

**Publisher:** Institute for Network Professionals



004.

**ILINX REVIEW:  
THE INFORMATION AGE AT  
YOUR FINGERTIPS**

The information overload problem is not that we have too much information; it is that our tools are inadequate. We end up having to navigate a growing world of information with

> page 7, bottom right

003.

**SOFTSKILLS:  
LEADERSHIP**

BY DARYL ALDER

- > Paradigms
- > Principles
- > Managing Attention
- > Managing Meaning
- > Managing Trust
- > Managing Self

As technical experts we take pride in our competence—in enhancing our skills and keeping

> page 9, top right

001.

**DIRECTORY SERVICES: NOV-  
ELL'S NDS VS. MICROSOFT'S  
ACTIVE DIRECTORY**

BY TERRY JEFFERS, NICHE

- > Directory Architecture
- > Directory Distribution and Replication
- > Object Management

At the center of the network operating system battle lies directory services. Directory services—a single, central database for network functions such as authenticating users, NOS administration, and assigning users' rights to resources. Many applications, such as messaging, group scheduling, and database applications, have maintained their own user directories for these same purposes. Extending these applications to use a central directory service reduces redundant information and the effort required to maintain separate directories.

Many view directories as a "white pages" reference for both end-users and applications. For example, users can use a direc-

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002.

**USING THE TECHNICAL  
RESOURCE CD**

BY ED KRACH, CNP

- > Licensed NFR Software for Institute & NPA Members
- > Live Trials
- > Shareware
- > Software Updates
- > Free Stuff
- > FAQs
- > Education
- > Tutorials
- > Vendor White Papers
- > Novell App Notes

This monthly column covers how to use the Quarterly Network Professional Technical Resource CD. This column is the one place to get a bird's eye view of each CD at a glance, including pointers to great resources you might be particularly interested in among the over 600 Mb of resources packed on the CD.

We developed the CD with Microsoft's Front Page 98 and NetObjects Fusion and

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tory-integrated e-mail application to look up e-mail addresses or group distribution lists. But directory services can offer much more than a place to look up user information. Each resource in an organization, including network resources such as printers and firewalls and physical resources such as workstations or conference rooms, can be represented as an object in the directory. The directory also provides a hierarchical structure, or tree, to simplify the organization and management of all directory objects. A directory-services database must be extensible and highly scalable, offer global distribution and replication, and provide easy centralized administration.

Novell and Microsoft both claim that their directory is the best way to get the job done. This article offers a side-by-side comparison of each directory service to help you choose the directory service that suits your organization.

### > Directory Architecture

Both the NDS and Active Directory architecture originated with the X.500 OSI directory recommendation. However, Novell and Microsoft take different approaches in implementing a directory. NDS starts at the top and works its way

down, and Active Directory begins at the bottom and works its way up.

NDS. Novell closely based the NDS schema (the set of rules defining directory object properties and attributes) on the X.500 directory recommendation. However, NDS does not natively support X.500 access protocols such as the Directory Access Protocol (DAP). Novell does provide an add-on for accessing NDS through the Lightweight Directory Access Protocol (LDAP)—a subset of X.500's DAP.

NetWare principally employs the IPX-based NetWare Core Protocol (NCP) to communicate with the directory. In the upcoming release of NetWare 5, in which Novell will incorporate native TCP/IP support, NetWare will still use NCP to communicate with the directory. Running NCP over an IP network does not change how NetWare uses the available bandwidth, but when capturing and analyzing network traffic, you will need a utility that can decode NCP to make sense of the packets you capture.

NDS uses a tree metaphor to implement a hierarchical directory structure. NDS trees stem from a Root directory object and allow for a top-down organizational structure through the creation of multiple Country, Organization, and

burned our Gold Master using the Joliet file format. The Joliet file format allows us to use long filenames with up to 64 characters in the path, but requires the use of Windows 95, Windows NT, or OS/2 Warp to view it with a web browser. The CD is viewed best with either Netscape Navigator 4.x or Microsoft Internet Explorer 4.x (both of which are on the CD). The CD will automatically launch your browser and load the first page on most Win95 and NT machines. If it doesn't, simply double click on the "Welcome.htm" file in the root of the CD.

When you launch the CD, you are greeted with our main page. This page will be the same for all four quarterly releases this year, with the only difference being the Quarter des-

ignator in the bottom right corner. This page organizes the CD into ten categories:

**The Institute  
Calendar  
Vendor Info  
From the Lab  
Software  
Tutorials  
Education  
Resources  
Published Media  
Free Stuff**

Here's a quick look at what the Technical Resource CD contains and why.

