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Information technology — Telecommunications and information exchange between systems — WS-Session — Web Services for Application Session Services

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Session WS — Services web pour services de session d'application

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 25437 was prepared by Ecma International (as ECMA-366) and was adopted, under a special “fast-track procedure”, by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

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Introduction

(ECMA 354) ISO/IEC 22534 specifies XML protocols that can be used to create and manage application sessions that are independent of the transport layer protocols. This International Standard (WS-Session) specifies Web services for ECMA-354 (ISO/IEC 22534).

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Information technology — Telecommunications and information exchange between systems — WS-Session — Web Services for Application Session Services

1 Scope

This International Standard specifies Web Services (in WSDL) and a SOAP binding for the Application Session Services defined in (ECMA 354) ISO/IEC 22534. The Application Session Services allow Applications to create and maintain a relationship with Servers termed Application Session. The Web services specified herein, allow Service Subscribers (Applications in (ECMA 354) ISO/IEC 22534) and Service Providers (Servers in (ECMA 354) ISO/IEC 22534) to create and maintain such Application Sessions.

This International Standard builds upon and imports the XML schema definitions from (ECMA 354) ISO/IEC 22534.

Although this International Standard only specifies the abstract WSDL definitions and its SOAP binding, Annex A shows an example WSDL binding with SOAP/HTTP.

Annex B lists SOAP XML Templates for (ECMA 354) ISO/IEC 22534 Messages.

Annex C illustrates how WS-Eventing can be used to establish event channels to receive ApplicationSessionTerminated messages.

2 Conformance

Conforming implementations support the port type and the WSDL to SOAP binding as specified in this International Standard.

To support the port type, conforming implementations support all operations in the port type.

For each operation, conforming implementations also satisfy all the requirements that (ECMA 354) ISO/IEC 22534 specifies for the corresponding service definition.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Ecma references

ECMA-354 Application Session Services, June 2004 (ISO/IEC 22534)

W3C references

SOAP 1.1 Simple Object Access Protocol 1.1, W3C Note 08 May 2000

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WSDL 1.1 Web Service Description Language 1.1, W3C Note 15 March 2001

XML Schema 1.0: XML Schema Language Part 1: Structure, W3C Recommendation 28 October 2004

XML Schema Language Part 2: Data Types, W3C Recommendation 28 October 2004

4 Terms and definitions

For the purposes of this document, the terms and definitions given in (ECMA 354) ISO/IEC 22534 apply.

This International Standard refers to these two main Web services concepts:

1) Service Subscriber – provides the following major functions: 1) queries a Service Provider for services, and 2) binds and interacts with a Service Provider.

2) Service Provider – provides the following major functions: 1) publishes its services (e.g. WSDL document), and 2) interacts with a Service Subscriber.

4.1 Namespaces

This International Standard uses these two Ecma namespaces:

1) aps: http://www.ecma-international.org/standards/ecma-354/appl_session: This International Standard imports all XML messages defined in ECMA-354 from the aps namespace.

2) tns: http://www.ecma-international.org/standards/ecma-366/ws-session: The target namespace for this International Standard.

This International Standard refers to these other namespaces:

1) http://schemas.xmlsoap.org/wsdl/: This contains the W3C WSDL 1.1 schema.

2) http://www.w3.org/2001/XMLSchema: This contains the W3C XML Schema definition.

3) http://schemas.xmlsoap.org/wsdl/soap: This contains the W3C SOAP bindings for WSDL 1.1.

5 Service Provider WSDL Abstract Definitions

This Clause specifies the abstract WSDL definitions to support the services specified in (ECMA 354) ISO/IEC 22534.

```
<definitions
    xmlns="http://schemas.xmlsoap.org/wsdl/"
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session"
    xmlns:tns="http://www.ecma-international.org/standards/ecma-366/ws-session"
    targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-session">
    <types>
        <xs:schema>
            <xs:import namespace="http://www.ecma-international.org/standards/ecma-354/appl_session"
schemaLocation="http://www.ecma-international.org/standards/ecma-354/appl_session/start-application-session.xsd"/>
            <xs:import namespace="http://www.ecma-international.org/standards/ecma-354/appl_session"
schemaLocation="http://www.ecma-international.org/standards/ecma-354/appl_session/stop-application-session.xsd"/>
            <xs:import namespace="http://www.ecma-international.org/standards/ecma-354/appl_session"
schemaLocation="http://www.ecma-international.org/standards/ecma-354/appl_session/reset-application-session-
timer.xsd"/>
```


