



INTRODUCTION TO WEB SERVICES



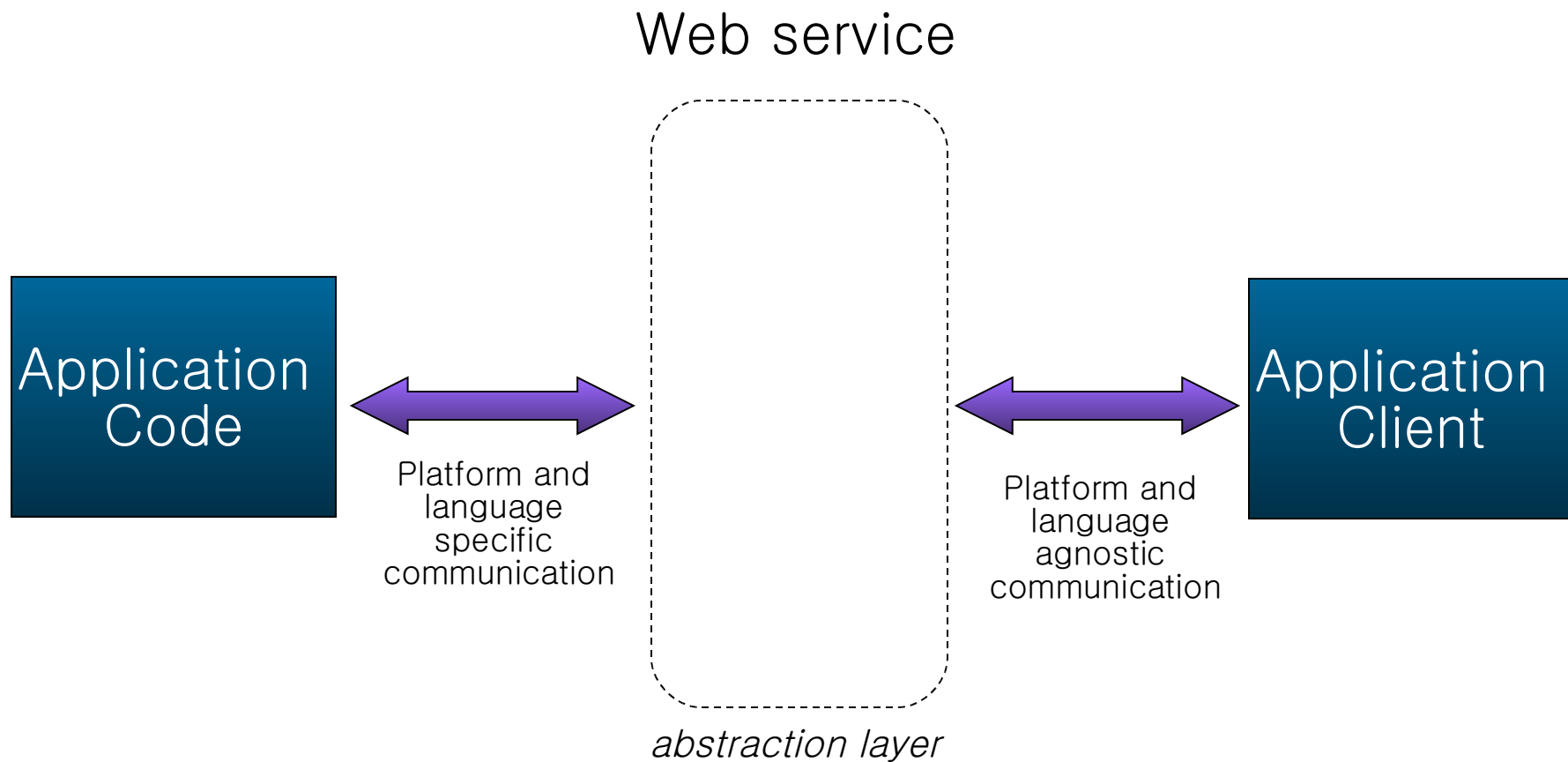
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Web Service

- ◆ A *Web Service* is a network accessible interface to application functionality, built using standard Internet protocols
- ◆ A Web Service exposes functionality to a consumer
 - Over the Internet or intranet
 - A programmable URL
 - Functions you can call over the Internet



Web service simplified



Web Service

Based on Web standards

- ⊕ HTTP/(S), XML, SOAP, WSDL, UDDI
- ⊕ Can be implemented in any language on any platform
- ⊕ Component-like, reusable
- ⊕ Not tied to any platform / languages

