Server Framework2

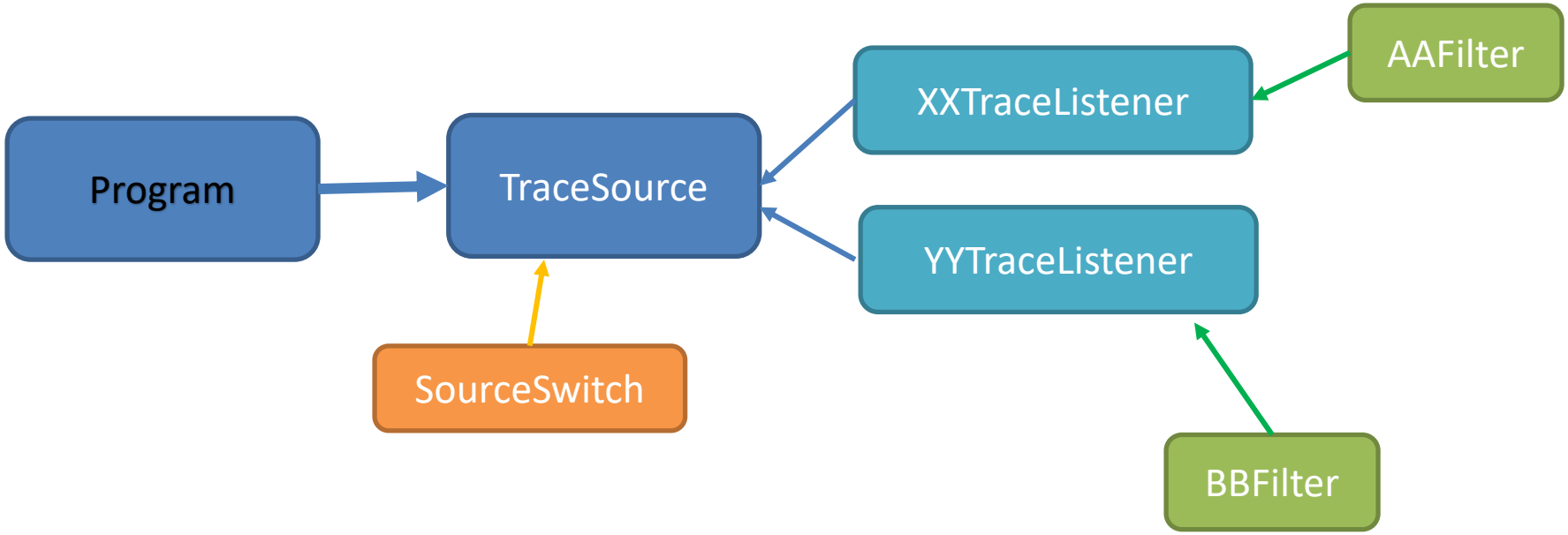
Logging
Configuration

Tracing / logging information

- Instead of using Console.WriteLine use tracing / logging for released Systems.
- You can setup the log to write to:
  - The Console
  - A File, in different formats
  - (Windows Event Log)

- The Tracing can have several output channels
- The Trace level can be changed (actual at runtime)

Overview Tracing / logging



How to Choose Output Chanel

- The **TraceSource** class can write to “TraceListener”
- The ”TraceListener” is an abstract class
  i.e. you need concrete TraceListener class.

- C# have some buildt in classes like:
  - TextWriterTraceListener
  - XmlWriterTraceListener
  - EventLogTraceListener
  - Customer Created Listener

- They work like observers
  i.e. you can add them to a TraceSource (ts) object like:

```
ts.Listeners.Add(objOfTraceListener);
```

Make your own TraceListener class

- You can design and implement you own Listener by Inherits from **`TraceListener`** and override:
  - **public override void Write(string message)**
  - **public override void WriteLine(string message)**

Trace Level

- TraceSource works with diff. Levels of logging
  - Verbose
  - Info
  - Warning
  - Error
  - Critical

- Setting actual levels of logging ex:
  ts.Switch = new SourceSwitch("Peters","All");

- You specify the level when you logging like:

  ts.TraceEvent(TraceEventType.Error, <<ID>>, <<Object/string to log>>);

  Example:

  ts.TraceEvent(TraceEventType.Error, 333, ”This is an Error");

Trace Filters

- TraceSource can take filters to configure the individual TraceListener

- Types of filters:
  - SourceFilter -- for configure which part of the system to log
  - EventTypeFilter -- for configure level of logging messages to log
  - Customer Created Filters

- Example of filter setting:

```
xxListener.Filter = new EventTypeFilter(SourceLevels.All);
```

Make your own Filter

- You can design and implement you own Filter by Inherits from **`TraceFilter`** and override:

  - **public override bool ShouldTrace(**

TraceEventCache cache,	-- some metadata
string source,	**-- where does it come from**
TraceEventType eventType,	**-- the level error,warning…**
int id,	**-- some id**
string formatOrMessage,	**-- the text string – can be null**
object[] args,	-- additional inf.
object data1,	-- additional inf.
object[] data)	-- additional inf.

