



IBM Software Group

WebSphere® Message Broker V6

Web Services



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This presentation discusses the changes in Web Services message modeling support implemented in WebSphere Message Broker V6.

Agenda

- Enhancements to Web Services
 - ▶ SOAP/WSDL and Web Service review
 - ▶ Summary of “what’s new”
 - ▶ SOAP Message Model
 - ▶ WSDL generator
 - ▶ WSDL importer



This topic presents the V6 message modeling enhancements to Web Services, including a review of SOAP, WSDL, and Web Services, a summary of “what’s new”, and information about the enhancements in the SOAP Message Model, the WSDL generator, and the new WSDL importer.

Section

Enhancements to Web services



This section discusses the changes in WebSphere Message Broker V6 message modeling in regard to Web Services.

Web Services and SOAP - review

- A web service is a remotely accessible piece of software
 - ▶ Typically implies a SOAP message format and HTTP transport
 - ▶ The broker also supports WebSphere MQ & JMS as a transport
- SOAP defines a common envelope to wrap payload data
 - ▶ A top-level <Envelope> with <Header> and <Body> sections



A web service is a remotely accessible piece of software, typically implying a SOAP message format and HTTP transport, although WebSphere MQ and JMS can also be used as transports. SOAP is a message format that defines a common envelope to wrap payload data, comprised of a top-level “Envelope” followed by “Header” and “Body” sections.

WSDL and Web services - review

- WSDL (Web Services Description Language) defines a web service
 - ▶ WSDL defines the message format, transport/binding and service endpoints
- A web services provider advertises a web service using WSDL
- SOAP and WSDL standards are published by the W3C
 - ▶ SOAP and WSDL are further qualified by the WS-I Basic Profile



WSDL (Web Services Description Language) defines a web service; it describes where the service can be found and what operations are provided. The WSDL defines the message format, the transport and binding information, and the service endpoints available. In other words, a web services provider uses WSDL to advertise a web service.

Basic SOAP and WSDL standards implemented by IBM are published by W3C (World Wide Web Consortium). SOAP V1.1 and WSDL V1.1 are further qualified by the WS-I Basic Profile. Note that JMS as the transport is NOT part of the basic profile.

Example SOAP Message - review

```
<SOAP-ENV:Envelope
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/" ...>
  <SOAP-ENV:Header>
    <ns1:myHeaderBlock1
      SOAP-ENV:actor="audit"
      SOAP-ENV:mustUnderstand="1"
      xsi:type="xsd:string">
      ...
    </ns1:myHeaderBlock1>
  </SOAP-ENV:Header>

  <SOAP-ENV:Body>
    <ns2:myPayload ...>
    ...
  </ns2:myPayload>
</SOAP-ENV:Body>

</SOAP-ENV:Envelope>
```

The diagram illustrates the structure of a SOAP message. It shows the XML code with three callout boxes: 'Envelope' pointing to the root element, 'Header' pointing to the header block, and 'Body' pointing to the body block.



This is a basic example of a SOAP message. The SOAP message is based on XML formatting. The SOAP message is comprised of an 'Envelope', followed by a 'Header', and finally by the 'Body', which contains the payload of the message.

Web Service Support – summary of what is new

- Improved support for modeling, working with SOAP messages
 - ▶ Canned message definitions for SOAP 1.1 & 1.2
 - ▶ Better editor support: ESQL and Mapping editors
- More flexibility in generating WSDL
 - ▶ Improved integration of Message Category Wizard and Editor
 - ▶ Single/multi-file formats, rpc and document styles, literal encoding
- A mechanism for importing an existing WSDL definition
 - ▶ New WSDL importer wizard, accepting variety of WSDL styles
 - ▶ Single/multi-file formats, rpc and document styles, literal and SOAP encoding
- SOAP with Attachments support in new MIME domain
- Options to validate WSDL and XML schema in the toolkit



In WebSphere Message Broker V6, there is improved support for modeling and working with SOAP messages. Predefined message definitions are provided for SOAP 1.1 and 1.2. There is better ESQL and mapping editor support.

V6 also provides greater flexibility in generating WSDL. The Message Category Wizard and the Editor have been further integrated and WSDL can now specify single and multi-file formats, rpc and document styles, and literal encoding.

