

Novell Connecting

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Servers had been set in their places, wiring had been rolled out, switches and routers had been connected, and workstations were ready when the doors of the Salt Palace Convention Center opened and BrainShare '99 in Salt Lake City began. Once again BrainShare attendees were not only allowed but encouraged to personally interact with one of the stars of the show: BrainShare Network—Novell Connecting Points (NCP). NCP is the network that works behind the scenes at BrainShare and at other Novell-sponsored events (such as trade shows) to provide attendees with messaging and other services. (Novell's 15th annual BrainShare was held March 21–26, 1999.)

Since its debut at NetWorld+Interop Las Vegas '94, NCP has performed at events from Paris to Sydney and from Malaysia to the Netherlands. (For more information about NCP, see "Novell Connecting Point: Live at Trade Shows All Over the World," *NetWare Connection*, Mar. 1997, pp. 30–38 and "COMDEX Intranet—Novell Connecting Points: Mission Impossible?" *NetWare Connection*, Dec. 1997/Jan. 1998, pp. 24–32. You can download these articles from <http://www.nwconnection.com/past/>.) Given the number of past appearances, you may think that you know all there is to know about NCP. However, the Novell corporate events team is always changing and updating NCP, adapting the network to new technologies and to the demands of each show.

What was new about NCP at BrainShare '99? Among other things, the Novell corporate events teams enhanced NCP's performance through a new suite of Java servlets. Other changes include the introduction of Novell Directory Services version 8 (NDS 8), the latest version of GroupWise WebAccess, and some of the fastest hardware available.

COMING SOON TO A TRADE SHOW NEAR YOU

If you attended BrainShare '99 or accessed NCP prior to the show via the Internet, you saw NCP use the following Java servlets running on the NetWare 5 Java Virtual Machine (JVM):

- The Service Launcher (featuring the Service Bar)
- BrainShare '99 Registration
- Ultimate Home Network Giveaway
- Success Stories
- The BrainShare Feedback Survey
- The One-Click Survey

If you missed BrainShare '99 in Salt Lake City, you can still catch NCP's Java-enhanced performance at trade shows worldwide. (For a list of trade shows that will be featuring NCP in 1999, see "Novell Connecting Points With Java Available Here" on p. 23.)



Full Service

The Service Launcher is key to NCP's performance. The Service Launcher takes advantage of resources running on NetWare 5, such as NDS 8 and Oracle8 for NetWare, to create a home page that is customized to the specific needs of each NCP user. (Oracle8 for NetWare ships with NetWare 5.) This home page appears with a personal greeting to the user each time the user launches the browser on his or her workstation. In addition, the home page provides the user with access to the range of services to which the user has rights.

The Service Launcher determines which services the user has rights to based on information stored in NDS and Oracle8 for NetWare. NDS contains information about NCP users, such as usernames, passwords, and a list of the services to which the user has rights. The Oracle8 database stores information that is linked to other NCP services, such as the Registration Service.

The Service Launcher accesses NDS with the help of Novell Java beans and the Java Naming and Directory Interface (JNDI), an Application Program Interface (API) that is included with the NetWare 5 JVM. (For more information about Java and NetWare 5, see the related article on p. 6.) JNDI allows Java programs to access directory services, such as NDS and naming applications such as Domain Naming System (DNS). (For more information about JNDI, visit <http://www.java.sun.com/products/jndi>.)

Located at the top of the NCP home page and at the top of every web page that exists within the context of that home page, the Service Bar makes accessing NCP services easy. (See Figure 1 on p. 22.) In addition, NCP users can access the Service Bar from pages outside the context of the NCP home page simply by clicking the "Home" icon on their NCP workstation's browser menu.

The Service Launcher is more than an easy way for users to access authorized services. The Service Launcher allows the corporate events team to add, delete, and manage services without taking NCP servers down, assuring NCP users consistent access to NCP services. For example, if the Novell corporate events team decides to add or delete an NCP service, a member of the team can log in to NCP with administrative rights and, in real time, add or remove the code that tells the Service Launcher where to find the resources that start this service.

