Web Services

Introduction

Lecture "XML in Communication Systems"
Chapter 11

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Recommended Reading

- Booth, D. et al.:
  Web Services Architecture
  http://www.w3.org/TR/ws-arch/

- Christensen, E., Curbera, F., Meredith, G., Weerawarana, S.:
  Web Services Description Language (WSDL) 1.1
  http://www.w3.org/TR/wsdl

- Booth, D., Liu, C.K.:
  Web Services Description Language (WSDL) Version 2.0 Part 0: Primer
  http://www.w3.org/TR/wsdl20-primer

- Ballinger, K., Ehnebuske, D., Gudgin, M., Nottingham, M., Yendluri, P.:
  Web Services Interoperability Organization Basic Profile Version 1.0
  http://www.ws-i.org/Profiles/BasicProfile-1.0.html

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Introduction

- Terminology
  - Intranet:
    - operated by a single organisation,
    - applies Internet technolgies (TCP/IP, SMTP, http, …),
    - possibly consists of several interrelated local area networks,
    - → provides information services for business processes

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Introduction

- Terminology (cont'd.)
  - Extranet:
    - enables sharing part of an organization's business processes with suppliers, vendors, partners, customers, etc.
    - extends company's intranet to users outside the company,
    - provides services offered by one company to a group of other companies.

    → "loose coupling"

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Introduction

- Distributed Object Infrastructures
  - Distributed object infrastructure
    = component technology + wire protocol
  - Current distributed object infrastructures:
    COM/DCOM, Java RMI/JRMP, CORBA/GIOP
  - Disadvantages of proprietary distributed object infrastructures
    - Lack of interoperability: Vendor- and/or platform specific
    - Administrative costs:
      Custom runtime environment, configuring firewalls

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Introduction

- Web Service definition

> A Web service is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL).
>
> Other systems interact with the Web service in a manner prescribed by its description using SOAP messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards.

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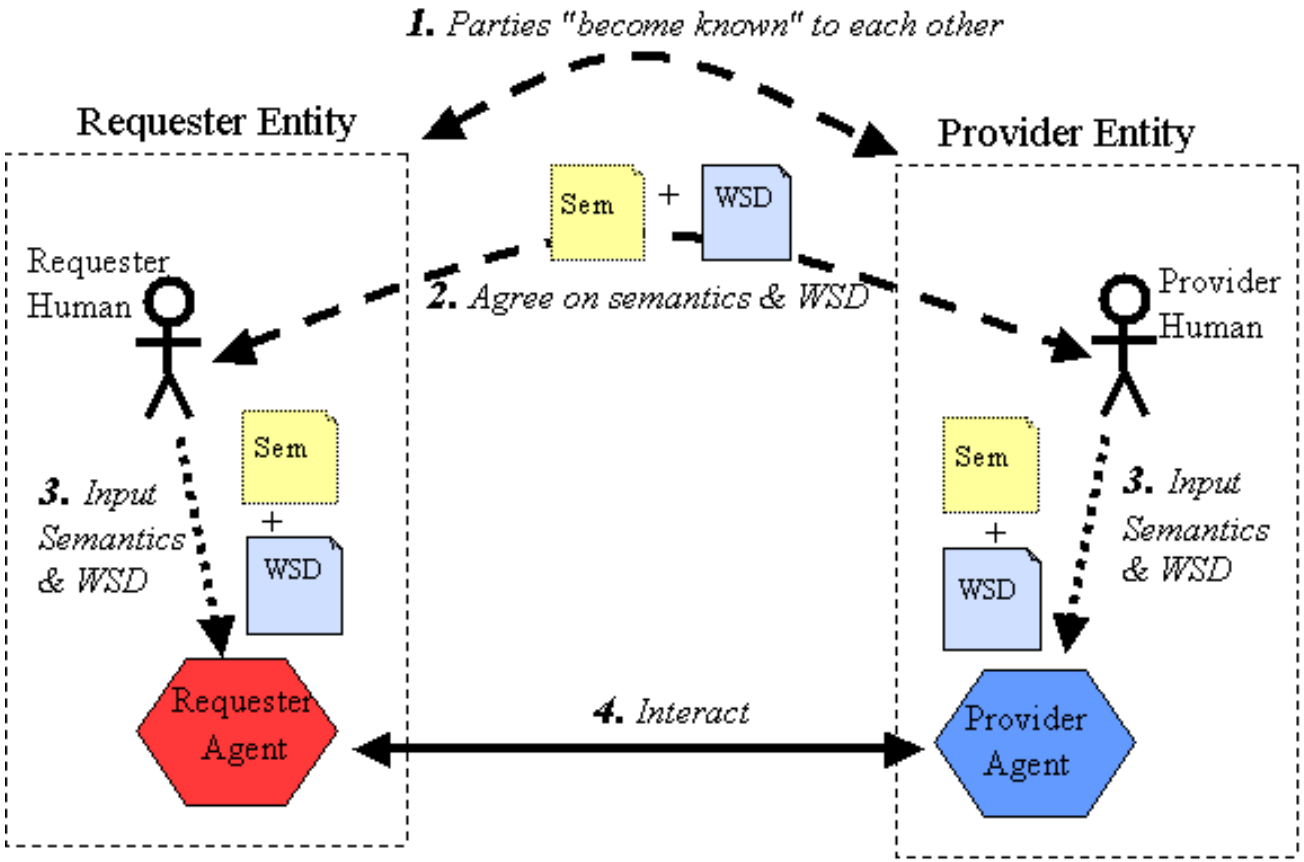
Introduction

