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# **Introduction to Web Services**

Jim Fawcett  
CSE775 – Distributed Objects  
Spring 2003

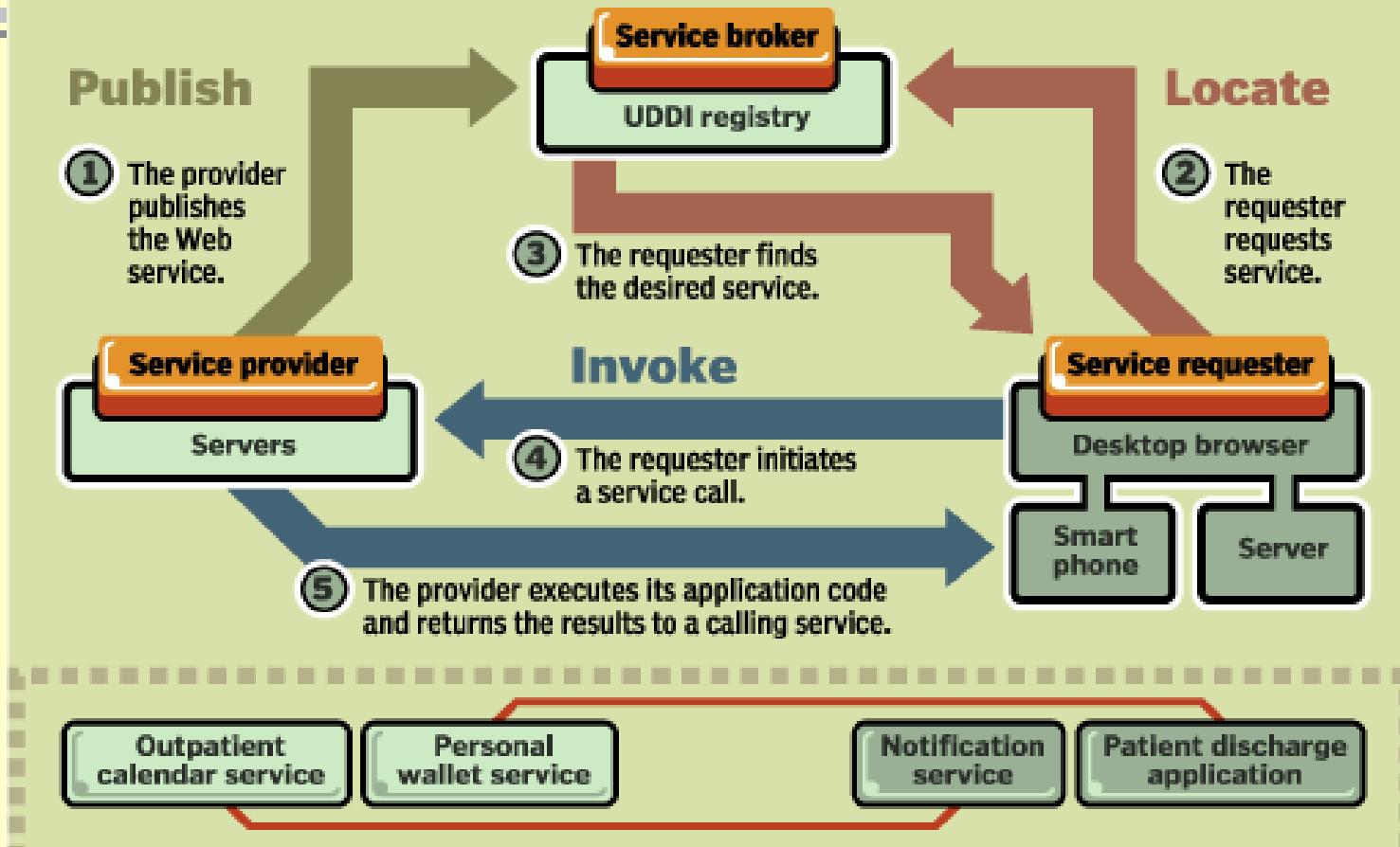
# The Service Bazaar

- Microsoft and Sun seem to have a vision of the web as a bazaar of services, as well as products.
  - With the product model you make one large payment and get unlimited access to one product version, shipped over the web or via a physical route.
  - In the services model you make a per-use payment and get access to the most current version, over the web.

