

Web Services: Usage and challenges in mobile phones (computers)

W3C Seminar - Monday 6 March 2006 - Paris, France

Timo Skyttä

Director, Web Services

Nokia Technology Platforms



Topics

- Web Services & presentation scope defined
- Web Services - business ?
- Challenges in general, and some mobile specific....
- Nokia Web Services
- Application Examples



The Web and Web Services



The Web connects people to information
on a global scale

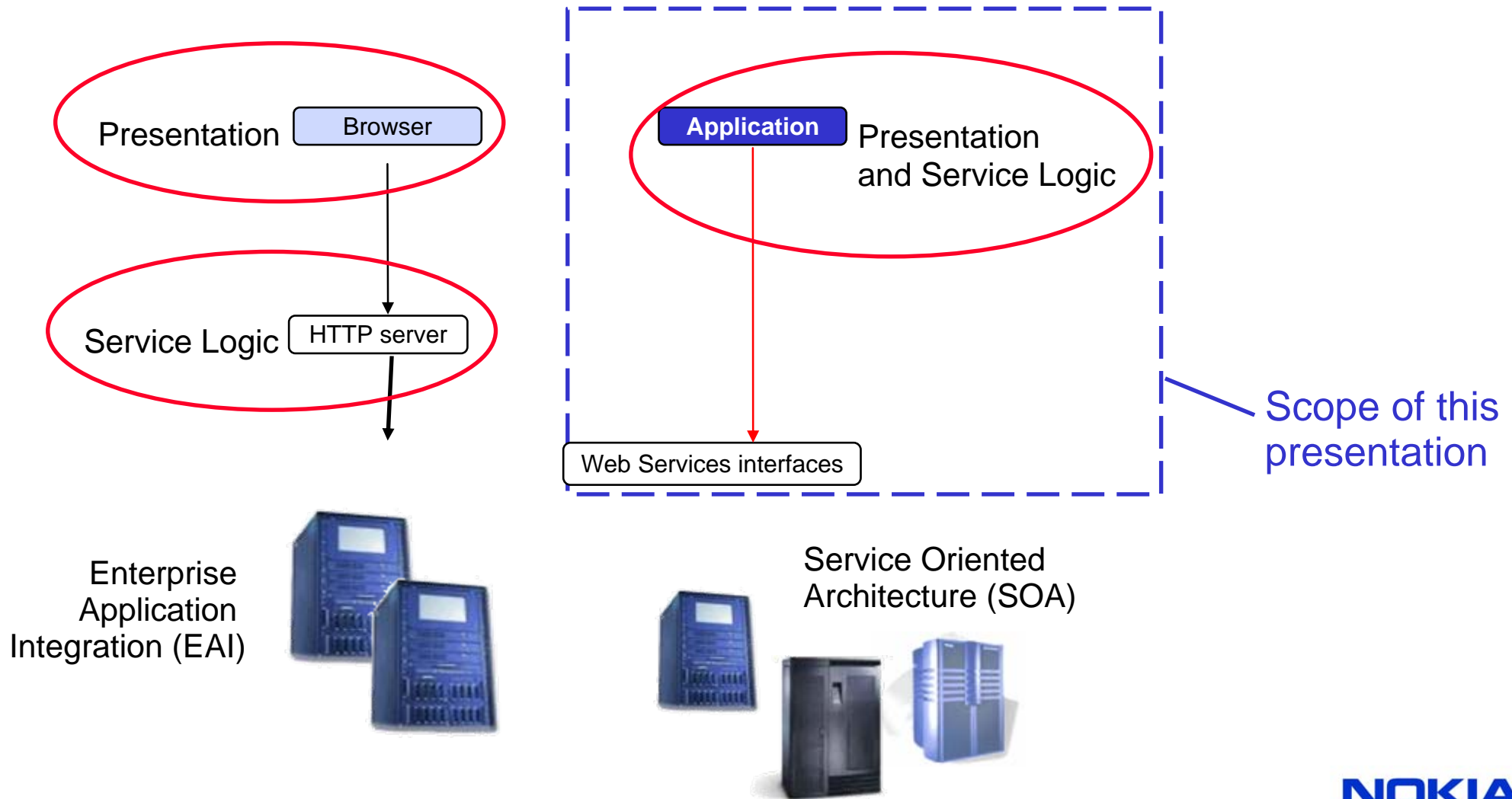


Web Services connect computer applications
to each other
on a global scale

"A perceived transition of the Web from a collection of Web sites to a computing platform serving applications to end users"

(GARTNER, Oct 2005)

Two models of mobilising service access



Web Services - business ?