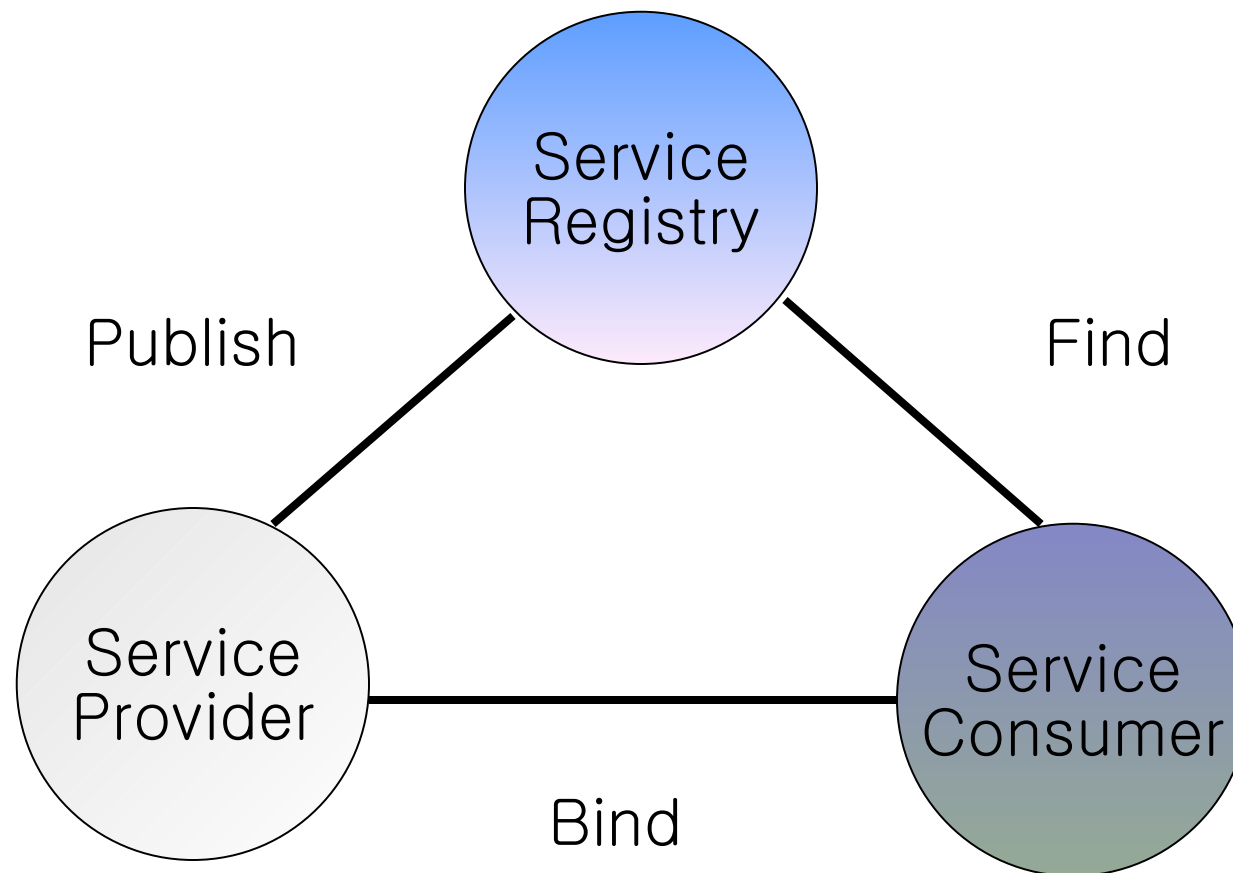


Components of a Web Service

- A standard way for communication (**SOAP**)
- A uniform data representation and exchange mechanism (**XML**)
- A standard meta language to describe the services offered (**WSDL**)
- A mechanism to register and locate WS based applications (**UDDI**)



