Novell

DirXML

Reviewer's Guide

Quick Profile

Product:	*DirXML™*
Summary:	DirXML is data sharing and integration software. DirXML extends the data replication and synchronization capabilities of NDS eDirectory to other data sources such as user directories or databases, eliminating the isolation of data among various applications. It is flexible enough to accommodate any application, database or directory. As a data sharing service, DirXML and NDS eDirectory allow for centralized automation of business process data flow. Through rules and policies stored in NDS eDirectory, DirXML manages the flow of data, while preserving and enforcing the authoritative sources of that data. DirXML is event driven, so the changes to data are propagated through an environment in real-time.
Announce date:	September 27, 2000
Availability:	October 11, 2000
Key Benefits:	DirXML provides organizations that have user profile and access information in multiple applications and directories the ability to automatically and perpetually synchronize common data. There are numerous benefits of such a solution including more accurate control of access to applications and resources, lower cost of administration and management and streamlined integration with applications enabling eBusiness solutions and relationships.
Pricing:	DixXML is sold separately from NDS eDirectory. However, the purchase of DirXML includes eDirectory. It is currently only available as part of a Novell Consulting Services sale or through Novell Authorized Consulting Services Integration partners with price being determined as part of each integration project.
What's Included:	• NDS eDirectory • DirXML Join Engine • DirXML Driver Development Kit
Licensing:	NetWare Windows NT/2000, Linux, Solaris Corporate pricing (MLA, CLA and ALA) discounts apply Special pricing options for ISV/OEMs
Availability	• Through Novell Consulting Services • Currently through Novell Authorized Consulting Systems Integrator (CSI) partners, and mid-tier systems integrators and channel reseller partners (anticipated) by Spring 2001.
For Additional Information:	www.novell.com/products/nds/dirxml

Installation Requirements

Hardware Requirements

- Intel Pentium PC-based server, Sun Microsystems SPARC processor or Compaq Tru64 server
- If an Intel processor, then 64 MB of RAM (128MB recommended)
- If a Sun Microsystems SPARC processor, then 128MB
- If Linux running on any hardware, then 32MB or RAM (64MB recommended)

Software Requirements

- NDS eDirectory 8.5
- NetWare 5 with Support Pack 4 or above, or Windows 2000, or Windows NT, or Solaris, or Linux

Overview

One common and almost universal problem among today's enterprise companies is the proliferation of user profile information for access to different applications and resources. Applications, storage services, network services and even networked devices all rely on user databases (directories) to determine 'who has access to what'. In many cases, organizations have human or device profile information in human resource, accounting, network, specialized application and other repositories that is at a minimum redundant and often outdated or out of sync. As the number of access control databases increase, the job of management becomes exponentially more complex. Studies have found that in many large enterprises, profile information is kept in over 100 different data 'islands'. According to Forrester Research, only 8% of large corporations have these disparate data islands connected; 42% synchronize their data manually.

Novell has developed DirXML™ to eliminate this problem. Multiple applications and directories can be synchronized together to create a distributed network of consistent profile and application access information. Profile information for network access, accounting, human resources, specialized applications, Internet access, supply-chain networks, etc. can exist in native formats at different locations but still be shared and synchronized for any type of use. This makes it possible to change information in only one location and have it automatically updated in all associated systems.

DirXML is a dynamic, real-time data-sharing and integration service that runs on and extends the capabilities of NDS eDirectory. It combines state-of-the-art directory technologies with the common language of eBusiness, XML, to power secure cross-platform, cross-network information exchange. DirXML is flexible enough to accommodate any database, directory or application and includes the benefits of a true directory service with inheritance, scalability and system fault tolerance. DirXML includes a powerful join engine that enables synchronization of different directories using variable mapping schemas, definable business rules and based on specific directory events. Unlike today's typical 'meta-directory' offerings, DirXML offers robust features and functionality that make it an ideal solution for user/resource management. It not only provides a complete framework for enterprise profile management but enables companies to quickly pull together existing disparate user databases. Using DirXML, organizations can implement a 'virtual single directory' solution without having to 'rip and replace' or retrofit existing profile databases.

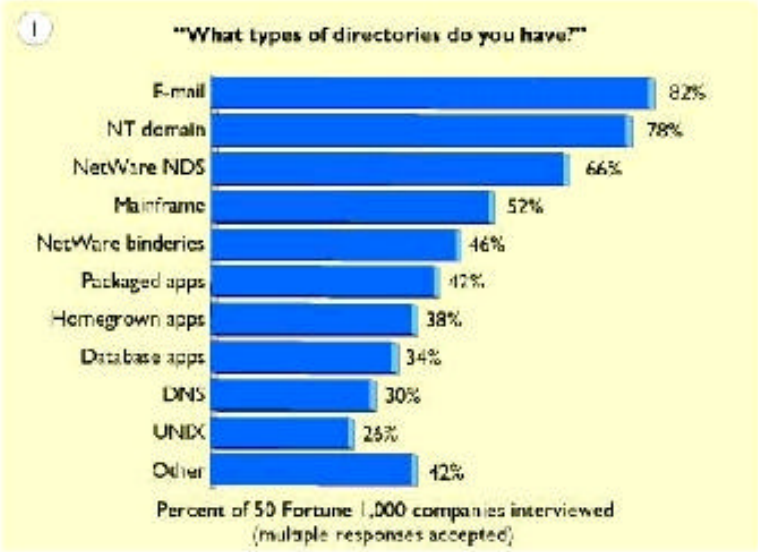
DirXML enables data owners to retain access authority to their own resources. The NDS eDirectory model accommodates the distribution of responsibility and access control authority to those departments and groups who own the data, applications or services.

