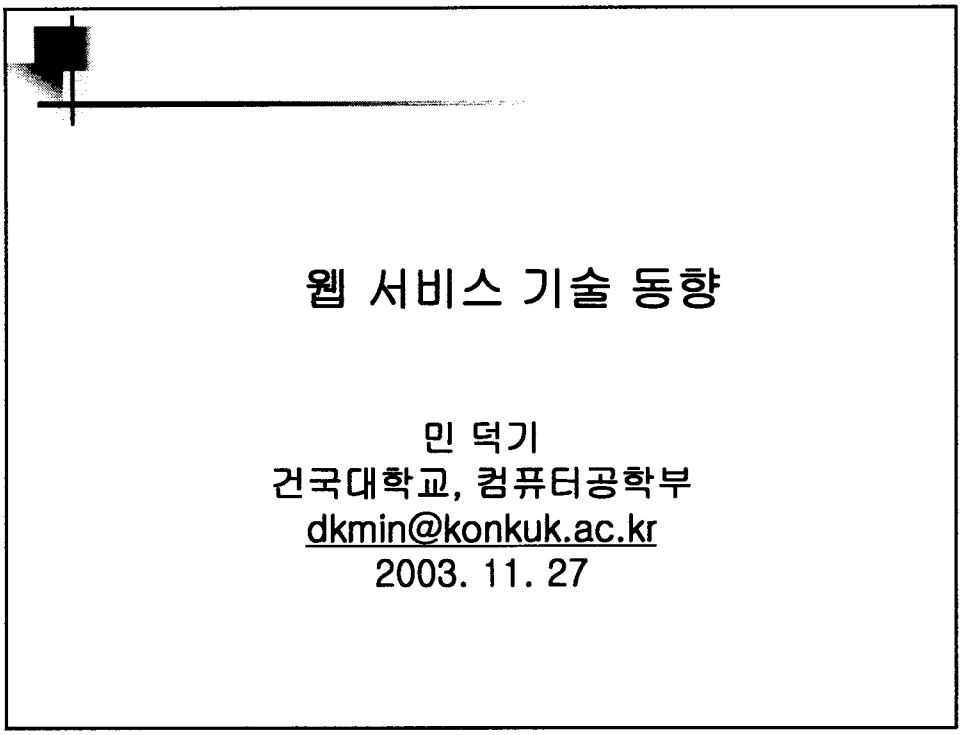
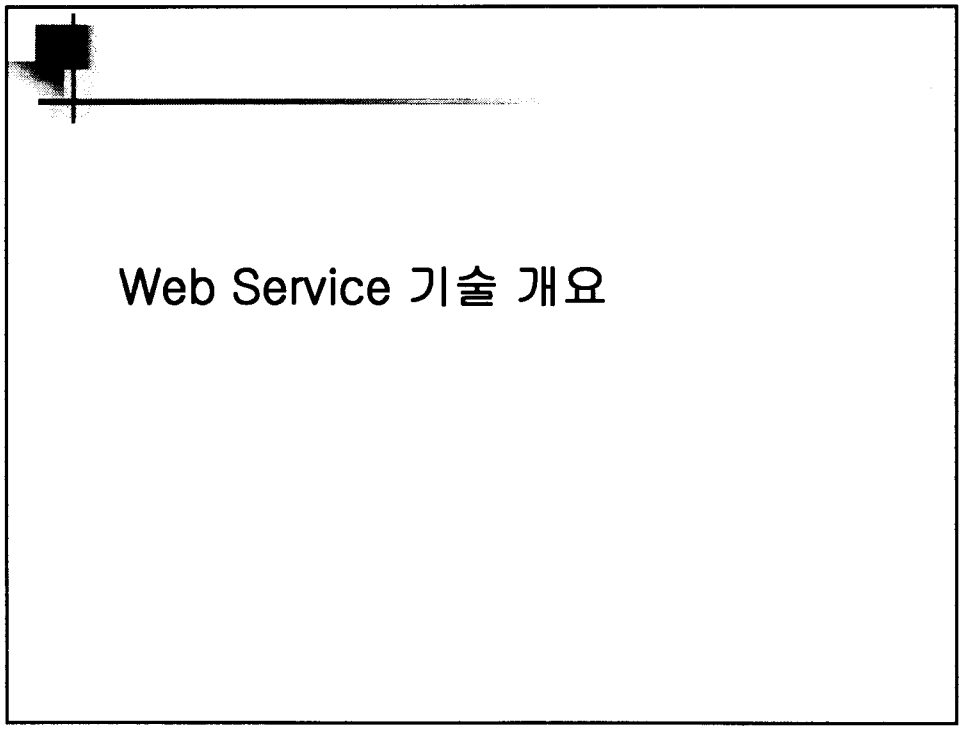


웹 서비스 기술 동향

민 덕기
건국대학교, 컴퓨터공학부
dkmin@konkuk.ac.kr
2003. 11. 27



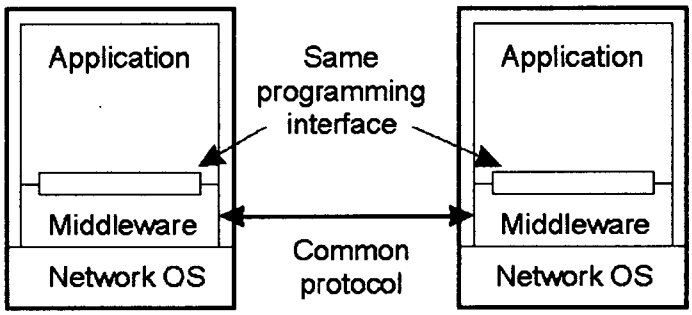
Web Service 기술 개요

What is Web Service

Service-Oriented
Standardized Distributed Computing
on LAN and WAN

Standardized Distributed Computing

- Provide standardized and complete environment for open and interoperable distributed computing
  - Communication protocol
  - Application Programming interface
  - Discovery, Reference



Web Service Model

- Combination of Web Model and Distributed Object Model
  - Web Model (90년대 중반)
    - Scale: On WAN (Globally Scalable)
    - Key Tech: HTTP Protocol, XML Data Representation
    - Focus:
      - Distributed and Integrated Information
      - Simplifies the use of network resources
  - Distributed Object Model (90년대 후반)
    - Scale: On LAN
    - Key Tech: Interface, Naming and Directory Service
    - Focus: Interoperability, Encapsulation
      - Each object implements an interface that hides all the internal details of the object from its users

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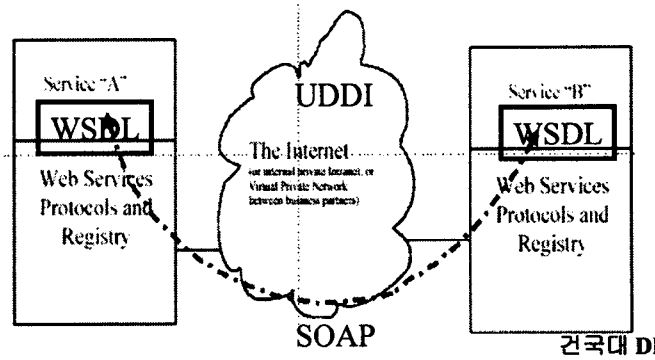
Web Service Model

- Web Service Model (2000년대)
  - Scale: On LAN and WAN
  - Key Tech:
    - SOAP(XML/HTTP) : Simple Object Access Protocol
    - WSDL(Interface) : Web Service Description Language
    - UDDI (Directory Service) : Universal Description Discovery and Integration
  - Focus: Service-Orientation, Application Integration



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Standard WS Specifications

- Communication Protocol – SOAP
  - Simple Object Access Protocol
  - XML/HTTP
  - Dynamic Integration / Internet
- Behavior – WSDL
  - Web Service Description Language
  - XML-Based
  - Messages, operations, port types, biding, services
- Location – UDDI
  - Universal Description Discovery and Integration
  - Service Registry and Discovery