### Licensed NFR Software for Institute & NPA Members Only

Most members will look here first to find out what's available on the CD. The first section they check out is the Licensed NFR section. The Institute

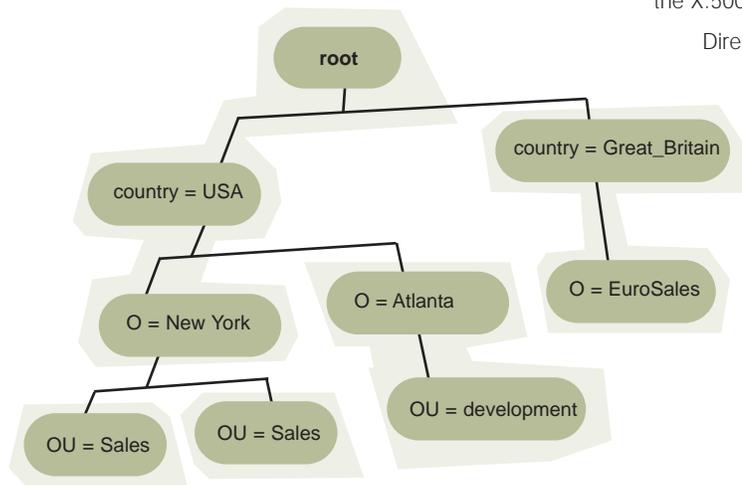
works with various Industry Vendors to bring the latest software technology to you in the form of licensed full versions. These products are for your personal and educational use only. They are not licensed for production environments, but rather for your own evaluation and use in lab environment. The idea is to expose you to solutions, so you can gain the necessary experience to make educated decisions when recommending or purchasing software solutions. What you get on the Q1 CD >

1. Calypso Mail 2.40—MCS Dallas
2. Drive Pro 3.1—Micro House Solutions (does not include EZ-COPY or EZ-SMART)
3. ImageCast 25 pak license—Micro House Solutions (For Technical Instructors Only)
4. Novell NetWare 3.2 Enhancement Pack
5. Symantec Norton AntiVirus for

The idea is to expose you to solutions. You gain the necessary experience to make educated decisions when recommending or purchasing solutions.

Unit objects. Organization and Unit objects can contain directory leaf objects such as users, servers, or groups, as well as additional organizational units.

One advantage to using NDS is that you can merge two separate directories with a tool called DSMerge, as long as the two trees have identical schemas. Fortunately, Novell's



NDS Tree for a company with multiple geographic locations. Partitions:

DSRepair tool lets you import the schema of the first tree into the second tree and vice versa.

One thing that NDS lacks is federated partitions, which enables you to link two separate trees and subsequently perform operations, such as granting user-access rights, between the two trees.

Active Directory. Active Directory also originates from the X.500 recommendation, but Microsoft based Active Directory's schema on LDAP, and uses LDAP as

Active Directory's native access protocol.

Active Directory also uses TCP/IP-based DNS to locate instances of the directory and create a directory hierarchy.

As in NT 4.0, the basic architectural unit of Active Directory is the NT domain. Each NT 5.0 domain contains a separate directory. Active Directory maps DNS domain names to NT domains and subsequently uses these DNS mappings to link multiple domains together into a hierarchy. For example, you can link three NT domains

- Internet Email Gateways
6. Symantec Norton AntiVirus for NT
7. Symantec Norton AntiVirus for Windows 95
8. Symantec Norton AntiVirus for DOS/Windows 3.x
9. Symantec Norton AntiVirus for NetWare
10. Symantec Norton AntiVirus for Firewalls
11. Symantec Norton Utilities 3.0 for Windows 95
12. Symantec pcAnywhere 8.0 for Win95/NT
13. Stac Reachout Enterprise 8.0
14. McAfee VirusScan DOS/Win
15. McAfee VirusScan Win95
16. McAfee VirusScan WinNT
17. McAfee VirusScan OS/2

### >Live Trials

We put live trials on the CDs for many reasons. I worked for Dell Computer Germany in the early 90s, and I traveled all over the country installing and supporting Dell networks. I carried a

lot of trial software with me because I found it easier to demonstrate a solution on the spot rather to try to explain an abstract technical solution to a non-technical client (let alone in a foreign language). My efforts were rewarded with a much higher customer satisfaction. My clients were impressed that I saw the need for a solution and that I had one with me that I could demonstrate. The end result was increased credibility and an enhanced professional reputation network.

The live trials allow me to experiment with the latest technology and that gives me the experience necessary to make important decisions whether for myself, a client, or the Institute. Granted, I can get the live trials myself, but the CD saves me time from having to search for solutions and the download time, which can be hours for large files. The latest technology is available at my fingertips.

