

Web Services Based Architectures I

INSE 7110 – Winter 2007

Value Added Services Engineering in Next Generation Networks

Week #12

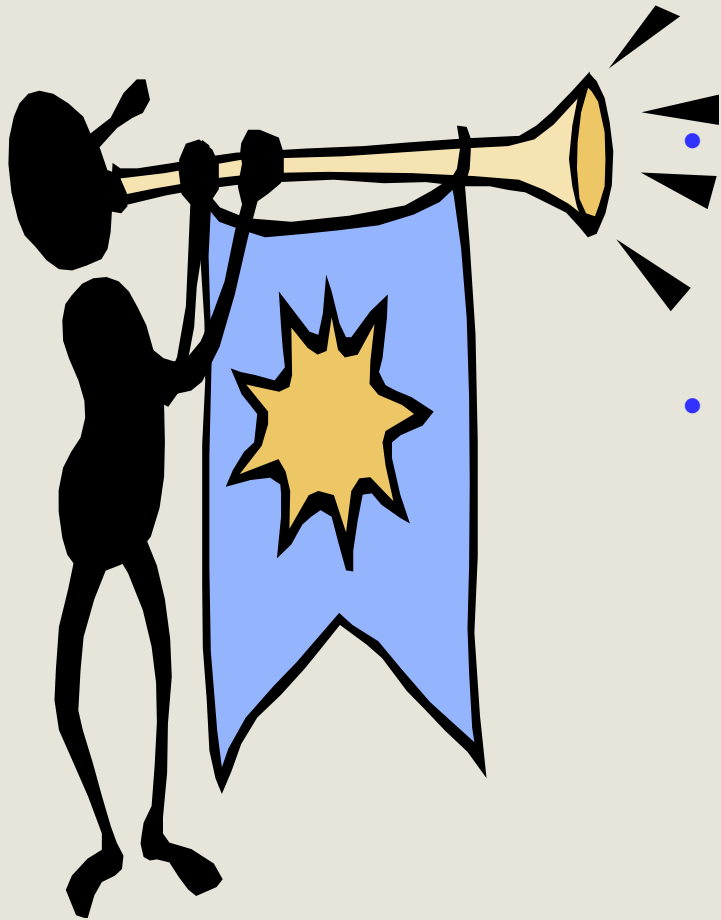
Application areas

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

Two issues ...

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

Billing

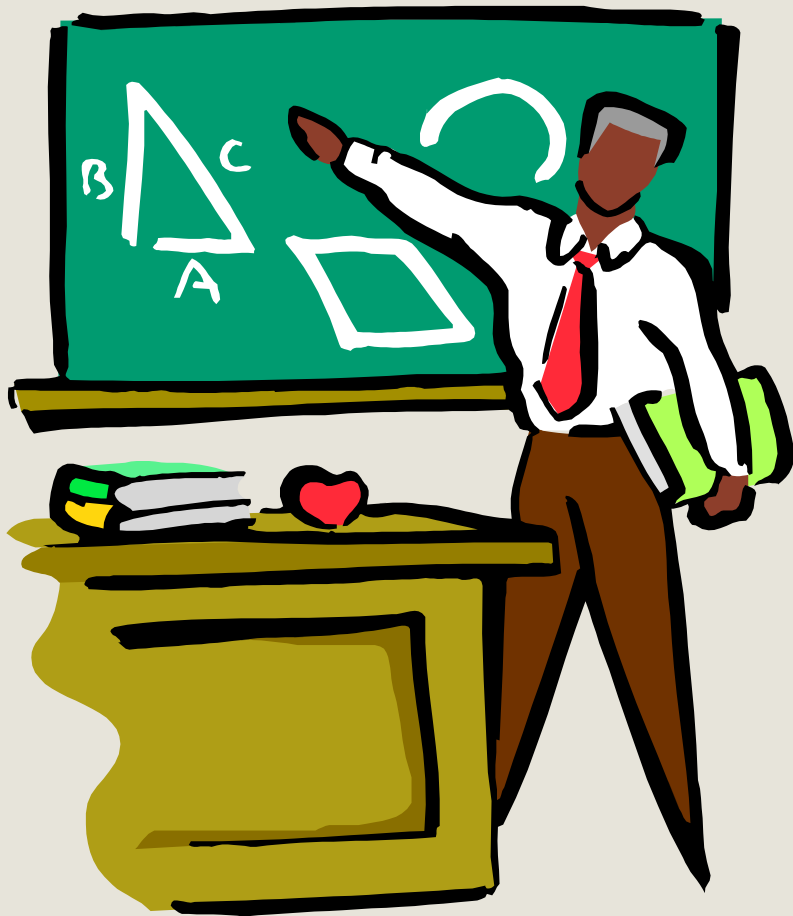
Security -

- Authentication
- Authorization
- Non repudiation
- Others

Service management

- registration
- Discovery
- Others

Parlay-X ...