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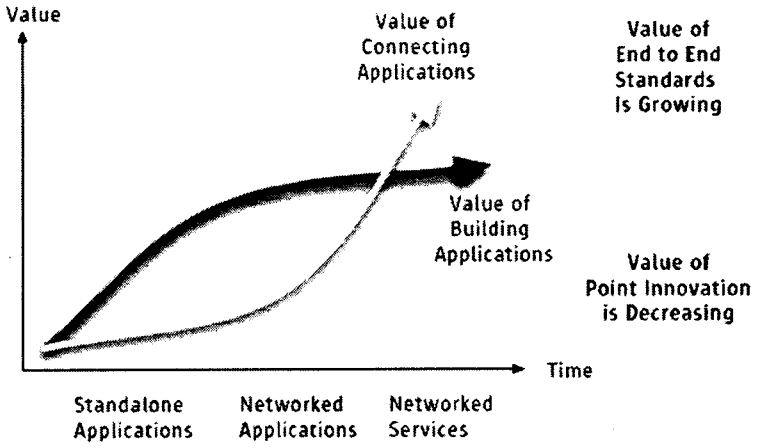
Why Web Service:

Technology Evolution

Value of Connecting Applications

- End to End View is Critical



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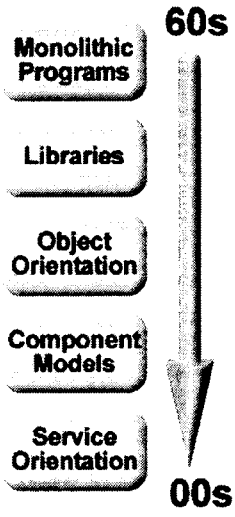
Software Evolution

- Trends to
  - Loosely coupled
  - Reusable
  - Distributed
  - Coarse Grain Size
  - Solution driven
- Direction to
  - Service-Oriented Application Integration



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Application Integration Platform

- 70s
  - By Socket Programming

Network Computing

- 80s
  - By RPC (Remote Procedure Call)
    - RPC on DCE
    - RPC on DCOM
- 90s
  - By ROI (Remote Object Invocation)
    - ORB on CORBA Platform
    - RMI on Java Platform
    - Remote on .NET Platform
- 00s
  - By Web Service
    - Web Service on Java Platform
    - Web Service on .NET Platform

Distributed Computing

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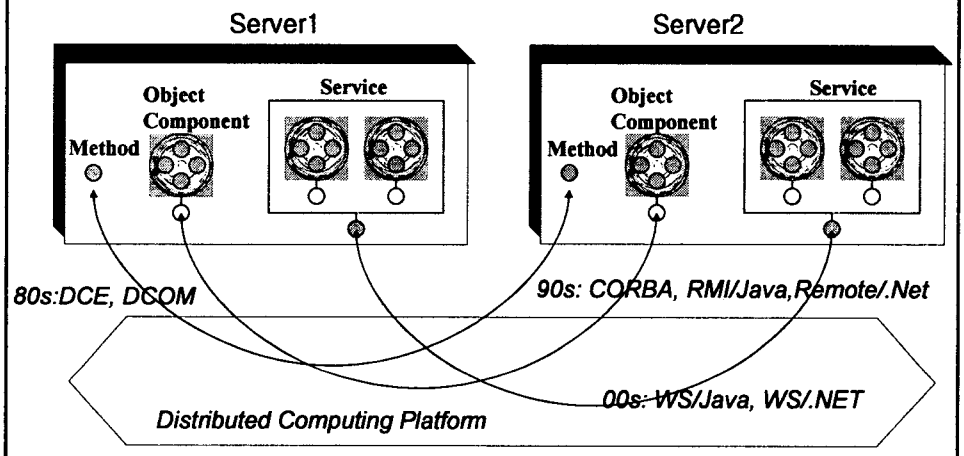
Distributed Application Integration



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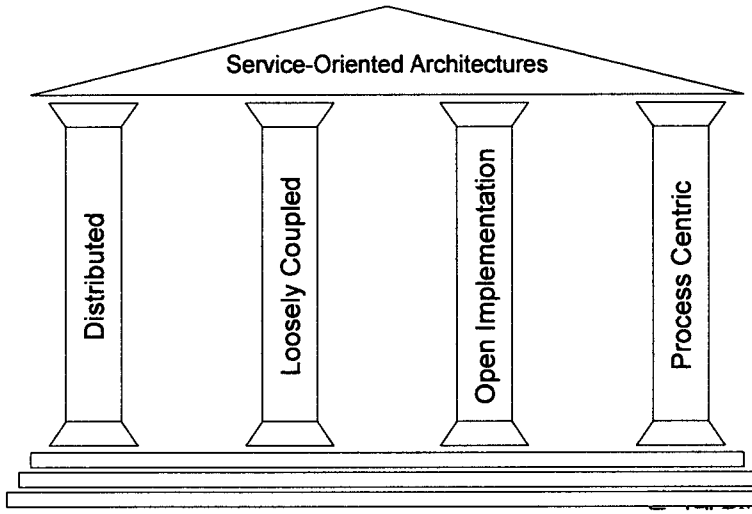
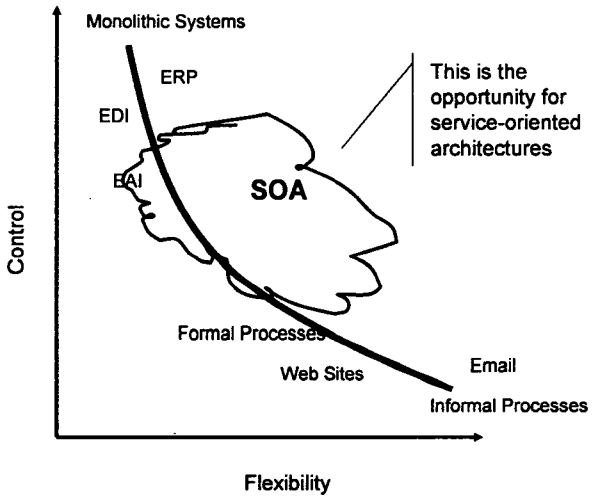
Four Pillars of SOA

- SOA = Service Oriented Architecture

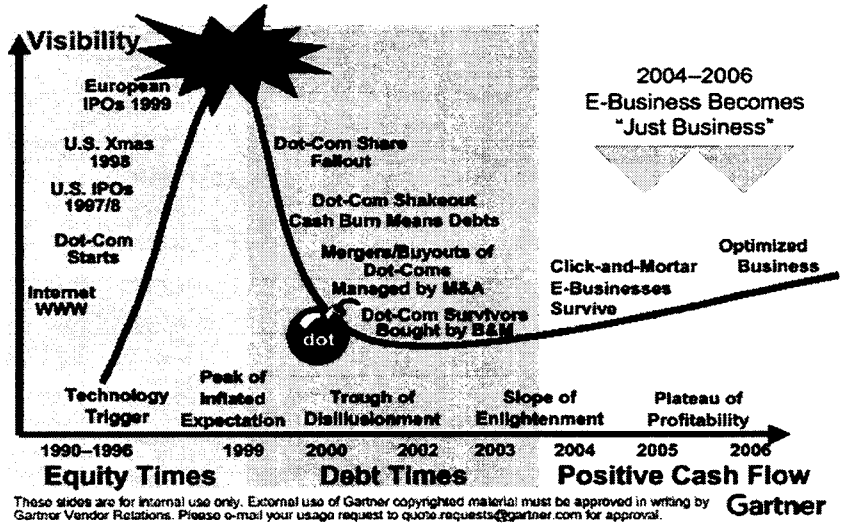


Position of SOA



Usage of Web Service

E-Business Hype Cycle



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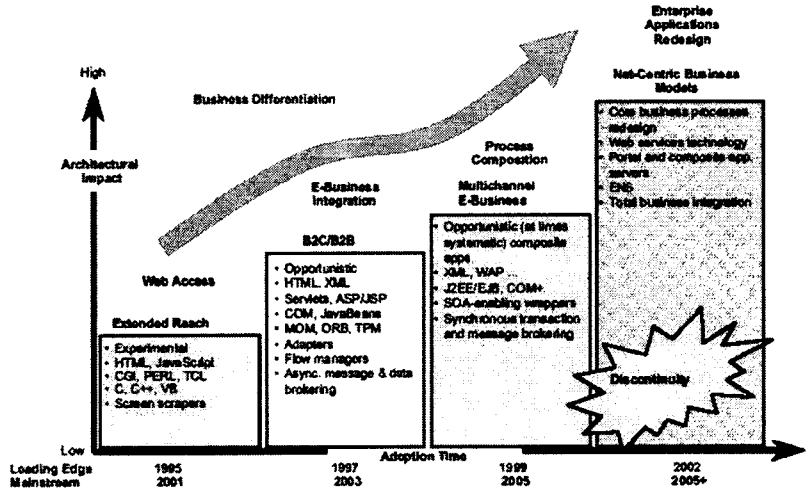
E-Business Direction



