



XSD



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About the Tutorial

XML Schema Definition commonly known as XSD is a way to describe precisely the XML language. XSDs check the validity of structure and vocabulary of an XML document against the grammatical rules of the appropriate XML language.

This tutorial will teach you the basics of XSD. It contains chapters that explain all the basic components of XSD with suitable examples.

Audience

This tutorial has been prepared for beginners to help them understand the basic concepts related to XSD. It will give you enough understanding on XSD from where you can take yourself to a higher level of expertise.

Prerequisites

Before proceeding with this tutorial, you should have basic knowledge of XML, HTML, and JavaScript.

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1. XSD – Overview

XML Schema Definition, commonly known as XSD, is a way to describe precisely the XML language. XSD checks the validity of structure and vocabulary of an XML document against the grammatical rules of the appropriate XML language.

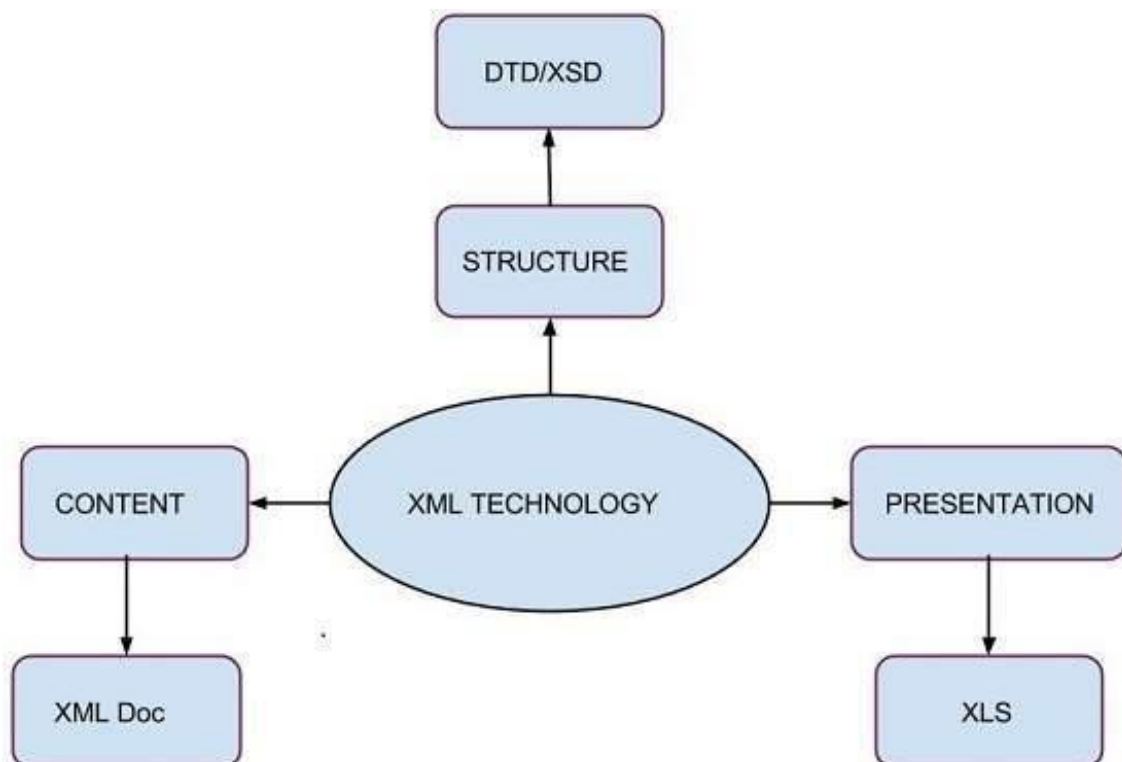
An XML document can be defined as:

- **Well-formed:** If the XML document adheres to all the general XML rules such as tags must be properly nested, opening and closing tags must be balanced, and empty tags must end with '</>', then it is called as *well-formed*.

OR

- **Valid:** An XML document said to be valid when it is not only *well-formed*, but it also conforms to available XSD that specifies which tags it uses, what attributes those tags can contain, and which tags can occur inside other tags, among other properties.

