



Instituto Politécnico  
de Viana do Castelo

ipvc Instituto Politécnico  
de Viana do Castelo



Escola Superior  
de Tecnologia e Gestão

Versão 1 – Documento em Atualização

# Integração de Sistemas e Tecnologias

## Interoperabilidade de Sistemas e Tecnologias

### XML, XSL, Xpath, XQuery

Escola Superior de Tecnologia e Gestão  
Instituto Politécnico de Viana do Castelo  
Braga, Portugal

Jorge Ribeiro

jribeiro@estg.ipvc.pt



<https://www.europeandataportal.eu/elearning/en/module9/#/id/co-01>

europedataportal.eu/data/datasets

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. Importar marcadores agora...

Data Impact & Studies EU and international data Country data

### Formats

CSV	2630
HTML	2237
WMS	1194
Karte	1141
Webanwendung	1141
Excel XLS	1079
PDF	892
ZIP	885
JSON	865
application/json	673
Excel XLSX	453
Esri Shape	407
Provisional data	367
KML	253
XML	242

Staatsarchiv Hamburg, 314-15 Obe

314-15, Nr. 30 UA 2: Abrechnungen 34 (später: Hallerstraße 56) über Erl und von Umzugsgut jüdischer Emig

Staatsarchiv Hamburg, 314-15 Obe

314-15, Nr. 31 UA 1: Abrechnungen Versteigerungen von Hausrat depor (1942) nach 1945

Staatsarchiv Hamburg, 314-15 Obe

314-15, Nr. R 1938/3624: Najman, L 15.01.1901).- Najman, Fajga, geb. Bl

europedataportal.eu/en

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. Importar marcadores agora.

EUROPEAN DATA PORTAL

English (en) Site content

Data Impact & Studies Training News & Events About

### Search Datasets

By category By term

Agriculture, Fisheries, Forestry & Foods	Economy & Finance	Education, Culture & Sport	Energy	Environment
Government & Public Sector	Health	International Issues	Justice, Legal System & Public Safety	Population & Society
Regions & Cities	Science & Technology	Transport		

DATA CATALOGUES ALL DATASETS

## European Data Portal

The European Data Portal harvests the metadata of Public Sector information available on public data portals across European countries. Information regarding the provision of data and the benefits of re-using data is also included.

36 Countries 81 Catalogues 1166906 Datasets



<https://www.europeandataportal.eu/data/datasets?locale=pt&minScoring=0>

<https://www.europeandataportal.eu/elearning/en/module9/#/id/co-01>

The screenshot shows the European Data Portal homepage. It features a map of Europe with various icons representing different data categories. Below the map, there are three main statistics: 36 Countries, 81 Catalogues, and 1166906 Datasets. The page has a dark blue header with navigation links for Data, Impact & Studies, Training, News & Events, and About.

The screenshot shows the search results for the category "Agriculture, fisheries, forestry and food". It displays a map of Europe with highlighted locations. A specific result for "Yacht Moorings Locations" is shown, which is available on the Coast of Galway, Ireland. The result includes a link to a bathymetry map and download options in CSV, ZIP, GeoJSON, KML, KML Esri, and HTML formats. A red arrow points from the bottom left towards this result.

The screenshot shows the search results for the category "Education, culture and sport". It displays a map of Europe with highlighted locations. A specific result for "Mobile Jugendarbeit" is shown, which is available in Germany. The result includes a link to a JSON file and download options in UNKNOWN, JSON, CSV, KML, ZIP, and HTML formats. A red arrow points from the bottom right towards this result.



# XML

<https://www.w3.org/XML/>

The screenshot shows a web browser window displaying the W3C XML Activity Statement. The URL in the address bar is <https://www.w3.org/XML/>. The page header includes the W3C logo and the text "Information and knowledge domain". On the right side, there is a sidebar with the heading "Upcoming:" followed by links to "XML London Conference" and "Balisage Markup Conference". The main content area features a large section titled "Extensible Markup Language (XML)" with a list of five navigation links: "Introduction", "Working Groups", "Events", "Other Resources", and "Contact". Below this list, a note says "Nearby: [XML Specifications](#) and [Translations](#) of them." A red arrow icon is positioned on the left side of the page.

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

w3.org/XML/

about XML . [XML Activity Statement](#)

**W3C** Information and knowledge domain

## Extensible Markup Language (XML)

1. [Introduction](#)
2. [Working Groups](#)
3. [Events](#)
4. [Other Resources](#)
5. [Contact](#)

Nearby: [XML Specifications](#) and [Translations](#) of them.

**Upcoming:**

[XML London Conference](#)

[Balisage Markup Conference](#)

## Introduction

Extensible Markup Language (XML) is a simple, very flexible text format derived from SGML (ISO 8879). Originally designed to meet the challenges of large-scale electronic publishing, XML is also playing an increasingly important role in the exchange of a wide variety of data on the Web and elsewhere.

This page describes the work being done at W3C within the XML Activity, and how it is structured. Work at W3C takes place in *Working Groups*. The Working Groups within the XML Activity are listed below, together with links to their individual web pages.



# XML

[https://developer.mozilla.org/pt-PT/docs/Web/XML/Introducao\\_a\\_XML](https://developer.mozilla.org/pt-PT/docs/Web/XML/Introducao_a_XML)

The screenshot shows a web browser window displaying the MDN Web Docs article 'Introdução à XML'. The URL in the address bar is 'developer.mozilla.org/pt-PT/docs/Web/XML/Introducao\_a\_XML'. The page title is 'Introdução à XML'. The MDN logo is at the top left. Navigation links include 'Technologies ▾', 'References & Guides ▾', and 'Feedback ▾'. A note on the right says 'This translation is incomplete. Please help translate this article from English'. The main content explains what XML is and its purpose. A sidebar on the left lists 'On this Page' topics: 'Correct' XML (valid and well-formed), Entidades, Exibir XML, Recomendações, and Consulte também.

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

MDN web docs

Technologies ▾

References & Guides ▾

Feedback ▾

# Introdução à XML

Tecnologia da Web para programadores > XML:- Linguagem de Marcação Extensível > Introdução à XML

This translation is incomplete. Please help translate this article from English

"Correct" XML (valid and well-formed)

Entidades

Exibir XML

Recomendações

Consulte também

XML é uma linguagem de marcação similar à HTML. It stands for Extensible Markup Language and is a W3C recommended specification as a general purpose markup language. This means, unlike other markup languages, XML is not predefined so you must define your own tags. The primary purpose of the language is the sharing of data across different systems, such as the Internet.

There are many languages based on XML; Some examples are XHTML, MathML, SVG, XUL, XBL, RSS, and RDF. You can also create your own.

## "Correct" XML (valid and well-formed)

For an XML document to be correct it must be a well-formed document, conforming to all of XML's syntax rules, and valid, conforming to a specific language's rules. An example of a document that is not well formed is one with an element that has an opening tag with no closing tag.



## XML

[http://ftp.sage.pt/sage/saft/Exemplo\\_SAFT\\_v1\\_01.xml](http://ftp.sage.pt/sage/saft/Exemplo_SAFT_v1_01.xml)

← → C ▲ Não seguro | http://ftp.sage.pt/sage/saft/Exemplo\_SAFT\_v1\_01.xml

This XML file does not appear to have any style information associated with it. The document tree is sh

```
<AuditFile xmlns="urn:OECD:StandardAuditFile-Tax:PT_1.01_01">
  <Header>
    <AuditFileVersion>1.01_01</AuditFileVersion>
    <CompanyID>Nr-Conservatoria/123 123123123</CompanyID>
    <TaxRegistrationNumber>123456789</TaxRegistrationNumber>
    <TaxAccountingBasis>I</TaxAccountingBasis>
    <CompanyName>Empresa de teste S.A.</CompanyName>
    <BusinessName>Empresa de testes</BusinessName>
    <CompanyAddress>
      <AddressDetail>Avenida das Demonstrações, lote 1 Piso 1</AddressDetail>
      <City>Parque das Demonstrações</City>
      <PostalCode>4100-615</PostalCode>
      <Country>PT</Country>
    </CompanyAddress>
    <FiscalYear>2008</FiscalYear>
    <StartDate>2001-01-01</StartDate>
    <EndDate>2007-12-31</EndDate>
    <CurrencyCode>EUR</CurrencyCode>
    <DateCreated>2007-09-28</DateCreated>
    <TaxEntity>Sede</TaxEntity>
    <ProductCompanyTaxID>123456789</ProductCompanyTaxID>
    <SoftwareCertificateNumber></SoftwareCertificateNumber>
    <ProductID>Gestão sadsad sadfsd/Sage sd fsd</ProductID>
    <ProductVersion>07.01.0004</ProductVersion>
    <HeaderComment>Comentários ao SAFT exportado</HeaderComment>
    <Telephone>211234567</Telephone>
    <Fax>211234567</Fax>
    <Email>teste@maria.com</Email>
    <Website>www.mariatestes.com</Website>
  </Header>
  <MasterFiles>
    <GeneralLedger>
      <AccountID>22</AccountID>
      <AccountDescription>Fornecedores</AccountDescription>
      <OpeningDebitBalance>0</OpeningDebitBalance>
      <OpeningCreditBalance>0</OpeningCreditBalance>
    </GeneralLedger>
    <GeneralLedger>
      <AccountID>221</AccountID>
      <AccountDescription>Fornecedores c/c</AccountDescription>
      <OpeningDebitBalance>0</OpeningDebitBalance>
      <OpeningCreditBalance>0</OpeningCreditBalance>
    </GeneralLedger>
    <GeneralLedger>
      <AccountID>24</AccountID>
      <AccountDescription>Estado e Outros Entes Públicos</AccountDescription>
      <OpeningDebitBalance>0</OpeningDebitBalance>
      <OpeningCreditBalance>0</OpeningCreditBalance>
    </GeneralLedger>
  </MasterFiles>

```

← → C ▲ Não seguro | http://ftp.sage.pt/sage/saft/Exemplo\_SAFT\_v1\_01.xml

```
<description>impressora Jet ZWC</description>
<CreditAmount>130</CreditAmount>
  <Tax>
    <TaxType>IVA</TaxType>
    <TaxCountryRegion>PT</TaxCountryRegion>
    <TaxCode>NOR</TaxCode>
    <TaxPercentage>21</TaxPercentage>
  </Tax>
  <SettlementAmount>0</SettlementAmount>
</Line>
  <DocumentTotals>
    <TaxPayable>128.64</TaxPayable>
    <NetTotal>612.59</NetTotal>
    <GrossTotal>741.23</GrossTotal>
  </DocumentTotals>
  <Invoice>
    <InvoiceNo>NF 1/2</InvoiceNo>
    <InvoiceStatus>N</InvoiceStatus>
    <Hash>1232</Hash>
    <Period>9</Period>
    <InvoiceDate>2007-09-28</InvoiceDate>
    <InvoiceType>FT</InvoiceType>
    <SelfBillingIndicator>0</SelfBillingIndicator>
    <SystemEntryDate>2007-09-28T15:31:21</SystemEntryDate>
    <CustomerID>C1</CustomerID>
    <Line>
      <LineNumber>1</LineNumber>
      <ProductCode>P2</ProductCode>
      <ProductDescription>Canetas</ProductDescription>
      <Quantity>2</Quantity>
      <UnitOfMeasure>Unid</UnitOfMeasure>
      <UnitPrice>1.35</UnitPrice>
      <TaxPointDate>2007-09-28</TaxPointDate>
      <Description>Canetas</Description>
      <CreditAmount>2.7</CreditAmount>
    </Line>
    <Tax>
      <TaxType>IS</TaxType>
      <TaxCountryRegion>PT</TaxCountryRegion>
      <TaxCode>2.1.1</TaxCode>
      <TaxPercentage>21</TaxPercentage>
    </Tax>
    <SettlementAmount>0</SettlementAmount>
  </Line>
  <DocumentTotals>
    <TaxPayable>.57</TaxPayable>
    <NetTotal>2.7</NetTotal>
    <GrossTotal>3.27</GrossTotal>
  </DocumentTotals>
  <Invoice>
    <SalesInvoices>
      <SourceDocuments>
        </SourceDocuments>
    </SalesInvoices>
  </Invoice>
</AuditFile>
```



<https://www.hl7.org/>

<https://www.hl7.org/implement/standards/index.cfm?ref=nav>

## XML (Standard HL7 – Patient Healthcare)

The screenshot shows the HL7 International website's "Standards" page. The header includes the HL7 logo and navigation links for About, Standards, Membership, Resources, Events, Training, and Certification. Below the header, a breadcrumb trail shows "Home > Standards". The main content area features an introduction to HL7 Standards, mentioning its framework for exchange, integration, sharing, and retrieval of electronic health information. It highlights primary standards like CDA®, EHR, FHIR®, and Version 2 (V2), as well as HL7 Version 3 (V3) based on the Reference Information Model (RIM). A sidebar on the right provides links to licensed products, adopted standards (HL7 Standards Referenced, ANSI Approved Standards, ISO Approved HL7 Standards), and information about STU & RIM.

Home > Standards

### Introduction to HL7 Standards

HL7 and its members provide a framework (and related standards) for the exchange, [integration](#), sharing, and retrieval of electronic health information. These standards define how information is packaged and communicated from one party to another, setting the language, structure and data types required for seamless integration between systems. HL7 standards support clinical practice and the management, delivery, and evaluation of health services, and are recognized as the most commonly used in the world. For more information about the HL7 standards process, please read [Understanding the Standards Process](#).

