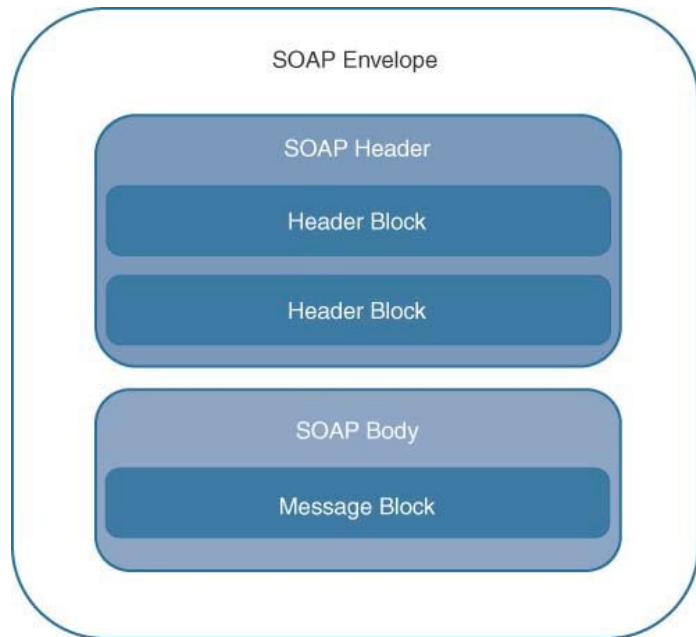


# SIMPLE OBJECT ACCESS PROTOCOL

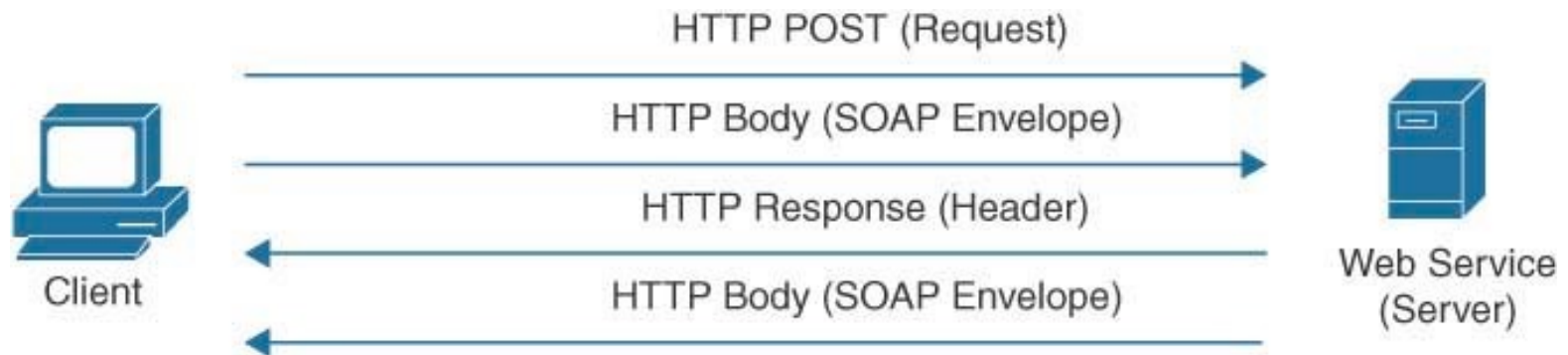
- SOAP stands for simple object access protocol
- It's used today to be able to provide programmatic access to different types of web services
- It can use UDP, TCP, SMTP
- SOAP uses XML to communicate between web services and clients.



- The SOAP specification defines the messaging framework, which consists of four parts.

