XPointer and XLink

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XML Processing

Context

- XML adds new capabilities to documents on the World Wide Web
- These capabilities will not be immediately apparent to end users as it will be some time before servers and browsers implement the capability
- The XML Pointer Standard defines a mechanism for locating a point or region within an XML document
- The XML Linking Language (XLL) provides a new set of capabilities for links between documents

Overview

- XPointer
  - Points
  - Regions
  - Sets of regions
- XLink
  - Simple Links
  - Extended Links
**XPointers**

- Path information allows a link to be made to a specific location within a document using XPointer.
- Xpointer extends the capabilities of URI, URL, URN, and fragment identifier.
- In some ways, XPointer is a shell for Xpath.
  - consider the following url:
    - http://www/c/g/xyz.xml#xptr(/mydoc/chap[3])

**The Uses of XPath**

- Having XPath, the question is why all this functionality.
- In the remaining slides we address two standards that define application functionality built upon XPath.
- XPointer is a way of identifying a location within an XML document. We will cover most of what is defined for XPointer.
- XSLT is used to match, select, choose, and filter sets of nodes from an input document passed to an output document. XSLT is a very complex standard, and we will only overview it here.

**XPointers**

- Under html, a reference to a part of a document – a fragment could be made using the following:
  - `<A NAME = "SOMEPLACE">some info</A>`
  - `<A HREF = "#SOMEPLACE">anchor to “info”</A>`
- XPointer allows a link to be made to a specific location within a document using XPath.
- Any of the XPath specifications could be used.
- For example, the following URL would point to the third chapter within doc:
  - http://abc.com/xyz.xml#xptr(doc/chap[3])
XPointer Options

- XPointer supports the use of "|" as well as "#" to separate the fragment identifier. The "|" implies that a conforming server would only return the fragment.

- XPointer allows absolute location specification using:
  - id(xyz) would locate the element in the tree with the specified id.
  - root() would locate the root element
  - html(xyz) would locate the element that contains the old style html named anchor

XPointer Options (continued)

- More interesting uses of XPointers involve the specification of relative locations
  - #root().child(6,ITEM) would select the 6th ITEM element that is a child of the root – if one exists.
  - #root().descendant(3,BOOK) would select the third BOOK element that is a descendant of root – i.e., anywhere in the tree

- Similarly, ancestor looks up the tree, preceding and following look at preceding and following nodes in a list

- Finally psibling and fsibling look at the preceding and following sibling nodes

Still More XPointer Options

- Each of the operations (child, preceding, etc.) allows for two arguments in the form child(number, NAME).
  - If only a number is presented, that node, regardless of type is selected
  - If only a name is presented, all those elements, regardless of position are selected

- Where the name is placed, node type may also be used where the types allowed include: #text, #comment, #cdata, #element, #pi, #all

- In reality, a third and fourth argument are allowed specifying attribute name and value
Strings

- A specific string or set of strings can be identified using the form:
  - `#string(1, "Hello")` which targets the first occurrence of the string `Hello`. This would target the position right before the H in `Hello`.
  - `#string(3, "Hello", 5)` targets the position 5 characters after the position before the third `Hello`, i.e. right after the o.
  - `#string(1, "Hello", 1, 5)` would target the first "Hello"
  - `#string(200,"",1,100)` would target the characters from 200-300
  - `#string(all, "Pitt")` would target all instances of "Pitt"

Spans

- A span of text can be specified using the keyword `span`
  - `#root().span(child(1), child(3))` would span the text from the first to the third child of the root node.
The XML Linking Language (XLL)

- XLL provides more linking capability
- Simple linking, like that in HTML, would look as follows:
  - `<citation xlink:type="simple" xlink:href=URL>text</citation>`
- Use of the xlink attributes requires the xlink namespace:
  - `<rootname xmlns:xlink="http://www.w3.org/XML/Xlink/0.9">`

XLINK Attributes

- The definition of XLink allows a variety of different link types to be developed.
- Many of these are defined by the `show` attribute of xlink: `xlink:show` may be set to the following values:
  - "replace" does what we see on the WWW
  - "new" causes a new window to be opened
  - "parsed" causes the href to be parsed and included
- Another attribute of xlink is `actuate` which can take the following values:
  - "user" indicates that traversal is based on user action
  - "auto" specifies that traversal should be automatic
Extended Links

- Extended links include links that make use of the locator element
  - `<mylink xlink:type="extended">`
    - `<locator xlink:type="locator" xlink:href="url" xlink:role="type of link">`
    - `<locator xlink:type="locator" xlink:href="url" xlink:role="type of link">`
  - `</mylink>`

- Link groups allow sets of documents to be linked together
  - Behavior and processing of these is undefined
  - `<xlink:group>`
    - `<xlink:document href="url"/>`
    - `<xlink:document href="url"/>`
    - `<xlink:document href="url"/>`
  - `</xlink:group>`

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  - <xlink:group>
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