The Service Launcher provides on-the-fly services through a Java language capability called *multithreading*. (A *thread* is a lightweight process—that is, a process that requires minimal system resources—that executes within a program. Java allows programmers to write multiple threads, which can be executed simultaneously.)

Each NCP user receives a new thread and session each time he or she accesses the Service Launcher. In addition, each time a member of the Novell corporate events team logs in to NCP with administrative rights, he or she receives a special thread and session that allows him or her to modify the state of the Service Launcher servlet. Multithreading allows hundreds of NCP users to access the same Service Launcher service at the same time. Multithreading also simultaneously provides a way to alter the Service Launcher itself.

BrainShare '99 Registration

Web users could preview the NCP Service Launcher and several other servlet-enabled services by accessing NCP prior to the show. (NCP was available via the In-

ternet.) Among the NCP services available to preshow users was the BrainShare '99 Registration Servlet.

As its name suggests, the BrainShare '99 Registration Servlet enabled prospective attendees to register for BrainShare '99. To register, the prospective attendees clicked the Registration section on the Service Bar. After the prospective attendee entered all of the information that the BrainShare '99 Registration Servlet requested (such as the attendee's name, address, and company affiliation), the servlet asked the attendee to review this information for accuracy. The BrainShare '99 Registration Servlet then stored this information in the NCP Oracle8 database. Next, the BrainShare '99 Registration Servlet notified the attendees, via an e-mail message, that the registration was completed.

Eyes on the Prize

The Novell corporate events team offered another preshow servlet, the Ultimate Home Network Giveaway Servlet, to encourage frequent access to the NCP site. The first time a user accessed this site for

information about BrainShare '99, the Giveaway Servlet prompted that user to type in his or her name and e-mail address. The Giveaway servlet then stored the user's name and e-mail address in the NCP Oracle8 database and used this information to create a cookie, which it placed on the user's hard drive.

If the user visited the NCP site again, this cookie informed the Giveaway Servlet that the user had already entered his or her name and e-mail address. As a result, the Giveaway Servlet did not ask the user to enter that information again.

Instead, each time the user accessed the BrainShare '99 site, the Giveaway Servlet added an additional row, called a *tuple*, of information to the user's Oracle8 database entry. Each tuple represented an additional entry in the Ultimate Home Network Giveaway. The more times the user accessed the NCP site, the greater his or her chances of winning one of two prizes, both of which were awarded a few days before BrainShare began. (For more information about these two prizes, see "Dream Networks" on p. 22.)

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(7.375" x 4.875")



Figure 1. The Service Bar on the pre-event BrainShare '99 NCP

Win-Win

Before and during BrainShare '99, the Service Bar provided access to the Success Stories Servlet, which provided NCP users with the opportunity to submit stories about how Novell products have contributed to the success of their networks. NCP users could also click the Success Stories section to browse through the stories that other BrainShare attendees (past and present) had submitted.

After a user submitted a success story, the Success Stories Servlet placed that story in the NCP Oracle8 database, where all of the success stories were stored. Furthermore, every story submitted was automatically entered into the Success Stories contest. Each day of BrainShare '99, the Novell corporate events team awarded prizes for the most intriguing stories. (To read a winning story, see "A Successful Story" on the *NetWare Connection* web site at <http://www.nwconnection.com>.)

Tell Novell What You Think

Although most NCP services appeared on the Service Bar either throughout the preshow period or throughout the BrainShare '99 show itself (or both), the BrainShare Feedback Survey Servlet did a disappearing act. The purpose of this servlet

was to record attendee feedback about BrainShare '99. When a user clicked the BrainShare Feedback Survey section on the Service Bar, this servlet provided a space in which the user could voice his or her opinions about the event. The user could also share any suggestions he or she may have for future events.

The BrainShare Feedback Survey Servlet then stored the user's response in the Oracle8 database. Thereafter, each time that user launched his or her browser, the Service Launcher found the user's response to the opinion survey in the Oracle8 database and did not offer the BrainShare Feedback Survey service to the user.

Now You See It, Now You Don't

The One-Click Survey appeared on the web pages of various NCP services, such as the NCP home page. The One-Click Survey was a daily opinion poll that had the look and feel of a Cable News Network (CNN) "Quick Vote" survey. (You can view a CNN Quick Vote survey at <http://www.cnn.com>.)

