

# XPointer and XLink

Michael B. Spring  
Department of Information Science and Telecommunications  
University of Pittsburgh  
spring@imap.pitt.edu  
<http://www.sis.pitt.edu/~spring>

---

---

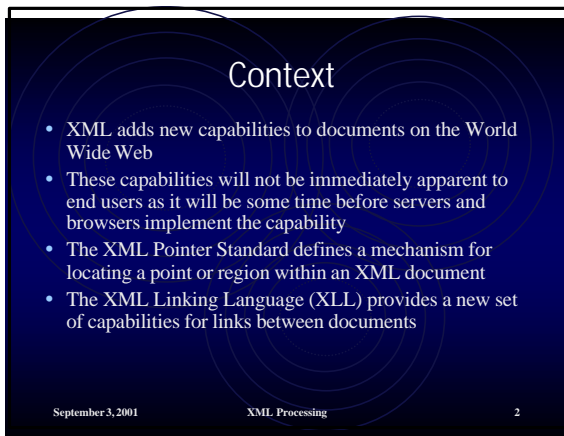
---

---

---

---

---



## 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

September 3, 2001 XML Processing 2

---

---


---

---

---

---

---



## Overview

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

September 3, 2001 XML Processing 3

---

---

---

---

---

---

---

## 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\[3\]](http://www/c/g/xyz.xml#xptr/mydoc/chap[3])

September 3, 2001

XML Processing

4

---

---

---

---

---

---

---

## 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.

September 3, 2001

XML Processing

5

---

---

---

---

---

---

---

## 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\[3\]](http://abc.com/xyz.xml#xptr/doc/chap[3])

September 3, 2001

XML Processing

6

---

---

---

---

---

---

---

## 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

September 3, 2001

XML Processing

7

---

---

---

---

---

---

---

---

## XPointer Options (continued)

- More interesting uses of XPointers involve the specification of relative locations
  - `#root().child(6,ITEM)` would select the 6<sup>th</sup> 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

September 3, 2001

XML Processing

8

---

---

---

---

---

---

---

---

## 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

September 3, 2001

XML Processing

9

---

---

---

---

---

---

---

---

## 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"

September 3, 2001 XML Processing 10

---

---

---

---

---

---

---

---

## 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.

September 3, 2001 XML Processing 11

---

---

---

---

---

---

---

---

## Spans

September 3, 2001 XML Processing 12

---

---

---

---

---

---

---

---

# XLINK

September 3, 2001
XML Processing
13

---

---

---

---

---

---

---

---

## 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">`

September 3, 2001
XML Processing
14

---

---

---

---

---

---

---

---

## 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

September 3, 2001
XML Processing
15

---

---

---

---

---

---

---

---

## 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>`

September 3, 2001

XML Processing

16

---

---

---

---

---

---

---

---

## XLINK

September 3, 2001

XML Processing

17

---

---

---

---

---

---

---

---

## 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">`

September 3, 2001

XML Processing

18

---

---

---

---

---

---

---

---

## 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

September 3, 2001

XML Processing

19

---

---

---

---

---

---

---

## 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>`

September 3, 2001

XML Processing

20

---

---

---

---

---

---

---

## 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]`

September 3, 2001

XML Processing

21

---

---

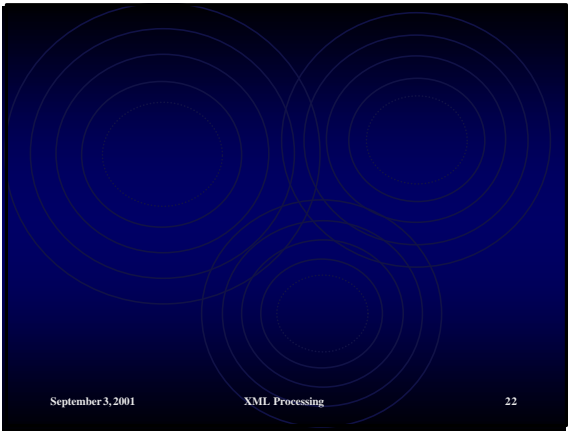
---

---

---

---

---



---

---

---

---

---

---

---