



SOAP

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内容安排

- SOAP介绍
- AXIS介绍
- 演示

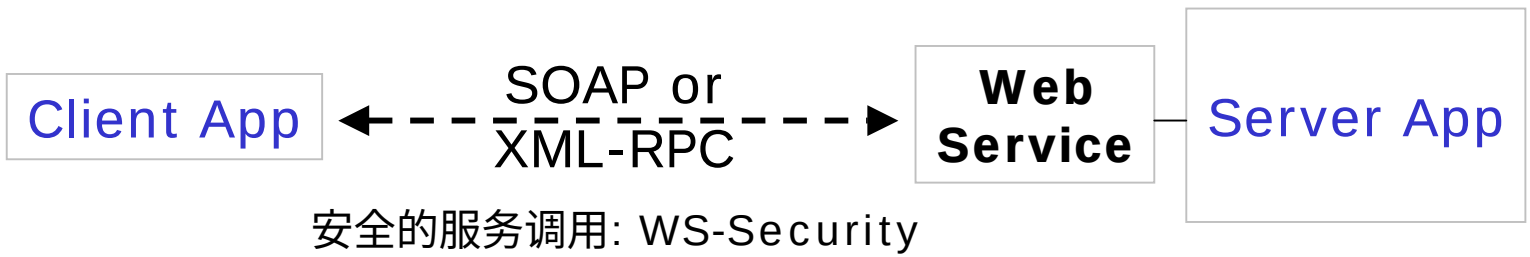
SOAP




SOAP 是 Simple Object Access Protocol（简单对象访问协议）的缩写。

HTTP + XML = SOAP

可简单理解为使用XML通过HTTP协议(常用)对等地交换结构化的和类型化的信息



安全的服务调用: WS-Security

SOAP设计目标

SOAP的主要设计目标是简明性和可扩展性。这就意味着有一些传统消息系统或分布式对象系统中的特性将不包含在SOAP的核心规范中。这些特性包括：

--分布式垃圾收集 (distributed garbage collection);

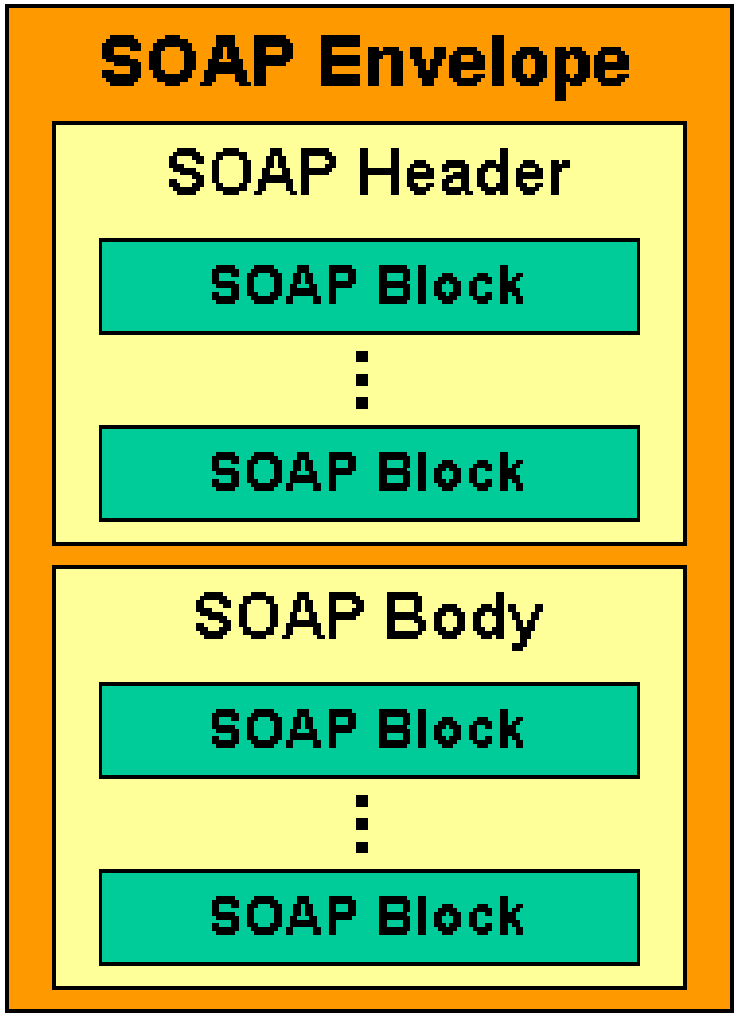
--批量消息传输/处理 (boxcarring or batching of messages);

