



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



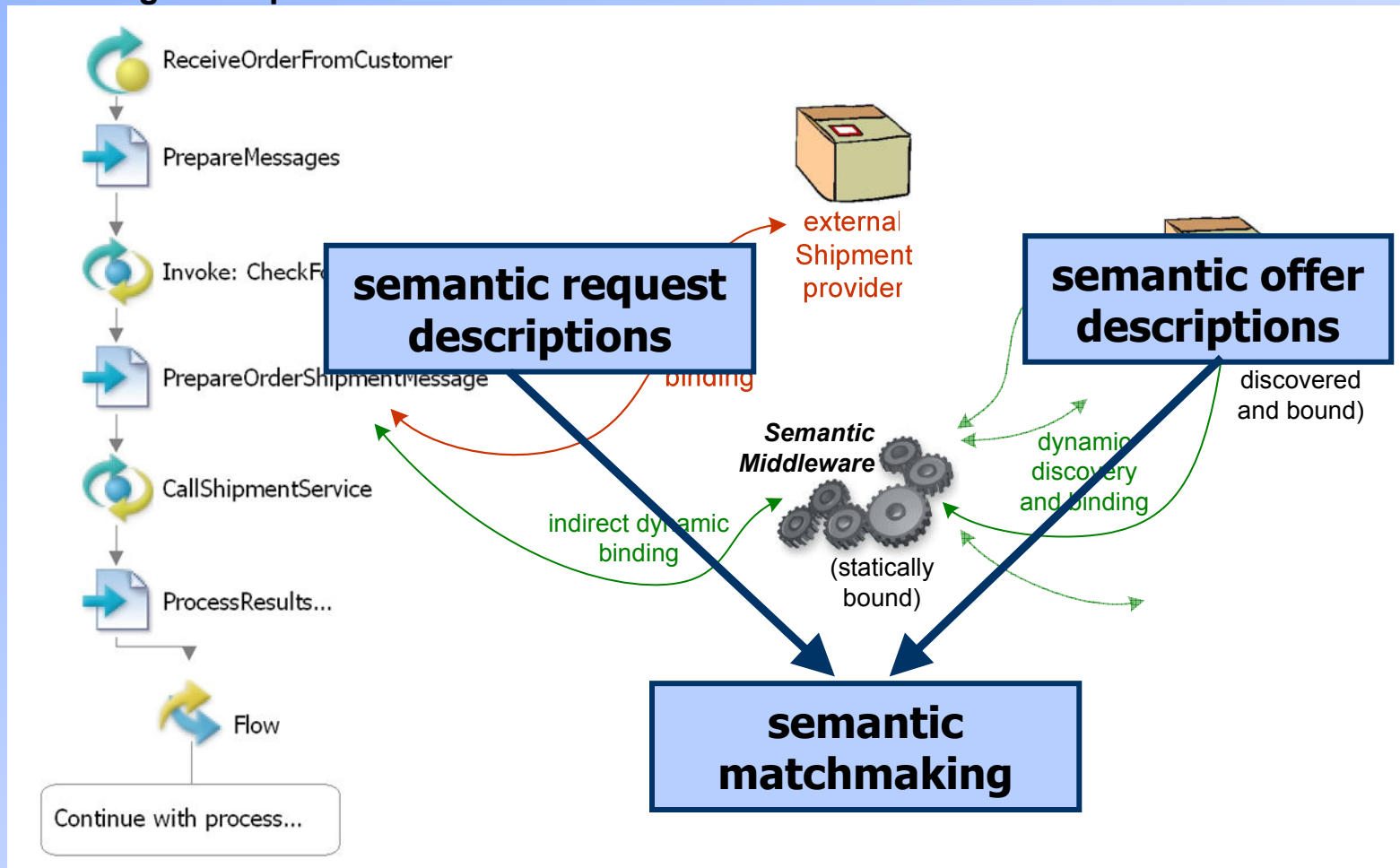
What is DIANE and DSD?