What you get on the Q1 CD >

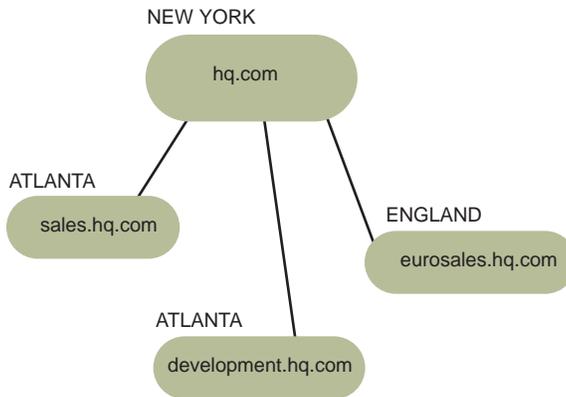
- Seagate Backup Exec for NetWare
- Seagate Backup Exec for NT
- Centrax CAST Audit Tool for NT
- Cheyenne FAX Serve for NT
- Mijenix Free Space
- Microhouse ImageCast 2.0 - 10 User
- Network Associates NetXRay 3.0
- Mijenix PowerDesk Utilities
- Stac Replica for NetWare
- Stac Replica for NT
- Microhouse Support Source
- MDD Trusted Enterprise Manager 2.0
- Visio Professional
- Mijenix Zip Magic

### > Shareware

We scour the Net every quarter for the latest and greatest networking and utility shareware and bring it to you on the CD. We are firm believers of the shareware concept. If you decide to use it after the trial period, be sure to register it with the developer. This keeps shareware moving forward with

called HQ, Sales, and Development together as the DNS domains `hq.com`, `sales.hq.com`, and `development.hq.com`. Linked domains create domain trees, which are better thought of as a hierarchy of directories than as a single, hierarchical directory.

But domain trees provide more than simple DNS domain mapping. In addition to hierarchy, domain trees establish a series of "trusts" between parent domain (`hq.com`) and



MS ActiveDirectory possible domain Tree structure

child domains (`sales.hq.com` and `development.hq.com`). Trust relationships enable user and administrator access between domains. Fortunately, NT Server creates default trusts for domain tree relationships during install.

Unfortunately, Windows NT does not allow you to move an NT domain from one domain tree to another domain tree. And Active Directory cannot merge two existing domains. For example, if your company merges with another, you will not be able to merge the directories from the two company's networks into a single directory.

### > Directory Distribution and Replication

If your organization is large or has more than one geographical location, you must be able to create multiple copies of the directory—called replication—for load balancing and fault tolerance. You might also want to partitioning the directory into smaller pieces and locate copies of each directory partition closest to the users and objects within that partition. Partitioning also helps lower WAN traffic in organizations that span multiple locations because you don't have to constantly update the entire directory at each site, only the objects in the local partition.

better products every quarter. What you get on the Q1 CD >

1. Add Remove Cleaner
2. Any Speed for Windows 95
3. Bookmark Converter
4. Cache Compactor
5. Cheat Informant
6. Cleanup 1.1
7. CompuPic
8. CuteFTP 1.8
9. Deadlink Finder
10. Disk Usage
11. DiskFactory
12. Dropit
13. Editpad
14. Flywheel
15. FTP Explorer 1.00
16. Hot Explorer
17. ICQ (I Seek You)
18. Inbox Organizer
19. IPQuery 2.0
20. LView Pro
21. Net Scan Tools
22. NetInfo 1.3
23. NetLab for Windows 95
24. Net-Monitor 1.0
25. Networking Essentials Exam
26. PKZIP 2.5
27. PKZIP for Windows
28. SchizoPing!
29. Super Notetab
30. TweakUI
31. UnMozify for MSIE
32. UnMozify for Netscape Navigator
33. Vopt97
34. WinImage 3.03
35. WinZip 6.3
36. WorldMerge

### Software Updates

How often do you waste time waiting on slow downloads—sometimes of the same file many times a month? I've done it. But now when people come looking for some patch I tell

them it's on the CD. And I don't worry about waiting for slow downloads or lack of Internet access at a client site. You just come across as much more competent and prepared when you whip out the CD and solve a problem on the spot. What you get on the Q1 CD >

- All of Novell's Minimum Patch List for NetWare 3.x & 4.x & IntranetWare
- Windows 95 Service Pack 1
- Windows 95 Dial-up Networking v. 1.2 (includes PPTP)
- Windows 95 Socket API update
- Windows NT 4.0 Service Pack 3 for Intel (x86)
- Windows NT 4.0 Routing & RAS update. Requires Service Pack 3
- Microsoft Office 97 Service Release 1
- Word 6.0/95 Converter (MS Word 97)
- Microsoft Word 97 Viewer

You just come across as much more competent and prepared when you whip out the CD and solve a problem on the spot.

Both Novell and Microsoft have methods of addressing these tasks, although their approaches differ.

NDS. By default, the NDS tree consists of a single root partition, which it replicates to the first three servers installed on the network. NDS offers the capability to further partition the directory tree at the three object levels: country, organization, or organizational unit. Administrators can then separately manage each partition.

