WSDL 2.0

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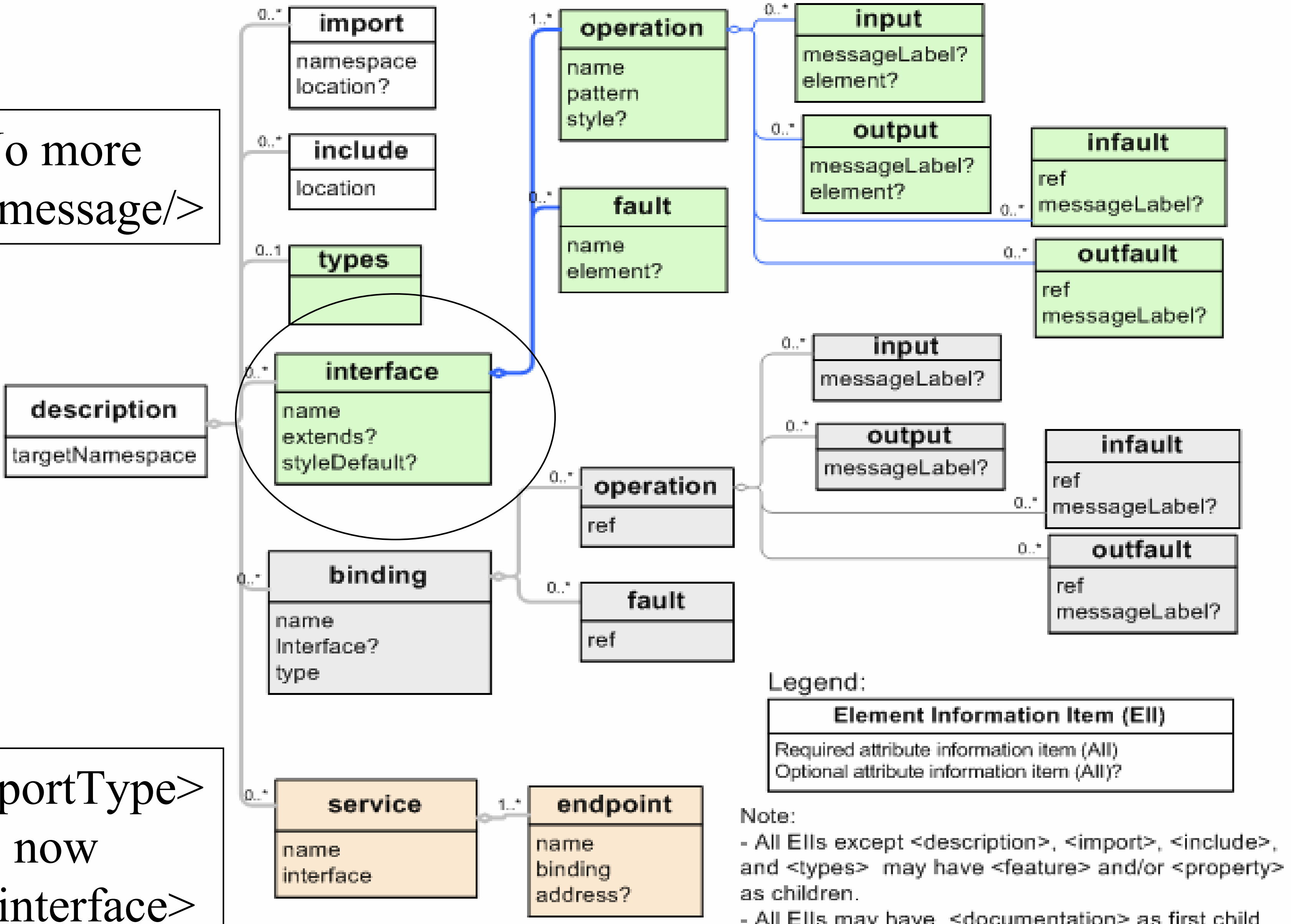
WSDL 1.1 to WSDL 2.0

- WSDL 1.1 never actually became a full fledged recommendation.
- WSDL 2.0 working draft has just completed public comment phase.
  - September 19th
- In general, WSDL 2.0 seems to clean up a lot of WSDL 1.1's complications.
- But really for most users this will not be an issue, since tools such as Apache Axis 2 will conceal these issues.

A WSDL Example

- Acknowledgement: I took this from the WSDL 2.0 Primer
  - http://www.w3.org/TR/2005/WD-wsdl20-primer-20050803/
- Basic parts:
  - Description: root tag
  - Types: local data types
  - Interface: the new portType
  - Binding: bind the interface to transport
  - Service: bind the binding to an end point.
- But first, a big picture.

