

# Web Services Based Architectures I

**INSE 7110 – Winter 2006**

**Value Added Services Engineering in Next Generation Networks**

**Week #12**

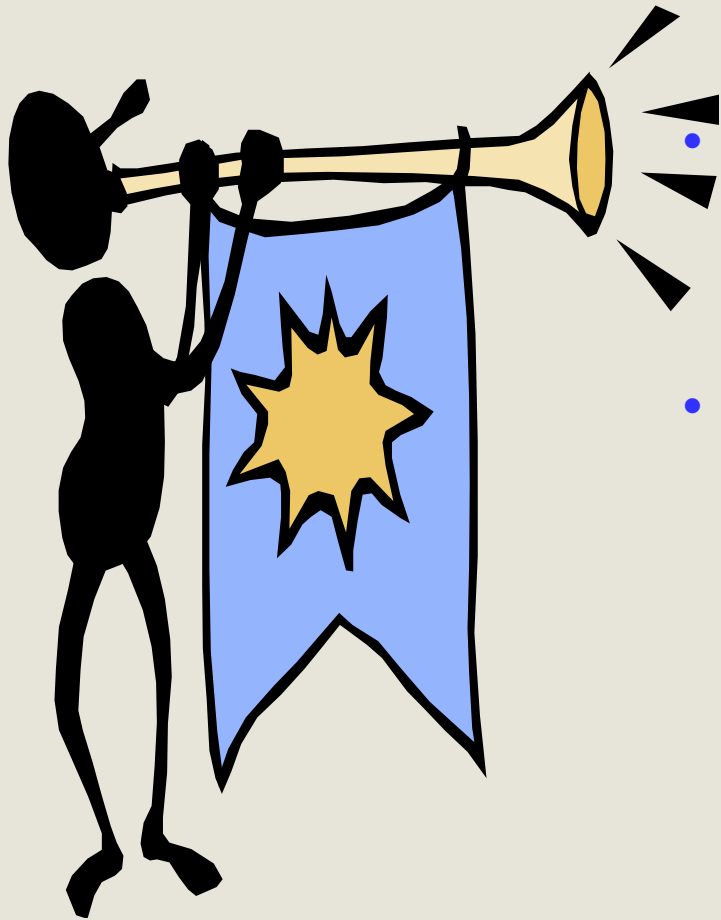
## Application areas

**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

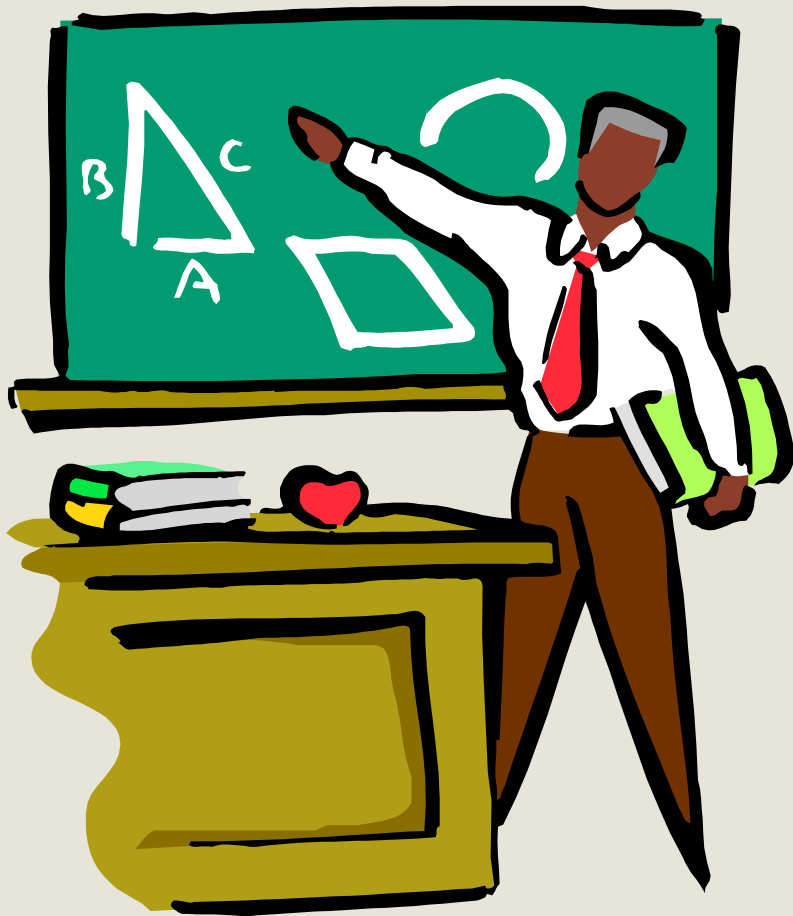
Security -

- Authentication
- Authorization
- Non repudiation
- Others

Service management

- registration
- Discovery
- Others

# Parlay-X ...



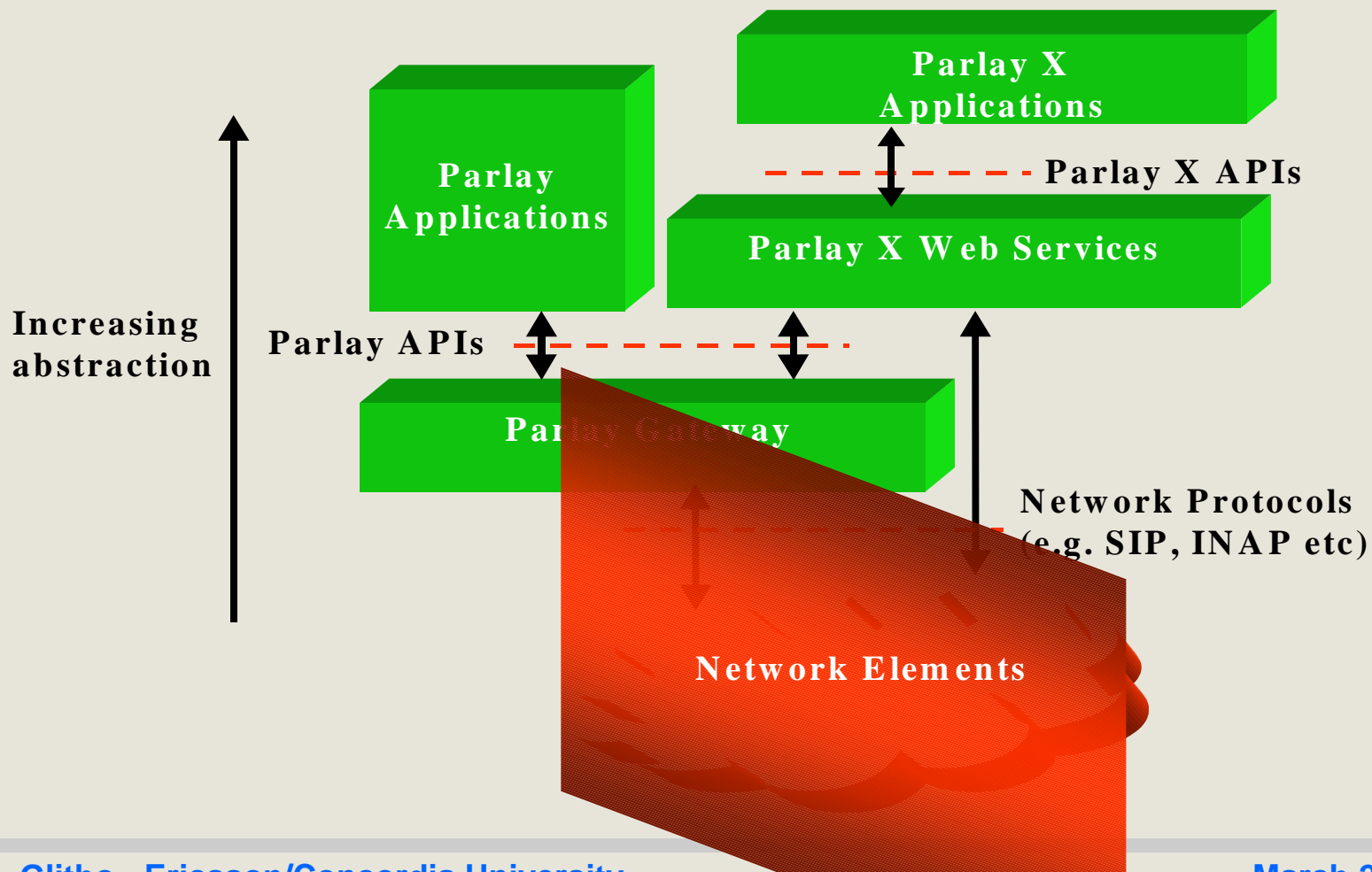
1. Introduction
2. Architecture
3. The services

