SOAP

From Wikipedia, the free encyclopedia

> *This article is about a computer protocol. For the common cleaning mixture, see soap. For other uses of the acronym SOAP, see soap (disambiguation).*

SOAP is a protocol for exchanging XML-based messages over a computer network, normally using HTTP. SOAP forms the foundation layer of the web services stack, providing a basic messaging framework that more abstract layers can build on. SOAP facilitates the Service-Oriented architectural pattern.

There are several different types of messaging patterns in SOAP, but by far the most common is the Remote Procedure Call (RPC) pattern, where one network node (the *client*) sends a request message to another node (the *server*), and the server immediately sends a response message to the client. Indeed, SOAP is the successor of XML RPC.

Contents

Overview

Originally designed by Dave Winer, Don Box, Bob Atkinson, and Mohsen Al-Ghosein in 1998 with backing from Microsoft (where Atkinson and Al-Ghosein worked at the time) as an object access protocol, the SOAP specification is currently maintained by the XML Protocol Working Group of the World Wide Web Consortium.

Name

The name "SOAP" was originally an acronym for *Simple Object Access Protocol*, but the full name was dropped in Version 1.2 of the SOAP specification, because the focus of SOAP shifted from object access to object inter-operability.

Transport methods

Both SMTP and HTTP are valid application layer protocols for SOAP, but HTTP has gained wider acceptance as it works well with today's Internet infrastructure; specifically, SOAP works well with network firewalls. This is a major advantage over other distributed protocols like GIOP/IIOP or DCOM which are normally filtered by firewalls. A key issue under discussion is whether or not HTTP is the right transport given its inherent synchronous nature.

XML was chosen as the standard message format because of its widespread acceptance by major corporations and open source development efforts. Additionally, a wide variety of freely available tools significantly ease the transition to a SOAP-based implementation.

The somewhat lengthy syntax of XML can be both a benefit and a drawback. Its format is easy for humans to read, but can be complex and can have slow processing times. For example, CORBA, GIOP and DCOM use much shorter, binary message formats. On the other hand, hardware appliances are available to accelerate processing of XML messages. Binary XML (the use of the word "XML" is controversial here) is also being explored as a means for streamlining the throughput requirements of XML.

Structure of a SOAP message

A SOAP message is contained in an **envelope**. Within this envelope are two additional sections: the **header** and the **body** of the message. SOAP messages use XML namespaces.

The header contains relevant information about the message. For example, a header can contain the date the message is sent, or authentication information. It is not required, but, if present, must always be included at the top of the envelope.

Example SOAP messages

Here is an example of how a client might format a SOAP message requesting product information from a fictional warehouse web service. The client needs to know which product corresponds with the ID 827635:

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <getProductDetails xmlns="http://warehouse.example.com/ws">
      <productID>827635</productID>
    </getProductDetails>
  </soap:Body>
</soap:Envelope>
```

Here is how the warehouse web service might format its reply message with the requested product information:

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <getProductDetailsResponse xmlns="http://warehouse.example.com/ws">
      <getProductDetailsResult>
        <productName>Toptimate 3-Piece Set</productName>
        <productID>827635</productID>
        <description>3-Piece luggage set. Black Polyester.</description>
        <price>96.50</price>
        <inStock>true</inStock>
      </getProductDetailsResult>
    </getProductDetailsResponse>
  </soap:Body>
</soap:Envelope>
```

Performance of SOAP

Because of the lengthy XML format, SOAP is considerably slower than competing middleware technologies such as CORBA. Typically, SOAP is about 10 times slower than binary network protocols such as RMI or IIOP. This may not be an issue when only small messages are sent.

See also

Related technologies

- Comparison of Web service markup languages
- List of Web service markup languages
- Component technologies
- Web service and some of its core technologies WSDL, UDDI

- WS-I Basic Profile
- XMLHTTP
- Netconf
- SOAP with Attachments

Alternatives to SOAP

- JSON
- XINS
- Burlap [1] (http://www.caucho.com/burlap/)
- GXA
- Hessian Web Service Protocol [2] (http://www.caucho.com/hessian/index.xtp)
- REST
- XML-RPC
- BEEP

External links

- Generic SOAP Client (http://soapclient.com/soaptest.html)
- Dave Winer's history of SOAP (http://www.xmlrpc.com/stories/storyReader$555)
- Discussion on Web Services technology (SOAP and REST) (http://www.advogato.org/article/464.html)
- Don Box's history of SOAP (http://webservices.xml.com/pub/a/ws/2001/04/04/soap.html)
- Simon Fell's PocketSOAP (http://www.pocketsoap.com) and his blog (http://www.pocketsoap.com/weblog/) , which frequently covers contemporary SOAP topics
- SOAP Category at ODP (http://dmoz.org/Computers/Programming/Internet/Web_Services/)
- SOAP Implementations (list) (http://www.soaprpc.com/ws_implementations.html)
- Technology Report (http://xml.coverpages.org/soap.html)
- Two-way SOAP to CORBA bridge (http://soap2corba.sourceforge.net/)
- What is SOAP? (http://searchwebservices.techtarget.com/searchWebServices/downloads/what_is_soap.swf) (Flash presentation; requires plugin.)
- W3Schools SOAP Tutorial (http://www.w3schools.com/soap/) (Note: This is an outdated tutorial, which advocates the incorrect **SOAP** namespace)
- W3C SOAP: Primer (http://www.w3.org/TR/soap12-part0/)
- W3C SOAP: Messaging Framework (http://www.w3.org/TR/soap12-part1/)
- W3C SOAP: Adjuncts (http://www.w3.org/TR/soap12-part2/)
- XML protocol activity (http://www.w3.org/2000/xp/)

Retrieved from "http://en.wikipedia.org/wiki/SOAP"

Categories: W3C standards | Web service specifications | XML-based standards | Web services

---

- This page was last modified 21:43, 21 March 2006.
- All text is available under the terms of the GNU Free Documentation License (see **Copyrights** for details).
  Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc.
- Privacy policy
- About Wikipedia
- Disclaimers