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Sub- Web Services  
Assignment - ①

## Assignment - (II)

Q.1 "SOAP" fault is caused due to client or server failure.

State T/F with justification.

→ • SOAP provides a model for handling

• Fault arises

• It distinguishes both the conditions that result in a faultability to signal that fault to the originator of the faulty message or another node.

• SOAP message can carry only one faults ~~work~~.

Q.2 Give the use of SOAP actor attribute.

→ - SOAP actor attribute is specifically used to address the header element to a specific endpoint.

- SOAP actor attribute is used to annotate an extension element.

- The SOAP actor global attribute can be used to indicate the recipient of a header element.

Q.3 What do you mean by wire protocol and transport protocol?

→

\* Wire protocol :-

i) In computer networking, a wire protocol refers to a way of getting data from point to point.

ii) A wire protocol is needed if more than one application has to interoperate.

iii) It generally refers to communication protocols higher than the physical layer.

## \* Transport Protocol :-

- (i) The term transport protocol also implies transport services.
- (ii) It includes the lower - level data link protocol that moves packets from one node to another.
- (iii) Transport protocols run over the best - effort IP layer to provide a mechanism for applications to communicate with each other without directly interacting with the IP layer.

Q 4 What is SOAP message path?

- (i) The SOAP message path is the set of SOAP nodes.
- (ii) In the SOAP node a single SOAP message passes, including the initial SOAP sender, zero or more SOAP intermediaries, and an ultimate SOAP receiver.

Q.5 Explain in short Apache Axis environment.

- (i) Apache Axis is essentially a SOAP engine & framework for constructing SOAP processors such as clients, servers, gateways, etc.
- (ii) The current version of Axis is written in java, but a C++ implementation of the client side of Axis is being developed.

③ How errors are handled using SOAP faults, give an example for adding Fault in XML of SOAP message?

→ SOAP provides a model for handling situations when faults arise in the processing of a message.

The SOAP <Body> element has another distinguishing role in that it is the place where fault information is placed.

i) The SOAP fault model requires that all SOAP specific and application specific faults be reported using a special-purpose element called env:Fault.

ii) The env:fault element is a reserved element predefined by the SOAP specification whose purpose is to provide an extensible mechanism for transporting structured and unstructured information about problems that have arisen during the processing of a SOAP message.

\* Example of a SOAP Fault element:-

```
<?xml version="1.0"?>
```

```
<env:Envelope xmlns:env="http://www.w3.org/2001/12/soap-envelope">
```

```
<env:Body>
```

```
<env:Fault>
```

```
<env:Code>
```

```
<env:Value>env:Sender</env:Value>
```

```
</env:Code>
```

```
<env:Reason>
```

```
<env:Text xml:lang="en-US"> Processing error  
</env:Text>  
<env:Text xml:lang="da"> Processorings - fej.  
</env:Text>  
</env:Reason>  
</env:Fault>  
</env:Body>  
</env:Envelope>
```

⑦ What are advantages and disadvantages of SOAP?

→ The primary advantages of SOAP are summarized as follows:-

① Simplicity :-

SOAP is simple as it is based on XML, which is highly structured and easy to parse.

② Portability :-

SOAP is portable without any dependencies on the underlying platform like byte-ordering issues or machine-word widths. Today, XML parsers exist for virtually any platform from mainframes to wrist-watch-size devices.

③ firewall-friendly :-

Posting data over HTTP

means not only that the delivery mechanism is widely available but also that SOAP is able to get past firewalls that pose problems for other methods.

#### ④ Use of open standards:-

SOAP uses the open standard of XML to format the data, which makes it easily extendable and well supported.

#### ⑤ Interoperability:-

SOAP is built on open, rather than vendor-specific, technologies and facilitates true distributed interoperability and loosely coupled applications. Because SOAP is a wire protocol based on XML and HTTP.

#### ⑥ Universal Acceptance:-

SOAP is the most widely accepted standard in the message communication domain.

#### ⑦ Resilience to changes:-

Changes to the SOAP infrastructure will likely not affect applications using the protocol, unless significant serialization changes are made to the SOAP specification.

## \* Disadvantages of SOAP :

- ① SOAP was initially tied to HTTP and this mandated a request / response architecture that was not appropriate for all situations. HTTP is a relatively slow protocol and of course the performance of SOAP suffered. The latest version of the SOAP specification loosens this requirement.
- ② SOAP is stateless. The stateless nature of SOAP requires that the requesting application must re-introduce itself to other applications when more connections are required as if it had never been connected before. Maintaining the state of a connection is desirable when multiple web services interact in the context of business processes and transactions.
- ③ SOAP serializes by value and does not support serializations by reference. Serialization by value requires that multiple copies of an object will, over time, contain state information that is not synchronized with other dislocated copies of the same object.

Q. 8) What is SOAP? Give the structure of SOAP message, explain it.



\* SOAP :-

i) SOAP stands for Simple Object Access Protocol.

ii) SOAP is a lightweight XML based protocol.

iii) SOAP is used for the exchange of information in decentralized, distributed application environments.

iv) SOAP is built upon the XML specification and works with the HTTP protocol.