HL7 standards are grouped into reference categories:

- Section 1: Primary Standards** - Primary standards are considered the most popular standards integral for system integrations, inter-operability and compliance. Our most frequently used and in-demand standards are in this category.
  - Section 1a: Clinical Document Architecture (CDA®)** - Clinical Document Architecture (CDA®) Products
  - Section 1b: EHR - Electronic Health Records** - These standards provide functional models and profiles that enable the constructs for management of electronic health records.
  - Section 1c: FHIR®-Fast Health Interop Resources** - FHIR® – Fast Health Interop Resources
  - Section 1d: Version 2 (V2)** - Version 2 (V2)
- Section 1e: Version 3 (V3)** - HL7 Version 3 (V3) - a suite of specifications based on HL7's Reference Information Model (RIM)
- Section 1f: Arden Syntax** - The Arden Syntax is a formalism for representing procedural clinical knowledge in order to facilitate the sharing of

**HL7 Standards Licensed At**  
Health Level Seven International is other select products are now licen:

**Adopted HL7 Standards**

- HL7 Standards Referenced
- HL7 ANSI Approved Standa
- ISO Approved HL7 Standard

**STU & RIM**  
In addition to the American National Standards for Trial Use (STU)

Looking for the Reference Informati

Show the world you have st

Escola Superior de Tecnologia e Gestão



<https://www.w3.org/TR/wot-thing-description/>

← → C 🔒 w3.org/TR/wot-thing-description/

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

**W3C Recommendation**

<b>TABLE OF CONTENTS</b>	
1.	<a href="#">Introduction</a>
2.	<a href="#">Conformance</a>
3.	<a href="#">Terminology</a>
4.	<a href="#">Namespaces</a>
5.	<b>TD Information Model</b>
5.1	<a href="#">Overview</a>
5.2	<a href="#">Preliminaries</a>
5.3	<a href="#">Class Definitions</a>
5.3.1	<a href="#">Core Vocabulary Definitions</a>
5.3.1.1	<a href="#">Thing</a>
5.3.1.2	<a href="#">InteractionAffordance</a>
5.3.1.3	<a href="#">PropertyAffordance</a>
5.3.1.4	<a href="#">ActionAffordance</a>
5.3.1.5	<a href="#">EventAffordance</a>
5.3.1.6	<a href="#">VersionInfo</a>
5.3.1.7	<a href="#">MultiLanguage</a>
5.3.2	<a href="#">Data Schema Vocabulary Definitions</a>
5.3.2.1	<a href="#">DataSchema</a>
5.3.2.2	<a href="#">ArraySchema</a>
5.3.2.3	<a href="#">BooleanSchema</a>
5.3.2.4	<a href="#">NumberSchema</a>
5.3.2.5	<a href="#">IntegerSchema</a>

# Web of Things (WoT) Thing Description

W3C Recommendation 9 April 2020 (Link errors corrected 23 June 2020)



**This version:**

<https://www.w3.org/TR/2020/REC-wot-thing-description-20200409/>

**Latest published version:**

<https://www.w3.org/TR/wot-thing-description/>

**Latest editor's draft:**

<https://w3c.github.io/wot-thing-description/>

**Implementation report:**

<https://w3c.github.io/wot-thing-description/testing/report.html>

**Previous version:**

<https://www.w3.org/TR/2020/PR-wot-thing-description-20200130/>

**Editors:**

Sebastian Kaebisch ([Siemens AG](#))

Takuki Kamiya ([Fujitsu Laboratories of America](#))

Michael McCool ([Intel](#))

Victor Charpenay ([Siemens AG](#))

Matthias Kovatsch ([Huawei](#))

**Participate:**

[GitHub w3c/wot-thing-description](#)

[File a bug](#)

[Commit history](#)



XSLT

<https://www.w3.org/Style/XSL/>

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

## The Extensible Stylesheet Language Family (XSL)

XSL is a family of recommendations for defining XML document transformation and presentation. It consists of three parts:

- [XSL Transformations \(XSLT\)](#)  
a language for transforming XML;
- [The XML Path Language \(XPath\)](#)  
an expression language used by XSLT (and many other languages) to access or refer to parts of an XML document;
- [XSL Formatting Objects \(XSL-FO\)](#)  
an XML vocabulary for specifying formatting semantics.

An XSLT stylesheet specifies the presentation of a class of XML documents by describing how an instance of the class is transformed into an XML document that uses a formatting vocabulary, such as (X)HTML or XSL-FO. For a more detailed explanation of how XSL works, see the [What Is XSL](#) page.

XSLT is developed by the W3C [XSLT Working Group \(members only\)](#), whose [charter](#) is to develop the next version of XSLT. XSLT is part of W3C's [XML Activity](#), whose work is described in the [XML Activity Statement](#).

XPath is developed jointly by the [XQuery](#) and XSLT Working Groups.

The XSL-FO work at W3C was taken over by the [XML Print and Page Layout Working Group](#) which has now been closed.

**Specifications**

- [XSLT 3.0](#)
- [XSLT 2.0](#)
- [XSLT 1.0](#)
- [XPath 3.1](#)

**News**

**2017-06-08: XSLT 3.0 is a W3C Recommendation**  
[XSLT 3.0 is a W3C Recommendation](#).

**2017-03-21: XQuery 3.1, XPath 3.1, XDM 3.1 etc W3C Recommendations**  
[XPath 3.1, XQuery 3.1, XQueryX 3.1, and supporting documents now W3C Recommendations](#).

**Tutorials**

- [XSL-FO tutorial by Rend](#)
- [How to Develop Stylesheets](#)
- [XSL-FO Transformation](#)
- [House](#)



## XSLT

[https://www.w3schools.com/xml/xsl\\_intro.asp](https://www.w3schools.com/xml/xsl_intro.asp)

← → C [w3schools.com/xml/xsl\\_intro.asp](https://www.w3schools.com/xml/xsl_intro.asp)

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

# w3schools.com

Home HTML CSS JAVASCRIPT SQL PYTHON PHP BOOTSTRAP HOW TO W3.CSS

DOM Clone Nodes

DOM Examples

XPath Tutorial

XPath Introduction

XPath Nodes

XPath Syntax

XPath Axes

XPath Operators

XPath Examples

XSLT Tutorial

XSLT Introduction

XSL Languages

XSLT Transform

XSLT <template>

XSLT <value-of>

XSLT <for-each>

XSLT <sort>

XSLT <if>

XSLT <choose>

XSLT Apply

XSLT on the Client

XSLT on the Server

XSLT Edit XML

XSLT Examples

## XSLT Introduction

◀ Previous

XSL (eXtensible Stylesheet Language) is a styling language for XML.

XSLT stands for XSL Transformations.

This tutorial will teach you how to use XSLT to transform XML documents into other formats.

## Online XSLT Editor

With our online editor, you can edit XML and XSLT code, and click on a button to

### XSLT Example

```
<?xml version="1.0"?>  
  
<xsl:stylesheet version="1.0"  
    xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
```

### XSLT Example

```
<?xml version="1.0"?>  
  
<xsl:stylesheet version="1.0"  
    xmlns:xsl="http://www.w3.org/1999/XSL/Transform">  
  
<xsl:template match="/">  
    <html>  
        <body>  
            <h2>My CD Collection</h2>  
            <table border="1">  
                <tr bgcolor="#9acd32">  
                    <th>Title</th>  
                    <th>Artist</th>  
                </tr>  
                <xsl:for-each select="catalog/cd">  
                    <tr>  
                        <td><xsl:value-of select="title"/></td>  
                        <td><xsl:value-of select="artist"/></td>  
                    </tr>  
                </xsl:for-each>  
            </table>  
        </body>  
    </html>  
</xsl:template>  
  
</xsl:stylesheet>
```



## XPOINTER

[https://www.w3schools.com/xml/xml\\_xlink.asp](https://www.w3schools.com/xml/xml_xlink.asp)

### XPointer Example

In this example, we will use XPointer in conjunction with XLink to point to a specific part of another document.

We will start by looking at the target XML document (the document we are linking to):

```
<?xml version="1.0" encoding="UTF-8"?>

<dogbreeds>

  <dog breed="Rottweiler" id="Rottweiler">
    <picture url="https://dog.com/rottweiler.gif" />
    <history>The Rottweiler's ancestors were probably Roman
    drover dogs.....</history>
    <temperament>Confident, bold, alert and imposing, the Rottweiler
    is a popular choice for its ability to protect....</temperament>
  </dog>

  <dog breed="FCRetriever" id="FCRetriever">
    <picture url="https://dog.com/fcretriever.gif" />
    <history>One of the earliest uses of retrieving dogs was to
    help fishermen retrieve fish from the water....</history>
    <temperament>The flat-coated retriever is a sweet, exuberant,
    lively dog that loves to play and retrieve....</temperament>
  </dog>

</dogbreeds>
```



## XPOINTER

<https://www.w3.org/TR/WD-xptr>

← → C ( [w3.org/TR/WD-xptr](https://www.w3.org/TR/WD-xptr) )



Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

W3C Working Draft



## XML Pointer Language (XPointer) Version 1.0

W3C Last Call Working Draft 8 January 2001

**This version:**

<http://www.w3.org/TR/2001/WD-xptr-20010108>

**Latest version:**

<http://www.w3.org/TR/xptr>

**Previous version:**

<http://www.w3.org/TR/2000/CR-xptr-20000607>

**Editors:**

Steve DeRose, Brown University Scholarly Technology Group <[Steven\\_DeRose@Brown.edu](mailto:Steven_DeRose@Brown.edu)>

Eve Maler, Sun Microsystems <[eve.maler@east.sun.com](mailto:eve.maler@east.sun.com)>

Ron Daniel Jr., Interwoven <[r.daniel@interwoven.com](mailto:r.daniel@interwoven.com)>

Copyright ©2001 W3C® (MIT, INRIA, Keio). All Rights Reserved. W3C [liability](#), [trademark](#), [document use](#) and [software licensing](#) rules apply.

### Abstract

This specification defines the XML Pointer Language (XPointer), the language to be used as the basis for a fragment identifier for any URI reference that locates a resource whose Internet media type is one of `text/xml`, `application/xml`, `text/xml-external-parsed-entity`, or `application/xml-external-parsed-entity`.

XPointer, which is based on the XML Path Language (XPath), supports addressing into the internal structures of XML documents. It allows for examination of a hierarchical document structure and choice of its internal parts based on various properties, such as element types, attribute values, character content, and relative position.

[Download](#) [Print](#) [Search](#)



## XLINK

<https://www.w3.org/TR/xlink/>

← → C 🔒 w3.org/TR/xlink/

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

W3C Recommendation



# XML Linking Language (XLink) Version 1.1

W3C Recommendation 06 May 2010

**This version:**

<http://www.w3.org/TR/2010/REC-xlink11-20100506/>

**Latest version:**

<http://www.w3.org/TR/xlink11/>

**Previous versions:**

<http://www.w3.org/TR/2010/PR-xlink11-20100225/> <http://www.w3.org/TR/2008/WD-xlink11-20080331/>

**Editors:**

Steve DeRose, Brown University Scholarly Technology Group

Eve Maler, Sun Microsystems

David Orchard, Jamcracker

Norman Walsh, Mark Logic Corporation - Version 1.1

Please refer to the [errata](#) for this document, which may include normative corrections.

See also [translations](#).

This document is also available in these non-normative formats: [XML](#).

[Copyright](#) © 2010 W3C® ([MIT](#), [ERCIM](#), [Keio](#)). All Rights Reserved. W3C [liability](#), [trademark](#) and [document use](#) rules apply.



## XLINK

[https://www.w3schools.com/xml/xml\\_xlink.asp](https://www.w3schools.com/xml/xml_xlink.asp)

### XLink Example

The following XML document contains XLink features:

```
<?xml version="1.0" encoding="UTF-8"?>

<bookstore xmlns:xlink="http://www.w3.org/1999/xlink">

    <book title="Harry Potter">
        <description
            xlink:type="simple"
            xlink:href="/images/HPotter.gif"
            xlink:show="new">
            As his fifth year at Hogwarts School of Witchcraft and
            Wizardry approaches, 15-year-old Harry Potter is.....
        </description>
    </book>

    <book title="XQuery Kick Start">
        <description
            xlink:type="simple"
            xlink:href="/images/XQuery.gif"
            xlink:show="new">
            XQuery Kick Start delivers a concise introduction
            to the XQuery standard.....
        </description>
    </book>

</bookstore>
```



## XQUERY

<https://www.w3.org/XML/Query/>



Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)



*The un-queried life is not worth living.*  
— Socrates (*Plato, The Apology*, 3)

## W3C XML Query (XQuery)

[High level Overview](#) [Architects & Analysts](#) [For Users](#) [For Implementers](#) [What's New](#) [References](#)

# 30,000 Foot VIEW

## XQuery: 30,000 foot view (CIO, CTO, Journalist)

XQuery is a standardized language for combining documents, databases, Web pages and almost anything else. It is very widely implemented. It is powerful and easy to learn.

XQuery is replacing proprietary middleware languages and Web Application development languages. XQuery is replacing complex Java or C++ programs with a few lines of code. XQuery is simpler to work with and easier to maintain than many other alternatives.

Do more with less.

## Contents

- News
- XQuery for the Systems Analyst or Architect
- Getting Started With XQuery; Using XQuery; FAQ
- Resources for Implementers
- Documents and Current Status: Specifications and Working Group Notes



## XPATH

<https://www.w3.org/TR/xpath/>

← → C w3.org/TR/xpath/

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)



Leading the web to its full potential

STANDARDS PARTICIPATE MEMBERSHIP ABOUT W3C

W3C » Standards » All Standards and Drafts

## XPATH COVER PAGE

Date	Type	Title	Description
2017-03-21	Recommendation	<a href="#">XML Path Language (XPath) 3.1</a>	XPath is an expression language that allows the processing of values conforming to the data model defined in the XQuery and Xpath Model.
2014-04-08	Recommendation	<a href="#">XML Path Language (XPath) 3.0</a>	XPath 3.0 (renamed from XPath 2.1 to align with the family of "3.0" specifications) is an expression language that allows the process values conforming to the data model defined in [XQuery and XPath Data Model (XDM) 3.0]. Some of the important new features sinc XPath 2.0 are: Literal function items, inline functions, dynamic function invocations, and function item coercion Clarification of rules associated with sequence type matching let expressions QNames (QNames with a namespace URI instead of a namespace prefix) Support for union types in casting and function arguments
2010-12-14	Recommendation	<a href="#">XML Path Language (XPath) 2.0 (Second Edition)</a>	XPath is a way to refer to parts of an XML document. XPath 2.0 is based on the XQuery 1.0 and XPath 2.0 Data Model (XDM), and a introduces Schema awareness and data typing.
1999-11-16	Recommendation	<a href="#">XML Path Language (XPath) Version 1.0</a>	XPath is a language for addressing parts of an XML document, designed to be used by both XSLT and XPointer.

## XPATH

← → C 🔍 w3schools.com/xml/xpath\_intro.asp

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)



HTML

CSS

JAVASCRIPT

SQL

PYTHON

PHP

BOOTSTRAP

MORE ▾

REFERENCES ▾

CERT

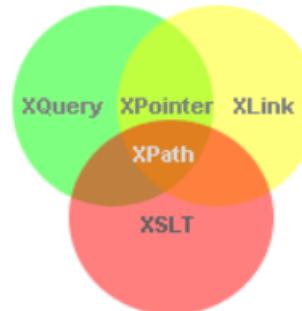
### XML DOM

- DOM Introduction
- DOM Nodes
- DOM Accessing
- DOM Node Info
- DOM Node List
- DOM Traversing
- DOM Navigating
- DOM Get Values
- DOM Change Nodes
- DOM Remove Nodes
- DOM Replace Nodes
- DOM Create Nodes
- DOM Add Nodes
- DOM Clone Nodes

## What is XPath?

XPath is a major element in the XSLT standard.