Why Web Services

The deployment of Web Services technology aims to enhance existing services and to create new and innovative services.

- **Service/Consumer runtime independence !**
 - to facilitate interoperability across different hardware and software implementations, machine architectures and application programming interfaces (APIs).
- **Interoperability !**
 - to define an environment where applications can be created by combining multiple services in a single workflow (a.k.a. mashups). This will make it easy to adjust application workflow.
- **Automatic code generation (WSDL + tools) !**
 - In addition, interoperability will allow application designers to replace one service implementation with another for technical or business reasons.

This vision of Service-Oriented Architectures (SOAs) is rapidly becoming a reality through the standardization and deployment of Web Services technology.

Web Services enables a high level of connectedness

“Looking to accelerate your eBay business? The eBay Developers Program provides **access to the eBay marketplace through Web Services** so you can create software to make selling and buying on eBay even easier.” <http://developer.ebay.com/>

“Amazon Web Services (AWS) provides software developers **direct access to Amazon's ever-growing technology platform and product data.** Developers are empowered to innovate and build businesses by creating dynamic, highly-effective Web sites and Web applications.”
<http://www.amazon.com/gp/browse.html/103-5872145-4006252?%5Fencoding=UTF8&node=3435361>

“With the Google Web APIs service, software developers can **query billions of web pages directly from their own computer programs.** Google uses the SOAP and WSDL standards so a developer can program in his or her favorite environment - such as Java, Perl, or Visual Studio .NET.”
<http://www.google.com/apis/>

“The Appforce API is one of the industry's most successful Web Services APIs — **more than 20 percent of our more than 100 million monthly transactions go through the Appforce API.**”
<http://www.salesforce.com/developers/>

The logo for amazon.com, featuring the text "amazon.com" in a black sans-serif font with a registered trademark symbol, and a curved orange arrow underneath the text pointing from the letter 'a' to the letter 'z'.The logo for salesforce.com, featuring the text "salesforce.com" in a black serif font with a registered trademark symbol, and the tagline "Success On Demand." in a red sans-serif font below it.The eBay logo, consisting of the word "eBay" in a stylized font where each letter is a different color: 'e' is red, 'b' is blue, 'a' is yellow, and 'y' is green.The Google logo, featuring the word "Google" in its signature multi-colored font (blue, red, yellow, blue, green, red) with a trademark symbol.

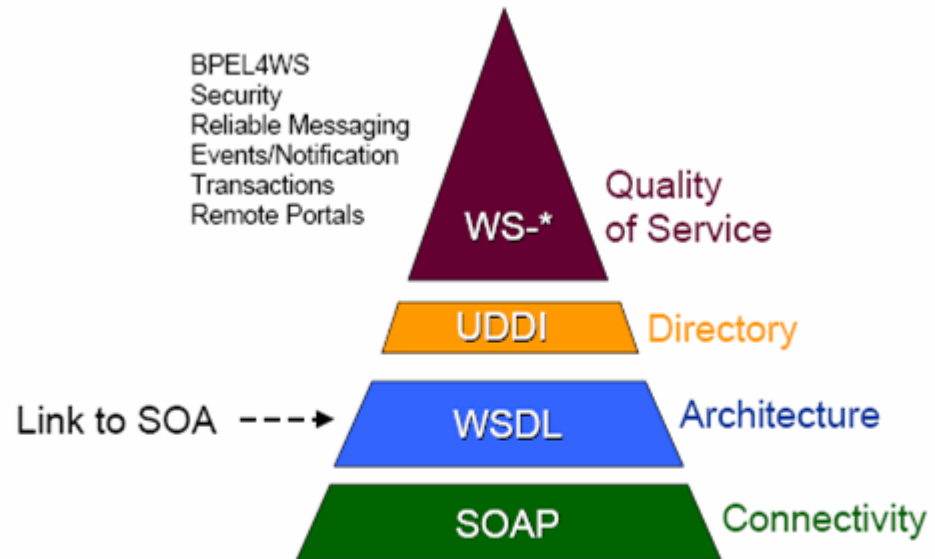
Market maturing

Gartner Hype Cycle for Web Services, 20 July 2005:

“No longer are Web Services decisions questions of whether Web Services have value; instead, the question is how deeply to dive into Web Services to extract value.”

Gartner Market Focus: Trends and Forecast for IT Professional Services for Web Services and SOA, 2005 by Michele Cantara, 27 June, 2005:

“The IT professional services market involving Web Services is forecast to reach \$261billion by 2008, representing a pervasive shift in technology. Surveys show that most systems integrators are developing frameworks, methods and tools to accelerate Web Services solutions.”