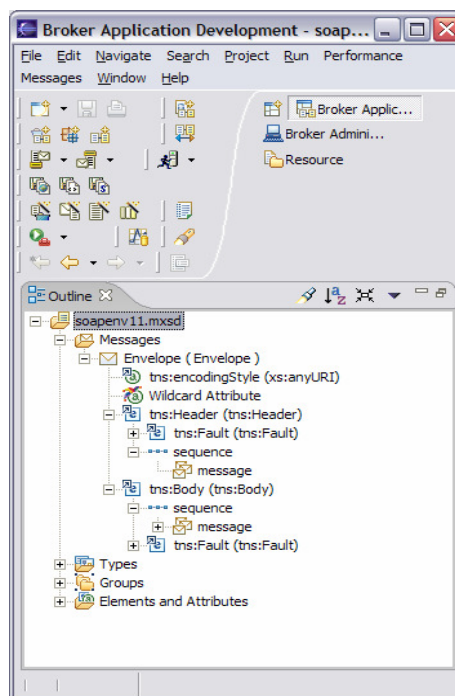
You can now import an existing WSDL definition using the new WSDL importer wizard, accepting a variety of WSDL styles. Single and multi-file format, rpc and document styles, literal encoding, and SOAP encoding are supported during import.

Additionally, SOAP with Attachments (SwA) is supported with the new MIME domain within WebSphere Message Broker V6.

There are options to validate WSDL and SML schema in the toolkit.

SOAP message model

- Canned message definitions for SOAP
- Imported automatically by WSDL importer or manually with New Message Definition File wizard
- Both SOAP 1.1 and SOAP 1.2
- Both <Header> and <Body> use composition="message" to support loose coupling of user data; orderedSet and unorderedSet still supported



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Web Services

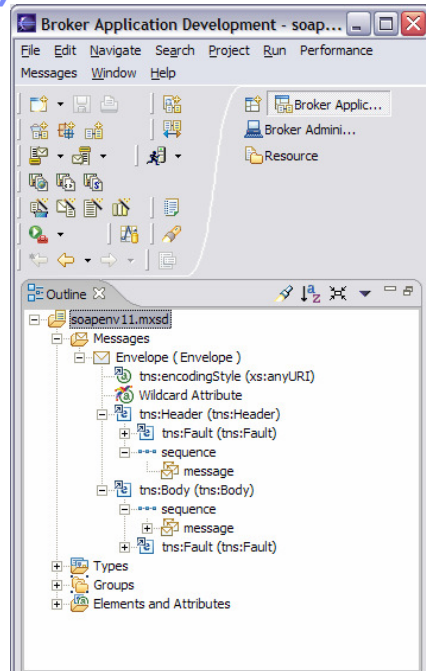
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Because canned message definitions for SOAP are supplied, you can use predefined message definitions when building new message sets. You can import the message definitions by using the WSDL importer, or you can define the definitions manually using the New Message Definition File wizard. Both SOAP 1.1 and SOAP 1.2 are supported.

Both the <Header> and <Body> envelopes use composition="message" to support the loose coupling of user data. Composition="message" permits you to introduce multi-part messages or sub-maps. For compatibility reasons, "orderedSet" and "unorderedSet" are also supported as composition settings.

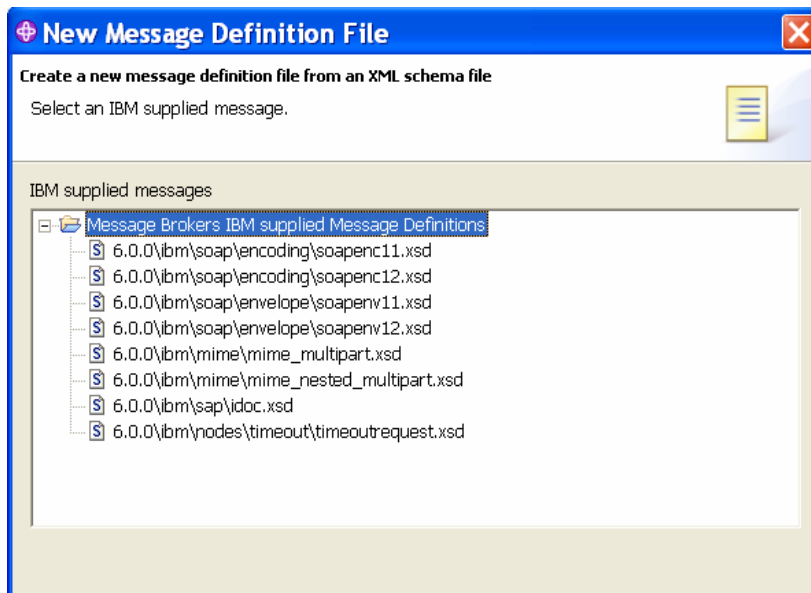
SOAP message model (cont.)

