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Web Services Based Architectures II

INSE 7110 – Winter 2004
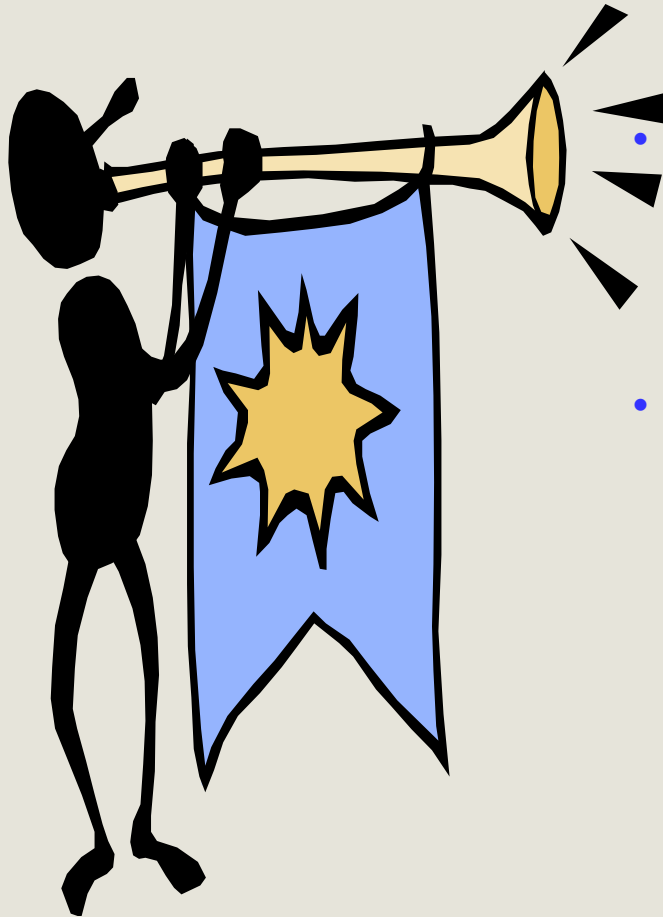**Value Added Services Engineering in Next Generation Networks**
Week #10

Application areas

Any area that requires program to program interactions over a network

Examples

- Value added service engineering in NGN
- Digital imagery
- Geographical information systems

Outline

- **Web services for value added service engineering in NGN**

- **A digression on digital imagery**

Applying Web services to value added service engineering in NGN

1. **Parlay-X**

2. **OMA**

Two issues   …

1. Define Web services for making telecommunications capabilities available to applications in same or foreign domain

- - Call control
- - Presence
- - Location
- - Messaging

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Two issues …

2 - Enable the use of Web services in telecommunications by providing common / supporting functions such as:
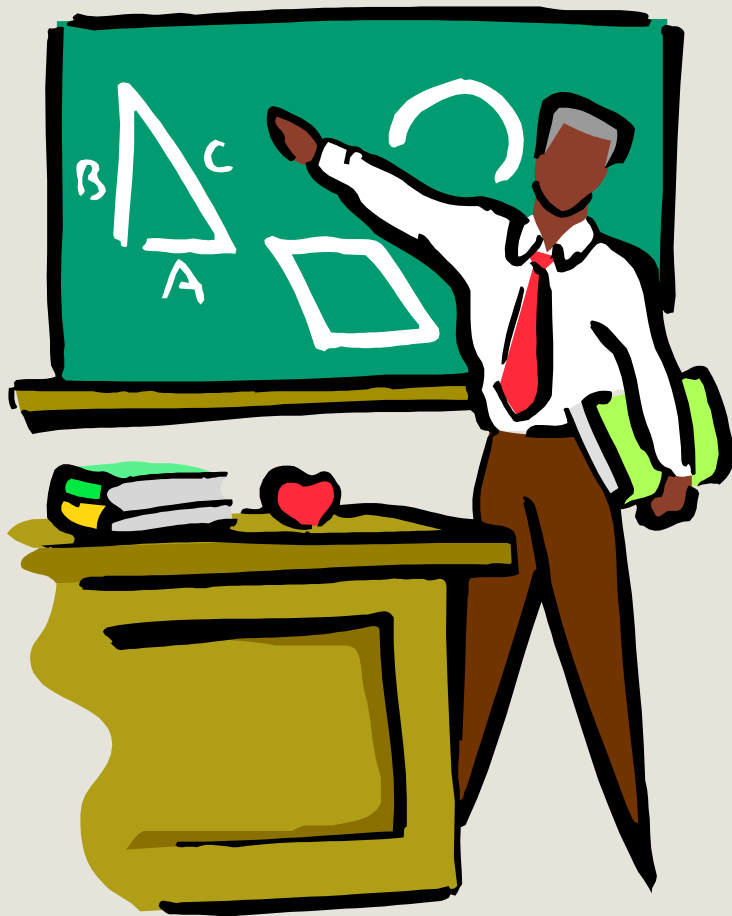
Billing

Security -
- Authentication
- Authorization
- Non repudiation
- Others

Service management
- registration
- Discovery
- Others

Parlay-X ...

