Intro to XML

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History XML (eXtensible Markup Language)

- Based on SGML (Standard Generalized Markup Language)
- Develop by a committee in the W3C consortium on 1996-98
- It was build for the future of the web. Their goals:
  - Internet usability
  - SGML compatibility
  - General purpose stability
  - Formality
  - Conciseness
  - Legibility
  - Ease of authoring
  - Minimization of optional features

Famous uses of XML

- **XHTML**: This is the "XMLization" of HTML 4.0 by W3c.
- **Web Collections:** Web Collections are a meta-data syntax. They fit within the WWW. Web collections are subsequently used for scheduling, HTML Email Threading, content labeling, distributed authoring, etc.
- **Chemical Markup Language (CML)**: CML is used for molecular information management. Its extensive scope covers a wide range of subjects such as inorganic molecules, quantum chemistry and macromolecular sequences.
- **Commerce eXtensible Markup Language (CXML)**: A protocol used for continuous communication of business documents used in e-commerce.
- **Electronic Business XML (EBXML)**: It is used to provide an infrastructure allowing the use of electronic business information by everyone consistently and securely.
- **Simple Object Access Protocol (SOAP)**: A protocol that is object based and used for information exchange in a decentralized and distributed environment.

Anatomy of an XML file: Prologue

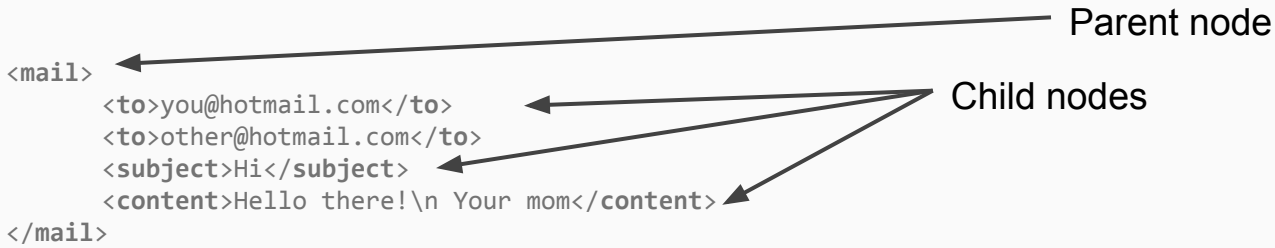
```
<?xml version="1.0" encoding="iso-8859-1"?>
```

- **<?xml** declares to a processor that this is where the XML document begins.
- **version="1.0"** declares which recommended version of XML the document should be evaluated in.
- **encoding="iso-8859-1"** identifies the standardized character set that is being used to write the markup and content of the XML.

Anatomy of an XML file: Content

XML data consist in **elements**, **attributes** and **entities** (meh).

1. Elements: The format is *<element_name>content</element_name>*
   a. Name is case sensitive
   b. Names cannot contain **<**, **>**, **&**, **“** and :
2. Elements can be nested:



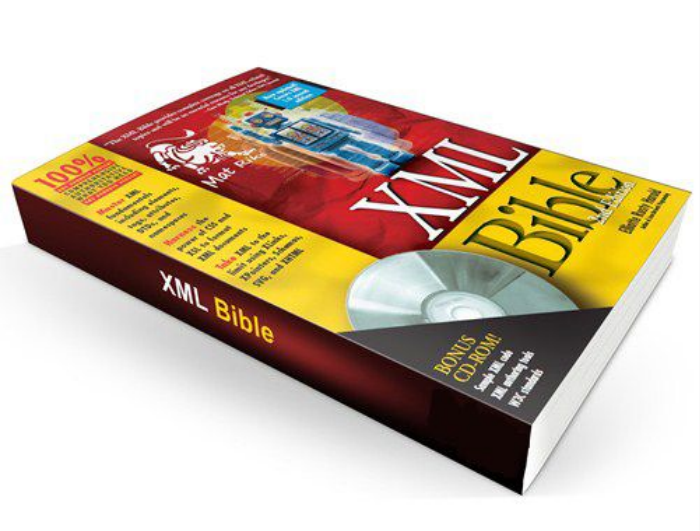
Anatomy of an XML file: Content

3. Elements can contain attributes, using single or double quotes (‘,”):

```
<!-- This is a mail definition -->
<mail>
     <to>you@hotmail.com</to>
     <to status=”cc”>other@hotmail.com</to>
     <subject>Hi</subject>
     <content>Hello there!\n Your mom</content>
</mail>
```

What we do not use

- DTDs: Documents that validates other XML
- XSLT Grammar (some do actually)
- The rest XML advanced features



More info

- http://www.w3.org/XML/
- Intro to XML by GameDev.net
- XPath guide

Full example

```
<Ui xmlns="http://www.blizzard.com/wow/ui/" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xsi:schemaLocation="http://www.blizzard.com/wow/ui/ ..\FrameXML\UI.xsd">
   <Frame name="MyAddon_Frame">
      <Anchors>
            <Anchor point="CENTER"/>
      </Anchors>
      <Frames>
            <Button name="MyAddon_Button">
                        <Anchors>
                        <Anchor point="CENTER"/>
                        </Anchors>
            </Button>
      </Frames>
   </Frame>
</Ui>
```

XML libraries for C/C++

- PuguiXML (DOM model)
- TinyXML (DOM model)
- Expat (SAX model)
- DOM model loads all in memory
- SAX is faster but more complex to handle
- More info in this gamasutra article

TODO 1

“Let’s create config.xml to store configuration data for each module”

- You can edit xml files inside Visual Studio
- For now let’s just add the name of the app
- Come up with any tags you feel appropriate

TODO 1: Example

```
<!-- Config file for the game -->
<config>
    <name>My super awesome game with XML</name>
</config>
```

TODO 2

*“Create two new variables from pugui namespace: a **xml_document** to store the whole config file and a **xml_node** to read specific branches of the xml”*

- To use a namespace directly use the :: notation
- E.g. pugui::xml_node

TODO 3

*“Load "config.xml" file to a buffer, then send the data to pugi using **load_buffer()** method from the xml_document class. If everything goes well, load the top tag inside the xml_node property created in the last TODO”*

- We have to load our config file from the virtual file system
- So we load the data to a buffer, create the xml and **RELEASE()** the buffer

TODO 4

*“Read the title of the app from the XML and set directly the window title using **SetTitle()**”*

- Since the xml_node class is public, we can use it directly
- Read pugui documentation to understand how to read data
- Try executing, you should now see the new title

TODO 5

“Improve config.xml to store all configuration variables that we have as macros.

Use a section with the name of each module (see Module::name)”

- Since the xml_node class is public, we can use it directly
- Read pugui documentation to understand how to read data
- Try executing, you should now see the new title

TODO 6

*“Add a new argument to the **Awake()** method to receive a pointer to a **xml_node**.*

*If the section with the module name exist in config.xml, fill the pointer with the address of a valid **xml_node** that can be used to read all variables from that section. Send nullptr if the section does not exist in config.xml”*

Homework

- Add code so each module receives its set of configuration variables.
- Remove all configuration macros from **p2Defs.h**
- Add music and fx volume as configuration options
- Use this configuration in the Audio Module