Challenges in general and some mobile specific....

Nokia strategy approach to Web Services standardization and interoperability

- Integrate with the Internet, i.e. whatever is winning out there
 - Drive generic Internet standards in relevant organizations such as W3C, OASIS, Liberty Alliance and WS-I
 - Try to avoid mobile specific standards at all cost (OMA, 3GPP)
 - Work with IT-vendors and other industry players to introduce optimizations that are beneficial to all parties including mobile sw-platform providers
 - Drive use of well specified, interoperable specifications to minimize cost for all parties included on the value chain

Standardization challenges

- In general, it seems standardization, while doing adequate job, is moving slower than the marketplace (but this is quite normal)
- For any given problem there seems to be at least 2 competing solutions or....
- There are multiple versions of the solution, some of which are standardized, some of which are in the midst of standardization
- Mobile SW-platforms are today mostly not easily upgradeable, thus you need to:
 - Build an internal WS-architecture which anticipates changes
 - At any given time try to pick up the “winning horses” on the marketplace to be included in the platform
- Currently not too many folks think about WS-clients on devices (PC, TV, Digi-TV box, Mobile phone etc...), a lot of the work is server-to-server focused and not always consumer oriented
- Standardization is split between several orgs (W3C, OASIS, WS-I) but fortunately it seems they all have found their role

Interoperability challenges

- The Web Services architecture, and what specifications make it, is not yet properly nailed down
 - REST and WS-* approach gaining wide acceptance, neither properly standardized yet
- Whilst Basic web services building blocks are standardized and quite adequately profiled (WS-I Basic Profile 1.x), there is still a lot to do with more advanced Web service specifications
- Many of the advanced Web service specifications, mostly emerging from WS-* family, are very generic by default and need profiling to ensure interoperability, but this is still in the works
- However, there is good adoption on the marketplace, and thus vendors do need to ship Web Services solutions and keep on upgrading them as the specs mature
- For a Mobile SW-platform this situation is quite new compared to older Telecom standardization (standardize first, implement then) and also due to the fact that Over The Air (OTA) update of Mobile SW is just emerging
- It is vital that emerging specifications contains a well defined, interoperable and tested core set of features – generality is good but not at the expense of interoperability
- There is no Internet Service platform, Liberty is an effort to that direction, but today there is just divergence between the players

General Performance worries around mobile devices and Web Services

- Processing requirements:
 - Claim: CPUs in mobile devices can't handle complex XML Parsing and XML Security (signature, en/decryption) and in general can't deal with the processing needs of WS
 - Truth: Based on Nokia demo/pilot activities during 2002-2005 we know that current Smartphone implementations have no problems on handling WS messages/features and it only gets better very soon.....
- Limited downlink/uplink bandwidth:
 - Claim: WS and XML are verbose, thus the downlink/uplink capacity generally available for mobile devices can't provide acceptable response times for the applications
 - Truth: WS applications typically send/receive information only when needed, thus good design principles can reduce the overhead significantly and provide acceptable response times to users even with basic GPRS data rates (<40kbps). Emergence of widely used faster uplinks such as E-GPRS (~100kbps) remove this worry, and it only gets better very soon (W-CDMA +300kbps, Wlan 11mbps)
 - Introducing compression, such as GZIP (part of ZLIB) can help while waiting for W3C EXI results