Working with Novell's Consulting Services and Novell Authorized Consulting Service Integrators, companies can quickly and effectively establish an access control management system that simplifies profile management among disparate systems.

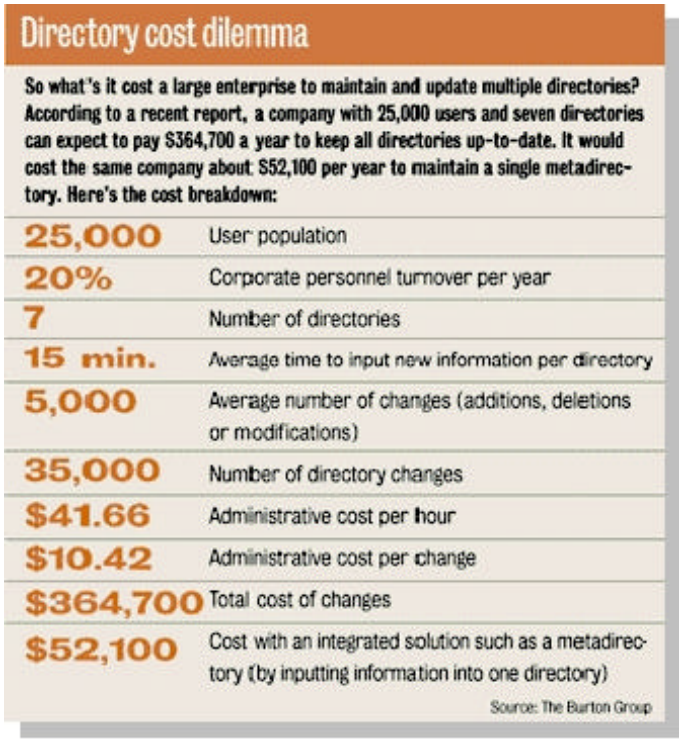
DirXML Market Facts

The problem of multiple, unsynchronized user databases (directories) has been growing increasingly difficult to handle--especially with the rise of the Internet and Web access to applications. The average corporation has over 100 disparate directories/databases that contain user profile information required for access and authentication to networks, applications and resources. According to Forrester Research, only 8% of large corporations have these disparate data 'islands' connected. Forty-two percent synchronize their data manually and the rest are generally working with multiple sets of redundant but inaccurate data, cumbersome tools or just don't synchronize directories at all.

Forrester also indicates that over half of those directories could contain customer information that when used with the Internet, could enable powerful and useful eBusiness applications.



The dollar cost of multiple, disparate directories has actually been calculated by the Burton Group, an analyst firm specializing in network management issues. Using a sample company with 7 directories and 25,000 users, the average cost of creating and modifying directory entries over a one year period is $364,700. With an integrated solution such as DirXML, these costs could be reduced to $52,100, a resulting cost savings of $312,600.



Directory cost dilemma

So what's it cost a large enterprise to maintain and update multiple directories? According to a recent report, a company with 25,000 users and seven directories can expect to pay $364,700 a year to keep all directories up-to-date. It would cost the same company about $52,100 per year to maintain a single metadirectory. Here's the cost breakdown:

25,000	User population
20%	Corporate personnel turnover per year
7	Number of directories
15 min.	Average time to input new information per directory
5,000	Average number of changes (additions, deletions or modifications)
35,000	Number of directory changes
$41.66	Administrative cost per hour
$10.42	Administrative cost per change
$364,700	Total cost of changes
$52,100	Cost with an integrated solution such as a metadirectory (by inputting information into one directory)

Source: The Burton Group

Using these same metrics to calculate the requirements for an enterprise-size corporation with 180 directories, management costs would be over $9 million and again could be reduced to $52K if the systems were integrated.

XML Concepts

In simplest terms, DirXML is a synchronization mechanism between different directories or databases. It takes changes in one directory and propagates to another making sure that the changed attributes are in synch. The methods used to make these changes are based on the open, industry data translation standard, eXtensible Markup Language (XML).

XML is a technology, or rather a technology specification, which provides a means for generically representing data that can be reused between applications. Some applications have a proprietary data format, others use open standards. XML is used as a bridge between all different data formats to ensure that data is understood across the entire network.

XML is vital to the exchange of information that often is in a different format or includes attributes that do not map directly across. For example, one directory may have fields for *first*

name, *last name* and *password*, while a second may have fields for *user ID*, *password* plus profile information such as *phone number, e-mail address* etc. XML enables the representation of relevant information between these two directories and a mapping ability to coordinate differently named fields.

The exchange of data is further made possible through the use of XSLT (eXtensible Stylesheet Language Transformations). XSLT is a language used to convert an XML document into another XML document or into HTML, PDF or some other format. Information in an XML file can be transformed into any other format such as Java Database Connectivity (JDBC), Active Directory Services Interface (ADSI) or an open directory format such as LDAP. The use of XSLT makes it possible to synchronize data from any directory to any other directory, database, application or device. DirXML also uses eXtensible Stylesheet Language (XSL). XSL is a language for expressing stylesheets and makes it possible to pre-define data formats so that the translation of data can be automated. An XSL processor converts data from one format to another using predefined format specifications.