1. **Introduction**

2. **Architecture**

3. **The services**

Introduction

1. **Specifications available in their first version**
   - White paper + actual specifications
   - Released as part of Parlay 4.0 specifications
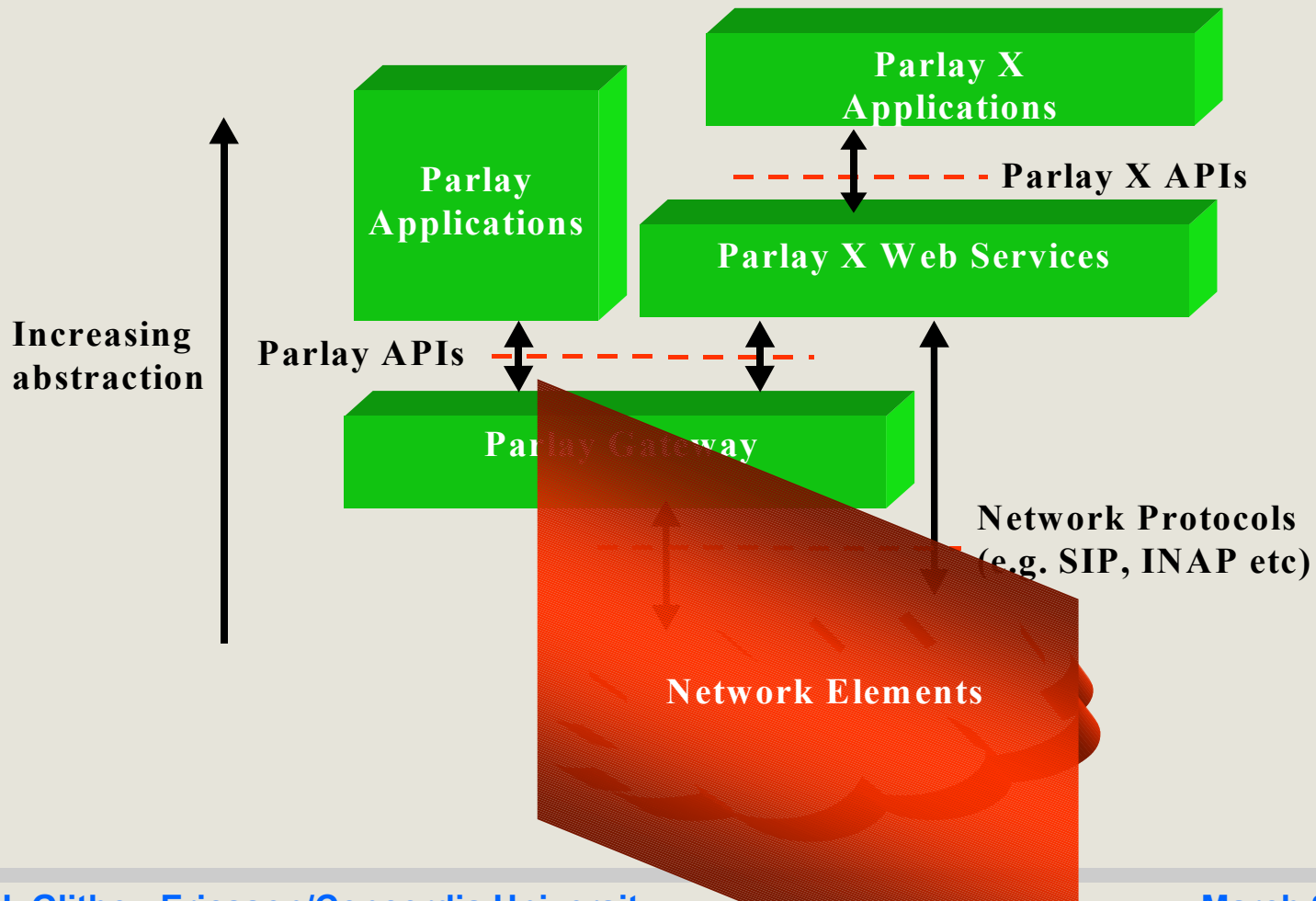
2. **Application interfaces**
   - Focus: First issue
   - Aim at covering all telecommunication capabilities
      - Stand alone capabilities (e.g. presence, call control)
      - Combined capabilities (presence + call control)

3. **Use the reference Web service principles (e.g. coarse grained) technologies (e.g. WSDL)**

Architecture

Parlay X Applications

Parlay Applications

Parlay X APIs

Parlay X Web Services

Increasing abstraction

Parlay APIs

Parlay Gateway

Network Protocols (e.g. SIP, INAP etc)

Network Elements

The services

1. **Call control**
2. **Messaging**
   - SMS
   - MMS

3. Payment (e.g. volume charging)

4. Account management (e.g. account credit expiration date query)

5. User status (online / offline)

6. Terminal location

Parlay-X Call Control …

Make a call

Get call information

End call

Cancel call request

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Parlay-X Call Control …

Handle busy

Handle Not reachable

Handle No answer

Handle off Hook

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Parlay-X MMS …

Send Message

Get Message Delivery Status
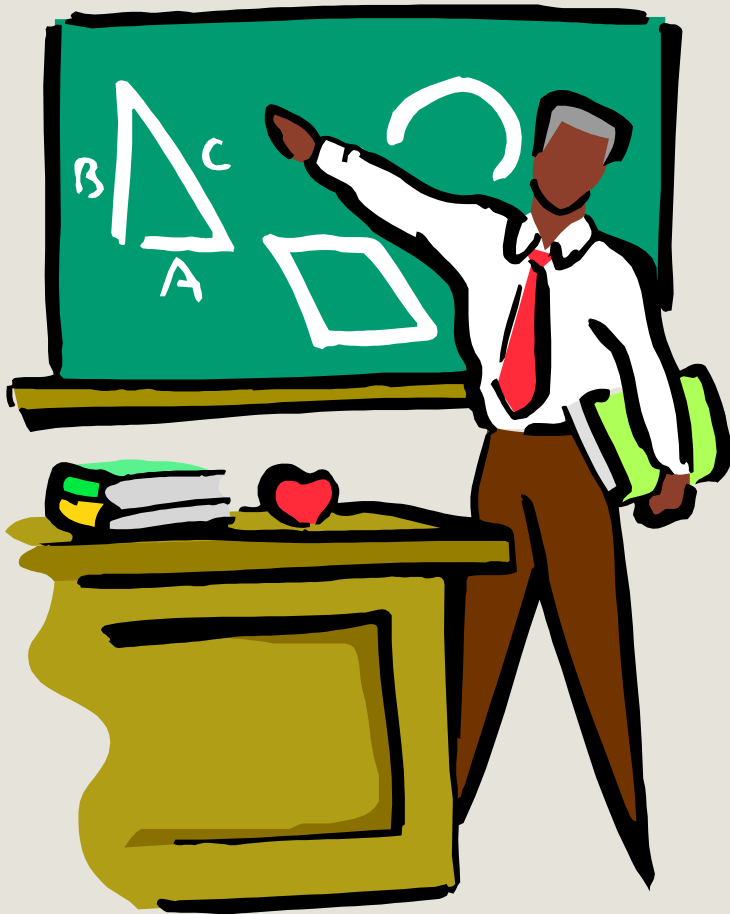
Get Received messages