- "Engaging a Web Service"



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Introduction

- WS basic operation

Web Service Client

Request for WS Description

WS Description

Web Service Request

Web Service Response

```
<definitions>
  ...
  <element
  ...
  <operati
  ...
</definiti
```

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    <Body>
      <add>
        <x>12</x>
        <x>38</x>
        <x>27</x>
      </add>
    </Body>
  </Envelope>
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  <Body>
    <result>77</result>
  </Body>
</Envelope>
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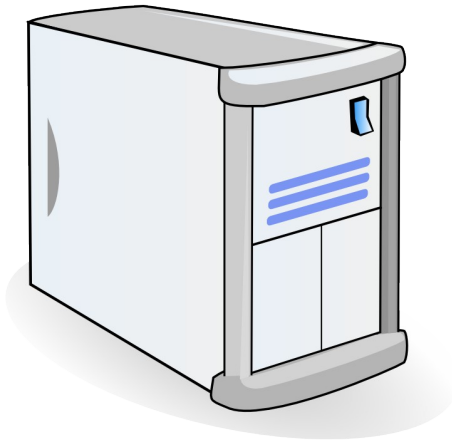

Web Service Server

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Introduction

- Web Services: Core element of Service-Oriented Architecture (SOA)
  - Middleware for distributed systems: Independent of OS or programming language
  - XML-encoded messages in XML-based "framing protocol": SOAP
  - Formal interface description: Web Service Description Language (WSDL)

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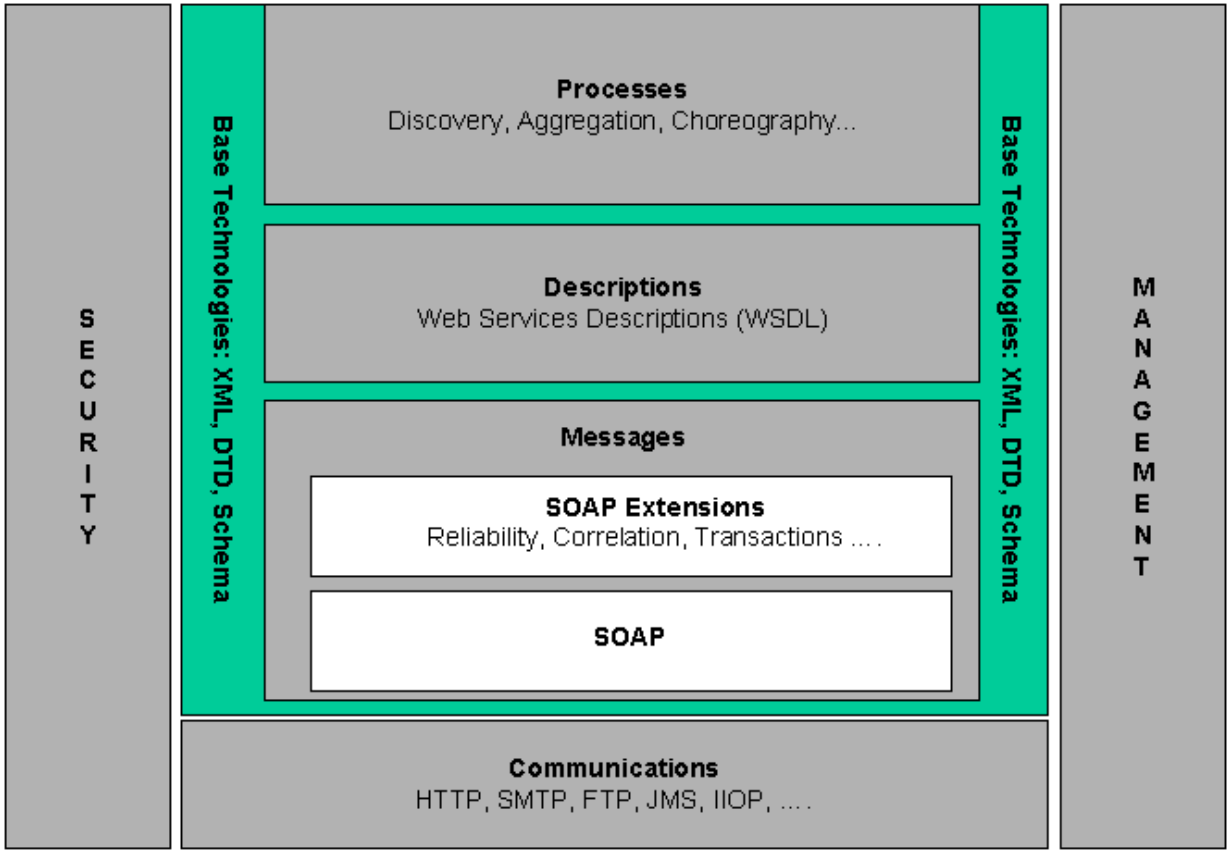
Introduction