A good way to think of XML is as a common language (a "lingua franca") that makes it possible for disparate systems to share data. According to Jamie Lewis of The Burton Group, "The eXtensible Markup Language (XML) provides a flexible language for defining content that carries its own application context. A 'self-describing' XML document or object can contain all the content and context that two dissimilar systems or applications need to ensure interoperability."

NDS Concepts

DirXML runs on top of Novell Directory Services' (NDS) eDirectory 8.5. Several characteristics of NDS make it the premier platform for aggregating the synchronization and management of multiple directories and databases.

First, NDS is the most proven and robust directory service available on the market with management of over 66 million users in the world's largest corporations. It's track record for security and stability is unmatched in the directory arena.

NDS is also architected to manage 'more' of 'anything'. Its hierarchical structure provides for the unique identification and classification of any type of resource including users, groups, services, devices, applications, connections, etc. This structure also facilitates the mapping and management of 'relationships' between resources. Individuals, for example, can be associated with groups, organizations, or individually be granted access to specific resources. Entire organizations can be granted/restricted access with one simple operation.

The NDS management paradigm is powerful and precise. Ownership and management responsibility can be widely distributed or it can be centrally contained. A common interface, which can be accessed from anywhere on the Internet, makes it possible to manage a wide range of resources from a single console.

NDS is also useful as a data repository for information other than user profiles. Because of its 'object oriented' nature, NDS is useful as a database for all types of object and attribute information. A resource object for a desktop PC for example, can include hardware asset inventory information, software asset information as well as cost, location, ownership, depreciation, etc. Other applications such as facilities management or inventory can access, query and modify this information using DirXML.

NDS also is designed with unlimited scalability. The partitioning and replication features enable a directory service that can be distributed globally, including massive numbers of objects with no performance degradation. With this type of architecture, DirXML combined with NDS enables a powerful meta-directory solution that accommodates any type of synchronized directory or database need, anywhere.

Who Uses DirXML?

While DirXML can be of use to any organization with more than one directory, it is especially applicable to enterprise companies and eBuseinesses that are struggling to provide consistency of user lists and access control for applications and resources.

Companies with existing 'islands' of NT Domains, Lotus Notes, Active Directory, Exchange, Oracle, Sybase and other database or application user directories will benefit most from DirXML. Companies with a diverse collection of resources and applications will be able to dramatically reduce administration requirements and greatly simplify the resource access process for both users and applications.

DirXML will also provide significant benefit for organizations that are implementing eBusiness components and establishing businesses online. The ability to manage and control secure interactions and relationships between online customers, suppliers, distributors and other online partners is easily possible using DirXML.

Independent Software Vendors (ISVs) also can use DirXML to create solutions that leverage the capabilities of diverse systems linked through a common access and control mechanism. Vendors that currently support DirXML include: **IBM, Lucent, Cabletron, Nortel, Compaq, Hewlett-Packard, Dell, Sun Microsystems, Bowstreet, Oblix, Intracus, enCommerce, Netegrity, NetPro, BulletProof, Entrust, Security Dynamics, UNIMAX, CHECKPOINT,** and many others. **(Need to confirm whether support from above vendors still exists)**

What can I do with DirXML?

The primary purpose for DirXML is to synchronize and share data with directories, databases, and applications. This allows organizations with disparate islands of user information to link them together in a dynamic, consistently current directory. For example, companies with Unix UID files, NT domains, Lotus Notes user databases, and application access control lists can aggregate the management of that information into a single system that monitors changes in each system and intelligently updates the directory.

The potential uses for DirXML extend beyond the basic function of directory synchronization. Below are listed several possible activities and applications:

Activity	Example
Manage User Accounts	With a single operation, grant/eliminate access for an employee to all resources almost immediately. Provides automated employee provisioning capability where a new employee has access to network, e-mail, applications, resources, etc. with a single operation. Access is also restricted with a single operation on termination or exit.
Asset Inventory	Use the directory to include all asset inventory items (computers, monitors, phones, library resources, chairs, desks, etc.) and link it to individuals, departments and organizations.
White/Yellow Page Directories	Create unified directories with varying levels of information for internal or external use. External directories may contain only e-mail addresses. Internal may include location, phone, fax, cell, home address, etc.
Switch/router Configuration	Guarantee quality of service by providing bandwidth or throughput thresholds for specific users or groups. Variable switch/router parameters in directories are synchronized with user profile directories to map privileges.
Facilities Info	Synchronize facilities information (phone, keys, location, inventory, etc.) with user profiles to keep facilities information consistent.
Profiles	Augment user profiles with all types of additional information by adding or synchronizing e-mail address, phone number, home address, preferences, reporting relationships, physical location, hardware assets, facilities info, etc.
Software Leasing	Create software asset management systems by controlling application access via user directories.
Location Identification	Include physical location attributes for users and assets.
Inventory	Extend directory to include inventory information with part numbers and location, and synchronize with applications providing employee or customer self-service.
Client Data	Provide internal employees with customer/client profiles complete with synchronized information including relationships, status, service records, etc. Customer/client profiles can also be used to provide varying levels of access to self-service or internal information.
Unified Communications Access	Simplify network, phone, pagers, Web, wireless access, etc. for individual users or groups by synchronizing directories for each to a common management interface.