- **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



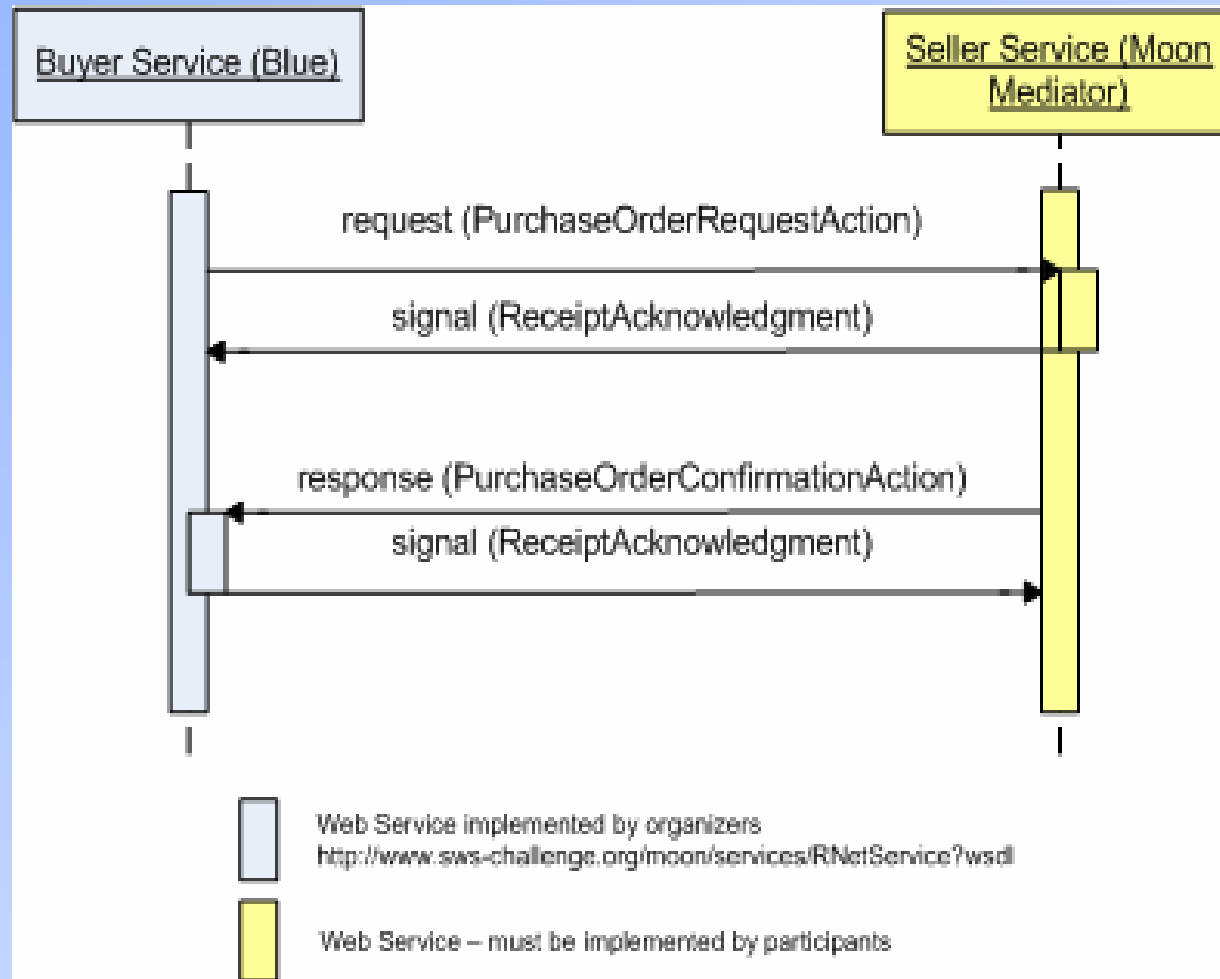
Motivation: Dynamic Service Binding

BPEL based order management process:



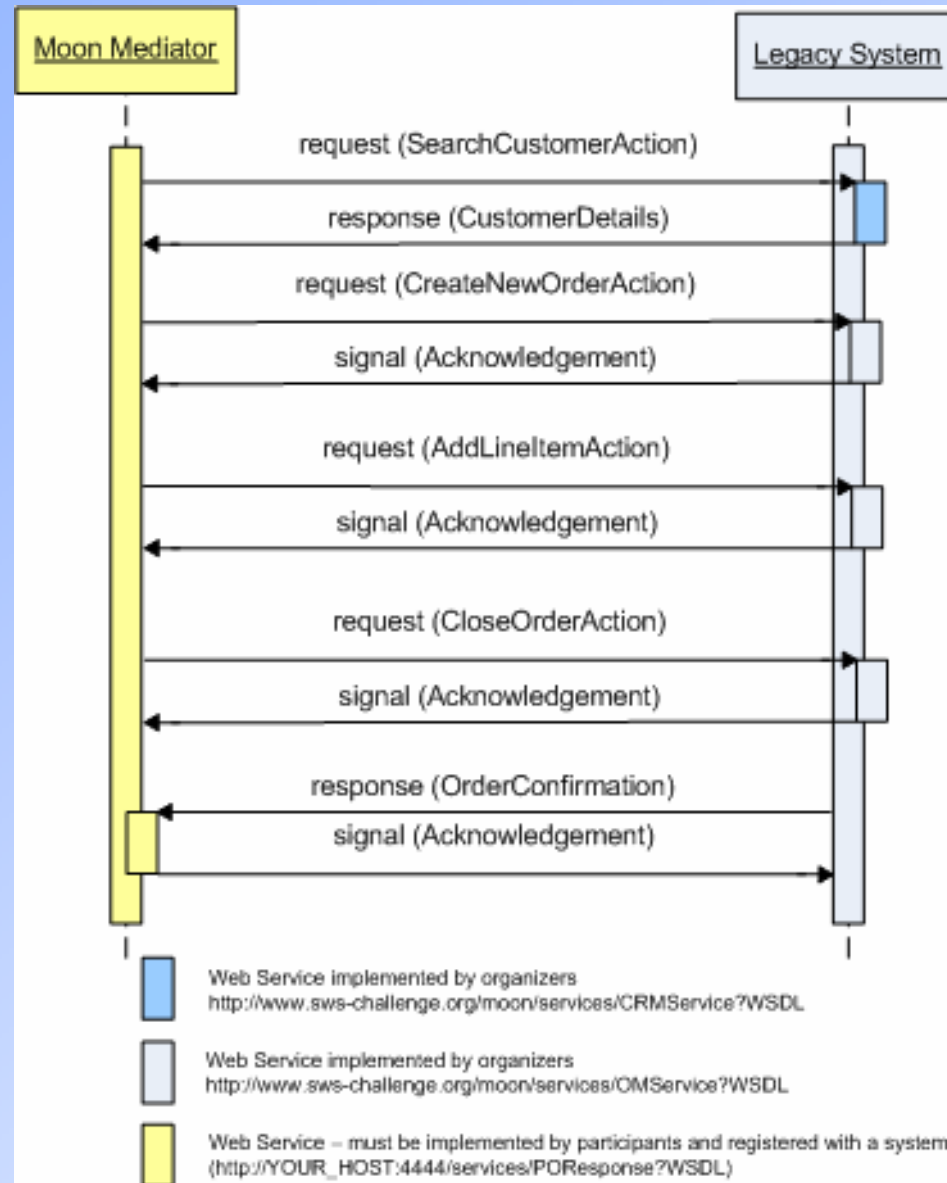


SWS-Challenge Mediation Scenario (V1)



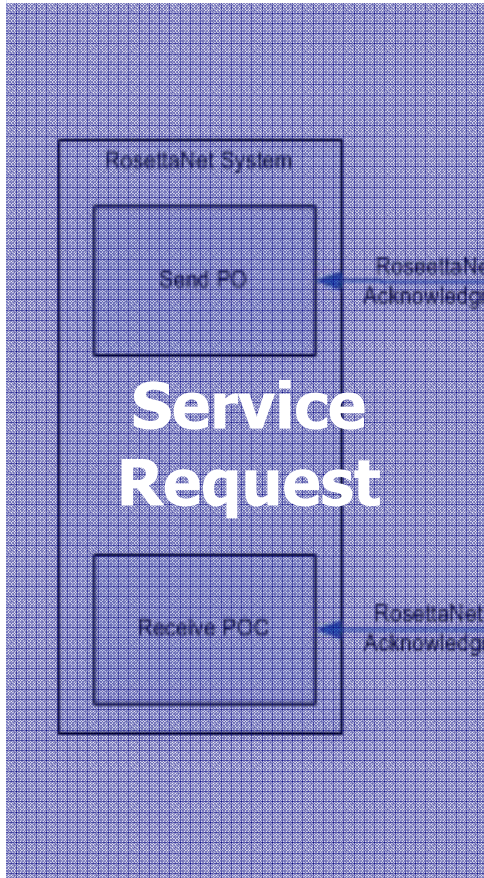


SWS-Challenge Mediation Scenario (V1)