The following diagram shows how XSD is used to structure XML documents:



Here is a simple XSD code. Take a look at it.

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.tutorialspoint.com"
xmlns="http://www.tutorialspoint.com"
elementFormDefault="qualified">
  <xs:element name='class'>
    <xs:complexType>
      <xs:sequence>
        <xs:element name='student' type='StudentType'
          minOccurs='0' maxOccurs='unbounded' />
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  <xs:complexType name="StudentType">
    <xs:sequence>
      <xs:element name="firstname" type="xs:string"/>
      <xs:element name="lastname" type="xs:string"/>
      <xs:element name="nickname" type="xs:string"/>
      <xs:element name="marks" type="xs:positiveInteger"/>
    </xs:sequence>
    <xs:attribute name='rollno' type='xs:positiveInteger' />
  </xs:complexType>
</xs:schema>
```

Features

Here is a list of some of the popular features of XSD:

- XSDs can be extensible for future additions.
- XSD is richer and more powerful than DTD.
- XSD is written in XML.
- XSD supports data types.
- XSD supports namespaces.
- XSD is W3C recommendation.

2. XSD – Syntax

An XML XSD is kept in a separate document and then the document can be linked to an XML document to use it.

Syntax

The basic syntax of an XSD is as follows:

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.tutorialspoint.com"
xmlns="http://www.tutorialspoint.com"
elementFormDefault="qualified">
  <xs:element name='class'>
    <xs:complexType>
      <xs:sequence>
        <xs:element name='student' type='StudentType'
          minOccurs='0' maxOccurs='unbounded' />
      </xs:sequence>
    </xs:complexType>
  </xs:element>

  <xs:complexType name="StudentType">
    <xs:sequence>
      <xs:element name="firstname" type="xs:string"/>
      <xs:element name="lastname" type="xs:string"/>
      <xs:element name="nickname" type="xs:string"/>
      <xs:element name="marks" type="xs:positiveInteger"/>
    </xs:sequence>
    <xs:attribute name='rollno' type='xs:positiveInteger' />
  </xs:complexType>
```

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```
</xs:schema>
```

<Schema> Element

Schema is the root element of XSD and it is always required.

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
```

The above fragment specifies that elements and datatypes used in the schema are defined in "http://www.w3.org/2001/XMLSchema" namespace and these elements/data types should be prefixed with **xs**. It is always required.

```
targetNamespace="http://www.tutorialspoint.com"
```

The above fragment specifies that elements used in this schema are defined in "http://www.tutorialspoint.com" namespace. It is optional.

```
xmlns="http://www.tutorialspoint.com"
```

The above fragment specifies that default namespace is "http://www.tutorialspoint.com".

```
xmlns="http://www.tutorialspoint.com"
```

The above fragment indicates that any elements declared in this schema must be namespace qualified before using them in any XML Document. It is optional.

Referencing Schema

Take a look at the following Referencing Schema:

```
<?xml version="1.0"?>
<class xmlns="http://www.tutorialspoint.com"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.tutorialspoint.com student.xsd">
  <student rollno="393">
    <firstname>Dinkar</firstname>
    <lastname>Kad</lastname>
    <nickname>Dinkar</nickname>
```

```

    <marks>85</marks>
</student>
<student rollno="493">
    <firstname>Vaneet</firstname>
    <lastname>Gupta</lastname>
    <nickname>Vinni</nickname>
    <marks>95</marks>
</student>
<student rollno="593">
    <firstname>Jasvir</firstname>
    <lastname>Singh</lastname>
    <nickname>Jazz</nickname>
    <marks>90</marks>
</student>
</class>
xmlns="http://www.tutorialspoint.com"

```

The above fragment specifies default namespace declaration. This namespace is used by the schema validator check that all the elements are part of this namespace. It is optional.

```

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.tutorialspoint.com student.xsd">

```

After defining the XMLSchema-instance xsi, use **schemaLocation** attribute. This attribute has two values, namespace and location of XML Schema, to be used separated by a space. It is optional.

End of ebook preview

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