Special TraceListener - EventLog

- **The `EventLogTraceListener` will log to the system Event Log System (use EventViewer to lookup the logging)**

- **Need to get NuGet Package (System.Diagnostics.EventLog)**

- **Example:**

```
TraceListener logListener = new EventLogTraceListener("Application");
ts.Listeners.Add(logListener);
```

Demo

Og derefter opgave.

XML intro

What is XML?

- XML stands for E**X**tensible **M**arkup **L**anguage
- XML is a **markup language** much like HTML
- XML was designed to **carry data**, not to display data
- XML tags are not predefined. You must **define your own tags**
- XML is designed to be **self-descriptive**
- XML is a **W3C Recommendation**

The Difference Between XML and HTML

- **XML is not a replacement for HTML**.

- XML and HTML were designed with different goals:
  - **XML** was designed to transport and **store** data, with focus on what data is. (like model)
  - **HTML** was designed to **display** data, with focus on how data looks. (like view)

  Therefore - HTML is about displaying information, while XML is about carrying information.

XML Example

```
<note>
  <to>Tove</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this Weekend!</body>
</note>
```

XML Simplifies Data Sharing

- XML data is stored in plain text format.
- Meaning it is software- and hardware-independent.
- With XML, data can easily be exchanged between incompatible systems.

XML Documents Form a Tree Structure

- XML documents must contain a **root element**.
  This element is "the parent" of all other elements.
  NB! Only **one** root element are allowed

- The elements in an XML document form a document tree.

- The tree starts at the root.