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



- XPath stands for XML Path Language
- XPath uses "path like" syntax to identify and navigate nodes in an XML document
- XPath contains over 200 built-in functions
- XPath is a major element in the XSLT standard
- XPath is a W3C recommendation

## XPATH

<https://www.tutorialspoint.com/xpath/index.htm>

The screenshot shows the homepage of the tutorialspoint.com/xpath/index.htm website. The top navigation bar includes links for Home, Jobs, Tools, Coding Ground, Current Affairs, UPSC Notes, Online Tutors, Whiteboard, Net Meeting, Tutorix, Login, and Packages. The main content area features a large banner with the text "LEARN XPATH" and "simply easy learning". Below the banner, there is a "XPath Tutorial" section with a list of topics: XPath - Home, XPath - Overview, XPath - Expression, XPath - Nodes, XPath - Absolute Path, XPath - Relative Path, XPath - Axes, XPath - Operators, and XPath - Wildcard. At the bottom of the page, there is a section titled "Audience" with the text: "This tutorials has been designed for beginners to help them understand the basic concepts related".



## XPATH

[https://www.tutorialspoint.com/xpath/xpath\\_quick\\_guide.htm](https://www.tutorialspoint.com/xpath/xpath_quick_guide.htm)

- → C [tutorialspoint.com/xpath/xpath\\_quick\\_guide.htm](https://www.tutorialspoint.com/xpath/xpath_quick_guide.htm)

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

**LEARN XPATH**  
query language for xml

**XPath Tutorial**

- XPath - Home
- XPath - Overview
- XPath - Expression
- XPath - Nodes
- XPath - Absolute Path
- XPath - Relative Path
- XPath - Axes
- XPath - Operators
- XPath - Wildcard
- XPath - Predicate

**XPath Useful Resources**

- XPath - Quick Guide
- XPath - Useful Resources
- XPath - Discussion

**Selected Reading**

- UPSC IAS Exams Notes
- Developer's Best Practices
- Questions and Answers
- Effective Resume Writing
- HR Interview Questions
- Computer Glossary
- Who is Who

## XPath - Overview

Before learning XPath, we should first understand XSL which stands for Extensible Stylesheet Language. It is similar to XML as CSS is to HTML.

### Need for XSL

In case of HTML documents, tags are predefined such as table, div, span, etc. The browser knows how to add style to them and display them using CSS styles. But in case of XML documents, tags are not predefined. In order to understand and style an XML document, World Wide Web Consortium (W3C) developed XSL which can act as an XML-based Stylesheet Language. An XSL document specifies how a browser should render an XML document.

Following are the main parts of XSL –

- XSLT – used to transform XML documents into various other types of document.
- XPath – used to navigate XML documents.
- XSL-FO – used to format XML documents.

### What is XPath?

XPath is an official recommendation of the World Wide Web Consortium (W3C). It defines a language to find information in an XML file. It is used to traverse elements and attributes of an XML document. XPath provides various types of expressions which can be used to enquire relevant information from the XML document.

- **Structure Definitions** – XPath defines the parts of an XML document like element, attribute, text, namespace, processing-instruction, comment, and document nodes
- **Path Expressions** – XPath provides powerful path expressions select nodes or list of nodes in XML documents.
- **Standard Functions** – XPath provides a rich library of standard functions for manipulation of string values, numeric values, date and time comparison, node and QName manipulation, sequence manipulation, Boolean values etc.
- **Major part of XSLT** – XPath is one of the major elements in XSLT standard and is must have knowledge in order to work with XSLT documents.
- **W3C recommendation** – XPath is an official recommendation of World Wide Web Consortium (W3C).

## XPATH – TUTORIAIS:

- **O que é o XPATH:** <https://www.javatpoint.com/xpath-interview-questions>
- **Tutorial 1:** [http://www.macoratti.net/vb\\_xpath.htm](http://www.macoratti.net/vb_xpath.htm)
- **Tutoria 2:** [https://www.tutorialspoint.com/xpath/xpath\\_expression.htm](https://www.tutorialspoint.com/xpath/xpath_expression.htm)
- **Tutorial 3:** <https://www.softwaretestinghelp.com/xml-path-language-xpath-tutorial/>
- **Intro to XPath with Java:** <https://www.baeldung.com/java-xpath>
- **Java XPath Parser - Parse XML Document:** [https://www.tutorialspoint.com/java\\_xml/java\\_xpath\\_parse\\_document.htm](https://www.tutorialspoint.com/java_xml/java_xpath_parse_document.htm)
- **EXECUTAR O TUTORIAL: Java XPath Example – XPath Tutorial:** <https://howtodoinjava.com/java/xml/java-xpath-tutorial-example/>



## XPATH – TUTORIAIS:

<https://librarycarpentry.org/lc-webscraping/02-xpath/index.html>

librarycarpentry.org/lc-webscraping/02-xpath/index.html

Library Carpentry Home Code of Conduct Setup Episodes Extras License Improve this page Search...

Introduction to web scraping

## Selecting content on a web page with XPath

**Overview**

**Teaching:** 30 min    **Exercises:** 15 min

**Questions**

- How can I select a specific element on web page?
- What is XPath and how can I use it?

**Objectives**

- Introduce XPath queries
- Explain the structure of an XML or HTML document
- Explain how to view the underlying HTML content of a web page in a browser
- Explain how to run XPath queries in a browser
- Introduce the XPath syntax
- Use the XPath syntax to select elements on this web page

Before we delve into web scraping proper, we will first spend some time introducing some of the techniques that are required to indicate exactly what should be extracted from the web pages we aim to scrape.

The material in this section was adapted from the [XPath and XQuery Tutorial](#) written by Kim Pham (@tolloid) for the July 2016 Library Carpentry workshop in Toronto.

## Introduction

XPath (which stands for XML Path Language) is an *expression language* used to specify parts of an XML document. XPath is rarely used on its own, rather it is used within software and languages that are aimed at manipulating XML documents, such as XSLT, XQuery or the web scraping tools that will be introduced later in this lesson. XPath can also be used in documents with a structure that is similar to XML, like HTML.

## Markup Languages

XML and HTML are *markup languages*. This means that they use a set of tags or rules to organise and provide information about the data they contain. This structure helps to automate processing, editing, formatting, displaying, printing, etc. that information.

## XPATH – TUTORIAIS:

<https://librarycarpentry.org/lc-webscraping/02-xpath/index.html>

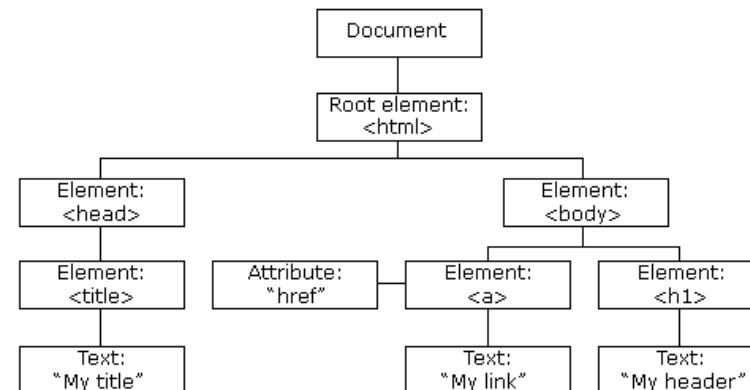
librarycarpentry.org/lc-webscraping/02-xpath/index.html

**XPath always assumes structured data.**

Now let's start using XPath.

## Navigating through the HTML node tree using XPath

A popular way to represent the structure of an XML or HTML document is the *node tree*:

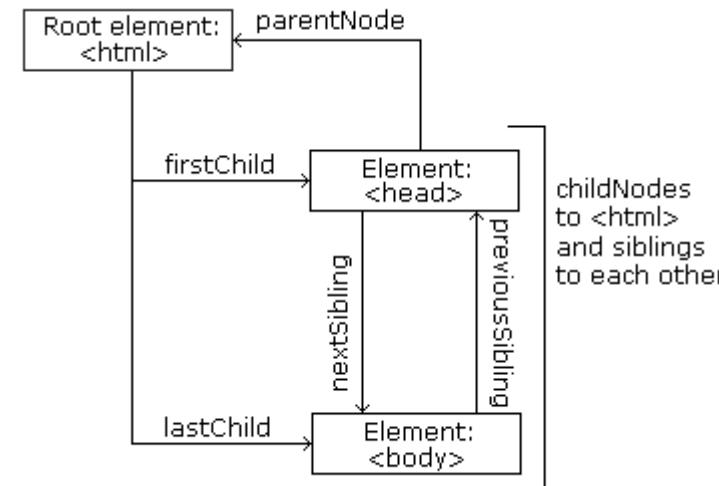


In an HTML document, everything is a node:

- The entire document is a document node
- Every HTML element is an element node
- The text inside HTML elements are text nodes

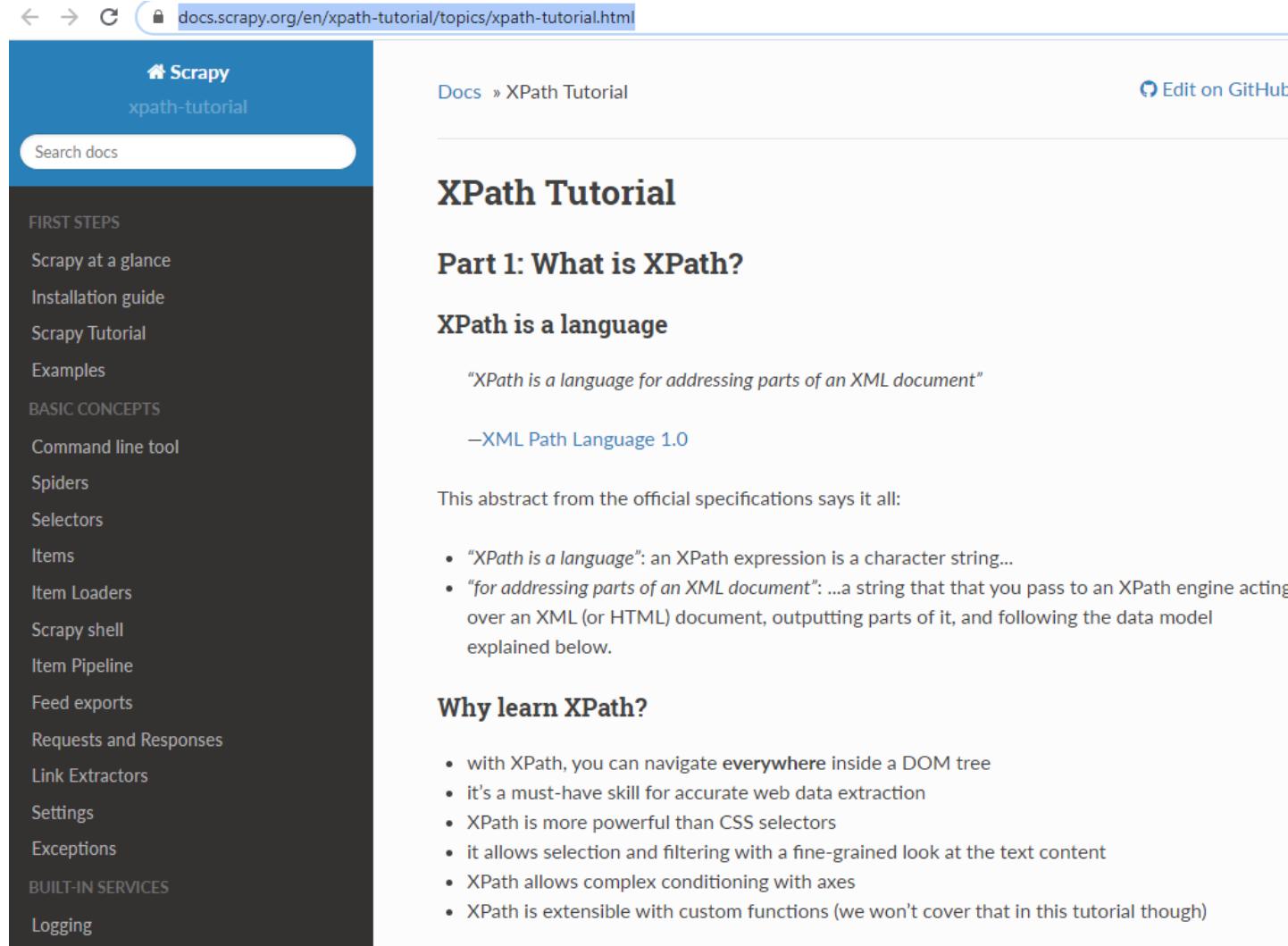
The nodes in such a tree have a hierarchical relationship to each other. We use the terms *parent*, *child* and *sibling* to describe these relationships:

- In a node tree, the top node is called the root (or *root node*)
- Every node has exactly one *parent*, except the root (which has no parent)
- A node can have zero, one or several *children*
- *Siblings* are nodes with the same parent
- The sequence of connections from node to node is called a *path*



## XPATH – TUTORIAIS:

<https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html>



The screenshot shows a web browser displaying the Scrapy XPath Tutorial. The URL in the address bar is [docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html](https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html). The page title is "XPath Tutorial". On the left, there is a sidebar with a dark background containing a navigation menu for the Scrapy documentation. The menu includes sections like "FIRST STEPS", "BASIC CONCEPTS", and "BUILT-IN SERVICES", each with several sub-links. The main content area on the right starts with a section titled "Part 1: What is XPath?". It contains a heading "XPath is a language" and a quote: "XPath is a language for addressing parts of an XML document". Below this, it says "—XML Path Language 1.0". A note states: "This abstract from the official specifications says it all:". A bulleted list follows, explaining what XPath is and how it works. Further down, another section is titled "Why learn XPath?", with a bulleted list of reasons why learning XPath is beneficial.

Scrapy

xpath-tutorial

Docs » XPath Tutorial

Edit on GitHub

## XPath Tutorial

### Part 1: What is XPath?

#### XPath is a language

"XPath is a language for addressing parts of an XML document"

—XML Path Language 1.0

This abstract from the official specifications says it all:

- "XPath is a language": an XPath expression is a character string...
- "for addressing parts of an XML document": ...a string that you pass to an XPath engine acting over an XML (or HTML) document, outputting parts of it, and following the data model explained below.