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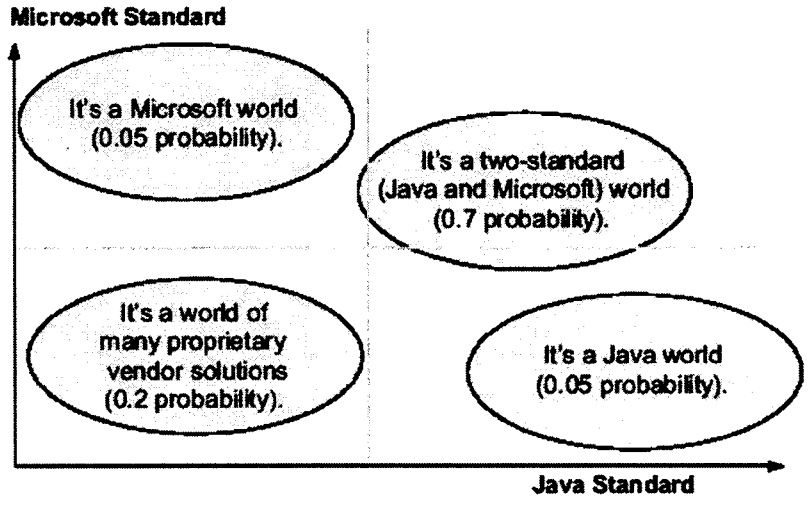
Platform Direction



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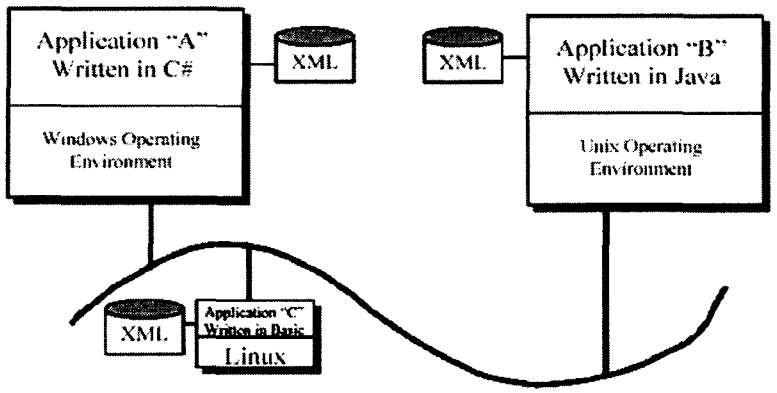
Heterogeneous System Integration



XML – A Common Format

SOAP – Communications APIs RPCs

WSDL – Negotiate How to Work Together

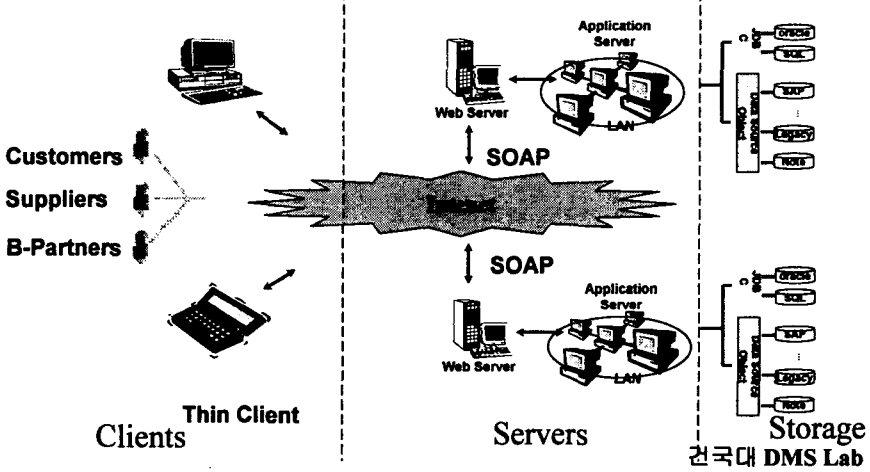
UDDI – Used to Help Find Cooperative Applications

Source: Bloor Research NA – May, 2002

b

Front-End Integration

- 3G Internet: Server-to-Server Talk
- Backbone Protocol



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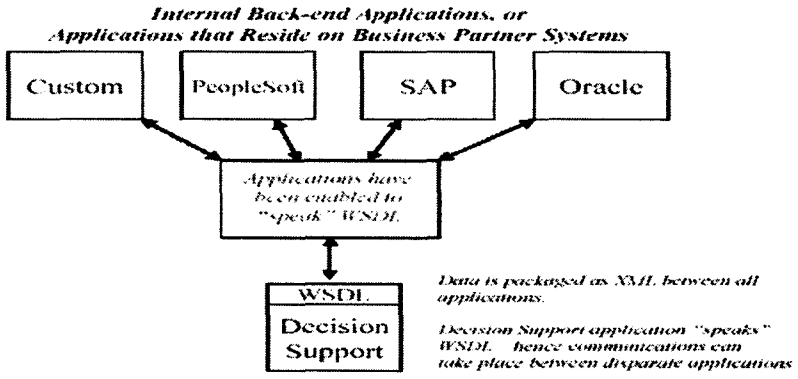
Back-End Integration

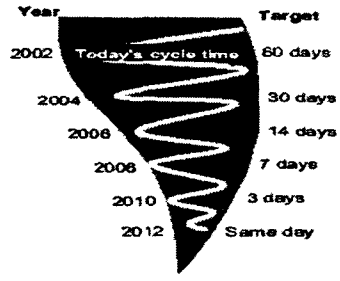
- Ex) Decision Support System
  - Integration of Legacy Data
  - Web Services-enabled Decision Support Application



Business Result: *Information from disparate systems can automatically be shared. Reduces specialized programming requirements and streamlines administrative data acquisition and reporting tasks.*

Real-time Enterprise

- Fast Business Integration
- Dynamic Business Integration
- Cheap Business Integration



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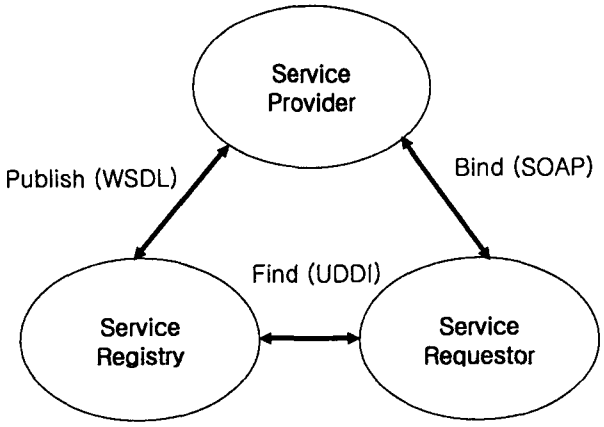
Web Service 기술 현황

Web Services Architecture



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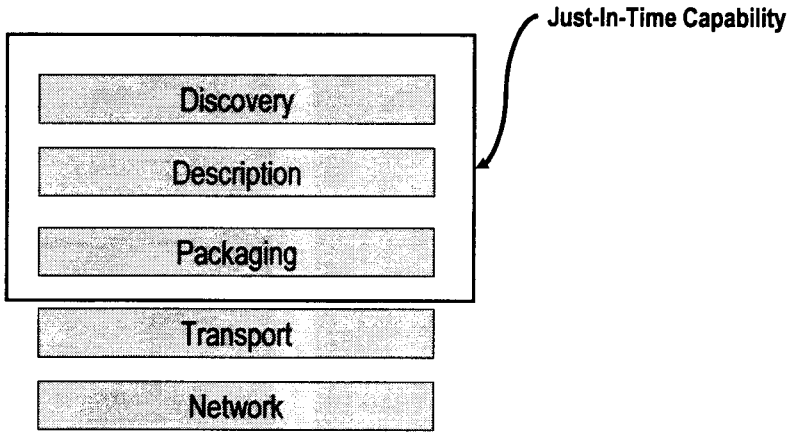
Basic Web Service Profile