Nokia Web Services

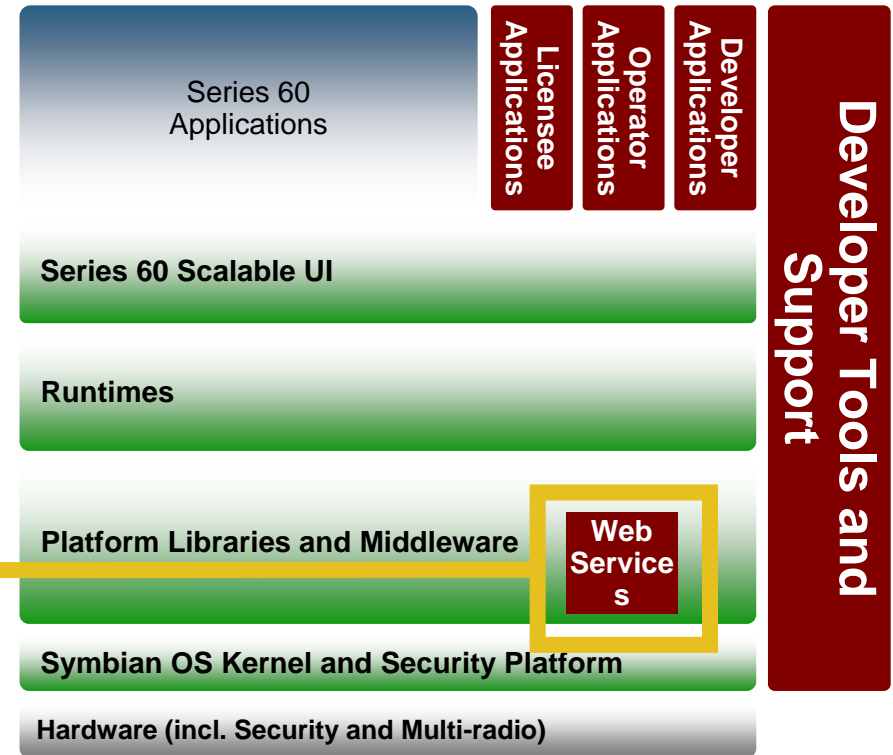
SOA for S60 Platform: Service Middleware offering

Standard functionality:

- Connect to WS-I Basic compliant services
- Send and receive messages over mobile networks and the Internet using Web Services protocols
- Maintain control over Web Services sessions
- Apply communication security with OASIS WS-Security

Identity Web Services offering:

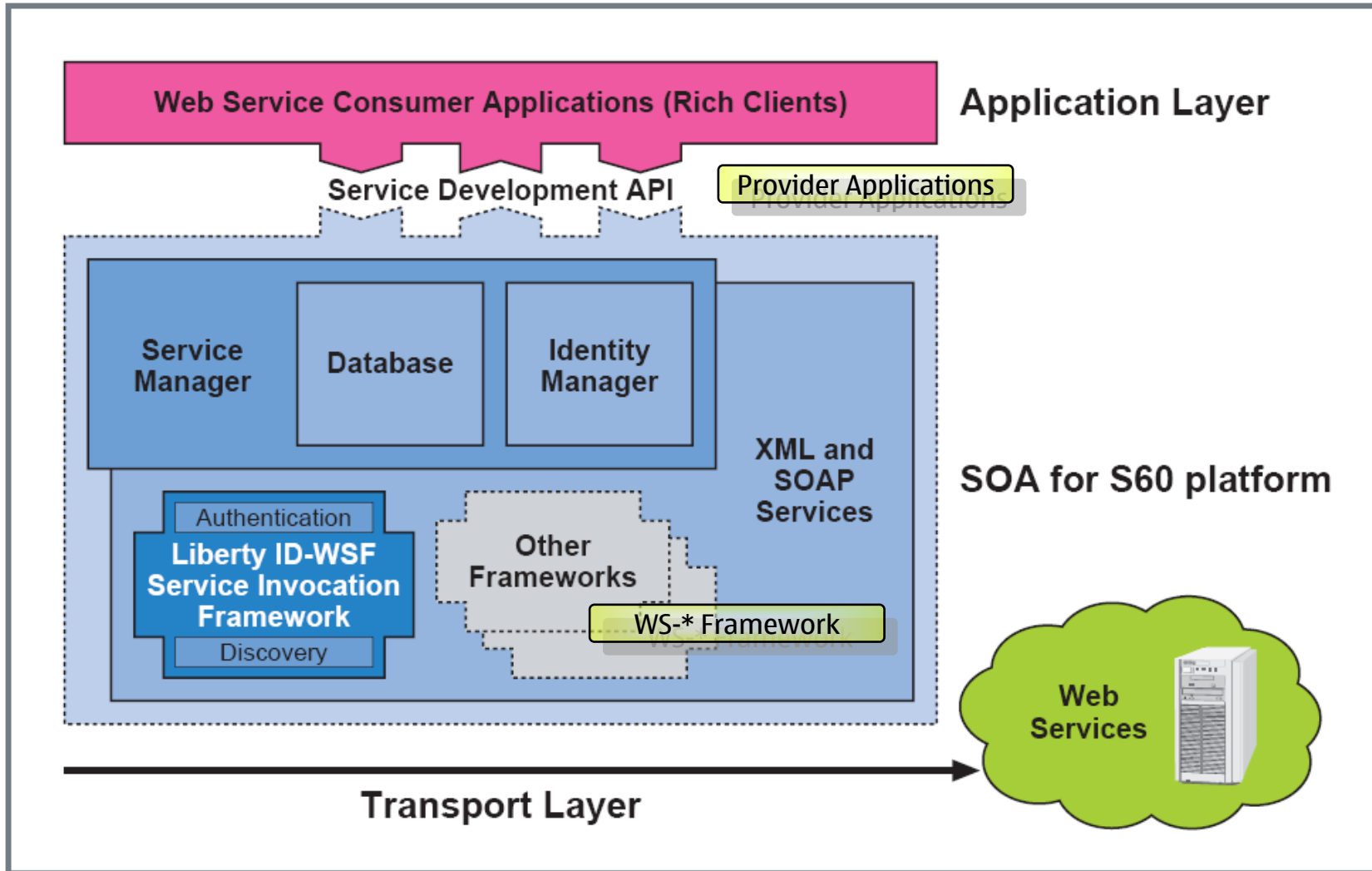
- Connect to Liberty Identity Web Services Framework compliant services
- Manage services