1. Introduction
2. Architecture
3. The services

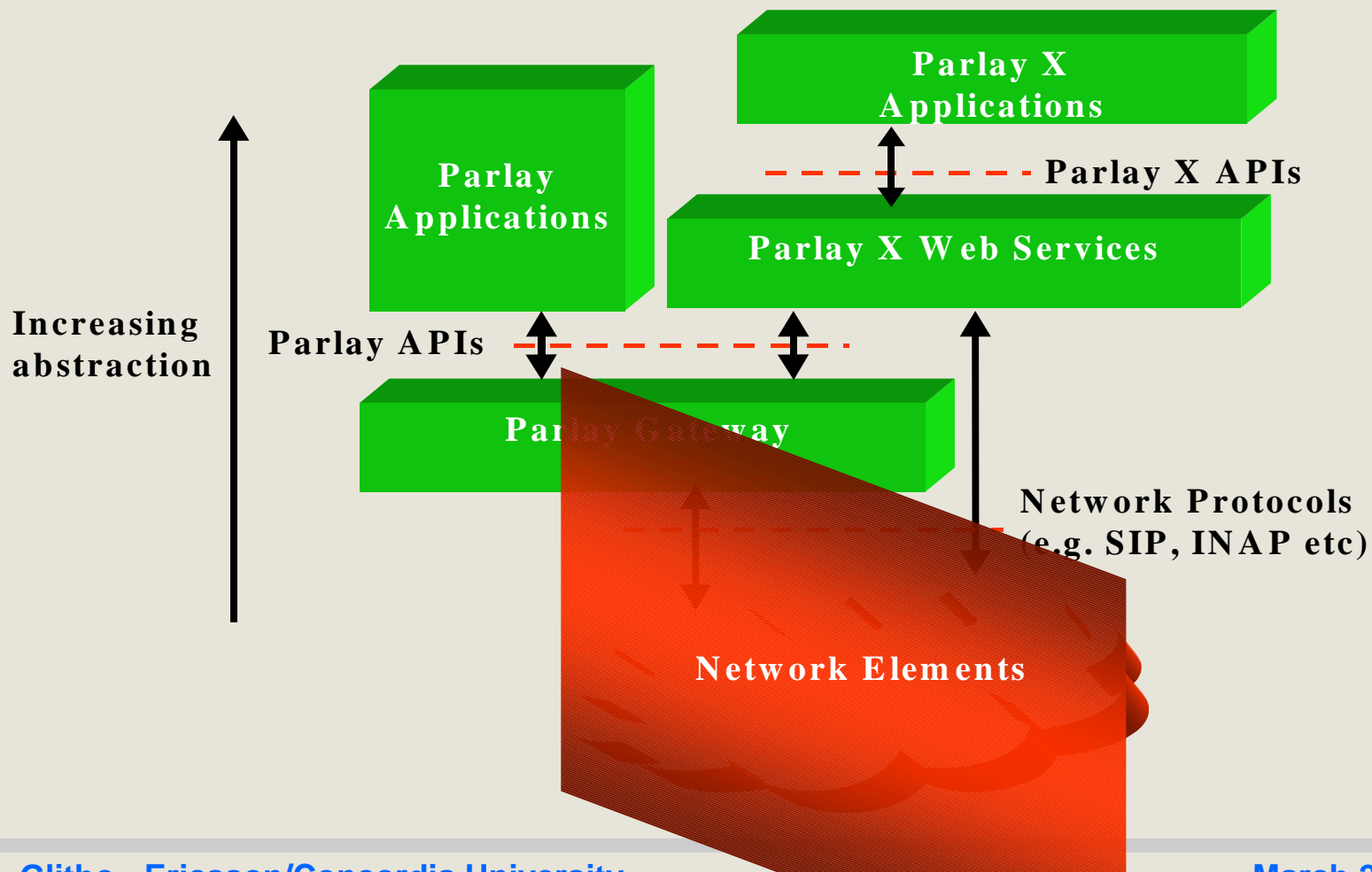
Introduction

- 1. Specifications available in their first version**
 - White paper + actual specifications
 - Last version released in 2005

- 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



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

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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 Conferencing Basics...

Allow the creation of a multimedia conference call and the dynamic management of:

- Conference
- Participants
- Media

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Parlay-X Conferencing Basics...

Service model entities

- Conference
 - “Context / virtual room” to which participants can be added
- Participants
 - Parties involved in the conference
- Media
 - audio/video/chat

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Parlay-X Conferencing Basics...

- Conference
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Parlay-X Conferencing Basics...

Create conference

- Create a multimedia conference with initially no participant

GetConference Info

- Information on status (e.g. active, terminated)

EndConference

Several possibilities

Maximum duration has expired

All participants have left

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Parlay-X Conferencing Basics...

inviteParticipant

- Add a new participant to the conference

disconnectParticipant

- Disconnects the participant

addMediaForParticipant

Executed on a single participant

- Add a media stream to the media set used by participant

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Parlay-X Conferencing Basics...

deleteMediaForParticipant

disconnectParticipant

getParticipantInfo

Parlay-X MMS ...

