DFS SOA 2005
SOA och standarder

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W3C & SICS

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[V 1.0]

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Vem?

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Nationellt forskningsinstitut – stött av en industrigrupp och av staten – avancerad FoU inom IT: teknik och metodik

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Internationell konsortium som tar fram generella webbstandarder

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What SOA products?

I choose standards-based products.

The best thing about standards is that there are so many of them!

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What technologies are there?

SOAP 1.1	XML Signature	SAML 1.1	WS-PolicyAttachment	WS-MessageData
WS-I Basic Profile 1.0.	XML Encryption	SAML 1.0	WS-Policy	OWL-S 0.9
SOAP 1.2	XKMS	WS-Trust 1.0	WS-Addressing	OWL
EbMS	WS-CHOR	WS-Reliability 1.0	WS-Federation 1.0	SOAPAttachments
WSDL 1.1	WSCI 1.0	WS-ReliableMessaging	SPML	SOAP-MTOM
WSDL 1.2	WSCL	XACML 1.0	ID-FF	WS-Attachments
EbCPPA	BPEL 1.0	WSCoordination	ID-WSF	BEEP
UDDI 3.0	BPEL 1.1	WS-Transaction	WSRP	WS-SecureConversation 1.0
UDDI 2.0	WSFL 1.0	WSAtomicTransaction	SOAP Conversation 1.0	WS-SecurityPolicy 1.0
ebXML Registry Services	ebBPSS	WS-CAF	WS-CallBack	
AS2	WS-Security	WS-PolicyAssertions	WS-Acknowledgement	

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Timeline

Category	Content
Security	WS-Security; WS-Federation; WS-Trust; WS-Federation Active Requestor Profile; WS-Security Addendum; WS-Security Profile for Tokens; WS-Security SOAP Message Security; WS-Security Username Token Profile; WS-Security X.509 Certificate Token Profile; WS-Security Kerberos Binding
Reliability	WS-ReliableMessaging
Transactions	WS-Coordination; WS-AtomicTransaction; WS-Transaction; WS-BusinessActivity
Metadata	UDDI 1.0; UDDI 2.0; UDDI 3.0; WS-Discovery; WSDL; WS-Inspection; WS-Policy; WS-MetadataExchange; WS-PolicyAssertions; WS-PolicyAttachment; WS-SecurityPolicy; WS-Policy 1.1; WS-PolicyAssertions 1.1; WS-PolicyAttachment 1.1
Messaging	SOAP 1.1; SOAP 1.2; SOAP Messages with Attachments; PASWA [1]; DIME; WS-Attachments; MTOM; WS-Referral; WS-Addressing; WS-Eventing; WS-Routing
Whitepapers	Security Roadmap; Reliable Messaging Roadmap; Secure, Reliable, Transacted Web Services Whitepaper
Epoch	Foundations; Secure, Reliable and Transacted; Evolve and Extend

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2000 2001 2002 2003 2004 2005

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A simplified standards stack

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Web Service Standards Stack
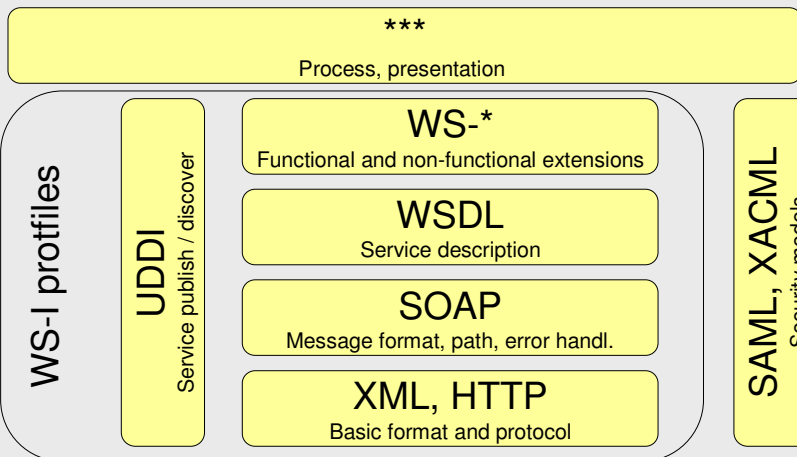
* * *
Process, presentation

WS-I protfiles

UDDI
Service publish / discover

WS-*
Functional and non-functional extensions

WSDL
Service description

SOAP
Message format, path, error handl.

