

WSDL

COMP750 Distributed Systems

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

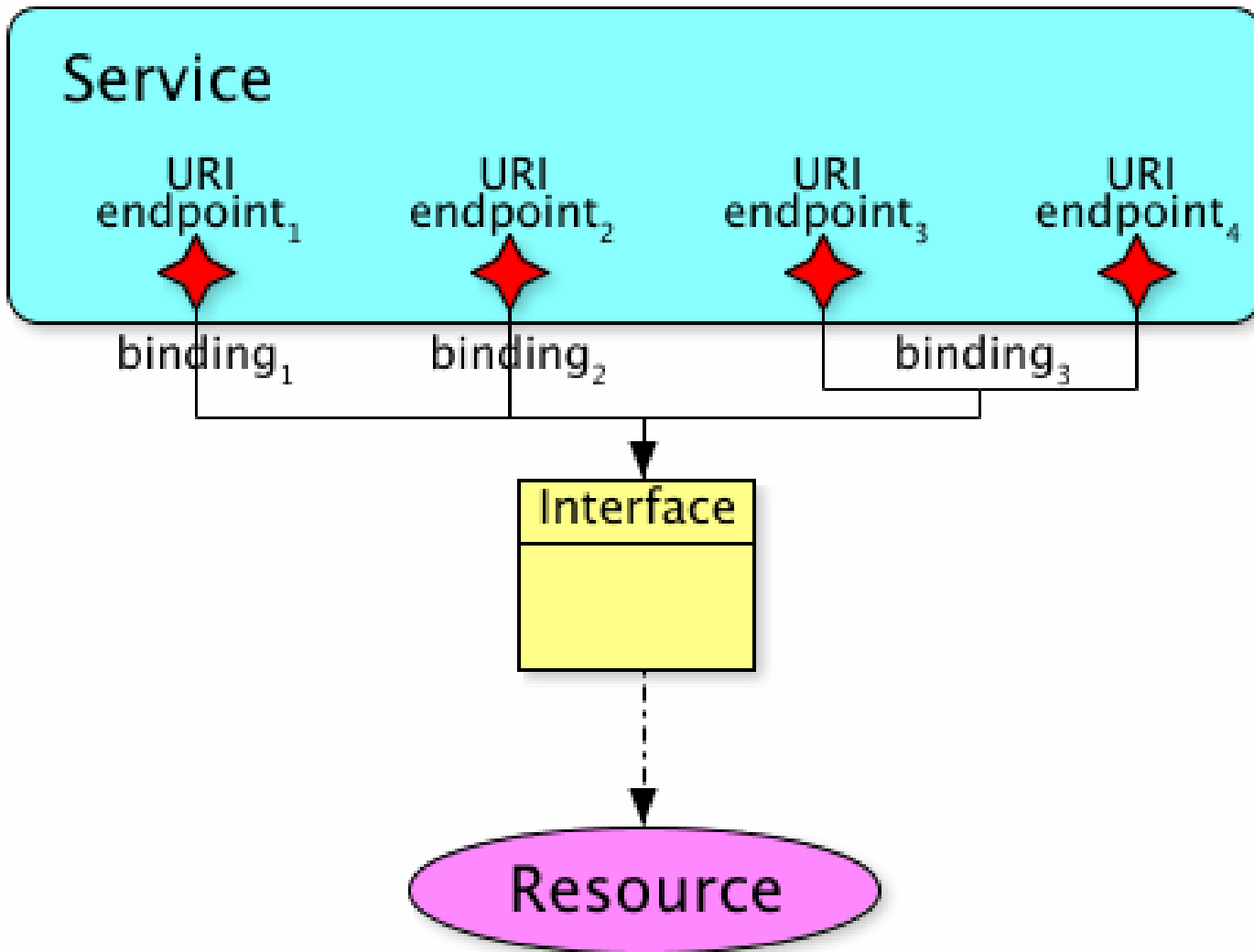
WSDL Messages

- 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 describes 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 example

```
<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.