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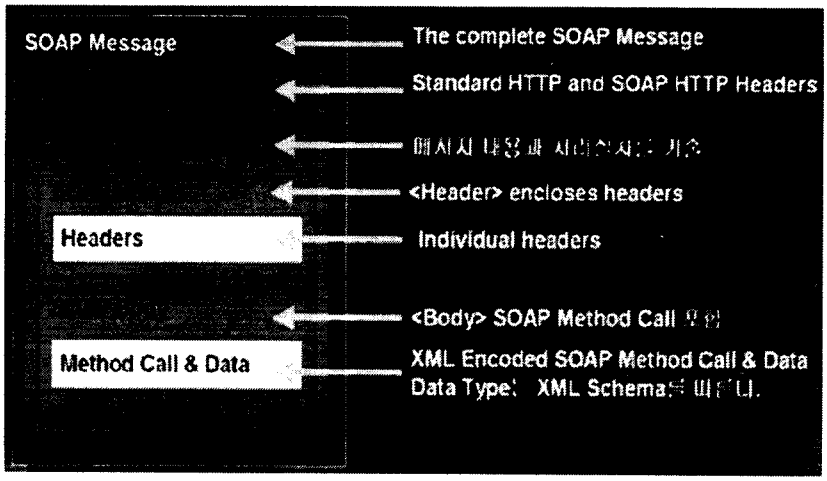
SOAP Message



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WSDL Message

```
<?xml version="1.0" ?>
- <definitions name="TemperatureService"
    targetNamespace="http://www.xmethods.net/sd/TemperatureService.wsdl"
    xmlns:tns="http://www.xmethods.net/sd/TemperatureService.wsdl"
    xmlns:xsd="http://www.w3.org/1999/XMLSchema" xmlns:soap="http://schemas.xmlsoap.
    xmlns="http://schemas.xmlsoap.org/wsdl/">
  - <message name="getTempRequest">
      <part name="zipcode" type="xsd:string" />
    </message>
  - <message name="getTempResponse">
      <part name="return" type="xsd:float" />
    </message>
  - <portType name="TemperaturePortType">
    - <operation name="getTemp">
        <input message="getTempRequest" name="getTemp" />
        <output message="getTempResponse" name="getTempResponse" />
      </operation>
    </portType>
  - <binding name="TemperatureBinding" type="TemperaturePortType">
      <soap:binding style="rpc" transport="http://schemas.xmlsoap.org/soap/http" />
    - <operation name="getTemp">
        <soap:operation soapAction="" />
      - <input>
          <soap:body use="encoded" namespace="urn:xmethods-Temperature"
            encodingStyle="http://schemas.xmlsoap.org/soap/encoding/" />
        </input>
      - <output>
          <soap:body use="encoded" namespace="urn:xmethods-Temperature"
            encodingStyle="http://schemas.xmlsoap.org/soap/encoding/" />
        </output>
      </operation>
    </binding>
  - <service name="TemperatureService">
      <documentation>Returns current temperature in a given U.S. zipcode</documentation>
    - <port name="TemperaturePort" binding="TemperatureBinding">
        <soap:address location="http://services.xmethods.net:80/soap/servlet/rpcrouter" />
      </port>
    </service>
</definitions>
```

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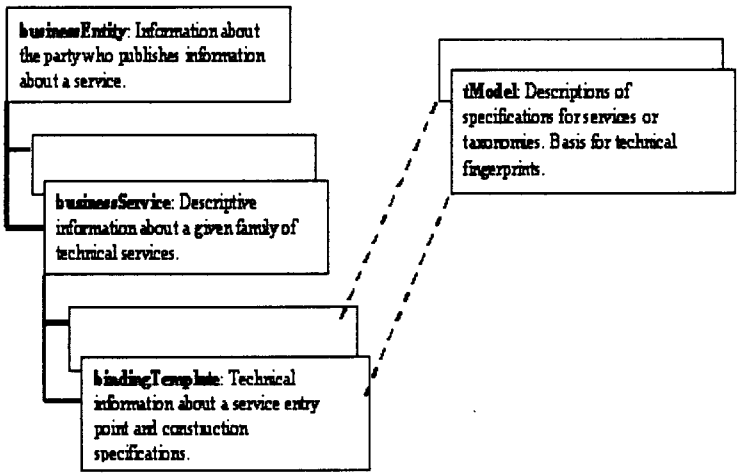
UDDI Core Structure



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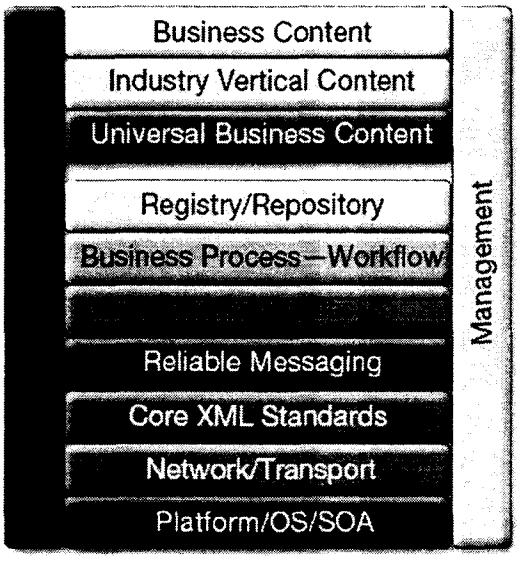
Service-Oriented Architecture



Business or Application Layer Standards

Technical Infrastructure Standards

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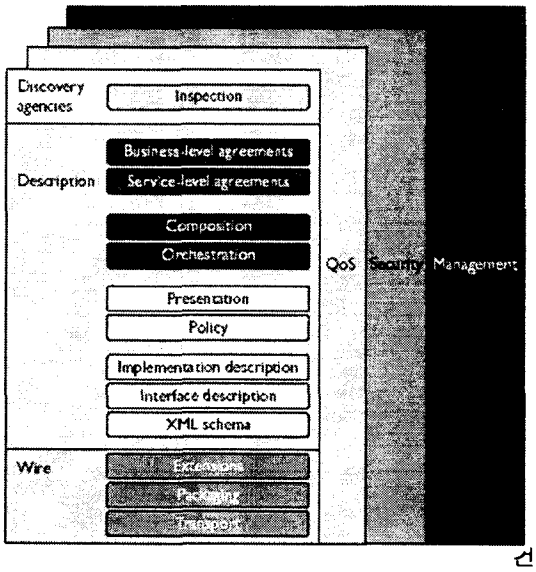
WS Business Profile



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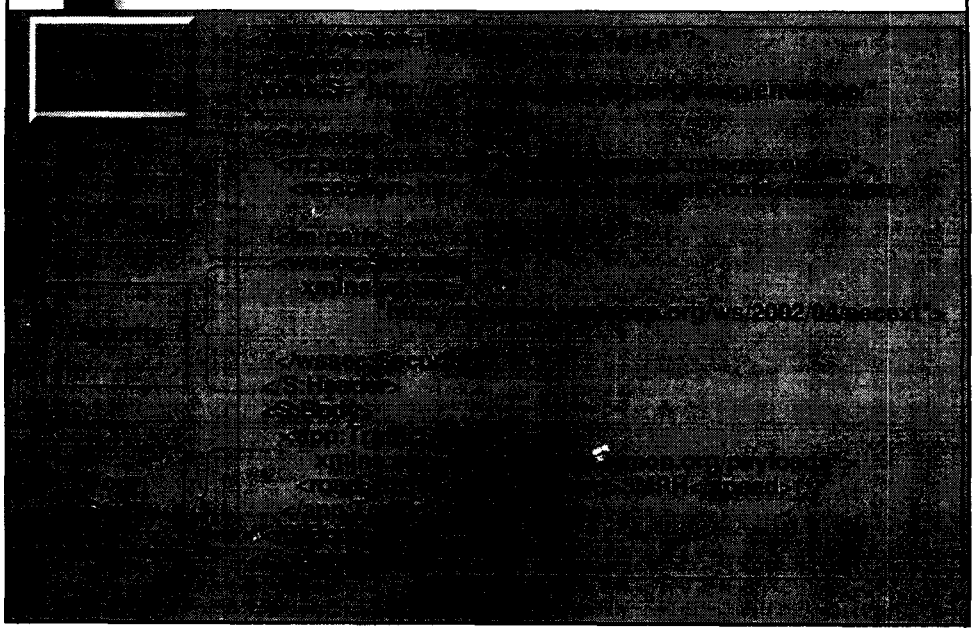
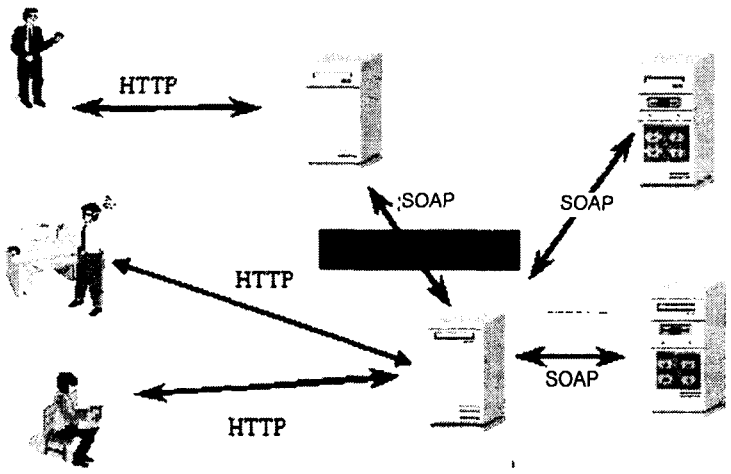
Example of Extended SOAP



