

An Example SOAP Service

(Week 11 Lecture 1)



Learning Objectives

- Clarify understanding of SOAP messages by looking at an example SOAP service.
- Learn the basics of using Perl module SOAP::Lite to implement a SOAP service.

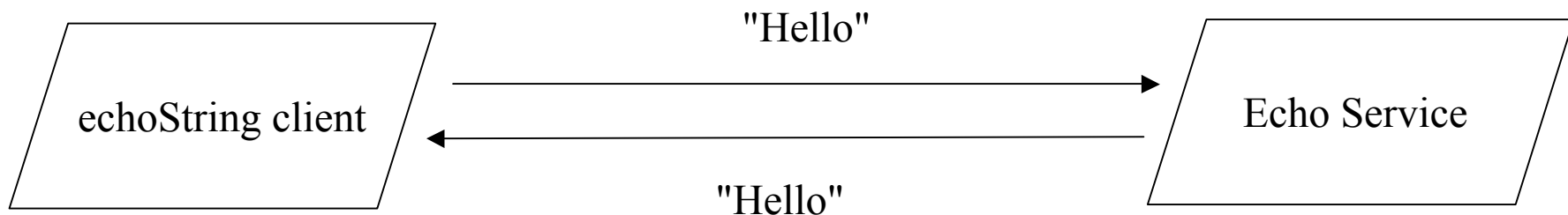


Lecture Outline

- A demonstration of a simple SOAP service.
- What is in a SOAP Message?

A Simple SOAP Service

- First of all, a demo of the Echo service you are implementing in this week's lab...



From echoString client to Echo server

POST http://gryphon:15678

Accept: text/xml

Accept: multipart/*

Content-Length: 528

Content-Type: text/xml; charset=utf-8

SOAPAction: "http://soapinterop.org/v"

<?xml version="1.0" encoding="UTF-8"?>

<SOAP-ENV:Envelope SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"

xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/"

xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"

xmlns:xsd="http://www.w3.org/1999/XMLSchema"

xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance">

<SOAP-ENV:Body>

<namespace1:echoString xmlns:namespace1="http://soapinterop.org/">

<inputString xsi:type="xsd:string">Hello</inputString>

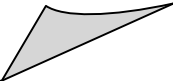
</namespace1:echoString>

</SOAP-ENV:Body>

</SOAP-ENV:Envelope>

Simplified...

```
<?xml version="1.0" encoding="UTF-8"?>  
<Envelope>  
  <Body>  
    <echoString>  
      <inputString type="string">Hello</inputString>  
    </echoString>  
  </Body>  
</Envelope>
```



From Echo server to echoString client

```
HTTP/1.1 200 OK
Date: Thu, 13 May 2004 12:20:50 GMT
Server: libwww-perl-daemon/1.26
Content-Length: 533
Content-Type: text/xml; charset=utf-8
Client-Date: Thu, 13 May 2004 12:20:50 GMT
Client-Peer: 134.115.64.20:15678
Client-Response-Num: 1
SOAPServer: SOAP::Lite/Perl/0.55
```

```
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/1999/XMLSchema"
  xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance">
  <SOAP-ENV:Body>
    <namespace1:echoStringResponse xmlns:namespace1="http://soapinterop.org/">
      <return xsi:type="xsd:string">Hello</return>
    </namespace1:echoStringResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Simplified...

```
<?xml version="1.0" encoding="UTF-8"?>  
<Envelope>  
  <Body>  
    <echoStringResponse>  
      <return type="string">Hello</return>  
    </echoStringResponse>  
  </Body>  
</Envelope>
```



SOAP Envelope

- The SOAP <Envelope> element consist of two parts:
 - <Header> - optional
 - Contains control information - eg. to be used by intermediaries between sender and receiver.
 - <Body> - mandatory
 - Contains content used for the service.

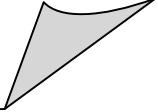
Fault Message

HTTP/1.1 500 Internal Server Error
Date: Thu, 13 May 2004 12:05:59 GMT
Server: libwww-perl-daemon/1.26
Content-Length: 649
Content-Type: text/xml; charset=utf-8
Client-Date: Thu, 13 May 2004 12:05:59 GMT
Client-Peer: 134.115.64.20:15678
Client-Response-Num: 1
SOAPServer: SOAP::Lite/Perl/0.55

```
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/"
  xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/1999/XMLSchema"
  xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance">
  <SOAP-ENV:Body>
    <SOAP-ENV:Fault>
      <faultcode xsi:type="xsd:string">SOAP-ENV:Client</faultcode>
      <faultstring xsi:type="xsd:string">SOAPAction should be "http://soapinterop.org/"</faultstring>
      <faultactor xsi:type="xsd:string">http://gryphon:15678/</faultactor>
    </SOAP-ENV:Fault>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Simplified...

```
<?xml version="1.0" encoding="UTF-8"?>
<Envelope>
  <Body>
    <Fault>
      <faultcode type="string">
        SOAP-ENV:Client
      </faultcode>
      <faultstring type="string">
        SOAPAction should be "http://soapinterop.org/"
      </faultstring>
      <faultactor type="string">
        http://gryphon:15678/
      </faultactor>
    </Fault>
  </Body>
</Envelope>
```





SOAP Faults

- All generated errors are reported in `<Fault>` element.
 - The `<Fault>` element in our Echo service example is one for SOAP v1.1. The new SOAP v1.2 has slightly different sub-elements.

Echo server

```
#!/usr/bin/perl

use SOAP::Lite;
use SOAP::Transport::HTTP ;

my $port = shift ;

my $soapServer = SOAP::Transport::HTTP::Daemon
    -> new (LocalPort => $port )
    -> dispatch_to ( qw(echoString) )
    -> on_action ( sub {
        die "SOAPAction should be \"http://soapinterop.org/\"\n"
        unless $_[0] eq "http://soapinterop.org/"; } ) ;

print "Starting SOAP server on URL: ".$soapServer->url."\n" ;
$soapServer->handle;

sub echoString {
    # Receives a string and echoes it back
    my ($class, $inputString) = @_ ;
    die "no input provided\n" if !$inputString ;
    return SOAP::Data->name('return')->type('string')->value($inputString);
}
```

echoString client

```
#!/usr/bin/perl -w

use SOAP::Lite;

my $url = shift ;

$inputString="Hello" ;
$inputSoapParam = SOAP::Data
    -> name ('inputString')
    -> type ('string')
    -> value ($inputString) ;

$response = SOAP::Lite
    -> proxy($url)
    -> uri('http://soapinterop.org/')
    -> on_action( sub { "http://soapinterop.org/" } )
    -> echoString ($inputSoapParam) ;

if ($response->fault) {
    print "SOAP Fault received.\n\n" ;
    print "Fault Code   : ".$response->faultcode."\n" ;
    print "Fault String : ".$response->faultstring."\n" ;
    print "Fault Actor  : ".$response->faultactor."\n" ;
    die ;
}
```



Reference

- Echo server and client code described in Unit Reader chapter 6.
 - Note that the first page in chapter 5 in the Unit Reader should be the first page of chapter 6.
- References to SOAP at W3C
 - <http://www.w3.org/2002/ws/>



Next lecture...

- An easier way of invoking a Web Service:
WSDL.