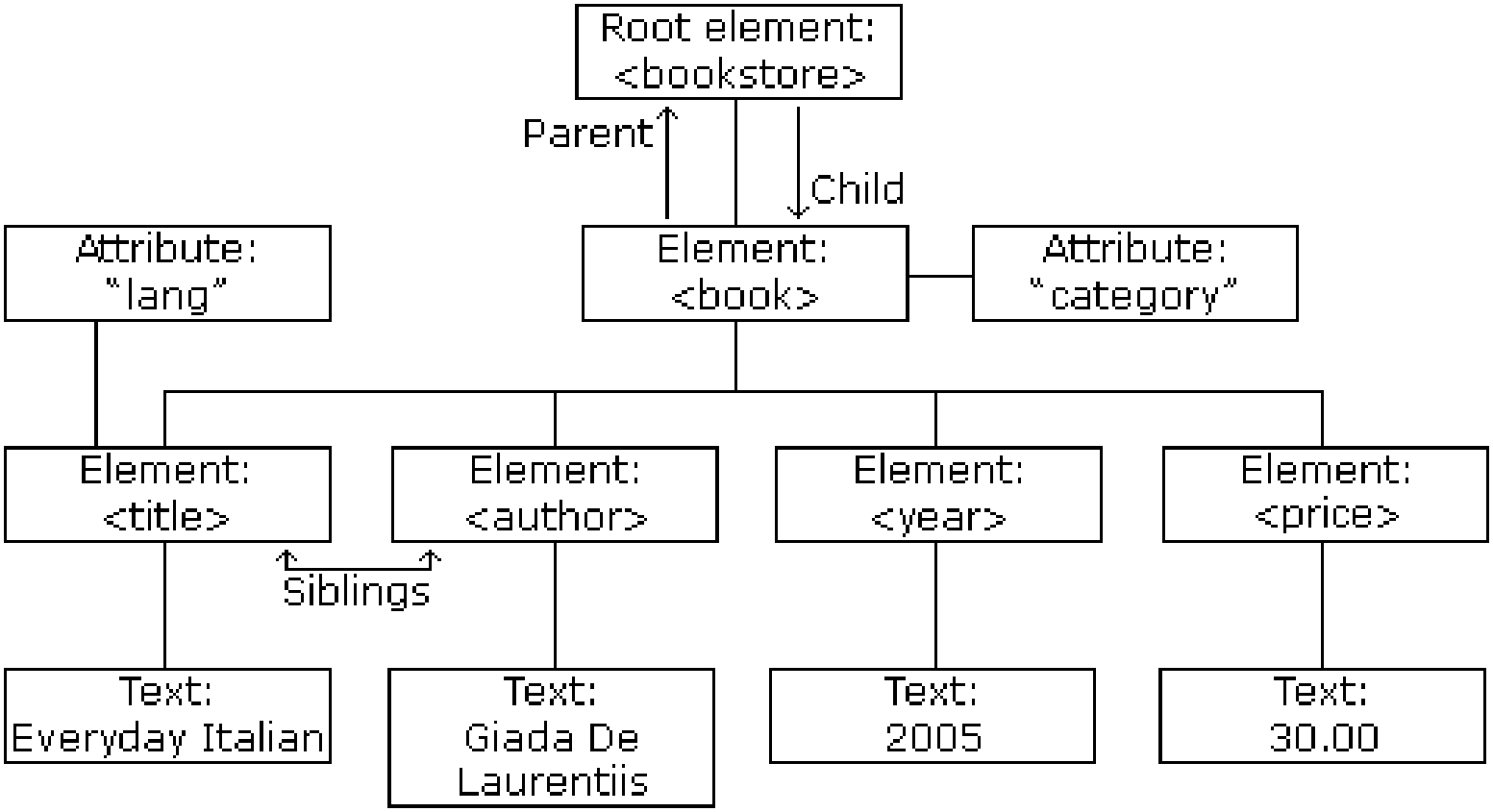
XML Documents – General structure

- All elements can have sub elements (child elements):

- ```
  <root>
    <child>
      <subchild>.....</subchild>
    </child>
    <child> // sibling
      <subchild>.....</subchild>
    </child>
  </root>
  ```

- Parent elements have children. Children on the same level are called siblings (brothers or sisters).
  ```

Example of XML-dom-tree



```
<bookstore>
<book category="COOKING">
  <title lang="en">Everyday Italian</title>
  <author>Giada De Laurentiis</author>
  <year>2005</year>
  <price>30.00</price>
</book>
<book category="CHILDREN">
  <title lang="en">Harry Potter</title>
  <author>J K. Rowling</author>
  <year>2005</year>
  <price>29.99</price>
</book>
<book category="WEB">
  <title lang="en">Learning XML</title>
  <author>Erik T. Ray</author>
  <year>2003</year>
  <price>39.95</price>
</book>
</bookstore>
```

The <book> element itself has 4 children:

<title>,< author>, <year>, <price>.

The root element in the example is <bookstore>. All <book> elements in the document are contained within <bookstore>.

XML Syntax Rules – to be wellformed

- **All XML Elements Must Have a Closing Tag**
- **XML Tags are Case Sensitive**
- **XML Documents must have one Root Element**
- **XML Elements must be Properly Nested**
- **XML Attribute values must be Quoted**
- **Entity References**

XML Elements vs. Attributes

- Take a look at these two examples:

```
<person sex="female">          // Attribute
<firstname>Anna</firstname> // Sex inf. to 'person'-tag
<lastname>Smith</lastname>
</person>
```

-
```
<person>                       // Element
<sex>female</sex>                 // Sex separate tag
<firstname>Anna</firstname>
<lastname>Smith</lastname>
</person>
```

- Both examples provide the same information.

- There are no rules about when to use attributes and when to use elements. But in general use elements **except** for metadata.

Valid XML Documents

- A "Valid" XML document is
  - "Well Formed" XML document
  - Conforms to a Document Type Definition (DTD):

- ```
  <?xml version="1.0" encoding="ISO-8859-1"?>
  <!DOCTYPE note SYSTEM "Note.dtd">
  <note>
  <to>Tove</to><from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
  </note>
  ```

- The DOCTYPE declaration in the example above, is a reference to an external DTD file.
  ```

XML DTD (ex: note.dtd)

- The purpose of a DTD is to define the structure of an XML document. It defines the structure with a list of legal elements:
- ```
  <!DOCTYPE note [
  <!ELEMENT note (to,from,heading,body)>
  <!ELEMENT to       (#PCDATA)>
  <!ELEMENT from     (#PCDATA)>
  <!ELEMENT heading (#PCDATA)>
  <!ELEMENT body     (#PCDATA)>
  ]>
  ```
- xxx+ ->1-many xxx* -> 0-many xxx? -> 0-1
- , -> and | -> or
  ```

XML Schema

- W3C supports an XML based alternative to DTD called XML Schema:
-
```
<xs:element name="note">
<xs:complexType>
 <xs:sequence>
  <xs:element name="to"      type="xs:string"/>
  <xs:element name="from"    type="xs:string"/>
  <xs:element name="heading" type="xs:string"/>
  <xs:element name="body"    type="xs:string"/>
 </xs:sequence>
</xs:complexType>
</xs:element>
```

Reading XML files

Example:

- To open config-file use:

```
XmlDocument configDoc = new XmlDocument();
configDoc.Load( " << configFileName >> ");
```

- To read a port number:

```
XmlNode xxNode =
configDoc.DocumentElement.SelectSingleNode("<NameO
fTag>");
if (xxNode != null)
{
    String xxStr = xxNode.InnerText.Trim();
    Int xx = Convert.ToInt32(xxStr);
}
```

Demo

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