



Xbean Distributed Applications

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Distributed Applications

- XML data need to be *processed, communicated and shared.*
- An application that communicates and processes XML between computers is in fact, a *distributed application.*



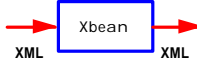
Outline

- XML and distributed applications
- Xbeans defined
- Xbean channels
- Xbeans as Java Beans
- Example Xbeans
- XML over the wire
- Xbeans.org




Xbean

- Java Bean that consumes XML, processes it and passes it on.




- Inspired by IBM's XML Productivity Kit for Java:
 - Distributed application focus
 - Open source project



XML

- Portable, vendor neutral, readable data format.
- **Lingua franca for data exchange**
 - Standards groups representing almost every human endeavor are agreeing upon DTDs for exchanging data.



Document Object Model

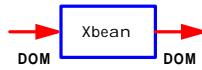
- Undesirable if every object processing XML had to parse it.
- W3C defined the Document Object Model (DOM).
- Standard application programmer's interface to XML data.
- Most XML parsers produce a DOM representation of the parsed XML.

Xbean Distributed Applications

More precisely ...



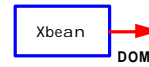
An Xbean is a Java Bean that consumes a DOM document, processes it and passes it on.



Source Xbeans



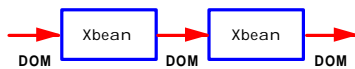
- An Xbean that produces a DOM document.



Xbean Channels



- Xbeans are connected together to form applications.

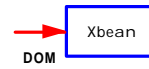


- Like a distributed UNIX pipe with tagged data.

Sink Xbeans



- An Xbean that consumes a DOM document.

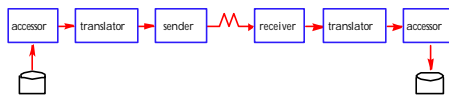


- Most Xbeans are both sources and sinks.

Example Distributed Application



- Data Exchange



Generic Xbeans

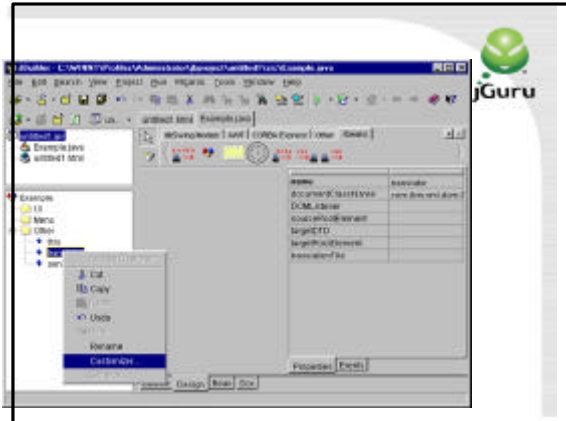


- A generic Xbean is an Xbean that will operate on any DOM document.
- The Java code does not statically depend on a particular DTD.

DTD Specific Xbeans



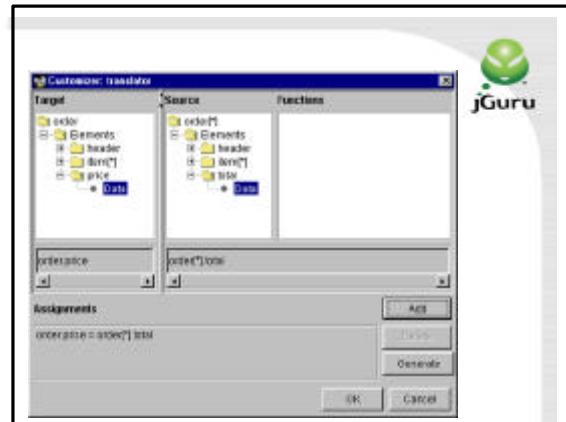
- An Xbean can be DTD Specific.
- The Xbean checks the document type.
- The Java code is written to operate on a document supporting a particular DTD.



