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Technical Committee:
OASIS Service-Oriented Architecture End-to-End Resource Planning (SOA-EERP) TC

Chair(s):
William Cox
Andy Lee, Changfeng Open Standards Platform Software Alliance

Editor(s):
Szu Chang, Changfeng Open Standards Platform Software Alliance

Related work:
This specification is related to:

This document is one of three closely related specifications, SOA-EERP Business Quality of Service (bQoS), SOA-EERP Rating and SOA-EERP Service Level Agreement which need to be understood in combination.

Declared XML Namespace(s):
http://docs.oasis-open.org/ns/soa-eerp/200903

Abstract:
This document specifies the XML vocabulary for business service level agreement (SLA), one of three Specifications for end-to-end resource planning (EERP). Business service level agreement describes the agreement between two parties, service requester and service provider, on business-related characteristics or attributes of a service.
**Status:**

This document was last revised or approved by the SOA-EERP TC on the above date. The level of approval is also listed above. Check the “Latest Version” or “Latest Approved Version” location noted above for possible later revisions of this document.

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The non-normative errata page for this specification is located at http://www.oasis-open.org/committees/soa-eerp/.
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1 Introduction

This document is the specification for the Business Service Level Agreement for (BSLA) for End-to-End Resource Planning (EERP), an XML vocabulary for information exchange by which a business application can manage and evaluate services with agreed business quality of service, obligations and terms.

EERP applies service discovery, composition, simulation, and optimization techniques in a novel way to improve business results. It models the business process and the range of potential services, then guide the selection and deployment of services based on the end-to-end business value.

Modeling the business service-level agreements to manage and evaluate services and establishing agreements about the business service is essential to long-term value chain improvement. The details of the business service level agreement defined in this BSLA specification will enable EERP to determine the varieties of optimization to be supported, and to manage the end-to-end business process.

1.1 Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

1.1.1 Notational Conventions

This specification uses the following syntax to define outlines for detailed elements:

- The syntax appears as an XML instance, but values in italics indicate data types instead of literal values.
- Characters are appended to elements and attributes to indicate cardinality:
  - "?" (0 or 1)
  - "*" (0 or more)
  - "+" (1 or more)
- The character "|" is used to indicate a choice between alternatives.
- The characters "(" and ")" are used to indicate that contained items are to be treated as a group with respect to cardinality or choice.
- The characters "[" and "]" are used to call out references and property names.
- Ellipses (i.e., "...") indicate points of extensibility. Additional children and/or attributes MAY be added at the indicated extension points but MUST NOT contradict the semantics of the parent and/or owner, respectively. By default, if a receiver does not recognize an extension, the receiver SHOULD ignore the extension; exceptions to this processing rule, if any, are clearly indicated below.
- XML namespace prefixes (see Table 2) are used to indicate the namespace of the element being defined.

Elements and Attributes defined by this specification are referred to in the text of this document using XPath 1.0 expressions. Extensibility points are referred to using an extended version of this syntax:

- An element extensibility point is referred to using (any) in place of the element name. This indicates that any element name can be used, from any namespace other than the namespace of this specification.
• An attribute extensibility point is referred to using @{any} in place of the attribute name. This indicates that any attribute name can be used, from any namespace other than the namespace of this specification.

Extensibility points in the exemplar may not be described in the corresponding text.

1.2 Normative References


http://www.w3.org/TR/2000/NOTE-SOAP-20000508/

http://www.w3.org/TR/2003/REC-soap12-part1-20030624/

http://www.ietf.org/rfc/rfc3986.txt

http://docs.oasis-open.org/ubl/os-UBL-2.0/UBL-2.0.pdf

[UBL-20-cbc] Universal Business Language (UBL) v2.0, Common Basic Components
http://docs.oasis-open.org/ubl/os-UBL-2.0/xsd/common/UBL-CommonBasicComponents-2.0.xsd

[UBL-20-udt] Universal Business Language (UBL) v2.0. Unqualified Data Type
http://docs.oasis-open.org/ubl/os-UBL-2.0/xsd/common/UnqualifiedDataTypeSchemaModule-2.0.xsd

http://www.w3.org/TR/2004/REC-xmlschema-1-20041028/

http://www.w3.org/TR/2004/REC-xmlschema-2-20041028/

http://docs.oasis-open.org/soa-eerp/sla/v1.0/SOA-EERP-BSLA-spec-cd03.pdf


[CEFACT] CEFACT – Core components specifications.
http://webster.disa.org/cefact-groups/tmg/

1.2.1 Reference

In this document reference is made to some basic elements and data types in UBL 2.0, in the following schema:

• UBL 2.0 Common Basic Components [UBL-20-cbc], UBL-CommonBasicComponents-2.0.xsd
• UBL 2.0 Unqualified Data Type [UBL-20-udt], UnqualifiedDataTypeSchemaModule-2.0.xsd
In addition, this document also reference to some elements defined in SOA-EERP Business Quality of Service Version 1.0.

This specification is designed to work with the general Web Services framework including WSDL service descriptions, and SOAP message structure and message processing model. The XML vocabulary defined in BSLA should be applicable to any version of SOAP.

1.3 Non-Normative References

None.
2 Business Services Level Agreement Contents

The Business Service Level Agreement (BSLA) of the XML vocabulary is defined in XML Schema format that has information on both requester and service provider and their agreement on the service level.

2.1 Namespaces

The XML namespace URI that MUST be used by implementations of this specification is:

http://docs.oasis-open.org/ns/soa-eerp/sla/200903

Table 1 lists XML namespaces that are used in this specification. The choice of any namespace prefix is arbitrary and not semantically significant.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Namespace</th>
<th>Specification(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td><a href="http://schemas.xmlsoap.org/soap/envelope/">http://schemas.xmlsoap.org/soap/envelope/</a></td>
<td>[SOAP]</td>
</tr>
<tr>
<td>S12</td>
<td><a href="http://www.w3.org/2003/05/soap-envelope">http://www.w3.org/2003/05/soap-envelope</a></td>
<td>[SOAP12]</td>
</tr>
<tr>
<td>xsd</td>
<td><a href="http://www.w3.org/2001/XMLSchema">http://www.w3.org/2001/XMLSchema</a></td>
<td>[XML-Schema1], [XML-Schema2]</td>
</tr>
<tr>
<td>udt</td>
<td>urn:un:unece:uncefact:data:specification:UnqualifiedDataTypesSchemaModule:2</td>
<td>[UBL-20-udt], [CEFACT]</td>
</tr>
<tr>
<td>ccts</td>
<td>urn:un:unece:uncefact:documentation:2</td>
<td>[UBL-20]</td>
</tr>
<tr>
<td>bqos</td>
<td><a href="http://docs.oasis-open.org/ns/soa-eerp/bqos/200903">http://docs.oasis-open.org/ns/soa-eerp/bqos/200903</a></td>
<td>[EERP-BQoS]</td>
</tr>
<tr>
<td>sla</td>
<td><a href="http://docs.oasis-open.org/ns/soa-eerp/sla/200903">http://docs.oasis-open.org/ns/soa-eerp/sla/200903</a></td>
<td>This specification</td>
</tr>
</tbody>
</table>