S60 Open to new features

The Nokia Web Services framework for devices

We are working on:

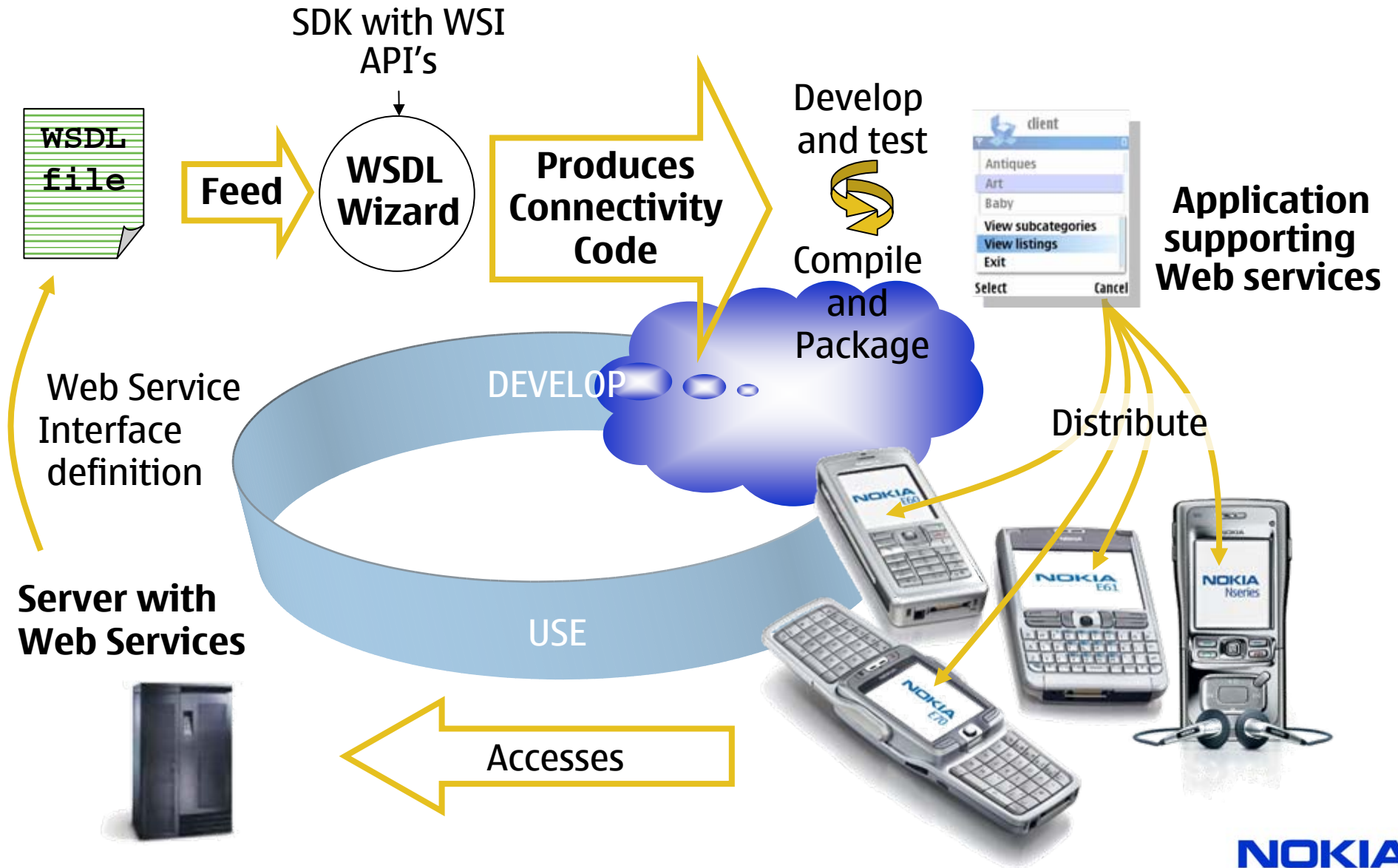


Nokia Web Services Availability

| Platform | Series 80 | | | S60 Platform | | | |
|------------------------|------------------------------|--|-----------------------------|--|---|----------------------------------|--|
| Runtime | Symbian C++ | | Java | Java | Symbian C++ | | |
| Product | Nokia Web Services Framework | Nokia Web Services Enhancement for Series 80 | Nokia Web Services for Java | JSR 172 for MIDP 2 | Nokia SOA for S60 | Nokia SOA for S60 - REST plug-in | Nokia Web Services Framework for S60 2 nd edition |
| Platform version | Series 80 2.0 | | Series 80 CDC Java | S60 2 nd Ed. Feature pack 3 | S60 3 rd Edition | | S60 2 nd Ed. |
| Supported technologies | WS-I BP ID-WSF 1.0 | WS-I BP ID-WSF 1.0 | WS-I BP, ID-WSF 1.0 | JSR 172 | WS-I BP ID-WSF 1.1 | "XML REST" style | WS-I BP ID-WSF 1.1 "XML REST" style |