Here are a few examples of DirXML implementation from major corporations.

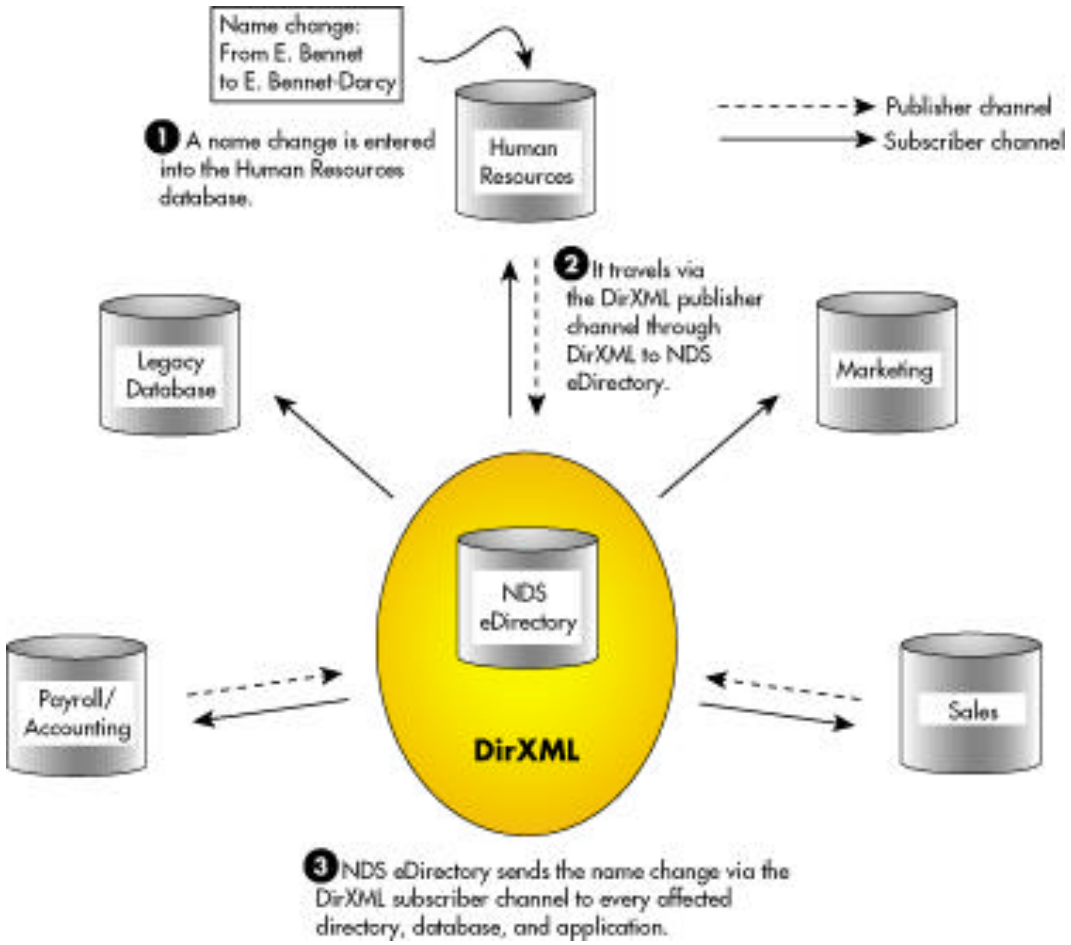
Employee Management
Many companies are synchronizing information from their Human Resources database with user profile information for other applications. The HR source (such as PeopleSoft or SAP) is considered the primary authority for employee information. A new employee is first added to this database on hire and status is changed on termination or exit. The HR database is synchronized with directories for network access, e-mail, application access, payroll, facility information, asset

inventory information, security keys, file space allocation, proxy/Internet access, phones/pagers, etc.

Using DirXML, the addition of a new employee in the HR database triggers a sequence of directory additions that populate each of these other directories. In cases where more information is required (such as providing a new location or phone number), applications can interface with existing systems to query or abstract this info automatically or electronically notify the appropriate person to provide it. In a relatively short period of time, access to all resources can be provided.

Employee moves, department changes, reorganizations and exits can be simplified with changes in any one directory being synchronized throughout the system. On termination or exit, a change in employee status in the HR database triggers a synchronization sequence that immediately terminates access to all resources.

Information from these multiple sources can be queried or extracted (automatically) to create dynamic corporate address books, internal directories, external directories, asset lists, access lists, etc. which are always up-to-date. Employees can also 'self-service' many change needs by modifying mailing addresses, phone numbers, personal preferences, etc.



Customer Account Provisioning

DirXML is also extremely valuable in creating integrated customer or supply-chain eBusiness systems. Web partners often each have directory or database information that needs to be shared with other stakeholders outside the organization. Billing systems, inventory management, security systems, account status, tracking and shipping, etc. are samples of applications that include valuable information for multiple parties.

