XML Schema for WIRED

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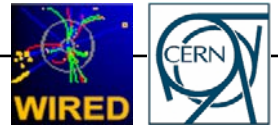

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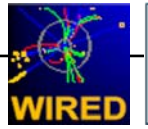
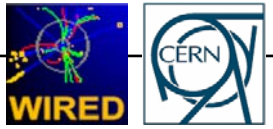


Features (basic)

- **A better DTD, written in XML**
  - There is both a DTD and an XSD (recursive) for XML Schema
- **Basic Concepts**
  - Types
    - simpleType: boolean, float, double, string, enumeration, ...
    - complexType: may contain primitives and other elements
    - reuse simpleType and complexType to type elements and attributes
  - Annotations, Versions and Comments
  - Groups of elements or attributes
    - one of many
    - all, in order

Features (advanced)

- **Advanced Concepts**
  - Organization
    - Schema inclusion
    - Import of types (from other schema)
    - Schema location
  - Types
    - Cardinality on elements and attributes
    - Derived Types (Inheritance)
      - by extension
      - by restriction
    - Equivalence of types
    - Abstract Elements
  - Other
    - Uniqueness of elements or attributes
    - Keys and references



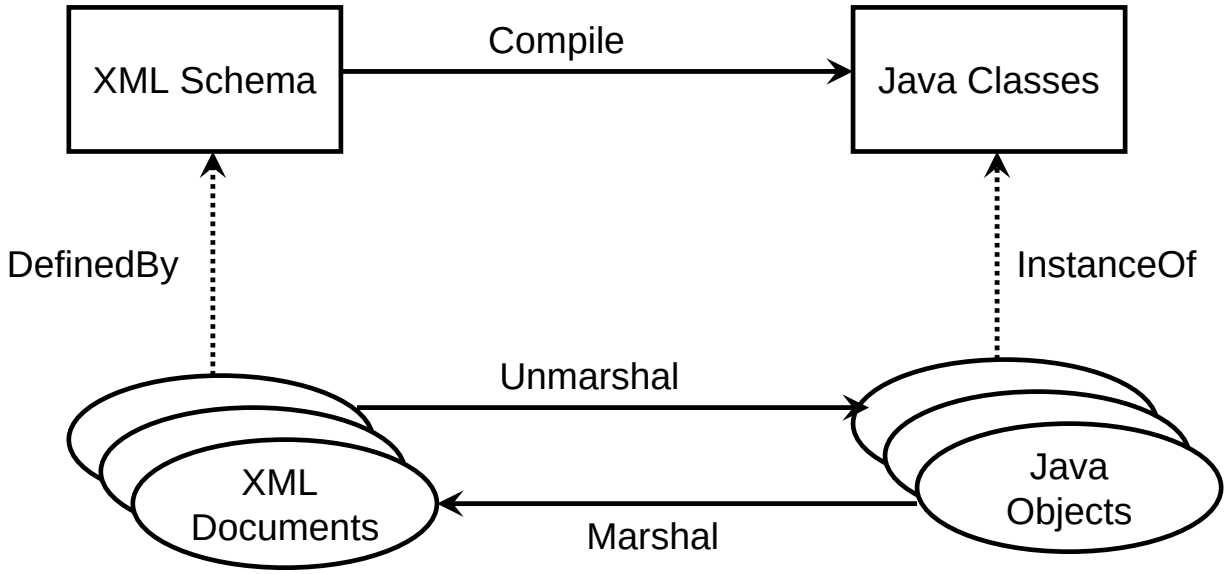
Tools

- Any XML Editor will be able to edit XML Schema
- IBM Visual XML Tools provide a DTD->Schema converter (as a first start)
- Same toolset currently has DTD visualization tools, which may migrate to XML Schema
- Same toolset can convert DTD in set of Java Classes (see next slide)

XML-Data Binding

- **Today using DTD / Schema:**
  - Define a DTD / Schema
  - Write/generate XML
  - Use a SAX or DOM parser
  - Write a set of Classes for your model
  - SAX: Write code to handle elements and attributes and build objects
  - DOM: Write code to browse tree and build objects
- **Sun proposes XML-Data Binding Facility (July 1999)**
- **Java Beans Persistency proposed recently**

XML-Data Binding



- **Schema Compiler**
  - Compiles XML Schemas into a set of Classes
- **Marshalling Framework**
  - Internally uses SAX/DOM parser
  - Unmarshals a set XML documents into a set of objects
  - Marshals a set of objects into a set of XML documents

Current Status and Implementation

- **XML Schema Standard (Datatypes and Structures)**
  - Defined at the World Wide Web Consortium
  - Proposed Recommendation, since Dec 1999
  - Most recent public draft: 25 Feb 2000
- **XML Schema Implementation**
  - Xerces-j 1.0.3 (xml4j, java version)
    - implements the latest standard
    - some exceptions:
      - Unique, key and key ref no supported
      - limitations on Inheritance
      - elements, types, … in same namespace
  - Xerces-c 1.1.0 (xml4c, c++ version)
    - does NOT yet implement XML Schema

Conclusions

- **WIRED is based on:**
  - It's own Loader
  - One namespace for all the elements
  - Multiple DTD's, with some tricks to load them
  - Our own key keyref implementation
  - A small pre-SAX Parser
- **XML Schema will provide WIRED with:**
  - Separate namespaces
  - Multiple XSD's, which load properly
  - Type checking on all the input
  - A standard key keyref implementation
- **XML-Data Binding should:**
  - Get rid of the parser and loader
  - Replace those with a generic one