# 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

# 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

▪

## Parlay-X Conferencing Basics...

- Conference
  - “Context / virtual room” to which participants can be added
- Participants
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- Media
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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

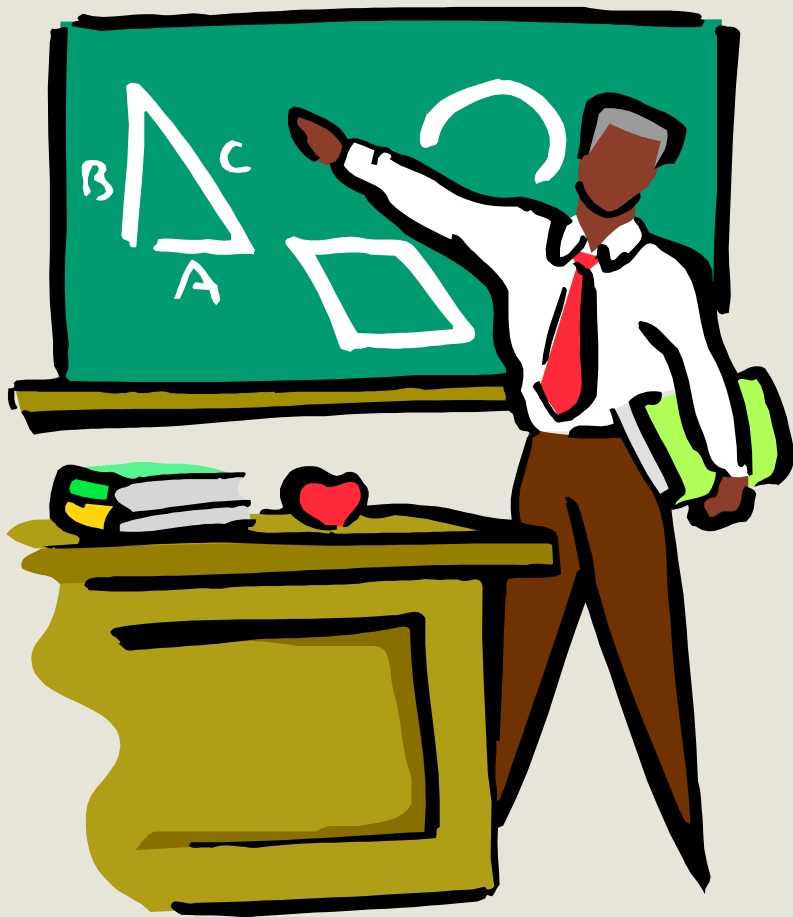
Get Received messages

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)