Send Message

Get Message Delivery Status

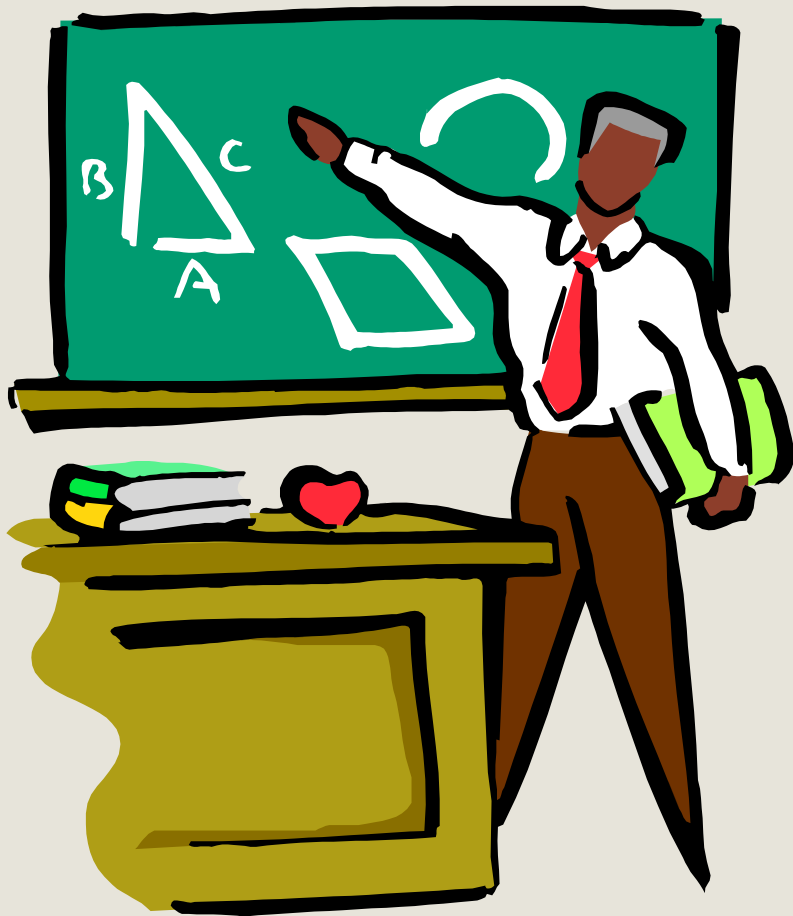
Get Received messages

Get messages URIs

Notify message reception

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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

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

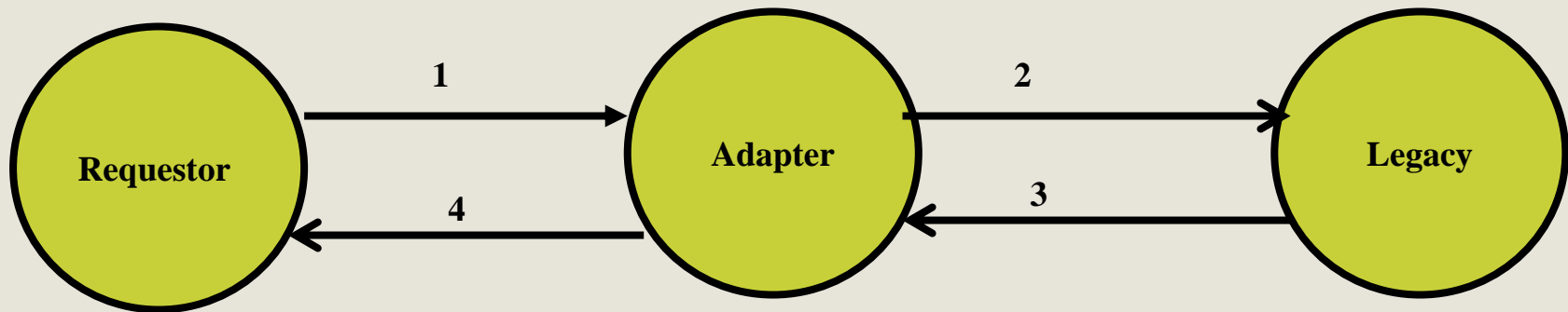
OMA Web service enabler (OWSER)

