Programmable Web Services and SOAP Architectural Overview

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Agenda

❖   **The evolution to Web Services**

❖   **SOAP**
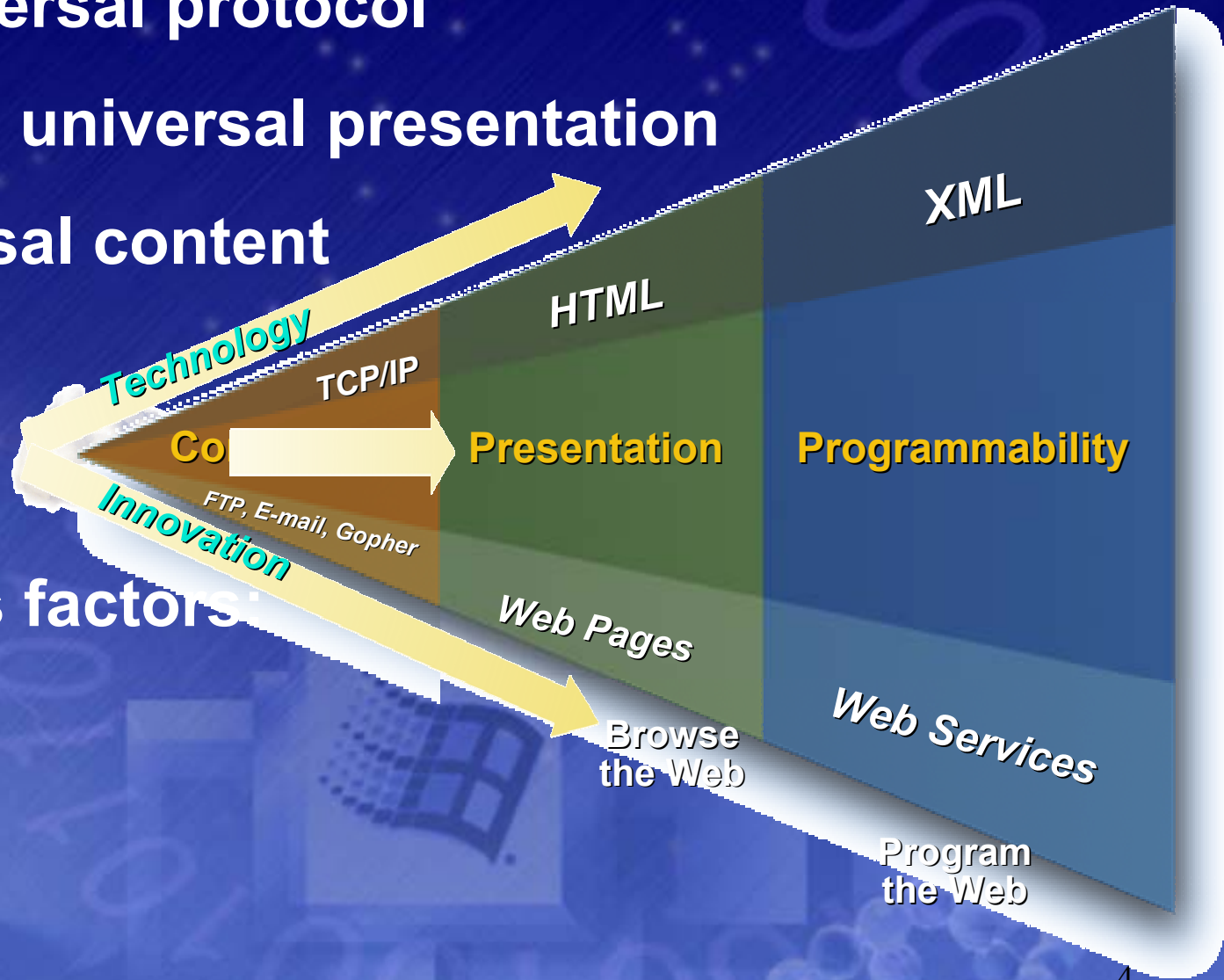
❖   **Future of Web Services**

Web Services are …

❖ **Components over the web**

❖ **"Best of breed" tools**

The path to Web Services

TCP/IP: universal protocol

HTTP/HTML: universal presentation

XML: universal content

Key success factors:

- Ubiquity

- Simplicity

- Standards

Technology

Innovation

XML

HTML

TCP/IP

FTP, E-mail, Gopher

Content

Presentation

Programmability

Web Pages

Web Services

Browse the Web

Program the Web

Why do we need the Programmable Web?

Can't I just do all this with Java?

Doesn't the Web do everything you need?

