



Extensible Markup Language (XML)

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Technical skill

Innovation

Professionalism



Extensible Markup Language (XML)

- XML is a method for putting structured data in a text file
- XML looks a bit like HTML but isn't HTML
- XML is text, but isn't meant to be read
- XML is a family of technologies
- XML is verbose, but that is not a problem
- XML is new, but not that new
- XML is license-free, platform, language and middleware independent



Hypertext Markup Language (HTML)

- Presentation + Content
- Fixed tag set

```
<html>
  <head>
    <title>This documents title</title>
  </head>
  <body>
    <h1>This documents title</h1>
    Some text, some is <b>bold</b>
    <p>
      more text
    </p>
  </body>
</html>
```



Extensible Markup Language (XML)

- Subset of SGML
- Well-formed or Valid

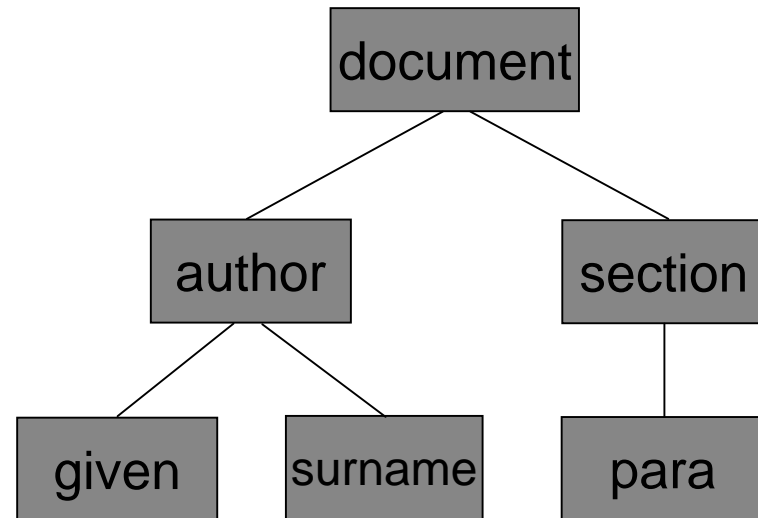
```
<?xml version="1.0"?>
<!DOCTYPE document SYSTEM "hello.dtd">
<document>
  <author>
    <given>Tony</given>
    <surname>Allan</surname>
  </author>
  <section>
    <para>Hello, world!</para>
  </section>
</document>
```



Document Type Definition (DTD)

- hello.dtd

```
<!ENTITY lt      "&#38;#60;">
<!ENTITY gt      "&#62;">
<!ENTITY amp     "&#38;#38;">
<!ENTITY apos    "&#39;">
<!ENTITY quot    "&#34;">
<!ELEMENT document (author, section+)>
<!ELEMENT author (given, surname)>
<!ELEMENT given (#PCDATA)>
<!ELEMENT surname (#PCDATA)>
<!ELEMENT section (para+)>
<!ELEMENT para (#PCDATA)>
```





XML - DTD

- Document Type Definitions
 - MathML - Mathematical Markup Language
 - SMIL - Synchronized Multimedia Integration Language
 - CML - Chemical Markup Language
 - FinXML - Financial Markup Language
 - RDF - Resource Definition Framework
 - SVG - Scalable Vector Graphics
 - XHTML
 - Applications using XML file formats:
 - AbiWord - Wordprocessor
 - Dia - Drawing package
 - gNumeric - spreadsheet



Namespaces

```
<?xml version="1.0"?>
  <!-- unprefixed element types are from "books" -->
  <book xmlns='urn:loc.gov:books'
        xmlns:isbn='urn:ISBN:0-395-36341-6'>
    <title>Cheaper by the Dozen</title>
    <isbn:number>1568491379</isbn:number>
  </book>
```