The Web Service architecture



Underlying Technology Web Service Stack

Directory: Publish & Find Services:	UDDI
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Inspection: Find Services on server:	DISCO
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Description: Formal Service Descriptions:	WSDL
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Wire Format: Service Interactions:	SOAP
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Universal Data Format:	XML
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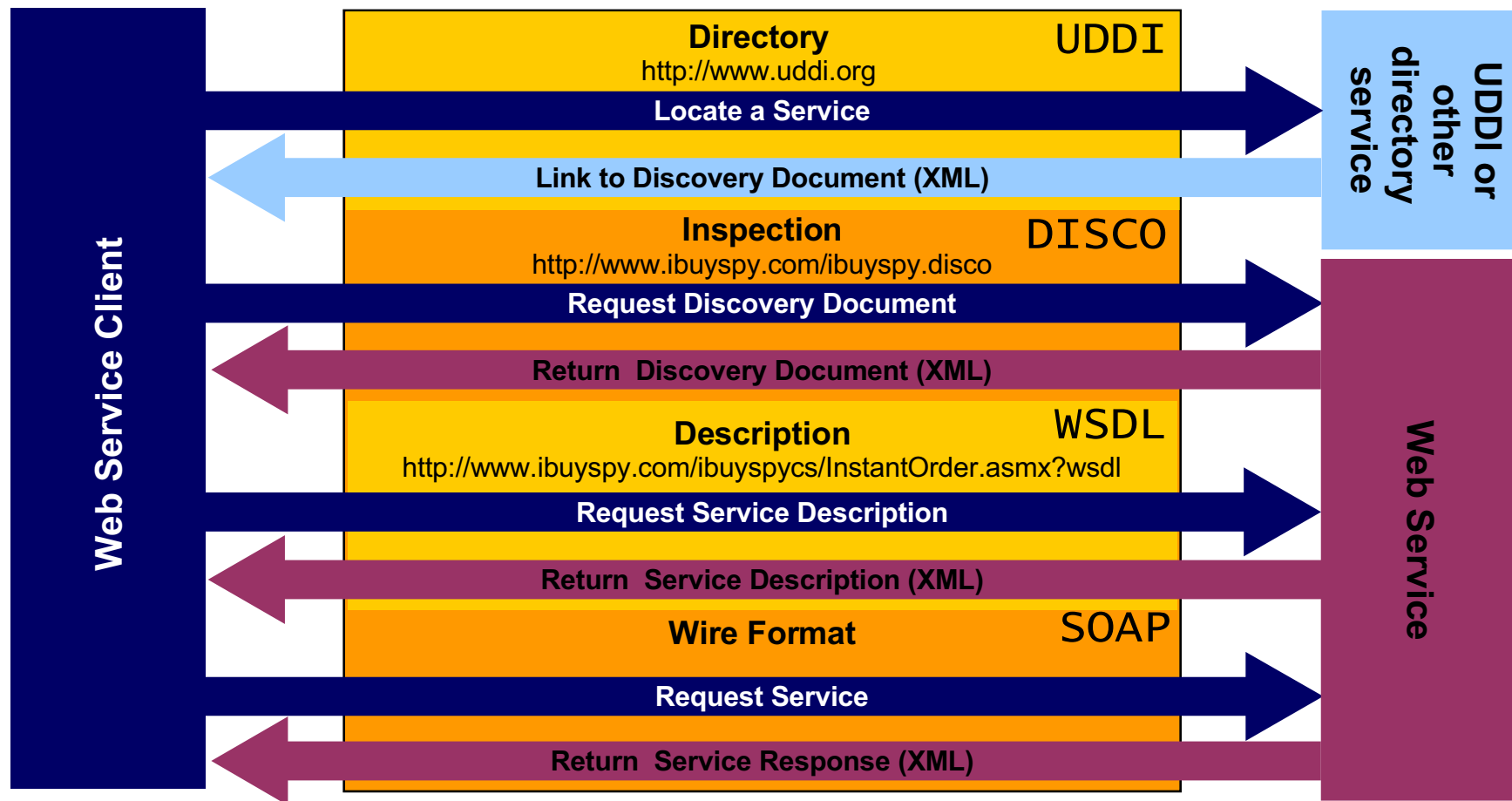
Ubiquitous Communications:	Internet
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Simple, Open, Broad Industry Support



Underlying Technology

Web Service Stack



Universal Description, Discovery and Integration (UDDI) Protocol

- ▶ Enables enterprises to quickly and dynamically discover and invoke Web Services both internally and externally
- ▶ Yellow pages of Web services