2.2 Schema Files

A normative copy of the XML Schema [XML-Schema1, XML-Schema2] description for this specification can be retrieved from the following address:

http://docs.oasis-open.org/soa-eerp/eerp-sla/200903/eerp-sla.xsd

2.3 BSLA Contents

The BSLA is the root element for EERP- Business Service-level agreement (BSLA). Business SLA is a formal contract between a service provider and a client guaranteeing quantifiable business quality of service (bQoS) at defined levels. It can have one or more of the following elements:

- SLAParties describes the parties invoked in the SLA for the service
- SLAParameters describes the parameters for the service, which are defined ways of monitoring of QoS metrics.
- SLAObligations describes the agreed SLA obligations for the service.
• SLATerms describes the agreed SLA Terms for the service.

• Any additional elements for the agreement of the service

**Syntax**

```xml
<sla:BSLA xmlns:sla="..." xmlns:bqos="..." ...>
  <sla:SLAParties ...>sla:SLAPartiesType</sla:SLAParties>
  <sla:SLAParameters ...>sla:SLAParametersType</sla:SLAParameters>
  <sla:SLAObligations ...>sla:SLAObligationsType</sla:SLAObligations> ?
  <sla:SLATerms ...>sla:SLATermsType</sla:SLATerms> ?
  ...
</sla:BSLA>
```

The following describes the attributes and elements listed in the schema outlined above:

/sla:BSLA

Root element of Business Service-level agreement (SLA) for EERP

/sla:BSLA/sla:SLAParties

SLAParties is a required element in BSLA that defines parties invoked in this SLA for the service. SLAParties element has both the service provider and services requester elements, see Section 3 for more details.

/sla:BSLA/sla:SLAParties/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLAParties element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:BSLA/sla:SLAParameters

SLAParameters element, SLA parameters aspect of the service, is defined monitoring of QoS metrics, including service profile uri, operations and other optional elements. It is a required element that uses sla:SLAParametersType, see Section 4 for more details.

/sla:BSLA/sla:SLAParameters/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLAParameters element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:BSLA/sla:SLAObligations

Agreed SLA obligations aspect of the service, including obligations, action guarantees. It is a optional element that uses sla:SLAObligationsType, see Section 5 for more details.

/sla:BSLA/sla:SLAObligations/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLAObligations element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:BSLA/sla:SLATerms

Agreed SLA terms aspect of the service, including SLA term elements. It is optional, see Section 6 for more details.

/sla:BSLA/sla:SLATerms/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLATerms element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:BSLA/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the root BSLA element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.
/sla:BSLA/(any)

This is an extensibility mechanism to allow different (extensible) elements to be specified in the future. Unrecognized elements MAY cause a fault or be silently ignore.
3 SLAParties

The SLAParties describes the list of parties invoked in the SLA for the service.

There SHOULD be one SLAParties element present in the SLA of service.

Syntax

```
<sla:SLAParties xmlns:sla="..." ...>
  <sla:ServiceProvider ...>sla:ServiceProviderType
  <sla:ServiceUri ...>sla:SlUriType</sla:ServiceUri>
  <sla:ServiceProviderName
    languageID="...">sla:ServiceProviderNameType</sla:ServiceProviderName
  </sla:ServiceProvider>
  <sla:ServiceRequester ... >sla:ServiceRequesterType
  <sla:ServiceRequesterUri ... >sla:SlUriType</sla:ServiceRequesterUri>
  <sla:ServiceRequesterName
    languageID="...">sla:ServiceRequesterNameType</sla:ServiceRequesterName>
  </sla:ServiceRequester>
  ...
</sla:SLAParties>
```

The following describes the attributes and elements listed in the schema outlined above:

- `/sla:SLAParties` - SLAParties element, SLA Parties aspect of the service, is for parties invoked in the SLA for the service, including both service provider and service requester elements.
- `/sla:SLAParties/sla:ServiceProvider` - Service Provider element represents the provider for parties. It is a required element for SLA Parties.
- `/sla:SLAParties/sla:ServiceProvider/sla:ServiceUri` - Service identifier in URI format, such as a service URL, is a required element for Service Provider.
- `/sla:SLAParties/sla:ServiceProvider/sla:ServiceProviderName` - Service Provider Name is the name of the service provider. It is also a required element for Service Provider.
- `/sla:SLAParties/sla:ServiceProvider/@{any}` - This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ServiceProvider element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.
- `/sla:SLAParties/sla:ServiceRequester` - ServiceRequester element represents requester for the service, including requester's name and the URI that represents the requester. It is a required element for SLA Parties.
- `/sla:SLAParties/sla:ServiceRequester/sla:ServiceRequesterUri` - ServiceRequesterUri element represents the requester’s identifier in URI format for the service requester. It is a required element for Service Requester.
Requester’s name for the service requester. It is a required element for Service Requester.

```
s/SLAParties/sla:ServiceRequester/sla:ServiceRequesterName/languageID
```


```
s/SLAParties/sla:ServiceRequester/@{any}
```

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ServiceRequester element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

```
s/SLAParties/{any}
```

This is an extensibility mechanism to allow different (extensible) elements to be specified in the future. Unrecognized elements MAY cause a fault or be silently ignore.

**Example**

The following example illustrates the use of the SLA Parties element. The Service Provider is a fictitious Hangzhou Innover Co. Ltd. in China; the Service Requester is a fictitious Mianyang Gas Corp. in China.

```
<?xml version="1.0" encoding="utf-8"?>
<SLAParties xmlns="..." ...>
  <ServiceProvider>
    <ServiceUri>http://www.innover.com.cn</ServiceUri>
    <ServiceProviderName>Hangzhou Innover Co. Ltd</ServiceProviderName>
  </ServiceProvider>
  <ServiceRequester>
    <ServiceRequesterUri>http://www.scmyng.com</ServiceRequesterUri>
    <ServiceRequesterName>Mianyang Gas Corp.</ServiceRequesterName>
  </ServiceRequester>
</SLAParties>
```
4 SLAParameters

The SLAParameters element for EERP-SLA describes the parameters of the service used to define monitoring of QoS metrics, including the service profile URI, operations and other optional elements.