# Web Services

- Provide a service over the internet
- Support construction of distributed applications
  - Reuse model – a distributed application may use third-party services as part of their basic functionality.
  - Example – Travel Agency application uses scheduling services provided by airlines, trains, and hotels.

# The Web Service Model

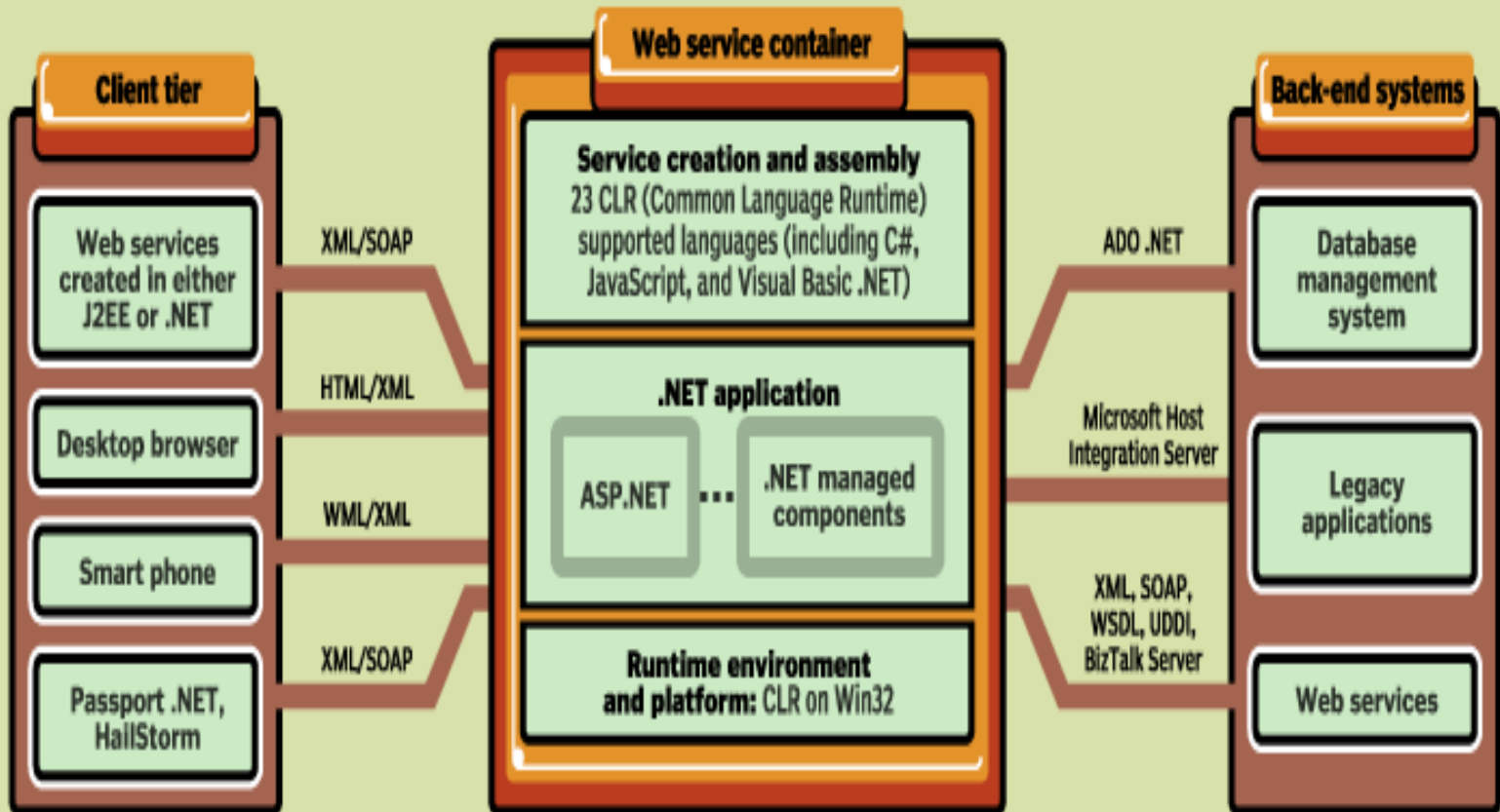


- PC Magazine – Secret Services, 13 Nov 01

# Web Service Components

- XML
  - eXtensible Markup Language
- SOAP
  - Simple Object Access Protocol
- UDDI