| Distribution | 9300, 9500 | SDK plug-in and .SIS | SDK plug-in and .JAR | N90, N70 etc | N91, E-series, 3250 etc | SDK plug-in and .SIS | SDK plug-in and .SIS |
| Availability | 4Q/2004 | 3Q/2005 | 3Q/2005 | 3Q/2005 | 1Q/2006 *) | | 1Q/2006 *) |
| Tools | - | Visual Studio WSDL converter. | Eclipse WSDL converter. | WSDL converter for Nokia developer's suite 3.0 for J2ME. | To be announced – check www.forum.nokia.com regularly! | | |

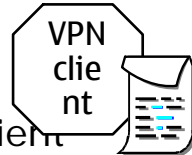
*) Planned

SOA Platform Tools "value circle"

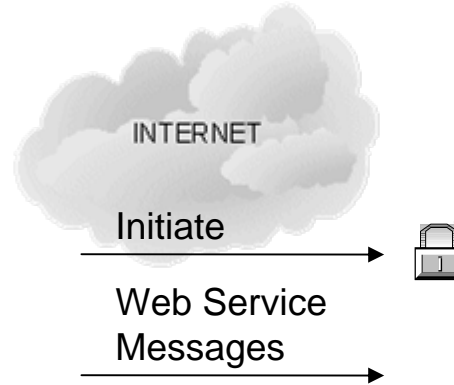


Application examples

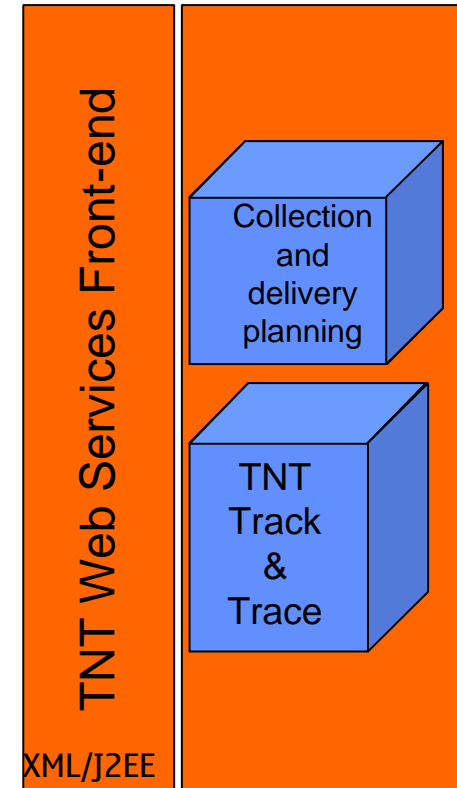
Web Services enhanced Partner process



1. Starting IBM WECM VPN client
2. Scanning consignment number using Nokia 9500 camera and Scanbuy barcode reader software



3. Use Nokia Web Service Framework
 - 3.1 Initiate connection to TNT WS enabled system
 - 3.2 Send delivery data over GPRS using WS messages