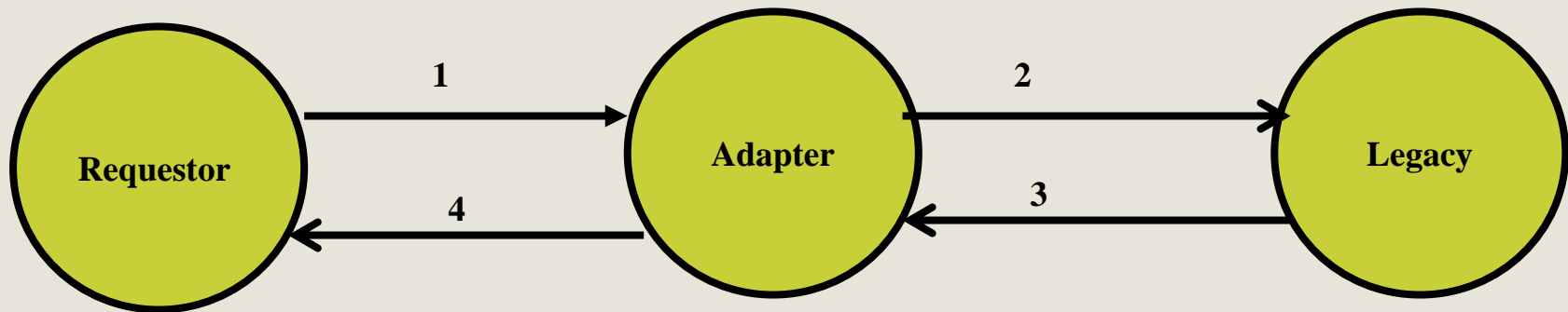
**Aim at providing solutions to common problems faced by designers when using Web services in an OMA environment**

