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
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
Parlay-X Call Control …

Handle busy
Handle Not reachable
Handle No answer
Handle off Hook
Parlay-X Conferencing Basics…

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

- Conference
- Participants
- Media
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
  Parties involved in the conference
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  audio/video/chat
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
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
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
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

```
Requestor --1--> Adapter --2--> Legacy
       |   4   |            |   3       |
       v   |       v            v
```

Examples of deployment patterns

The gateway pattern

1. Requestor
2. Gateway
3. Web service
4. Requestor
Examples of deployment patterns

The proxy pattern

1. Legacy → Proxy (Requestor)
2. Proxy (Requestor) → Web service
3. Web service → Proxy (Requestor)
4. Proxy (Requestor) → Legacy
Examples of deployment patterns

The delegate pattern

1. Legacy → Web service
2. Web service → Delegate (WS1)
3. Delegate (WS1) → Web service
4. Web service → Legacy
Examples of deployment patterns

The orchestrator pattern
Examples of deployment patterns

The filter pattern
Examples of deployment patterns

The workflow pattern

- Requestor 1/ Web service 4
- Requestor 2/ Web service 1
- Requestor 3/ Web service 2
- Requestor 4/ Web service 3
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)
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 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