#### Why learn XPath?

- with XPath, you can navigate everywhere inside a DOM tree
- it's a must-have skill for accurate web data extraction
- XPath is more powerful than CSS selectors
- it allows selection and filtering with a fine-grained look at the text content
- XPath allows complex conditioning with axes
- XPath is extensible with custom functions (we won't cover that in this tutorial though)



## XPATH – TUTORIAIS:

<https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html>

The screenshot shows a web browser displaying the Scrapy documentation page for XPath tutorials. The URL in the address bar is <https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html>. The page content is as follows:

Sending e-mail  
Telnet Console  
Web Service  
SOLVING SPECIFIC PROBLEMS  
Frequently Asked Questions  
Debugging Spiders  
Spiders Contracts  
Common Practices  
Broad Crawls  
Using Firefox for scraping  
Using Firebug for scraping  
Debugging memory leaks  
Downloading and processing files and images  
Deploying Spiders  
AutoThrottle extension  
Benchmarking  
Jobs: pausing and resuming crawls

XPath Tutorial

- Part 1: What is XPath?
- Part 2: Location Paths: how to move inside the document tree
- Part 3: Use-cases for web scraping
- Summary of tips

EXTENDING SCRAPY

Architecture overview

Read the Docs

## XPath return types

When applied over a document, an XPath expression can return either:

- a node-set – this is the most common case, and often it's a set of element nodes
- a string
- a number (floating point)
- a boolean

**Note**

When an XPath expression returns a node-set, you do get a set of nodes, even if there's only one node in the set. With `parsel`, you get a `list` of nodes though, not a Python `set`.

## XPath expressions

We will now take a look at some example XPath expressions to get a feeling of how they work. We'll explain the syntax in more details later on.

XPath expressions are passed to an XPath engine as strings.

### Selecting the root node of a document (warning: special case)

The root node is a special node: this is a quote from XPath 1.0 specs:

*"The root node is the root of the tree. A root node does not occur except as the root of the tree. The element node for the document element is a child of the root node."*

Selecting the root node of a document with XPath is one of the shortest XPath expressions: `"/"` (a



## XPATH – TUTORIAIS:

<https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html>

The screenshot shows a user interface for learning XPATH. It consists of three main sections: 'HTML Input', 'XPath Expression', and 'Result'.

**HTML Input:**  
<html>  
  <head>  
    <title>This is a title</title>  
    <meta content="text/html; charset=utf-8" http-equiv="content-type" />  
  </head>  
  <body>  
    <div>  
      <div>  
        <p>This is a paragraph.</p>  
        <p>Is this <a href="page2.html">a link</a>?</p>  
        <br />  
      </div>  
    </div>  
  </body>  
</html>

**XPath Expression:**  
/\*

**Result:**  
<html>  
  <head>  
    <title>This is a title</title>  
    <meta content="text/html; charset=utf-8" http-equiv="content-type"/>  
  </head>  
  <body>  
    <div>  
      <div>  
        <p>This is a paragraph.</p>  
        <p>Is this <a href="page2.html">a link</a>?</p>  
        <br />  
        Apparently.  
      </div>  
      <div class="second">  
        Nothing to add.  
        Except maybe this <a href="page3.html">other link</a>.<!-- And this comment --&gt;<br/>      </div>  
    </div>  
  </body>  
</html>

## XPATH – TUTORIAIS:

<https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html>

Another example: how to get `<title>` elements? Use `/html/head/title`:

HTML Input

```
<html>
<head>
  <title>This is a title</title>
  <meta content="text/html; charset=utf-8" http-equiv="content-type" />
</head>
<body>
  <div>
    <div>
      <p>This is a paragraph.</p>
      <p>Is this <a href="page2.html">a link</a>?</p>
      <br />
    </div>
  </div>
</body>
```

XPath Expression

```
/html/head/title
```

Result

```
<title>This is a title</title>
```

Again, if you are familiar with the Unix filesystem, you probably intuitively understand what this does:

- start from the root (of the document)
  - select the `<html>` node (with `/html`)
    - select the `<head>` node under the `<html>` node (appending `/head`)
      - select the `<title>` node under the `<head>` node (appending `/title`)

HTML Input

```
<html>
<head>
  <title>This is a title</title>
  <meta content="text/html; charset=utf-8" http-equiv="content-type" />
</head>
<body>
  <div>
    <div>
      <p>This is a paragraph.</p>
      <p>Is this <a href="page2.html">a link</a>?</p>
      <br />
    </div>
  </div>
</body>
```

XPath Expression

```
/html/body/div/div[1]/p
```

Result

```
<p>This is a paragraph.</p>

<p>Is this <a href="page2.html">a link</a>?</p>
```



## XPATH – TUTORIAIS:

<https://docs.scrapy.org/en/xpath-tutorial/topics/xpath-tutorial.html>

HTML Input

```
<html>
<head>
  <title>This is a title</title>
  <meta content="text/html; charset=utf-8" http-equiv="content-type" />
</head>
<body>
  <div>
    <p>This is a paragraph.</p>
    <p>Is this <a href="page2.html">a link</a>?</p>
    <br />
  </div>
</body>
</html>
```

XPath Expression

```
//body//text()
```

Result

This is a paragraph.

Is this

a link

?

HTML Input

```
<html>
<head>
  <title>This is a title</title>
  <meta content="text/html; charset=utf-8" http-equiv="content-type" />
</head>
<body>
  <div>
    <div>
      <p>This is a paragraph.</p>
      <p>Is this <a href="page2.html">a link</a>?</p>
      <br />
    </div>
  </body>
</html>
```

XPath Expression

```
//a/@href
```

Result

page2.html

page3.html



## XPATH – TUTORIAIS:

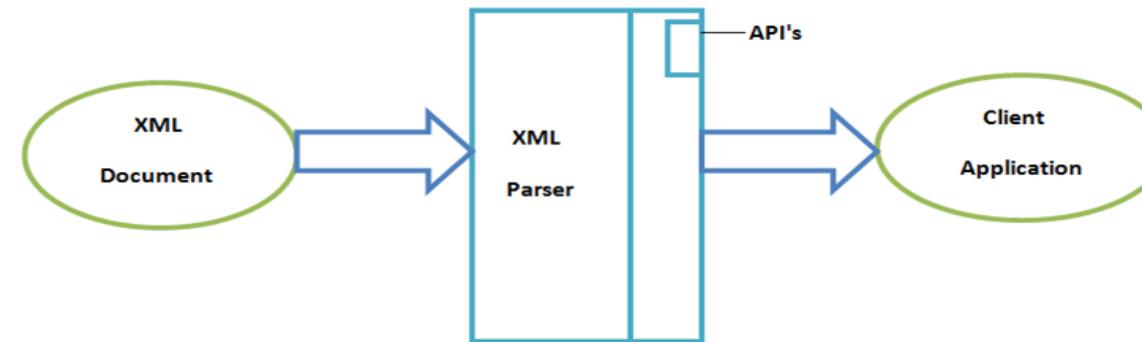
- Java XPath Parser - Parse XML Document: [https://www.tutorialspoint.com/java\\_xml/java\\_xpath\\_parse\\_document.htm](https://www.tutorialspoint.com/java_xml/java_xpath_parse_document.htm)
- EXECUTAR O TUTORIAL: Java XPath Example – XPath Tutorial: <https://howtodoinjava.com/java/xml/java-xpath-tutorial-example/>

## Java Parser – TUTORIAIS:

### ■ XML Parsing

A *parser* is a piece of program that takes a physical representation of some data and converts it into an in-memory form for the program as a whole to use. Parsers are used everywhere in software. An *XML Parser* is a parser that is designed to read XML and create a way for programs to use XML. There are different types, and each has its advantages. Unless a program simply and blindly copies the whole XML file as a unit, every program must implement or call on an XML parser.

The main types of parsers are known by some funny names: [SAX](#), [DOM](#) and [pull](#). For each type, there are some excellent implementations freely available for a variety of languages, including [Java](#), C++, C#, VB# (in fact, any .Net language), PHP, Perl, Python, Ruby and so on.



Fonte: <http://www.stylusstudio.com/xml/parser.html>



## XPATH – TUTORIAIS:

- EXECUTAR O TUTORIAL: Java XPath Example – XPath Tutorial: <https://howtodoinjava.com/java/xml/java-xpath-tutorial-example/>

information from XML file or document. This information can be XML nodes or XML attributes or even comments as well.

### Table of Contents

1. What is XPath?
2. XPath Data Model
3. XPath Data Types
4. XPath Syntax
5. XPath Expressions
6. Recommended reading

We will use this XML in running various XPath examples in this tutorial.

### inventory.xml

```
<?xml version="1.0" encoding="utf-8" ?>
<inventory>
    <!--Test is test comment-->
    <book year="2000">
        <title>Snow Crash</title>
        <author>Neal Stephenson</author>
        <publisher>Spectra</publisher>
        <isbn>0553380958</isbn>
        <price>14.95</price>
    </book>
    <book year="2005">
        <title>Burning Tower</title>
        <author>Larry Niven</author>
        <author>Jerry Pournelle</author>
        <publisher>Pocket</publisher>
        <isbn>0743416910</isbn>
        <price>5.99</price>
    </book>
    <book year="1995">
        <title>Zodiac</title>
        <author>Neal Stephenson</author>
        <publisher>Spectra</publisher>
        <isbn>0553573862</isbn>
        <price>7.50</price>
    </book>
</inventory>
```

### inventory.xml

```
<?xml version="1.0" encoding="utf-8" ?>
<inventory>
    <!--Test is test comment-->
    <book year="2000">
        <title>Snow Crash</title>
        <author>Neal Stephenson</author>
        <publisher>Spectra</publisher>
        <isbn>0553380958</isbn>
        <price>14.95</price>
    </book>
    <book year="2005">
        <title>Burning Tower</title>
        <author>Larry Niven</author>
        <author>Jerry Pournelle</author>
        <publisher>Pocket</publisher>
        <isbn>0743416910</isbn>
        <price>5.99</price>
    </book>
    <book year="1995">
        <title>Zodiac</title>
        <author>Neal Stephenson</author>
        <publisher>Spectra</publisher>
        <isbn>0553573862</isbn>
        <price>7.50</price>
    </book>
</inventory>
```



## XPATH – TUTORIAIS:

- EXECUTAR O TUTORIAL: Java XPath Example – XPath Tutorial: <https://howtodoinjava.com/java/xml/java-xpath-tutorial-example/>

inventory.xml

```
<?xml version="1.0" encoding="utf-8" ?>
<inventory>
    <!--Test is test comment-->
    <book year="2000">
        <title>Snow Crash</title>
        <author>Neal Stephenson</author>
        <publisher>Spectra</publisher>
        <isbn>0553380958</isbn>
        <price>14.95</price>
    </book>
    <book year="2005">
        <title>Burning Tower</title>
        <author>Larry Niven</author>
        <author>Jerry Pournelle</author>
        <publisher>Pocket</publisher>
        <isbn>0743416910</isbn>
        <price>5.99</price>
    </book>
    <book year="1995">
        <title>Zodiac</title>
        <author>Neal Stephenson</author>
        <publisher>Spectra</publisher>
        <isbn>0553573862</isbn>
        <price>7.50</price>
    </book>
</inventory>
```

```
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.xpath.XPath;
import javax.xml.xpath.XPathConstants;
import javax.xml.xpath.XPathExpression;
import javax.xml.xpath.XPathFactory;

import org.w3c.dom.Document;
import org.w3c.dom.NodeList;

public class XPathTest
{
    public static void main(String[] args) throws Exception
    {
        //Build DOM

        DocumentBuilderFactory factory = DocumentBuilderFactory.newInstance();
        factory.setNamespaceAware(true); // never forget this!
        DocumentBuilder builder = factory.newDocumentBuilder();
        Document doc = builder.parse("inventory.xml");

        //Create XPath

        XPathFactory xpathfactory = XPathFactory.newInstance();
        XPath xpath = xpathfactory.newXPath();

        System.out.println("//1) Get book titles written after 2001");

        // 1) Get book titles written after 2001
        XPathExpression expr = xpath.compile("//book[@year>2001]/title/text()");
        Object result = expr.evaluate(doc, XPathConstants.NODESET);
        NodeList nodes = (NodeList) result;
        for (int i = 0; i < nodes.getLength(); i++) {
            System.out.println(nodes.item(i).getNodeValue());
        }

        System.out.println("//2) Get book titles written before 2001");

        // 2) Get book titles written before 2001
        expr = xpath.compile("//book[@year<2001]/title/text()");
        result = expr.evaluate(doc, XPathConstants.NODESET);
        nodes = (NodeList) result;
        for (int i = 0; i < nodes.getLength(); i++) {
            System.out.println(nodes.item(i).getNodeValue());
        }
    }
}
```



## XPATH – TUTORIAIS:

- EXECUTAR O TUTORIAL: Java XPath Example – XPath Tutorial: <https://howtodoinjava.com/java/xml/java-xpath-tutorial-example/>

OSDisk (C:) > testes

```
C:\testes>java XPathTest
n//1) Get book titles written after 2001
Burning Tower
n//2) Get book titles written before 2001
Snow Crash
Zodiac
n//3) Get book titles cheaper than 8 dollars
Burning Tower
Zodiac
n//4) Get book titles costlier than 8 dollars
Snow Crash
n//5) Get book titles added in first node
Snow Crash
n//6) Get book title added in last node
Zodiac
n//7) Get all writers
Neal Stephenson
Larry Niven
Jerry Pournelle
Neal Stephenson
n//8) Count all books titles
3
n//9) Get book titles with writer name start with Neal
Snow Crash
Zodiac
n//10) Get book titles with writer name containing Niven
Burning Tower
n//11) Get book titles written by Neal Stephenson
Snow Crash
Zodiac
n//12) Get count of book titles written by Neal Stephenson
2
n//13) Reading comment node
Test is test comment

C:\testes>
```

```
C:\testes>java XPathTest
n//1) Get book titles written after 2001
Burning Tower
n//2) Get book titles written before 2001
Snow Crash
Zodiac
n//3) Get book titles cheaper than 8 dollars
Burning Tower
Zodiac
n//4) Get book titles costlier than 8 dollars
Snow Crash
n//5) Get book titles added in first node
Snow Crash
n//6) Get book title added in last node
Zodiac
n//7) Get all writers
Neal Stephenson
Larry Niven
Jerry Pournelle
Neal Stephenson
n//8) Count all books titles
3
n//9) Get book titles with writer name start with Neal
Snow Crash
Zodiac
n//10) Get book titles with writer name containing Niven
Burning Tower
n//11) Get book titles written by Neal Stephenson
Snow Crash
Zodiac
n//12) Get count of book titles written by Neal Stephenson
2
n//13) Reading comment node
Test is test comment

C:\testes>
```



## XPATH – TUTORIAIS:

- Java XPath Parser - Parse XML Document:[https://www.tutorialspoint.com/java\\_xml/java\\_xpath\\_parse\\_document.htm](https://www.tutorialspoint.com/java_xml/java_xpath_parse_document.htm)