- 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



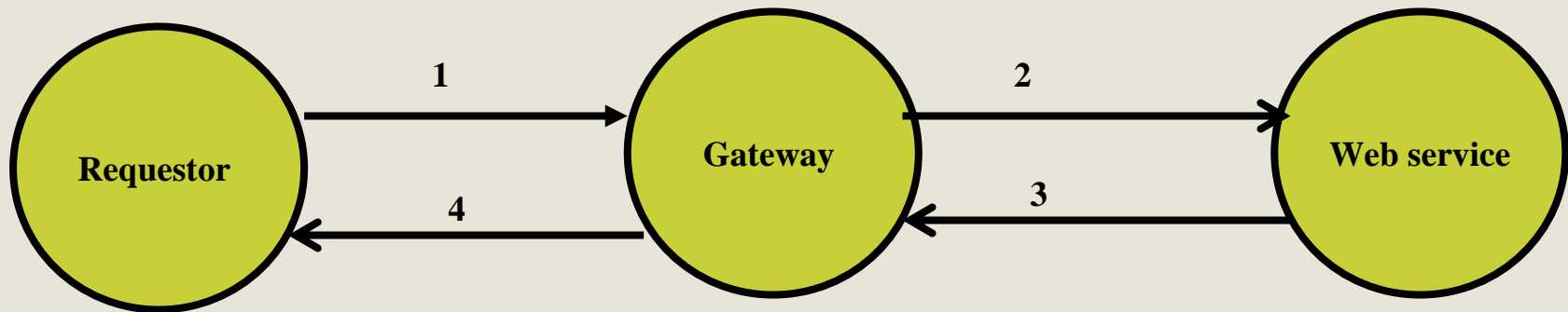
# Examples of deployment patterns

## The adapter pattern



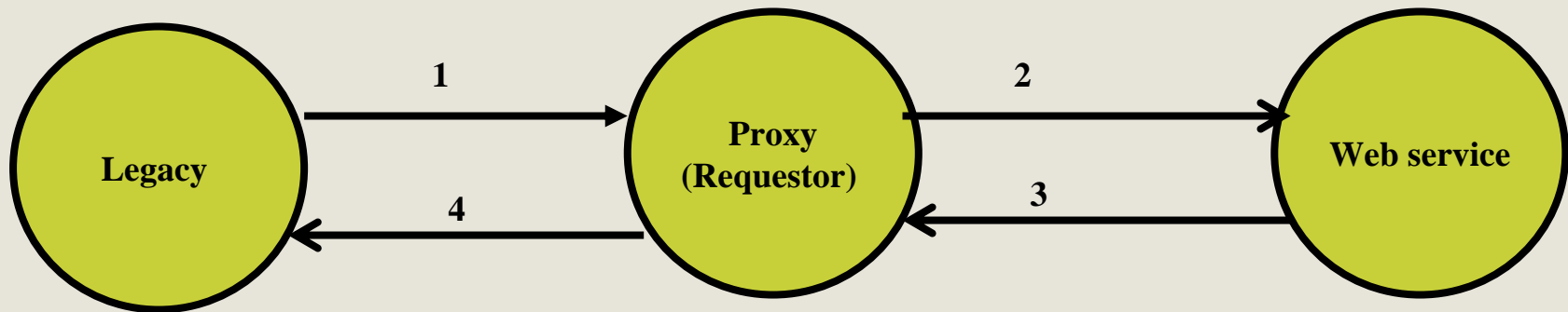
# Examples of deployment patterns

## The gateway pattern



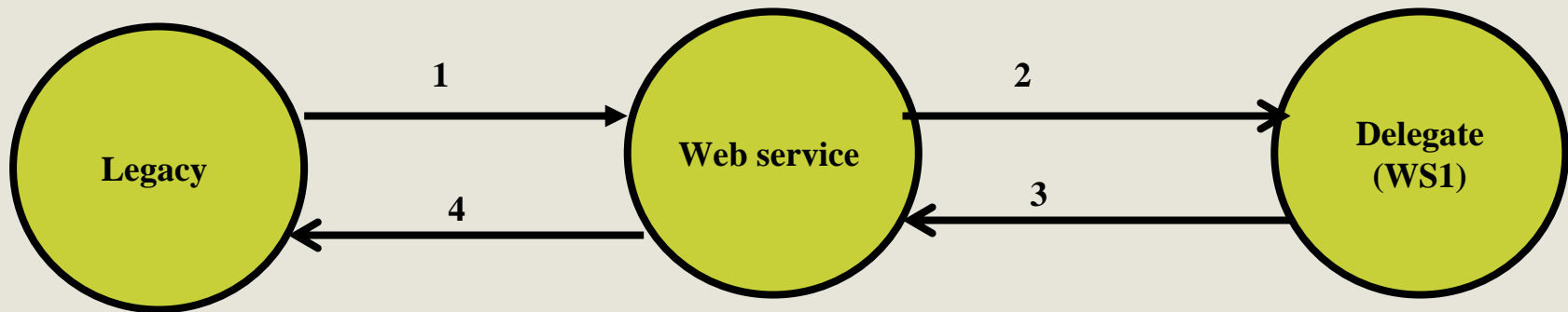