When you partition an NDS tree, each partition has a master replica. Additional replicas of that partition can be either read/write or read-only. To enable access to objects outside the local partition, NDS redirects the user or application to the appropriate partition.

Novell provides a good set of tools for creating and managing partitions and replicas, but a few capabilities are absent. One feature not available in NDS is Catalog Services, a technology that maintains a partial, indexed replica of all directory objects—and so provides a local reference for the entire directory without requiring full-directory replication or per-instance look-ups. Thus without Catalog Services, whenever a user must access a directory object that is not in the user's local partition, NDS must forward a

request across the network—and often across a WAN link—to access needed information.

Active Directory. Microsoft uses NT domains as the replication boundary. That is, the directory for each domain is replicated only on all domain controller servers within that NT domain. Active Directory does not support directory partitioning. To break up Active Directory, you really need to create domain trees, which will require additional administration, because to get smaller pieces of the directory you in essence create multiple, smaller directories. And unlike NDS which enables you to change the directory partition at any time, to break up Active Directory usually requires extensive preplanning or recreating the entire directory.

Given its limitation with respect to partitions, Active Directory has two features that make it more efficient in a distributed environment. First, as in Microsoft's Systems Management Server, Active Directory employs the idea of "sites." Sites define areas of high bandwidth, allowing administrators to classify servers into groups based on location. Theoretically, administrators can then set more conservative, scheduled replication policies among two or more sites.

Second, Active Directory uses a global catalog. Similar to

unlike NDS which enables you to change the directory partition at any time, to break up Active Directory usually requires extensive preplanning or recreating the entire directory.

## Free Stuff

Some CD contents are only for members of the Institute. Full version software, licensed for personal and self-education use, allows you to keep your skills sharp with the latest technology without having to worry about time-outs or crippled features. Member Special Offers like 50% software from Mijenix and an 8 Port Hub with 2 PCI NICs for only \$59 from Accton are some examples. These types of special offers will be made available every quarter, but only to members of the Institute and the NPA.

## Resources

We've compiled numerous technical documents, FAQs, White Papers, and tutorials to provide access to information that can help educate the network professional. Technology changes so fast that it's hard to keep up with what's new in network solutions. Take

a look at some of the resources available on the Q1 CD.

## FAQs

1. Basic Telecommunications Guide
2. Basics of the World-Wide-Web
3. Bay Networks Routers
4. Cell Relay (ATM)
5. Cisco Routers
6. Computer Security Evaluation
7. Data Comm Cabling
8. Ethernet
9. FDDI
10. Frame Relay
11. How to Find E-mail Addresses
12. ISDN
13. LAN Glossary
14. Modem Technology
15. Novell Networks
16. Power PC Computers
17. TCP/IP Networking
18. TCP/IP Protocol Suite
19. TCP/IP's Point to Point Protocol
20. Unix Systems

21. V.34 & V.FC Modem Technology
22. Windows 95 Networking
23. Windows NT on the Internet
24. Windows NT Security

## Technical Papers

1. 32-Bit Operating Systems
2. 10 Networking Commandments
3. An Analysis of ISDN
4. Beyond Token Ring
5. DVD Optical Storage
6. Hard Drive Interfaces
7. Implementing and Maintaining Quality in Computer Networks
8. Pentium Processor Technology
9. Picking a Partner
10. RAID Technology
11. Service Level Agreements
12. Symmetric Multiprocessing
13. The Fall of I.S.
14. Types of Memory
15. Understanding Viruses
16. Understanding 56Kbps Modems

The advantages of directory services really become apparent when network administrators begin to manage the objects in the directory. For example, the directory should make it easy to assign user rights to files, printers, and applications.

Novell's idea of catalog services, Active Directory's global catalog maintains a partial, indexed replica of all directory objects for all directories in the domain tree. One server in each geographical site can be the site's global catalog server. If the global catalog is insufficient for the request—for example, if a user requests access rights—Active Directory uses referrals to redirect the client to the appropriate remote domain directory to complete the lookup.

One important difference between NDS and Active Directory is that you can place multiple partition replicas on a single NetWare server. You could, for example, maintain a full replica of the New York directory partition at the Atlanta location. Active Directory requires multiple domains to break up the directory, and a server can be a member of only one domain. So you would have to place an additional server at the Atlanta location and make it a member of the New York domain to achieve the same effect. Thus, with NDS, you can provide local replicas of nonlocal partitions on a single server. To achieve the same results with Active Directory, you would have to add an additional server for each domain that you wanted to replicate.

## Object Management

The advantages of directory services really become apparent when network administrators begin to manage the objects in the directory. For example, the directory should make it easy to assign user rights to files, printers, and applications. Directory management falls into three major areas: the attributes and properties of each object, the management tools, and the object inheritance model. Inheritance in this case is the capability of directory objects to assume the properties and rights of their parent objects (those higher in the directory structure).

