



# X36DSV – 3. seminar

**XML**

(eXtensible Markup Language)

**JavaScript**

**AJAX**

(Asynchronous JavaScript and XML)



# XML

- subset of SGML (Standard Generalized Markup Language)
- describes only data (difference from HTML)
- multi platform data exchange
- 'text based'
- DTD, XML Schema, XSL (XSLT, XPath, XSLFO), XQuery, ...
- XML-RPC, SOAP, WDSL, ...



# XML - example

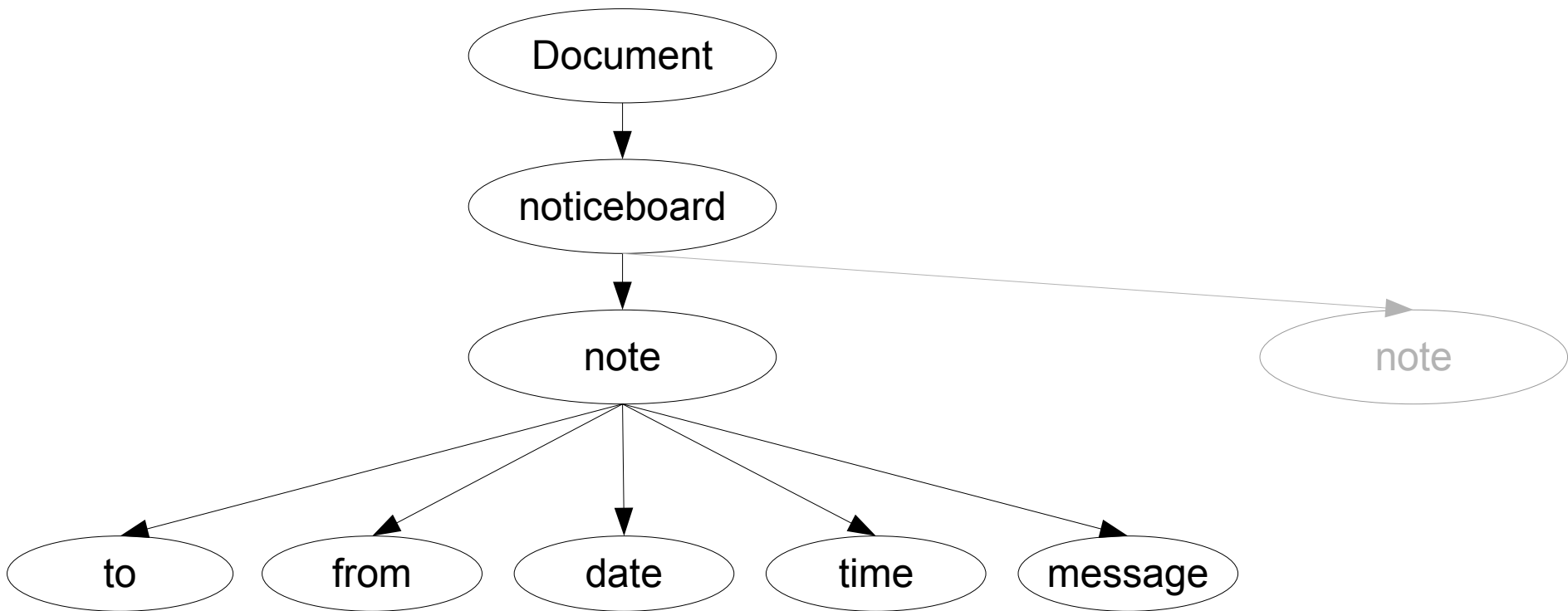
- **example:**

```
<noticeboard>
  <note priority="high">
    <to>System administrator</to>
    <from>Desperate user</from>
    <date>2000-01-01</date>
    <time>11:22:33.445-00:00</time>
    <message>What does it mean, ALL YOUR BASE ARE BELONG TO
US? And why it is in my text files instead of my own
data?</message>
  </note>
  <note>
    ... <another_node> ...
  </note>
</noticeboard>
```