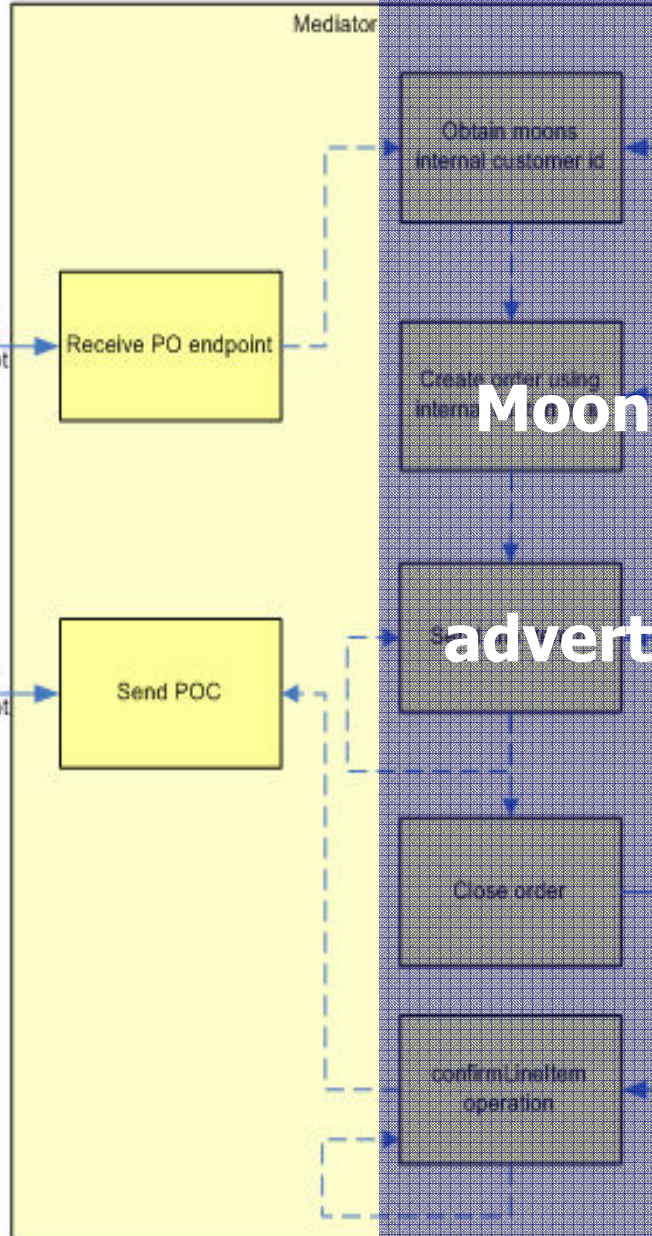
Blue (Customer)

Web Services
(provided by workshop organizers)

