XML Namespaces

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The Problem

- Documents use different vocabularies
  - Example 1: CD music collection
  - Example 2: online order transaction
- Merging multiple documents together
  - Name collisions can occur
    - Example 1: albums have a <name>
    - Example 2: customers have a <name>
  - How do you differentiate between the two?

The Solution: Namespaces!

- What is a namespace?
  - A syntactic way to differentiate similar names in an XML document

- Binding namespaces
  - Uses Uniform Resource Identifier (URI)
    - e.g. "http://example.com/NS"
  - Can bind to a named or "default" prefix

Namespace Binding Syntax

- Use "xmlns" attribute
  - Named prefix
    - e.g. <a:foo xmlns:a='http://example.com/NS'/>
  - Default prefix
    - e.g. <foo xmlns='http://example.com/NS'/>
- Element and attribute names are "qualified"
  - URI, local part (or "local name") pair
    - e.g. { "http://example.com/NS" , "foo" }

Example Document (1 of 3)

- Namespace binding

```
01    <?xml version='1.0' encoding='UTF-8'?>
02    <order>
03      <item code='BK123'>
04        <name>Care and Feeding of Wombats</name>
05        <desc xmlns:html='http://www.w3.org/1999/xhtml'>
06          The <html:b>best</html:b> book ever written!
07        </desc>
08      </item>
09    </order>
```

Example Document (2 of 3)

- Namespace scope

```
01    <?xml version='1.0' encoding='UTF-8'?>
02    <order>
03      <item code='BK123'>
04        <name>Care and Feeding of Wombats</name>
05        <desc xmlns:html='http://www.w3.org/1999/xhtml'>
06          The <html:b>best</html:b> book ever written!
07        </desc>
08      </item>
09    </order>
```

Example Document (3 of 3)

- Bound elements

```
01    <?xml version='1.0' encoding='UTF-8'?>
02    <order>
03      <item code='BK123'>
04        <name>Care and Feeding of Wombats</name>
05        <desc xmlns:html='http://www.w3.org/1999/xhtml'>
06          The <html:b>best</html:b> book ever written!
07        </desc>
08      </item>
09    </order>
```

Important Points

- Namespace "scope" is the element and descendents from point of binding
- Attributes are **not** in element's namespace
  - Unless implicitly prefixed
- Can **not** unbind named prefixes
  - However, you *can* unbind default prefix

Using Namespaces with DTDs

- The problem
    - DTD syntax does not support namespaces
- The solution
    - Use a namespace-aware schema language
    - Use parameter entity "trick" to add simple namespace support to existing DTDs

Parameter Entity Trick: Step 1

- Define parameter entities
  - Prefix, suffix, and xmlns parameter entity

```
01 <!ENTITY % prefix ''>

02    <!ENTITY % suffix ''>
```

  - Xmlns parameter entity

```
03 <!ENTITY % xmlns 'xmlns%suffix;'>
```

Parameter Entity Trick: Step 2

- Define element name parameter entities
  - One for every element name in grammar

```
04  <!ENTITY % order '%prefix;order' >
05      <!ENTITY % item '%prefix;item'>
06      <!ENTITY % name '%prefix;name'>
07      <!ENTITY % price '%prefix;price'>
```

Parameter Entity Trick: Step 3

- Modify all element declarations to reference element names by parameter entity

```
08  <!ELEMENT %order; (%item;)+>
09      <!ELEMENT %item; (%name;,%price;)>
10      <!ELEMENT %name; (#PCDATA)>
11      <!ELEMENT %price; (#PCDATA)>
```

Parameter Entity Trick: Step 4

- Declare namespace binding attribute for all possible root elements

```
12 <!ATTLIST %order; %xmlns; CDATA 'http://example.com/NS'>
```

Add Namespace Information to Existing, Un-prefixed Documents

- Existing documents gain namespace info

```
01 <?xml version='1.0' encoding='EBCDIC'?>
02 <!DOCTYPE order SYSTEM 'grammar.dtd'>
03 <order>
04   <item code='BK123'>
05     <name>Care and Feeding of Wombats</name>
06     <price currency='USD'>42.00</price>
07   </item>
08 </order>
```

Use New Prefix with Same DTD

- Redefine prefix, suffix in DTD internal subset

```
01 <?xml version='1.0' encoding='EBCDIC'?>
02 <!DOCTYPE a:order SYSTEM 'grammar.dtd' [
03      <!ENTITY % prefix 'a:'>
04      <!ENTITY % suffix ':a'>
05    ]>
06 <a:order xmlns:a='http://example.com/NS'>
07   <a:item code='BK123'>
08   <!-- ... -->
```

Useful Links

- XML 1.0 Specification
    - http://www.w3.org/TR/REC-xml
- Namespaces in XML Specification
    - http://www.w3.org/TR/REC-xml-names

- XHTML 1.0 Specification
    - http://www.w3.org/TR/xhtml1

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