# Examples of deployment patterns

## The proxy pattern



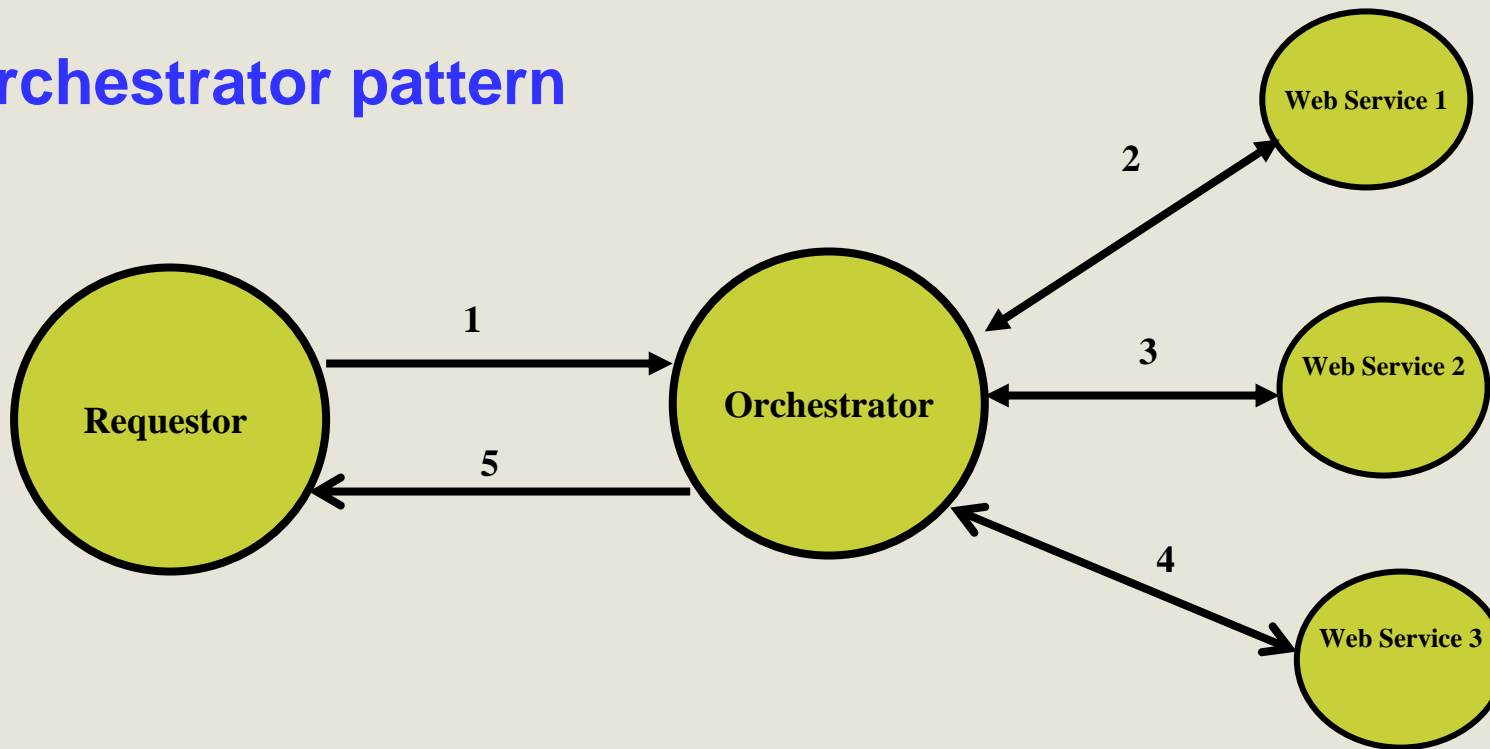
# Examples of deployment patterns

## The delegate pattern



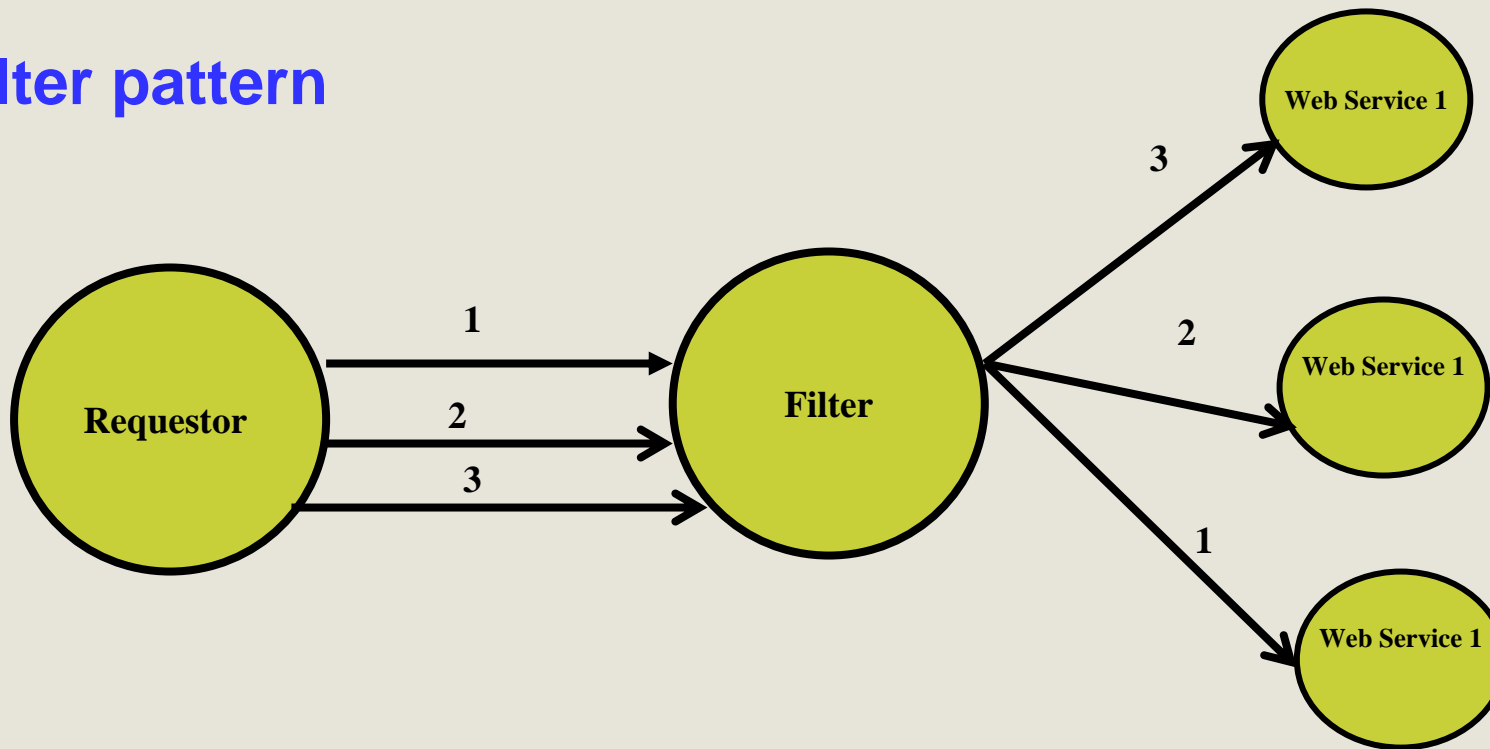
# Examples of deployment patterns

## The