

## ZAPTHINK ZAPNOTE™

### NEOCORE *PATTERN-BASED NATIVE XML DATA STORAGE*

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#### Abstract

Rather than being forced to map XML documents to an alternate data representation format or insert an entire XML document into a single field as is the case with XML-enabled RDBMS, the Native XML Data Store (NXD) can accept XML documents for storage and retrieval without any modifications, mapping, or transformations. NeoCore provides a patented NXD approach that assigns a unique fingerprint called an "icon" to each XML document and then applies hashing and storage techniques to these iconic representations. This approach allows the user to experience speed and indexing improvements over other methods of XML storage and retrieval and exploits XML structure by self-constructing the data store, reducing development time.

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## Native XML Data Storage

Emerging from roots in SGML, HTML, text, object-oriented, and hierarchical storage roots comes a new category of XML storage solution: the "Native" XML Data Store (NXD). Rather than being forced to map XML documents to an alternate data representation format or insert an entire XML document into a single field, the NXD can accept XML documents for storage and retrieval without any modifications, mapping, or transformations. The term NXD does not imply storage architecture, but rather implies that XML data can be stored without any explicit transformation, mapping, or manipulation. Basically, to the user it should seem as if they are simply inserting an XML document. Any mapping, transformation, or other manipulations must happen completely behind the scenes, invisible to the user.

Since an NXD doesn't specify any particular storage architecture, measurements such as system performance, footprint, and other such metrics cannot be construed as valid benefits of NXD systems. NXD systems can use hierarchical, object-oriented, file system, relational, and binary storage formats that exhibit highly variable performance metrics. As a result, the primary value of NXDs is not so much their performance, but rather their inherent understanding of XML capabilities. However, business users care about the overall effectiveness of the solution, not how the solution is accomplished. As such, the particular storage architecture is essentially irrelevant. It is measures such as implementation time, overall system performance, storage and processing footprint, among others that really matter.

NXDs' most valuable attribute is their ability to store arbitrary and highly variant XML documents. RDBMS systems require explicit mappings, and by their very nature are unable to deal with XML documents that have a highly variable structure and take advantage of XML's extensibility capabilities. **NeoCore** provides a patented XML data storage approach that assigns a unique fingerprint called an "icon" to each XML document and then applies hashing and storage techniques to these iconic representations.

## NeoCore XML Information Management System (XMS)

NeoCore's XML Information Management System (XMS) provides speed improvements over other Native XML data storage systems by virtue of its use of patented technology known as Digital Pattern Processing (DPP) and the Iconic Data Store. Rather than indexing and navigating an XML tree, the system uses a unique pattern-matching index that results in efficiency and performance gains. Instead of requiring that a path be named to a particular node, XMS can locate the document using its index and pattern matching capabilities. DPP is "pattern-centric", meaning that NeoCore XMS performs most internal operations through

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numerical operations, rather than examining the underlying data. Using DPP, XML documents, their component contents, and all indices are described in finite-width fields, unaffected by the length of tag names, element content, or document hierarchy. The system assigns a numeric value to each document without having to inspect the underlying data. As a result, index and storage requirements are dramatically reduced.

Even though the system maps a document using its pattern-recognition techniques, it is not document-centric, but rather focuses at the element level. As a result, XMS can insert, modify, and delete XML metadata structure as well as data contents. NeoCore XMS is schema-independent and can derive the structure of the data from XML documents at runtime. The system is a fully ACID transactional database and can be implemented in J2EE environments. Other features of NeoCore XMS include support for arbitrary XML documents, large collections of XML documents, user-defined document data management, GUI-based administration, and session control. The system extends the capabilities of XPath with Update and Delete capabilities with plans for enhanced support for XQuery in version 3.0.

NeoCore XMS is implemented as a bi-directional web server that accepts and returns XML documents and fragments via HTTP(S) – not quite Web Services, but very similar. This interface is wrapped by Java and C/C++ APIs to provide further programming flexibility. NeoCore XMS uses XPath as its main query means, and can perform insertions of XML fragments in a “fractional” manner into a middle portion of the document without using the DOM.