Messaging / Routing



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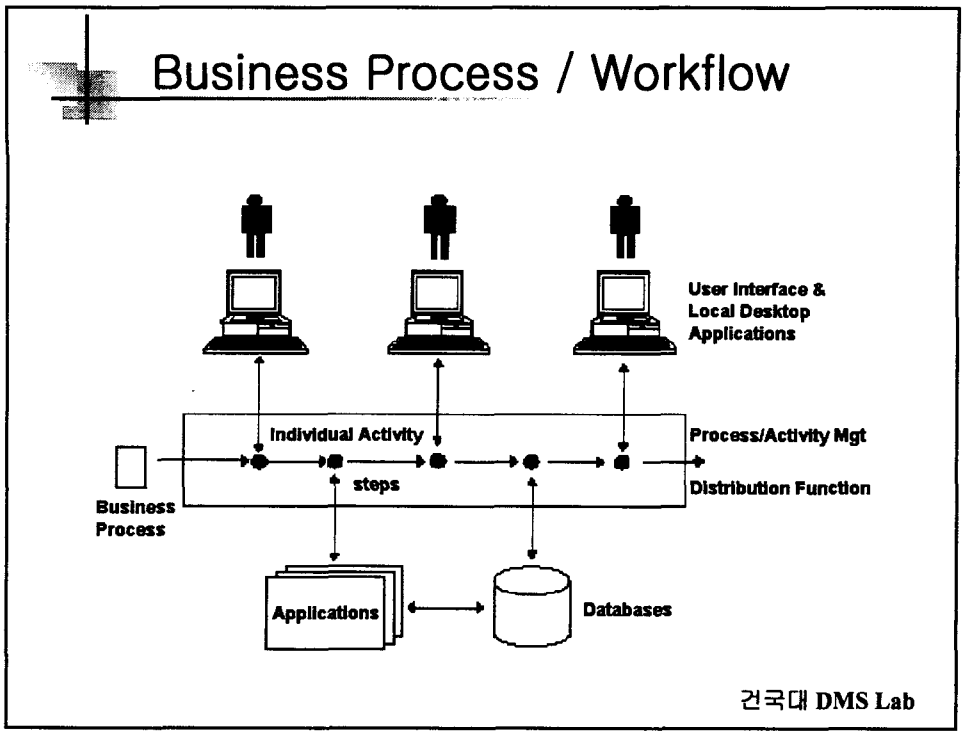
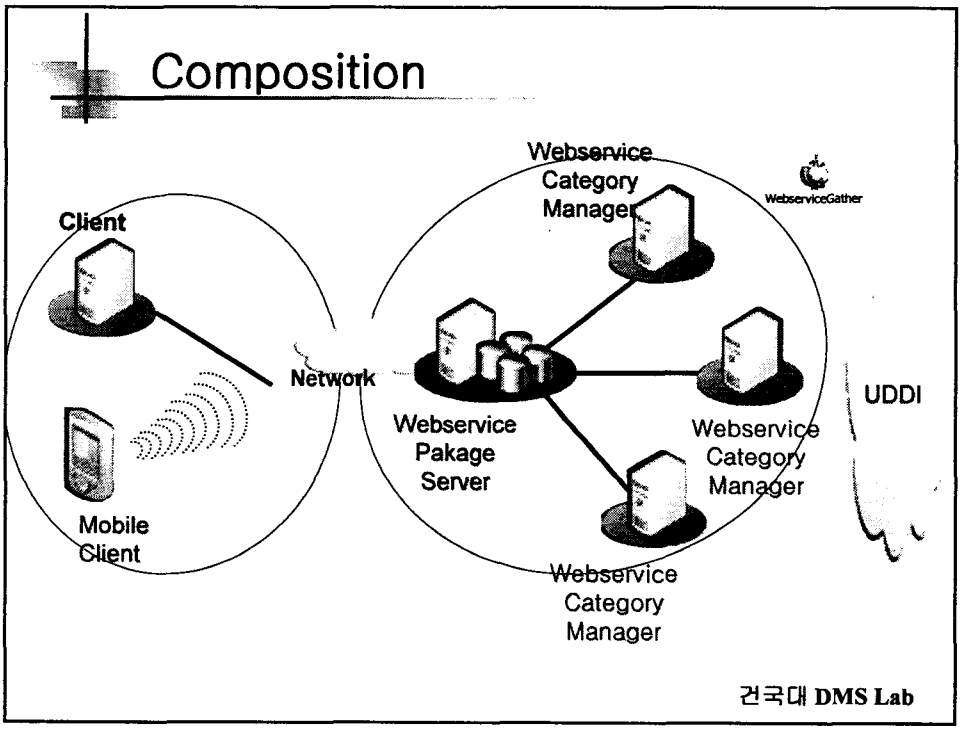
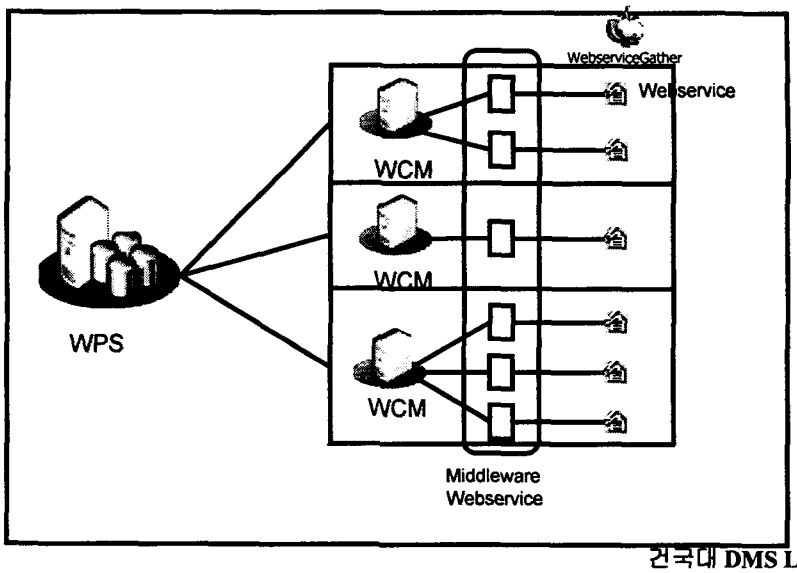

Business Process / Workflow
User Interface &
Local Desktop
Applications
Individual Activity
steps
Process/Activity Mgt
Distribution Function
Business
Process
Applications
Databases
건국대 DMS Lab


Composition
Webservice
Category
Manager
WebserviceGather
Client
Network
UDDI
Webservice
Pakage
Server
Webservice
Category
Manager
Mobile
Client
Webservice
Category
Manager
건국대 DMS Lab

Composition



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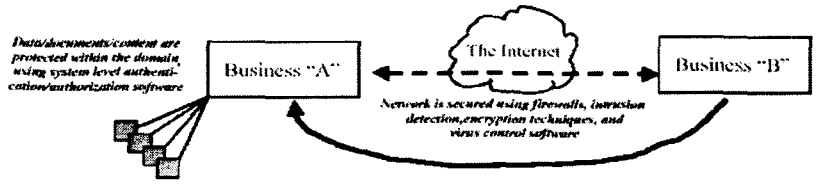
Security of Documents/Data

Today:



As content flow increases between partners, not enough attention is being paid to confidentiality protection, authentication, authorization, data integrity checking, and non-repudiation. Further, increasing business-to-business transaction workload is increasing message transfer and transactional workload on application servers at both business "A" and business "B" sites.

Tomorrow:

New hardware and software will be used to lighten the routing/security checking load on both company's servers. New content security software will reside on both sides that will provide confidentiality protection, authentication, authorization, data integrity checking, and non-repudiation across collaborative business-to-business environments.