orchestrator pattern



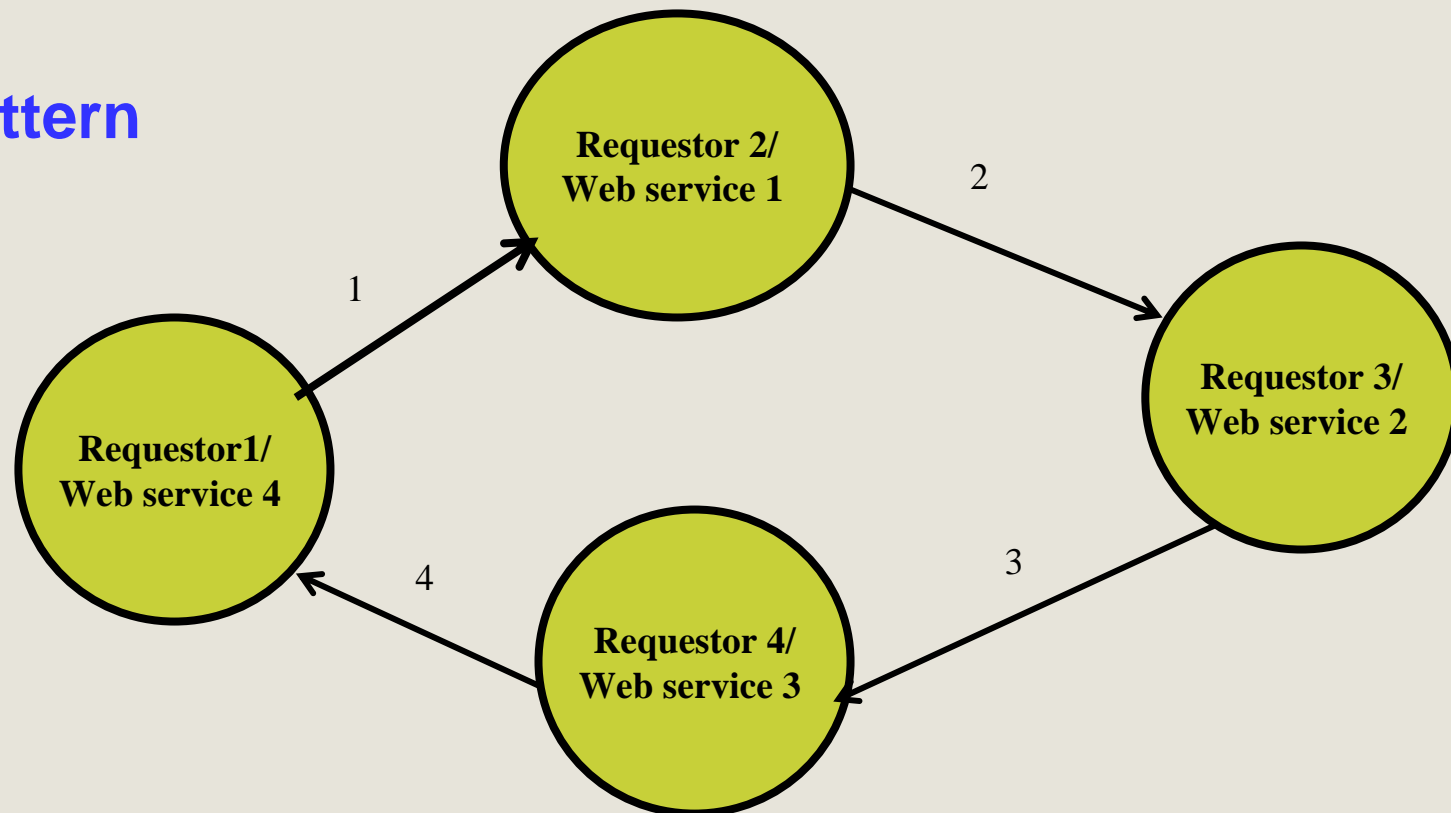
# Examples of deployment patterns

## 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

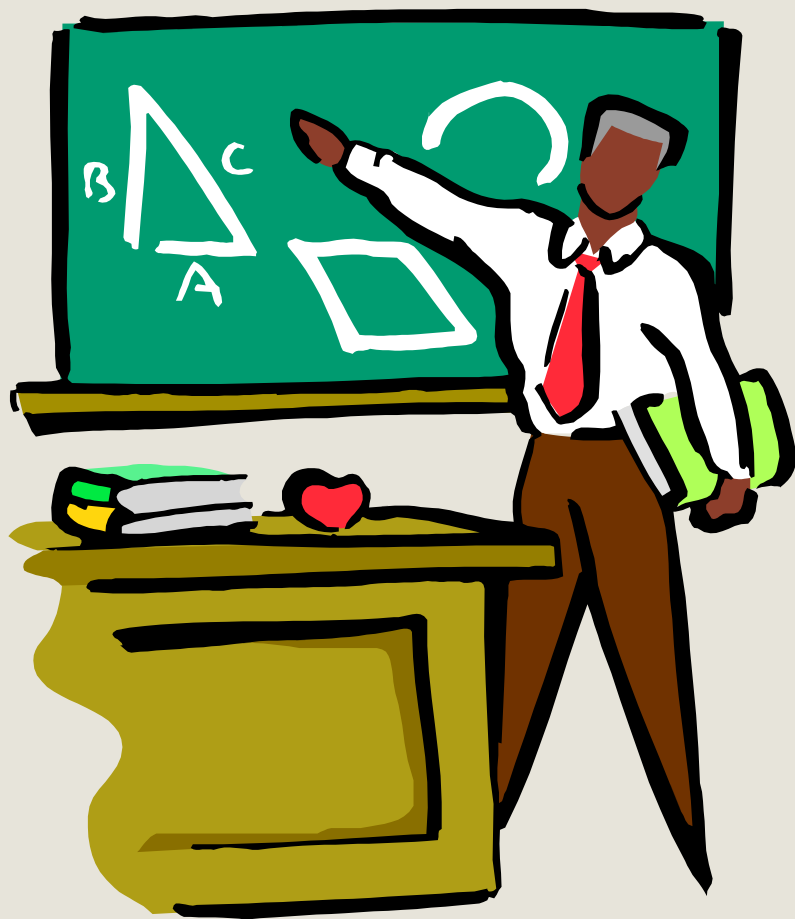
## 1. Parlay-X Web services

- 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