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```
                <xs:import namespace="http://www.ecma-international.org/standards/ecma-354/appl_session"
schemaLocation="http://www.ecma-international.org/standards/ecma-354/appl_session/application-session-
terminated.xsd"/>
            </xs:schema>
        </types>
        <message name="startApplicationSession">
            <part name="parameter" element="aps:StartApplicationSession"/>
        </message>
        <message name="startApplicationSessionPosResponse">
            <part name="parameter" element="aps:StartApplicationSessionPosResponse"/>
        </message>
        <message name="startApplicationSessionNegResponse">
            <part name="parameter" element="aps:StartApplicationSessionNegResponse"/>
        </message>
        <message name="stopApplicationSession">
            <part name="parameter" element="aps:StopApplicationSession"/>
        </message>
        <message name="stopApplicationSessionPosResponse">
            <part name="parameter" element="aps:StopApplicationSessionPosResponse"/>
        </message>
        <message name="stopApplicationSessionNegResponse">
            <part name="parameter" element="aps:StopApplicationSessionNegResponse"/>
        </message>
        <message name="resetApplicationSessionTimer">
            <part name="parameter" element="aps:ResetApplicationSessionTimer"/>
        </message>
        <message name="resetApplicationSessionTimerPosResponse">
            <part name="parameter" element="aps:ResetApplicationSessionTimerPosResponse"/>
        </message>
        <message name="resetApplicationSessionTimerNegResponse">
            <part name="parameter" element="aps:ResetApplicationSessionTimerNegResponse"/>
        </message>
        <message name="applicationSessionTerminated">
            <part name="parameter" element="aps:ApplicationSessionTerminated"/>
        </message>
        <portType name="ApplicationSessionServicesPortType">
            <operation name="tns:StartApplicationSession">
                <input message="tns:startApplicationSession"/>
                <output message="tns:startApplicationSessionPosResponse"/>
                <fault name="StartFault" message="tns:startApplicationSessionNegResponse"/>
            </operation>
            <operation name="tns:StopApplicationSession">
                <input message="tns:stopApplicationSession"/>
                <output message="tns:stopApplicationSessionPosResponse"/>
                <fault name="StopFault" message="tns:stopApplicationSessionNegResponse"/>
            </operation>
            <operation name="tns:ResetApplicationSessionTimer">
                <input message="tns:resetApplicationSessionTimer"/>
                <output message="tns:resetApplicationSessionTimerPosResponse"/>
                <fault name="ResetFault" message="tns:resetApplicationSessionTimerNegResponse"/>
            </operation>
            <operation name="tns:ApplicationSessionTerminated">
                <output message="tns:applicationSessionTerminated"/>
            </operation>
        </portType>
</definitions>
```

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6 Service Provider WSDL SOAP Binding

This Clause specifies the binding of the abstract WSDL definitions in Clause 5 with SOAP Messages. ECMA-354 (ISO/IEC 22534) requires Applications to include the aps:sessionID in some service requests, in these cases, the corresponding Service Subscribers shall include the aps:sessionID as a header block in the application SOAP message.

```
<definitions
      xmlns="http://schemas.xmlsoap.org/wsdl/"
      xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session"
      xmlns:tns="http://www.ecma-international.org/standards/ecma-354/ws-session"
      targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-session">
      <import namespace="http://www.ecma-international.org/standards/ecma-366/ws-session"
            location="http://www.ecma-international.org/standards/ecma-366/ws-session/ws-session-wsdl-abstract-
definitions.wsdl" />
      <binding name="xs:nmtoken" type="tns:ApplicationSessionServicesPortType">
            <soap:binding style="document" transport="xs:anyURI"/>
            <operation name="tns:StartApplicationSession">
                  <input>
                        <soap:body use="literal"/>
                  </input>
                  <output>
                        <soap:body use="literal"/>
                  </output>
                  <fault name="StartFault">
                        <soap:fault name="StartFault" use="literal"/>
                  </fault>
            </operation>
            <operation name="tns:StopApplicationSession">
                  <input>
                        <soap:body use="literal"/>
                  </input>
                  <output>
                        <soap:body use="literal"/>
                  </output>
                  <fault name="StopFault">
                        <soap:fault name="StopFault " use="literal"/>
                  </fault>
            </operation>
            <operation name="tns:ResetApplicationSessionTimer">
                  <input>
                        <soap:body use="literal"/>
                  </input>
                  <output>
                        <soap:body use="literal"/>
                  </output>
                  <fault name="ResetFault">
                        <soap:fault name="ResetFault " use="literal"/>
                  </fault>
            </operation>
            <operation name="tns:ApplicationSessionTerminated">
                  <output>
                        <soap:body use="literal"/>
                  </output>
            </operation>
      </binding>
</definitions>
```

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Annex A
(informative)

Service WSDL with SOAP/HTTP Binding

This Annex provides an example WSDL binding with SOAP/HTTP.