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

XPathParserDemo.java

```
package com.tutorialspoint.xml;

import java.io.File;
import java.io.IOException;

import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.ParserConfigurationException;
import javax.xml.xpath.XPath;
import javax.xml.xpath.XPathConstants;
import javax.xml.xpath.XPathExpressionException;
import javax.xml.xpath.XPathFactory;

import org.w3c.dom.Document;
import org.w3c.dom.NodeList;
import org.w3c.dom.Node;
import org.w3c.dom.Element;
import org.xml.sax.SAXException;

public class XPathParserDemo {

    public static void main(String[] args) {
        try {
            File inputFile = new File("input.txt");
            DocumentBuilderFactory dbFactory = DocumentBuilderFactory.newInstance();
            DocumentBuilder dBuilder;

            dBuilder = dbFactory.newDocumentBuilder();

            Document doc = dBuilder.parse(inputFile);
            doc.getDocumentElement().normalize();

            XPath xPath = XPathFactory.newInstance().newXPath();

            String expression = "/class/student";
            NodeList nodeList = (NodeList) xPath.compile(expression).evaluate(
                doc, XPathConstants.NODESET);

            for (int i = 0; i < nodeList.getLength(); i++) {
                Node node = nodeList.item(i);
                System.out.println(((Element) node).getElementsByTagName("firstname").item(0).getTextContent());
            }
        } catch (SAXException | IOException | ParserConfigurationException | XPathExpressionException e) {
            e.printStackTrace();
        }
    }
}
```

input.xml



## XPATH – TUTORIAIS:

- Java XPath Parser - Parse XML Document:[https://www.tutorialspoint.com/java\\_xml/java\\_xpath\\_parse\\_document.htm](https://www.tutorialspoint.com/java_xml/java_xpath_parse_document.htm)

OSDisk (C:) > testes

```
C:\ Linha de comandos
Microsoft Windows [Version 10.0.19041.450]
(c) 2020 Microsoft Corporation. Todos os direitos reservados.

C:\Users\JMR>cd \testes

C:\testes>config.bat

C:\testes>SET PATH=C:\ProgramData\Oracle\Java\javapath;C:\WINDOWS\system32;C:\WINDOWS;C:\WINDOWS\System32\WBem;C:\WINDOWS\System32\WindowsPowerShell\v1.0\;C:\Program Files\dotnet\;C:\ubiquity\docfx\;C:\Program Files (x86)\ATI Technologies\ATI.ACE\Core-Static;C:\WINDOWS\System32\OpenSSH\;C:\Program Files\Intel\WiFi\bin\;C:\Program Files\Common Files\Intel\WirelessCommon\;C:\Program Files\nodejs\;C:\Program Files\Portugal Identity Card\;C:\Users\JMR\AppData\Local\Microsoft\WindowsApps\;C:\Users\JMR\AppData\Local\Programs\Microsoft VS Code\bin;C:\Users\JMR\AppData\Roaming\npm;"c:\Program Files\Java\jdk1.8.0_77\bin";

C:\testes>SET CLASSPATH=C:\Program Files\Portugal Identity Card\;

C:\testes>javac XPathParserDemo.java

C:\testes>
```

```
C:\ Linha de comandos
C:\testes>javac XPathParserDemo.java
C:\testes>java XPathParserDemo

Current Element :student
Student roll no :393
First Name : dinkar
Last Name : kad
Nick Name : dinkar
Marks : 85

Current Element :student
Student roll no :493
First Name : Vaneet
Last Name : Gupta
Nick Name : vinni
Marks : 95

Current Element :student
Student roll no :593
First Name : jasvir
Last Name : singh
Nick Name : jazz
Marks : 90

C:\testes>
```



## XFORMS: Prof. Steven Pemberton

<https://homepages.cwi.nl/~steven/#bio>

← → C <https://homepages.cwi.nl/~steven/#bio>

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)



## Steven Pemberton

### Contents

Contact  
Brief Biography  
News  
Projects: current, web, programming languages, interactive documents  
Publications  
Talks  
Organisations  
Blatant Self Promotion: awards, the press, radio/tv, film  
Other Stuff

### Contact

#### Address

Group [DIS](#)  
[CWI](#)  
Science Park 123  
P.O. Box 94079  
1090 GB [Amsterdam](#)  
The Netherlands  
Email: [Steven.Pemberton \(at\) cwi.nl](mailto:Steven.Pemberton(at)cwi.nl)  
Tel: +31 624 671 668

#### Home Address

Bloemgracht 129  
1016 KL Amsterdam  
The Netherlands  
Home phone: +31 20 6385568

#### Instant messengers

Skype: [stevenpemberton](#)

### Brief Biography

**Now:** I am a researcher, author, public speaker, and occasional broadcaster, based at the [CWI](#), The Dutch National Research Centre for Mathematics and Informatics. My research is broadly in interaction, and how the underlying software architecture can better support users.

**Before:** At university I was tutored by [Richard Grimsdale](#), who built the first transistorised computer, and [was tutored himself by Alan Turing](#). I was a research programmer at the University of Sussex before going to implement [Algol 68](#) for the research computer [MU5](#) at the University of Manchester (where Turing had worked himself); and later was a lecturer in computing at the University of Brighton, and wrote a book on [Pascal Implementation](#).

**Programming languages:** Coming to the CWI, I co-designed the programming language [ABC](#), the forerunner of [Python](#), and co-wrote a book on [ABC](#). I wrote part of [gcc](#).

**Human Computer Interaction:** I was a member of the [SIGCHI](#) Executive Committee for a decade, and editor in chief of the [SIGCHI Bulletin](#), and later [ACM/interactions](#). I chaired the [CHI conference](#) in 1997.

### News

[XForms Hands-On](#): A new, online, hands-on tutorial, leading you through XForms, with exercises you have to do yourself.

[Declarative Amsterdam: A Symposium](#): Was held on Thursday/Friday 8/9 October, a tutorial day and symposium celebrating

## XFORMS: Prof. Steven Pemberton

<https://homepages.cwi.nl/~steven/#bio>

← → C 🔒 homepages.cwi.nl/~steven/#bio

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

**daugmier: Great work!**  
"Love the elaboration of numbers as a concept. ❤️" "So pleasant to read, very accessible!" "It's great!"

**Onze maatschappij is nog niet klaar voor AI:** Interview with me (in Dutch) in AGConnect. (Alas registration required to read it all).

**"A back-end engineer gets overly excited about stack machines..." and other talks...:** an interview with me and two other speakers at Bristech.

**Inspiring Web Pioneer Steven Pemberton:** an interview.

A series of articles on XForms I am writing, published at XML.com.  
"Even as someone who's not a developer, I've found [these] quite approachable."

 **An Introduction to XForms:** An overview and a simple example. "[Fabulous](#)"  
**Viewing Data with XForms:** Displaying and searching data.  
**A Calendar in XForms:** Dynamic data. "[Cool!](#)" "[Very nice!](#)" "[Really very neat!](#)" "[XForms awesomeness](#)"  
**A Clock in XForms:** XForms plus SVG. "[Great tutorial, and very cool example!](#)"  
**A Game in XForms:** Interaction.  
**A News Carousel in XForms:** Displaying alternating information.  
**NoPHP: A Conference Website in XForms:** Managing and updating live information.  
"[Another great step-by-step demo showing how easy it is to do things in XForms.](#)"

**Want to learn XForms?** See [XForms: An Introduction](#).

**Lit Lace:** A colleague and I have worked on a project to design and implement interfaces to self-illuminating fabrics. It is featured in Dutch Design Week this year.

**Invisible XML Specification:** a draft is available. Comments gladly received.

Upcoming and recent talks:

**Invited Talk: Declarative Programming at 79th meeting of IFIP WG 2.1, Otterlo, NL, 6-10 January 2020.**

**Invited Talk: The Internet of Things and the Coming Robot Rebellion at Freelance Friday, Pakhuis de Zwijger Amsterdam, NL, 10 January 2020.** "[Really great talk](#)" "[even intrigerend als verontrustend](#)" "[inspirational and mind twisting](#)" "[super interessant verhaal dat je dwingt tot kijken vanuit verschillende perspectieven](#)"

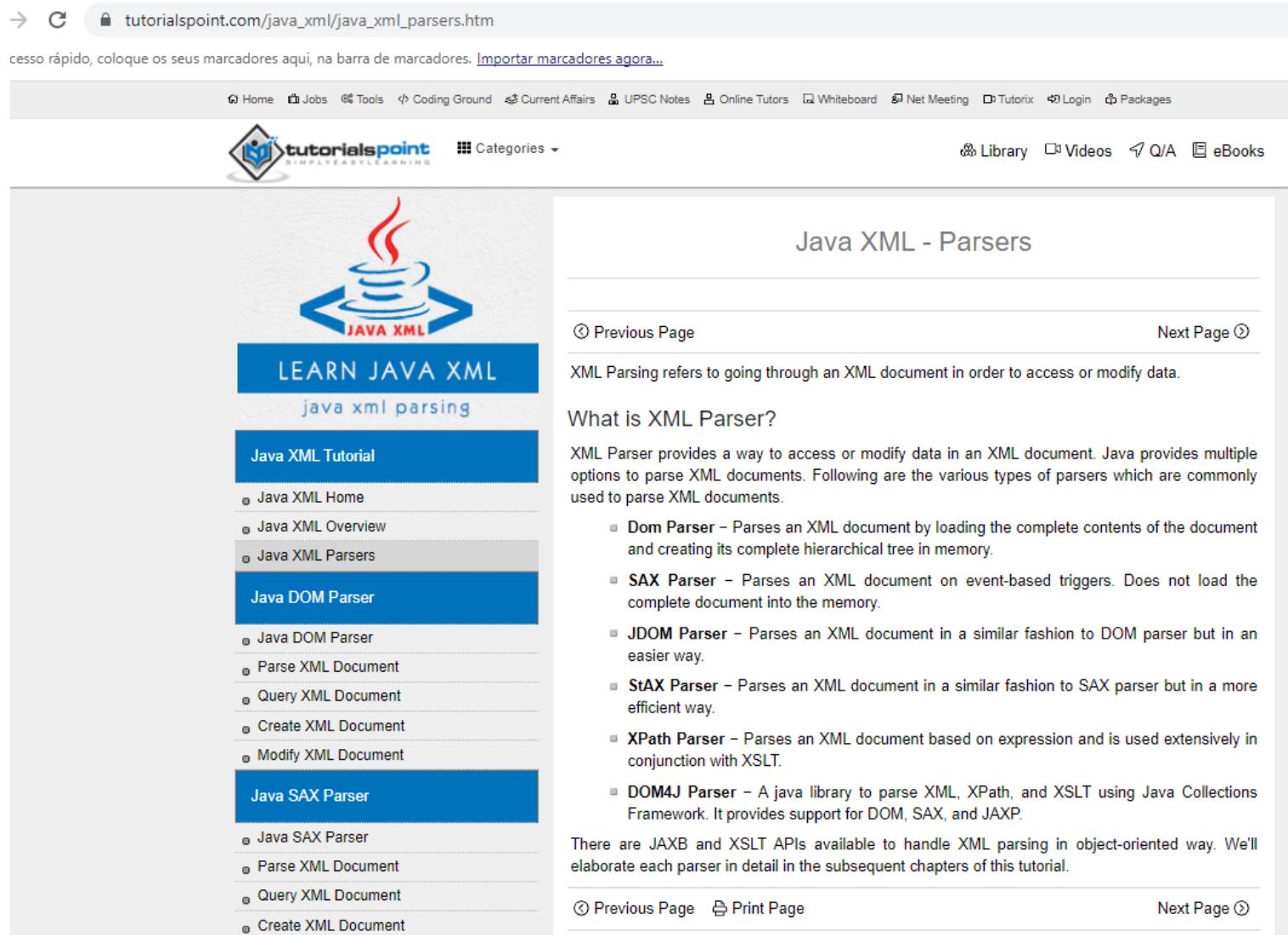
**Tutorial: Declarative Applications with XForms at XML Prague, Prague, Czechia, 14-15 February.** "[really interesting](#)" "[It is not often that someone who is technically proficient in his field is also a good speaker](#)"

<https://www.xml.com/articles/2010/02/02/reviewing-data-xforms/>

## XML PARSING

### Em JAVA

[https://www.tutorialspoint.com/java\\_xml/java\\_xml\\_parsers.htm](https://www.tutorialspoint.com/java_xml/java_xml_parsers.htm)



The screenshot shows a web browser displaying the tutorialspoint.com website. The URL in the address bar is [https://www.tutorialspoint.com/java\\_xml/java\\_xml\\_parsers.htm](https://www.tutorialspoint.com/java_xml/java_xml_parsers.htm). The page title is "Java XML - Parsers". The left sidebar has a "LEARN JAVA XML" section with "java xml parsing" and a "Java XML Tutorial" section containing links for Java XML Home, Java XML Overview, Java XML Parsers (which is highlighted), Java DOM Parser, Java SAX Parser, Parse XML Document, Query XML Document, Create XML Document, and Modify XML Document. The main content area starts with a heading "What is XML Parser?" followed by a paragraph about XML Parser and a list of various types of parsers: Dom Parser, SAX Parser, JDOM Parser, StAX Parser, XPath Parser, and DOM4J Parser. There are also links for "Previous Page", "Print Page", and "Next Page".



## XML PARSING

<https://www.php.net/xml>

The screenshot shows a web browser displaying the PHP Manual's XML Manipulation section. The URL in the address bar is <https://www.php.net/xml>. The page title is "The PHP Online Conference 2021". The main navigation menu includes "php", "Downloads", "Documentation" (which is highlighted), "Get Involved", and "Help". Below the menu, the breadcrumb navigation shows "PHP Manual > Function Reference > XML Manipulation". On the right side, there are links to "Change language: English", "Edit", and "Report a Bug". The main content area is titled "XML Parser" and contains a bulleted list of topics:

- [Introduction](#)
- [Installing/Configuring](#)
  - [Requirements](#)
  - [Installation](#)
  - [Runtime Configuration](#)
  - [Resource Types](#)
- [Predefined Constants](#)
- [Event Handlers](#)
- [Case Folding](#)
- [Error Codes](#)
- [Character Encoding](#)
- [Examples](#)
  - [XML Element Structure Example](#)
  - [XML Tag Mapping Example](#)
  - [XML External Entity Example](#)



## XML PARSING - JavaScript

[https://www.w3schools.com/xml/xml\\_parser.asp](https://www.w3schools.com/xml/xml_parser.asp)

The screenshot shows a web browser displaying the URL [https://www.w3schools.com/xml/xml\\_parser.asp](https://www.w3schools.com/xml/xml_parser.asp). The page title is "XML PARSING - JavaScript". The navigation bar includes links for Home, HTML, CSS, JAVASCRIPT (which is selected), SQL, PYTHON, PHP, BOOTSTRAP, HOW TO, W3.CSS, JQUERY, JAVA, MORE, and REF. A sub-navigation menu on the left under "XML Tutorial" lists various XML-related topics, with "XML Parser" highlighted in green. The main content area is titled "Example" and contains the following JavaScript code:

```
<html>
<body>

<p id="demo"></p>

<script>
var text, parser, xmlDoc;

text = "<bookstore><book>" +
"<title>Everyday Italian</title>" +
"<author>Giada De Laurentiis</author>" +
"<year>2005</year>" +
"</book></bookstore>";

parser = new DOMParser();
xmlDoc = parser.parseFromString(text,"text/xml");

document.getElementById("demo").innerHTML =
xmlDoc.getElementsByTagName("title")[0].childNodes[0].nodeValue;
</script>

</body>
</html>
```

At the bottom of the code block is a green button labeled "Try it Yourself »".