  - Universal Description, Discovery, & Integration
- WSDL
  - Web Services Description Language

# Microsoft.NET Web Services



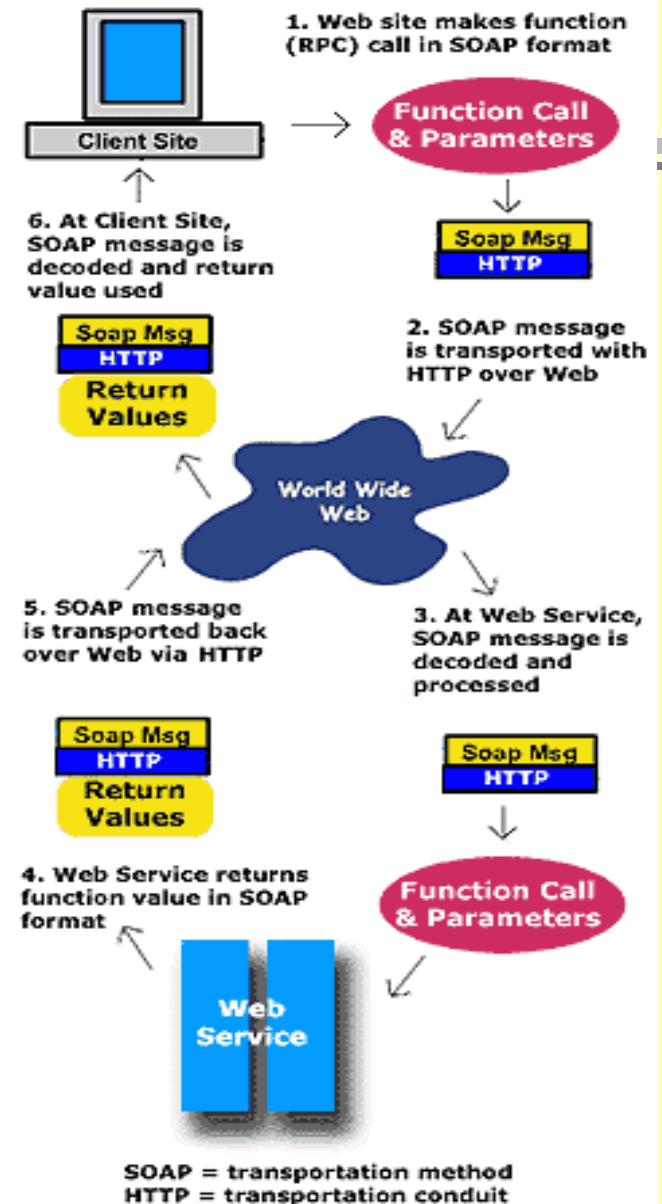
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# XML

- Tagged, hierarchical markup language intended to describe data.
  - Schemas are used to verify that a given XML document satisfies some structural constraints.
  - eXtensible Stylesheet Language (XSL) is a presentation language used to support the styling and presentation of XML documents.
  - XML documents can also be styled with Cascading Style Sheets (CSS).