- Can be used with XMLNS, XMLNSC and MRM domains
- Provides 'content assist' for ESQL editor
- Provides model for Mapping editor



This SOAP Message Model can be used within the XMLNS, XMLNSC, and MRM domains. The SOAP model allows you to use ESQL 'content assist' during development. As an additional benefit of the SOAP Message Model, you may use the Mapping editor to auto create a sub-map so that you can add your message into the soap body.

IBM Supplied Messages



Here is a graphic showing you the supplied XML schema file from which you can choose when creating a New Message Definition File. The choices include V1.1 and V1.2 soap encoding, V1.1 and V1.2 envelope, mime-multipart, mime_nested_multipart, idoc, and timeoutrequest.

WSDL Generator

- Improved wizards
 - ▶ New Message Category File wizard allows messages to be selected
 - ▶ New WSDL Definition wizard for the actual generation
 - ▶ Categories are mandatory for generating WSDL in the toolkit
- Single and Multi-File Formats
 - ▶ The multi-file format is recommended by the W3C
- Both the recognized WSDL styles: “rpc” and “document”
 - ▶ Recently “document” style has become more popular
- Only “literal” encoding
 - ▶ Literal encoding – straightforward XML Schema definition
 - ▶ SOAP encoding not supported
 - Not WS-I Basic Profile compliant
- Validates generated WSDL against WS-I Basic Profile
 - ▶ Ignore, Warn or Fail if errors found
 - ▶ Recommended that WSDL conform to WS-I Basic Profile



A New Message Category File wizard is provided in V6 which allows message types to be selected. The new WSDL Definition wizard is provided for the generation of WSDL. Note that categories are mandatory for generating WSDL in the toolkit. Before you run the WSDL generator, you must create one or more message category files for your message set. Set the Message Category Kind to WSDL for each category file. Include one or more messages in each category file and assign a role type of `wsdl:input`, `wsdl:output`, or `wsdl:fault`. Each category corresponds to a WSDL operation in the generated WSDL document.

Single and multi-file WSDL formats are supported; multi-file format is recommended by the World Wide Web Consortium. A single file format is one in which the WSDL contains the bindings, services, ports and messages within one file with a separate schema file. A multi-file format is one in which one WSDL file contains the port types and messages, another WSDL files contains the services, another WSDL file contains the bindings, and a schema file is in a separate file.

Both the “rpc” and “document” WSDL are recognized, although the “document” style is now more commonly used.

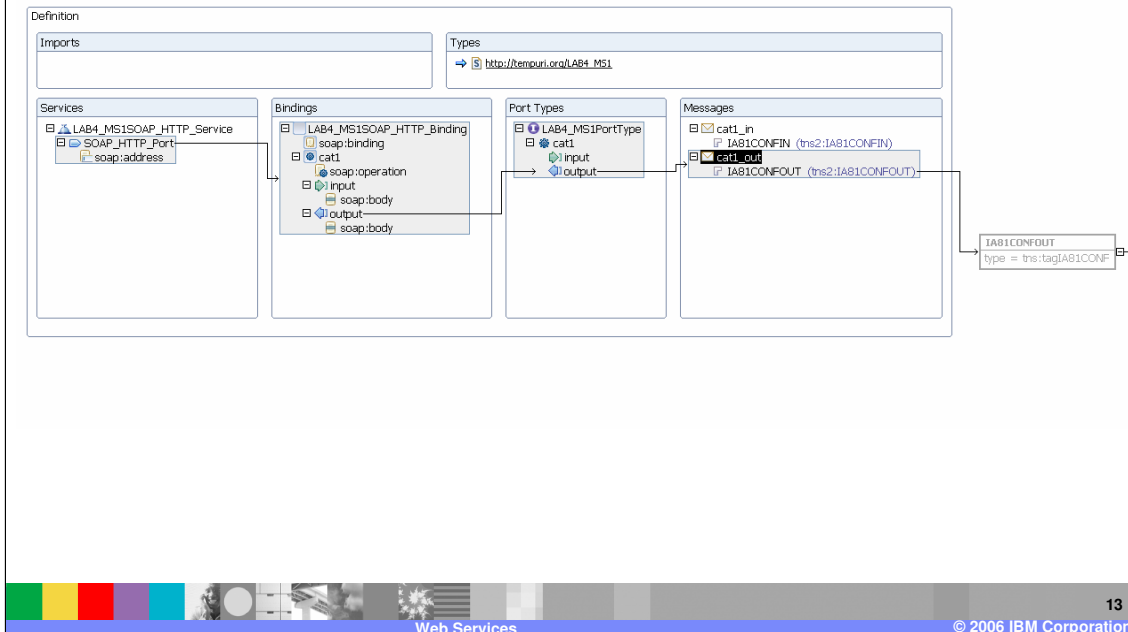
The WSDL generator only generates “literal” encoding. SOAP encoding is not supported because it is not WS-I Basic Profile compliant. During WSDL generation, the WSDL is checked against the WS-I Basic Profile, and errors are flagged as “Ignore”, “Warn”, or “Fail”. However, WSDL should conform to WS-I Basic Profile.