--对象引用 (objects-by-reference, 需要分布式垃圾收集的支持);

--对象激活 (activation, 需要对象引用的支持)。

SOAP消息组成


JAVA


SOAP Envelope
SOAP Header
SOAP Block
SOAP Block
SOAP Body
SOAP Block
SOAP Block

一个例子

```
<Envelope>
  <Header>
    <transId>1234</transId>
  </Header>
  <Body>
    <Add>
      <a>3</a>
      <b>4</b>
    </Add>
  </Body>
</Envelope>
```

c = Add(a, b)

使用HTTP

```
<Envelope>
   <Header>
      <transId>1234</transId>
   </Header>
   <Body>
      <Add>
         <a>3</a>
         <b>4</b>
      </Add>
   </Body>
</Envelope>
```

Server

Request

Response

Client

```
<Envelope>
   <Header>
      <transId>1234</transId>
   </Header>
   <Body>
      <AddResponse>
         <c>7</c>
      </AddResponse>
   </Body>
</Envelope>
```

SOAP请求


```
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-
ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/”>
   <SOAP-ENV:Header>
      <t:transId xmlns:t=“http://a.com/trans”>1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:Add xmlns:m=“http://a.com/Calculator”>
         <a xsi:type=“integer”>3</a>
         <b xsi:type=“integer”>4</b>
      </m:Add>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP响应

```
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-
ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/”>
   <SOAP-ENV:Header>
      <t:transId xmlns:t=“http://a.com/trans”>1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:AddResponse xmlns:m=“http://a.com/Calculator”>
         <c xsi:type=“integer”>7</c>
      </m:AddResponse>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

分析请求




```
<SOAP-ENV:Envelope
xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/”>
...etc...
</SOAP-ENV:Envelope>
```

Scopes the message to the SOAP namespace

Establishes the type of encoding that is used within the message

分析请求

```
   ...etc...
   <SOAP-ENV:Header>
      <t:transId
xmlns:t="http://a.com/trans">1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:Add
xmlns:m="http://a.com/Calculator">
         <a xsi:type="integer">3</a>
         <b xsi:type="integer">4</b>
      </m:Add>
   </SOAP-ENV:Body>
   ...etc...
```

Qualifies transId

Establishes the interface/method

Describes parameter types

分析响应

```
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/
   <SOAP-ENV:Header>
      <t:transId xmlns:t=“http://a.com/trans”>1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:AddResponse xmlns:m=“http://a.com/Calculator”>
         <c xsi:type=“integer”>7</c>
      </m:AddResponse>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Response typically uses method name with “Response” appended

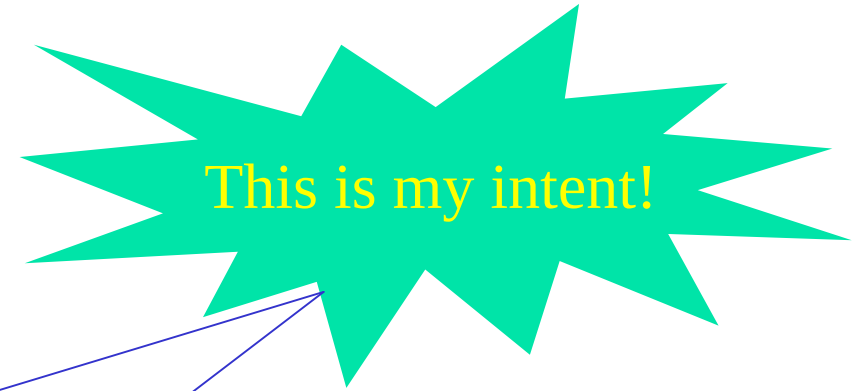
绑定HTTP (Request)