Get messages URIs

Notify message reception

![Ericsson logo]

OMA …

1. **Introduction**

2. **Architecture (ARCH)**

3. **OMA Web Service Enabler (OWSER)**

Introduction

OMA

- Industry association created in 2002

- Focus on mobile services

- Aims at:

  - Consolidating standards for wireless services (e.g. 3GPP/PP2, IETF, W3C)

  - Producing new standards if needed-

  - Tackling the two issues

Architecture

Aim at providing a general architecture for mobile services

- Requirements

- Principles

- Functional entities

- Common framework

- Service adaptability

Principles

- Signalling protocol neutrality and independence from programming languages, operating systems and so on

- Leverage existing standards

- Interoperability, scalability

- Service adaptability

- Consistency with Internet models

OMA Web service enabler (OWSER)

Aim at providing solutions to common problems faced by designers when using Web services in an OMA environment

- Practical deployment patterns

- Common functions (e.g. charging, security)

- Network Identity specifications (I.e. specific aspects of security – Based on Liberty alliance specifications)

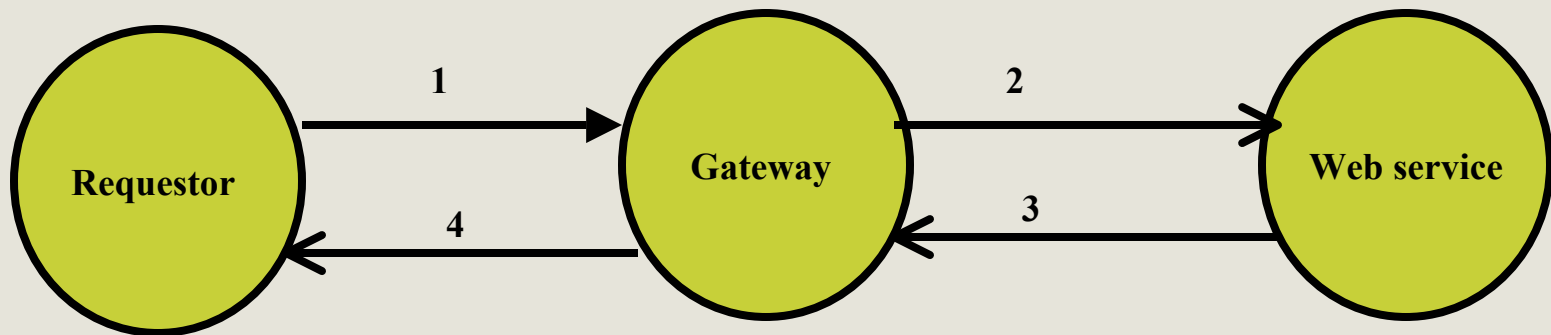- WSDL Style guidelines

- Test requirements

Examples of deployment patterns
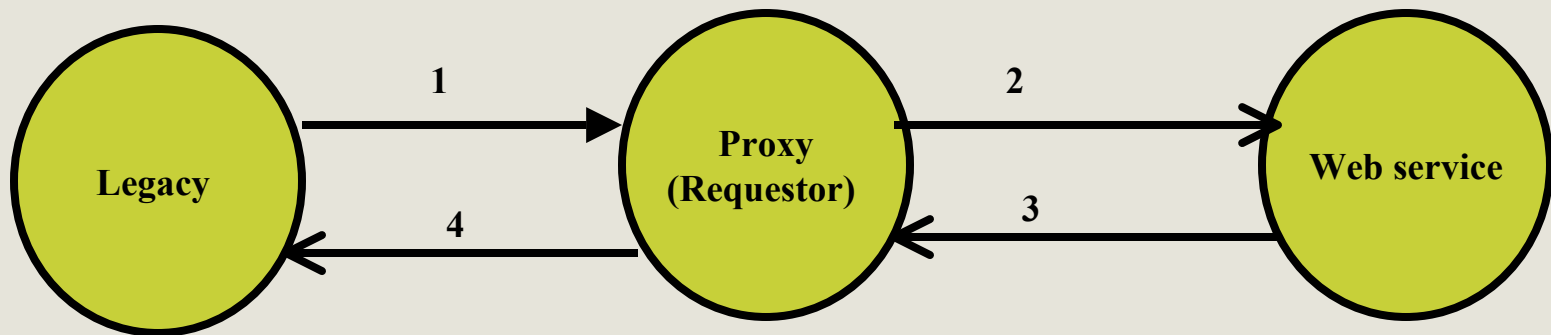
The adapter pattern
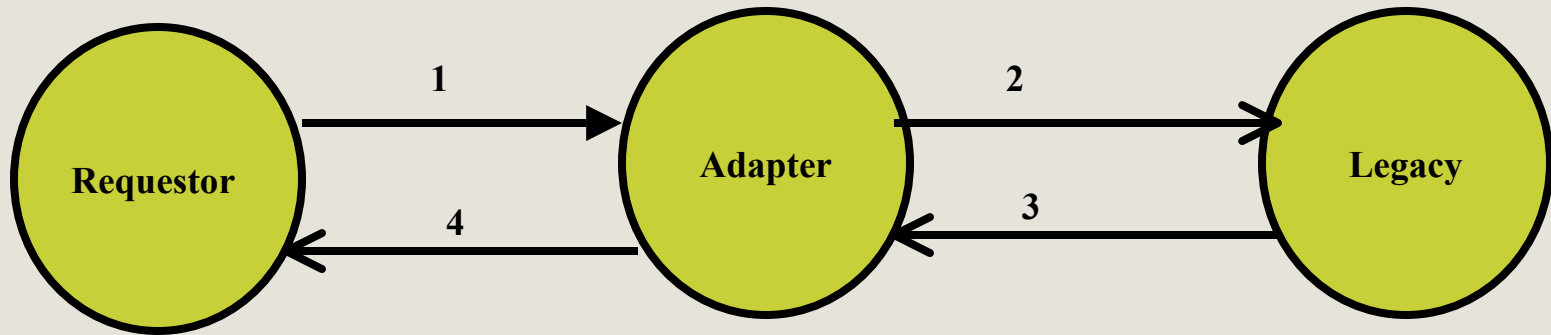
Examples of deployment patterns
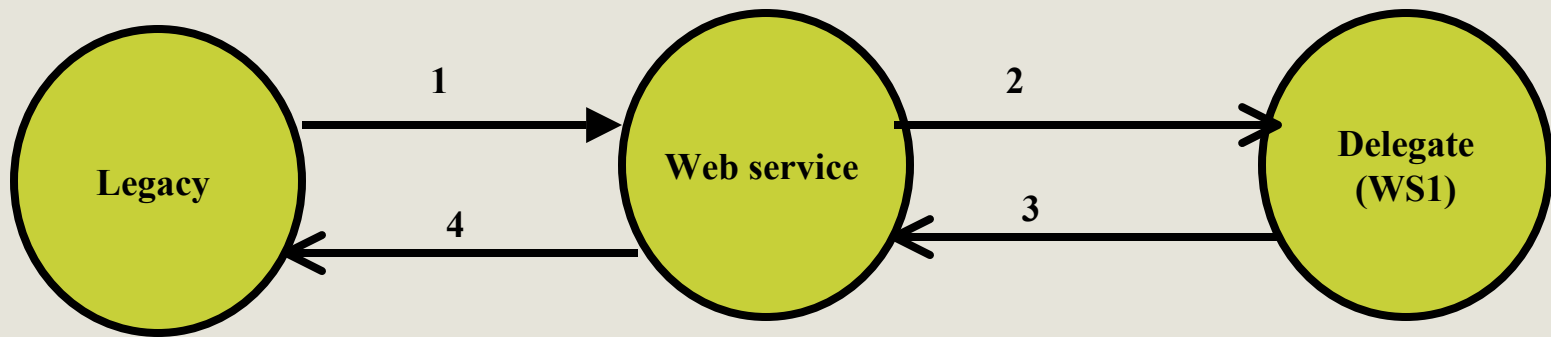
The gateway pattern