No more <message/>



<portType> is now <interface>

WSDL 2.0 InfoSet Diagram

http://www.w3.org/TR/2005/WD-wsdl20-primer-20050803/

The WSDL Sandwich

```
<?xml version="1.0" encoding="utf-8" ?>


<description xmlns="http://www.w3.org/2005/08/wsdl"
    targetNamespace= "http://greath.example.com/2004/wsdl/resSvc"
    xmlns:tns= "http://greath.example.com/2004/wsdl/resSvc"
    xmlns:ghns = "http://greath.example.com/2004/schemas/resSvc"
    xmlns:wsoap= "http://www.w3.org/2005/08/wsdl/soap"
    xmlns:soap="http://www.w3.org/2003/05/soap-envelope"
    xmlns:wsdlx= "http://www.w3.org/2005/08/wsdl-extensions">


   <documentation>Blah blah blah </documentation>
    <!-- Types, Interface, Binding, and Service -->
</description>
```

<Types> Example

```
<types>
  <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
             xmlns="http://greath.example.com/2004/schemas/resSvc">
  <xs:element name="checkAvailability“ type="tCheckAvailability"/>
  <xs:complexType  name="tCheckAvailability">
     <xs:sequence>
        <xs:element name="checkInDate" type="xs:date"/>
        <xs:element name="checkOutDate" type="xs:date"/>
        <xs:element name="roomType" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
  <xs:element name="checkAvailabilityResponse" type="xs:double"/>
  <xs:element name="invalidDataError" type="xs:string"/>
 </xs:schema>
</types>
```

Notes on <types>

- <type/> technically includes a sequence of <xsd:any> tags
  - The schema defines it this way.
- In practice, you just use XML Schemas to define messages.
- The <input> and <output> tags of the interface operations use these element.

<interface/> Example

```
<interface name = "reservationInterface" >
   <fault name = "invalidDataFault" element =
         "ghns:invalidDataError"/>
  <operation name="opCheckAvailability"
         pattern="http://www.w3.org/2005/08/wsdl/in-out"
         style="http://www.w3.org/2005/08/wsdl/style/iri"
         wsdlx:safe = "true">
    <input messageLabel="In" element="ghns:checkAvailability" />
    <output messageLabel="Out"
         element="ghns:checkAvailabilityResponse" />
    <outfault ref="tns:invalidDataFault" messageLabel="Out"/>
  </operation>
</interface>
```

Notes on <interface/>

- Several new features over portType.
- Interfaces now contain <fault> definitions as well as <operation>.
- <operation> has three important attributes
  - pattern (required): the URI of the appropriate message pattern
    - Out-in, in-out, in-only, out-only
    - But not up-down or round-round
  - Style (optional): the URI name of the encoding convention to be used.
    - RPC, IRI, Multipart
  - wsdl:safe (optional): if true, means the client acquires no additional obligations.
    - Safe pages can be pre-fetched and cached for performance.
- The <input> and <output> tags all refer to the <type> definition.

<binding/> and <service/>

```
<binding name="reservationSOAPBinding"
        interface="tns:reservationInterface"
        type="http://www.w3.org/2005/08/wsdl/soap"
        wsoap:protocol="http://www.w3.org/2003/05/soap/bindings/
   HTTP">
   <fault ref="tns:invalidDataFault" wsoap:code="soap:Sender"/>
   <operation ref="tns:opCheckAvailability"
        wsoap:mep="http://www.w3.org/2003/05/soap/mep/soap-
        response"/>
</binding>
<service name="reservationService"
        interface="tns:reservationInterface">
<endpoint name="reservationEndpoint"
        binding="tns:reservationSOAPBinding"
        address ="http://greath.example.com/2004/reservation"/>
</service>
```

Notes on <binding/>

- The binding element’s “interface” attribute connects it to the appropriate <interface>.
  - Recall there can be more than one <interface/>.
  - This is a non-reusable binding example.
  - Bindings that omit “interface” attribute are *reusable*.
    - Must also omit operation and fault specific details.
  - What’s left?
    - See wsoap:code and wsoap:mep from previous example.
- The child <operation/> tag tells you which transport protocol to use with the associated interface operation.

Notes on <service/>

- The <service/> is associated with an <interface/> by QName through the “interface” attribute.
- The <endpoint/> tag associates with a <binding/> through the “binding” attribute.
- The “address” attribute is the URL of the actual service.
- So a service can have multiple endpoints, each binding to a different transport protocol, but all associated with the same interface.
  - So your interface can support SOAP 1.1 and SOAP 1.2 bindings through two different endpoints.

Interface Inheritance

- WSDL 2.0 <interface/> elements can use the “extend” attribute to inherit operations.
- Extended interfaces gain all operations from the other interface.
- Two caveats
  - Recursive loops are forbidden.
  - All operations should have unique QNames.
  - If two operations have the same QName, they MUST be identical operations, or there is an error.
- Recall that <interface/> can occur zero or more times, so we can use “extends” and multiple interfaces to “universal” operations.
  - In following example, the reservationInterface will also have the opLogMessage operation.

An Interface Extension Example

```
<interface name = "messageLogInterface" >
    <operation name="opLogMessage"
            pattern="http://www.w3.org/2005/08/wsdl/out-only">
            <output messageLabel="out" element="ghns:messageLog" />
    </operation>
</interface>

<interface name="reservationInterface" extends="tns:messageLogInterface" >
<operation name="opCheckAvailability"
            pattern="http://www.w3.org/2005/08/wsdl/in-out"
            style="http://www.w3.org/2005/08/wsdl/style/iri"
            wsdlx:safe = "true">
    <input messageLabel="In" element="ghns:checkAvailability" />
    <output messageLabel="Out"
            element="ghns:checkAvailabilityResponse" />
             <outfault ref="tns:invalidDataFault" messageLabel="Out"/>
    </operation>
</interface>
```

More Stuff: Features

- WSDL 2.0 interfaces have optional <feature/> tags.
- These seem to be related to "quality of service" considerations.
  - That is, should the operation be secure, reliable, etc?
  - These correspond roughly to various Web Service extensions.
    - And corresponding SOAP headers.
  - But the actual connection seems to be very loose.