XML, HTTP
Basic format and protocol

SAML, XACML
Security models

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Fundamental Standards

* * *
Process, presentation

WS-I protfiles

UDDI
Service publish / discover

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Fundamental Standards

- XML
  - "eXtensible Markup Language"
  - Standard representation format – documents, data, schemas, ...
  - XML 1.0 (February 2004) W3C Recommendation
- HTTP
  - "HyperText Transfer Protocol"
  - Stateless protocol for communication between client and server
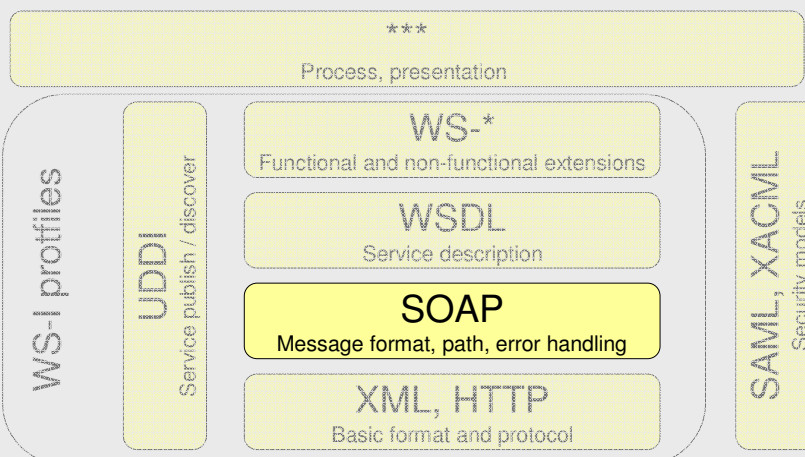 - HTTP/1.1 (June 1999) IETF RFC

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Structured messages


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***
Process, presentation

WS-I profiles

UDDI
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Structured Messages

- SOAP
  - "SOAP"
  - Message format: sender requests invocation of recipient's service; Message protocol
  - SOAP 1.2 (June 2003) W3C Recommendation
- MTOM
  - "SOAP Message Transmission Optimization Mechanism"
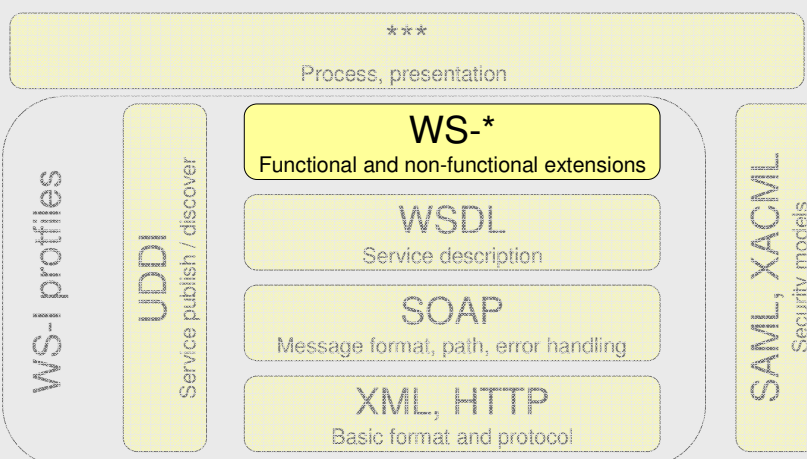 - Tranfer of binary data
  - MTOM (January 2005) W3C Recommendation

