mediation

Blue

RosettaNet Schema

mapping coded in Rosetta-DSD Translator

DIANE Ontologies

DIANE

used internally by semantic middleware

DIANE Ontologies

Moon

Moon Schema / BPEL Wrapper Schema

declarative mapping rules in Offer Grounding

DIANE Ontologies
Changes between V1 and V2

- Data format of RosettaNet changed: new optional ship-to address on item level
  - intended to split order according to ship-to address
  - most properly modeled as different orders
  - change performed in Rosetta-DSD translator

- New Moon Production Scheduling System (opaque to requester)
  - change in Moon's business logic
  - implemented in BPEL wrapper

- Very easy to implement, not very semantic though
- Maintained decoupling!
Modeling of services easy, but handwritten BPEL wrapper needed to expose simple interface

- General question:
  - Granularity to expose services?
  - Stateless or statefull services?

- Rosetta-DSD Translator mainly handwritten (but need to write mappings anyway)

- Decoupled mediation quite a bit of effort
  - approach not efficient for two systems
  - only advantageous if more partners cooperate
Advantage of Decoupled Mediation

Turquoise (WhateverNet)

DIANE Service Request

Blue (RosettaNet)

DIANE Service Request

Green (SomeotherNet)

DIANE Service Offer

Moon

DIANE Service Offer
Advantage of Decoupled Mediation
Thank you for your attendance!

Questions?

Ulrich Küster
DIANE project (services in ad hoc networks)
http://hnsp.inf-bb.uni-jena.de/DIANE/