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

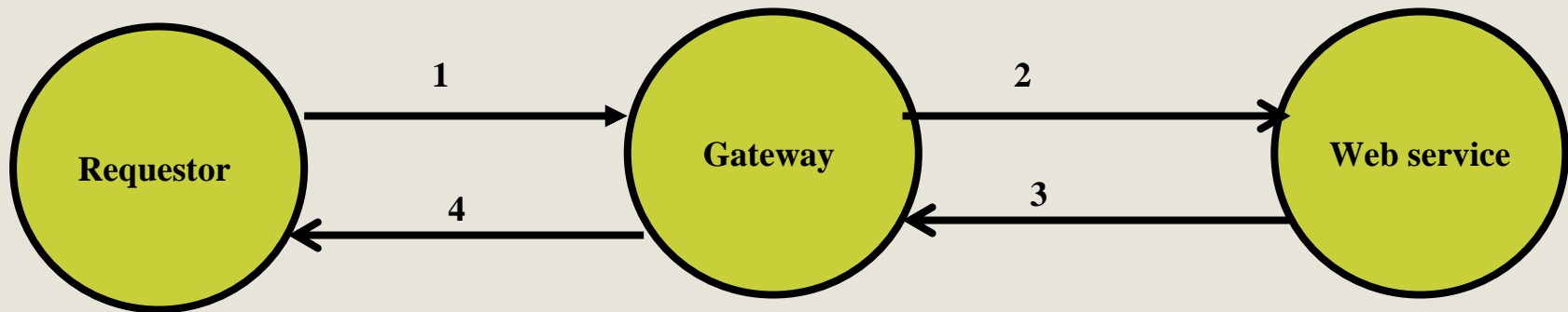
Examples of deployment patterns

The adapter pattern



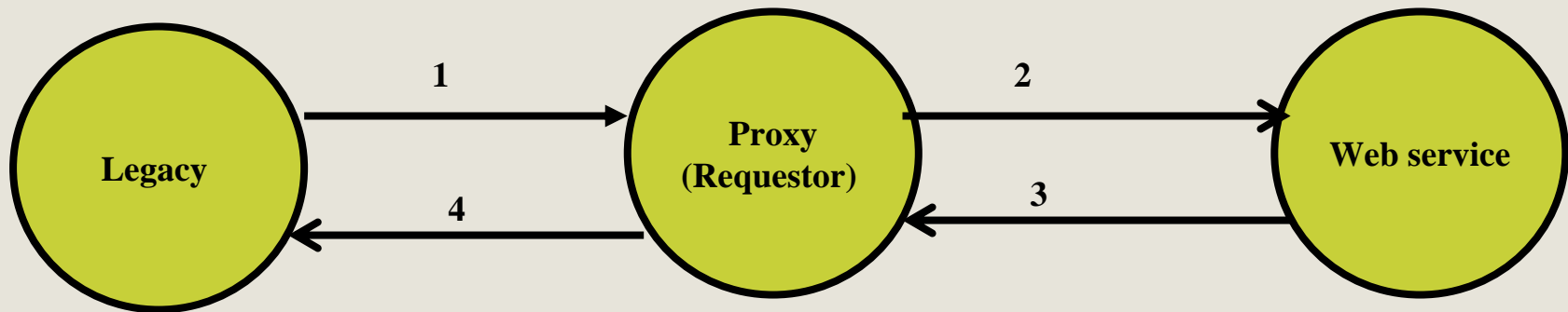
Examples of deployment patterns

The gateway pattern



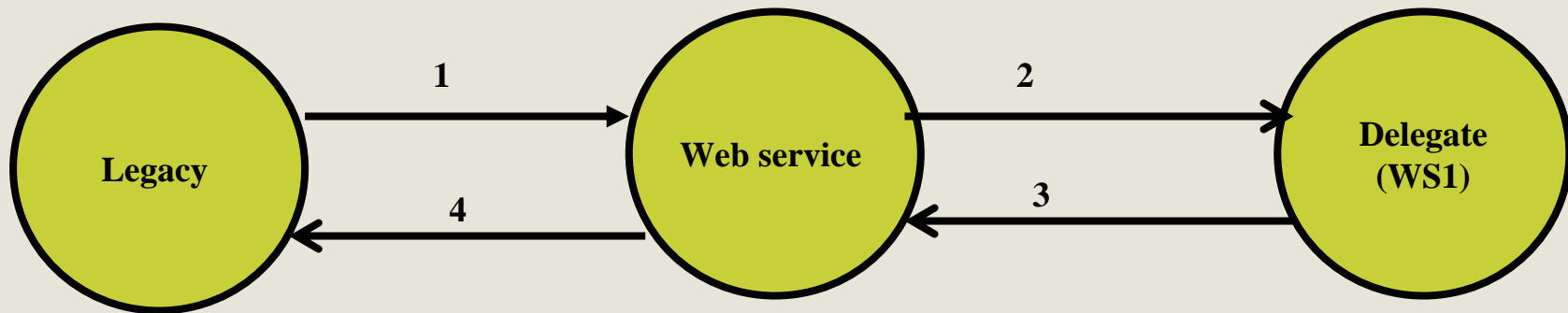
Examples of deployment patterns