Element	Description	Required
Envelope	Identifies the XML document as a SOAP message.	Yes
Header	Contains SOAP header information.	No
Body	Body of the message; contains the remote call, parameters, and response information.	Yes
Fault	Provides information about any errors that occurred.	No

# High-Level SOAP Communication



# Sample SOAP Message

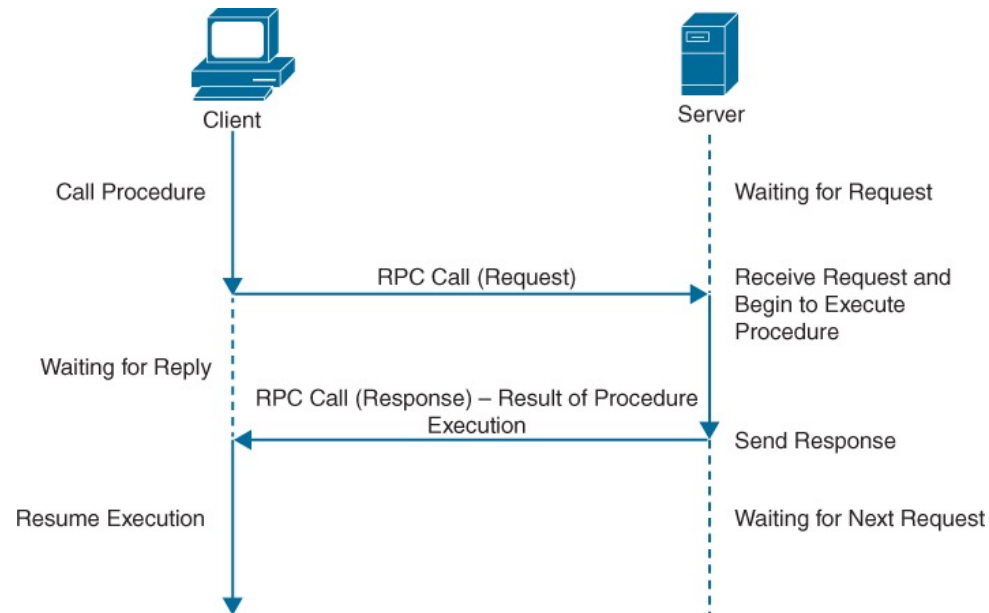
```
POST /InStock HTTP/1.1
Host: www.example.org
Content-Type: application/soap+xml; charset=utf-8
Content-Length: 299
SOAPAction: "http://www.w3.org/2003/05/soap-envelope"

<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://www.w3.org/2003/05/soap-envelope" xmlns:m="http://
www.example.org">
  <soap:Header>
  </soap:Header>
  <soap:Body>
    <m:GetStockPrice>
      <m:StockName>CSCO</m:StockName>
    </m:GetStockPrice>
  </soap:Body>
</soap:Envelope>
```

# RPC (JSON AND XML)

- RPC is a Remote Procedure Call and it has the ability to be able to run code or a program on a remote system just like it was being executed locally on your own machine.
- API style used in numerous protocols:
  - SOAP
  - JSON RPC
  - XML RPC
  - NETCONF
  - gRPC

# RPC communication





- JSON-RPC is a very simple and lightweight RPC protocol encoded in JSON that defines only a few primitive data types, such as string, integer, Boolean, and null, and commands such as params, method, id, and so on.
- It also supports notifications like sending data to the server that does not require a response, which is useful for asynchronous updates and batch requests (multiple requests inside one request body).



- XML-RPC is a protocol that is similar to SOAP. However, it is less structured and uses fewer constraints than SOAP. In addition to the basic data types, it also supports some more complex types like Base64, array, datetime, and struct.
- It also supports basic HTTP authentication.

```
<?xml version="1.0" encoding="UTF-8"?>
<methodCall>
  <methodName>subtract</methodName>
  <params>
    <param>
      <value>
        <x>42</x>
      </value>
      <value>
        <y>23</y>
      </value>
    </param>
  </params>
</methodCall>
```



```
<?xml version="1.0" encoding="UTF-8"?>
<methodResponse>
  <params>
    <param>
      <value>
        <string>19</string>
      </value>
    </param>
  </params>
</methodResponse>
```