MathML

- MathML is a format for describing mathematics

$$x^2 + 4x + 4 = 0$$

<mrow>

<mrow>

<msup> <mi>x</mi> <mn>2</mn> </msup> <mo>+</mo>

<mrow>

<mn>4</mn>

<mo>&invisibletimes;</mo>

<mi>x</mi>

</mrow>

<mo>+</mo>

<mn>4</mn>

</mrow> <mo>=</mo> <mn>0</mn>

</mrow>



SMIL

- Using SMIL, an author can:
 - describe the temporal behaviour of the presentation
 - describe the layout of the presentation on a screen
 - associate hyperlinks with media objects
- In the following example fragment, the position of a text element is set to a 5 pixel distance from the top border of the rendering window:

```
<smil>  
  <head>  
    <layout> <region id="a" top="5" /> </layout>  
  </head>  
  <body> <text region="a" src="text.html" dur="10s" /> </body>  
</smil>
```

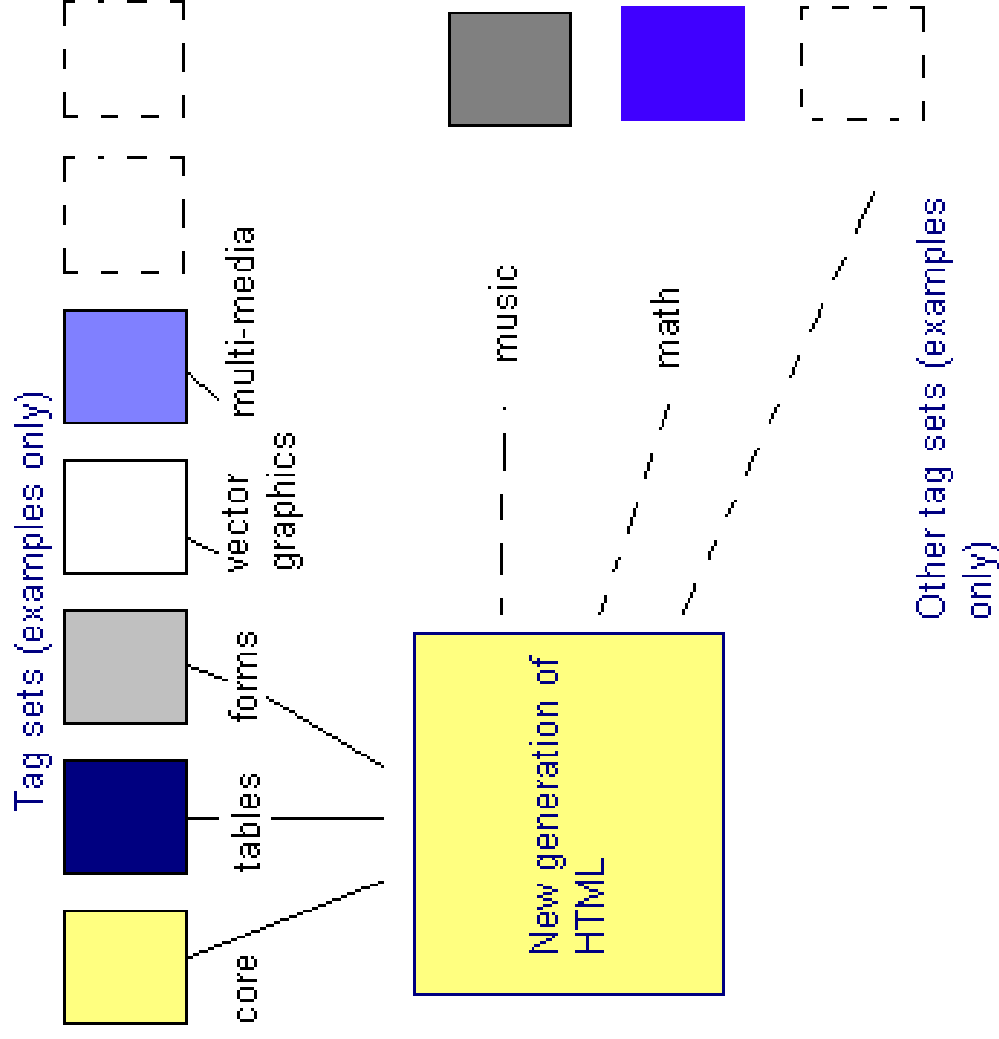


XHTML

- XHTML - Recasting HTML in XML
 - Make a fresh start with a new generation of HTML, which would be re-cast as a suite of XML tag-sets
 - Based on HTML 4.0
 - An improved match to database and workflow applications
 - Tables emphasize the data model
 - Style sheets become more important
 - Mark-up to meet the different needs of a variety of devices