## XML PARSING

<https://www.geeksforgeeks.org/xml-parsing-python/>

### Em Python

The screenshot shows a web browser displaying the GeeksforGeeks article on XML parsing in Python. The URL in the address bar is [geeksforgeeks.org/xml-parsing-python/](https://www.geeksforgeeks.org/xml-parsing-python/). The page title is "XML parsing in Python". The main content discusses XML and RSS feeds, and includes a bulleted list of pros for RSS. Below the content, there's a section on Python modules for XML processing.

Para acesso rápido, coloque os seus marcadores aqui, na barra de marcadores. [Importar marcadores agora...](#)

Tutorials Student Courses Hire With Us

GeeksforGeeks

Reading and Writing XML Files in Python

**XML parsing in Python**

Last Updated: 16-07-2020

This article focuses on how one can parse a given XML file and extract some useful data out of it in a structured way.

**XML:** XML stands for eXtensible Markup Language. It was designed to store and transport data. It was designed to be both human- and machine-readable. That's why, the design goals of XML emphasize simplicity, generality, and usability across the Internet.

The XML file to be parsed in this tutorial is actually a RSS feed.

**RSS:** RSS(Rich Site Summary, often called Really Simple Syndication) uses a family of standard web feed formats to publish frequently updated information like blog entries, news headlines, audio, video. RSS is XML formatted plain text.

- The RSS format itself is relatively easy to read both by automated processes and by humans alike.
- The RSS processed in this tutorial is the RSS feed of top news stories from a popular news website. You can check it out [here](#). Our goal is to process this RSS feed (or XML file) and save it in some other format for future use.

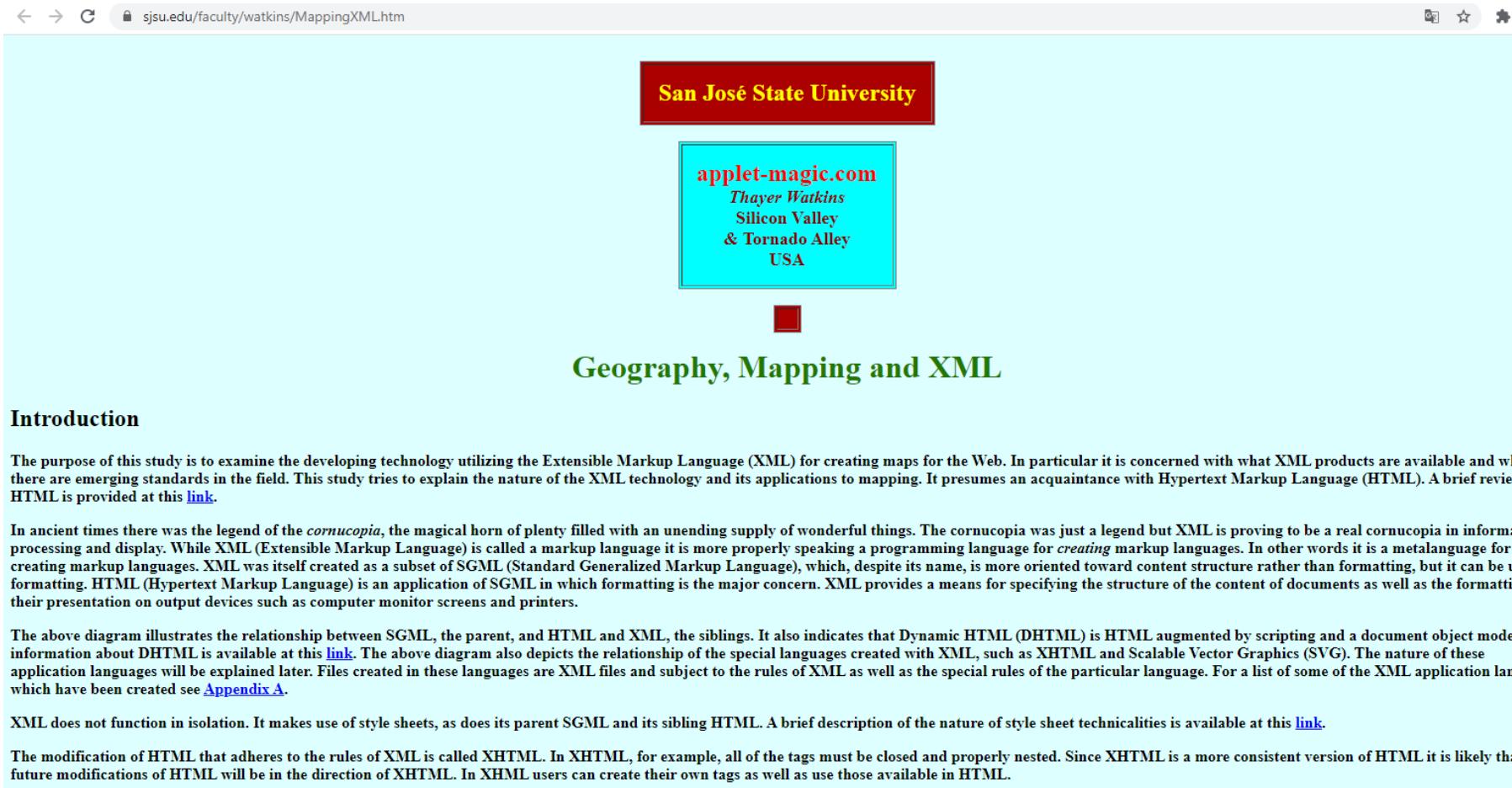
**Python Module used:** This article will focus on using inbuilt `xml` module in python for parsing XML and the main focus will be on the `ElementTree XML API` of this module.

**Implementation:**

Python | Get a list as input from user

## XML Files for Geographic Information

<https://www.sjsu.edu/faculty/watkins/MappingXML.htm>



The purpose of this study is to examine the developing technology utilizing the Extensible Markup Language (XML) for creating maps for the Web. In particular it is concerned with what XML products are available and whether there are emerging standards in the field. This study tries to explain the nature of the XML technology and its applications to mapping. It presumes an acquaintance with Hypertext Markup Language (HTML). A brief review of HTML is provided at this [link](#).

In ancient times there was the legend of the *cornucopia*, the magical horn of plenty filled with an unending supply of wonderful things. The cornucopia was just a legend but XML is proving to be a real cornucopia in information processing and display. While XML (Extensible Markup Language) is called a markup language it is more properly speaking a programming language for *creating* markup languages. In other words it is a metalanguage for creating markup languages. XML was itself created as a subset of SGML (Standard Generalized Markup Language), which, despite its name, is more oriented toward content structure rather than formatting, but it can be used for formatting. HTML (Hypertext Markup Language) is an application of SGML in which formatting is the major concern. XML provides a means for specifying the structure of the content of documents as well as the formatting of their presentation on output devices such as computer monitor screens and printers.

The above diagram illustrates the relationship between SGML, the parent, and HTML and XML, the siblings. It also indicates that Dynamic HTML (DHTML) is HTML augmented by scripting and a document object model. More information about DHTML is available at this [link](#). The above diagram also depicts the relationship of the special languages created with XML, such as XHTML and Scalable Vector Graphics (SVG). The nature of these application languages will be explained later. Files created in these languages are XML files and subject to the rules of XML as well as the special rules of the particular language. For a list of some of the XML application languages which have been created see [Appendix A](#).

XML does not function in isolation. It makes use of style sheets, as does its parent SGML and its sibling HTML. A brief description of the nature of style sheet technicalities is available at this [link](#).

The modification of HTML that adheres to the rules of XML is called XHTML. In XHTML, for example, all of the tags must be closed and properly nested. Since XHTML is a more consistent version of HTML it is likely that future modifications of HTML will be in the direction of XHTML. In XHTML users can create their own tags as well as use those available in HTML.

## XML Files for Geographic Information



<https://www.spatialpost.com/list-common-gis-file-format/>

[https://developers.google.com/kml/documentation/kml\\_tut](https://developers.google.com/kml/documentation/kml_tut)

## XML Files for Geographic Information

← → C 🔒 developers.google.com/kml/documentation/kml\_tut

### Keyhole Markup Language

Página inicial Guias Referência Suporte

Introdução Tutorial do KML Topic Overview

Changing the Camera Passeio Modos de altitude Tempo e animação Câmeras

Data Types Dados do céu em KML PhotoOverlays Como adicionar dados personalizados Modelos

Developer Concepts Arquivos KMZ Regiões Atualizações Expiração

## Tutorial do KML

KML é um formato de arquivo usado para exibir dados geográficos em um navegador da Terra, como Google Earth, Google Maps e Google Maps para celular. O KML utiliza uma estrutura de tags com elementos e atributos aninhados e se baseia no padrão XML. Todas as tags diferenciam maiúscula de minúscula e precisam aparecer exatamente como estão listadas na [Referência de KML](#). A Referência indica quais tags são opcionais. Em determinado elemento, as tags devem aparecer na ordem mostrada na referência.

Se você não conhece KML, explore este documento e os arquivos de amostra que o acompanham ([SamplesInEarth](#) e [SamplesInMaps](#)) para começar a aprender sobre a estrutura básica de um arquivo KML e as tags mais usadas. A primeira seção descreve os elementos que podem ser criados com a interface de usuário do Google Earth. Esses elementos incluem marcadores, descrições, superposições de solo, caminhos e polígonos. A segunda seção descreve os elementos que exigem a criação de KML com um editor de texto. Quando um arquivo de texto é salvo com a extensão `.kml` ou `.kmz`, os navegadores da Terra sabem como exibi-lo.



```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2"> <Placemark>
  <name>Simple placemark</name>
  <description>Attached to the ground. Intelligently places itself at the height of the underlying terrain.</description>
  <Point>
    <coordinates>-122.0822035425683,37.42228990140251,0</coordinates>
  </Point>
</Placemark> </kml>
```

★ **Dica:** para ver o "código" KML de um elemento no Google Earth, basta clicar com o botão direito do mouse no elemento no Visualizador em 3D do Google Earth e selecionar "Copiar". Em seguida, cole o conteúdo da área de transferência em qualquer editor de texto. O elemento visual exibido no Google Earth é convertido em seu equivalente de texto KML. Experimente esse elemento.

Todos os exemplos descritos aqui estão no arquivo [Amostras de KML](#). Comece fazendo download desse arquivo para exibir os exemplos no Google Earth.

Arquivos KMZ: <https://developers.google.com/kml/documentation/kmzarchives?hl=pt-PT>



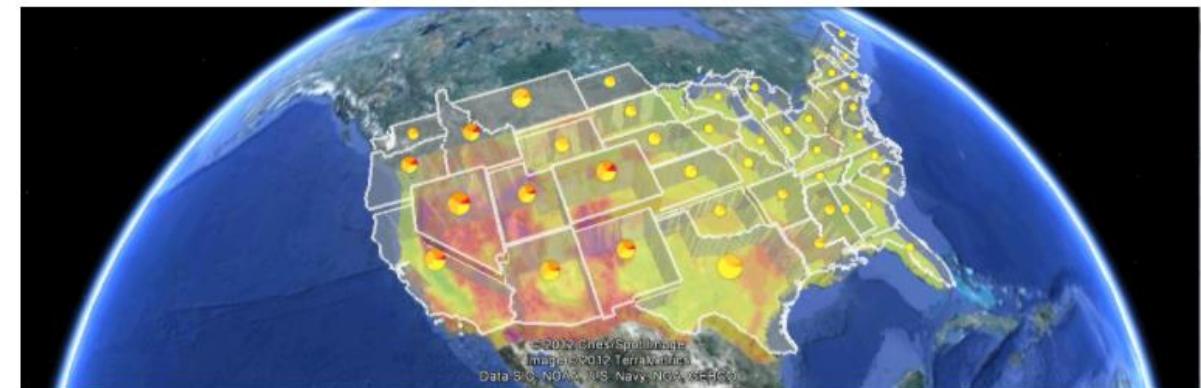
## XML Files for Geographic Information

<https://developers.google.com/kml/documentation/kmlreference>

The screenshot shows the top portion of a web browser window displaying the Google Developers KML documentation. The address bar shows the URL. Below it is the main content area with a teal header bar containing the title "Keyhole Markup Language". The main text area describes KML as a file format for geographic data. Navigation links for "Página inicial", "Guias", "Referência", and "Suporte" are visible at the bottom of the teal bar.

### What is KML?

KML is a file format used to display geographic data in an Earth browser such as Google Earth. You can create KML files to pinpoint locations, add image overlays, and expose rich data in new ways. KML is an international standard maintained by the Open Geospatial Consortium, Inc. (OGC).



### Who uses KML

#### Casual users

You can use KML to plan trips, share location data with friends, or record hikes you've been on.

[Half Dome hike](#)

#### Scientists

Scientific data, such as natural resource maps, or geographic trends, are easily shared as a KML file.

