



Sécurité en ingénierie du Logiciel
Le cadre des Web Services
Partie 7 : Introduction à SOAP

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- Introduction
- SOAP format (par l'exemple)
- SOAP format des erreurs
- SOAP format et transport HTTP

SOAP is a lightweight protocol for exchange of information in a decentralized, distributed environment. It is an XML based protocol that consists of three parts: an envelope that defines a framework for describing what is in a message and how to process it, a set of encoding rules for expressing instances of application-defined datatypes, and a convention for representing remote procedure calls and responses. SOAP can potentially be used in combination with a variety of other protocols; however, the only bindings defined in this document describe how to use SOAP in combination with HTTP and HTTP Extension Framework.

Simple Object Access Protocol (SOAP) 1.1 - Document W3C

SOAP format (par l'exemple)

```
public interface Hello
{
public String sayHelloTo(String name);
}
```

- La méthode sayHelloTo pourrait être *
- Pour interfacer sayHelloTo (client/serveur),
- Pas limité à Java (uniquement pour l'exemple),

SOAP format (par l'exemple)

```
<?xml version="1.0"?>  
<Hello>  
  <sayHelloTo>  
    <name>John</name>  
  </sayHelloTo>  
</Hello>
```

- Requête vers l'interface Hello définie,
- Définition de la méthode,
- Paramètres de la méthode,

SOAP format (par l'exemple)

```
<?xml version="1.0"?>  
<Hello>  
<sayHelloToResponse>  
<message>Hello John, How are you?</message>  
</sayHelloToResponse>  
</Hello>
```

- Réponse à la requête (vers l'interface Hello),
- Methode + "Response",
- Un "message" de retour.

SOAP format (requête)

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="
http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="
http://www.w3.org/1999/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/1999/XMLSchema">
<SOAP-ENV:Header>
</SOAP-ENV:Header>
<SOAP-ENV:Body>
<ns1:sayHelloTo
xmlns:ns1="Hello"
SOAP-ENV:encodingStyle="
http://schemas.xmlsoap.org/soap/encoding/">
<name xsi:type="xsd:string">John</name>
</ns1:sayHelloTo>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP format (retour)

```
<SOAP-ENV:Envelope xmlns:SOAP-
ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/1999/XMLSchema">
<SOAP-ENV:Body>
<ns1:sayHelloToResponse
xmlns:ns1="Hello"
SOAP-
ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding"
<return xsi:type="xsd:string">Hello John, How are you
doing?</return>
</ns1:sayHelloToResponse>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```


SOAP format (header)

```
<SOAP-ENV:Header>  
<t:Transaction xmlns:t="some-URI"  
SOAP-ENV:mustUnderstand="1">  
5  
</t:Transaction>  
</SOAP-ENV:Header>
```

SOAP format (erreur)

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="
http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<SOAP-ENV:Fault>
<faultcode>SOAP-ENV:Server</faultcode>
<faultstring>Server Error</faultstring>
<detail> <e:myfaultdetails xmlns:e="Hello">
<message> Sorry, my silly constraint says that I cannot say
hello on Friday. </message>
<errorcode> 1001 </errorcode>
</e:myfaultdetails>
</detail>
</SOAP-ENV:Fault>
</SOAP-ENV:Body> </SOAP-ENV:Envelope>
```

SOAP format (+header)

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="
http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsi="
http://www.w3.org/1999/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/1999/XMLSchema">
<SOAP-ENV:Header>
<t:Transaction xmlns:t="some-URI"
SOAP-ENV:mustUnderstand="1">
5 </t:Transaction>
</SOAP-ENV:Header> <SOAP-ENV:Body>
<ns1:sayHelloTo xmlns:ns1="Hello"
SOAP-ENV:encodingStyle="
http://schemas.xmlsoap.org/soap/encoding/">
<name xsi:type="xsd:string">Alex</name>
</ns1:sayHelloTo>
</SOAP-ENV:Body> </SOAP-ENV:Envelope>
```

SOAP format (erreur sur header)

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV="
http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Body>
<SOAP-ENV:Fault>
<faultcode>SOAP-ENV:MustUnderstand</faultcode>
<faultstring>SOAP Must Understand
Error</faultstring> </SOAP-ENV:Fault>
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP via HTTP

POST http://www.SmartHello.com/HelloApplication HTTP/1.0

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

Content-Length: 587

SOAPAction: "http://www.SmartHello.com/HelloApplication#sayHelloTo"

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

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

xmlns:xsd="http://www.w3.org/1999/XMLSchema"> <SOAP-ENV:Header> </SOAP-ENV:Header>

<SOAP-ENV:Body> <ns1:sayHelloTo xmlns:ns1="Hello" SOAP-ENV:encodingStyle="

http://schemas.xmlsoap.org/soap/encoding/"> <name xsi:type="xsd:string">John</name>

</ns1:sayHelloTo> </SOAP-ENV:Body> </SOAP-ENV:Envelope>

SOAP via HTTP (retour)

HTTP/1.0 200 OK

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

Content-Length: 615

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV=" http://schemas.xmlsoap.org/soap/envelope/"
xmlns:xsi="
http://www.w3.org/1999/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/1999/XMLSchema">
<SOAP-ENV:Body> <ns1:sayHelloToResponse
xmlns:ns1="Hello" SOAP-ENV:encodingStyle=" http://schemas.xmlsoap.org/soap/encoding/">
<return xsi:type="xsd:string">Hello John, How are you doing?</return>
</ns1:sayHelloToResponse> </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

SOAP : plusieurs transports

- via HTTP / TLS,
- via les extensions HTTP,
- via SMTP,
- via "Batch processing",
- via ...

- `adulau@foo.be`
- `http://www.foo.be/cours/securite-webservices/`
- `3B12 DCC2 82FA 2931 2F5B 709A 09E2 CD49 44E6
CBCD`