Source: Bloor Research North America, May, 2002

WS "Needs Improvement"

- Security/privacy
- Messaging/routing
- Quality-of-Service/reliability
- Transaction-handling
- Management
- Performance
- Interoperability

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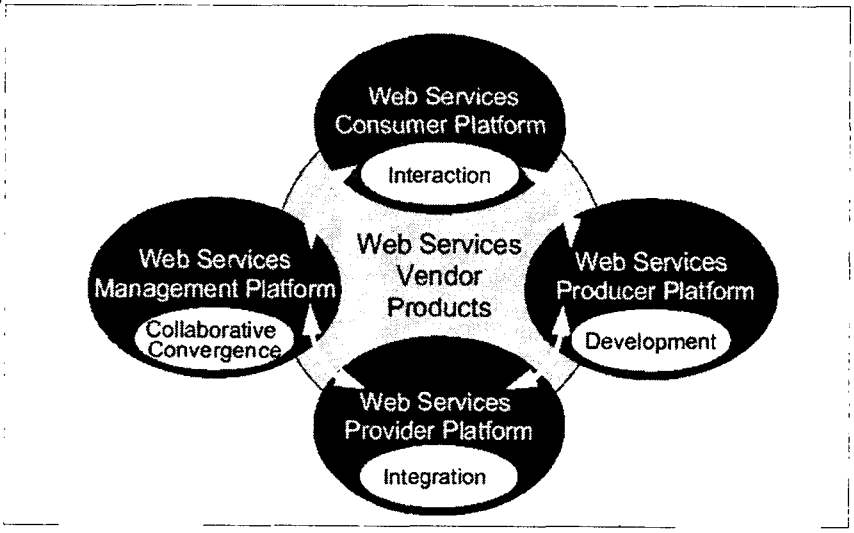
Four Platforms for WS



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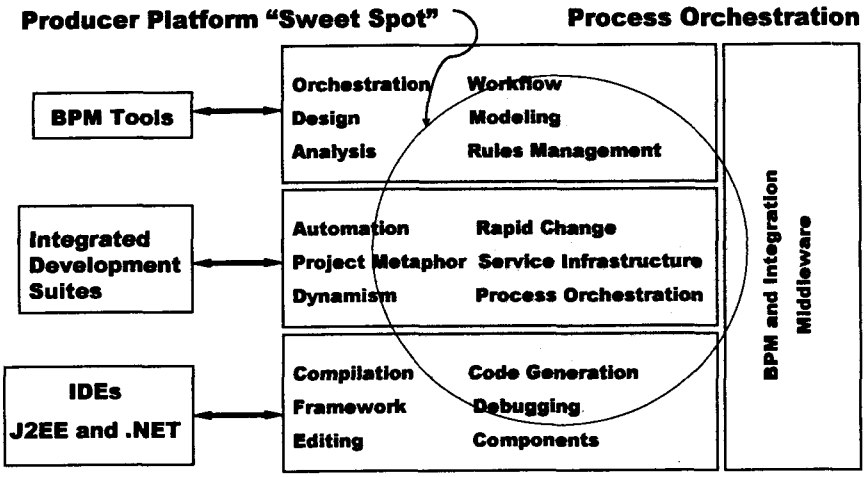
WS Producer Platform



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WS Client/Provider Platform

- Java Platforms
  - Customer: J2ME, J2SE
  - Provider: J2EE
- MS Platforms
  - Customer: Compact/.NET Framework
  - Provider: .NET Framework

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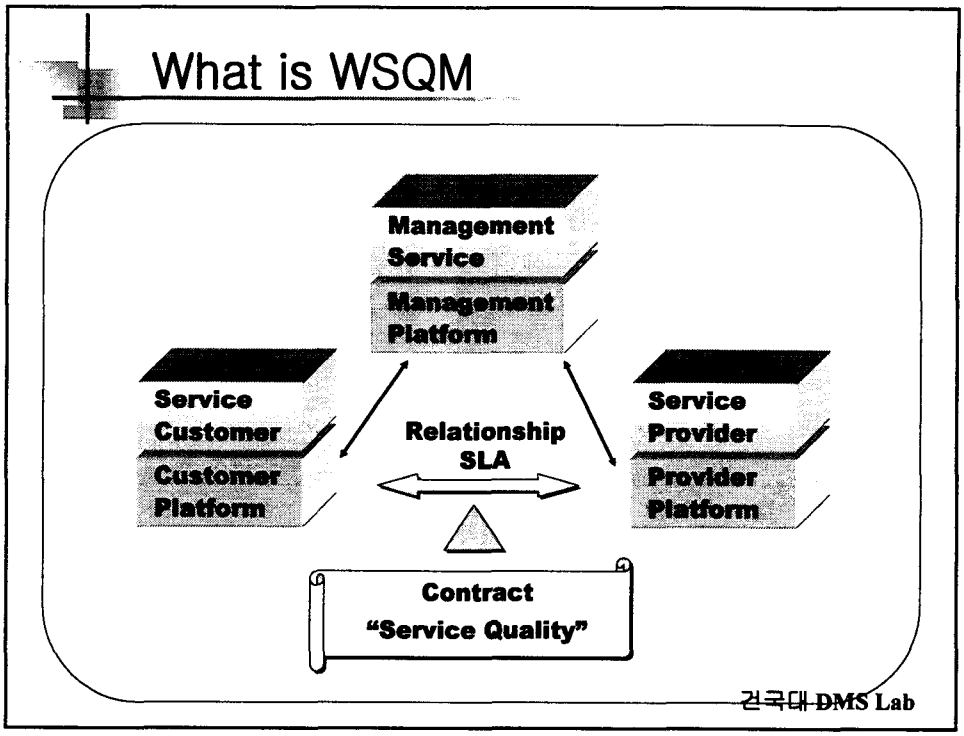
What is WSQM
Management Service
Management Platform
Service Customer
Customer Platform
Relationship SLA
Service Provider
Provider Platform
Contract "Service Quality"
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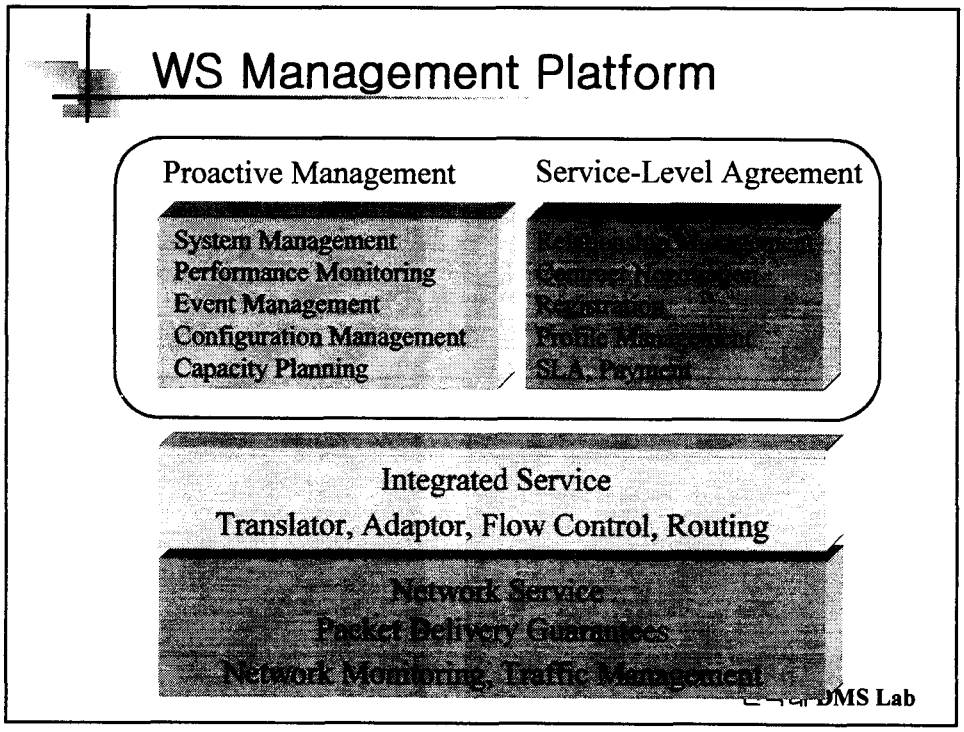
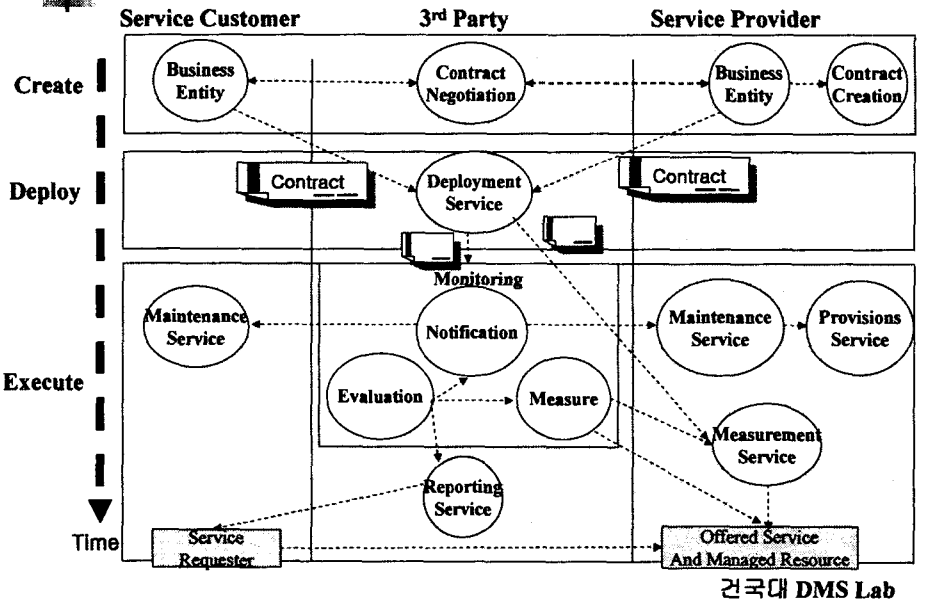