If you deploy applications that extend the directory schema, the directory management tools should accommodate the new objects associated with a new application. Both Novell and Microsoft offer extensible management tools, but again each offers a unique approach.

NDS. Inheritance is an NDS strength. Using the NetWare Administration (NWAdmin) utility, you can assign a user or group read-and-write access at the top of the tree, at an organization, or at an organizational unit. That rights assignment flows down the tree, granting the user those same rights to all directory objects below that point in the tree.

17. Universal Serial Bus
18. Templates
19. Confidentiality Agreement
20. Employee Agreement
21. Non-Disclosure Agreement
22. Partnering Agreement

### Tutorials

1. 802.11 and Spread Spectrum
2. Basic Phone Services and Circuits
3. Cable Testing
4. CGI and Web Servers
5. Configuring a Router
6. Creating Documents with CGI
7. Directories
8. Dynamic Host Configuration Protocol
9. E-Mail and MIME
10. E-mail and SMTP
11. E-Mail Security
12. Ethernet Frame Types
13. Getting Data VIA Telephone Line

14. HTML and CGI - Part I
15. HTML and CGI - Part II
16. Hypertext Markup Language
17. Internetworking
18. Interoperability
19. IP Security
20. LDAP
21. Network Basics
22. Network Hardware
23. Network Management
24. Network Software
25. Providing Internet and World Wide Web Services
26. Public Key Cryptography
27. Simple Network Management Protocol—SNMP
28. SSL and S-HTTP
29. Switching vs. Routing
30. Synchronous Optical Network
31. TCP/IP Tutorial & Technical Overview
32. The Basics of E-Mail Access
33. The Switching Book
34. VLANs and Broadcast Domains

35. Web Server Image Maps

### Vendor White Papers

1. Enhancing Your Business through the Internet
2. A Cost Effective Approach to Improving Server Performance & Fault Tolerance
3. A New Model for Internetwork Analysis: A WAN's-Eye View
4. Advanced Internetworking—Layer 3 Switching
5. Automatic Application Fail-Over
6. Choosing Server Tape Drives
7. Clustering
8. Evaluating UPSes
9. How to Optimize Network Performance while Avoiding Unnecessary Investments
10. Intelligent High-Speed Troubleshooting
11. Intelligent Input/Output for Servers
12. Managing WAN Technologies for Maximum Internetwork Performance

You can also assign an organizational unit rights to a file system directory. Then all users below the organizational unit would inherit access to that directory and all the files and subdirectories that it contains.

NWAdmin runs on Windows 3.x, Windows 95, and Windows NT. You can extend NWAdmin through snap-ins—DLLs that add new functions to NWAdmin. NWAdmin is a good approach to directory management because you access all properties on all directory objects. The one hassle with NWAdmin is that you must register all snap-ins on each administrative machine by editing each machine's registry. Novell generally makes it easy to register snap-ins with registry merge files, but you need a separate merge file for each snap-in.

Active Directory. You manage Active Directory through the Microsoft Management Console (MMC). MMC does not do anything on its own; it is a shell that hosts the ActiveX controls, or plug-ins, that provide management functions. The main shortcoming of MMC is that you usually need more than one plug-in to complete a management task. Also, any plug-ins you use must be available on each administrative machine.

The benefit of MMC is that it offers a single utility for various management applications. For example, you can load several controls in the same console to manage different applications, such as the directory, a database server, and a Web server. With MMC, you can manage these different services from the same session.

In Active Directory is that you can specify the password expiration and log-in time policies at the domain level. You can also use the policy for one domain in other domains in your domain tree, making it easy to change policies for the entire domain tree by editing a single object. However, by setting domain-wide policies, you give up ability to manage properties for individual user objects.

Active Directory allows inheritance through the directory structure, but only at the single domain level. For example, rights assignments cannot propagate down a domain tree. Like NDS, Active Directory can assign down to the directory-object level. Thus within a single domain, you have about the same level of access control in both Active Directory and NDS, but assigning access controls across domains in Active Directory is not as easy as assigning access controls across NDS partitions.

- mance
13. Meeting New Requirements for Enterprise Data Protection
  14. NDS Management Tools & Techniques
  15. Network Layer Switching
  16. Proactive Solutions to the Five Most Critical Networking Problems
  17. Protecting Your Network
  18. Self-Monitoring, Analysis and Reporting Technology
  19. Storage Expansion Enclosures
  20. Superhubs & Superswitches
  21. Understanding & Managing Polymorphic Viruses
  22. Understanding Symantec's Anti-Virus Internet Gateway Strategy
  23. Virtual LANs
  24. What's New in NetWare 3.2

### Novell AppNotes

The Q1 CD has all of Novell's AppNotes in PDF format from January

1996 through October 1997. This is an exceptional resource library from Novell—all in one place.