```
<definitions xmlns="http://schemas.xmlsoap.org/wsdl/" xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session"
      xmlns:tns="http://www.ecma-international.org/standards/ecma-366/ws-session"
      targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-session">
      <import namespace="http://www.ecma-international.org/standards/ecma-366/ws-session"
            location="http://www.ecma-international.org/standards/ecma-366/ws-session/ws-session-wsdl-abstract-
definitions.wsdl" />
      <binding name="SOAP_HTTP" type="tns:ApplicationSessionServicesPortType">
            <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
            <operation name="tns:StartApplicationSession">
                  <input>
                        <soap:body use="literal"/>
                  </input>
                  <output>
                        <soap:body use="literal"/>
                  </output>
                  <fault name="StartFault">
                        <soap:fault name="StartFault" use="literal"/>
                  </fault>
            </operation>
            <operation name="tns:StopApplicationSession">
                  <input>
                        <soap:body use="literal"/>
                  </input>
                  <output>
                        <soap:body use="literal"/>
                  </output>
                  <fault name="StopFault">
                        <soap:fault name="StopFault " use="literal"/>
                  </fault>
            </operation>
            <operation name="tns:ResetApplicationSessionTimer">
                  <input>
                        <soap:body use="literal"/>
                  </input>
                  <output>
                        <soap:body use="literal"/>
                  </output>
                  <fault name="ResetFault">
                        <soap:fault name="ResetFault " use="literal"/>
                  </fault>
            </operation>
            <operation name="tns:ApplicationSessionTerminated">
                  <output>
                        <soap:body use="literal"/>
                  </output>
            </operation>
      </binding>
      <service name="ApplicationSessionServices">
            <port name="ApplicationSessionServicesSoapHttpPort" binding="tns:SOAP_HTTP">
                  <soap:address location="http://ecma_ws-session.com"/>
            </port>
      </service>
</definitions>
```

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Annex B
(informative)

SOAP XML Templates for ECMA-354 (ISO/IEC 22534) Messages

B.1 StartApplicationSession request message template

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
    <S:Body>aps:StartApplicationSession</S:Body>
</S:Envelope>
```

B.1.1 StartApplicationSession Positive response message template

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
    <S:Body>aps:StartApplicationSessionPosResponse</S:Body>
</S:Envelope>
```

B.1.2 StartApplicationSession negative response message template

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
    <S:Body>aps:StartApplicationSessionNegResponse</S:Body>
</S:Envelope>
```

B.2 StopApplicationSession request message template

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
    <S:Body>aps:StopApplicationSession</S:Body>
</S:Envelope>
```

B.2.1 StopApplicationSession positive response message template

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
    <S:Body>aps:StopApplicationSessionPosResponse</S:Body>
</S:Envelope>
```


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B.2.2 StopApplicationSession negative response message template

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Body>aps:StopApplicationSessionNegResponse</S:Body>
</S:Envelope>
```

B.3 ResetApplicationSessionTimer request message template

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Body>aps:ResetApplicationSessionTimer</S:Body>
</S:Envelope>
```

B.3.1 ResetApplicationSessionTimer positive response message template

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Body>aps:ResetApplicationSessionTimerPosResponse</S:Body>
</S:Envelope>
```

B.3.2 Reset Application Session Timer negative response message template