```
POST /Calculator.pl HTTP/1.0
Host: www.a.com
Accept: text/*
Content-type: text/xml
Content-length: nnnn
SOAPAction: “http://www.a.com/Calculator#Add”
{CR}{LF}
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-
ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/”>
   <SOAP-ENV:Header>
      <t:transId xmlns:t=“http://a.com/trans”>1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:Add xmlns:m=“http://a.com/Calculator”>
         <a xsi:type=“integer”>3</a>
         <b xsi:type=“integer”>4</b>
      </m:Add>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

绑定 HTTP (Response)


```
HTTP/1.0 200 OK
Content-type: text/xml
Content-length: nnnn
{CR}{LF}
<SOAP-ENV:Envelope
   xmlns:SOAP-
ENV=”http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-
ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/
”>
   <SOAP-ENV:Header>
      <t:transId
xmlns:t=”http://a.com/trans”>1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:AddResponse xmlns:m=”http://a.com/Calculator”>
         <c xsi:type=”integer”>7</c>
      </m:AddResponse>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAPAction




```
POST /Calculator.pl HTTP/1.0
Host: www.a.com
Accept: text/*
Content-type: text/xml
Content-length: nnnn
SOAPAction: “http://www.a.com/Calculator#Add”
{CR}{LF}
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/”>
   <SOAP-ENV:Header>
      <t:transId xmlns:t=“http://a.com/trans”>1234</t:transId>
   </SOAP-ENV:Header>
   <SOAP-ENV:Body>
      <m:Add xmlns:m=“http://a.com/Calculator”>
      ...etc...
```

SOAP Faults


```
HTTP/1.0 200 OK
Content-type: text/xml
Content-length: nnnn
{CR}{LF}
<SOAP-ENV:Envelope
   xmlns:SOAP-ENV=“http://schemas.xmlsoap.org/soap/envelope/”
   SOAP-
ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/”>
   <SOAP-ENV:Body>
      <SOAP-ENV:Fault>
         <faultcode>SOAP-ENV:Server</faultcode>
         <faultstring>Internal Application Error</faultstring>
         <detail xmlns:f=“http://www.a.com/CalculatorFault”>
            <f:errorCode>794634</f:errorCode>
            <f:errorMsg>Divide by zero</f:errorMsg>
         </detail>
      </SOAP-ENV:Fault>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP在应用中所处位置

Client	Server
Application	Web Service
Interface Semantics	Interface Semantics
Envelope/Header/Body	Envelope/Header/Body
Message Encoding	Message Encoding
Transport (e.g. HTTP)	Transport (e.g. HTTP)
TCP/IP	TCP/IP

SOAP

AXIS




Apache AXIS是Apache组织的一个开放源代码项目,它提供了用于解析和处理SOAP消息的引擎。

AXIS实质上是一个SOAP引擎,它提供了一个处理SOAP 消息的框架。具体的说,AXIS 提供了一套系统可以把SOAP消息调用转化成对具体的对象（如Java 类和EJB 对象）等的调用。开发人员可在AXIS的基础上搭建客户端,服务器,或网关等应用程序。

项目主页 http://ws.apache.org/axis/

AXIS 功能和特点

1．支持多种传输协议：AXIS对于传输层进行了抽象,他可以处理使用不同传输协议传输的SOAP消息,(如HTTP,SMTP,FTP,MOM等等),AXIS引擎的核心处理单元完全独立于传输层

2．良好可扩展性：AXIS系统定义了清晰和可扩展的系统结构，后台支持对JAVA和EJB对象的调用

3．灵活配置：AXIS允许Web服务的开发人员自由添加自定义消息处理器，用户可以使用配置文件对Web服务进行管理和配置

4．支持WSDL：AXIS支持WSDL1.1版本,它提供WSDL2Java工具,支持从WSDL文件生成客户端的桩(client stub)和服务器的实现框架(server skeleton)。另外,系统可以生成已注册服务的WSDL描述文件。

5．速度快：AXIS使用基于事件驱动的SAX解析器解析XML,因此它比早期的使用DOM 解析器Apache SOAP速度更快

总结




- SOAP—种用于在松散的,分布式环境中交换信息的轻型协议
- 使用AXIS可快速的构建基于SOAP的应用

参考资料

- http://www.w3.org/TR/soap12/
SOAP1.2英文版的最后版

- http://ws.apache.org/axis/
AXIS站点

结束




谢谢大家！

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