Examples

- www.uddi.org
- www.biomoby.org
- www.xmethods.com

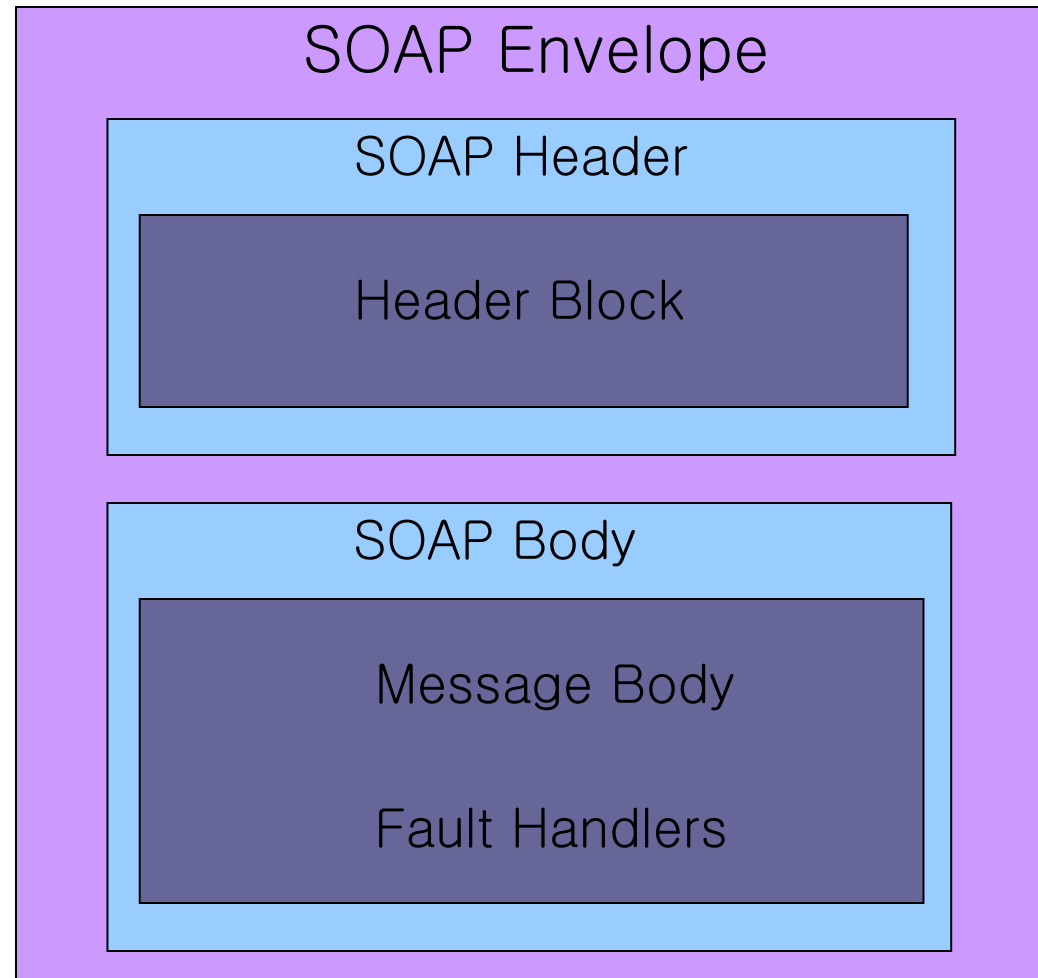


Simple Object Access Protocol (SOAP)

- SOAP is a lightweight (XML-based) protocol for exchange of information in a decentralized, distributed environment. It consists of mainly of:
 - an envelope that defines a framework for describing what is in a message and how to process it
 - relies heavily on XML standards (schemas & name spaces)



The SOAP message structure



Web Service Definition Language (WSDL)

- ▶ WSDL is an XML format for describing network services operating on messages containing either document-oriented or procedure-oriented information.
- ▶ It defines Web Service as collection of network endpoints or ports.



- The following is a list of [Web service markup languages](#).
- [BEEP](#) - Blocks Extensible Exchange Protocol
- [BPEL](#) - Business Process Execution Language
- [E-Business XML](#)
- [REST](#) - Representational State Transfer
- [SOAP](#) - outgrowth of [XML-RPC](#), originally an acronym for Simple Object Access Protocol
- [UDDI](#) - Universal Description, Discovery, and Integration
- [WSDL](#) - Web Services Description Language
- [WSFL](#) - Web Services Flow Language (superseded by [BPEL](#))
- [WSCL](#)
- [XML-RPC](#) - XML Remote Procedure Call



XML

- Stands for “Extensible Markup Language”
- Language specification for describing data
 - Syntax rules
 - Syntax & Grammar for creating Document Type Definitions
- Widely used and open standard
 - Defined by the World Wide Web Consortium (W3C)
 - <http://www.w3.org/TR/2000/REC-xml-20001006>



Advantages of WebServices

- ◆ Allow programs written in different languages on different platforms to distribute an application in a standards-based manner.
- ◆ Adapt the loosely coupled Web programming model for use in applications that are not browser based.
- ◆ The goal is to provide a platform for building distributed applications using software
 - running on different operating systems and devices,
 - written using different programming languages and tools from multiple vendors,
 - all potentially developed and deployed independently.



Footer

- Web Service security
 - Web Service Security Model Principles
 - WS-Security
 - WS-Policy
 - WS-Trust
 - WS-Privacy
 - *WS-SecureConversation*
 - *WS-Federation*
 - *WS-Authorization*

Microsoft Passport Service – Single click sign-on!



Future....

- Semantic Web Services
 - Extension of the current web – information is given well-defined meaning
 - Contains machine readable instructions and metadata expressed in RDF.

Leads to intelligent web.



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Questions?

