WSDL

• Web Services Description Language (WSDL) provides a model and an XML format for describing Web services.
• WSDL is an XML description of the messages sent to and from an interface.
• Defines a language for describing the abstract functionality of a service as well as a framework for describing the concrete details of a service description.
WSDL Messages

• WSDL describes the *messages* that are exchanged between the service provider and requester.

• The messages are described abstractly and then bound to a concrete network protocol and message format.

• A message consists of a collection of typed data items

• An exchange of messages is described as an operation.
Endpoints

- A collection of operations is called an *interface*.
- An interface is bound to a concrete protocol and message format via one or more *bindings*.
- A binding, and therefore an interface, is accessible via one or more *endpoints*.
- Each endpoint has its own URI.
- A *service* is a collection of *endpoints* bound to the same interface.
A resource offering a single Web Service
WSDL XML Structure

• The root element of a WSDL file is `<definitions>`. Other elements are:
  • types
  • message
  • interface
  • binding
  • service
types

• The types element describes the data being transmitted between the client and server.

• Data is defined using the XML schema format.
Example <types>

<types>
  <s:schema elementFormDefault="qualified"
    targetNamespace="http://www.luigicastaldo.com/webservices">
    <s:element name="TimePlease">
      <s:complexType />
    </s:element>
    <s:element name="TimePleaseResponse">
      <s:complexType>
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="1"
            name="TimePleaseResult" type="s:string" />
        </s:sequence>
      </s:complexType>
    </s:element>
    <s:element name="string" nillable="true" type="s:string" />
  </s:schema>
</types>
interface

• An interface component describes a set of messages that a service sends and/or receives.
• It does this by grouping related messages into operations.
• Previously called portType
message elements

• A WSDL message element contains
• operation – name of action
• documentation – English description
• input – message sent to server
• output – message received from server
interface Example

<interface name="TimeServiceSoap">
  <operation name="TimePlease">
    <documentation>blah blah</documentation>
    <input message="s0:TimePleaseSoapIn" />
    <output message="s0:TimePleaseSoapOut" />
  </operation>
</interface>
message

• A message component describes the abstract format of a particular message that a Web service sends or receives.
• messages are specified in the interface elements
• messages refer to the type specifications
message example

<message name="TimePleaseSoapIn">
  <part name="parameters"
       element="s0:TimePlease" />
</message>

<message name="TimePleaseSoapOut">
  <part name="parameters"
       element="s0:TimePleaseResponse" />
</message>
binding

- A binding component described a concrete binding of an interface component and associated operations to a particular concrete message format and transmission protocol.
- A binding might specify soap, http or other protocol.
<binding name="TimeServiceHttpGet"
type="s0:TimeServiceHttpGet">
  <http:binding verb="GET" />
  <operation name="TimePlease">
    <http:operation location="/TimePlease" />
    <input>
      <http:urlEncoded />  
    </input>
    <output>
      <mime:mimeXml part="Body" />
    </output>
  </operation>
</binding>
service

• A service component describes one and only one interface that a service provides, and the endpoints it is provided over.

• The service provides the address of the server.
service example

<service name="TimeService">
   <documentation>blah blah</documentation>
   <port name="TimeServiceHttpGet"
      binding="s0:TimeServiceHttpGet">
      <http:address
         location="http://www.abc.com/xyz.asmx" />
   </port>
</service>
UDDI

• Universal Description Discovery and Integration is a database of available services.
• UDDI database points to servers that contain WSDL files.
• You can search a UDDI database by category, services and providers.
• http://uddi.microsoft.com is a UDDI server
Using UDDI and WSDL with .NET

1. Search UDDI for a service you want.
2. Use `disco.exe` to download the WSDL file from the location specified by UDDI.
3. Use `wsdl.exe` to convert the WSDL into C# code.
4. Add the generated C# code to a C# program.
5. The program should create the generated object and call the methods.