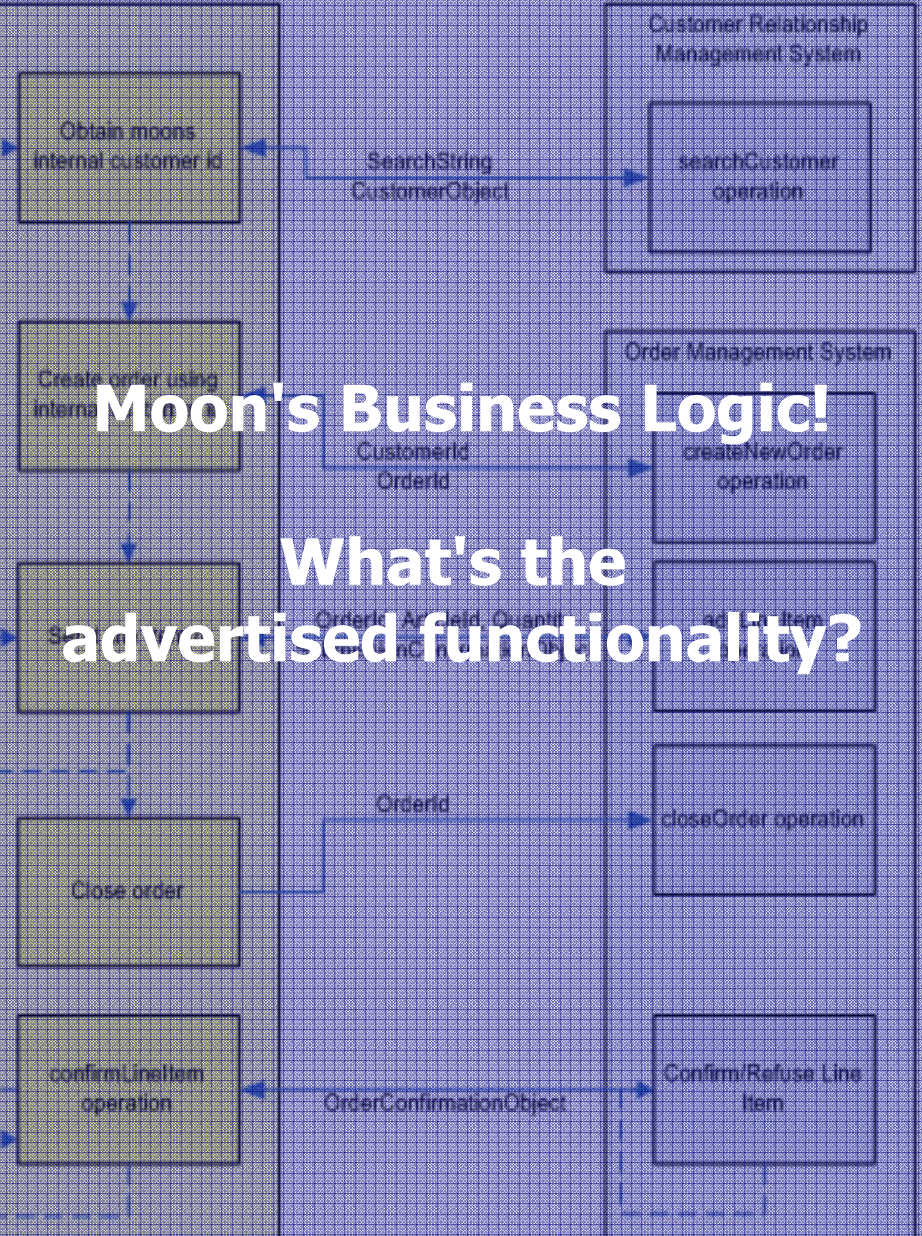


Moon (Manufacturer)

Mediator
(to be built by participants)