### Other Items

- All of Net Notify E-zine's Archive
- Excerpt from Laura Chappell's Latest Book—*Wire Walking*
- The CD has so much information crammed into 600 MB of space, that I could write a book just describing the Q1 release alone. We actually printed all of the resources on the CD and used over 10 reams of paper. That's over 5,000 pages of information.

We'll dig deeper into the Q1 CD in the next issue of *NICS*.



004

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browsers and document applications that are not up to the task.

When you find needed information, whether from the Web, from e-mail, from a "push" newsfeed, or directly from an expert, how do you store or distribute this information?

iLinx is a knowledge app that automatically formats inserted information into a single, fully searchable, unlimited-capacity document. (The Institute CD included with this newsletter contains your three free iLinx demo applets).

### iLinx features:

- virtually unlimited capacity (caps at a 16-terabyte document)

Active Directory lacks the capability to move users from one domain to another, even within the same domain tree, and it will not let you edit multiple user objects at the same time. For example, if a user is transferred from one location (one domain) to another location (within a different domain), you would have to delete the user's object from the first domain, recreate the user object in the new domain, and reassign the user's rights. In NDS, you could just move the user from one location to another, and the user would maintain all the same rights.

### The Bottom Line

Novell Directory Services (NDS) has been shipping since 1993 and provides robust directory services implementation and management tools. Microsoft's Active Directory, due to ship sometime this year, provides some improvements to Win-

### COMPARISON

	Novell Directory Services	Active Directory
<b>Architecture</b>	<ul style="list-style-type: none"> <li>▪ LDAP Access (through an add-on component)</li> <li>▪ Allows merging trees</li> </ul>	<ul style="list-style-type: none"> <li>▪ LDAP Access</li> <li>▪ Uses domain trees identified through DNS</li> </ul>
<b>Replication</b>	<ul style="list-style-type: none"> <li>▪ Uses NCP to access directory</li> <li>▪ Allows partitions and replicas that can be reassigned dynamically</li> <li>▪ Servers can replicate multiple partitions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Provides a global catalog</li> <li>▪ Domains can be replicated to other servers within that domain</li> </ul>
<b>Object management</b>	<ul style="list-style-type: none"> <li>▪ Extensible Schema</li> <li>▪ One management tool that supports plug-ins</li> <li>▪ Inherited rights throughout the entire tree</li> </ul>	<ul style="list-style-type: none"> <li>▪ Extensible Schema</li> <li>▪ Manage directory from a management console running various ActiveX controls</li> <li>▪ Inherited rights within each domain</li> </ul>
<b>Maturity/availability</b>	<ul style="list-style-type: none"> <li>▪ Available since 1993</li> </ul>	<ul style="list-style-type: none"> <li>▪ Available as beta</li> </ul>

Build navigable, searchable, and usable knowledge from the endless sea of electronic information, to quickly make informed decisions

- open architecture that easily integrates with any capturing and distribution process
- ability to run any number of specialized data entry forms, or applets to match the format of your knowledge base.
- ability to run on a network
- compression of text, rich text, and graphics
- a variety of collaboration features
- dynamic hypertext Tables of Contents for one or multiple knowledge bases
- query dialogues which allow easy or intricate applications of Boolean,

stem, thesaurus-based, and other search syntaxes

- dynamic hypertext HitLists which show results of your query, as applied to one or multiple knowledge bases
  - support for twenty-six graphic import/export types
- iLinx streamlines processes such as capturing, storing, retrieving, and sharing knowledge. By building navigable, searchable, and usable knowledge from the endless sea of electronic information, iLinx allows you to quickly make informed decisions. By facilitating knowledge distribution and simultaneous multi-reader/multi-writer access to company knowledge bases, iLinx fosters collective knowledge and

collective intelligence within your organization.

Create, view, search, annotate, and edit knowledge bases. Knowledge bases can contain all types of electronic reference information, including FAQ archives, policies and procedure manuals, specs, and instructions—or any other data needed in an instant-access form.

Before you can effectively use information, you must be able to find it. iLinx provides a dynamic Table of Contents that allows you to get a holistic view of the knowledge base contents. Expand or collapse the headings as necessary to see as much or as little of the contents as

dows NT Server's current user directory and has improvements that make it a more viable directory service. To decide which one is right for your organization, you should consider the following questions:

- Does the architecture enable you to create a directory structure that resembles your organization's size and structure?
- Can you easily manage the directory and easily make changes as your organization's structure changes?
- Can you extend the directory to support custom application and services?
- Can the applications your organization uses access the data in the directory? Will a future version support the directory?
- Which brand of servers does your organization currently use?
- Can your organization benefit from using more than one directory service? Or would the additional management necessary make using a single directory worthwhile?
- How easily will the directory enable you to manage user workstations? 