Doesn't SOAP compromise security?

Aren't DCOM and CORBA IIOP enough?

ASP/JSP/Servlets/CGI

❖ **Pros**

   ➤ **Simple solution**

   ➤ **Works well with firewalls**

   ➤ **Somewhat portable**

❖ **Cons**

   ➤ **Output is typically HTML (requires parsing to retrieve data)**

DCOM/Corba (IIOP)/RMI

- ❖ **Pros**
  - ➢ **Most direct way of accessing component functionality**
  - ➢ **Best performance**
- ❖ **Cons**
  - ➢ **Complexity**
  - ➢ **Not good for talking to "the other ones"**
  - ➢ **Don't pass through firewalls well**

SOAP

❖ **Pros**

  ➢ **Works well with firewalls**

  ➢ **Great for communicating between different platforms**

  ➢ **Uses XML, therefore allows rich, extensible messages**

❖ **Cons**

  ➢ **Limited tools (for now…)**

Uses for Programmable Web Services

- ❖ **Inside the firewall**
  - ➢ **Enterprise Application Integration (EAI)**
  - ➢ **Intranet**
- ❖ **Between partners**
  - ➢ **Business to Business (B2B)**
  - ➢ **Application to Application (A2A)**
- ❖ **On the Internet**

Benefits

❖ **Standard communication format**

❖ **Use existing infrastructure**

❖ **Connecting diverse systems**

❖ **New revenue streams**

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Standards and SOAP

❖ **Builds on**
  ➤ **W3C XML standards**
  ➤ **IETF HTTP standard**

❖ **SOAP Spec v1.0 to IETF**

  ➤ **http://www.ietf.org/internet-drafts/draft-box-http-soap-01.txt**

❖ **SOAP Spec v1.1 to W3C**

  ➤ **http://msdn.microsoft.com/workshop/xml/general/soapspec.asp**

Logical structure of SOAP

Applications
Routing protocols (BizTalk, ebXML)
XML RPC protocols (SOAP, XML-RPC)
W3C Standards (XML, Namespaces)
Internet Standards (TCP, UDP, IP)

SOAP message types

❖ **Request**

❖ **Response**

❖ **Fault**

SOAP message structure: Request

```
POST /StockQuote HTTP/1.1
Host: www.stockquoteserver.com
Content-Type: text/xml
Content-Length: nnnn
SOAPAction: Some-Namespace-URI#GetLastTradePrice

<SOAP-ENV:Envelope
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
>

  <SOAP-ENV:Body>
    <m:GetLastTradePrice xmlns:m="Some-URI">
      <symbol>DIS</symbol>
    </m:GetLastTradePrice>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP message structure: Response

```
HTTP/1.1 200 OK
Content-Type: text/xml;
charset="utf-8"
Content-Length: nnnn

<SOAP-ENV:Envelope
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
>

  <SOAP-ENV:Body>
    <m:GetLastTradePriceResponse xmlns:m="Some-URI">
      <Price>34.5</Price>
    </m:GetLastTradePriceResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP/HTTP and Security

❖ **HTTP Header Filtering**
  ➤ **M-POST verb**

❖ **HTTP**
  ➤ **Basic**
  ➤ **SSL**

❖ **Header filtering (on SOAPAction)**

❖ **Application Level Restriction**
  ➤ **Only allow access to "Web Service" registered components**

Industry support

- ❖ **DevelopMentor**
- ❖ **IBM/Lotus**
- ❖ **Intel**
- ❖ **IONA Technologies**
- ❖ **Jetform**
- ❖ **ObjectSpace**
- ❖ **Rockwell Software**
- ❖ **Rogue Wave Software**
- ❖ **UserLand Software**
- ❖ **And many more…**

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SOAP Toolkit

- ❖ **Designed to make using SOAP over HTTP easier**
- ❖ **A reference implementation of a proxy and listeners**
- ❖ **Due out RSN**

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Towards the future

❖ **Increasing industry support**

➢ **Iona, IBM/Lotus now, more soon**

❖ **Better tool support**

➢ **Visual Studio**

➢ **Object Brokers (ORBs)**

❖ **Implementations on other protocols**

➢ **SMTP, FTP, MSMQ, MQ Series…**

Summary

❖ **SOAP = XML + HTTP (eventually other protocols)**

❖ **Cross platform**

❖ **Language independent**

❖ **Works with firewalls**

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Call to action

❖ **Read the SOAP spec: http://msdn.microsoft.com/workshop/xml /general/soapspec.asp**

❖ **Identify potential WebServices**

❖ **Implement SOAP listeners for service**

❖ **Create SOAP clients for other services**

Questions?