The proxy pattern



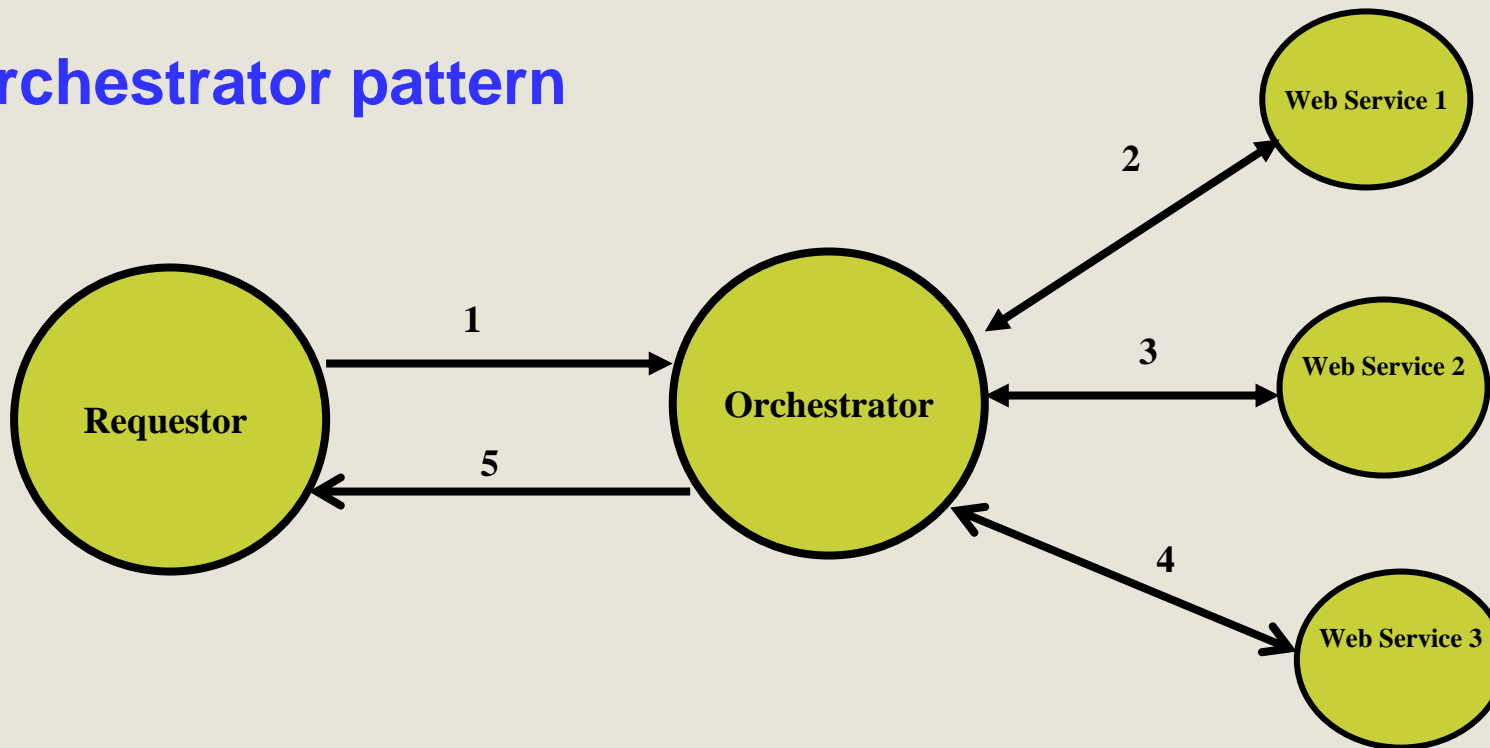
Examples of deployment patterns

The delegate pattern



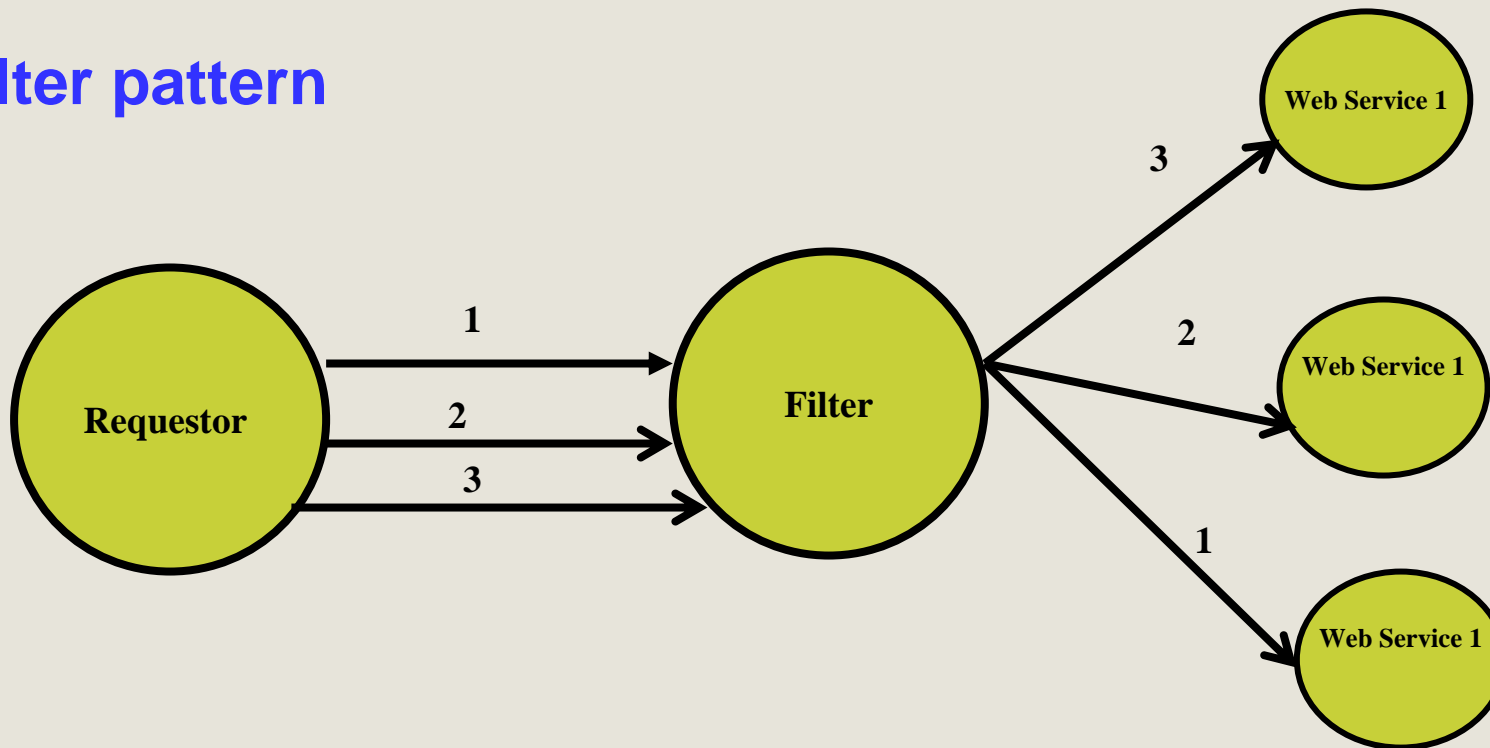
Examples of deployment patterns

The orchestrator pattern



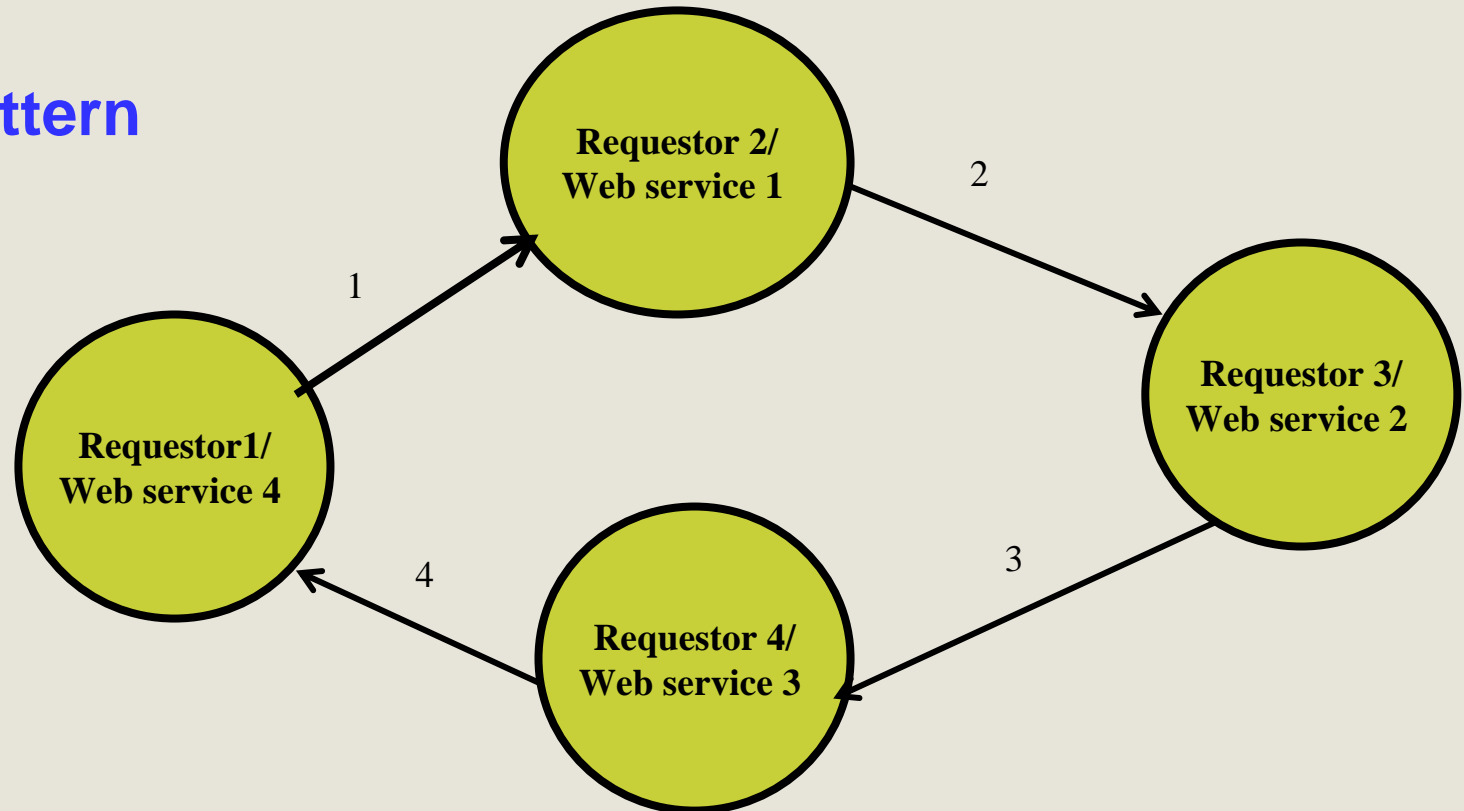
Examples of deployment patterns