Service Descriptions

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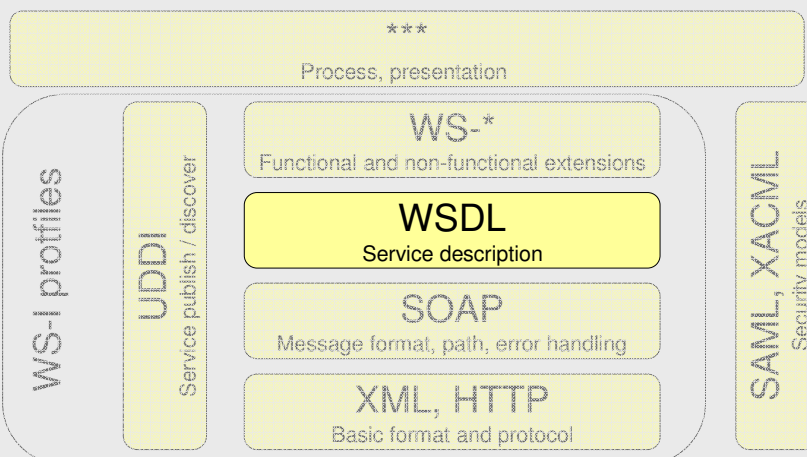
Service Descriptions

- WSDL
  - "Web Services Description Language"
  - Service descriptions: the what / where / how of the service
  - WSDL 1.1 (June 2002), WSDL 2.0 (Aug 2005) W3C
- XML Schema
  - "XML Schema"
  - Types of structures, documents, ...
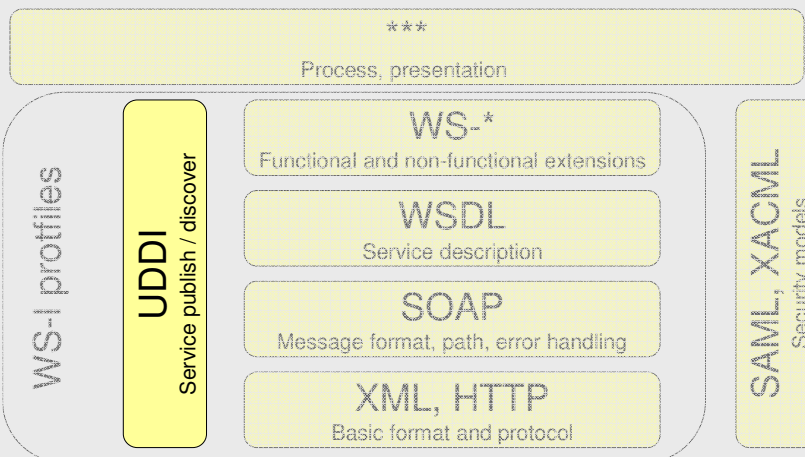 - XML Schema 1.0 (October 2004) W3C Recommendation

Extensions

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Extensions

- WS-Addressing
  - "Web Services Addressing"
  - How to specify senders, receivers, notifiers, ...
  - WS-Addressing 1.0 (August 2005) W3C Candidate Recommendation
- WSS
  - "Web Services Security"
  - Support message integrity and confidentiality, ...
  - WS-Security SOAP Message Security (March 2004) OASIS
- WSRM
  - "Web Services Reliable Messaging"
  - Fully defined consequences if case of message delivery problems
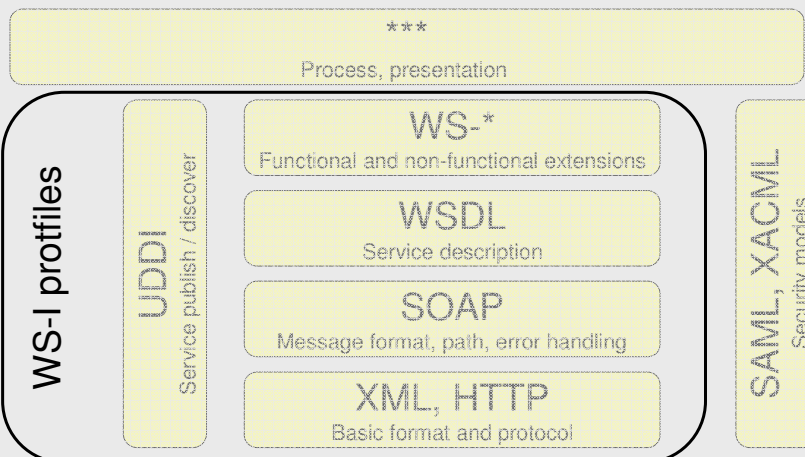 - WS-RM 1.1 (November 2004) OASIS