- "Big picture"



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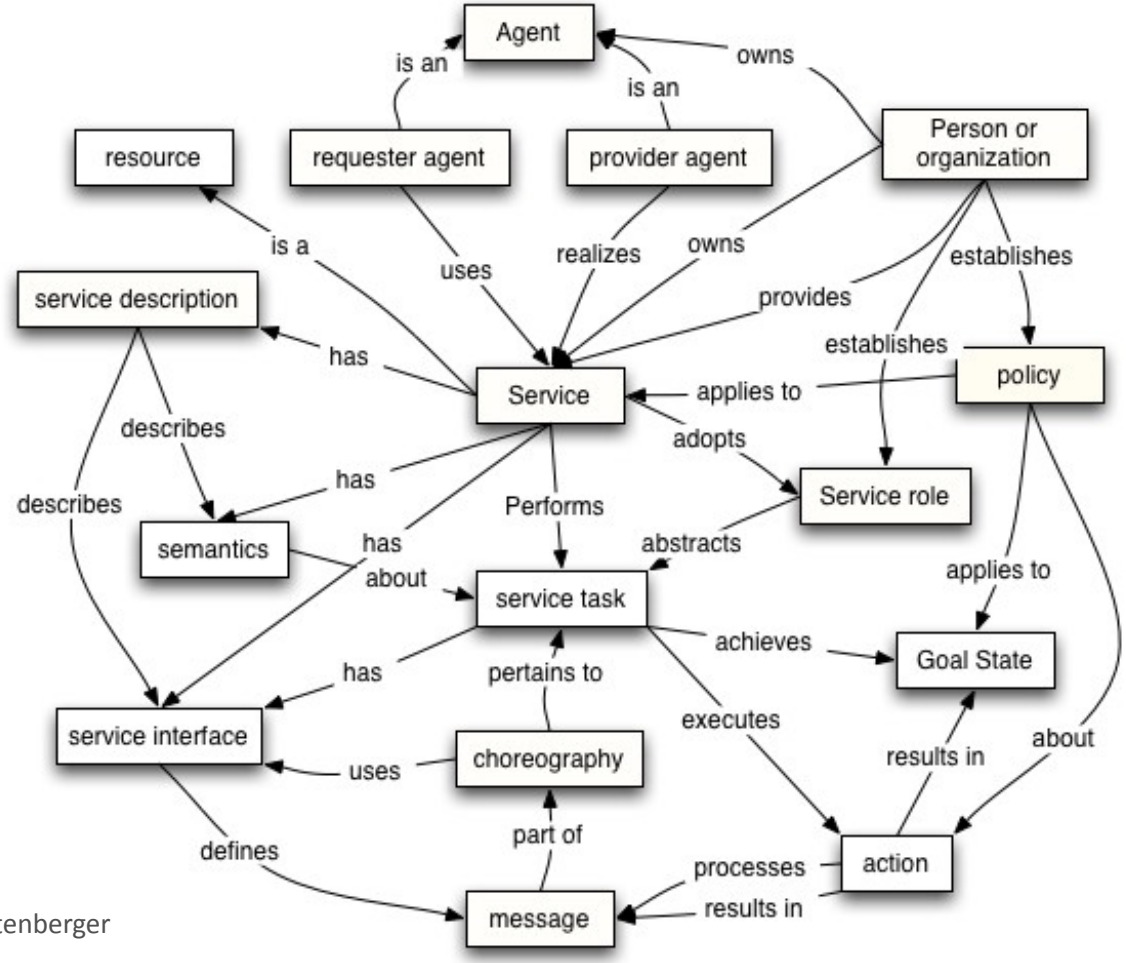
- Service-oriented model



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