```
<S:Envelope
            xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
            xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Body>aps:ResetApplicationSessionTimerNegResponse</S:Body>
</S:Envelope>
```

B.3.3 ApplicationSessionTerminated

ApplicationSessionTerminated operation is discussed in Annex C.

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Annex C
(informative)

WS-Session Events

C.1 Event Sink of Application Session Terminated Service

The ApplicationSessionTerminated operation defines an outbound asynchronous event notification. The Service Subscriber should subscribe to receive the ApplicationSessionTerminated event from the Service Provider according to WS-Eventing [**WS-Eventing**]. It should provide to the Service Provider the URI of the event sink, so that it can receive the event notification.

The Service Subscriber should subscribe to receive the ApplicationSessionTerminated event immediately after the successful completion of the StartApplicationSession operation. The subscription message must include the mandatory elements of WS-Addressing (i.e. <wsa:To>, <wsa:Action>, <wsa:MessageID> and <wsa:ReplyTo>) and the unique aps:sessionID obtained from the StartApplicationSession operation.

Message header processing should follow the conformance requirement of WS-Addressing, e.g. the <wsa:MessageID> in the Service Subscriber subscription message should be copied back in the <wsa:RelatesTo> field of the response message from the Service Provider.

The aps:sessionID element should be the first level child element of the subscription endpoint reference parameters [**WS-Addressing**]. The subscription message from the Service Subscriber must provide at least one event sink endpoint reference [**WS-Addressing**] to the Service Provider.

The Service Provider should use the push delivery mode to deliver the event notification. The Service Provider should send event notification to each of the event sink endpoint declared in the event subscription message. The Service Provider shall copy the endpoint reference from the Service Subscriber to the <wsa:To> header block of the notification.

The event notification message from the Service Provider should include the sink endpoint reference parameters, so that the Service Subscriber can correlate the event notification obtained from the Service Provider with the corresponding session and event operation.

If the application session abnormally terminated, before the ApplicationSessionTerminated event can be subscribed, the subsequent subscription of ApplicationSessionTerminated event by the Service Subscriber will result in a SOAP faultstring invalidSessionID and the faultcode is wse:EventSouceUnableToProcess. The Service Provider should only send the notifications for valid event subscriptions.

When a session terminates, any subscription associated with the session is deemed invalid.

C.2 Event Sink WSDL Specification

The event sink interface specified by the Service Subscriber in the event subscription message should provide a one-way Web service event notification operation to receive the notification of ApplicationSessionTerminated event from the Service Provider.

The generic event sink described in this Annex should be the default event sink, and the additional typed event sink described in this Annex is optional. But if it has a typed event sink, Service Subscriber should declare it in the ApplicationSessionTerminated event subscription message to the Service Provider; and the Service Provider should send the notification of ApplicationSessionTerminated event to the typed event sink of the Service Subscriber. In this case, the generic event sink should still be used as the default event sink for other event notifications within the session.

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C.2.1 Generic Event Sink Interface for WS-Session

The generic event sink described in this Annex can be used as a default event sink for all subscriptions within the session. The WSDL specification below contains a generic event notification operation NotifyEvent in the event sink.

```
<definitions
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:tns="http://www.ecma-international.org/standards/ecma-366/ws-session/generic_sink"
targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-session/generic_sink">
        <types>
            <xs:schema targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-
session/generic_sink">
                <xs:complexType name="EventType" mixed="true">
                    <xs:sequence>
                        <xs:any namespace="##any" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:schema>
    </types>
    <message name="notifyEvent">
        <part name="parameter" type="tns:EventType"/>
    </message>
    <portType name="GenericSinkPortType">
        <operation name="NotifyEvent">
            <input message="tns:notifyEvent"/>
        </operation>
    </portType>

</definitions>
```

C.2.2 Typed Event Sink Interface for WS-Session

The Service Subscriber can declare an additional typed event sink interface. It contains a typed operation derived from the Service Provider's WSDL which is a "reversal" of the outbound operation of ApplicationSessionTerminated event operation of the Service Provider. The WSDL for the typed event sink interface of WS-Session is specified as follows:

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```
<definitions
      xmlns="http://schemas.xmlsoap.org/wsdl/"
      xmlns:xs="http://www.w3.org/2001/XMLSchema"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session"
      xmlns:tns="http://www.ecma-international.org/standards/ecma-366/ws-session/sink"
      targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-session/sink">
      <types>
                <xs:schema>
            <xs:import namespace="http://www.ecma-international.org/standards/ecma-354/appl_session"
                  schemaLocation=
           "http://www.ecma-international.org/standards/ecma-354/appl_session/application-session-terminated.xsd"/>
                </xs:schema>
      </types>
      <message name="applicationSessionTerminated">
            <part name="parameter" element="aps:ApplicationSessionTerminated"/>
      </message>
      <portType name="ApplicationSessionTerminatedSinkPortType">
            <operation name="tns:ApplicationSessionTerminated">
                  <input message="tns:applicationSessionTerminated"/>
            </operation>
      </portType>
</definitions>
```