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Examples of deployment patterns
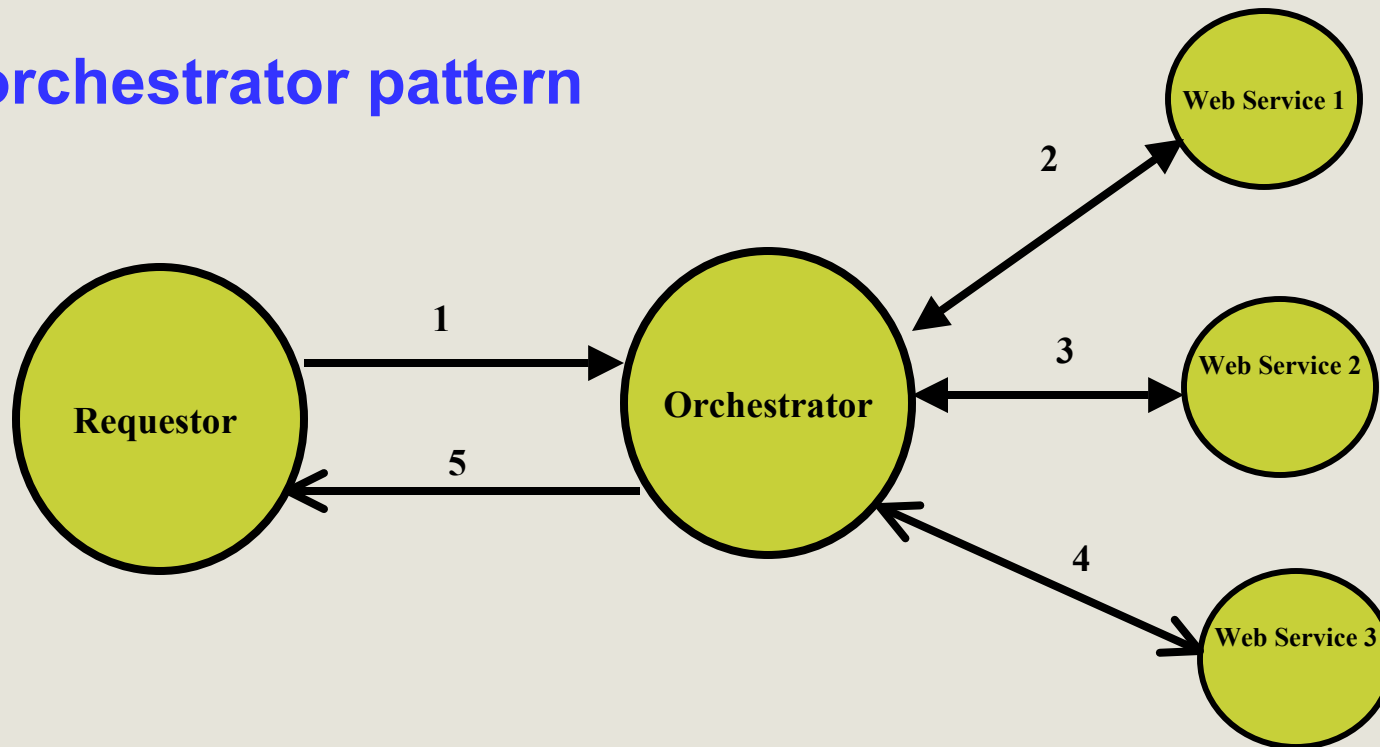
The proxy pattern