There SHOULD be one SLAParameters element present in the SLA of service.

Syntax

```
<sla:SLAParameters xmlns:sla="..." ...>
  <sla:ServiceProfileUri ...>sla:SlaUriType</sla:ServiceProfileUri>
  <sla:ServiceOperations ...>sla:ServiceOperationsType
    <sla:hasCommittedCost>xsd:boolean</sla:hasCommittedCost>
    <sla:hasCommittedTime>xsd:boolean</sla:hasCommittedTime>
    <sla:hasAvailabilities>xsd:boolean</sla:hasAvailabilities>
    <sla:hasCommittedThroughput>xsd:boolean</sla:hasCommittedThroughput>
    <sla:hasOtherTerms>xsd:boolean</sla:hasOtherTerms>
    ...
  </sla:ServiceOperations>
</sla:SLAParameters>
```

The following describes the attributes and elements listed in the schema outlined above:

/sla:SLAParameters

SLA parameters element defines aspect of the service which are defined monitoring of QoS metrics, including service uri, operations and other optional elements.

/sla:SLAParameters/sla:ServiceProfileUri

ServiceProfileUri element represents web page URL or other URI for the service profile that defines the details of the services. Different service providers will share the same profile. It is a required element for SLA Parameters.

/sla:SLAParameters/sla:ServiceProfileUri/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ServiceProfileUri element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:SLAParameters/sla:ServiceOperations

Describe available operations and bQoS. It is an optional element for SLA Parameters.

/sla:SLAParameters/sla:ServiceOperations/sla:hasCommittedCost

Describe if there is committed cost or not. It is a required element for SLA Parameters.

/sla:SLAParameters/sla:ServiceOperations/sla:hasCommittedTime

Describe if there is committed time or not. It is a required element for SLA Parameters.

/sla:SLAParameters/sla:ServiceOperations/sla:hasAvailabilities

Describe if there is availability or not. It is a required element for SLA Parameters.

/sla:SLAParameters/sla:ServiceOperations/sla:hasCommittedThroughput

Describe if there is committed throughput or not. It is a required element for SLA Parameters.

/sla:SLAParameters/sla:ServiceOperations/sla:hasOtherTerms

Describe if there are other terms or not. It is a required element for SLA Parameters.
This is an extensibility mechanism to allow different (extensible) property or attribute elements to be specified in the future. Unrecognized elements MAY cause a fault or be silently ignore.

```
/sla:SLAParameters /sla:ServiceOperations/@{any}
```

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ServiceOperations element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

```
/sla:SLAParameters /{any}
```

This is an extensibility mechanism to allow different (extensible) property or attribute elements to be specified in the future. Unrecognized elements MAY cause a fault or be silently ignore.

Example

The following example illustrates the use of SLA Parameters element. It describes the SLA parameters:

```
(001) <?xml version="1.0" encoding="utf-8"?>
(002) <SLAParameters xmlns="..." ...>
(003)    <ServiceProfileUri>http://www.innover.com.cn</ServiceProfileUri>
(004)    <ServiceOperations>
(005)      <hasCommittedCost>true</hasCommittedCost>
(006)      <hasCommittedTime>true</hasCommittedTime>
(007)      <hasAvailabilities>true</hasAvailabilities>
(008)      <hasCommittedTroughput>true</hasCommittedTroughput>
(009)      <hasOtherTerms>true</hasOtherTerms>
(010)    </ServiceOperations>
(011) </SLAParameters>
```
5 SLAObligations

The SLAObligations element describes the agreed SLA obligations of the service, including obligations and action guarantees.

There MAY be zero or one SLA Obligations element present in the SLA of service.

Note: There is a case for zero Obligation elements on SLA. Section 7.2 is an example illustrates the SLA document without Obligation element. It has some additional SAL terms instead.

Syntax

<sla:SLAObligations xmlns:sla="..." xmlns:bqos="..." ...>
  <sla:Obligation ...>sla:ObligationType</sla:Obligation> +
  <sla:ActionGuarantee ...>sla:ActionGuaranteeType</sla:ActionGuarantee> ?
  ...
</sla:SLAObligations>

The following describes the attributes and elements listed in the schema outlined above:

/sla:SLAObligations
SLA obligations aspect of the service, including obligations, action guarantees.

/sla:SLAObligations/sla:Obligation
Obligation element is agreed SLA obligation, including Service Level Objective (SLO) and the Action Guarantee that associates with that SLO. There MAY be one or more obligation elements in the SLAObligations element. See Section 5.1 for more details.

/sla:SLAObligations/sla:Obligation/@{any}
This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the Obligation element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:SLAObligations/sla:ActionGuarantee
Specify what happens if the Service Level Objective (SLO) is met or not met. This guarantee will be associated to all Obligations within the SLAObligations element. It is an optional element for the SLAObligations element. See Section 5.2 for more details.

/sla:SLAObligations/sla:ActionGuarantee/@{any}
This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ActionGuarantee element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:SLAObligations/@{any}
This is an extensibility mechanism to allow different (extensible) property or attribute elements to be specified in the future. Unrecognized elements MAY cause a fault or be silently ignore.

5.1 Obligation

The Obligation, obligation element for SLA Obligations in EERP-SLA, is the agreed SLA obligation, including Service Level Objective (SLO) and the Action Guarantee that associates with that SLO.

There MAY be one or more Obligation elements present in the SLA Obligations.
The following describes the attributes and elements listed in the schema outlined above:

/sla:SLAObligations/sla:Obligation
Obligation element is agreed SLA obligation, including Service Level Objective (SLO) and the Action Guarantee that associates with this Obligation.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective
Service Level Objective (SLO) for QoS guarantee. It is a required element for Obligation. See Section 5.1.1 for more details.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/@{any}
This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ServiceLevelObjective element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

/sla:SLAObligations/sla:Obligation/sla:ActionGuarantee
Service Level Objective (SLO) for QoS guarantee. This guarantee will be associated to all ServiceLevelObjective within this Obligation element. It is an optional element for Obligation. See Section 5.1.2 for more details.

/sla:SLAObligations/sla:Obligation/sla:ActionGuarantee/@{any}
This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ActionGuarantee element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

5.1.1 ServiceLevelObjective
The Service Level Objective element for Obligation in SLA Obligations in EERP-SLA, is the Service Level Objective (SLO) for the QoS guarantee, including Committed Cost, Committed Time, Availabilities, Committed Throughput and SLATerm.