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Service Federation

*** Process, presentation

WS-i profiles

UDDI — Service publish / discover

WS-* — Functional and non-functional extensions

WSDL — Service description

SOAP — Message format, path, error handling

XML, HTTP — Basic format and protocol

SAML, XACML — Security models

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Service Federation

- UDDI
  - "Universal Description, Discovery and Integration"
  - Publish service descriptions; discover service descriptions
 - UDDI 3.0 (February 2005) OASIS

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Standards combination

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Standards Combination

- WSI recommendations
  - Basic Profile 1.1 (Aug 2004) :
    - SOAP 1.1
    - HTTP 1.1
    - WSDL 1.1
    - XML Schema 1.0
    - UDDI 2
  - Basic Security Profile 1.0 (Aug 2005)
    - HTTP, SSL, TLS
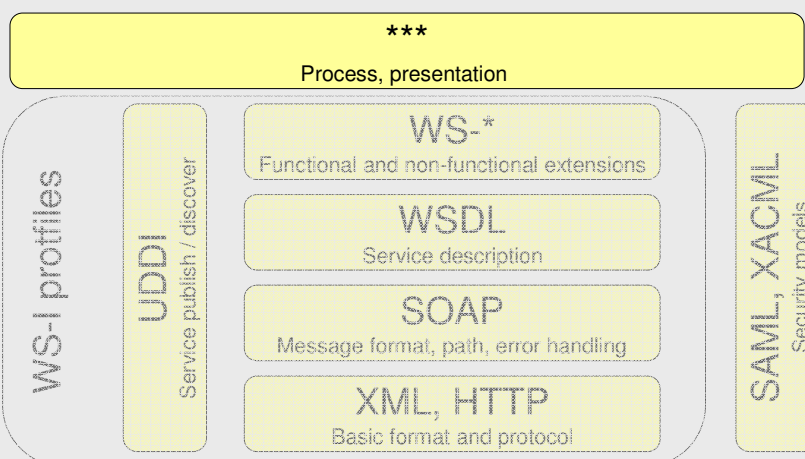   - WS-Security
    - PKI
    - XML Signature

Security models

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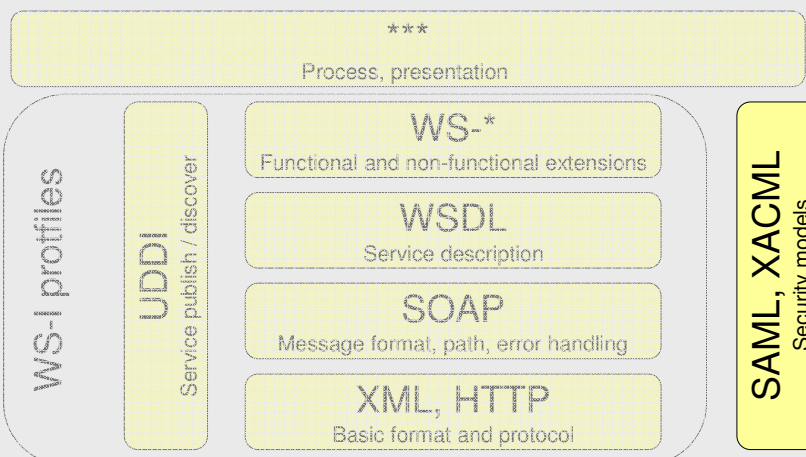
Security models

