

SOAP with Attachments API for Java

CSE 486/586
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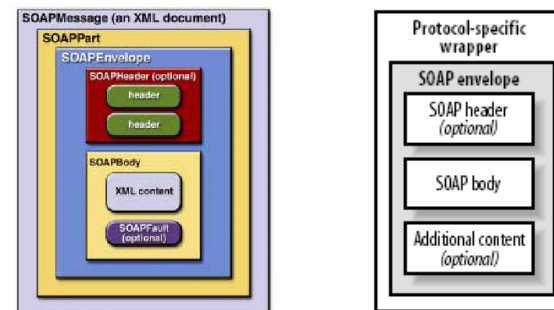
SAAJ - Package

- Two perspectives:
 - **Messages** – SAAJ helps create XML messages conforming to SOAP 1.1 by making Java API calls
 - **Connections** – SOAP Connection object represents *point-to-point* connection for sending and receiving *request-response* messages using SAAJ APIs
- SAAJ Classes and Interfaces represent XML elements
- Interface *Node* – base class for all interfaces, classes representing XML elements in SOAP message

SAAJ & JAXM

- **SAAJ** was previously part of JAXM (Java API for XML Messaging) package
- JAXM and SAAJ conforms to *SOAP 1.1* specification and SOAP with attachments specification
- SAAJ 1.1.1 - *javax.xml.soap* package provides API for creating, sending request-response SOAP messages
- JAXM 1.1.1- *javax.xml.messaging* package provides API needed for using a Messaging Provider to send one-way messages

SOAP Message with No Attachments



Creating simple SOAP Message

- ❑ Create a message using a **MessageFactory** object.
- ❑ SAAJ returns a new **SOAPMessage** object that already contains
 - A **SOAPPart** object that contains
 - ❑ A **SOAPEnvelope** object that contains
 - An empty **SOAPHeader** object
 - An empty **SOAPBody** object
- ❑ Access message elements using getter methods
- ❑ Create **SOAPBodyElement** object to hold the content
- ❑ Create an associated **Name** object for unique identification

Sending messages on SOAP connection

- ❑ Create a connection using a **SOAPConnectionFactory** object.
- ❑ Invoke the method **call** on the **SOAPConnection** object to send the SOAP message. Call method:
 - takes two arguments, the message being sent and the destination (usually identified by URL)
 - blocks until it receives the response.
 - returns the response SOAPMessage received from the remote party
- ❑ Close the connection

SOAP Connection

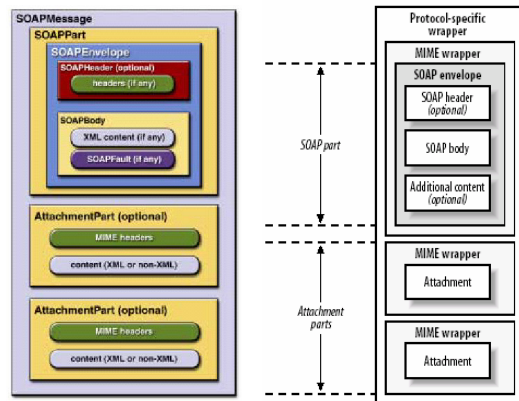
- ❑ Point-to-Point connection
- ❑ Request-Response messages
- ❑ Blocking Send



Getting the Content of a Message

- ❑ **getSOAPBody** on SOAPMessage gives a SOAPBody object
- ❑ **getChildElements** on SOAPBody object returns an Iterator object that contains all of the child elements (as Java Object) identified by the Name object passed as the argument.
- ❑ Need to cast the Objects returned by **getChildElements** to SOAPBodyElement objects.
- ❑ **getValue** on SOAPBodyElement returns the value of the immediate child of the element that calls the method.

SOAP Message with Attachments



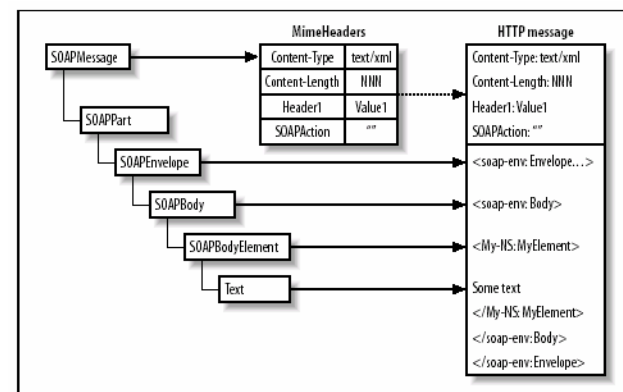
Accessing Attachments in SOAP Message

- SOAPMessage class provides two versions of the method **getAttachments** for retrieving its AttachmentPart objects depending upon the argument passed.
 - **No argument:** returns a java.util.Iterator object over all the AttachmentPart objects in a message
 - **Mime-Headers object (a list of MIME headers):** returns an iterator over the AttachmentPart objects that have a header that matches one of the headers in the list.

Adding Attachments to SOAP Message

- Create a **AttachmentPart** object.
- Add content to the AttachmentPart using **setContent** method
- Set AttachmentPart Headers (helpful in accessing a particular attachment when a message has multiple attachments):
 - Content-Type: required
 - Content-Id: optional
 - Content-Location: optional
- Add AttachmentPart to SOAP message using **addAttachmentPart** method

SAAJ – HTTP Mapping



SOAP Fault

- ❑ **SOAP Fault:** specific type of XML element placed in the body of a reply SOAP message to convey status information; to report a fault while processing the original request.
- ❑ SOAP specification requires that there be no more than one SOAP fault in the message body.
- ❑ Attributes (get and set methods):
 - Fault code (e.g. VersionMismatch, MustUnderstand, Client, Server)
 - Fault string
 - Fault actor
- ❑ Creating Fault Elements
 - addFault() method on SOAP Body
 - setFaultCode, setFaultString, setFaultActor
 - addDetail() method for a detailed entry
- ❑ HTTP response code 500 for a SOAP Message with fault

More on SAAJ and related technologies

❑ JWSDP Tutorial Document

- Chapter 13 SAAJ
- <http://java.sun.com/j2ee/1.4/docs/tutorial/doc/SAAJ.html#wp69380>

❑ Java Web Services in a Nutshell

- Chapter 3 SAAJ
- <http://www.oreilly.com/catalog/javawsian/chapter/ch03.pdf>

Receiving SOAP Message: Servlets

- ❑ No SAAJ API for of receiving a SOAP message (corresponding to **call()** on sender's side)
- ❑ HTTP Servlets can be used to receive the messages:
 - Servlet API contains support to handle a payload delivered over an HTTP connection, and
 - SOAPConnection class uses HTTP as the default protocol when transmitting messages.
- ❑ Extend the HTTP Servlet to handle the SOAP messages
- ❑ Inside doPost or doGet:
 - Extract request from SOAP Message
 - Prepare response SOAP Message
 - Write it to HttpServletResponse Object