# SOAP Transaction

- Simple Object Access Protocol (SOAP)
- XML data packed in soap wrapper, using HTTP protocol
- Remote Procedure Call (RPC) model





# WSDL

- Describes the capabilities of a web service
- Tells other machines how to format their requests and responses to a web service
- Defines a service's binding to a network transport protocol, usually HTTP

# WSDL According to the W3C:

- Services are defined using six major elements:
  - **types**, which provides data type definitions used to describe the messages exchanged.
  - **message**, which represents an abstract definition of the data being transmitted. A message consists of logical parts, each of which is associated with a definition within some type system.
  - **portType**, which is a set of abstract operations. Each operation refers to an input message and output messages.
  - **binding**, which specifies concrete protocol and data format specifications for the operations and messages defined by a particular portType.
  - **port**, which specifies an address for a binding, thus defining a single communication endpoint.
  - **service**, which is used to aggregate a set of related ports.

# UDDI

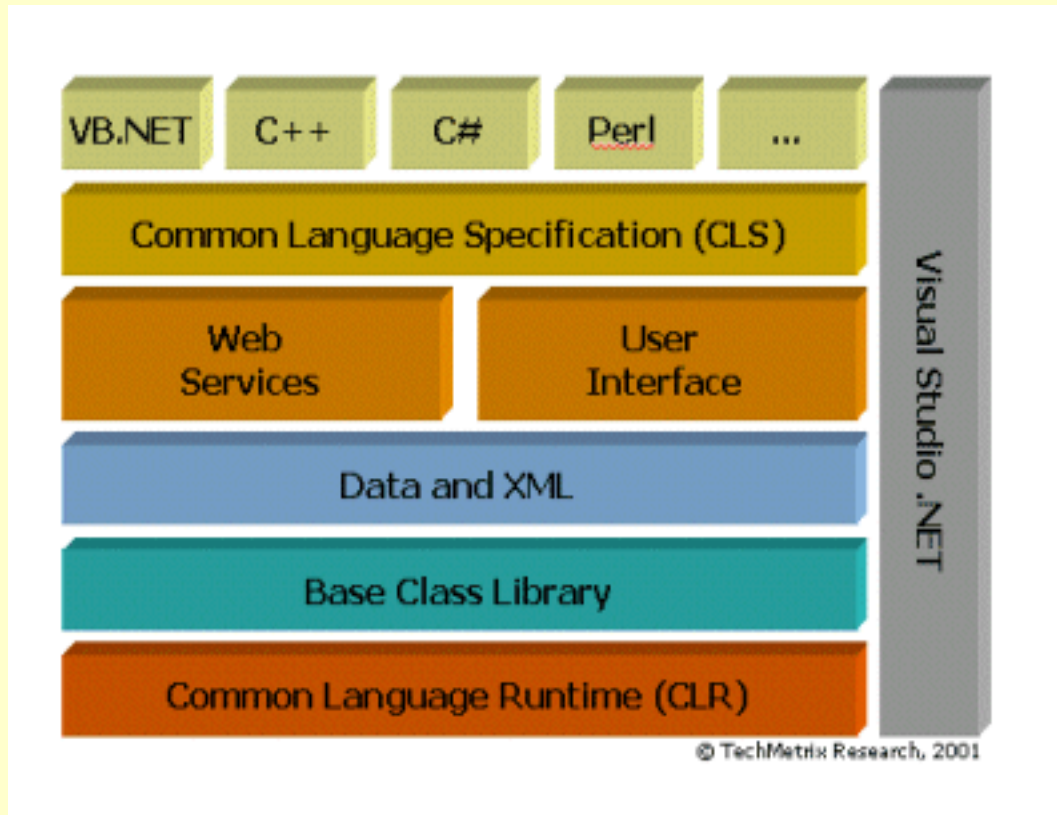
- A specification for an internet-wide registry of Web services.
- Uses metadata
  - Details about the provider
  - Details about how to access the service
- White pages
  - general information
- Yellow pages
  - categories by industry, products, services, and locations
- Green pages
  - technical details about invoking the services