C.3 Event Subscription SOAP Messages

C.3.1 SOAP Message for ApplicationSessionTerminated Event Subscription

The event subscription message from the Service Subscriber for ApplicationSessionTerminated Service contains the unique aps:sessionID element obtained from the StartApplicationSession operation. The unique aps:sessionID is bound to the SOAP message as a header block.

The Service Subscriber should declare the event sink type (i.e. generic or typed+generic) using WS-Addressing Endpoint Reference.

The event subscription message should include mandatory aps:sessionID element in the SOAP header, and other mandatory elements of WS-Addressing.

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The XML Schema definition of the event sink type elements (*generic* or *typed+generic*) of the sink interface in the wse:Subscribe message is as follows:

```
<xs:schema
      targetNamespace="http://www.ecma-international.org/standards/ecma-366/ws-session/event_sink_interface"
      xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="interface">
            <xs:complexType>
                        <xs:sequence>
                              <xs:any namespace="##any"  minOccurs="0"  maxOccurs="unbounded" />
                        </xs:sequence>
                        <xs:attribute name="type">
                                    <xs:simpleType>
                                                <xs:restriction base="xs:string">
                                                            <xs:enumeration value="generic"/>
                                                            <xs:enumeration value="typed+generic"/>
                                                </xs:restriction>
                                    </xs:simpleType>
             </xs:attribute>
             <xs:anyAttribute namespace="##other" />
            </xs:complexType>
</xs:element>
</xs:schema>
```

For the rest of this Annex, the SOAP XML message templates related to ApplicationSessionTerminated event subscription are described.

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C.4 WS-Session Event SOAP XML message templates

C.4.1 ApplicationSessionTerminated Event Subscription SOAP message template

The subscription to the ApplicationSessionTerminated event is shown below.

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
    xmlns:wse="http://schemas.xmlsoap.org/ws/2004/08/eventing"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session"
    xmlns:esi="http://www.ecma-international.org/standards/ecma-366/ws-session/event_sink_interface">
    <S:Header>
        <wsa:To>xs:anyURI</wsa:To>
        <aps:sessionID>xs:string</aps:sessionID>
        <wsa:ReplyTo><wsa:Address>xs:anyURI</wsa:Address></wsa:ReplyTo>
        <wsa:MessageID>xs:anyURI</wsa:MessageID>
        <wsa:Action>http://schemas.xmlsoap.org/ws/2004/08/eventing/Subscribe</wsa:Action>
        xs:any*
    </S:Header>
    <S:Body>
        <wse:Subscribe>
            <wse:Delivery>
                <wse:NotifyTo>
                    <wsa:Address>xs:anyURI</wsa:Address>
                    <esi:interface type="generic|typed+generic" />
                </wse:NotifyTo>
            </wse:Delivery>
        </wse:Subscribe>
    </S:Body>
</S:Envelope>
```

C.4.2 Template of positive response to the event subscription

The positive response to the ApplicationSessionTerminated event subscription is shown below.

```
<S:Envelope
    xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
    xmlns:wse="http://schemas.xmlsoap.org/ws/2004/08/eventing"
    xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
    <S:Header>
        <aps:sessionID>xs:string</aps:sessionID>
        <wsa:To>xs:anyURI</wsa:To>
            <wsa:RelatesTo>xs:anyURI</wsa:RelatesTo>
            <wsa:Action>http://schemas.xmlsoap.org/ws/2004/08/eventing/SubscribeResponse</wsa:Action>
            xs:any*
    </S:Header>
    <S:Body>
        <wse:SubscribeResponse>
            <wse:SubscriptionManager>
                wsa:EndpointReferenceType
            </wse:SubscriptionManager>
        </wse:SubscribeResponse>
    </S:Body>
</S:Envelope>
```


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C.4.3 Template of negative response (fault) to event subscription

The negative response to the ApplicationSessionTerminated event subscription is shown below.

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
      xmlns:wse="http://schemas.xmlsoap.org/ws/2004/08/eventing"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Header>
            <aps:sessionID>xs:anyURI</aps:sessionID>
            <wsa:To>xs:anyURI</wsa:To>
            <wsa:RelatesTo>xs:anyURI</wsa:RelatesTo>
            <wsa:Action>http://schemas.xmlsoap.org/ws/2004/08/addressing/fault</wsa:Action>
            xs:any*
      </S:Header>
      <S:Body >
            <S:Fault>S:Fault</S:Fault>
      </S:Body>
</S:Envelope>
```

C.4.4 Template of Unsubscribe message

The request to unsubscribe to an existing subscription is shown below.