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Examples of deployment patterns
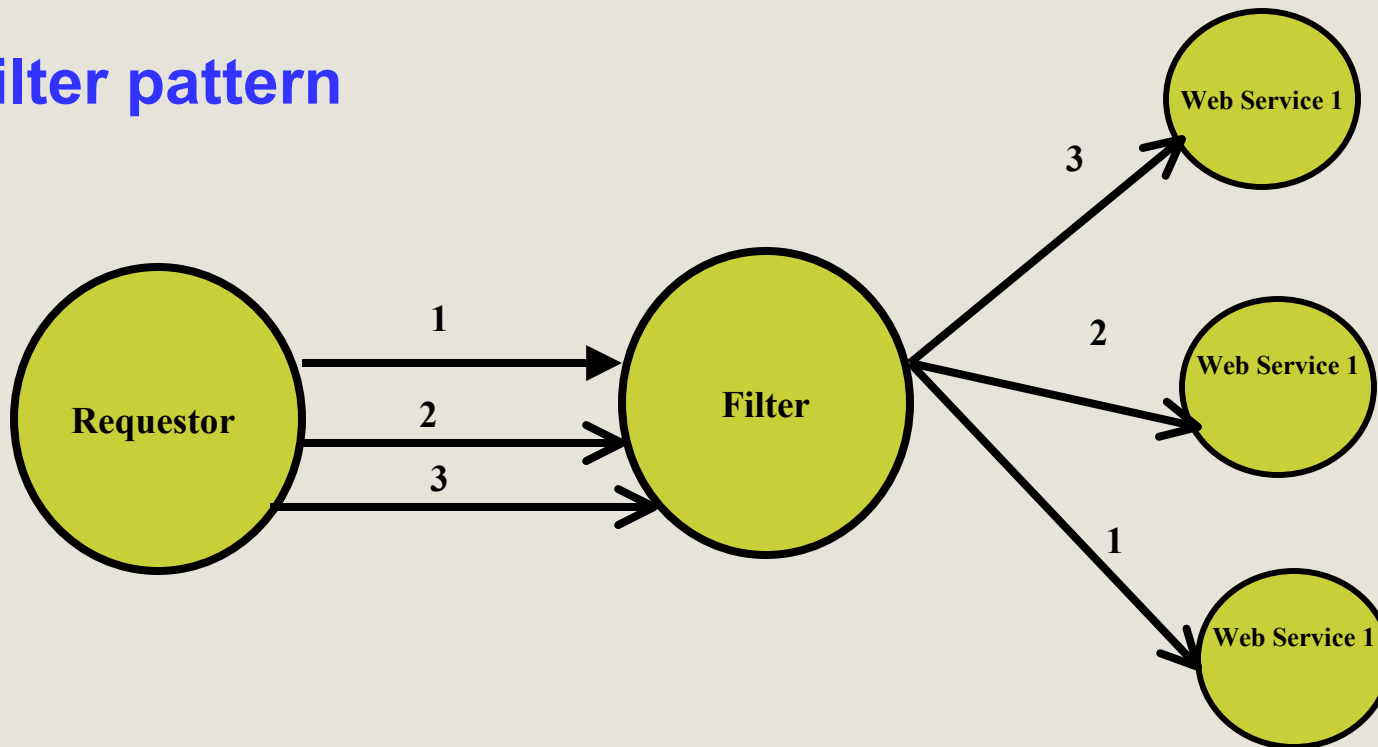
The delegate pattern

Examples of deployment patterns

The orchestrator pattern
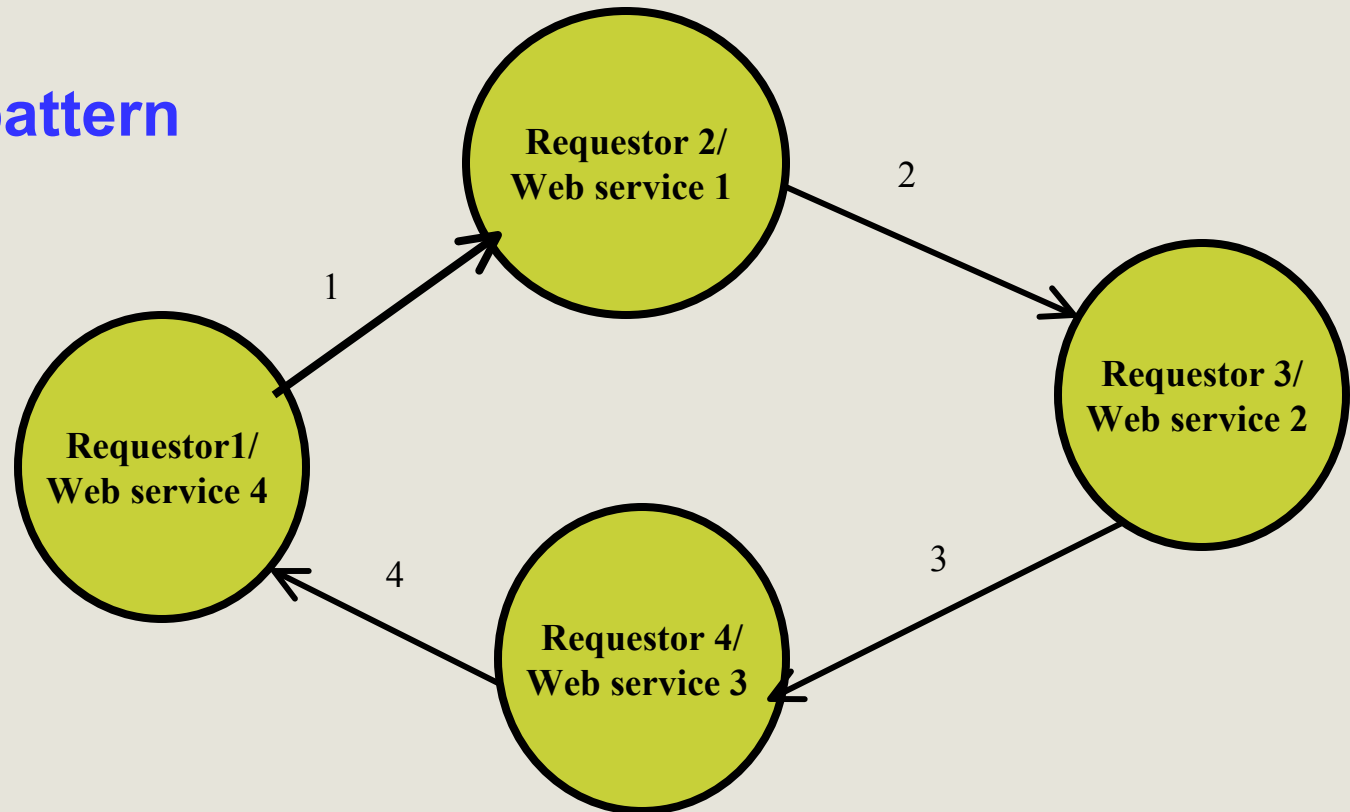
Examples of deployment patterns