Customized Xbeans



- A customized Xbean is a generic Xbean that is customized at *design time* to be a DTD specific Xbean.
- The code is written generically but at runtime it operates on documents supporting particular DTDs.



Xbeans are Java Beans



- **Configured using:**
 - Property editors
 - Customizers
- **Distributed Applications are created in a Java IDE**
 - Often without any additional programming

Some Xbeans



- data access
- translator
- sender – receiver
- viewer
- parser
- writer

Some Xbeans



- parallelizer
- synchronizer
- timer
- meter
- logger

Plus many more yet to be invented Xbeans!

Two DOM Representations



- XML as text
- Serialized DOM implementation

XML Over the Wire



Sender and receiver Xbeans *abstract the communication of XML "over the wire"*.



Http, XML Text



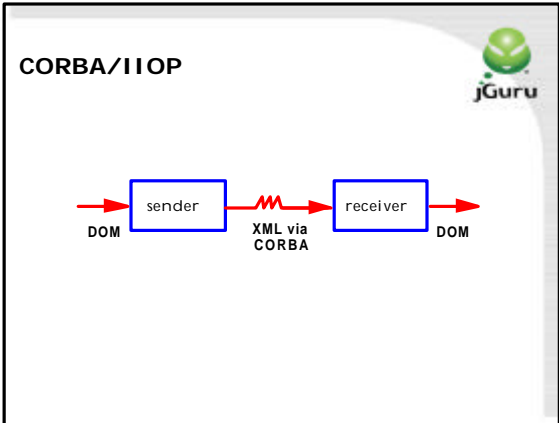
Three Transports



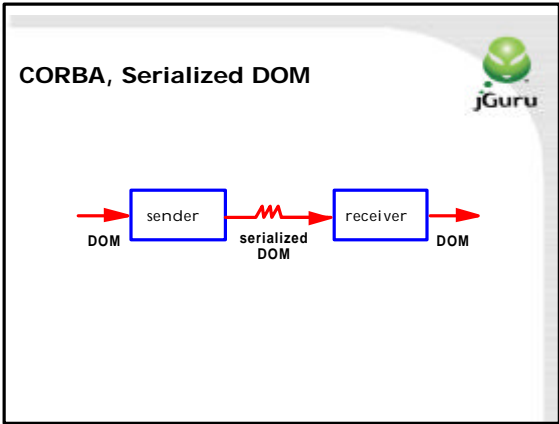
- Http
- RMI
- CORBA

RMI, Serialized DOM





- ### Performance Analysis
- Space XML text vs. serialized DOM
 - Time to write DOM and reparse vs. Java serialization and deserialization of DOM
 - Purchase order DTD
 - Typical ecommerce application
 - Grew number of orders
 - JavaWorld article presents results in detail.



Space Results

Number of orders	Bytes to represent as XML text	Bytes to represent as serialized DOM	Ratio (serialized / text)
1	1,048	7,278	6.9
5	4,900	29,310	5.9
10	9,715	56,850	5.9
100	9,6385	552,570	5.7
500	481,585	2,755,770	5.7

Analysis

	Http	RMI	CORBA
Space	+		
Time	+		
Ubiquity of Infrastructure	+		
Programming and execution model		+	+
Interoperability	+		+

Timing Results

Number of orders	Milliseconds to write and reparse DOM	Milliseconds to serialize & deserialize DOM	Ratio (serialize / parse)
1	191	478	2.5
5	199	534	2.7
10	231	603	2.6
100	862	2228	2.6
500	4707	10107	2.1

Xbean Distributed Applications

Xbeans.org



- **Open source project**
- **First release available:**
 - sender/receiver for http, rmi, corba
 - timer
 - memory meter
- **Next release of Prof. Volker Turau's DB2xml will be an Xbean – data access**
- **Looking for contributors:**
www.xbeans.org

Questions