# UDDI

## Sample UDDI Listings

- Finding a business.
  - `<find_business generic='1.0' xmlns='urn:uddi-org:api'>  
<name>IBM</name>  
</find_business>`
- Finding a service from a business
  - `<find_service generic='1.0' xmlns='urn:uddi-org:api' businessKey='6827FE60-00E2-F6A9-F6C4-C6113993AA77'>  
<name>UDDI Inquiry</name>  
</find_service>`
- Getting Details on a service
  - `<get_serviceDetail generic='1.0' xmlns='urn:uddi-org:api'>  
<serviceKey>68280DC6-00E2-F664-135E-C6113993AA77</serviceKey>  
</get_serviceDetail>`
- (note, these will see if a company has a UDDI directory. The responses from the UDDI are very long in most cases.)

# .Net Architecture

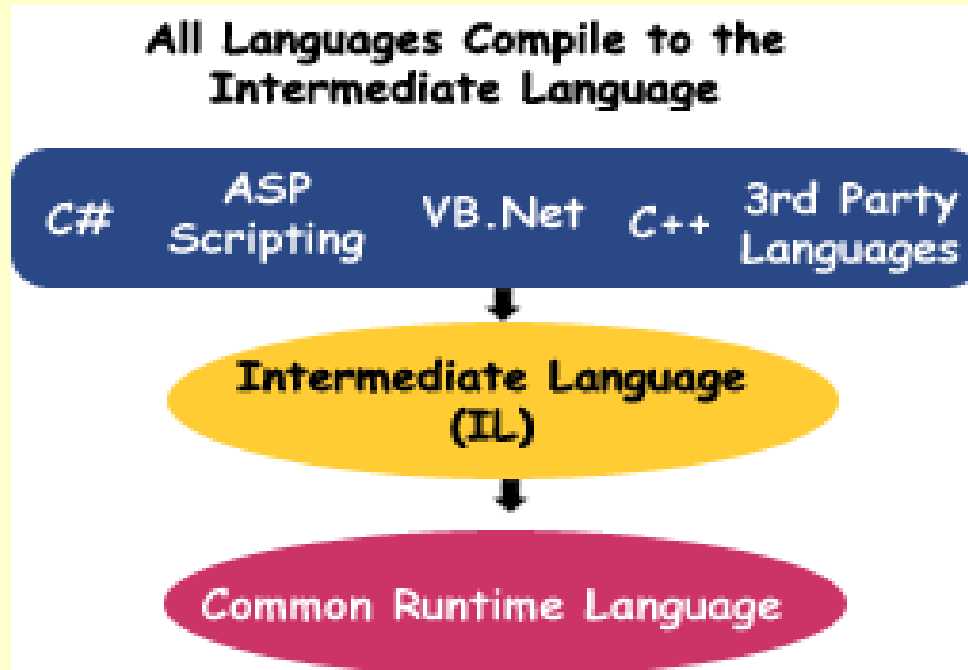


- [http://www.dotnet101.com/articles/art014\\_dotnet.asp](http://www.dotnet101.com/articles/art014_dotnet.asp)

# .Net Architecture

- Common language runtime library
- C# language
- A set of base components
  - provided by the common language runtime
  - Networking, containers, GUI parts, ...
- Win Forms and Web Forms
  - New UI framework, simplifying UI implementation
- ASP+
  - Active Server Pages supporting compiled server side components
- ADO+
  - Database access components using XML and SOAP
- Scripts can use common runtime library and can be compiled.

# Common Language Runtime (CLR)



- PC Magazine – Extreme Tech Web Site