



Engenharia de Dados e Conhecimento

XML DATABASES



- Why do I need to store XML in a database?
- Because a lot of information exchanged by systems is in XML format.
So, it's very reasonable to save that information as it is.
- Advantages
 - It spares time by no need of processing and transforming data
 - Support of backups, transactions, etc.
- Disadvantages
 - Format of store (more size)
 - (In)compatibilities with traditional RDBMSs



- How to store XML structured information?
- Four distinct ways:
 - Relational DB, storing the “text/xml” data in a table field as a string
 - Relational DB with internal schema parsing
 - Native XML Database (NXD)
 - Files System



- Allows to use functionalities from traditional RDBMs
- It hasn't efficient mechanisms to search and update the XML data
- It's a "forcing" solution for DBs
- Examples
 - MySQL



- Each DBMS process the information from the XML Schema and creates an internal representation of the XML structure
- If there isn't any schema, the representation is created according to the XML documents



- Advantages
 - Can consume XML data
 - Allows XQuery queries, resulting in sets of nodes and not in sets of registers
 - Validates the operations, in concordance with the XML Schema (if it exists)
- Disadvantages
 - Architecture dependent
 - Requires conversion from XQuery to SQL or internal mechanisms
- It's an adaptation from the RDBM model



- Examples of RDBs
 - SQL Server 2005 +
 - Oracle 9i +
 - PostgreSQL 8+
 - ...



- Advantages
 - Input, output and stored formats are all the same
 - Supports transactions
 - Validation according with XML Schema
 - Very good performance
- Disadvantages
 - Systems created from ground
 - Still don't have the trust of the well established RDBMs



- Examples of NXDs
 - BaseX
 - eXist
 - Sedna
 - Berkeley DB (Oracle)
 - EMC xDB
 - MarkLogic Server
 - ...



- Advantages
 - Input, output and stored formats are all the same
 - Very fast access to information
- Disadvantages
 - Doesn't support transactions, concurrency, ...
 - Need of external tools to search and update
 - Doesn't support validation



| | NXD | XEnDB | Files System |
|------------------------------|--|---------------------------------------|---------------------|
| Transactions | Yes | Yes | No |
| XML Insert | Direct insertion or light conversion to internal structure | Conversion to relational structure | Direct insertion |
| XML Retrieve | Direct retrieve | Conversion from relational to XML | Direct retrieve |
| XML Update | XQuery/XUpdate | SQL or Converted XQuery/XUpdate | File replace |
| XML Queries / Indexes | Yes | Yes | External tool |
| XML Document in-out | Generally YES | No / Can be | Always |