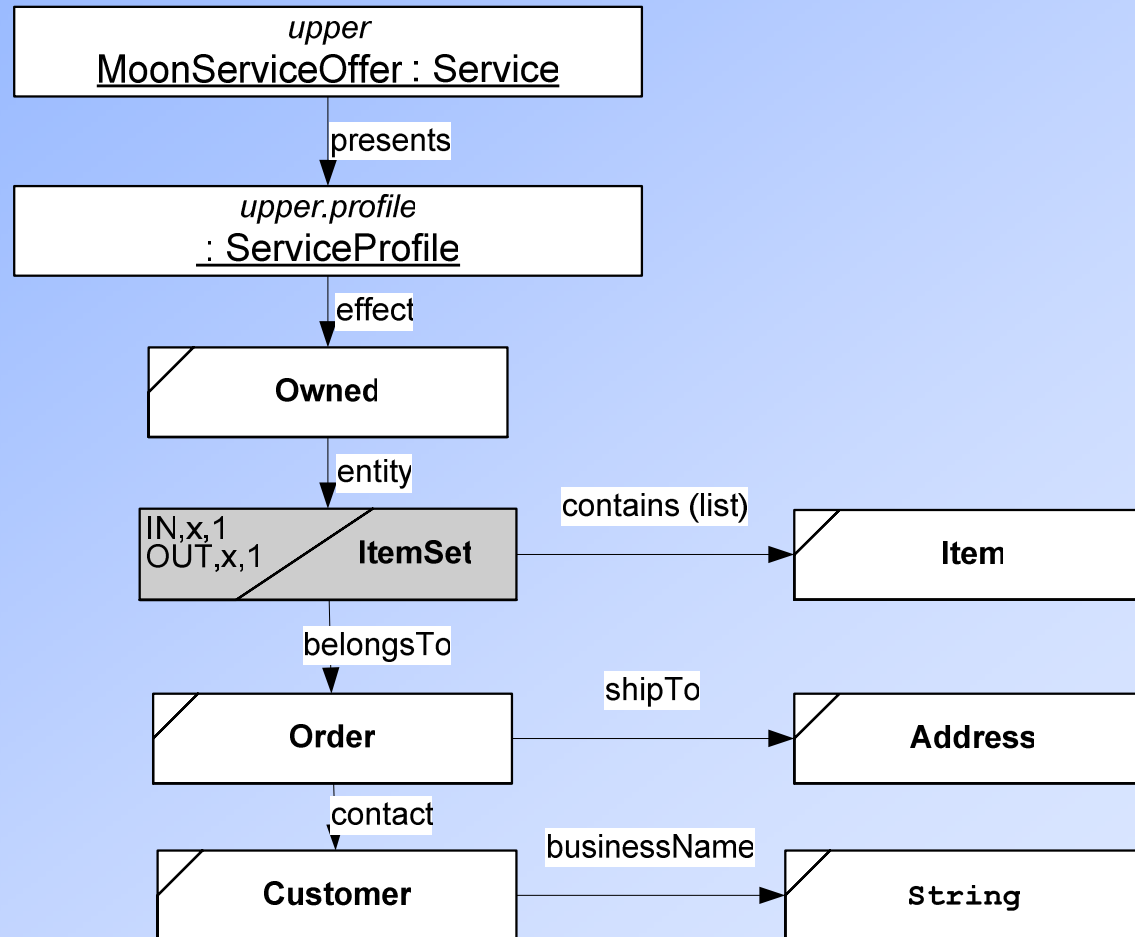
Legacy System Web Services
(provided by workshop organizers)



