

# Web Services

COMP750 Distributed Systems

# Service Programming

- Service programming has been proposed as an advancement over Object-Oriented programming.
- A Service is a program you communicate with using messages.

# Tenets of Service Programming

- Boundaries are explicit.
- The service you want to access may be:
  - on a different machine
  - created by a different programmer
  - owned by a different organization
  - updated on their schedule
- "Respecting the boundaries of others."

# Tenets of Service Programming

- Services are autonomous
- Client and Server may be independently deployed

# Tenets of Service Programming

- Share schema not class
- Integration based on message format and exchange patterns, not classes.
- Schema describe the purely structural format
- Contracts specify behavior

# Tenets of Service Programming

- Policy based compatibility.
- Service compatibility is based on policy assertions using stable global names.

# A Rose by Any Other Name...

- ***Longhorn*** is the codename for the next version of the Microsoft Windows OS.
- ***Yukon*** is the codename for the next version of the Microsoft SQL server.
- ***Whidbey*** is the codename for the next version of Microsoft Visual Studio
- ***Indigo*** is the new Web message service
- ***Avalon*** is the new Windows presentation system.
- ***WinFS*** is the Longhorn File System.

# Microsoft Remote Services

- Microsoft has several systems for network based programming
  - Enterprise Architect
  - .NET Remoting
  - ASMX
- Microsoft suggests ASMX for future development.



# .NET Remoting

- Object Orientation
- Access through proxy objects

```
ChannelServices.RegisterChannel(new  
TcpChannel());
```

```
HelloObj helloObjRef =  
(HelloObj)Activator.GetObject(  
    typeof(HelloObj), "tcp://localhost:6789/HelloObj" );
```

```
Console.WriteLine(helloObjRef.Greet("Joe Bloggs"));
```

# ASMX

- Uses WSDL to define services
- Data is transmitted with SOAP
- C# attributes are used to provide information about how the service is to be made available.

# How to make a Web Service

- Use Visual Studio to create a ASP Web Service
- Use a browser to view <http://wherever/myservice?wsdl>
- Save the WSDL file from the browser
- Use `wSDL.exe` to create a C# client
- Instantiate the web service object and call the methods.

# DotGNU Project

- The goal of the DotGNU project is to be a complete competitor to Microsoft's “.Net initiative”
- More information about the DotGNU project can be found at <http://www.gnu.org/projects/dotgnu/> *or* <http://dotgnu.org>

# DotGNU Project

- **DotGNU Portable.NET**, which contains an implementation of the Common Language Infrastructure (CLI). This component contains a portable runtime engine, compilers for C# and C, a C# class library, and related development tools.

# DotGNU Project

- The **DGEE** webservice server provides the functionality of accepting, validating and satisfying web service requests. It is implemented on top of distributed middleware called "Goldwater"
- You need this if you want to use web services with DotGNU and Portable.Net

# DotGNU Project

- **phpGroupWare**, a multi-user web-based GroupWare suite, which also serves to provide a collection of web service components, all of which can be accessed through XML-RPC so that you can integrate them into web service applications of your own.