# XML - DOM

## DOM – Document Object Model





# XML - DTD

- well-formed vs. valid
- DTD (Document Type Definition)
  - define XML document structure
  - Example:

```
<?xml version="1.0" encoding="UTF-8"?>
<!ELEMENT noticeboard (note+)>
<!ELEMENT note (to+, from, date, time, message)>
<!ATTLIST note priority (high | normal | low) "normal">
<!ELEMENT to (#PCDATA)>
<!ELEMENT from (#PCDATA)>
<!ELEMENT date (#PCDATA)>
<!ELEMENT time (#PCDATA)>
<!ELEMENT message (#PCDATA)>
```



# XML - XMLSchema

- XML Schema

- newer standard for defining XML document structure
- Example:

```
<xs:element name="noticeboard">
  <xs:annotation>
    <xs:documentation xml:lang="en">root element</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="note" maxOccurs="unbounded">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="to" type="xs:string"/>
            <xs:element name="from" type="xs:string"/>
            <xs:element name="date" type="xs:date"/>
            <xs:element name="time" type="xs:time"/>
            ...
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```



# XML - XPath

- used for element selection
- Examples
  - predicates
    - `//note[@priority='high']`
  - wildcards (\*)
  - operation AND (|)
  - relation
    - `child, parent, descendant, ...`
  - ...



# XML - XSLT

- transformation styles for XML documents
- Xpath is used for elements selection
- it can change elements, add elements, sort elements,  
...





# XML – XSLT example

```
<xsl:template match="/">
  <html>
  <body>
    <h2>My messages</h2>
    <table border="1">
      <tr bgcolor="#9acd32">
        <th align="left">To</th>
        <th align="left">From</th>
      </tr>
      <xsl:for-each select="noticeboard/note">
        <tr>
          <td><xsl:value-of select="to" /></td>
          <td><xsl:value-of select="from" /></td>
        </tr>
      </xsl:for-each>
    </table>
  </body>
</html>
</xsl:template>
```



# Javascript

- similar to Java
- bound on clients workspace (browser)
- simply - functions operating with DOM in HTML
- [http://developer.mozilla.org/en/docs/Core\\_JavaScript\\_1.5\\_Reference](http://developer.mozilla.org/en/docs/Core_JavaScript_1.5_Reference)



# Javascript - example