 - Transforming mark-up to make it suitable for different devices



XHTML





Xlink

- XLink

```
<commentary xml:link="extended" inline="false">
  <locator href="smith2.1" role="Essay"/>
  <locator href="jones1.4" role="Rebuttal"/>
  <locator href="robin3.2" role="Comparison"/>
</commentary>
```

```
<mylink xml:link="simple" title="Citation"
  href="http://www.xyz.com/xml/foo.xml" show="new"
  content-role="Reference">
  as discussed in Smith(1997)
</mylink>
```



XPointer

- ```
<!DOCTYPE SPEECH [
 <!ELEMENT SPEECH (#PCDATA | SPEAKER | DIRECTION) * >
 <!ATTLIST SPEECH
 ID ID #IMPLIED >
 <!ELEMENT SPEAKER (#PCDATA) >
 <!ELEMENT DIRECTION (#PCDATA) >
>
<SPEECH ID="a27"><SPEAKER>Polonius</SPEAKER>
<DIRECTION>crossing downstage</DIRECTION>Fare you well,
my lord. <DIRECTION>To Ros.</DIRECTION>
You go to seek Lord Hamlet? There he is.</SPEECH>
```

```
id(a27).child(2,DIRECTION)
id(a27).child(2,#element)
id(a27).child(2,#text)
```



# Document Object Model (DOM)

- Some node attributes:

nodeName

nodeValue

nodeType

parentNode

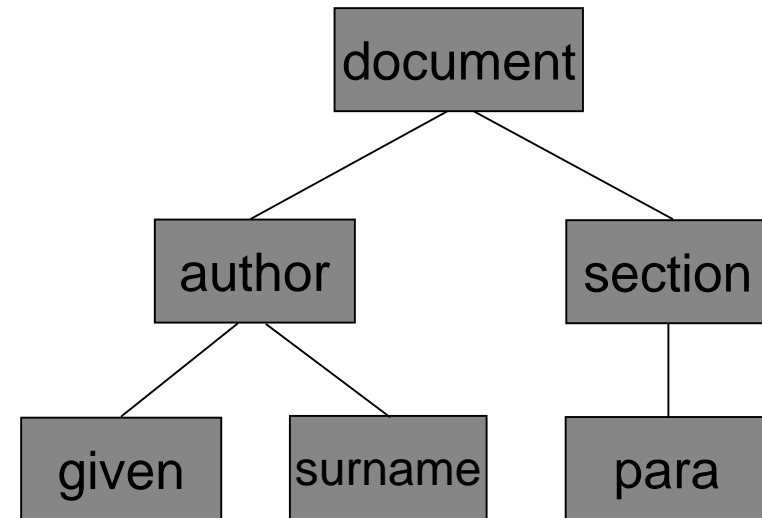
childNodes

firstChild

lastChild

previousSibling

nextSibling



- Some node methods:

insertBefore

replaceChild

removeChild

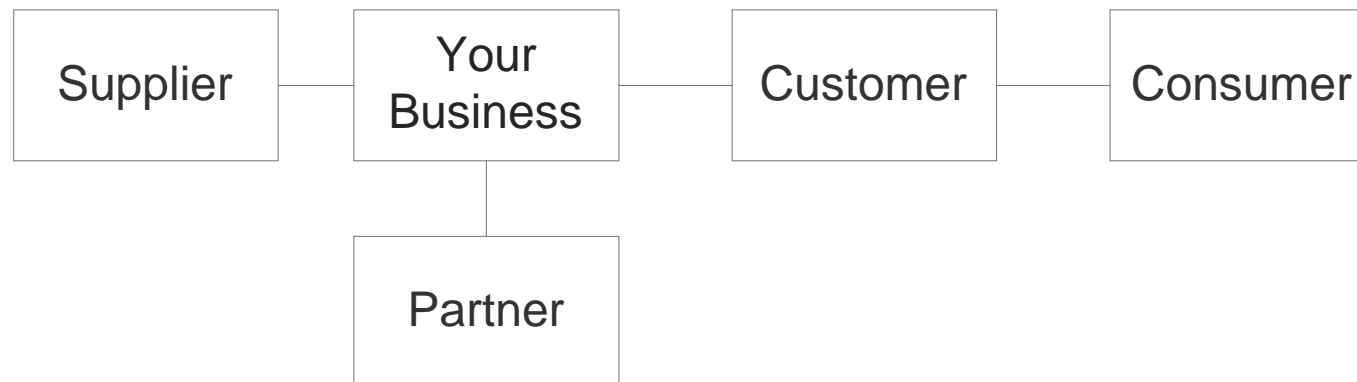
appendChild

hasChildNodes



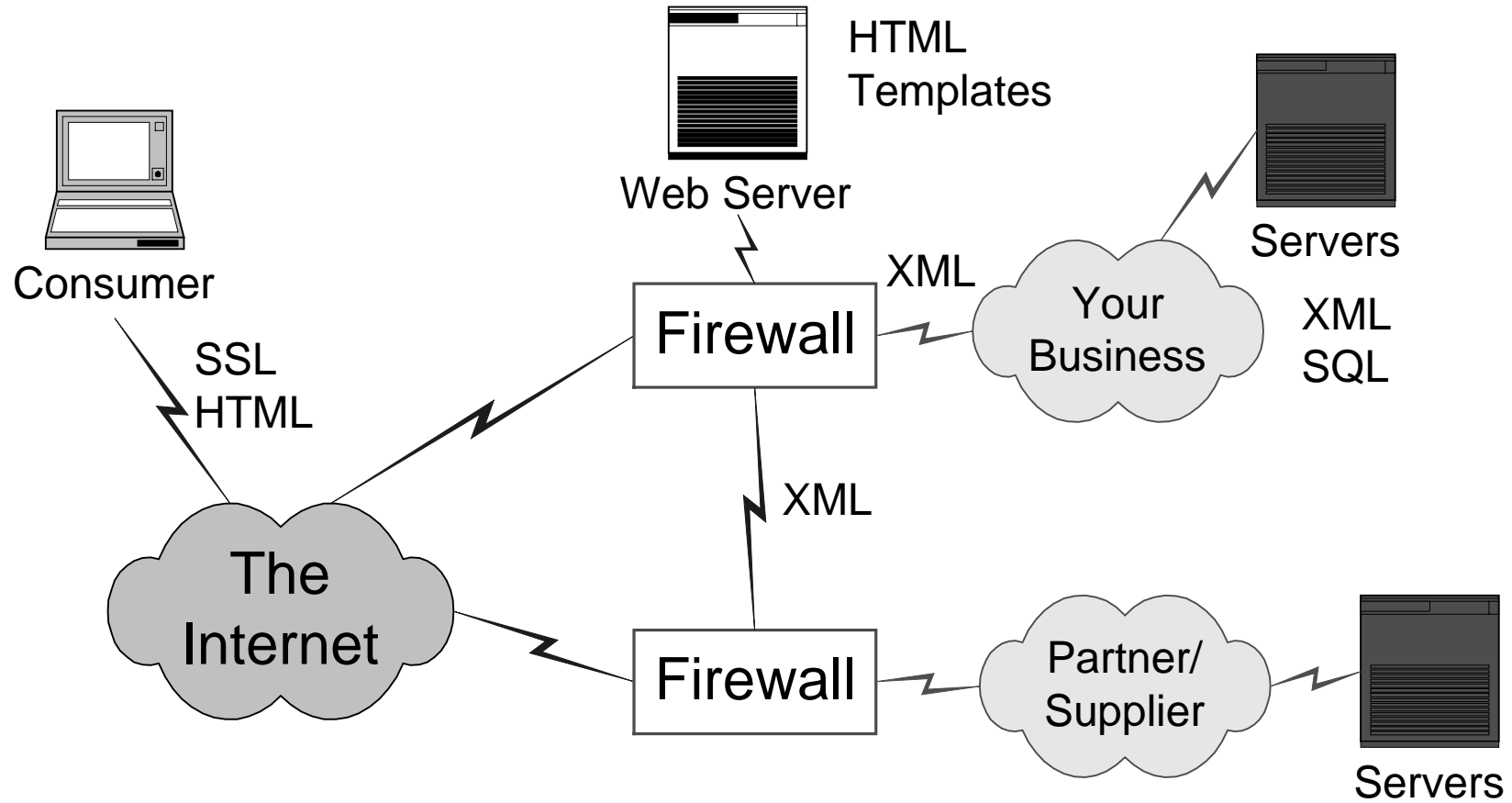
# e-commerce

- Electronic Commerce (a.k.a. e-commerce) is the application of Information Technology to electronically enable you to do business with other businesses (Customers, Suppliers and Partners) and Consumers. Its purpose is to create new or more effective streams of business. The aims of e-commerce are to deliver increased income, lower costs and achieve competitive advantage.



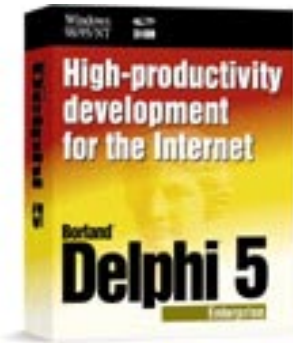


# e-commerce





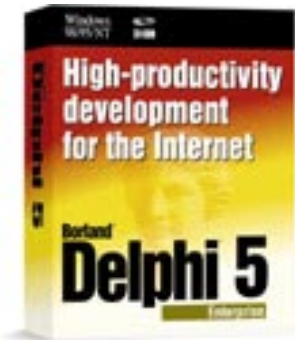
# Delphi



- XML: Simplify Data Distribution and optimize Data Exchange With Delphi 5. Delphi's support for XML data enables you to quickly build systems that are flexible and extensible to support the next wave of Internet e-commerce.
- HTML 4: Full featured Dynamic Thin-clients for the web Delphi 5 delivers the power you need to build dynamic ultra-thin clients using HTML 4 and XML. This gives you rapid deployment to the Internet with full-featured and responsive client applications.



# Delphi



- InternetExpress (Ent)
  - XML data from Borland MIDAS Servers to simplify data exchange
  - XML Broker for quickly providing XML data for Web server applications
  - MIDAS PageProducer wizard to migrate your applications to the Internet with XML and HTML4 for dynamic Web clients
  - Web Page Editor for instantly designing HTML4 Web documents that deliver dynamic XML data



# XML

- Content is king
- Presentation as needed - dynamic
- Stored as XML or in databases
- Technology Neutral Message encoding
- Signed XML for purchases - difficult
- XML to XML translators
- Parsers in many languages
- DOM - Document Object Model



# Links

- Extensible Markup Language (XML)
  - <http://www.w3.org/XML/>
- The XML Industry Portal
  - <http://xml.org/>
- CUEXml Delphi Documentation
  - [http://www.cuesoft.com/docs/cuexml\\_delphi/](http://www.cuesoft.com/docs/cuexml_delphi/)
- XML Tools for Delphi
  - <http://www.icom-dv.de/xml/>
- XMLWorks is a collection of OpenSource utilities
  - <http://www.pbe.com/sourceworks/XMLWorks/>