- XACML
  - " eXtensible Access Control Markup Language"
  - Model authorization control
  - XACML 2.0 (Feb 2003) OASIS
- SAML
  - "Security Assertion Markup Language"
  - X
  - SAML 2.0 (March 2005) OASIS

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Towards the real processes

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Towards the real processes

- WS-BPEL
  - " Business Process Execution Language for Web Services"
  - WS-BPEL 1.1 (May 2003)
- Etc....

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Standards: why?

IT standards:
- Accessible documented specifications

Types of standards:
- *De jure*: published by officially recognised standardisation bodies – ISO, ANSI, ETSI, ...
- *De facto*: long-term and broad acceptance by the market – Windows XP, Open Office, ...
- Consortium standards: produced in cooperation between a number of stakeholders, and they recommend its broad use – W3C, OASIS, ...

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Actors

Web standards– W3C

- **W**orld **W**ide **W**eb **C**onsortium (1994-)
- Industry consortium – specify web standards
- More than 400 members – industry, public sector, research
  - Global participation
- Produce standards ("W3C Recommendations") in a consensus-based process
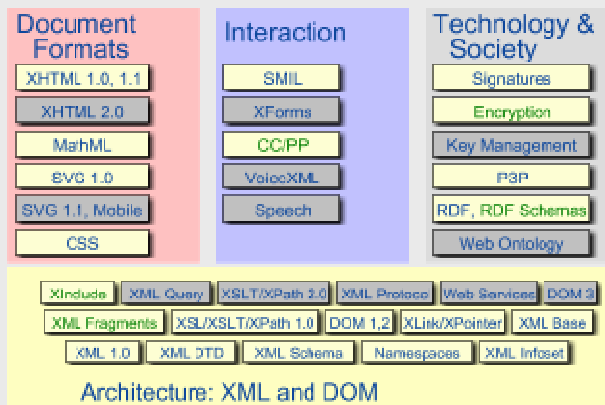 - HTML, HTTP, XML, ...

Web standards

Document Formats
- XHTML 1.0, 1.1
- XHTML 2.0
- MathML
- SVG 1.0
- SVG 1.1, Mobile
- CSS

Interaction
- SMIL
- XForms
- CC/PP
- VoiceXML
- Speech

Technology & Society
- Signatures
- Encryption
- Key Management
- P3P
- RDF, RDF Schemas
- Web Ontology

XInclude | XML Query | XSLT/XPath 2.0 | XML Protocol | Web Services | DOM 3
XML Fragments | XSL/XSLT/XPath 1.0 | DOM 1,2 | XLink/XPointer | XML Base
XML 1.0 | XML DTD | XML Schema | Namespaces | XML Infoset

Architecture: XML and DOM

Results

1996	1997	1998	1999	2000	2001	2002	2003	2004
PNG	PICSRules	XML 1.0	CSS 1	ATAG 1.0	MathML 2.0	XML Signature	SVG 1.1	CC/PP
PICS 1.1		MathML 1.0	Namespaces	XML 1.0	Canonical XML	P3P 1.0	SVG Mobile	DOM 3
CSS1		CSS 2	WebCGM	DOM 2	XML Schemas	XML Canonicalization	XPointer	Infoset (2nd)
		SMIL 1.0	RDF (Old Version)	(X)HTML	Ruby	XPath Filter	SOAP 1.2	Namespaces 1.1
		DOM 1	WCAG 1.0		XLink 1.0	Decrypt Transform	XForms 1.0	XML 1.0 (3rd)
			Style Sheets PI		XML Base	XML Encryption	XML Events	XML 1.1
			MathML 1.01		SMIL 2.0	UAAG1.0	MathML 2.0	OWL
			XPath 1.0		SMIL Animation		PNG (2nd)	RDF
			XSLT 1.0		SVG 1.0			Voice Framework
					XSL 1.0			
					Infoset			
					WebCGM			