```
function checkIt(v) {  
    if (v==1) {  
        var count=0;  
        if (document.f1.c1.checked) count++;  
        if (document.f1.c2.checked) count++;  
        if (document.f1.c3.checked) count++;  
        document.f1.p1.checked=(count==3);  
    } else if (v==2) {  
        document.f1.c1.checked=document.f1.p1.checked;  
        document.f1.c2.checked=document.f1.p1.checked;  
        document.f1.c3.checked=document.f1.p1.checked;  
    }  
}
```

Parent:

Child 1

Child 2

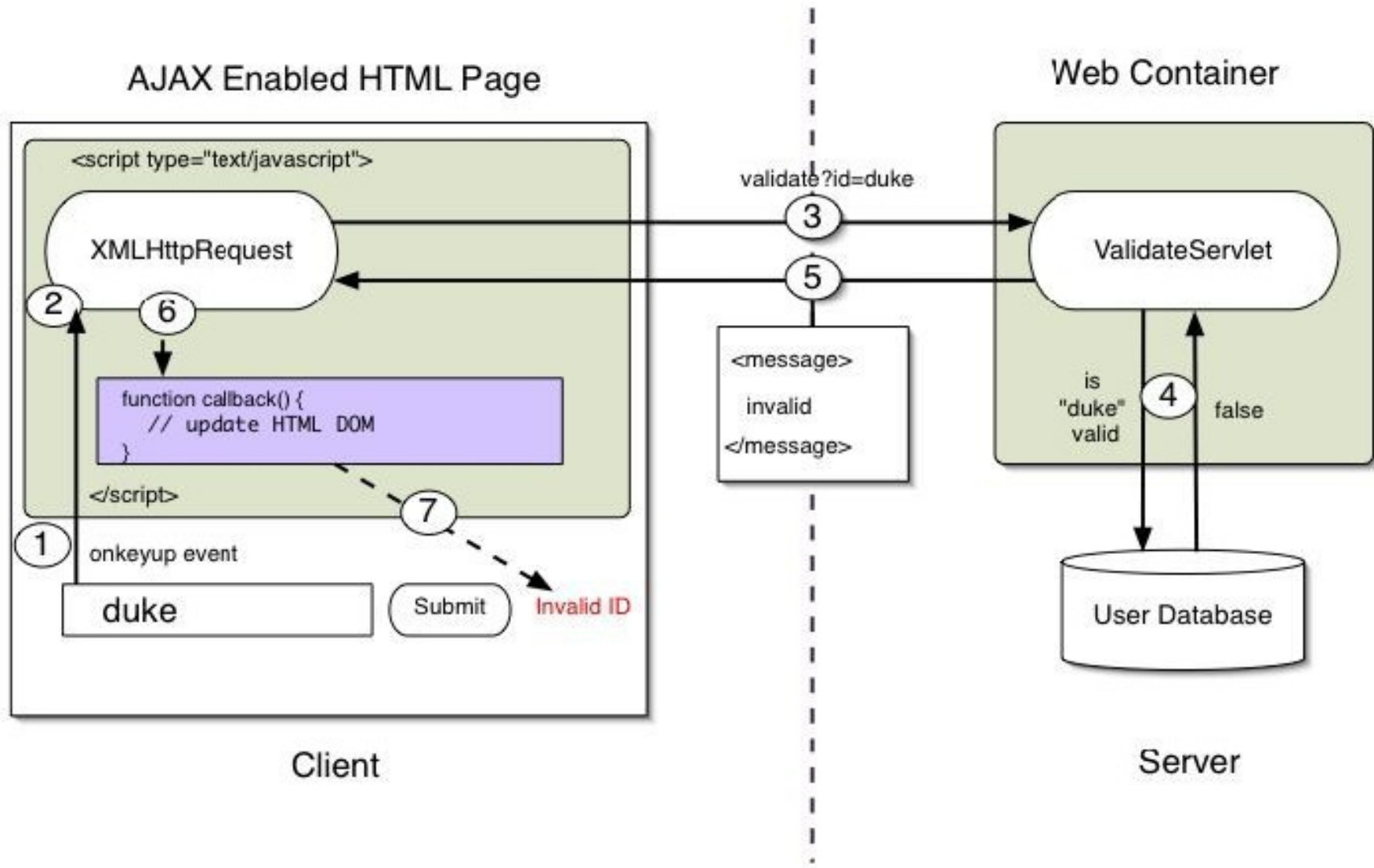
Child 3



# AJAX

- web application enhancement
- examples
  - <http://mapy.cz>
  - <https://www.youos.com/>
- possibility of partial DOM renewal/reread

# AJAX - interaction





# AJAX

- disadvantages
  - complex design
  - unnormalized object XMLHttpRequest
  - dependency on JavaScript
    - security, unnormalization, explicitly visible source, ...
  - problematic debugging



# XML - Java

- DOMParser vs. SAXParser
- Interfaces
  - org.w3c.dom.Node
    - appendChild()
    - getNextSibling()
    - getChildNodes()
    - getFirstChild()
    - getNodeName()
    - getNodeValue()
  - org.w3c.dom.Element
  - org.w3c.dom.Document



# XML - Java

- Class
  - `javax.xml.parsers.SAXParser`
    - `startDocument()`
    - `endDocument()`
    - `startElement()`
    - `endElement()`
    - `characters()`
    - ...





# XML - materiály

- <http://www.w3schools.com>
- <http://www.w3.org/>
- <http://java.sun.com/developer/codesamples/xml.html>