Moon's Business Logic!
What's the advertised functionality?

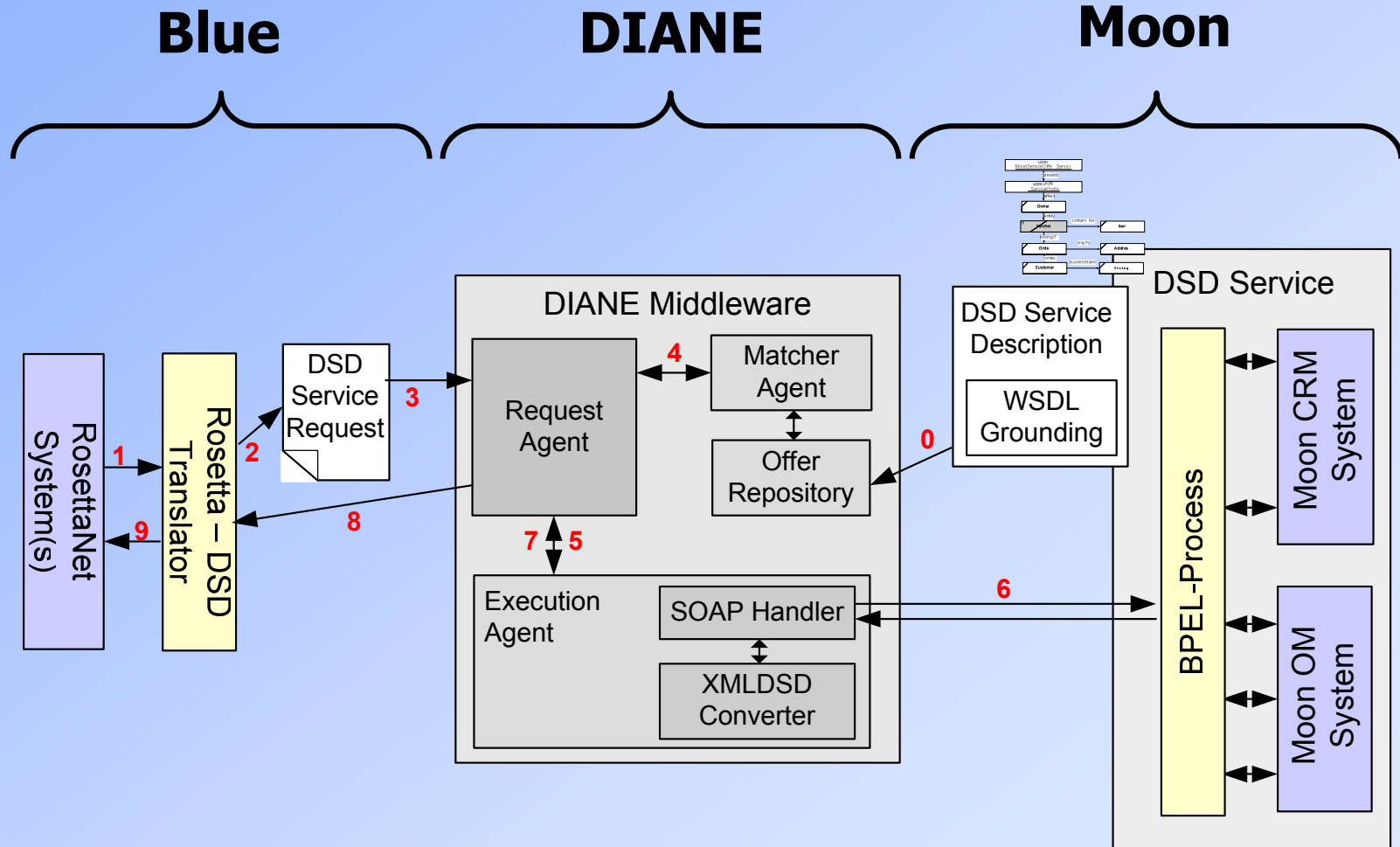


Excerpt from Moon's offer description





Mediation Scenario 1 - Architecture





Indirect Data Mediation

Blue

DIANE

Moon

RosettaNet Schema

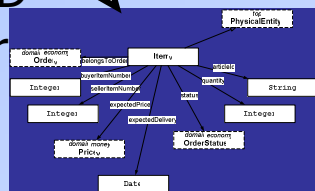
```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE OpenTrk [
  <ELEMENT EN "opentrack" />
  <ELEMENT NET1 />
  <ELEMENT NET2 />
  <ELEMENT NET3 />
] >
<OpenTrk>
  <configuration>
    <consoleConfig headline="Sample Output" interval="10"/>
  </configuration>
  <CON1COND (TRANSNET) (CON1COND) (CON1COND) (CON1COND)
  <EventTransform DEF="OTnode_1" id="1" comment="Test Source 1" >
    <NetworkLink DEF="OTnode_1" id="1" >
      <CON2 (SEKLINK)
        <TRANSFORM DEF="OTnode_2" id="2" comment="Test Source 2" >
          <CON3 (CONNET)
            <sink ->
              <CON4 (CON2) (CON4) (CON4)
            </sink ->
            <EventTransform DEF="OTnode_2" id="2" comment="Source 2" >
              <CON5 (CONCOND) DEF="OTnode_4" id="4" comment="1 1" >
                <Ref USE="OTnode_5"
                  <Event7 (CONCOND)
                    <NetworkLink DEF="OTnode_5"
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                    </NetworkLink>
                  </Ref>
                </Event7>
              </EventTransform>
            </CON5>
          </CON4>
        </CON3>
      </CON2>
    </EventTransform>
  </CON1COND>
</OpenTrk>
```