There SHOULD be one Service Level Objective element present in the Obligation, and it can have one and more element within this Service Level Objective element.

Syntax

```
<sla:ServiceLevelObjective xmlns:sla="..." xmlns:bqos="..." ...>
    <sla:CommittedCost>...<bqos:PriceType</sla:CommittedCost> ...</sla:CommittedCost>
    <sla:CommittedTime>...<sla:CommittedTimeType</sla:CommittedTime...
    <sla:Availabilities>...<sla:AvailabilitiesType</sla:Availabilities>
    <sla:CommittedThroughput>...<bqos:ThroughputType</sla:CommittedThroughput>
    <sla:SLATerm>...<sla:SLATermType</sla:SLATerm>
</sla:ServiceLevelObjective>
```

The following describes the attributes and elements listed in the schema outlined above:

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective
Service Level Objective (SLO) for QoS guarantee. It is a required element for Obligation.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:CommittedCost
Cost element in SLA. It is an optional element for ServiceLevelObjective. See Section 5.1.1.1 for more details.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:CommittedTime
Committed time period element in SLA is an optional element for ServiceLevelObjective. see Section 5.1.1.2 for more details.

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the CommittedTime element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

The services availability indicators element, including a list of availabilities, is an optional element for ServiceLevelObjective, see Section 5.1.1.3 for more details.

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the Availabilities element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

Committed performance throughput is an optional element for ServiceLevelObjective. See Section 5.1.1.4 for more details.

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the CommittedThroughput element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

SLA Term. It is an optional element for ServiceLevelObjective, see /sla:SLATerms/sla:SLATerm in Section 6 for more details.

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLATerm element in the future. Unrecognized attributes MAY cause a fault or be silently ignore.

5.1.1.1 CommittedCost

The Committed Cost element describes the cost element in SLA, including Unit and Amount.

There MAY be zero or one Committed Cost element present in the Service Level Objective.

Syntax

```xml
<sla:CommittedCost xmlns:sla="..." xmlns:bqos="...">
  <bqos:Unit unitCode="clm66411:UnitCodeContentType">  
    cbc:BaseUnitMeasureType </bqos:Unit> ?
  <bqos:Amount currencyID="clm54217:CurrencyCodeContentType">  
    cbc:AmountType </bqos:Amount>
</sla:CommittedCost>
```

The following describes the attributes and elements listed in the schema outlined above:

CommittedCost element is the cost element in SLA. It is an optional element for Service Level Objective.

Number of unit is a optional element that includes a attribute of unit of measurement uses cbc:BaseUnitMeasureType. See /bqos:BQoSPrice/bqos:Price/bqos:Unit in Section 3: BQoS Price in EERP-bQoS Specification for more details.
5.1.1.2 CommittedTime

The Committed Time, Committed Time element of Service Level Objective for Obligation in SLA Obligations in EERP-SLA, is the committed time period in SLA, including Duration, Latency and Committed Completion Time.

There MAY be zero or one Committed Time element present in the Service Level Objective.

Syntax

```
<sla:CommittedTime xmlns:sla="..." xmlns:bqos="..." ...>
  <bqos:Duration unitCode="clm66411:UnitCodeContentType">
    cbc:DurationMeasureType </bqos:Duration>
  </bqos:Duration>
  <bqos:Latency unitCode="clm66411:UnitCodeContentType">
    cbc:DurationMeasureType </bqos:Latency> ?
  </bqos:Latency>
  <bqos:StartTime>udt:DateTimeType</bqos:StartTime> ?
  <sla:CommittedCompletionTime>
    udt:DateTimeType</sla:CommittedCompletionTime> ?
</sla:CommittedTime>
```

The following describes the attributes and elements listed in the schema outlined above:

- CommittedTime element is an optional element for Service Level Objective which is the committed time period element in SLA.
- Duration element is a required element in the CommittedTime element which is the duration to complete the service. It uses cbc:DurationMeasureType from UBL that has a required unitCode attribute for unit of measurement on the time. See /bqos:BQoSPerformance/bqos:TimePeriod/bqos:Duration in Section 4: BQoS Performance in EERP-bQoS Specification for more details.
- Latency is an optional element for the time delay for starting the service. It uses cbc:DurationMeasureType from UBL that has a required unitCode attribute for unit of measurement on the time. See /bqos:BQoSPerformance/bqos:TimePeriod/bqos:Latency in Section 4: BQoS Performance in EERP-bQoS Specification for more details.
- StartTime is an optional element for the date and time to start the service. It uses udt:DateTimeType which is in UTC time format [ISO8601]. See /bqos:BQoSPerformance/bqos:TimePeriod/bqos:StartTime in Section 4: BQoS Performance in EERP-bQoS Specification for more details.
- CommittedCompletionTime is an optional element for the date and time for committed completion time. It uses udt:DateTimeType which is UTC time format [ISO8601].
5.1.1.3 Availabilities

The Availabilities, Availabilities of Service Level Objective for Obligation in SLA Obligations in EERP-SLA, is services availability indicators including a list of availabilities, including a list of Availability elements.

There MAY be zero or one Availabilities element present in the Service Level Objective.

Syntax

```
<sla:Availabilities xmlns:sla="..." xmlns:bqos="..." ...>
  <sla:Availability isAvailable="xs:boolean" ...>sla:AvailabilityType
    <sla:From xsi:dateTime</sla:From>
    <sla:To xsi:dateTime</sla:To>
  </sla:Availability>
</sla:Availabilities>
```

The following describes the attributes and elements listed in the schema outlined above:

- `/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:Availabilities`:
  - `Availabilities` is an optional element for Service Level Objective which is the services availability indicators including a list of availabilities.

- `/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:Availabilities/sla:Availability`:
  - `Availability` is a required element for the quality aspect of whether the service is present or ready for immediate use.

  - `From` is a required element for the date and time for availability starting time. It uses `udt:DateTimeType` which is UTC time format [ISO8601].

- `/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:Availabilities/sla:Availability/sla:To`:
  - `To` is a required element for the date and time for availability ending time. It uses `udt:DateTimeType` which UTC time format [ISO8601].

- `/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:Availabilities/sla:Availability/@isAvailable`:
  - `isAvailable` is an optional attribute to illustrate whether the Availability is available or not. It uses `xs:boolean` type.

- `/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:Availabilities/sla:Availability/@{any}`:
  - This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the Availability element in the future. Unrecognized attributes MAY cause a fault or be silently ignored.

5.1.1.4 Committed Throughput

The Committed Throughput, Committed Throughput element of Service Level Objective for Obligation in SLA Obligations in EERP-SLA, is the committed performance throughput, including Duration, Quantity and Latency.