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

A quick assessment

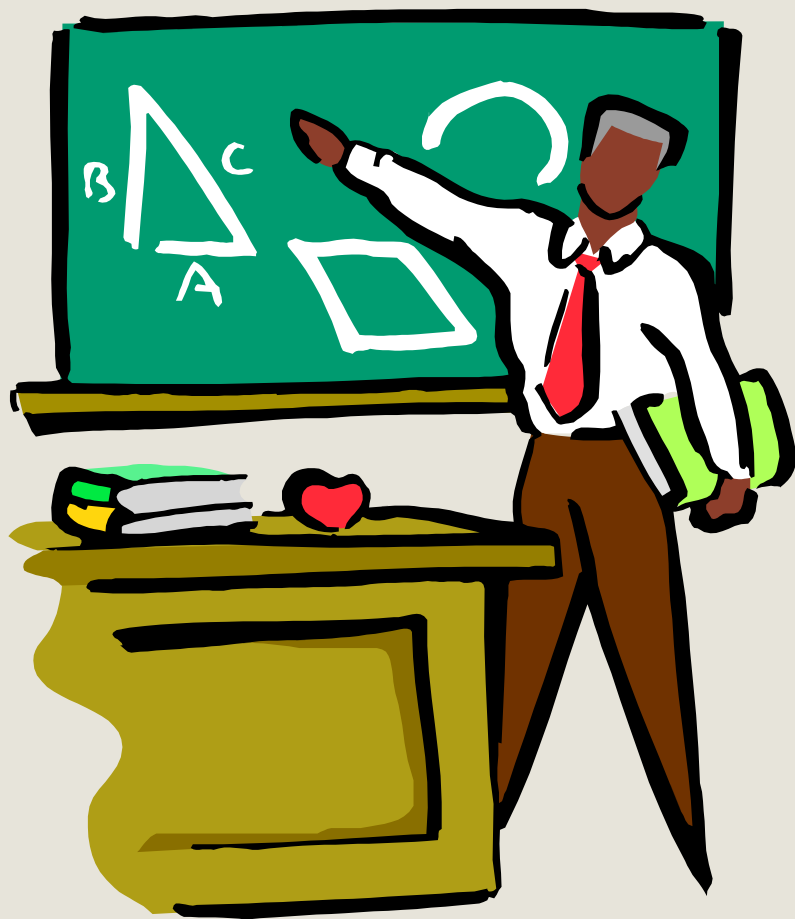
1. Parlay-X Web services

- 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

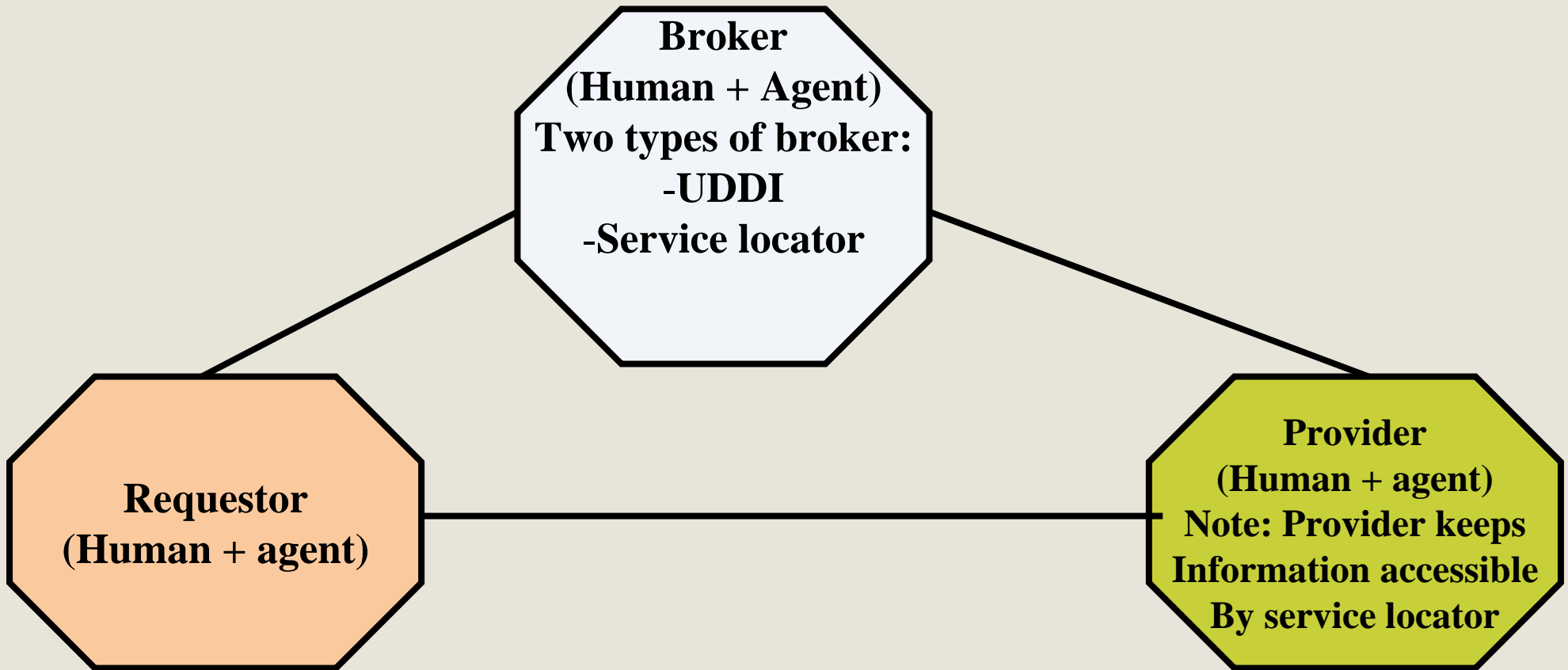
- Most companies active in the digital imaging industry (e.g Kodak, HP, Konica, Olympus and others)