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
      xmlns:wse="http://schemas.xmlsoap.org/ws/2004/08/eventing"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Header>
            <wsa:To>xs:anyURI</wsa:To>
            <aps:sessionID>xs:string</aps:sessionID>
                  <wsa:ReplyTo>xs:anyURI</wsa:ReplyTo>
                  <wsa:MessageID>xs:anyURI</wsa:MessageID>
                    <wsa:Action>http://schemas.xmlsoap.org/ws/2004/08/eventing/Unsubscribe</wsa:Action>
                  xs:any*
      </S:Header>
      <S:Body>
            <wse:Unsubscribe />
      </S:Body>
</S:Envelope>
```

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C.4.5 Template of positive response to Unsubscribe message

The positive response to unsubscribe to an existing subscription is shown below.

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
      xmlns:wse="http://schemas.xmlsoap.org/ws/2004/08/eventing"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Header>
            <aps:sessionID>xs:string</aps:sessionID>
            <wsa:To>xs:anyURI</wsa:To>
            <wsa:RelatesTo>xs:anyURI</wsa:RelatesTo>
                  <wsa:Action>http://schemas.xmlsoap.org/ws/2004/08/eventing/UnsubscribeResponse</wsa:Action>
            xs:any*
      </S:Header>
      <S:Body>
      </S:Body>
</S:Envelope>
```

C.4.6 Template of ApplicationSessionTerminated event notification to typed event sink

The event notification of ApplicationSessionTerminated event to the typed event sink is shown below.

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Header>
            <aps:sessionID>xs:string</aps:sessionID>
            <wsa:To>xs:anyURI</wsa:To>
            <wsa:Action>http://www.ecma-international.org/standards/ecma-366/ws-
session/sink/ApplicationSessionSinkPortType/ApplicationSessionTerminated</wsa:Action>
                  xs:any*
      </S:Header>
      <S:Body>aps:ApplicationSessionTerminated</S:Body>
</S:Envelope>
```

C.4.7 Template of ApplicationSessionTerminated event notification to generic event sink

The event notification of ApplicationSessionTerminated event to the generic event sink is shown below.

```
<S:Envelope
      xmlns:S="http://schemas.xmlsoap.org/soap/envelope/"
      xmlns:wsa="http://schemas.xmlsoap.org/ws/2005/02/addressing"
      xmlns:aps="http://www.ecma-international.org/standards/ecma-354/appl_session">
      <S:Header>
            <aps:sessionID>xs:string</aps:sessionID>
            <wsa:To>xs:anyURI</wsa:To>
            <wsa:Action>http://www.ecma-international.org/standards/ecma-366/ws-
session/generic_sink/GenericSinkPortType/NotifyEvent</wsa:Action>
                  xs:any*
      </S:Header>
      <S:Body>aps:ApplicationSessionTerminated</S:Body>
</S:Envelope>
```

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C.5 WS-Session Event supporting documents

1) WS-Addressing: Web Service Addressing (WS-Addressing) 1.0 from W3C:

   WS-Addressing 1.0 Core: W3C last call Working Draft (February 15, 2005), http://www.w3.org/TR/2005/WD-ws-addr-core-20050215/

   WS-Addressing 1.0 SOAP Biding: W3C last call Working Draft (February 15, 2005), http://www.w3.org/TR/2005/WD-ws-addr-soap-20050215/

   WS-Addressing 1.0 WSDL Binding: W3C Working Draft (February 15, 2005), http://www.w3.org/TR/2005/WD-ws-addr-wsdl-20050215/

2) WS-Eventing: Web Service Eventing (WS-Eventing) from Oasis, August, 2004, by IBM, Microsoft, BEA, Computer Associates, TIBCO Software, and Sun Microsystems (ftp://www6.software.ibm.com/software/developer/library/ws-eventing/WS-Eventing.pdf).

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