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up to date. But there is more to our careers than technical competence; consider your business habits, attitudes and ethics. These attributes communicate our professionalism, or lack of it, to others.

Think of your competence (knowledge and skill) as a packet in transmission on a network. Now ask these questions:

- What is on the header?
- Does it represent who you are to others in your network?
- Will it get you to where you really belong?

Our habits and attitudes are major parts of our "packet header." They tell people we are professionals—industry experts with strong ethics, reliable output and uncompromising standards. Such a "header" gets us where we need to go, but not without strict protocols.

During the next twelve months, professional protocols will be the focus of this SoftSkill column. Each month will introduce you to one of a set of twelve common skills used by successful leaders.

This introductory article makes a case for improving your leadership. However, you need to realize lasting

**Leadership is something else again. It is purely subjective, virtually impossible to measure objectively, and it can't be taught in school.**

you wish; click on a heading to view the complete information; mark whole sections of the knowledge base for one-step printing, e-mail, or export to a different format.

iLinX also allows you to query for critical information based on a wide variety of markers. Since every word in an iLinX knowledge base is indexed, you can query for any combination of words. You can use Boolean operators at any level of complexity and combine your search with other advanced search techniques to extract instant answers from a massive body of information.

**iLinX allows an unlimited variety of methods of entering, editing, and**

#### **annotating information:**

- Type text directly into an infobase
- Import various file formats into an infobase
- Import data directly from a World Wide Web sites by specifying a single URL (the import filter can also follow links from the starting page to retrieve as much information as you need)
- Enter information into a custom data entry template that organizes, formats, and optimizes the information for easy searching (your Institute CD includes QA builder, a free demo template ideal for handling support calls).
- Transfer information to knowledge base format by using an iLinX applet

designed specifically for that task (your Institute CD includes free newsfeed and email archival applets). Expand your capacity for entering information by creating or obtaining iLinX integration applets. A growing host of iLinX partners can write these custom applets for your specific needs, or you can easily write them yourself.

With the information in your knowledge base, you can annotate by adding popup notes, highlighters, and hyper-text links. Alternately, you can leave your master file intact, and add your changes and personalizations to a thin shadow file, which saves your changes and compares them to the master knowledge base. With your informa-

**The information overload problem is not that we have too much information; it is that our tools are inadequate. We end up having to navigate a growing world of information with browsers that are not up to the task.**

change will not come from new methods, attitudes or techniques alone. It has to come from deeper change in your paradigm. It must be based on long-standing principles and sound processes.

### Leadership Paradigms

In our society, leadership and management have become synonymous. But there are differences between good managers and good leaders. Consider the following *Wall Street Journal* ad run by United Technologies of Hartford, CT (as quoted in *Why Leaders Can't Lead* by Warren Bennis):

Warren Bennis gave us a simple but useful definition when he said managers do things right and leaders do the right things (Bennis, *Why Leaders Can't Lead*, 1989). The difference is subtle, but it really clarifies the roles of both. Managers perfect processes established by leaders and leaders envision the future, they define the direction to for managers to take.

Bennis and Burt Nanus, in their landmark leadership study reported in *Success* magazine, observed an evolution away from leadership in America and explained that during the eighteenth century, our leaders were geniuses who

#### Wall Street Journal Recruiting Ad for United Technologies

let's	People don't want to be man-	manage. The carrot always wins
get	aged. They want to be led. Who-	over the stick. Ask your horse.
rid	ever heard of a world manager?	You can lead your horse to water,
of	World leader, yes. Education	but you can't manage him to
man-	leader. Political leader. Religious	drink. If you want to manage
age-	leader. Scout leader. Community	somebody, manage yourself. Do
ment	leader. Labor leader. Business	that well, and you'll be ready to
	leader. They lead. They don't	stop managing. And start leading.

tion stored in an iLinX knowledge base, you can quickly find critical passages, and personalize them to reflect the way you use information—allowing you to work smarter.

### iLinX Applets

iLinX applets provide a custom interface for iLinX knowledge bases and any enterprise applications. Your Institute CD includes three useful demo applets:

QA Builder. This data entry applet, ideal for logging support calls, instantly organizes and fields each entry into your knowledge base. Thanks to iLinX

collaboration capabilities, multiple users can fill your knowledge base over a network while an administrator validates the entries.

Outlook i-mail. This applet integrates iLinX with Outlook or Outlook Express, allowing you to archive all of your e-mail messages into a single knowledge base. The imported information is fielded for Author, date, etc., optimizing the knowledge base for search-and-retrieval.

NewsFeed archival. This applet enables you to archive "push" information to knowledge base for storage and later search and retrieval.