DirXML enables e-commerce partners to not only share information but share ownership of information. Varying levels of information, depending on access authority, can be securely shared between partners and can be automatically kept up-to-date through DirXML synchronization. A 'preferred customer' status attribute when synchronized with other directories can provide preferred pricing, higher bandwidth access, a more comprehensive view of inventory, and even priority access to company executives.

[Try to substitute **Toyota** or some other highly recognized customer in-place of the U.S. Navy]

Benefits

DirXML benefits extend to enterprise companies, eBusiness and organizations of all types and sizes. The major advantages of DirXML can be categorized as follows:

Basis for eBusiness	DirXML enables eBusiness partners and customers access to networked information and applications. Businesses are able to share dynamic, common data and even maintain joint ownership.
Directory Control	An often-political problem is 'who' has control over directory information. DirXML enables individuals or departments to retain control and access of information and applications. It limits access to authorized users in proper departments and helps to resolve data ownership issues by distributing control to information/application owners.
Simple Integration	DirXML easily integrates with any other type of application or directory using open standards. Existing, new or legacy applications are easily integrated for directory synchronization.
Wide Support	Supports many data sources including ERP, e-mail systems, LDAP directories and directory solutions from other venders.
Centralized Administration	Centralizes directory management activities so that barriers between other directories are eliminated and all applications are keyed to common data. Make changes to or update every associated directory with a single operation.
Lower Cost of Administration	Eliminate manual synchronization, multiple entry of redundant profile information and administration costs associated with managing multiple directories/databases.
Assist in Producing Hardcopy Directories	Synchronized directories can be used to generate other directories with varying levels of information included. Create internal, external, yellow page and asset directories make them available online to eliminate printing costs.
Increase Value of Corporate Data	Provides access and exposes valuable corporate data that is often buried or inaccessible. Easy access by all executives allows them to monitor business environment more closely and react quickly to changes.
Leverage Existing Information	Take user account databases and applications that already exist and put them to use for other applications such as remote access, cross departmental applications, proxy/Web access, etc.
Minimize Human Error	Automatically synchronized directories eliminate discrepancies that occur due to human error with multiple entries of redundant data.

DirXML Features

The following is a summary list of features and functions that are available to administrators, users and developers using DirXML:

Feature	Benefit
Scalability	
Distributed System	Using NDS capabilities, DirXML provides for geographic distribution of directory information to enable faster response and timely updates. DirXML leverages NDS' partitioning and replication abilities to provide a scalable solution that is not limited by size or geographic distribution.
Fail-over Capability	NDS also provides for continuous operation in the event of failure through use of synchronized replicas. All directories synchronized through DirXML inherit this fail-over capability.
Interoperability	
Standards-based	DirXML is based on eXtensible Markup Language (XML), the industry standard that is simple to implement, inexpensive to deploy and easy to integrate.
Pre-defined Connectors Available	Connectors for existing user databases are available with DirXML and currently extend to Lotus Notes, Active Directory, Netscape, NDS and ERP applications.
NDS eDirectory Repository	Any information entered into a directory, application, or database can be sent through DirXML to eDirectory and back again. NDS eDirectory can act as a meta-directory source for all other directories/databases.
Integration	DirXML supports applications that are not XML-based--data can be replicated to any format in proprietary or legacy applications through use of XML. Easily create XSLT stylesheets to map and transform information to appropriate formats.
Cross Platform Support	NDS eDirectory and DirXML run natively on Solaris, Linux, NetWare, NT, Unix and Compaq Tru64 Unix.
Directory Synchronization	
Any Directory to Any Directory	DirXML allows you to synchronize any directory in any format to any other directory. Features allow you to map dissimilar schemas and tie to any type of directory or user database.
Automatic Updates	Event engine makes it possible for changes in any directory to trigger automatic updates of changes to other directories. Changes are automatically replicated to other directories.
Event Cache	All events generated through NDS are stored in an event queue until they are successfully processed. This guarantees that no data will be lost due to a bad connection, loss of system resources, unavailability of a driver or any other network failure.

Authority Management	
Establish any Source as Authority	Using DirXML, ANY directory or database can be the 'authoritative' source of information. Establish primary source and business rules for modifications and all other directories will be replicated based on this authority. Authoritative source of information can be HR database, LDAP directory, or any other network or application directory.
Distribute Ownership/Authority	Authority to create/modify/delete directory information can be distributed to rightful group or application owners. This eliminates political problems over control and can allow separate external entities to jointly share and manage information.
Management	
Single Interface	All directory solutions/relationships, accounts, etc. can be managed through a single interface. Most common method of management access is through a standard Web browser.
Flexibility	
Programmability	DirXML includes a Software Developer Kit (SDK) that can be used to write drivers for the applications, databases, and directories. These C++ and Java drivers will also work with legacy or custom applications.

How DirXML Works

DirXML is simply the convergence of directory service technologies, and XML. Directory services, in this case, NDS eDirectory, provide the power of managing data in a centralized way. NDS eDirectory allows you to describe the elements of a network and manage the inter-relationships between these elements. NDS eDirectory does this in a secure way so that only authorized entities can gain access to this managed data.