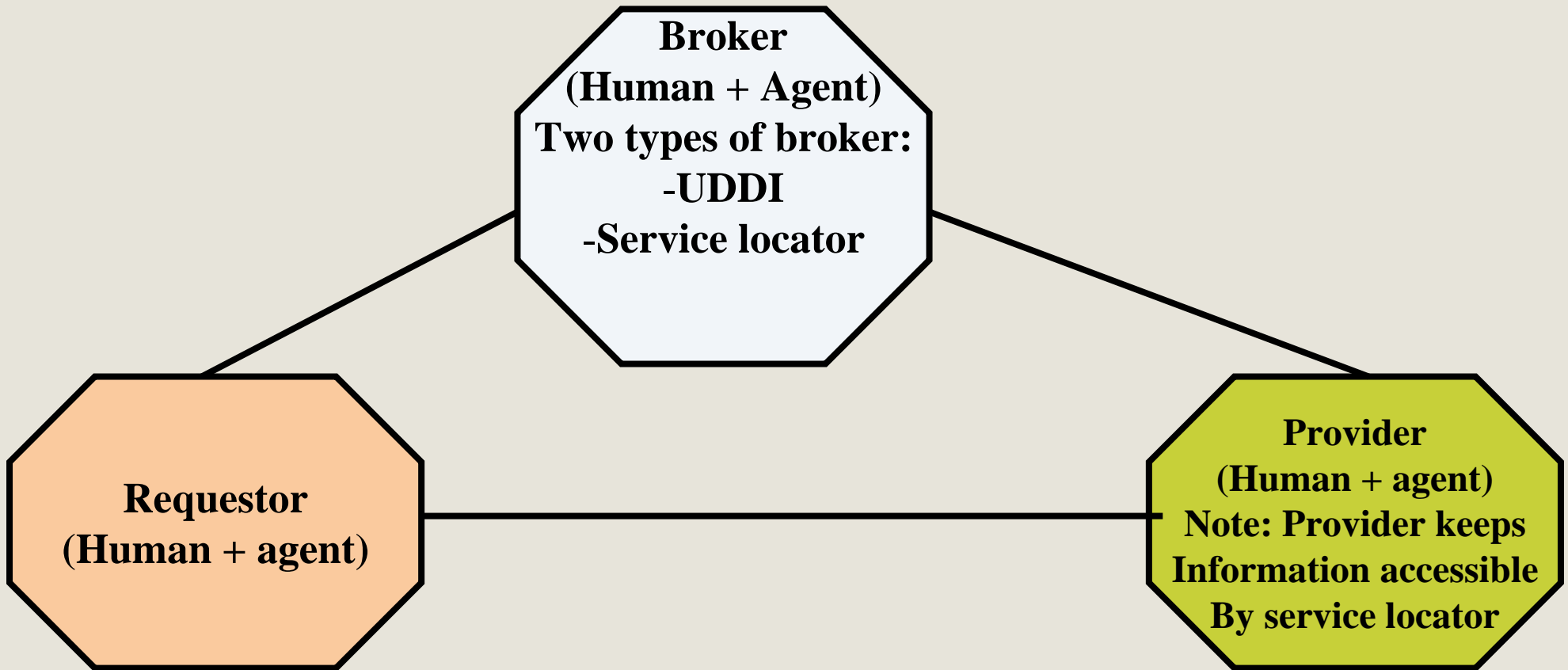
- Most companies active in the digital imaging industry (e.g Kodak, HP, Konica, Olympus and others)

# 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



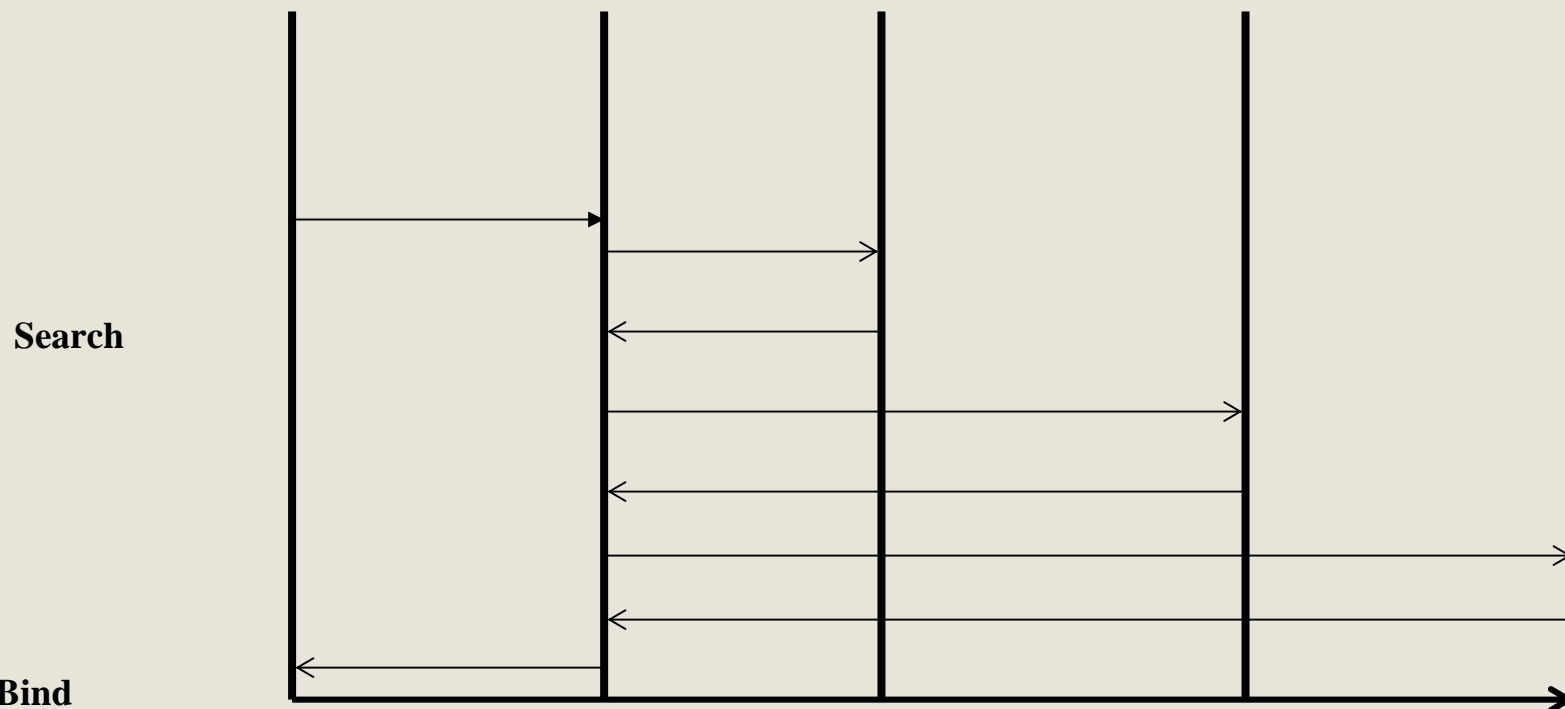
## Business model ...