[USGS earthquakes \(KMZ download\)](#)

#### Non-Profits

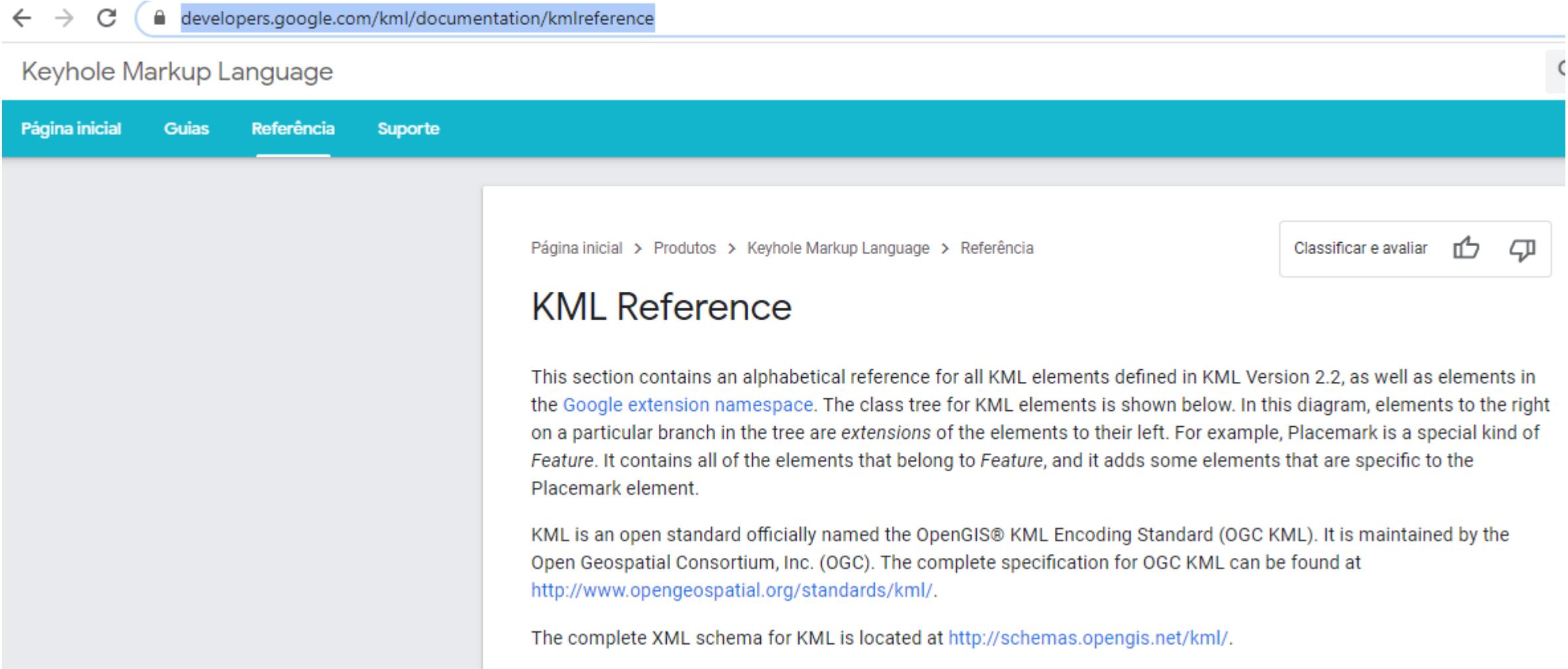
KML files can be used to highlight problems and advocate change.

[City of London Timeline \(KMZ download\)](#)



## XML Files for Geographic Information

<https://developers.google.com/kml/documentation/kmlreference>



The screenshot shows a web browser displaying the 'Keyhole Markup Language' reference documentation from Google. The URL in the address bar is <https://developers.google.com/kml/documentation/kmlreference>. The page has a teal header with navigation links: 'Página inicial', 'Guias', 'Referência' (which is underlined), and 'Suporte'. Below the header, there's a breadcrumb trail: 'Página inicial > Produtos > Keyhole Markup Language > Referência'. To the right of the breadcrumb trail are buttons for 'Classificar e avaliar', a thumbs-up icon, and a thumbs-down icon. The main content area features a large heading 'KML Reference' followed by a detailed text about the KML standard and its history. It mentions the OpenGIS® KML Encoding Standard (OGC KML) maintained by the Open Geospatial Consortium, Inc. (OGC), and provides a link to the complete specification at <http://www.opengeospatial.org/standards/kml/>. A note at the bottom indicates that the complete XML schema for KML is located at <http://schemas.opengis.net/kml/>.

Página inicial > Produtos > Keyhole Markup Language > Referência

Classificar e avaliar  

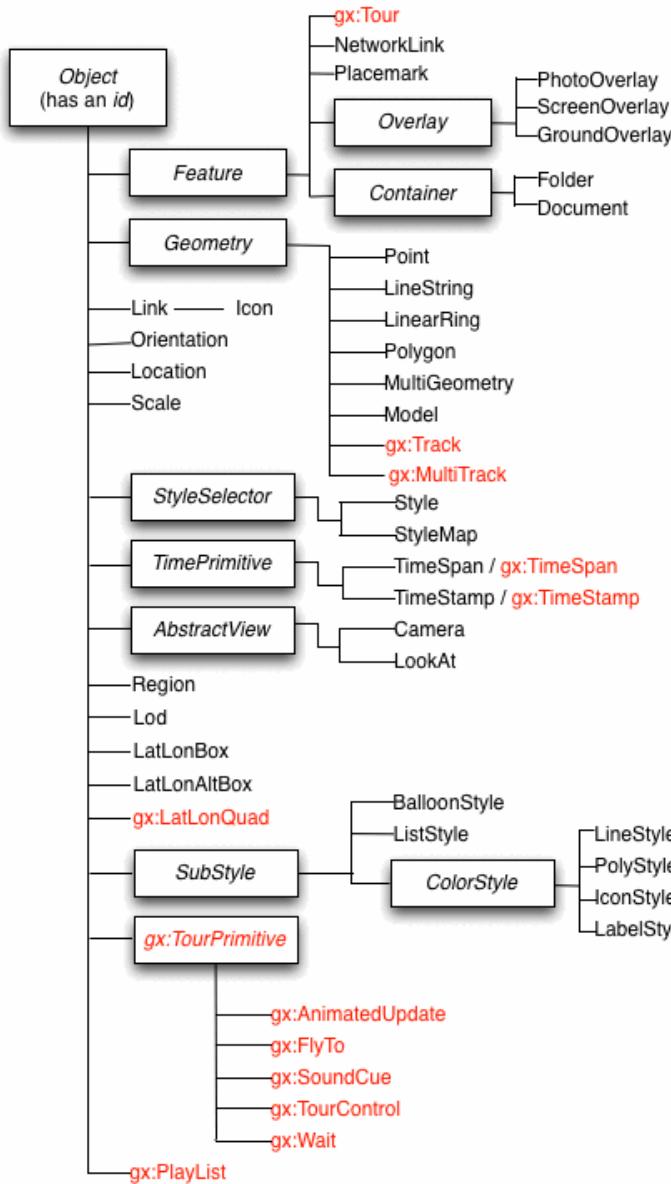
## KML Reference

This section contains an alphabetical reference for all KML elements defined in KML Version 2.2, as well as elements in the [Google extension namespace](#). The class tree for KML elements is shown below. In this diagram, elements to the right on a particular branch in the tree are extensions of the elements to their left. For example, Placemark is a special kind of Feature. It contains all of the elements that belong to Feature, and it adds some elements that are specific to the Placemark element.

KML is an open standard officially named the OpenGIS® KML Encoding Standard (OGC KML). It is maintained by the Open Geospatial Consortium, Inc. (OGC). The complete specification for OGC KML can be found at <http://www.opengeospatial.org/standards/kml/>.

The complete XML schema for KML is located at <http://schemas.opengis.net/kml/>.

## XML Files for Geographic Information



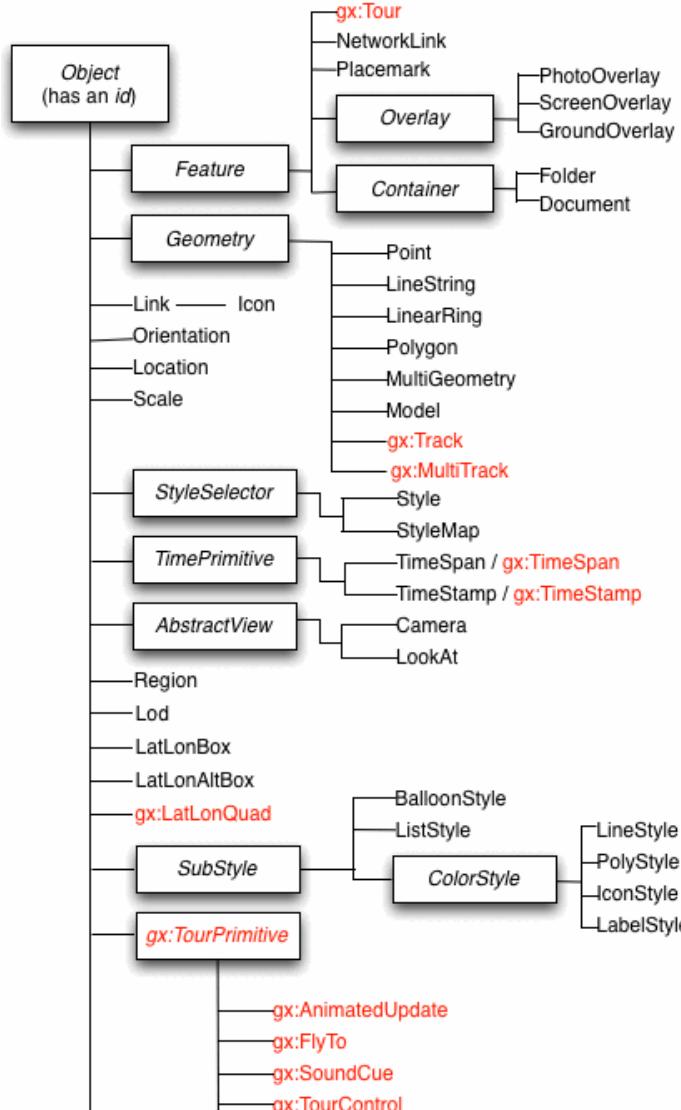
<https://developers.google.com/kml/documentation/kmlreference>

### Superposições de solo

As superposições de solo permitem "aplicar" uma imagem no terreno da Terra. O elemento <Icon> contém o link para o arquivo .jpg com a imagem de superposição. Veja um exemplo de superposição de solo no arquivo [Amostras de KML](#), que mostra o Vulcão Etna entrando em erupção em 2001:

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2"> <Folder>
  <name>Ground Overlays</name>
  <description>Examples of ground overlays</description>
  <GroundOverlay>
    <name>Large-scale overlay on terrain</name>
    <description>Overlay shows Mount Etna erupting on July 13th, 2001.</description>
    <Icon>
      <href>http://developers.google.com/kml/documentation/images/etna.jpg</href>
    </Icon>
    <LatLonBox>
      <north>37.91904192681665</north>
      <south>37.46543388598137</south>
      <east>15.35832653742206</east>
      <west>14.60128369746704</west>
      <rotation>-0.1556640799496235</rotation>
    </LatLonBox>
  </GroundOverlay>
</Folder> </kml>
```

## XML Files for Geographic Information



<https://developers.google.com/kml/documentation/kmlreference>

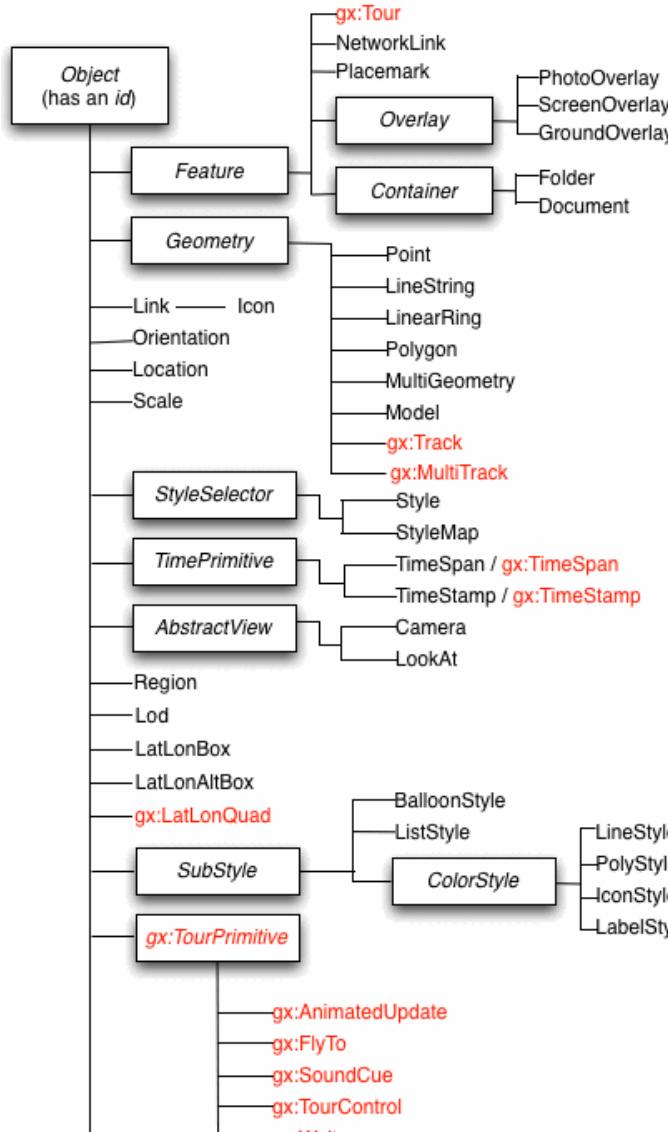
### Caminhos

É possível criar diferentes tipos de caminhos no Google Earth, e é fácil ser criativo com seus dados. Em KML, um caminho é criado por um elemento **<LineString>**. Observe o exemplo "Absolute Extruded" na pasta "Paths" e veja como a forma foi gerada pelo seguinte código:

```

<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2"> <Document>
  <name>Paths</name>
  <description>Examples of paths. Note that the tessellate tag is by default set to 0. If you want to create tessellated lines, they must be authored (or edited) directly in KML.</description> <Style id="yellowLineGreenPoly">
    <LineStyle>
      <color>7f00ffff</color>
      <width>4</width>
    </LineStyle>
    <PolyStyle>
      <color>7f00ff00</color>
    </PolyStyle>
  </Style> <Placemark>
    <name>Absolute Extruded</name>
    <description>Transparent green wall with yellow outlines</description>
    <styleUrl>#yellowLineGreenPoly</styleUrl>
    <LineString>
      <extrude>1</extrude>
      <tessellate>1</tessellate>
      <altitudeMode>absolute</altitudeMode>
      <coordinates> -112.2550785337791,36.07954952145647,2357
      -112.2549277039738,36.08117083492122,2357
      -112.2552905069063,36.08260761307279,2357
      -112.2564540158376,36.08395660588506,2357
      -112.2580238976449,36.08511401044813,2357
      -112.2595218489022,36.08584355239394,2357
      -112.2608216347552,36.08612634548589,2357
      -112.262073428656,36.08626019085147,2357
      -112.2633204928495,36.08621519860091,2357
      -112.2644963846444,36.08627897945274,2357
      -112.2656969554589,36.08649599090644,2357 </coordinates>
    </LineString> </Placemark>
  </Document> </kml>
  
```

## XML Files for Geographic Information



<https://developers.google.com/kml/documentation/kmlreference>

### Polígonos

É possível usar polígonos para criar edifícios simples e outras formas. Confira a pasta "Polígonos" no arquivo [Amostras de KML](#) para ver exemplos.

O exemplo de Pentágono é gerado desenhando formas internas e externas simples e forçando-as até o solo. Veja o código:

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://www.opengis.net/kml/2.2"> <Placemark>
  <name>The Pentagon</name>
  <Polygon>
    <extrude>1</extrude>
    <altitudeMode>relativeToGround</altitudeMode>
    <outerBoundaryIs>
      <LinearRing>
        <coordinates>
          -77.05788457660967,38.87253259892824,100
          -77.05465973756702,38.87291016281703,100
          -77.05315536854791,38.87053267794386,100
          -77.05552622493516,38.868757801256,100
          -77.05844056290393,38.86996206506943,100
          -77.05788457660967,38.87253259892824,100
        </coordinates>
      </LinearRing>
    </outerBoundaryIs>
    <innerBoundaryIs>
      <LinearRing>
        <coordinates>
          -77.05668055019126,38.87154239798456,100
          -77.05542625960818,38.87167890344077,100
          -77.05485125901024,38.87076535397792,100
          -77.05577677433152,38.87008686581446,100
          -77.05691162017543,38.87054446963351,100
          -77.05668055019126,38.87154239798456,100
        </coordinates>
      </LinearRing>
    </innerBoundaryIs>
  </Polygon>
</Placemark>
```



<https://file.org/extension/gpx>

## XML Files for Geographic Information

The screenshot shows a web browser window with the URL [file.org/extension/gpx](https://file.org/extension/gpx) in the address bar. The page is titled "File.org" with the tagline "We solve your file problems". A sidebar on the right says "Want to We have apps". The main content area has a heading "What is a GPX file?". It defines a GPX file as a GPS Exchange Format file containing waypoints, tracks, and routes, released in 2002. It also notes that GPX is based on XML. Below this is a section for software that can handle GPX files.