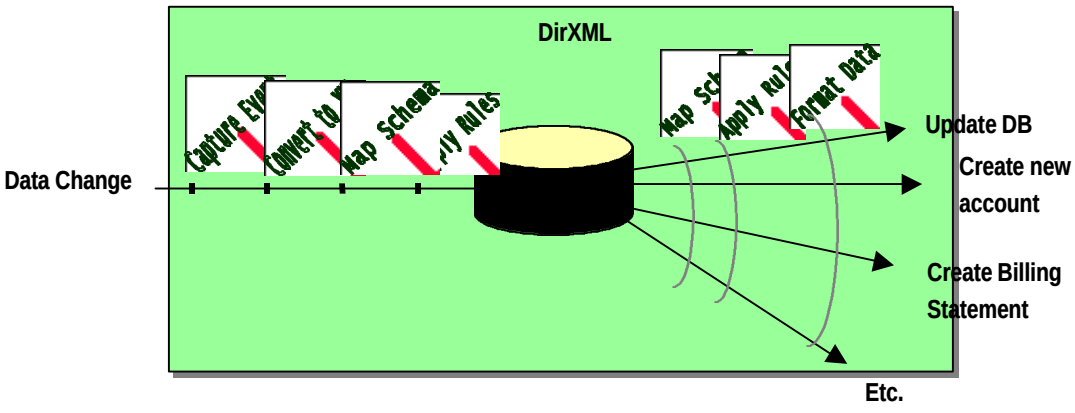
DirXML exposes the data structure of NDS eDirectory in a way that can be integrated with any other directory or user database for synchronization. The power of XML is this ability to define tags and then use the tags to organize, define, and structure data. This flexible method of organizing data makes XML technologies the perfect integration technology because of its inherent ability to conform to any environment and any data model.

DirXML – Directory / XML

- XML is a complimentary technology to directory services
- Directories store data
- XML is a data representation format
- Directories respond to queries for data
- XML is a way of representing the data
- Directories maintain data even in a changing environment
- XML is a format which can be used to represent changing directory events

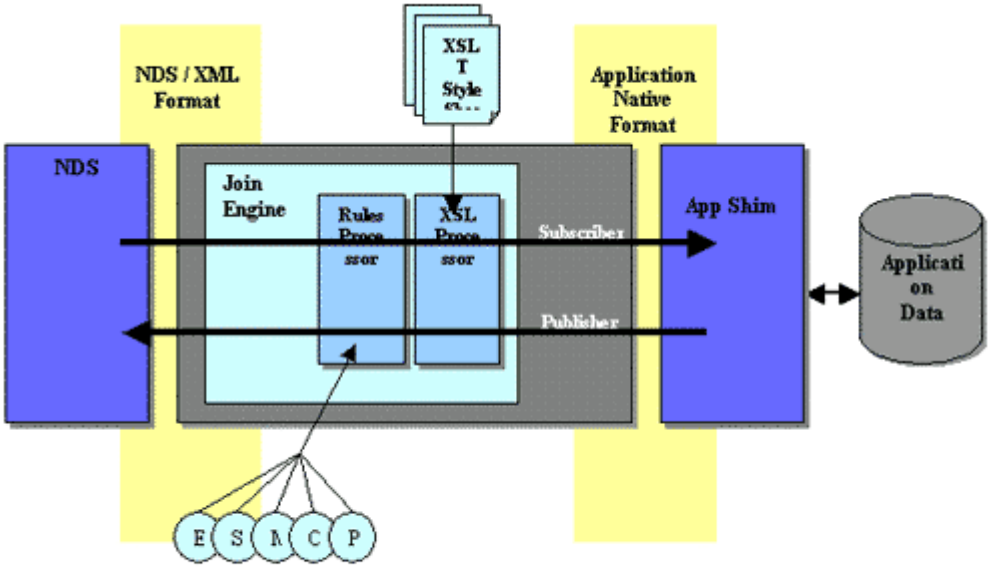
In short, XML and directory services provide a great combination for storing data about network entities, and then exposing this data to other applications. As more applications become XML aware, an XML-enabled directory service will be able to immediately begin delivering directory data to the application. By definition, this will make the application directory-enabled.

DirXML 'amplifies' changes that occur in a directory using the following steps. An event is captured, converted to XML, mapped to a particular directory schema (applying predefined rules) and then committed to NDS eDirectory. The changes are then mapped to a target directory's schema, rules are applied, the data formatted and then updated in the target directory.



Technically, DirXML is based on NDS eDirectory. NDS eDirectory includes an additional replica type that can maintain a filtered subset of information from any directory or application. This filtered subset of information becomes an application view of directory information, meaning the application will see replica information in its native interface.

The information is replicated to an application based on policies and access control that are defined in the directory. NDS uses its proven replication system to move information to and from the application. Each application has an XSLT style sheet that is stored in the directory and defines the mapping of events, data and schema between the application and NDS. The information defined in the XSLT style sheet is then replicated based on XML or LDAP to an application. The application then receives the information in its native format whether that is proprietary, LDIF or XML.



DirXML Architecture

There are two parts to any directory synchronization solution - the application shim and a specific DirXML configuration. The application shim is usually C or Java code that acts as a translation layer between the DirXML API and the application API.

DirXML consists of two channels, one pointing to NDS (publisher channel) and the other to the connected application (subscriber channel). Each channel takes an event from the originating system, applies a series of data transformation rules, and passes the resulting data and commands to the application shim. Shim then commits to the connected system.