The filter pattern

Examples of deployment patterns

The workflow pattern

Common functions

Common functions are key to interoperability

Common supporting technologies

- XML 1.0
- SOAP 1.0
- WSDL 1.1
- HTTP 1.1
- UDDI 2.0X
- Use of WS-I profile

Common functions

Common functions are key to interoperability

Security (Identification of relevant standards and normative security technologies)

- Authentication
- Data integrity
- Confidentiality
- Key management
- Access control / authorization
- Non repudiation

Common functions

Common functions are key to interoperability

Service management (Identification of specific versions of UDDI)

- Registration
- Publication
- Discovery

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A quick assessment

1. Parlay-X Web services

- True Web services
  - Coarse grained approach (unlike WSDL version of Parlay specifications)
- Work done "independently" of OMA
  - Situation is evolving (e.g. joint meetings are planned)

2. OMA

- Tackle critical issues such as common functions
- Integration of existing standards may take longer than planned

A Digression on Digital Imagery …
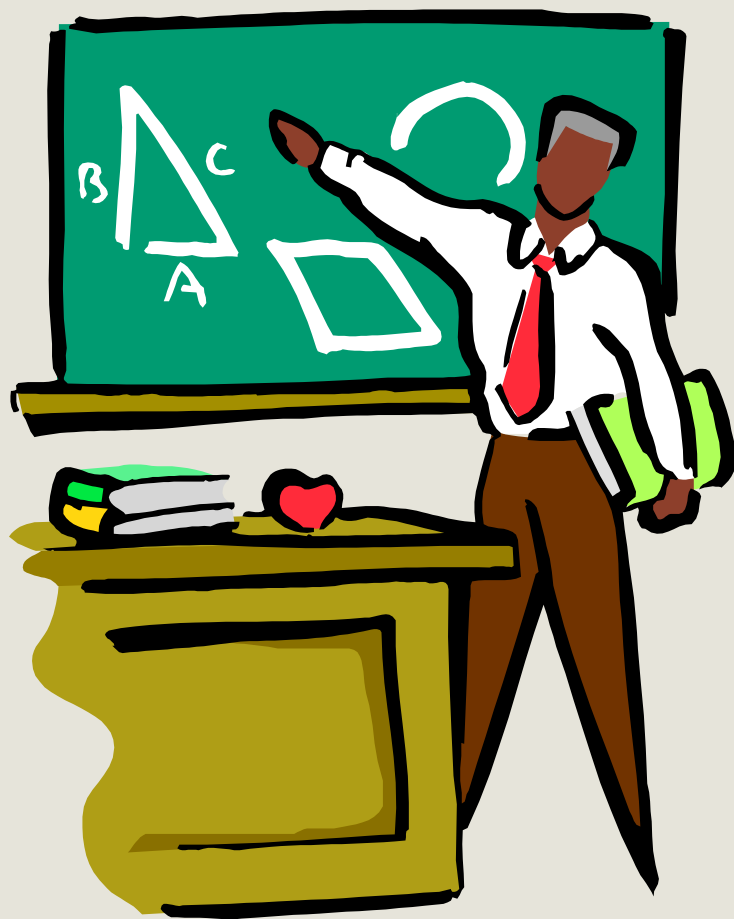
1. **Introduction**

2. **Business model**

3. **Examples of interactions**

Introduction …

Common Picture Exchange (CPXe)