There MAY be zero or one Committed Throughput element present in the Service Level Objective.

Syntax

```
<sla:CommittedThroughput xmlns:sla="..." xmlns:bqos="..." ...>
  <bqos:Duration unitCode="clm66411:UnitCodeContentType">
    cbc:DurationMeasureType</bqos:Duration>
  <bqos:Quantity unitCode="clm66411:UnitCodeContentType">
    cbc:BaseQuantityType</bqos:Quantity>
  <bqos:Latency unitCode="clm66411:UnitCodeContentType">
    cbc:DurationMeasureType</bqos:Latency>
</sla:CommittedThroughput>
```
The following describes the attributes and elements listed in the schema outlined above:

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:CommittedThroughput

CommittedThroughput is an optional element for ServiceLevelObjective element. This is the committed performance throughput.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:CommittedThroughput/bqos:Duration

Duration element is a required element in the CommittedThroughput element. This is the duration to complete the service. It uses cbc:DurationMeasureType from UBL that has a required unitCode attribute for unit of measurement on the time. See /bqos:BQoSPerformance/bqos:Throughput/bqos:Duration in Section 4: BQoS Performance in EERP-bQoS Specification for more details.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:CommittedThroughput/bqos:Quantity

Quantity is a required element in the Throughput element. It is the numbers for the throughput, with an attribute of unit of measurement, such as EA, pounds, cubic-feet, etc. See /bqos:BQoSPerformance/bqos:Throughput/bqos:Quantity in Section 4: BQoS Performance in EERP-bQoS Specification for more details.

/sla:SLAObligations/sla:Obligation/sla:ServiceLevelObjective/sla:CommittedThroughput/bqos:Latency

Latency is an optional element for the time delay for starting the service. It uses cbc:DurationMeasureType from UBL that has a required unitCode attribute for unit of measurement on the time. See /bqos:BQoSPerformance/bqos:Throughput/bqos:Latency in Section 4: BQoS Performance in EERP-bQoS Specification for more details.

5.1.1.5 SLA Term

The SLA Term, SLA Term element of Service Level Objective for Obligation in SLA Obligations in EERP-SLA, is the SLA term element in SLA.

There MAY be zero or one SLA Term element present in the Service Level Objective. See /sla:SLATerms/sla:SLATerm in Section 6 for more details.

5.1.2 Action Guarantee

The Action Guarantee, action guarantee element for SLA Obligations in EERP-SLA, is to specify what happens if the SLO is met or not met, including Reserve Fee and Penalty element.

There MAY be zero or one Action Guarantee element present in the Obligation element. See Section 5.2 for the detail of ActionGuaranteeType.

5.2 ActionGuarantee

The Action Guarantee, action guarantee element for SLA Obligations in EERP-SLA, is to specify what happens if the Service Level Objective (SLO) is met or not met, including Reserve Fee and Penalty element.

There MAY be zero or one SLA Obligations element present in the SLA Obligations.

Syntax

```xml
<sla:ActionGuarantee xmlns:sla="..." xmlns:bqos="..." ...>
  <sla:ReserveFee ...>bqos:PriceType
    <bqos:Unit unitCode="clm66411:UnitCodeContentType">cbc:BaseUnitMeasureType</bqos:Unit> ?
  </sla:ReserveFee>
</sla:ActionGuarantee>
```
The following describes the attributes and elements listed in the schema outlined above:

ReserveFee element is the reservation fee or money amount when Service Level Objective (SLO) is met. It is an optional element for Action Guarantee.

Number of unit is an optional element that includes a attribute of unit of measurement uses \texttt{cbc:BaseUnitMeasureType}. See \texttt{/bqos:BQoS\_Price/bqos:Price/bqos:Unit in Section 3: BQoS Price in EERP-bQoS Specification} for more details.

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the ReserveFee element in the future. Unrecognized attributes MAY cause a fault or be silently ignored.

Penalty element is the money amount when Service Level Objective (SLO) is not met. It is a required element for Action Guarantee.

Number of unit is a optional element that includes a attribute of unit of measurement uses \texttt{cbc:BaseUnitMeasureType}. See \texttt{/bqos:BQoS\_Price/bqos:Price/bqos:Unit in Section 3: BQoS Price in EERP-bQoS Specification} for more details.

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the Penalty element in the future. Unrecognized attributes MAY cause a fault or be silently ignored.

\textbf{Example}

The following example illustrates the use of Action Guarantee element. It describes the penalty:

```xml
<Penalty>
  <bqos:Unit unitCode="EA">10</bqos:Unit>
</Penalty>
```
<bqos:Amount currencyID="USD">17.15</bqos:Amount>
6 SLATerms

The SLA Terms, Terms element for EERP-SLA, is the agreed SLA terms aspect of the service, including SLA term elements.

There MAY be zero or one SLA Terms element present in the SLA of service.

Syntax

```
<sla:SLATerms xmlns:bqos="..." ...>
  <sla:SLATerm ...>sla:SLATermType
  ...
  </sla:SLATerm> +
</sla:SLATerms>
```

The following describes the attributes and elements listed in the schema outlined above:

/sla:SLATerms

The agreed SLA terms aspect of the service, including SLA term elements. It has a list of SLA terms for SLATerms.

/sla:SLATerms/sla:SLATerm

SLA Term element is an any type element to describe additional term for this SLA.

/sla:SLATerms/sla:SLATerm/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLATerm element in the future. Unrecognized attributes MAY cause a fault or be silently ignored.

/sla:SLATerms/sla:SLATerm/{any}

This is an extensibility mechanism to allow different (extensible) property or attribute elements to be specified in the future. Unrecognized elements MAY cause a fault or be silently ignored.

/sla:SLATerms/@{any}

This is an extensibility mechanism to allow additional attributes, based on schemas, to be added to the SLATerms element in the future. Unrecognized attributes MAY cause a fault or be silently ignored.

Example

The following example illustrates the use of SLA Terms element. It describes the term of the SLA:

```
(001) <?xml version="1.0" encoding="utf-8"?>
(002) <SLATerms xmlns="..." ...>
(003)   <SLATerm xmlns:t="..." >
(004)     <t:ServiceLocation>
(005)       <t:Lat>37.7749295</t:Lat>
(006)       <t:Lng>-122.4194155</t:Lng>
(007)     </t:ServiceLocation>
(008)   </SLATerm>
(009) </SLATerms>
```
7 SLA Examples

7.1 Committed Throughput with Penalty Example

This SLA example will show the following agreement between EERP Sample Service and EERP Service Requester:

1. The service is based on the Service profile defined on http://www.serviceprovider.com/eerp/service/profile
2. It will charge $17.15 per service.
3. Starting from January 1\textsuperscript{st}, 2009, the agreement last for one whole year.
4. The committed throughput is 10 services per day.
5. If the provider cannot meet the SLA for #3 and #4, the penalty will be $17.15 per 10 services.