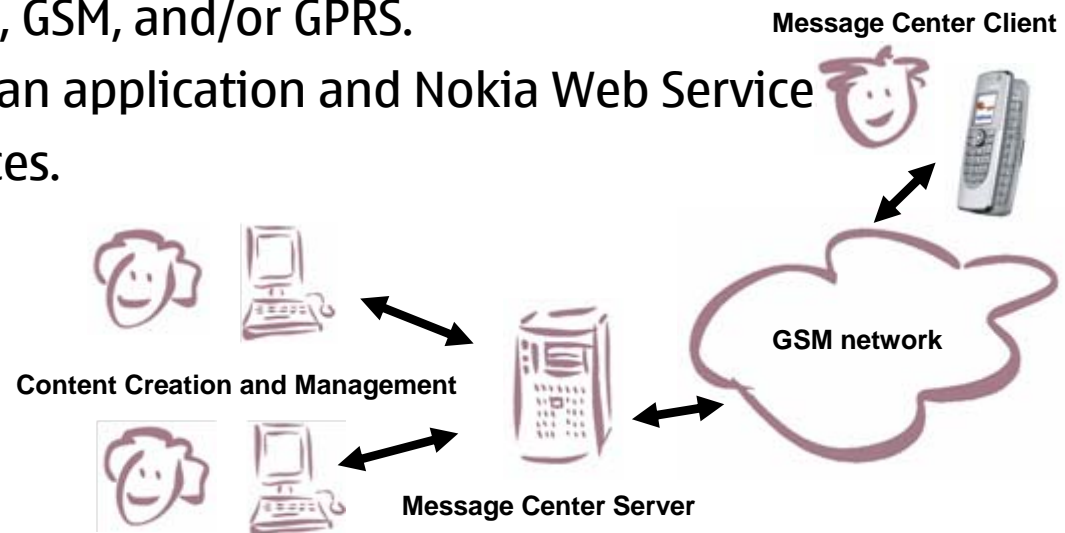
SysOpenDigia Success Case: Pfizer

- Pfizer Inc is a leading global pharmaceutical company.
- A local affiliate, Pfizer Finland, is using the SysOpenDigia Message Center with Nokia 9300 and Nokia 9500 Communicators to let sales representatives access medical data while on the move.
- Value of the combined solution:
 - More-effective communication among key users.
 - Enrichment of the information mix with a new tool and channel.
 - Cost savings from wireless data compared with print data.
 - Option of immediate or scheduled delivery of information.
 - Support of various content types: SMS, MMS, video, and applications.
 - Ability to be operator-hosted or run on the corporate intranet or extranet.



SysOpenDigia Message Center Overview

- SysOpenDigia Message Center is a cost-efficient way to distribute content to mobile devices.
- Key technologies:
 - Linux-based back end.
 - Data traffic process over SMS, MMS, GSM, and/or GPRS.
 - Client technology based on Symbian application and Nokia Web Service
 - Available for Nokia Series 80 devices.
- Implementation for Pfizer Finland:
 - SysOpenDigia Message Center.
 - Symbian client.
 - Linux server.
 - Browser-based content management.
 - Nokia 9300/9500 Communicators.