Purpose

- Automation of manipulation, printing and sharing digital images

Involved companies

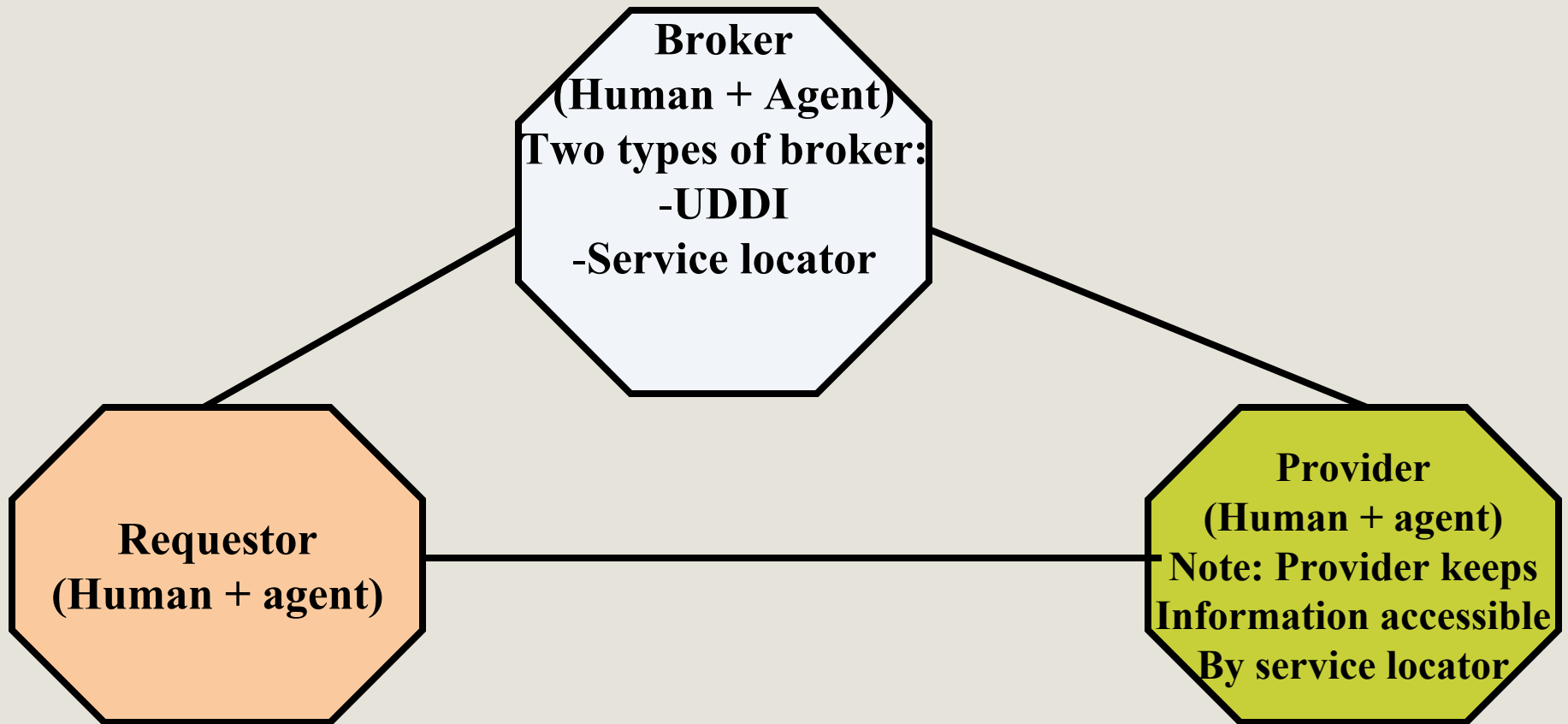- Most companies active in the digital imaging industry (e.g Kodak, HP, Konica, Olympus and others)

Business model …

Changes to the original Web service model

- Motivation:
    - UDDI does not provide the level of fine granularity required by the industry
        - Where to get poster size glossy print in a given city
        - Located at a given distance from an hotel
        - With given opening hours

- Changes
    - Possibility to give much more low level granularity about services
    - Possibility for searching such type of information

Business model

Broker
(Human + Agent)
Two types of broker:
-UDDI
-Service locator

Requestor
(Human + agent)

Provider
(Human + agent)
Note: Provider keeps
Information accessible
By service locator

Business model …

Service locators

- Interact (on behalf of service requestor with UDDI and/or catalogues to find service(s) meeting specific criteria
- May be deployed by providers to direct to her/his services
- May be deployed by an independent party
- Accessible via a standardized API

- Catalogues
  - Standardized way for service providers to provide more details about their services (e.g. closing hours of an outlet)
  - Kept in service provider domain
  - Accessible via a standardized API by:
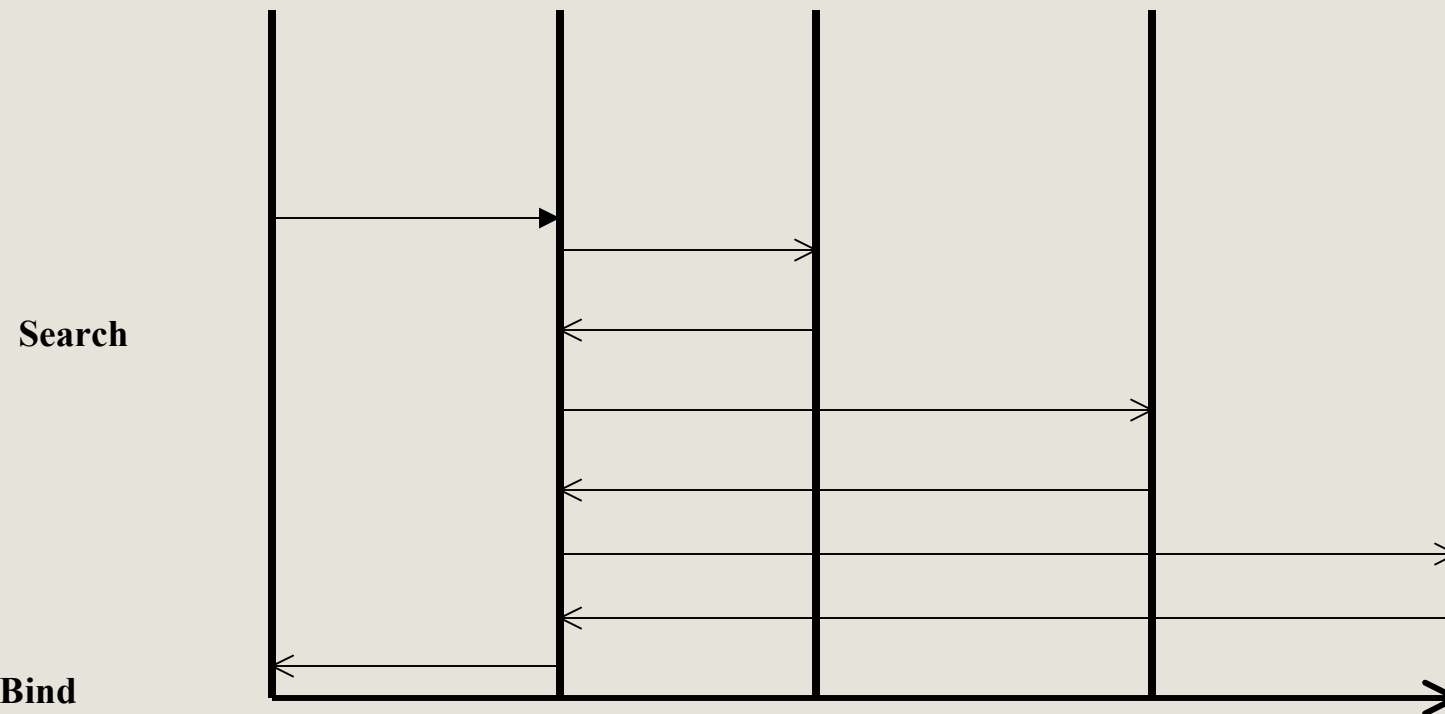   - Service requestors
    - Service locators