\* Structure of SOAP message :-

The

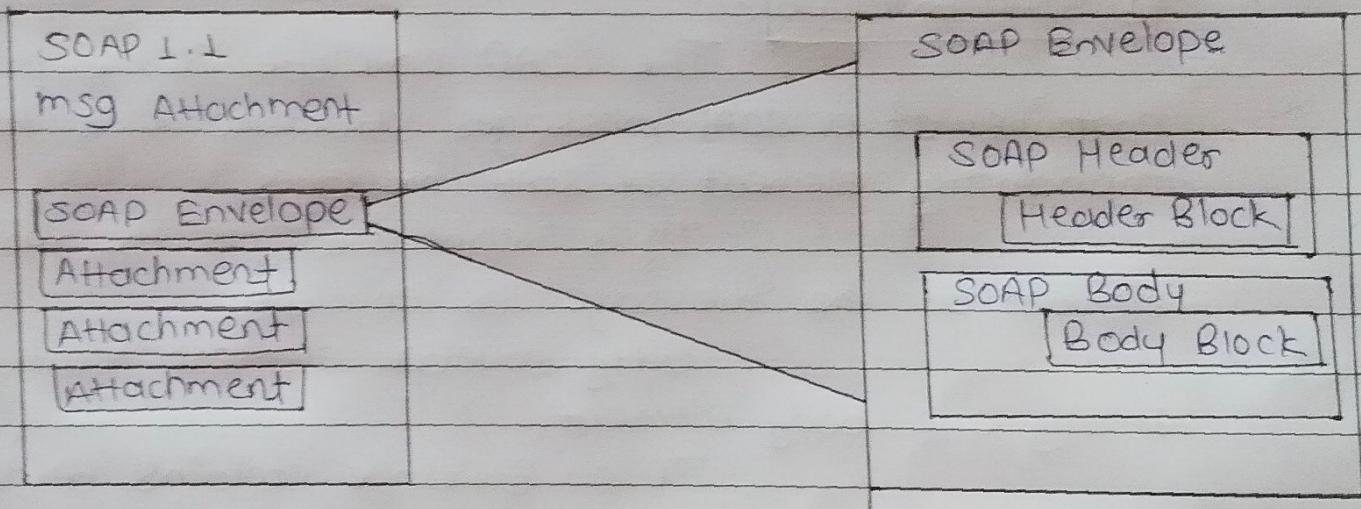


Fig. Structure of SOAP message.

The structure format of a SOAP message contains the following elements -

- ① Envelope
- ② Header
- ③ Body

The above figure represents the structure of a SOAP message with attachments.

SOAP message is represented by a SOAP envelope with zero or more attachments.

The SOAP message envelope contains the header & body of the message.

The SOAP message attachments enables the message to contain data, which include XML & non XML data (like text / binary files).

### ① SOAP Envelope:-

The SOAP envelope is the primary container of a SOAP messages structure & is the mandatory element of SOAP messages.

It is represented as the root element of the message as envelope.

Every envelope element must contain exactly one body element.

If an envelope contains a Header element, it must contain no more than the one & it must appear as the first child of the envelope, before the body.

The SOAP message requires defining two basic namespaces -

- ① SOAP Envelope
- ② SOAP Encoding

## ② Header :-

- ① The SOAP header is presented as the first immediate child element of a SOAP envelope.
- ② It also contains zero or more optional child elements, which referred to as SOAP header block.
- ③ The SOAP encodingStyle attribute will be used to define the encoding of the data types used in the header element entries.
- ④ The SOAP actor attribute & SOAP mustUnderstand attribute can be used to indicate the target SOAP application node and to process the Header entries.

```
<SOAP-ENV:Header>
<Wiley:Transaction
    xmlns:wiles = "http://wiles
    SOAP-ENV:mustUnderstand = "1">
    <key value="5"></key>
    </wile:Tr>
<SOAP-ENV:Header>
```

## ③ Body :-

- ① SOAP envelope contains at SOAP body as its child element, it may contain one or more optional SOAP body block entries.

① The body represents the mandatory processing information.

② A Body block of a SOAP message can contain any of the following.

- The method & its parameters
- Target application (receiver) specific data
- SOAP fault for reporting errors and status information.

③ - Body is a mandatory element which envelopes the message to send in XML format

④ This elements holds either the requested data (Response) or an error msg (fault).

⑤ Requested data represents the application specific data exchanged with a web service. This information can be XML data or parameters to a method call.

⑥ Inside the SOAP <body> the method call information as well as its related arguments are defined, the response to a method call is placed & error information can be saved.

\* Fault :-

is optional element that provide information about error that occurred while processing the msg.

g) Write an example of document styled SOAP body

A SOAP body is the area of the SOAP message where the application-specific XML data being exchanged in the message is placed.

The <Body> element must be present and must be an immediate child of the envelope.

<env:Envelope

  xmlns:SOAP-HTTP://www.w3.org/2003/05/soap-envelope">

  <env:Header>

    <tr:Transaction-id

      xmlns:t="http://www.transaction.com/transactions"

      env:mustUnderstand="1">

      S12

  </env:Header>

  <env:Body>

    <po:PurchaseOrder orderDate="2004-12-02"

      xmlns:m="http://www.plastics-supply.com/fac">

      <po:from>

        <po:accountName>RightPlastics</po:accountName>

        <po:accountNumber>PSL-0342-02</po:accountNumber>

      </po:from>

      <po:to>

        <po:supplierName>Plastics supplies Inc.</po:

          supplierName>

        <po:supplierAddress>Yarra Valley Melbourne

          </po:supplierAddress>

      </po:to>

<po: product>

<po: product-name> injection molder </po: product-name>

<po: product-model> G-100T </po: product-model>

<po: quantity> 2 </po: quantity>

</po: product>

</po: purchaseorder>

<env: Body>

</env: Envelope>

- Q ⑩ Give the use of SOAP mustUnderstand attribute.  
→
- ① The SOAP mustUnderstand attribute can be used to indicate whether a header entry is mandatory or optional for the recipient to process.
  - ② If you add `mustUnderstand = "1"` to a child element of the Header element it indicates that the receiver processing the Header must recognize the element.