WSDL – Multi-File Example



Here is an example of WSDL in multi-file format. Note there are 4 files related to this WSDL definition – 3 containing WSDL and the fourth containing the actual schema data.

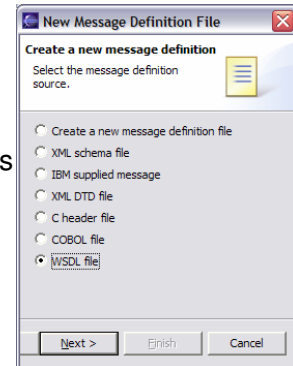
WSDL – Graphic Representation (Single File Example)



Here is a graphical representation of WSDL in single-file format. Note that the schema is shown separately (http://tempuri.org/LAB4_MS1) and will be in one file, while the other portions (Services, Bindings, Port Types, and Messages) will be contained in a single WSDL file.

WSDL Importer

- New option on the New Message Definition File wizard
- Creates a message model from WSDL
 - ▶ Models all messages which can appear inside SOAP <Envelope>
 - ▶ Imports the canned message definitions for the <Envelope> itself
 - ▶ Does *not* import the WSDL binding / endpoint details
 - These must be implemented by a message flow
- Accepts a range of WSDL formats
 - ▶ Single and multi-file formats
 - ▶ rpc-encoded, rpc-literal and document-literal WSDL styles
 - ▶ WSDL 1.1, SOAP 1.1 and SOAP 1.2
- Validates WSDL against WS-I Basic Profile
 - ▶ Ignore, Warn or Fail if errors found



The New Message Definition File wizard now creates a message model from the WSDL that is imported. This allows all the messages that can appear within the SOAP <Envelope> to be modeled. The importer can import the canned message definitions for the <Envelope> itself. It does not import the WSDL bindings nor the endpoint details; these must be implemented by a message flow.

The WSDL importer accepts a significant range of WSDL formats, including: single-file formats, multi-file formats, rpc-encoded styles, rpc-literal WSDL styles, document-literal WSDL styles, WSDL V1.1, SOAP V1.1, and SOAP V1.2. Note that although V6 does not generate rpc-encoded styles, it will import that style. Like the WSDL Generator, the WSDL importer validates the WSDL against the WS-I Basic Profile and errors are flagged as “Ignore”, “Warn”, or “Fail”.

Section

Summary and references



The last portion of the presentation contains a summary and references.

Summary

- **Web Services Enhancements:**
 - ▶ Improved message modeling support for SOAP and WSDL
 - ▶ Greater flexibility when generating WSDL
 - ▶ SwA (SOAP with Attachments) supported
 - ▶ New predefined message definitions feature
 - ▶ SOAP/WSDL V1.1 and V1.2 supported
 - ▶ WSDL Generator allows greater number of formats and output styles
 - ▶ New WSDL Importer accepts wide range of formats and styles



WebSphere Message Broker V6 has improved support for modeling and working with SOAP and WSDL. You now have more flexibility in generating WSDL. SOAP with Attachments (SwA) is now supported. A SOAP Message Model allows the creation of new messages using predefined message definitions. SOAP/WSDL V1.1 and V1.2 are supported. An improved WSDL Generator allows greater flexibility of options and styles when generating WSDL files. A new WSDL Importer is available which accepts a wide range of WSDL formats and styles.

References

- WebSphere Message Broker library:

<http://www-306.ibm.com/software/integration/wbimessagebroker/library/>

- WebSphere Message Broker Information Center:

<http://publib.boulder.ibm.com/infocenter/wmbhelp/v6r0m0/index.jsp>

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