Case Radio@AOL

Authentication services



2. Get the security token and address of the Discovery Service

3. Get the security token and address of Radio@AOL Service

Discovery services



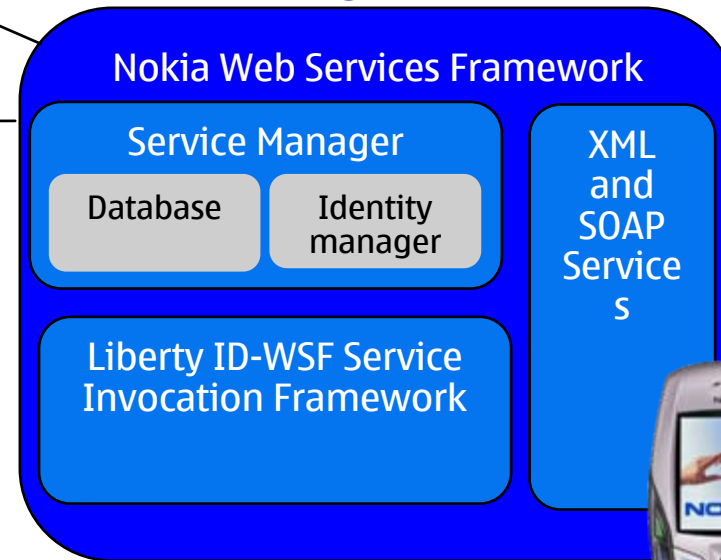
1. Create a connection to Radio@AOL

5. Ultravox™ stream

Ultravox Stream



Save and write presets.
Get genres & stations.
Get stream url for a station



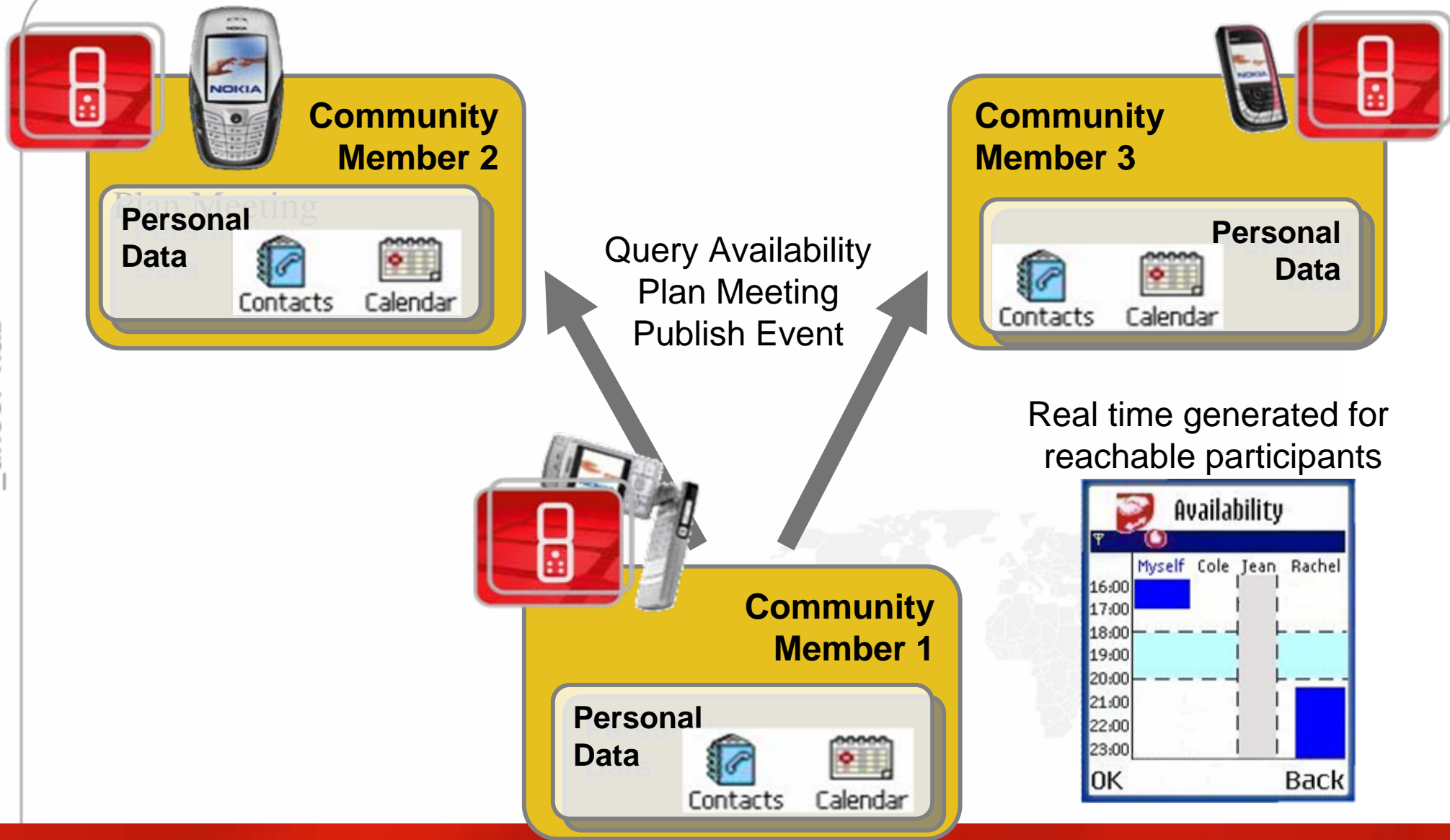
4. Send XML messages to Radio@AOL

Radio@AOL



Radio@AOL Service

Community Information Share Service



_GROUP R&D

My music, my tastes, my friends, always with me

Synchronised platforms

Mobile



PC



Web



Discover great new music, tag your songs, share
your tastes, keep an ear on your friends...

Further information

<http://www.nokia.com/webservices>

<http://www.forum.nokia.com/>

***Mobile Web Services: Architecture and
Implementation***

Frederick Hirsch, John Kemp, Jani Ilkka

ISBN: 0-470-01596-9