### Catalogues (Examples of info)

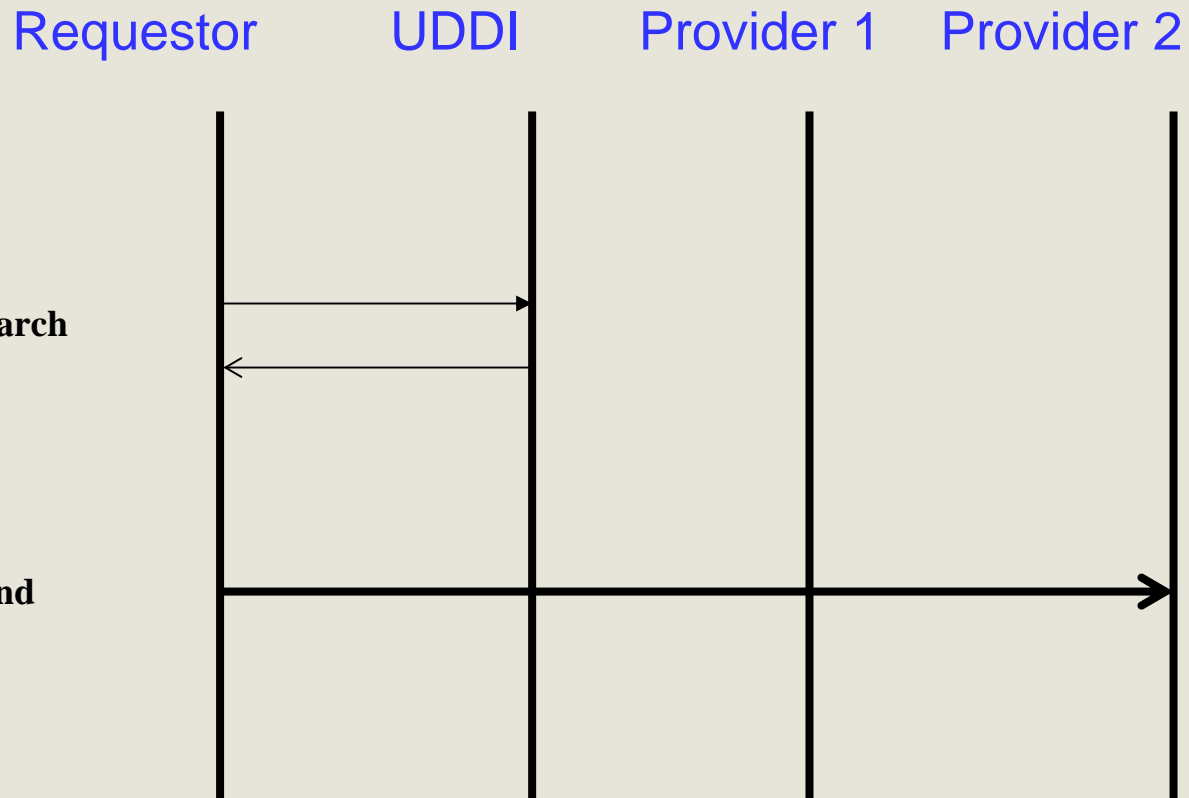
- Service property list
- Store list
  - Street address
  - Hours of operations
- Product list
- Price list
- Category list

# Examples of interactions ...

Requestor      Locator      UDDI      Provider 1      Provider 2



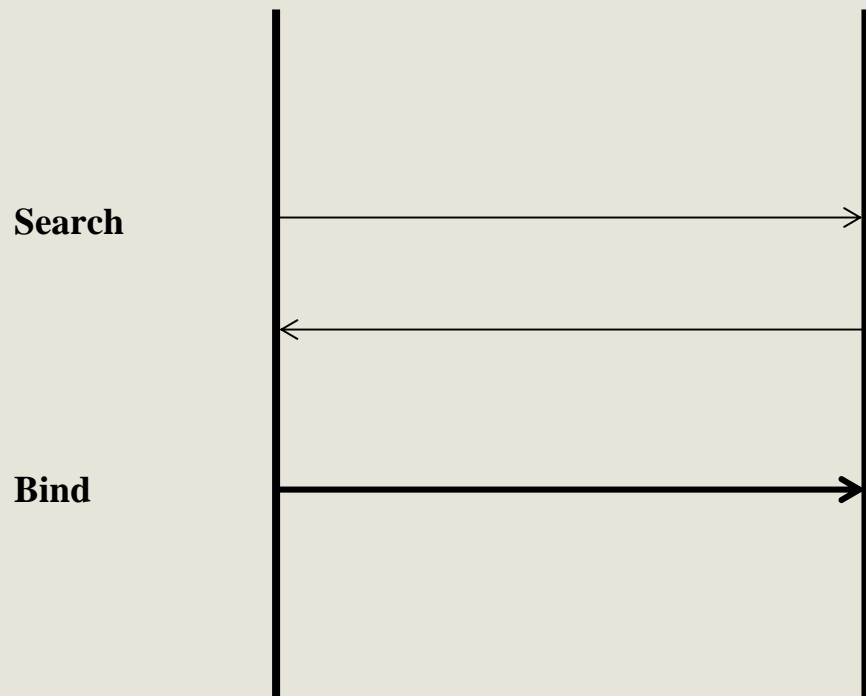
## Examples of interactions ...



# 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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