4.
XML Namespaces
XPath

PB138

Shortcuts

- attribute::   ->   @
- descendant-or-self   ->   //

find last element in third level of XML tree of the document (nodetest *)

XPath predicates

- **AXIS::NODETEST[predicate]**
  - position()=1
  - position=last()
  - you can use **or**, **and**
- find full_address of Steven Segal
- find phones of Jirka Novák and Segal
- Find name of the Person living on street 'Uvoz 22'

Node sets and Union

- **count(***nodeset***)** counts number of nodes
- *nodeset | nodeset* creates union of nodesets
- count number of phone elements and person elements together
- number of phones that contain number sequence "77" use **contains(string, string)**

XPath + namespaces

● XPath evaluator always assumes no namespace

```
XPath.setNamespaceContext(new
NamespaceContext() {
   @Override

   ....
```

XmlSchema

- xmllint --schema mySchema.xsd

Schema Parts

- Elements <xs:element...
- Element **may have** Simple Type   <xs:simpleType
    - contain only kind of text
    - contain numbers
    - contain regex restrictioned
- Element **may have** Complex Type <xs:complexType
    - contain other elements
    - contain attributes
    - contain text

Elements

```
<xs:element  name="jmeno" type="xs:string"/>
```

● Define messages element in your XSD

Complex Types

- Element is of Complex type when it may contain other elements
- <xs:complexType name="....">
- may contain **sequence** of elements **(all, choice....)**
  - minOccurs
  - maxOccurs
- Create a message subelements

Elements with Elements

- What is a mixed element type?
- Element has only attributes but no text. What kind of type is that?

```
<xs:complexType name="messagesType">
    <xs:sequence>
        <xs:element .....
    </xs:sequence>
</xs:complexType>
```

Simple Types

- We may specify precisely by inheritance
  - name is special type of string
  - date is special type of string
  - positive integer is special type of string

```
<xs:simpleType>
  <xs:restriction base="xs:string>
    ......
```

Simple Types Enumeration

```
<xs:enumeration value="xyz"/>
```

Elements with Attributes

- What kind of type they have? Simple or Complex?

```
<xs:complexType>
  <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute
        <xs:attribute
```

Attributes Type

- define types of **channel** (enumeration) and **sent** (regex)

Message has Header and Body

- add Header and Body elements instead of text!

What else is XML schema?

- Defining uniqueness (we need XPath)
- Element/Attribute groups
- Unions
- References
- Includes/Imports
- Annotations

Next Time

- xs:key, xs:unique