### iLinX Possibilities

InfoDynamics and its partners will continue to produce new applets that expand iLinX possibilities, and there is no reason why you cannot create or even sell a few of your own iLinX solutions. iLinX functionality is based on InfoDynamics' iNFOx.OCX, a standards-based ActiveX control that interacts with all ActiveX-compliant languages such as Visual Basic, Delphi, and Visual Basic for Applications (VBA). This makes iLinX one of the hottest development tools to hit the information world. A developer-ready iNFOx object is available with purchase of iLinX Pro (consult the iLinX documentation and/or InfoDynamics

invented government and processes that led to the Industrial Revolution. During the nineteenth century, swash-buckling adventurers and entrepreneurs lead us to the American dream, and during the first half of this century, scientists and inventors directed us to new, previously impossible realms. Unfortunately during the last half of this century there seem to have been too few leaders. Instead, management concepts have been studied, taught, and enthroned as leadership. This has left us generally under-led and over-managed in the workplace (Bennis and Nanus, *Leaders—Strategies for Taking Charge*, 1985).

"Business management." according to Harold Geneen, "is objective. You want to get from here to there, with measured performance. What's more, you can be taught the tools of the trade in a school of business administration.

"Leadership is something else again. It is subjective, virtually impossible to measure objectively, and it can't be taught in school. Leadership is the ability to inspire other people to work together as a team, following your lead, to attain a common objective. The ability to lead is acquired through the experience of every day life" (Geneen, *Managing*, 1992).

## Governing Leadership Principles

According to Bennis, a leader manages attention, meaning, trust and themselves. These are leadership's governing principles. Making each a part of your life will improve your leadership (Bennis, *Why*). With each principle, you can focus on several processes:

### Managing Attention

The process for managing attention is vision. Leaders using this process draw others to their vision. They give direction, establish goals, and clarify outcomes. For example, in the early 1960s, John F. Kennedy's promised to put a man on the moon before the end of the decade. U.S. citizens rallied to his call for support and they accomplished the task.

### Managing Meaning

The process for managing meaning is to make vision and mission really apparent to others. For example, while directing *Ordinary People*, Robert Redford played Pachelbel's Canon in D for his cinematographers. Although he knew little about the technical aspects of cinematography, he clear-

A managed group, while efficient, is uninspired and does not produce more than the sum of its parts.

A led team fulfills vision and is dynamically more than the sum of its parts.

Sales for more information). While the possibilities are endless, here are a few of the immediate iLinx possibilities:

- Save on training by logging support calls to an iLinx knowledge base via QA builder or other custom entry forms.
- Archive your e-mail, saving hard drive space and allowing fast and thorough retrieval.
- Archive electronic documents and useful "push" and Web content to an iLinx "knowledge repository".
- Use iLinx narrowed view features to display your iLinx "knowledge repository" selectively, like a database, to quickly produce "new" documents from previous writing.

- Simply export the desired information to the desired format, or use the "send" function to drop a rich text document into your e-mail application.

#### To install iLinx:

1. Double-click on Welcome.htm on the root directory of the CD.
2. Click on the "Free Stuff" link in the Institute entry page.
3. Choose the "InfoDynamics iLinx" link at the left side of the "Free Stuff" page.
4. Follow the InfoDynamics page instructions for installing iLinx.

(iLinx requires the following: Pentium

or Pentium II; Windows '95, Windows '98, or Windows NT, 16 Mb RAM—32 MG recommended.)



ly communicated the visual mood he wanted to capture through an altogether different medium—music.

### Managing Trust

Managing trust requires constancy, competence, and character. Benjamin Franklin spent his entire adult life trying to govern himself around thirteen traits that he wanted to make part of his character. He worked on each trait a week at a time, over a thirteen-week cycle. Daily he recorded his successes and challenges in a little book.

### Managing Self

Leaders must know themselves thoroughly before they can lead others. This self-knowledge comes through listening to your inner voice, accepting responsibility for who you are, reflecting on the unique experiences you have had in life, and learning in greater depth than the average person.

The processes for self-management come in the twelve skills

we will be discussing in this column's future installments.

They include

- Communication
- Knowing and using team resources
- Understanding team needs and characteristics
- Effective team representation
- Planning
- Effective teaching and mentoring
- Counseling and empathic listening
- Sharing leadership
- Teamwork
- Goal setting
- Example

As each issue arrives we hope you will consider the content of the article and do what Benjamin Franklin did. Write down what you want to change in your life, evaluate how you are doing each day, and try to improve. This will help you to overcome poor leadership paradigms from your past and will help you to use processes that lead to true leadership. Leaders are not born to lead, they are grown to lead. 



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NICs Network Professional's Reference exists (1) to support the Institute's Technical Resource CD and (2) to give you something to read about your profession and technology when you're somewhere you'd just as soon not bring your laptop—computer.

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