At the beginning of each day during BrainShare '99, the One-Click Survey Servlet displayed a new survey question. After a user submitted his or her response to this question, the One-Click Survey

Servlet recorded this response in the Oracle8 database. The servlet then added the response to a tally of other user's responses and used this information to produce a web page that gave the user up-to-the-minute results of that day's survey.

For the remainder of that day, each time the user initiated a new NCP session the Service Launcher found that user's response to the One-Click survey in the Oracle8 database. Since the user had already responded to that day's One-Click Survey, the Service Launcher no longer displayed the survey on the NCP web pages. However, when the user initiated an NCP session on the next day, the One-Click Survey again appeared on the NCP web pages.

THE SUPPORTING CAST

Of course, it took more than just Java servlets to ensure NCP's success at BrainShare '99. The Service Launcher also offered non-servlet services through the Service Bar. The following non-servlet services contributed to NCP's successful performance: the latest version of NDS, the latest version of GroupWise WebAccess, and web-based faxing.

NDS 8

When BrainShare '99 attendees browsed the NDS tree for their photographs or for other information, NDS 8 delivered those photographs and that information faster than any previous version of NDS could have. This speed is one of the things that distinguishes NDS 8 from earlier versions of NDS.

How fast is NDS 8? According to Gary Norton, NCP technical project manager,

Dream Networks

Two Novell Connecting Points (NCP) users who took advantage of NCP's services during the weeks prior to BrainShare '99 won dream-come-true home networks. Each network included the following networking software from Novell: NetWare 5, Zero Effort Networks (Z.E.N.works), ManageWise 2.6, and GroupWise 5.5.

The first Giveaway winner also received the following system from Compaq Computer Corp. and Nortel Networks:

- Compaq Prosignia 720 server with the following features: a 350 MHz Intel Pentium II processor, a 64 MB 100 MHz ECC SDRAM, an Integrated Wide Ultra2 SCSI Controller, a 4.3 GB Wide Ultra SCSI hard drive, a 32x CD-ROM, and a 1.44 MB floppy disk drive
- Compaq V55 15-inch monitor

- Compaq 10/100 TX PCI UTP controller card
- SmartStart and Compaq Insight Manager
- Compaq 3-year limited warranty
- Nortel Networks BayStack 350 16-port 10/100 autosensing switch

In addition, the second Giveaway winner received the following system from IBM Corp. and Nortel Networks:

- IBM Netfinity 5000 server with the following features: a 400 MHz Intel Pentium II processor, a 64 MB 100 MHz ECC SDRAM, a Dual Channel Wide Ultra SCSI Controller, a 9 GB SCSI hard drive, a 32x CD-ROM, and a 1.44 MB floppy disk drive
- Built-in Ethernet
- IBM 17-inch monitor
- IBM 3-year limited warranty
- Nortel Networks BayStack 350 16-port 10/100 autosensing switch

NDS 8 is fast enough to have a "huge impact" on the number of transactions the NDS tree can handle at a given time and on the number of objects an NDS container can hold.

For example, Norton says that during previous trade shows, Novell placed between 5,000 and 6,000 users in each NDS container object. At this year's larger trade shows (such as COMDEX Fall '99 in Las Vegas), Novell plans to place more than 200,000 users in each container object.

This is a significant increase, but Norton asserts that 200,000 objects per container is a conservative number for NDS 8. Norton explains, "NDS 8 actually has the ability to go much higher than that." How much higher? According to Novell, NDS 8 can manage "at least one billion directory objects." (For more information about NDS 8, visit http://www.novell.com/lead_stories/1999/mar11/index.html. See also "NDS 8: Rev Up Your Directory Tree," *NetWare Connection*, May 1999, pp. 34-38. You can download this article at <http://www.nwconnection.com/past>.)