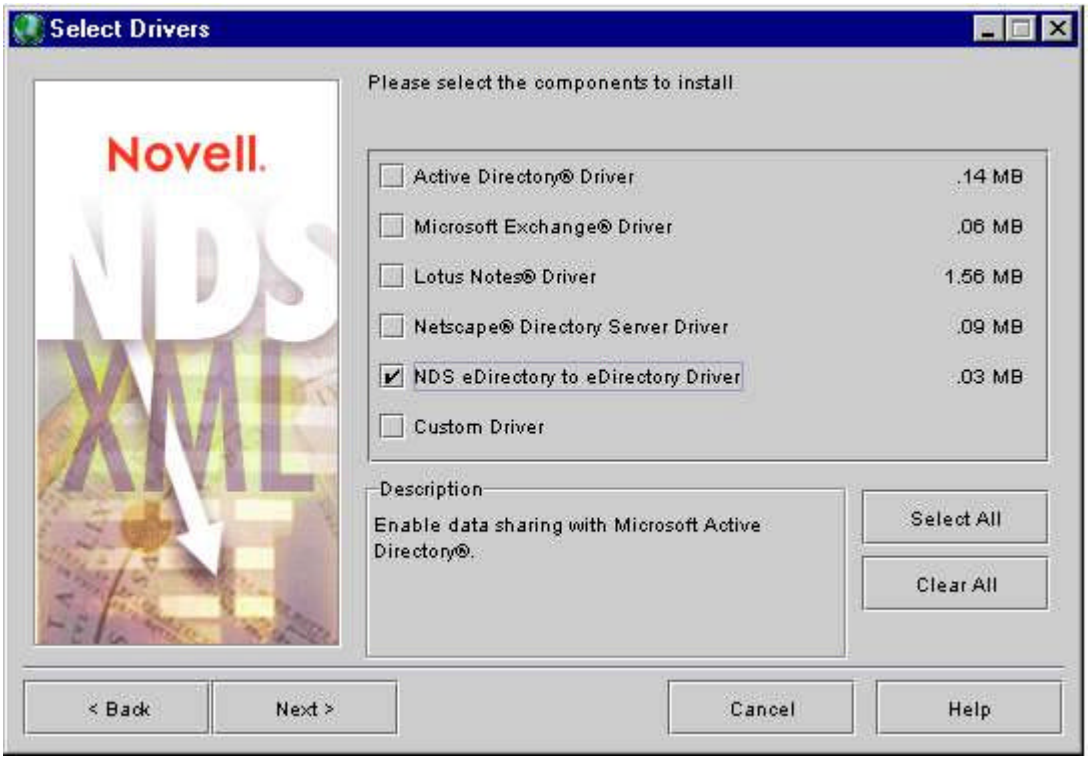
The subscriber channel (takes data from NDS to app) captures NDS event and then (using XML rules and XSLT) generates appropriate commands for the connected application. Commands are handed to the subscription shim which then uses the application's APIs to update the application.

For a comprehensive look at how DirXML works, please refer to the technical white paper at: http://www.novell.com/products/nds/dirxml/technical_wp.html

Installation

Since DirXML is initially only available through Novell Consulting Services or though a Novell Authorized Consulting Services Integrator (CSI) partner, installation will generally be handled by an experienced technician. The integration of any custom shims or directory interfaces to proprietary or legacy applications will require a certain amount of development. Complete solution architecture will vary depending on each customer's requirements. Some installations may require a 3-tier architecture (for example an NT server in the mix to link with Lotus Notes).

If your directory synchronization needs are fairly standard, the installation and synchronization process is fairly straight forward and includes the following steps:



- First, install NDS eDirectory 8.5 on your system of choice (NetWare, NT, Solaris, Linux, Tru64, etc.)
- Install or make sure that ConsoleOne is available for managing this system.
- Install DirXML from the appropriate directory on the Install CD (NT, Linux, NW, Solaris)
- If you are synchronizing any directories for which drivers are already available (Active Directory, Exchange, Lotus Notes, Netscape Directory Server, NDS, etc.), select those drivers from the available drivers list.
- If you are selecting a custom driver, that driver will have to have been defined and stored in an accessible directory.

The NDS schema has been extended to include several new objects that enable DirXML. In order for directory synchronization to take place, these objects will generally need to be modified with appropriate parameters. These new objects include:

- Driver Set - this object defines a collection of drivers.
- Driver - this object defines all the components of a driver including rules, style sheets and the application shim.
- Rule - an XML document that defines a rule that is applied to the NDS event stream as if flows through the DirXML engine.
- Style Sheets - an XSLT document that defines a transformation of the NDS XML code into some other format.

Also required is the configuration of an application shim, an executable piece of code that the DirXML engine uses to interface with the target application.

Once these options have been configured in NDS eDirectory, DirXML will automatically synchronize directories and directory changes throughout the system. Multiple directories can be linked together from any location with updates and changes occurring without the need for manual intervention. Directories can be accessed by any application or service for any purpose.