← → ⌂ file.org/extension/gpx

**File.org**  
We solve your file problems

WE KNOW can open or convert your files.

Suggest additional GPX format

### What is a GPX file?

Files that contain the .gpx file extension are commonly referred to as GPS Exchange Format files. The information that is contained in a GPX file **can include waypoints, tracks and routes**. This data format allows for the exchange of GPS information between different applications and users. It is an open standard file format and can be used by a variety of software programs. The initial GPX file format was released in 2002. Then in 2004 GPX 1.1 was introduced. Since then it has been the default XML standard for the interchange of GPS data.

The GPX file format is based on XML formatting, allowing it to be imported by a variety of GPS applications and devices.

Update info | Upload example file

### Software that will open, convert or fix GPX files

These apps are known to open certain types of GPX files. Since many different programs may use GPX files for different purposes, you may need to try a few of the apps to open your specific GPX file.



## XML Files for Geographic Information

<https://www.ogc.org/>

The screenshot shows the homepage of the Open Geospatial Consortium (OGC) website. The header includes the OGC logo and navigation links for About, Membership, Standards & Resources, Innovation, News & Events, and Careers. The main banner features a globe with a network of connections over a cityscape, with the text "OGC Location Powers Urban Digital Twins". Below the banner, the tagline "The Home of Location Technology Innovation and Collaboration" is displayed, followed by "Your Global Resource for Geospatial Information and Standards". A paragraph describes OGC as a worldwide community committed to improving access to geospatial information, representing over 500 members. Another paragraph discusses the OGC Innovation Program. To the right, there is a sidebar titled "Upcoming Events" listing several events with dates and descriptions.

**Upcoming Events**

- 5th Pan-Canadian Spatial Data Infrastructure (SDI) Summit  
02 Dec - 03 Dec
- December 2020 OGC Member Meetings - Virtual  
07 Dec - 16 Dec
- Location Powers: URBAN DIGITAL TWINS  
12 Jan - 14 Jan
- GEO Business 2021  
19 May - 20 May

[View all events...](#)



## XML Files for Geographic Information

<https://www.ogc.org/docs/is>

The screenshot shows the OGC website at <https://www.ogc.org/docs/is>. The page title is "OGC Standards". A sub-section titled "Implementation Standards" is highlighted. Below it, a table lists the "CDB Multi-Spectral Imagery Extension" standard, including its document title, version, editor, and publication date.

OGC Standards

Below is a list of OGC Implementation Standards.

Implementation Standards are different from the Abstract Specification. They are written for a more technical audience and detail the interface structure between software components. An interface specification is considered to be at the implementation level of detail if, when implemented by two different software engineers in ignorance of each other, the resulting components plug and play with each other at that interface.

Any Schemas (xsd, xslt, etc) that support an approved Implementation Standard can be found in the official [OGC Schema Repository](#).

Standards List      Standards Architecture Diagram

### Standards Listing

A list of the OGC standards

Document Title (click to view/download)	Version	OGC Doc.#	Editor	Publication Date
CDB Multi-Spectral Imagery Extension	1.0	17-080r2	Ryan Franz	2018

The "Multi-Spectral Imagery" extension defines how to encode and store reflected electromagnetic radiation from the infrared wavelengths into a CDB. The portion of the spectrum targeted is between the visible spectrum (current imagery and texture in CDB), and longer wavelength infrared that is

### OGC Standards

- [3D Tiles](#)
- [3dP](#)
- [ARML2.0](#)
- [Cat: ebRIM App Profile: Earth Observation Products](#)
- [Catalogue Service](#)
- [CDB](#)
- [CityGML](#)
- [Coordinate Transformation](#)
- [EO-GeoJSON](#)
- [Filter Encoding](#)
- [GML in JPEG 2000](#)
- [GeoAPI](#)
- [GeoPackage](#)
- [GeoSciML](#)
- [GeoSPARQL](#)
- [Geography Markup Language](#)
- [GeoRSS](#)
- [Geospatial eXtensible Access Control Markup Language \(GeoXACML\)](#)
- [Geospatial User Feedback \(GUF\)](#)
- [GeoTiff](#)



## XML Files for Geographic Information

# Geography Markup Language (GML)

← → C w3.org/Mobile/posdep/GMLIntroduction.html



### *Introduction to GML*

### *Geography Markup Language*

Ron Lake  
Galdos Systems Inc



#### 1.0 Introduction:

This paper provides a brief introduction to Geography Markup Language (GML). The paper is the first in a series of papers to get you acquainted with this exciting way to represent and manipulate geographic information. Following articles this site will introduce you to a variety of GML topics including GML map making, GML data transformations, spatial queries and geographic analysis, GML-based spatial databases, and a variety of GML applications including applications to mobile computing systems. We expect GML to revolutionize the treatment of spatial information. GML is web friendly. For the first time spatial information will have a truly public encoding standard.

#### 2.0 What is GML ?

##### 2.1 Status

GML or Geography Markup Language is an XML based encoding standard for geographic information developed by the OpenGIS Consortium (OGC). Its current status is an RFC under review within the OpenGIS Consortium. The RFC is supported by a variety of vendors including Oracle Corporation, Galdos Systems Inc, MapInfo, CubeWerx and Compusult Ltd. GML was implemented and tested through a series of demonstrations which formed part of the OpenGIS Consortium's Web Mapping Test Bed (WMT) conducted in September 1999. These tests involved GML mapping clients interacting with GML data servers and service providers.

##### 2.2 Geography, Graphics and Maps

Before we look at GML itself, it is important that we draw some clear distinctions between geographic data (which is encoded in GML) and graphic interpretations of that data as might appear on a map or other form of visualization. Geographic data is concerned with a representation of the world in spatial terms that is independent of any particular visualization of that data. When we talk about geographic data we are trying to capture information about the properties and geometry of the objects which populate the world about us. How we symbolize these on a map, what colors or line weights we use is something quite different. Just as XML is now helping the Web to clearly separate content from presentation

<https://www.w3.org/Mobile/posdep/GMLIntroduction.htm>



## XML Files for Geographic Information

### Geography Markup Language (GML)

The screenshot shows a web browser window with the URL [nrcan.gc.ca/earth-sciences/geomatics/canadas-spatial-data-infrastructure/standards-policies/8918](https://nrcan.gc.ca/earth-sciences/geomatics/canadas-spatial-data-infrastructure/standards-policies/8918). The page is in English, with a "Français" link available. It features the Government of Canada logo and a search bar. The breadcrumb navigation path is: Canada.ca > Natural Resources Canada > Science and Data > Science and Research > Earth Sciences > Geomatics > Canada's Spatial Data Infrastructure > CGDI Resource Centre > CGDI Interoperability Pilot Demonstration - Video > Gazetteer Service.

## Geography Markup Language (GML)

### Overview

Geography Markup Language (GML) is an XML application that provides a specialized vocabulary for working with geographic data. The main purpose of GML is to provide a standard means for representing information about geospatial Features—their properties, interrelationships, and so on. Features describe real world entities and are the fundamental objects used in GML. Features can be concrete and tangible, such as roads and buildings, or abstract and conceptual, such as political boundaries and distributions of quantities over geographical areas (coverages).

#### Additional Information

<https://www.nrcan.gc.ca/earth-sciences/geomatics/canadas-spatial-data-infrastructure/standards-policies/8918>



## XML Files for Geographic Information

### Geography Markup Language (GML)

## Standards

[OpenGIS® Geography Markup Language \(GML\) Encoding Standard](#)

[OpenGIS® City Geography Markup Language \(CityGML\) Encoding Standard](#)

[OpenGIS® GML in JPEG 2000 for Geographic Imagery Encoding Standard](#)

## Related Information

[Web Feature Service \(WFS\)](#)

[KML](#)

[Web Processing Service \(WPS\)](#)

[GeoRSS](#)



## XML Files for Geographic Information

### Free tools for visualizing and editing CityGML files

Não seguro | citygmlwiki.org/index.php/Freeware

Log

Page Discussion Read View source View history Search

## Freeware

Beside commercial software packages there is also a number of free tools and services that support CityGML.

### Free tools for visualizing and editing CityGML files

• <a href="#">3DCon GmbH (part of Hexagon)</a>	tridicon(R) <b>CityDiscoverer light</b> , a viewer for CityGML Data. <a href="#">--&gt; Download</a>
• <a href="#">CSTB</a>	<b>eveBIM</b> , Multi-scale viewer for CityGML , IFC, BCF, and GIS files. Multiples plugins for viewpoints, clipping, colorization, properties edition... <a href="#">--&gt; Download</a>
• <a href="#">GEORES</a>	<b>GEORES for Sketchup</b> , free and open-source plugins to export CityGML data from Sketchup™-Sketchsoftware (MIT license). <a href="#">--&gt; Download</a>
• <a href="#">Karlsruhe Institute of Technology</a> <a href="#">Institute for Applied Computer Science</a>	<b>FZKViewer</b> , a viewer for CityGML, IFC, gbXML, LandXML, CIM (IEC) and point clouds Data Data. <a href="#">--&gt; Download</a>
• <a href="#">Liquid Technologies Ltd.</a>	<b>Liquid XML Editor</b> , a free graphical XML Schema Editor (XSD), intellisense XML Editor and XSD & XML Validator. <a href="#">--&gt; Download</a>
• <a href="#">Open source BIMserver</a>	<b>BIMserver</b> , an open source Building Information Modelserver. Features are export to CityGML and visualisation in 03D. <a href="#">--&gt; Download</a>
• <a href="#">Snowflake Software</a>	<b>GML Viewer</b> , a generic 2D GML Viewer capable of viewing CityGML. <a href="#">--&gt; Download</a>
• <a href="#">TerrainView</a>	<b>TerrainView</b> , is a free (for non-profit use) 3D viewer for interactive visualization of 3D data with CityGML support. <a href="#">--&gt; Download</a>
• <a href="#">Technical University of Munich, Chair of Geoinformatics</a>	<b>3D City Database</b> , a free 3D geo database for the storage and management of virtual 3D city models based on CityGML - to be used in conjunction with Oracle 11G Spatial/Locator (or higher) or PostGIS. 3DCityDB comes with tools for CityGML import/export, export of data into spreadsheets, visualization support for KML, COLLADA, and glTF. Since version 3.2, a 3D web client which is based on the Cesium Virtual Globe is part of the project. <b>citygml4j</b> , an open-source Java class library and API for the processing of 3D city models encoded in CityGML. <a href="#">--&gt; Project website www.3dcitydb.org</a> <a href="#">--&gt; Source Code</a> <a href="#">--&gt; Download of latest release</a> <a href="#">--&gt; Online demos of 3D viewer</a>

<http://www.citygmlwiki.org/index.php/Freeware>



## XML Files for Geographic Information

[https://www.gpsvisualizer.com/map\\_input?form=leaflet](https://www.gpsvisualizer.com/map_input?form=leaflet)

gpsvisualizer.com/map\_input?form=leaflet

# GPS Visualizer

MAKE A MAP    MAKE A PROFILE    Geocode addresses    Examples  
- Leaflet/Google    CONVERT A FILE    Look up elevations    Help/FAQ  
- Google Earth    Draw on a map    Atlas: Share a map    About GPSV  
- JPG/PNG/SVG    Calculators    GPSBabel    [f](#)

[Donate](#)    No ads? No problem! You can support GPS Visualizer by [making a donation with PayPal](#) instead

### Make an HTML Map (Google/Leaflet) from a GPS file

Other forms: [Google Earth KML/KMZ](#), [JPEG/PNG/SVG](#), [Quantitative data](#), [GPX/text](#), [Profiles](#)

This form will automatically draw your GPS data (or KML/KMZ file, or plain text data in CSV or tab-delimited format) overlaid upon a visible map using either the [Google Maps API](#) or [Leaflet](#), an open-source mapping library.

Please note that creating a map with a very large number of waypoints (or very long tracklogs, especially if speed or altitude colorization) may grind to a halt. If you have thousands of markers, [Google Earth](#) might be a better choice.

If you don't have GPS data and want to interactively draw on a map, use [GPS Visualizer's "sandbox"](#) to create your own GPX or KML file.

**General map parameters** show advanced map options [+]

Format: Leaflet Width: 700 pixels Height: auto pixels   
Full screen mode: Yes Title:    
Initial map type: OpenStreetMap + relief Opacity: 100%   
Time offset:  hrs Units: Metric (in legend, etc.)   
Your project's Google API key:  [clear]   
Allow export of map data: No Allow elevation profiles: Yes   
Add DEM elevation data: No

**Upload your GPS data files here:** ?  
(Total size cannot exceed 10 MB; .zip/.gz is supported)  
File #1 Escolher arquivo Nenhum arquivo selecionado   
File #2 Escolher arquivo Nenhum arquivo selecionado   
File #3 Escolher arquivo Nenhum arquivo selecionado   
[Show additional file input boxes](#)

**Draw the map**  Open in new window  
[Save these settings](#) • [Load from saved](#)

**Or paste your data here:** ?  
name,desc,latitude,longitude  
  
Force plain text to be this type: default

**Track options** show advanced track options [+]

Track opacity: 90% Line width: 3   
Colorize by: Track (recommended) Default color: Red   
Track list: Names and descriptions Tickmark interval:    
Trackpoint distance threshold:  Max. points per track:    
Draw tracks as waypoints: No

**Waypoint options** show advanced waypoint options [+]

Show waypoints: All   
Default icon: Color: red