The speed with which NDS 8 can ac-

Novell Connecting Points With Java Available Here

The Novell Connecting Points (NCP) network has recently appeared at the following events:

- BrainShare '99, Salt Lake City
- NetWorld+Interop, Singapore
- Compaq Innovate, Houston
- COMDEX Spring '99, Chicago
- NetWorld+Interop, Las Vegas
- BrainShare Europe '99, France

If you missed these NCP appearances, you can still get a hands-on look at NCP at

the following upcoming events. (For more information, visit <http://www.novell.com/events/tradeshows>.)

- Edge '99, Boston, June 27-30
- NetWorld+Interop, Toronto, July 14-16
- BrainShare Australia '99, Sydney, Aug. 4-6
- NetWorld+Interop, Atlanta, Sept. 13-17
- NetWorld+Interop, Paris, Sept. 14-16
- BrainShare South America '99, Sao Paulo, Sept. 14-16
- BrainShare Africa '99, Johannesburg, Oct. 12-14
- COMDEX Fall '99, Las Vegas, Nov. 22-26 ●

cess information in the NDS tree affects more than the number of NDS objects that can be stored in each container. This increased speed also affects the amount of information that can be stored for each NDS object and the number of people who can access that information at any given time.

At BrainShare '99, Novell took advantage of these increased capabilities by offering attendees a look at two of the hot new technologies that NDS 8 supports: Identity and Persona technology and biometric technology. Identity and Persona technology allows an individual or a company to manage information about

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(7.375" x 4.875")

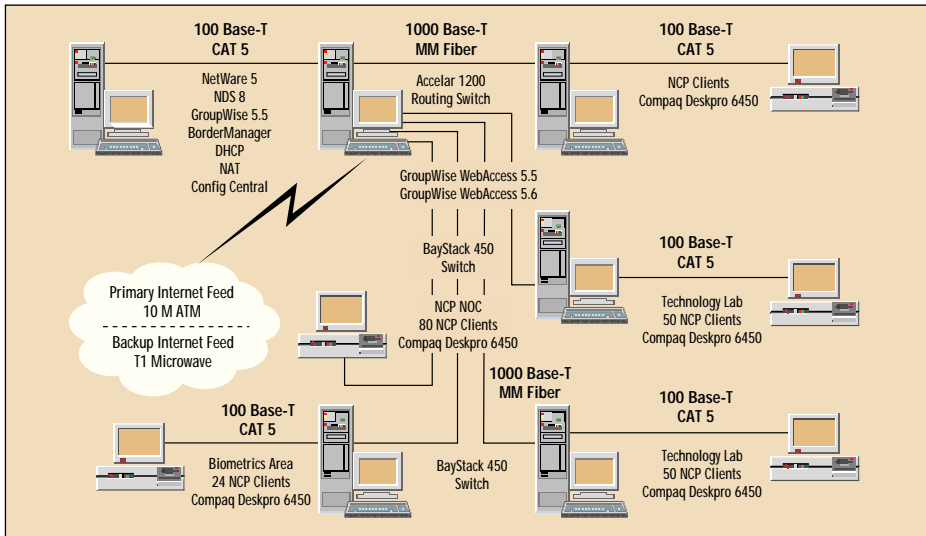


Figure 2. Two interconnected Accelar 1200 routing switches served as the logical center of the NCP network at BrainShare '99 in Salt Lake City.

themselves—such as names, addresses, and credit card numbers—through a single site on the Internet. (For more information about Identity and Persona technology, visit <http://www.digitalme.com>.)

Biometric technology allows users to log in to a network by using unique bio-

logical information, such as a fingerprint, to identify themselves. To log in to an NCP workstation, users could place the finger of their choice on a special pad attached to the workstations. (For more information about biometric technology, see "007 or Captain Kirk?")

007 or Captain Kirk?

BrainShare '99 attendees had the opportunity to view the latest version of Novell's biometric technology. Like security systems in futuristic films, this technology allows or denies access to system resources based upon fingerprint identification.

Novell's biometric technology takes advantage of Novell Directory Services (NDS) 8 to offer this new security option. When a BrainShare '99 attendee swiped his or her badge at one of the 24 workstations located in the biometrics area, a Dynamically Linked Library (DLL) file running on that workstation took over the login process. This DLL file forwarded the attendee's NDS username and password to a NetWare Loadable Module (NLM) running on a NetWare 5 server. The NLM then determined whether or not the attendee's NDS User object already contained a fingerprint attribute.