Example

The following example illustrates the whole SLA document for above agreements:

```xml
<?xml version="1.0" encoding="utf-8"?>
<BSLA xmlns="..." xmlns:bqos="..." ... >
  <SLAParties>
    <ServiceProvider>
      <ServiceUri>
        http://www.serviceprovider.com/eerp/service
      </ServiceUri>
      <ServiceProviderName languageID="EN">EERP Sample Service</ServiceProviderName>
    </ServiceProvider>
    <ServiceRequester>
      <ServiceRequesterUri>
        http://www.servicerequester.com
      </ServiceRequesterUri>
      <ServiceRequesterName languageID="EN">EERP Service Requester</ServiceRequesterName>
    </ServiceRequester>
  </SLAParties>
  <SLAParameters>
    <ServiceProfileUri>
      http://www.serviceprovider.com/eerp/service/profile
    </ServiceProfileUri>
    <ServiceOperations>
      <hasCommittedCost>true</hasCommittedCost>
      <hasCommittedTime>true</hasCommittedTime>
      <hasAvailabilities>false</hasAvailabilities>
      <hasCommittedThroughput>true</hasCommittedThroughput>
      <hasOtherTerms>false</hasOtherTerms>
    </ServiceOperations>
    <ServiceProfileUri>
    </ServiceProfileUri>
  </SLAParameters>
  <SLAObligations>
    <Obligation>
      <ServiceLevelObjective>
        <CommittedCost>
          <bqos:Unit unitCode="EA">1</bqos:Unit>
          <bqos:Amount currencyID="USD">17.15</bqos:Amount>
        </CommittedCost>
      </ServiceLevelObjective>
    </Obligation>
    <Obligation>
      <ServiceLevelObjective>
        <CommittedTime>
          <bqos:Duration unitCode="ANN">1</bqos:Duration>
        </CommittedTime>
      </ServiceLevelObjective>
    </Obligation>
  </SLAObligations>
</BSLA>
```
7.2 SLA without Obligation Example

This SLA example will show the following agreement between EERP Sample Service and EERP Service Requester:

1. The service is based on the Service profile defined on http://www.serviceprovider.com/eerp/service/profile2

2. There is no obligation

3. Additional SLA terms include service location and service hours:
   a. Service location is near San Francisco, CA with geocoding of 37.7749295 and -122.4194155
   b. Service hours will be 7 x 24, that is 7 days per week and 24 hours per day.

Example

The following example illustrates the whole SLA document for above agreements:
<SLATerm t:serviceHours="7x24">
</SLATerm>
8 Conformance

An implementation conforms to this specification if it satisfies all of the MUST or REQUIRED level requirements defined within this specification. A SOAP Node MUST NOT use the XML namespace identifier for this specification (listed in Section 1.1) within SOAP Envelopes unless it is compliant with this specification.

This specification references a number of other specifications (listed in Section 1.4.2). In order to comply with this specification, an implementation MUST implement the portions of referenced specifications necessary to comply with the required provisions of this specification. Additionally, the implementation of the portions of the referenced specifications that are specifically cited in this specification MUST comply with the rules for those portions as established in the referenced specification.

Normative text within this specification takes precedence over normative outlines (as described in section 1.4.1), which in turn take precedence over the XML Schema [XML Schema Part 1, Part 2] and WSDL [WSDL 1.1] descriptions. That is, the normative text in this specification further constrains the schemas and/or WSDL that are part of this specification; and this specification contains further constraints on the elements defined in referenced schemas.

The minimum set of information exchange for BSLA that would allow conforming applications to exchange information and satisfy the conformance should at least to have the following elements:

- \(/\text{sla:SLAParties}/\text{sla:ServiceProvider}/\text{sla:ServiceUri}\)
- \(/\text{sla:SLAParties}/\text{sla:ServiceProvider}/\text{sla:ServiceProviderName}\)
- \(/\text{sla:SLAParties}/\text{sla:ServiceRequester}/\text{sla:ServiceRequesterUri}\)
- \(/\text{sla:SLAParties}/\text{sla:ServiceRequester}/\text{sla:ServiceRequesterName}\)
- \(/\text{sla:SLAParameters}/\text{sla:ServiceProfileUri}\)

Example of such minimum set of information could like this:

```xml
  (001) <?xml version="1.0" encoding="utf-8"?>
  (002) <BSLA xmlns="http://docs.oasis-open.org/ns/soa-eerp/sla/200903">
  (003)   <SLAParties>
  (004)     <ServiceProvider>
  (005)       <ServiceUri>http://www.sample-eerp.com/myservice</ServiceUri>
  (006)       <ServiceProviderName>My Service Provider</ServiceProviderName>
  (007)     </ServiceProvider>
  (008)     <ServiceRequester>
  (009)       <ServiceRequesterUri>http://www.u-service.com</ServiceRequesterUri>
  (010)       <ServiceRequesterName>Your Service Requester</ServiceRequesterName>
  (011)     </ServiceRequester>
  (012)   </SLAParties>
  (013)   <SLAParameters>
  (014)     <ServiceProfileUri>http://www.sample-eerp.com/myservice/profile</ServiceProfileUri>
  (015)   </SLAParameters>
  (016)</BSLA>
```

This specification defines a number of extensions; compliant services are NOT REQUIRED to implement those extensions defined in this specification. However, if a service implements an aspect of the specification, it MUST comply with the requirements specified (e.g. related "MUST" statements). If an implementation silently ignore unrecognized attributes where any attribute is allowed, or silently ignore...
unrecognized elements where any element is allowed, should be considered as interoperable implementation.
A. Acknowledgements

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Participants:

Rex Brooks   Individual
Szu Chang   Changfeng Open Standards Platform Software Alliance
William Cox   Individual
Andy Lee   Changfeng Open Standards Platform Software Alliance
Carl Mattocks   Individual
James Zhili Zhang   TIBCO Software Inc.
Hong Zhou   Changfeng Open Standards Platform Software Alliance
B. XML Schema for Business Service Level Agreement

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!--
Document Type:   EERP Business SLA Schema CD03
Create On:       01/06/2010
-->
<xs:element name="Bqos:ServiceLevelTerms" ns:bqos="http://docs.oasis-open.org/ns/soa-eerp/bqos/200903">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="Bqos:ServiceLevelTerm" maxOccurs="unbounded" minOccurs="0" ns:bqos="http://docs.oasis-open.org/ns/soa-eerp/bqos/200903"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