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



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
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- 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

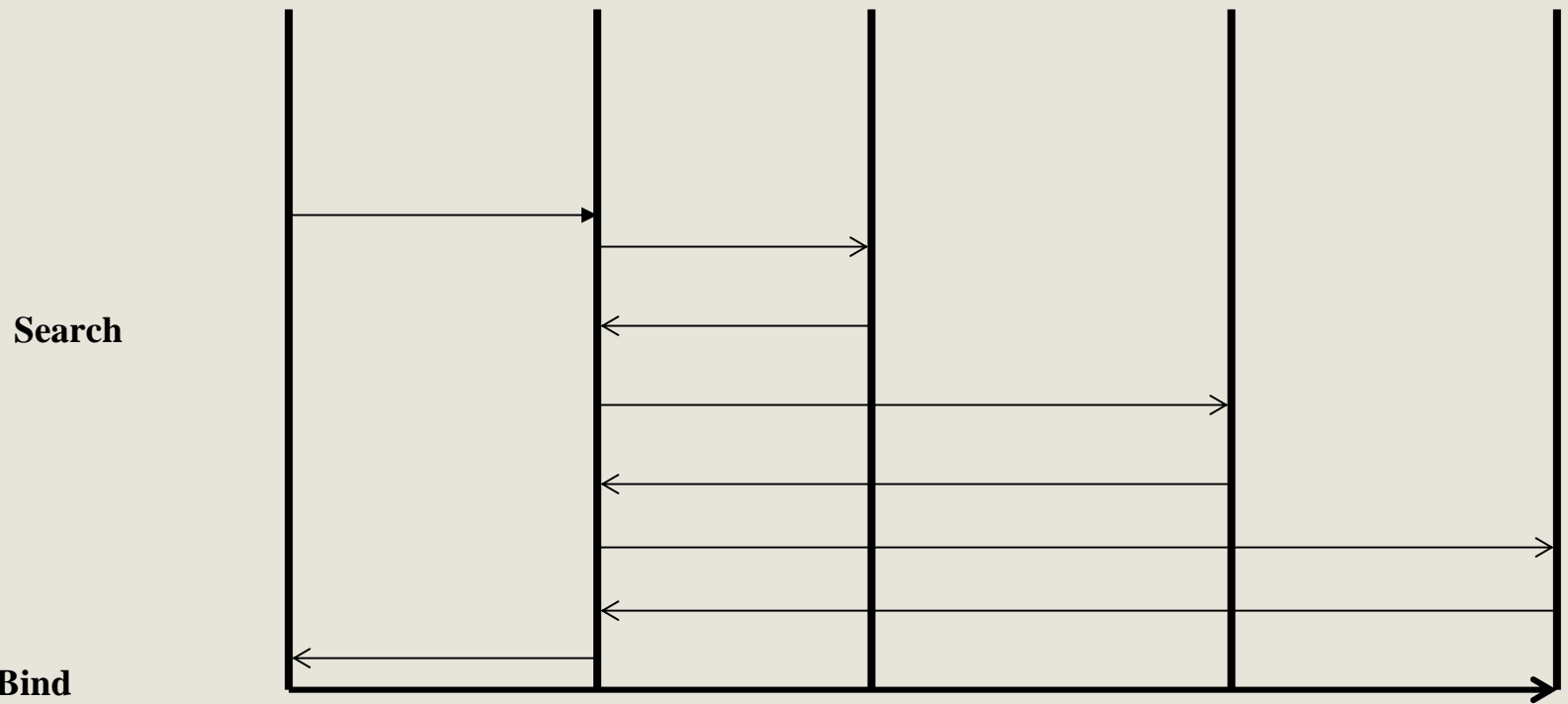
Business model ...