If the file running on the NetWare 5 server informed the file running on the workstation that the attendee's User object did not contain a fingerprint attribute, the workstation asked that attendee if he or she would like to enroll his or her fingerprint in NDS. If the attendee answered yes, the workstation asked the attendee to place a finger on the electronic fingerprint reader attached to that workstation. (If the attendee answered "Not this time," the attendee could log in just as he or she would from a non-biometric NCP workstation.)

When the attendee placed a finger on the reader, instructions appeared to help the attendee enroll his or her fingerprint in NDS. A large image of that fingerprint also appeared. (See Figure 3.) These instructions also cautioned the attendee to remember which finger he or she had chosen to enroll.

In addition to guiding the attendee through the enrollment pro-

cess, the workstation created a graphical representation (called a bitmap) of the attendee's fingerprint. This bitmap was based on thousands of checkpoints, called minutia, that registered the ridges and valleys of the fingerprint. After the bitmap was completed, the workstation converted this bitmap into a mathematical representation of the fingerprint. The workstation then forwarded this mathematical representation to the NetWare 5 server, which stored the mathematical representation as a fingerprint attribute in NDS.

The next time this attendee swiped his or her badge at a biometric workstation, the NetWare 5 server informed the workstation that the attendee had already enrolled a fingerprint in NDS. Next, the attendee placed his or her finger on the reader, which captured the image of the attendee's fingerprint. After the fingerprint was captured, the workstation again created a bitmap and converted the bitmap to a mathematical representation.

Next, the workstation forwarded the new mathematical representation to the NetWare 5 server, which compared this new representation to the attribute in the attendee's User object. If the new representation was within an acceptable range of difference, the attendee was automatically logged in to NCP. (Network administrators can set the acceptable range of difference to values ranging from 0 [no match] to 10,000 [a perfect match].) If the new representation was outside the acceptable range, the workstation asked the attendee to choose one of two options: The attendee could either try again to log in biometrically, or the attendee could log in as a guest.

Novell's biometric technology is still in the alpha stage of development and is not available for purchase. However, it may only be a matter of time before your users will be able to log in to your company's network with the touch of a finger, just like in the movies. ●

Improvements to GroupWise WebAccess

Another familiar NCP service also appeared at BrainShare '99 with noticeable improvements in speed: GroupWise WebAccess. The next generation of GroupWise WebAccess is not only faster than any previous version but also has a new look and feel.

Previous versions of GroupWise WebAccess use the main browser window to provide users with services (such as messaging and scheduling services). The newest version of GroupWise WebAccess uses parent and child windows to provide users with these services. This version of GroupWise WebAccess owes much of its speed to parent and child windows.

A parent window is the window through which various services are offered. A child window is a smaller window that appears as a result of selecting one of the services from the parent window. The GroupWise WebAccess parent window contains the main list of GroupWise WebAccess services such as a user's e-mail Inbox and Sent Items. A child window may then contain a particular message that the user selected from his or her Inbox.