Moon Schema /
BPEL Wrapper Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE OpenTrk [
  <ELEMENT EN "opentrack" />
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  <ELEMENT NET2 />
  <ELEMENT NET3 />
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          </CON4>
        </CON3>
      </CON2>
    </EventTransform>
  </CON1COND>
</OpenTrk>
```

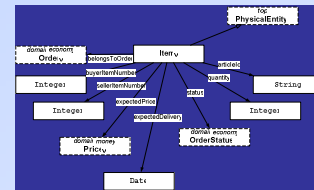
used internally
by semantic middleware

mapping
coded in
Rosetta-DSD
Translator



DIANE Ontologies

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!



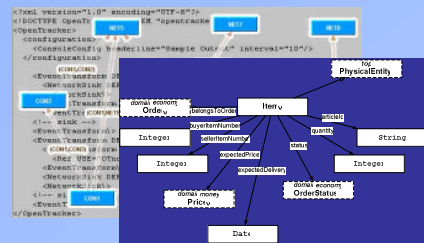
Discussion

- 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



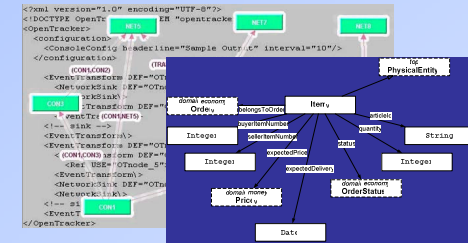
Advantage of Decoupled Mediation

Turquoise (WhateverNet)



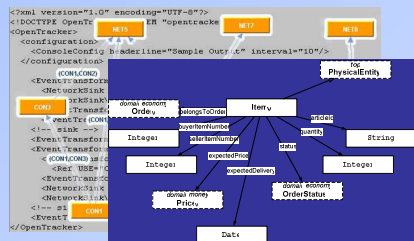
DIANE Service Request

Green (SomeotherNet)



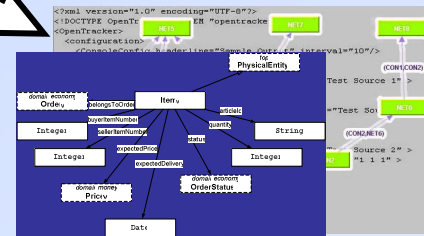
DIANE Service Offer

Blue (RosettaNet)

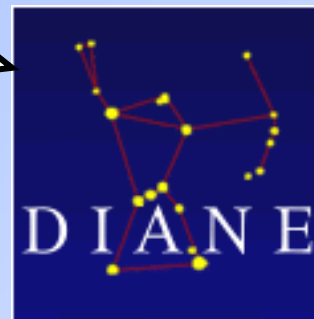


DIANE Service Request

Moon



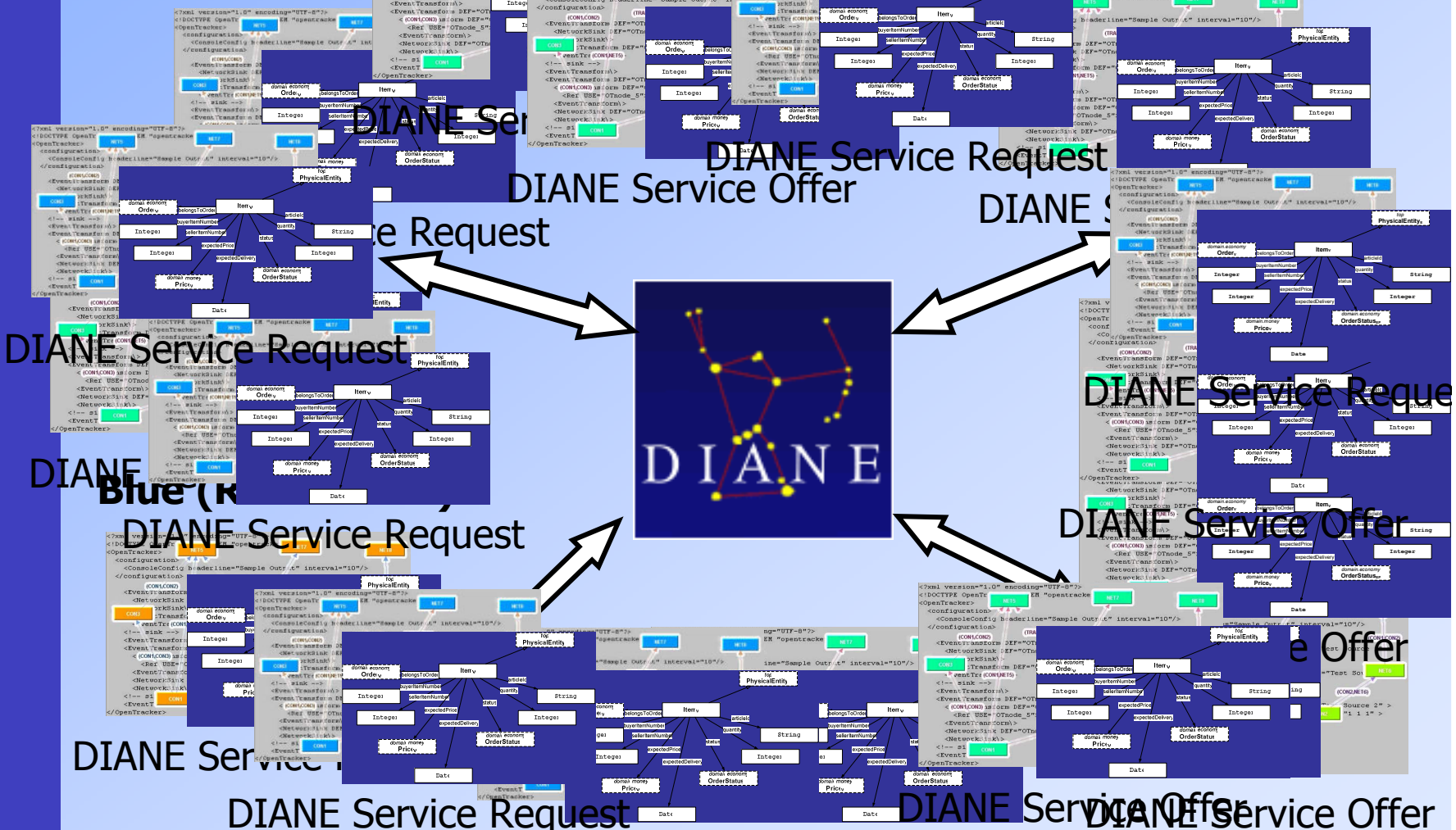
DIANE Service Offer





Advantage of Decoupled Mediation

Turquoise (W) **DIANE Service Request** **DIANE Service Offer** **DIANE Service Request** **DIANE Service Offer** **DIANE Service Request** **DIANE Service Offer** **DIANE Service Request** **DIANE Service Offer**





Thank you for your attendance!

Questions?

Ulrich Küster

DIANE project (services in ad hoc networks)

<http://hnsf.inf-bb.uni-jena.de/DIANE/>