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implement this specification. Please address the information to the
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```
  <xs:import namespace="http://docs.oasis-open.org/ns/soa-eerp/bqos/200903" schemaLocation="EERP-BQoS.xsd"/>
</xs:schema>
```

<!-- ===== Root Element ===== -->
<xsd:element name="BSLA" type="BSLAType">
  <xsd:annotation>
    <xsd:documentation>The BSLA is the root element for EERP- Service-level agreement (SLA). Business SLA is a formal contract between a service provider and a client guaranteeing quantifiable business quality of service (bQoS) at defined levels.</xsd:documentation>
  </xsd:annotation>
</xsd:element>

<!-- ===== Element Declarations ===== -->
<xsd:element name="ActionGuarantee" type="ActionGuaranteeType">
  <xsd:annotation>
    <xsd:documentation>The Action Guarantee, action guarantee element for SLA Obligations in EERP-SLA, is to specify what happens if the Service Level Objective (SLO) is met or not met, including Reserve Fee and Penalty element.</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="Availabilities" type="AvailabilitiesType">
  <xsd:annotation>
    <xsd:documentation>The services availability indicators</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="Availability" type="AvailabilityType">
  <xsd:annotation>
    <xsd:documentation>Availability is the quality aspect of whether the service is present or ready for immediate use.</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="CommittedCompletionTime" type="udt:DateTimeType">
  <xsd:annotation>
    <xsd:documentation>Committed completion time</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="CommittedCost" type="bqos:PriceType">
  <xsd:annotation>
    <xsd:documentation>Cost Element in SLA</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="CommittedTime" type="CommittedTimeType">
  <xsd:annotation>
    <xsd:documentation>Committed time period</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="CommittedThroughput" type="bqos:ThroughputType">
  <xsd:annotation>
    <xsd:documentation>Committed performance throughput</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="From" type="xs:dateTime">
  <xsd:annotation>
    <xsd:documentation>Availability starting time</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="Obligation" type="ObligationType">
  <xsd:annotation>
    <xsd:documentation>Agreed SLA obligation, including Service Level Objective (SLO) and the Action Guarantee that associates with that SLO</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:element name="Penalty">
  <xsd:annotation>
    <xsd:documentation>Penalty element is the money amount when Service Level Objective (SLO) is not met.</xsd:documentation>
  </xsd:annotation>
</xsd:element>
<xsd:complexType>
   <xsd:complexContent>
      <xsd:extension base="bqos:PriceType">
         <xsd:attribute name="##any" processContents="lax"/>
      </xsd:extension>
   </xsd:complexContent>
</xsd:complexType>
</xsd:element>

<xsd:element name="ReserveFee">
   <xsd:annotation>
      <xsd:documentation>ReserveFee element is the reservation fee or money amount when Service Level Objective (SLO) is met. It is an optional element for Action Guarantee.</xsd:documentation>
   </xsd:annotation>
   <xsd:complexType>
      <xsd:complexContent>
         <xsd:extension base="bqos:PriceType">
            <xsd:attribute name="##any" processContents="lax"/>
         </xsd:extension>
      </xsd:complexContent>
   </xsd:complexType>
</xsd:element>

<xsd:element name="ServiceLevelObjective" type="ServiceLevelObjectiveType">
   <xsd:annotation>
      <xsd:documentation>SLO (Service Level Objective) for QoS guarantee</xsd:documentation>
   </xsd:annotation>
   <xsd:element name="ServiceName" type="ServiceNameType">
      <xsd:annotation>
         <xsd:documentation>The service name</xsd:documentation>
      </xsd:annotation>
   </xsd:element>
   <xsd:element name="ServiceOperations" type="ServiceOperationsType">
      <xsd:annotation>
         <xsd:documentation>Describe available operations and bQoS</xsd:documentation>
      </xsd:annotation>
   </xsd:element>
   <xsd:element name="ServiceProfileUri" type="SlaUriType">
      <xsd:annotation>
         <xsd:documentation>Service Profile Uri element represents web page URL or other URI for the service profile that defines the details of the services. Different service providers will share the same profile. It is a required element for SLA Parameters.</xsd:documentation>
      </xsd:annotation>
   </xsd:element>
   <xsd:element name="ServiceProvider" type="ServiceProviderType">
      <xsd:annotation>
         <xsd:documentation>Service Provider element represents the provider for parties.</xsd:documentation>
      </xsd:annotation>
   </xsd:element>
   <xsd:element name="ServiceProviderName" type="ServiceProviderNameType">
      <xsd:annotation>
         <xsd:documentation>The name of service provider</xsd:documentation>
      </xsd:annotation>
   </xsd:element>
   <xsd:element name="ServiceRequester" type="ServiceRequesterType">
      <xsd:annotation>
         <xsd:documentation>ServiceRequester element represents requester for the service, including requester's name and the URI that represents the requester.</xsd:documentation>
      </xsd:annotation>
   </xsd:element>
   <xsd:element name="ServiceRequesterUri" type="SlaUriType">
      <xsd:annotation>
         <xsd:documentation>Service Requester Identifier in Uri format</xsd:documentation>
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   <xsd:element name="ServiceRequesterName" type="ServiceRequesterNameType">
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<xsd:documentation>SLAParties element, SLA Parties aspect of the service, is for parties invoked in the SLA for the service, including both service provider and service requester elements.</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="SLATerm" type="SLATermType">
<xsd:annotation>
<xsd:documentation>SLA Term element is an any type element to describe additional term for this SLA.</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="SLATerms" type="SLATermsType">
<xsd:annotation>
<xsd:documentation>The SLA Terms, Terms element for EERP-SLA, is the agreed SLA terms aspect of the service, including SLA term elements.</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="SLAParameters" type="SLAParametersType">
<xsd:annotation>
<xsd:documentation>The SLAParameters element for EERP-SLA describes the parameters of the service used to define monitoring of QoS metrics, including the service profile URI, operations and other optional elements.</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="SLAObligations" type="SLAObligationsType">
<xsd:annotation>
<xsd:documentation>The SLAObligations element describes the agreed SLA obligations of the service, including obligations and action guarantees.</xsd:documentation>
</xsd:annotation>
</xsd:element>
<xsd:element name="To" type="xs:dateTime">
<xsd:annotation>
<xsd:documentation>Availability ending time</xsd:documentation>
</xsd:annotation>
</xsd:element>
<!-- Extension -->
<xsd:element name="Extension">
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<xsd:documentation>Additional element</xsd:documentation>
</xsd:annotation>
<xsd:complexType mixed="true">
<xsd:choice minOccurs="0" maxOccurs="unbounded">
<xsd:any processContents="skip" minOccurs="0" maxOccurs="unbounded"/>
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<xsd:attribute name="optional" type="xsd:boolean" use="optional" default="true"/>