Comparative Information

There are no solutions on the market that provide the same functionality as DirXML with it's management, scalability, security and synchronization features. Related (but not competing) offerings are the so called 'meta-directory' solutions that have limited capabilities compared to DirXML's core functionality. DirXML is differentiated from these solutions by the following points:

- *Leverages existing databases* - DirXML does not try to consolidate multiple directory information to a single point for management. Separate directories still exist and are accessed by applications--DirXML facilitates the synchronization of these directories with other directories.
- *Reduces political issues over data ownership* - individual groups still retain ownership of directory information. They have the ability to control change and access and ultimately determine the use of the directory content.
- *Easy development* - To gain the benefits of DirXML, developers can write to the widely adopted open standard of XML. There is no need for customized, proprietary development that will be of no use to other applications or services.
- *No requirement to retrofit existing applications or databases* - Existing databases and directories can remain completely intact without the need to rip and replace or retrofit an access database to accommodate multiple applications. DirXML connectors can be located geographically close to a data source so performance degradation is not an issue.
- *Fault Tolerance* - Using NDS replication provides advanced scalability and fail-over capabilities.
- *Automation* - NDS eDirectory event engine enables automatic, bi-directional replication and synchronization without the need for manual intervention.

The two existing market segments with some overlap in the DirXML space are meta-directories and middleware for EDI and ERP applications. The advantages and disadvantages of each are as follows:

Group	Company/Product	Advantages	Disadvantages compared to eDirectory
Meta-directory	Sun-Netscape/iPlanet Metadirectory	LDAP based (originated with Netscape)	Not easy to setup or maintain. Connectors are difficult to build and configure.
	Microsoft/Meta Directory Services	Microsoft name plus includes some of Zoomit's utilities.	Runs only on Windows. Based on proprietary scripting language and currently cannot run on Active Directory.
	Critical Path/ISOCOR InJoin	Early meta-directory player with join and event engines.	Product is complex and future at Critical Path is uncertain.
	Mercator/Mercator	Good data migration and application integration capabilities.	Not XML based, not focused on directory integration and does not support LDAP. Proprietary technology.
Middleware (EIA solutions)	CrossWorlds	Licensed technology from TSI and Tibco.	Primarily integrates data from large ERP, CRM, HR and supply-chain management systems. Repackaged middleware as 'processware'.
	Neon	Mature product for ERP applications.	Built on message queuing architecture--not directory services.

About Novell

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For information on Novell's complete range of products and services, contact Novell's Customer Response Center at (888) 321-4CRC (4272), or visit Novell's Web site at http://www.novell.com. Press may access Novell announcements and company information on the World Wide Web at http://www.novell.com/pressroom. In addition, detailed comparisons between Novell products and competitive offerings from other vendors are available on the Web at http://www.novell.com/advantage.

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Glossary

Associations - Associations are the way that DirXML maps an object in NDS to an object in a connected application. Each object in NDS has an association table that describes exactly what the object is linked to in each connected system. Associations are stored in NDS so that applications don't need to keep track of NDS names.

ConsoleOne - Java-based console management interface for all of Novell's products. ZFS can only be managed through ConsoleOne.

DirXML - Novell product that gives NDS the ability to replicate data to external application data stores and to NDS itself in a filtered fashion. DirXML servers can expose the filtered set of NDS data through LDAP, XML, or any application data format.

eDirectory - Novell's latest generation directory service designed to accommodate eBusinesses and the Internet.

Hierarchy - A structure that has a predetermined ordering from high to low with lower objects being identified in relation to higher objects.

HTML - HyperText Markup Language, the document format used on the World Wide Web.

Identity - Identities include all of the information that define an individual's profile. This information at a minium includes user ID and password. It can be extended to include address and contact information as well as a comprehensive collection of access rights and authorities.

Indexes - In NDS/eDirectory, indexes are lists of all or portions of a directory that are available for high speed lookup or quick access by applications.

Inheritance - Characteristics or relationships passed on by virtue of relationship.

Partition - In NDS/eDirectory, a partition is a segment or portion of the directory that is usually separated and placed on another server. Partitioning enables eDirectory to scale indefinately.

LDAP - Lightweight Directory Access Protocol, a standards based protocol used to access directory information. LDAP is a simplified version of the DAP protocol, which is used to gain access to X.500 directories. It is easier to code the query in LDAP than in DAP, but LDAP is less comprehensive.

LDIF - Lightweight Data Interchange Format, a standards based format for exchanging information with LDAP based directories.

NDS - Novell Directory Service, the industry's first true directory service introduced in 1993.

Policies - the enforcement of rules and regulations associated with activities, events, and processes. In ZFS, the rules and regulations governing installation, monitoring, and managing of network resources.

Policy Engine - The NDS enabled mechanism that enforces established rules and regulations.

Replica - Replicas are 'copies' of a directory or portions of a directory. Replicas are strategically distributed reduce latency in directory access and lookup.

SSL - Secure Socket Layer is the leading security protocol on the Internet. It enables the establishment of a secure connection between the browser and a Web server through the use of public and secret keys.

XML - Extensible Markup Language, an open standard for describing data and defining data elements on a Web page and business-to-business documents.

XML Rules - Rules are pre-defined XML tags that map schema and help automate associating objects. Currently, there are five rules in DirXML: the schema mapping rule, the matching rule, the create rule, the placement rule, and the event transformation rule.

XSL - XML Stylesheet Language is a style sheet format for XML documents.

XSLT/XSLT - eXtensible Stylesheet Language Transformations are an open-standard method for transforming XML data. DirXML uses XSLT as a kind of open-standard scripting language. The XSLT processor included in DirXML makes it possible for implementers to create all sorts of data transformations.