The system also has robust user management features to prevent unauthorized access to XML data. These user controls allow administrators to specify that certain users can only see XML documents with elements that contain a specific range of values, for example. NeoCore XMS has built-in access control to set permissions at the document or fragment level, and at user or group levels. To hide data entries, NeoCore XMS keys off of the content of an element in that entry, such as a company name or identifier value, which allows individual data elements to be hidden. Access control works across the entire command set, allowing users to insert, modify, delete, and view catalog contents or structure without affecting the content belonging to others. NeoCore XMS also supports access control by specifying IP addresses and supporting X.509 certificates.

## Competition & Alternatives

Competition is heating up for XML Data Storage technologies (see ZapThink XML Data Storage Technologies and Trends Report for more detail). The space roughly is split between XML-enabled RDBMS vendors such as **IBM**, **Microsoft**, and **Oracle**, and the NXD vendors including **Software AG (Tamino)**, **Excelon**, **Ipedo**, **IXIASoft**, **XML Global**, and many others. NeoCore competes in this latter category, but is differentiated by its architectural approach. Many of the above mentioned vendors have object-oriented, hierarchical, text-based, relational, or other means for data storage. NeoCore's novel and patented storage architecture and focus on data index and retrieval speed and efficiency set it apart from the competition.

## Key Conclusions & Recommendations

- NeoCore's unique approach of using a pattern-based method for XML data storage and retrieval represents a compelling solution for vendors looking for robust, efficient, and fast XML data storage and retrieval.
- The market for XML data storage and retrieval is becoming increasingly crowded, and as such NeoCore will need to differentiate their product with additional value-added services or seek greater integration and OEM arrangements with other, complementary technology offerings.

- As XML standards continue to emerge for XML data storage and retrieval (such as XQuery and XUpdate), NeoCore will seek to add these capabilities to their system.

| Profile: NeoCore  | (March 2002) |
|---|--------------|
| Date Founded: 1997  |              |
| Funding: Privately-held, Venture-Backed:<br>Baker Capital, Wit SoundView          |              |
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| Employees: N/A  |              |
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## Related Research

- *XML Data Storage Technologies and Trends* Report (ZTR-ST101)
- *Web Services Technologies and Trends* Report (ZT-WEBSRV)
- *B-Bop* ZapNote (ZTZN-0204)
- *Coherity* ZapNote (ZTZN-0144)
- *Excelon* ZapNote (ZTZN-0205)
- *Infonyte* ZapNote (ZTZN-0124)
- *Ipedo* ZapNote (ZTZN-0151)
- *Software AG Tamino* ZapNote (ZTZN-0116)
- *X-Hive* ZapNote (ZTZN-0200)
- *XAware* ZapNote (ZTZN-0154)
- *XYZFind* ZapNote (ZTZN-0117)

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ZapThink is an IT market intelligence firm that provides trusted advice and critical insight into XML, Web Services, and Service Orientation. We provide our target audience of IT vendors, service providers and end-users a clear roadmap for standards-based, loosely coupled distributed computing – a vision of IT meeting the needs of the agile business.

ZapThink's role is to help companies understand these IT products and services in the context of SOAs and the vision of Service Orientation. ZapThink provides market intelligence to IT vendors who offer XML and Web Services-based products to help them understand their competitive landscape and how to communicate their value proposition to their customers within the context of Service Orientation, and lay out their product roadmaps for the coming wave of Service Orientation. ZapThink also provides implementation intelligence to IT users who are seeking guidance and clarity into how to assemble the available products and services into a coherent roadmap to Service Orientation. Finally, ZapThink provides demand intelligence to IT vendors and service providers who must understand the needs of IT users as they follow the roadmap to Service Orientation.

ZapThink's senior analysts are widely regarded as the "go to analysts" for XML, Web Services, and SOAs by vendors, end-users, and the press. They are in great demand as speakers, and have presented at conferences and industry events around the world. They are among the most quoted industry analysts in the IT industry.

ZapThink was founded in October 2000 and is headquartered in Waltham, Massachusetts. Its customers include Global 1000 firms, public sector organizations around the world, and many emerging businesses. ZapThink Analysts have years of experience in IT as well as research and analysis. Its analysts have previously been with such firms as IDC and ChannelWave, and have sat on the working group committees for standards bodies such as RosettaNet, UDDI, CPExchange, ebXML, EIDX, and CompTIA.

Call, email, or visit the ZapThink Web site to learn more about how ZapThink can help you to better understand how XML and Web Services impact your business or organization.

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