Date: 25-Sep-2004

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Web technologies

Initial Web → Tomorrow's Web

Higher-lever Web standards and applications

Accessibility, Internationalization, Device Independence, QA

HTML

Mark -up	Graph ics	Multi mocal	Secu rity	Web services	Privacy	Capab.
XHTML	SVG	VoiceXML	. .	Architecture	P3P	CC / PP
			Sig Enc Key mgt	SOAP 1.2 WSDL 2.0 WS-CDL 1.0	Semantic Web RDF OWL	

XML
(Namespaces, Base, Query, Schema, XSLT, XPath, Xlink, XForms)

HTTP → HTTP/1.1

URL → URI / IRI

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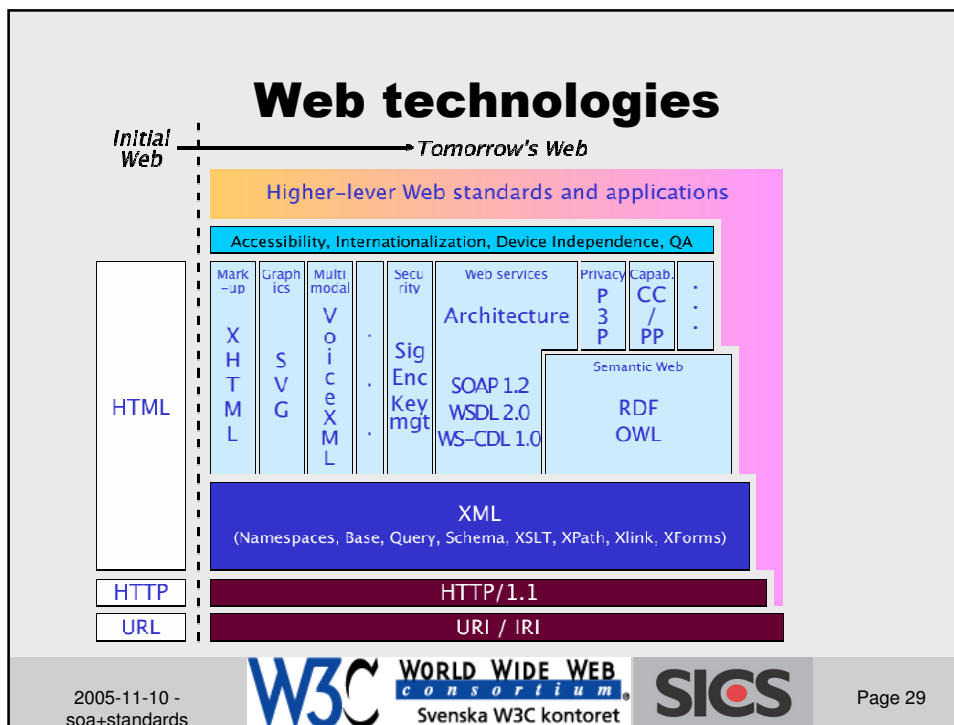
Conclusion on standards

It is profitable to use **vendor-independent** standards –
especially web standardes:

- Today
  - Decreased costs for development and maintenance
  - Improved interoperability
  - Quality assurance
- Tomorrow
  - Improved vendor-independence
  - Decreased costs for migration and rejuvenation
  - Improved support for heterogeneous environments
  - Simpler route to Service Oriented Infrastructures

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"To hedge one's product success and longevity bets,

*preserving a path to **cross-platform support** should be a development action item from day one."*

(Eweek, "If You Don't Build It, They May Never Come" Dec. 9, 2002)

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Frågor?

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