XML Namespaces:

XML Namespaces provide a method to avoid element name conflicts.

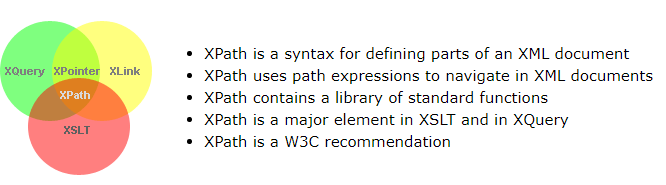
<https://www.w3schools.com/XML/xml_namespaces.asp>

XPath:

XPath can be used to navigate through elements and attributes in an XML document.

https://www.w3schools.com/XML/xpath\_intro.asp

There are functions for string values, numeric values, booleans, date and time comparison, node manipulation, sequence manipulation, and much more.



Path expressions can be used in JavaScript, Java, XML Schema, PHP, Python, C and C++, and lots of other languages.

XPath Nodes:

There are seven kinds of nodes: element, attribute, text, namespace, processing-instruction, comment, and document nodes.

1. Each element and attribute has one parent.
2. Element nodes may have zero, one or more children.
3. Nodes that have the same parent.
4. A node's parent, parent's parent, etc.
5. A node's children, children's children, etc.

XPath Syntax:

<https://www.w3schools.com/XML/xpath_syntax.asp>

Selecting Nodes - XPath uses path expressions to select nodes in an XML document.

|  |  |
| --- | --- |
| **Expression** | **Description** |
| *nodename* | Selects all nodes with the name "*nodename*" |
| / | Selects from the root node |
| // | Selects nodes in the document from the current node that match the selection no matter where they are |
| . | Selects the current node |
| .. | Selects the parent of the current node |
| @ | Selects attributes |

In the table below we have listed some path expressions and the result of the expressions:

|  |  |
| --- | --- |
| **Path Expression** | **Result** |
| bookstore | Selects all nodes with the name "bookstore" |
| /bookstore | Selects the root element bookstore  **Note:** If the path starts with a slash ( / ) it always represents an absolute path to an element! |
| bookstore/book | Selects all book elements that are children of bookstore |
| //book | Selects all book elements no matter where they are in the document |
| bookstore//book | Selects all book elements that are descendant of the bookstore element, no matter where they are under the bookstore element |
| //@lang | Selects all attributes that are named lang |

Predicates - Predicates are used to find a specific node or a node that contains a specific value.

|  |  |
| --- | --- |
| **Path Expression** | **Result** |
| /bookstore/book[1] | Selects the first book element that is the child of the bookstore element.  **Note:** In IE 5,6,7,8,9 first node is[0], but according to W3C, it is [1]. To solve this problem in IE, set the SelectionLanguage to XPath:  *In JavaScript: xml*.setProperty("SelectionLanguage","XPath"); |
| /bookstore/book[last()] | Selects the last book element that is the child of the bookstore element |
| /bookstore/book[last()-1] | Selects the last but one book element that is the child of the bookstore element |
| /bookstore/book[position()<3] | Selects the first two book elements that are children of the bookstore element |

Unknown nodes - XPath wildcards can be used to select unknown XML nodes.

|  |  |
| --- | --- |
| **Wildcard** | **Description** |
| \* | Matches any element node |
| @\* | Matches any attribute node |
| node() | Matches any node of any kind |

Selecting several paths.

|  |  |
| --- | --- |
| **Path Expression** | **Result** |
| //book/title | //book/price | Selects all the title AND price elements of all book elements |
| //title | //price | Selects all the title AND price elements in the document |
| /bookstore/book/title | //price | Selects all the title elements of the book element of the bookstore element AND all the price elements in the document |

XPath Axes:

Syntax: axisname::nodetest[predicate]

Ex: descendant::book[1]

An axis defines a node-set relative to the current node.

<https://www.w3schools.com/XML/xpath_axes.asp>

EX:

|  |  |
| --- | --- |
| ancestor | Selects all ancestors (parent, grandparent, etc.) of the current node |
| ancestor-or-self | Selects all ancestors (parent, grandparent, etc.) of the current node and the current node itself |
| attribute | Selects all attributes of the current node |
| child | Selects all children of the current node |

Examples

|  |  |
| --- | --- |
| **Example** | **Result** |
| child::book | Selects all book nodes that are children of the current node |
| attribute::lang | Selects the lang attribute of the current node |
| child::\* | Selects all element children of the current node |
| attribute::\* | Selects all attributes of the current node |
| child::text() | Selects all text node children of the current node |

XPath Operators:

XPath expression returns either a node-set, a string, a Boolean, or a number.

Below is a list of the operators that can be used in XPath expressions:

|  |  |  |
| --- | --- | --- |
| **Operator** | **Description** | **Example** |
| | | Computes two node-sets | //book | //cd |
| + | Addition | 6 + 4 |
| - | Subtraction | 6 - 4 |
| \* | Multiplication | 6 \* 4 |
| div | Division | 8 div 4 |
| = | Equal | price=9.80 |
| != | Not equal | price!=9.80 |
| < | Less than | price<9.80 |
| <= | Less than or equal to | price<=9.80 |
| > | Greater than | price>9.80 |
| >= | Greater than or equal to | price>=9.80 |
| or | or | price=9.80 or price=9.70 |
| and | and | price>9.00 and price<9.90 |
| mod | Modulus (division remainder) | 5 mod 2 |

## **The XML Example Document**

"books.xml":

<https://www.w3schools.com/XML/xpath_examples.asp>

<?xml version="1.0" encoding="UTF-8"?>  
  
<bookstore>  
  
<book category="cooking">  
  <title lang="en">Everyday Italian</title>  
  <author>Giada De Laurentiis</author>  
  <year>2005</year>  
  <price>30.00</price>  
</book>  
  
<book category="children">  
  <title lang="en">Harry Potter</title>  
  <author>J K. Rowling</author>  
  <year>2005</year>  
  <price>29.99</price>  
</book>  
  
<book category="web">  
  <title lang="en">XQuery Kick Start</title>  
  <author>James McGovern</author>  
  <author>Per Bothner</author>  
  <author>Kurt Cagle</author>  
  <author>James Linn</author>  
  <author>Vaidyanathan Nagarajan</author>  
  <year>2003</year>  
  <price>49.99</price>  
</book>  
  
<book category="web">  
  <title lang="en">Learning XML</title>  
  <author>Erik T. Ray</author>  
  <year>2003</year>  
  <price>39.95</price>  
</book>  
  
</bookstore>

XSLT:

XSLT is a language that can be used to transform XML documents into other formats.

<https://www.w3schools.com/XML/xml_namespaces.asp> (go to bottom of page and look for “Namespaces in Real Use)