WS Management Platform
Proactive Management
System Management
Performance Monitoring
Event Management
Configuration Management
Capacity Planning
Service-Level Agreement
Integrated Service
Translator, Adaptor, Flow Control, Routing
Network Service
Packet Delivery Guarantees
Network Monitoring, Traffic Management
DMS Lab

WSQM Architecture



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QoS 관련 용어

- Quality Guaranty (품질 보장): SLA
  - Provider가 3년 동안 품질 보장해 준다.
  - 문제가 있을 경우에는 환불해 준다
- Quality Management (품질 관리): QM
  - 품질이 유동적일 수 있는 상황에서 품질을 유지 할 수 있도록 한다
- Quality Assurance (품질 보증): QA
  - KS Mark(3rd Party)가 품질을 보증해 준다.
  - 어느 정도의 품질(보증서)이다.

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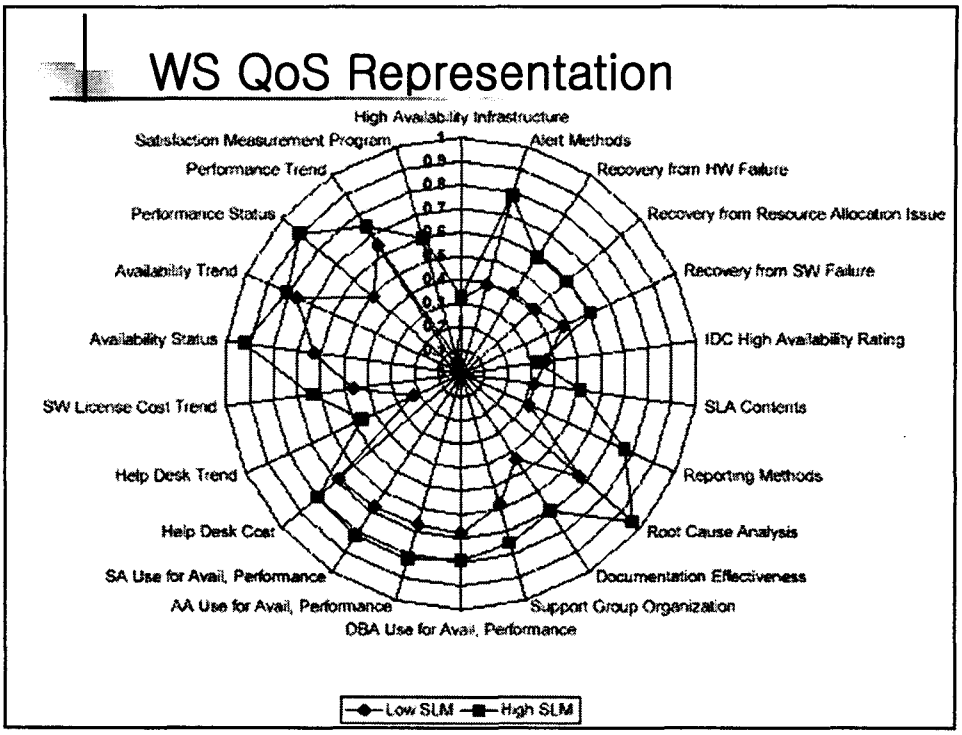
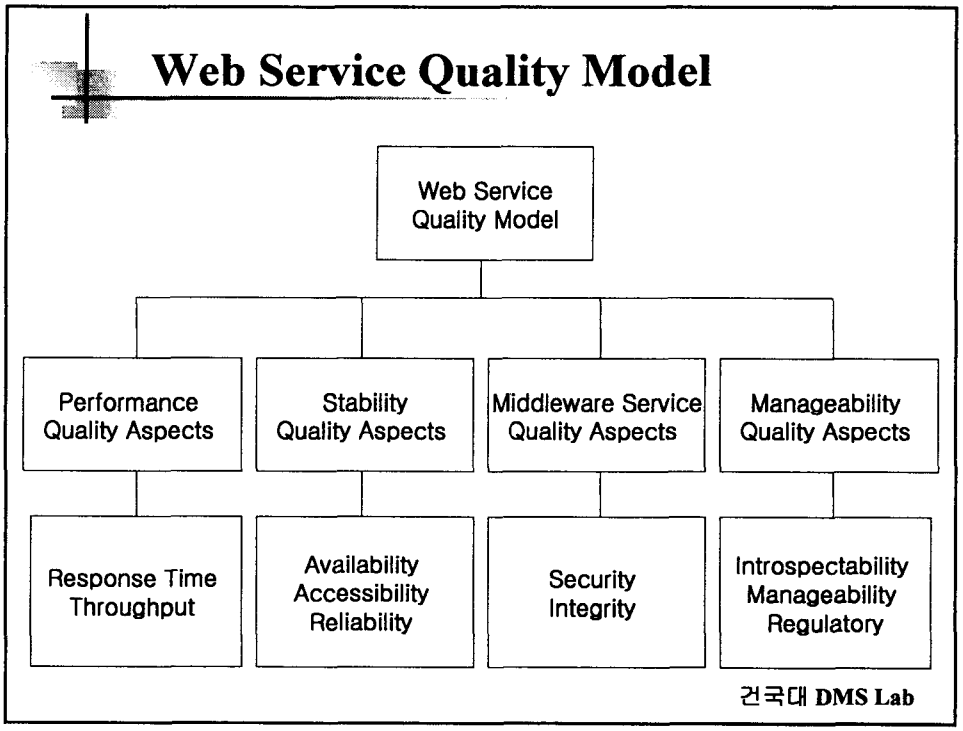

WS QoS Representation
High Availability Infrastructure
Alert Methods
Recovery from HW Failure
Recovery from Resource Allocation Issue
Recovery from SW Failure
IDC High Availability Rating
SLA Contents
Reporting Methods
Root Cause Analysis
Documentation Effectiveness
Support Group Organization
DBA Use for Avail, Performance
AA Use for Avail, Performance
SA Use for Avail, Performance
Help Desk Cost
Help Desk Trend
SW License Cost Trend
Availability Status
Availability Trend
Performance Status
Performance Trend
Satisfaction Measurement Program
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Low SLM
High SLM