Catalogues (Examples of info)

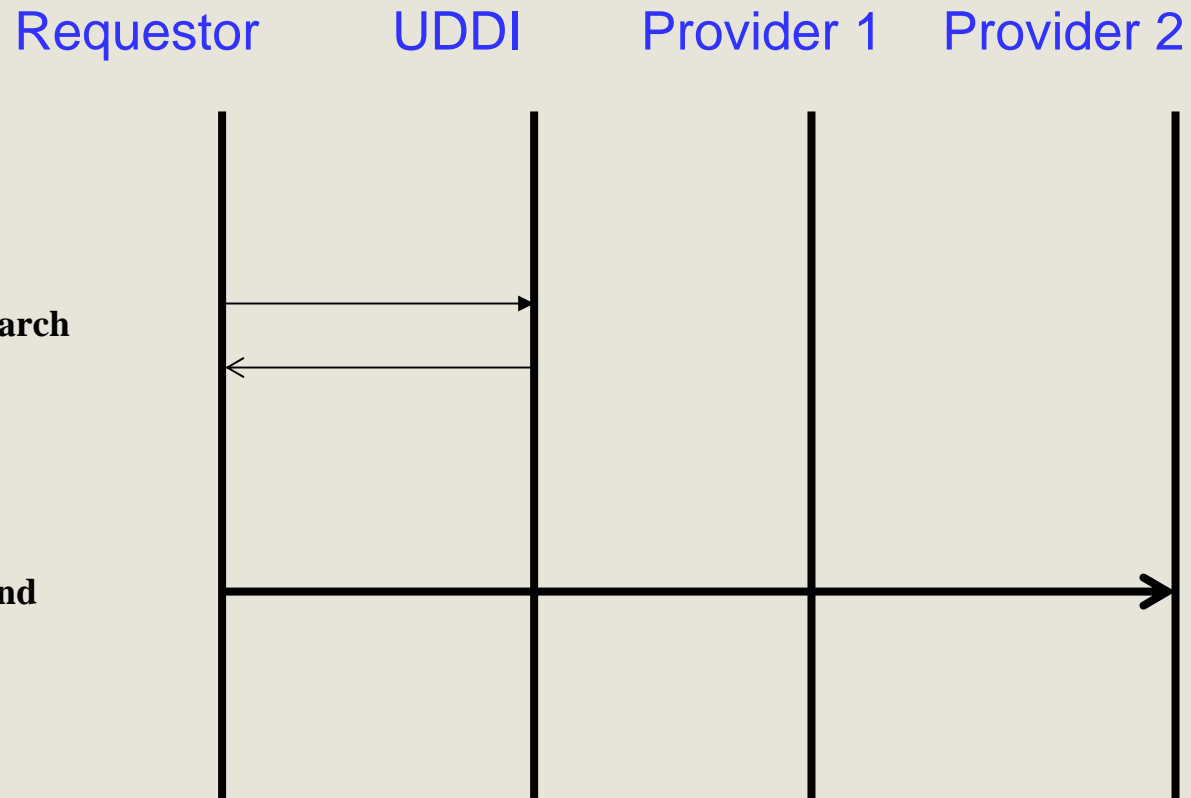
- Service property list
- Store list
 - Street address
 - Hours of operations
- Product list
- Price list
- Category list

Examples of interactions ...

Requestor Locator UDDI Provider 1 Provider 2



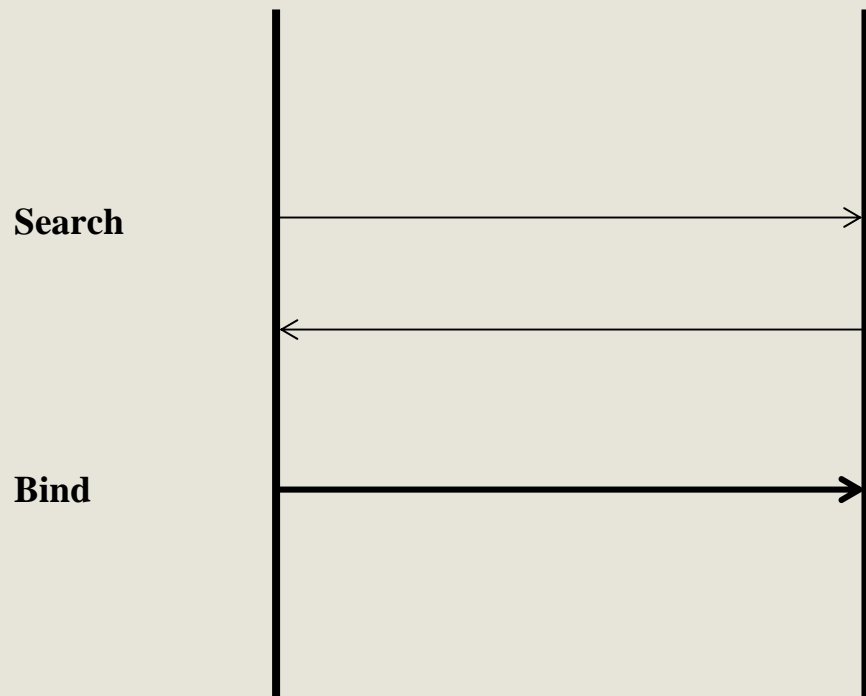
Examples of interactions ...



Examples of interactions ...

Requestor

Provider 1



To probe further ...

- Parlay-X
 - Parlay-X Web services white paper
 - Parlay-X Web services specifications including the one on conferencing
<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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