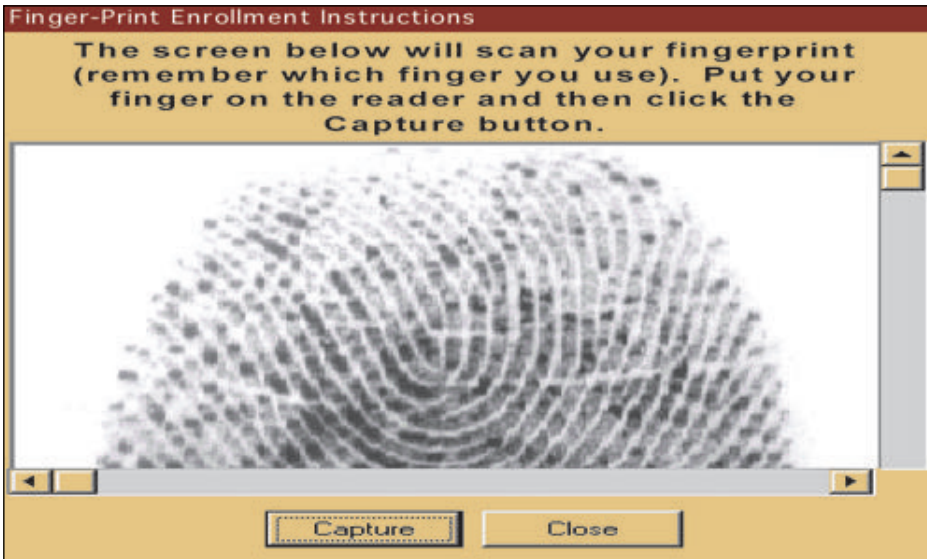


Figure 3. Biometric technology enabled users to log in to NCP with the touch of a finger.

The GroupWise WebAccess parent window remains in the background when the user opens a child window. When the user closes that child window, the parent window will still be open. This feature makes GroupWise WebAccess services easier to access than they have ever been before. Because the information contained in the parent window remains resident until the user closes that window, the user does not have to wait for the browser to retrieve this previously accessed information.

That's a Fax, Jack!

NCP also offered BrainShare '99 attendees a peek at some of the latest technologies from third-party vendors—technologies such as Tobit FaxWare. Tobit FaxWare is a software program that allows users to send HTML-based faxes across the Internet via the NetWare 5 server on which the program is running.

When BrainShare '99 users accessed Tobit FaxWare from the NCP home page, they could create their own HTML fax pages. Users could also attach non-HTML documents, such as WordPerfect documents, to those pages. After the user sent his or her documents, the specially configured Compaq ProLiant 1600 server at the back end of NCP sent these faxes and their attachments out to the Internet. (For more information about Tobit FaxWare, visit <http://www.ntfax.com/FWmain.htm>.)

NCP BEHIND THE SCENES

Although NCP services are important, it takes more than user services to ensure NCP's success. In part, NCP's successful

performance at BrainShare '99 was the result of a skillful arrangement of capable and fast hardware. (See Figure 2.)

Users who accessed NCP from remote locations dialed into two Ascend Max 2000 dial-in access servers over a 1.54 MB T1 line. These Ascend dial-in access servers authenticated users via Remote Authentication Dial In User Service (RADIUS), which accessed NDS via two Nortel Networks Accelar 1200 routing switches that served as the logical center of NCP.

Each of the Accelar 1200 routing switches contained 12 1-GB ports. One of these gigabit ports was used to connect the two switches to each other via multimode fiber optic cable. Other gigabit ports connected these two routing switches to the 10 MB Asynchronous Transfer Mode (ATM) link that provided Internet access for NCP users and to the Nortel Networks BayStack 450 and 350 switches that provided other BrainShare '99 networks, such as the DeveloperNet network, with access to NCP. For example, these BayStack switches provided NCP access for wireless devices.

Three of the gigabit ports at the logical center were attached to the three Accelar 1200 routing switches that provided connectivity to the 11 Compaq ProLiant 1850R servers at the back end of the network and to the 292 Compaq Deskpro 6450 workstations at the front end of the network. These three switches each had two 1-GB boards, and each of these boards contained 80 10/100 Ethernet ports that connected to the servers and workstations.

At the front end of the wireless network (through which BrainShare '99

attendees could access NCP) were 450 Nortel Network wireless access cards and 500 RadioLAN/10 wireless devices. Attendees had the option of checking these wireless devices out on a first-come, first serve basis. The Nortel Networks wireless cards provided service at a speed of 2 Mbit/s through 50 overlapping access points. The RadioLAN cards provided service at a speed of 10 Mbit/s through 50 overlapping access points.

The 11 servers at the back end of this wireless network configured IP addresses for wireless connections via Dynamic Host Configuration Protocol (DHCP). Border-Manager's Network Address Translation (NAT) provided the wireless network with connectivity to the Internet.

CONCLUSION

With its new servlets, new versions of NDS and GroupWise WebAccess, and some of the fastest hardware available, it's no wonder that NCP was one of the stars of BrainShare '99.

Cheryl Walton works for Niche Associates in Sandy, Utah. ●

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