</xsd:complexType>
</xsd:element>
<!-- ===== Type Definitions ===== -->
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<xsd:documentation>Complex type for action guarantee</xsd:documentation>
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<xsd:documentation>ReserveFee element is the reservation fee or money amount when Service Level Objective (SLO) is met. It is an optional element for Action Guarantee.</xsd:documentation>
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<xsd:element ref="Penalty" minOccurs="0">
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<!-- =====-- Type Definitions ------ -->
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<xsd:element ref="Penalty" minOccurs="0">
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Penalty element is the money amount when Service Level Objective (SLO) is not met. It is a required element for Action Guarantee.
<xsd:complexType name="ServiceLevelObjectiveType">
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    <xsd:documentation>Complex type for SLO</xsd:documentation>
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    <xsd:element ref="CommittedCost" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>Committed cost element in SLA</xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="CommittedTime" minOccurs="0"/>
    <xsd:element ref="Availabilities" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>Whether the service is present or ready for immediate use</xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="CommittedThroughput" minOccurs="0">
      <xsd:annotation>
        <xsd:documentation>Committed performance throughput</xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element ref="SLATerm" minOccurs="0"/>
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  <xsd:anyAttribute namespace="##any" processContents="lax"/>
</xsd:complexType>

<xsd:complexType name="ServiceNameType">
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    <xsd:extension base="cbc:NameType"/>
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    <xsd:documentation>Complex type for service operations</xsd:documentation>
  </xsd:annotation>
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    <xsd:element name="hasCommittedCost" type="xsd:boolean">
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    <xsd:element name="hasCommittedTime" type="xsd:boolean">
      <xsd:annotation>
        <xsd:documentation>has committed time or not</xsd:documentation>
      </xsd:annotation>
    </xsd:element>
    <xsd:element name="hasAvailabilities" type="xsd:boolean">
      <xsd:annotation>
        <xsd:documentation>has availabilities or not</xsd:documentation>
      </xsd:annotation>
    </xsd:element>
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      <xsd:annotation>
        <xsd:documentation>has committed throughput or not</xsd:documentation>
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        <xsd:documentation>has other SAL terms or not</xsd:documentation>
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    <xsd:documentation>Complex type for the service URI or service profile URI</xsd:documentation>
  </xsd:annotation>
  <xsd:simpleContent>
    <xsd:extension base="xsd:anyURI">
      <xsd:anyAttribute namespace="##any" processContents="lax"/>
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    <xsd:documentation>Complex type for the service provider</xsd:documentation>
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    <xsd:element ref="ServiceUri"/>
    <xsd:element ref="ServiceProviderName"/>
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  <xsd:simpleContent>
    <xsd:extension base="cbc:NameType"/>
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<xsd:complexType name="ServiceRequesterType">
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    <xsd:documentation>Complex type for the service requester</xsd:documentation>
  </xsd:annotation>
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    <xsd:element ref="ServiceRequesterUri"/>
    <xsd:element ref="ServiceRequesterName"/>
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  <xsd:anyAttribute namespace="##any" processContents="lax"/>
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<xsd:complexType name="ServiceRequesterUriType">
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    <xsd:extension base="cbc:IDType"/>
  </xsd:simpleContent>
</xsd:complexType>

<xsd:complexType name="SLAObligationsType">
  <xsd:annotation>
    <xsd:documentation>Complex type for SLA Obligations</xsd:documentation>
  </xsd:annotation>
</xsd:complexType>
The Obligation, obligation element for SLA Obligations in EERP-SLA, is the agreed SLA obligation, including Service Level Objective (SLO) and the Action Guarantee that associates with that SLO.

The Action Guarantee, action guarantee element for SLA Obligations in EERP-SLA, is to specify what happens if the Service Level Objective (SLO) is met or not met, including Reserve Fee and Penalty element.

The definition of the SLA Terms
<xsd:documentation>Complex type for SLA Terms</xsd:documentation>
<xsd:sequence>
  <xsd:element ref="SLATerm" maxOccurs="unbounded"/>
</xsd:sequence>
<xsd:anyAttribute namespace="##any" processContents="lax"/>
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<xsd:complexType name="BSLAType">
  <xsd:annotation>
    <xsd:documentation>Complex type for BSLA which is a formal contract between a service provider and a client guaranteeing quantifiable business quality of service (bQoS) at defined levels.</xsd:documentation>
  </xsd:annotation>
  <xsd:sequence>
    <xsd:element ref="SLAParties"/>
    <xsd:element ref="SLAParameters"/>
    <xsd:element ref="SLAObligations" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element ref="SLATerms" minOccurs="0" maxOccurs="unbounded" />
    <xsd:element ref="Extension" minOccurs="0" maxOccurs="unbounded"/>
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C. Non-Normative Text

None
## D. Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Editor</th>
<th>Changes Made</th>
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<tr>
<td>0.9</td>
<td>03/10/2009</td>
<td>Szu Chang</td>
<td>Initial draft</td>
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<tr>
<td>WD01</td>
<td>04/24/2009</td>
<td>Szu Chang</td>
<td>Renamed draft 0.9 to working draft 01</td>
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<tr>
<td>WD02</td>
<td>05/12/2009</td>
<td>Szu Chang</td>
<td>Fixed issue # I011, I012, and I014</td>
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<tr>
<td>WD03</td>
<td>05/17/2009</td>
<td>Szu Chang</td>
<td>Added conformance section</td>
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<tr>
<td>WD04</td>
<td>06/08/2009</td>
<td>Szu Chang</td>
<td>Fixed issue # I017, I018, and I020</td>
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<tr>
<td>WD05</td>
<td>06/24/2009</td>
<td>Szu Chang</td>
<td>Fixed issue # I028, I031, and I038, I041, I047, and I056</td>
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<tr>
<td>WD06</td>
<td>07/05/2009</td>
<td>Szu Chang</td>
<td>Fixed issue # I028, I035, I038, I043, I051, and I055</td>
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<td>CD02</td>
<td>07/11/2009</td>
<td>Szu Chang</td>
<td>Changed WD06 to CD02 after approved by TC</td>
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<tr>
<td>CD03</td>
<td>01/06/2010</td>
<td>Szu Chang</td>
<td>Changed NS and fixed URIs from CD02 to CD03</td>
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