Web Service Quality Model
Web Service Quality Model
Performance Quality Aspects
Stability Quality Aspects
Middleware Service Quality Aspects
Manageability Quality Aspects
Response Time Throughput
Availability Accessibility Reliability
Security Integrity
Introspectability Manageability Regulatory
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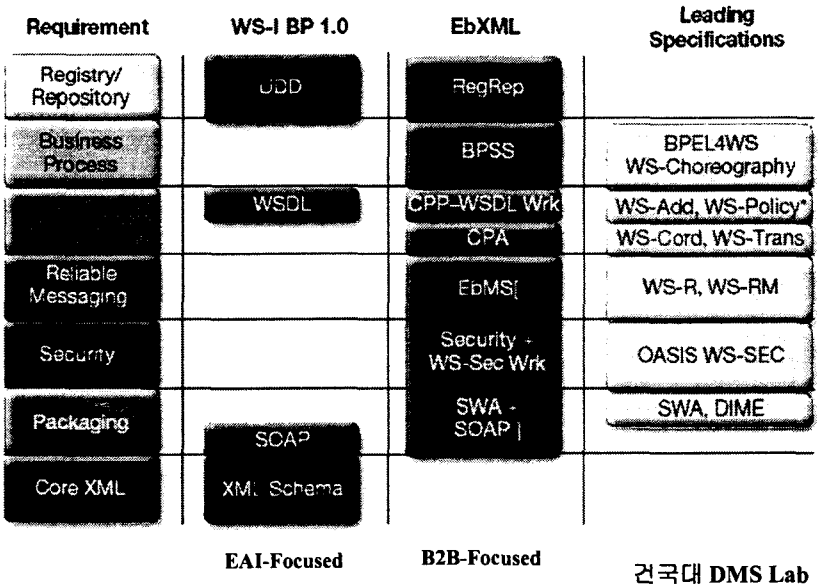
Web Service 표준 현황

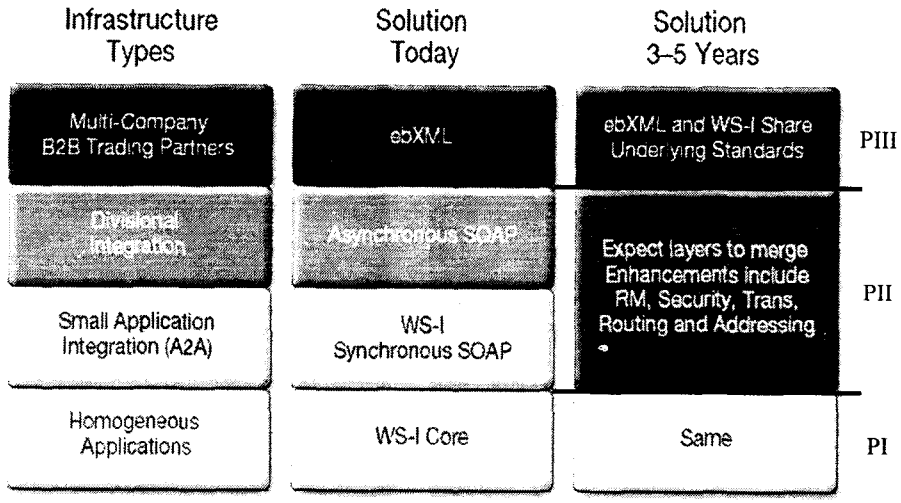
2 WS Standard Stacks



WS Standard Road Map

구분		프로토콜 명(표준 기구 명)	표준 채택 예상시기
			2003 / 2004 / 2005
Management	Distributed Management	WS-Manageability (OASIS)	S E EA
Security	Security	WS-Security (OASIS)	E BA
	Security Policy	WS-SecurityPolicy (N/A)	S E EA
	Secure Conversion	WS-SecurityConversion(N/A)	S E EA
	Trusted Message	WS-Trust (N/A)	S E EA
Discovery	Discovery		
	Publication	UDDI(OASIS)	EA
	Inspection	WSIL(N/A)	EA
Description	Portal	WSRP(OASIS)	S E EA
	transaction	WS-Transaction (N/A)	S E EA
		WS-Coordination (N/A)	S E EA
	Orchestration	BPEL4WS(OASIS)	S E EA
		WS-Choreography(W3C)	S E
	Presentation	WSIA	S
	Policy	WS-Policy (N/A)	S
	implementation		EA
	Interface	WSDL(W3C)	
Transport	Routing/Addressing	WS-Addressing (N/A)	S E EA
	Reliable Message	WS-ReliableMessaging (OASIS)	S E EA
		WS-Reliability (OASIS)	S E
	Packaging	SOAP(W3C)	EA
		WS-Attachment (IETF)	S E EA
		DIME(IETF)	S E EA
	Transport	HTTP, TCP, SMTP, etc	

Evolution of Web Service



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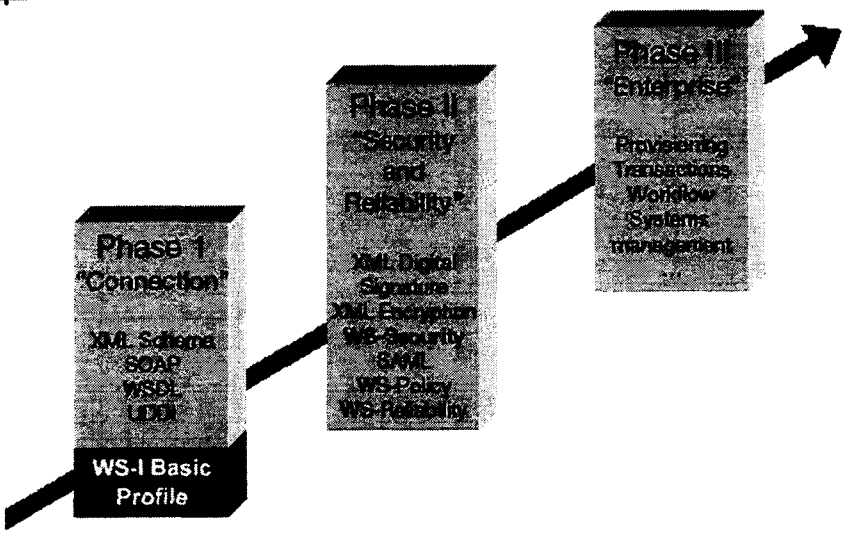
Evolution of Web Service



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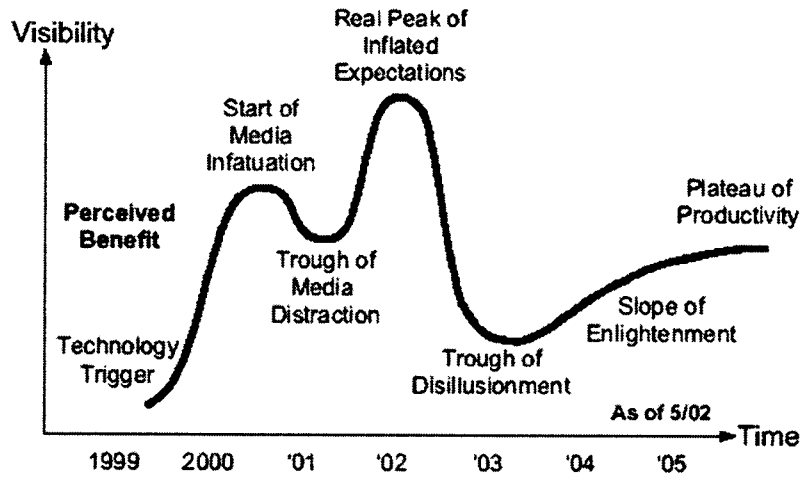
Web Service 적용 현황

WS Hype Cycle



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Web Services Forecasting

- IDC
  - Web Services market will reach 3100M$ in 2006 versus 550 M$ in 2001
- Forrester
  - 60% of companies will have an initiative about web services by the end of this year
- Meta Group
  - More than 85% of the software companies intend to build up web services before the end of 2004
- Gartner
  - Portals and portal servers will account for more than 60% of WS's consumers platform through 2004 (0.7 probability)
  - Through 2005, Web services and SODA will exert the strongest influence on business process management's direction(0.8 probability)

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WS Vendors

벤 더	제 품	표준 및 기술	비 고
Bowstreet.inc (www.bowstreet.com)	Bowstreet ™ Business Web Factory	SOAP XML Directory Service	
HP (www.hp.com)	e-Speak	SOAP UDDI	Open-sourcing Linux지원시도
IBM (www.ibm.com)	WebSphere	SOAP UDDI EJB SOM(System Object Model)	Linux지원
Microsoft (www.microsoft.com)	.NET	SOAP UDDI	EbXML,EJB등은지원이 약함 무선인터넷지원용으로 hailstorm발표
SUN (www.sun.com)	SunONEplatform	EJB EbXML (SOAP,UDDI)	

※기타 IT 벤더군:
- Web Server 벤더: BEA Systems 등
- EAI 및 EIP 벤더: TIBCO, webMethods 등
- Enterprise Application 벤더: SAP, Sybase, CA

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Any Questions ?

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