Business model …

Catalogues (Examples of info)

- Service property list
- Store list
    - Street address
    - Hours of operations
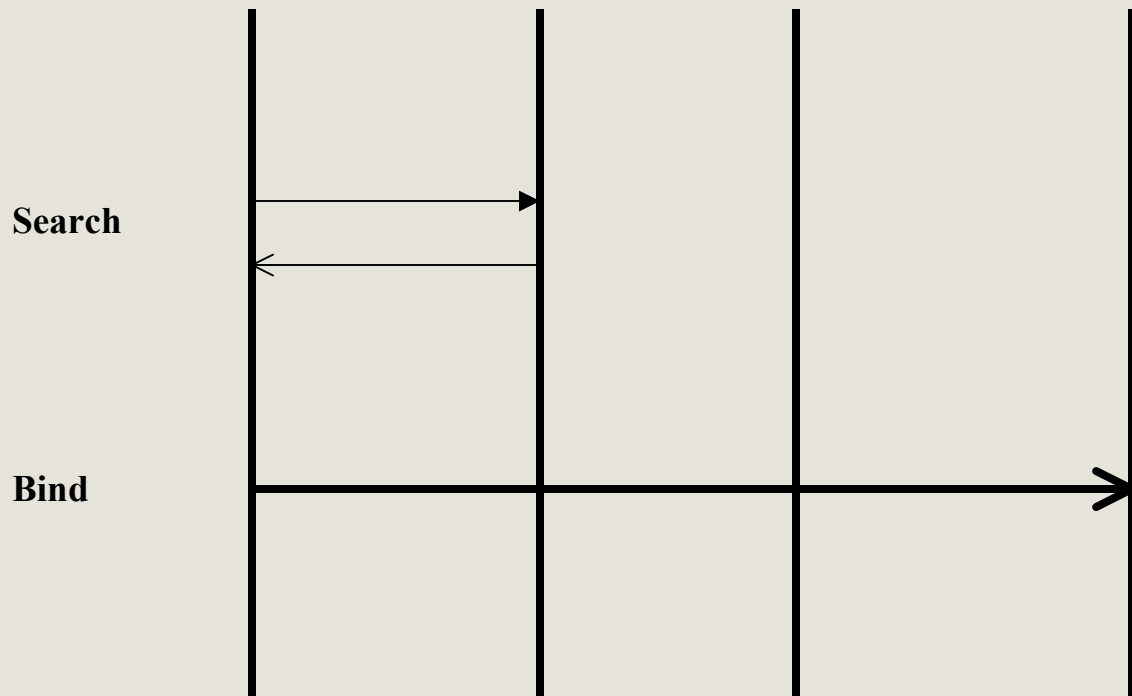- Product list
- Price list
- Category list

Examples of interactions …

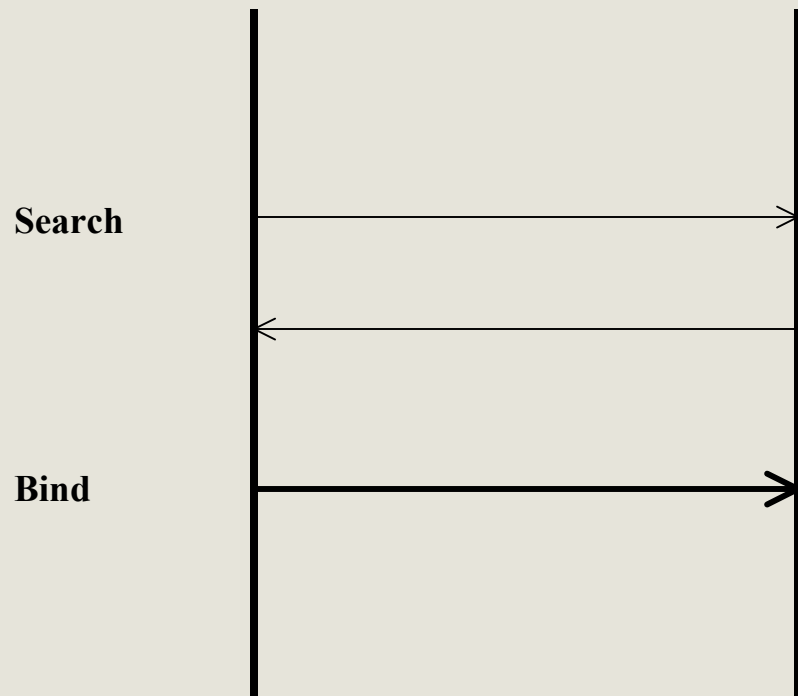Requestor   Locator   UDDI   Provider 1   Provider 2

Search

Bind

Examples of interactions …

Requestor   UDDI   Provider 1   Provider 2

Search

Bind

Examples of interactions …

Requestor   Provider 1

Search

Bind

To probe further   ...

- **Parlay-X**
    - **Parlay-X Web services white paper**
    - **Parlay-X Web services specifications**
    http://www.parlay.org/specs/index.asp
- OMA
    - http://www.openmobilealliance.org/

  Digital imagery

  T. Thomson et al., CPXe: Web services for Internet Imaging, IEEE Computer Magazine, October 2003

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