# Industry Outlook:

How Novell Is Connecting NetWare to the IBM Mainframe World—An Interview With Novell's Bernard Harguindeguy

By Stephen Force

This month, *Information Technologies* magazines' Contributing Editor, Stephen Force, interviews Bernard Harguindeguy, director of product marketing of Novell's NetWare Systems Group in Sunnyvale, Calif.

Bernard Harguindeguy has 10 years of experience in the data communications industry, primarily in the development and marketing of communications technologies, including network management, SNA and T-1. Prior to joining Novell, he held product marketing and development positions at 3COM and Bridge Communications.
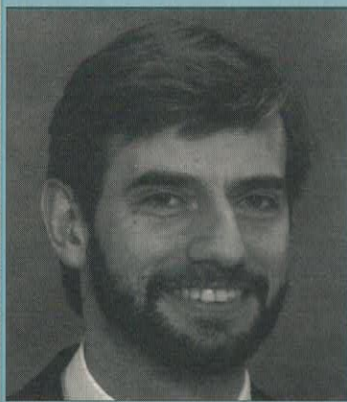
BH: Before we begin, I would like to first give you a quick background of NetWare for SAA. This product was conceived to help introduce NetWare into the mainframe world and vice versa. But from the start, we had a vision that strictly 3270 emulation was the way of the past. So, even though the product was built as a gateway with 3270 terminal emulation on the LAN, our main objective was to build a product to integrate LAN applications with mainframe applications. We also envisioned, from the beginning, linking together data bases, printing, (network) management, file transfer, software distribution and so forth. We had this vision in 1989, and have since really made it happen. We also knew that Novell needed to deliver a product that was simple to implement, without a lot of re-training for an organization.

IT: *Why would an enterprise choose Novell NetWare OS over TCP/IP?*

BH: NetWare supports TCP/IP, AppleTalk and IPX simultaneously. With NetWare, you get support for mul-tiple protocols automatically. A customer does not need to choose TCP/IP over NetWare, UNIX or IPX, since NetWare ties it all together. Call it what you want: downsizing, rightsizing, empowering users, but mostly, we give users what they want, a choice. Novell provides a platform that is very heterogeneous, and from the start, multi-vendor in nature.

IT: *It seems that Novell is a relatively new player in IBM mainframe connectivity. What experience does Novell have with it?*

BH: NetWare for SAA was first announced in June 1990 and we shipped the first release in June 1991. We shipped a follow-up release in September 1991 (Version 1.1), with a subsequent release in April 1992 (Version 1.2). The most current release (Version 1.3) shipped in January 1993. Each release contained major feature additions. For example, the first release supported 64 VTAM sessions; the second supported 500. Between the first and the second releases, we also introduced the integration with the AS/400 together with a lot of network management features.

Novell acquired its core SNA technology through the acquisition of CXI in 1988. CXI was a major supplier of coax-attached terminal emulation. Novell was able to take this existing SNA expertise and blend it with NetWare expertise. So, our SNA experts became NetWare experts and vice versa. This was how we were able to come up with the product that successfully merged the two worlds together.

With NetWare for SAA Version 1.3, we introduced a number of what we call critical features like hot standby, better security (i.e., the capability to do password encryption for users on the LAN), LU0 support and also an interface for third parties to send their alerts to a NetView console without having to know much about NetView.

IT: *Does NetWare for SAA support APPC?*

BH: The first release of NetWare for SAA was the first product on the market to be both CPI-C and APPC compatible at the server. Several competing products did not have this support until several years after our product first shipped.

NetWare for SAA is the most successful gateway on the market. The product is being resold by IBM, Memorex-Telex, Apertus, Eicon, DCA and others. NetWare for SAA can be purchased from IBM for installation into an IBM 3172.

IT: *You mentioned that NetWare for SAA can be run on an IBM 3172. Could you expand on this?*

BH: Today, IBM staff will come to a customer and install, service and support a 3172 with NetWare for SAA inside. It is called a 3172-BT1, and was developed by Bus-Tech Inc. (Burlington, Mass.) Bus-Tech sells the

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product, and IBM then installs and services it.

Early on, Novell made a strategic decision to provide our customers with a server that would integrate the mainframe and the AS/400 with third-party terminal emulation. A customer can buy terminal emulation products from DCA, Wall Data, Avatar, Attachmate, Eicon, NSA, SSI and other vendors.

IT: *What operating system platforms are supported?*

BH: We support DOS workstations with the product, as well as OS/2, Windows, UNIX and Apple Macintosh.

IT: *How did Novell first envision NetWare for SAA?*

BH: We wanted a product that could support hundreds of users, had built-in security and was scalable. A customer could first buy a server with, say, 64-session capability and then could grow the server along with the user base. We can support 500 users reliably on a single server with excellent response time. The server is, in fact, so fast that we are able to channel attach NetWare for SAA directly to a mainframe. By doing this, we are able to avoid the inherent delay associated with either IBM 3174 or IBM 3745 FEP (front-end processor) connected LANs. This was, in fact, a strategic decision of Novell to directly connect NetWare to the mainframe without needing to go through other IBM-type hardware.

IT: *What was your next step?*

BH: After we successfully connected NetWare to the mainframe and provided terminal emulation, our next goal was to extend the world beyond emulation itself, transparently—both at the software and hardware level. We started to work with data base vendors, for example, Gupta, Information Builders and Oracle, to tie the LAN-based data base with mainframe-based data bases. We consider this to be a

very sophisticated "pipe" between the LAN and the mainframe. Using this pipe, a LAN-based user not only can extract data from a LAN data base server, but also can transparently extract data from a mainframe-based data base.

IT: *Is ESCON connectivity coming?*

BH: When the customers request it, third-party vendors will provide it.

IT: *How does NetWare for SAA support data base activities?*

BH: Users can, by using either LAN, mainframe or a relational data base running directly on a NetWare server, bring data directly into front-end applications from multiple sources. Gupta has released a DB2 gateway on NetWare for SAA that allows Window's SQL clients to merge data from mainframe and LAN data bases into a single report. Information Builders and Novell have also developed modules on top of NetWare for SAA that will provide NetWare SQL front-ends and applications, such as Excel or Lotus, to access relational and non-relational data bases (i.e., IMS DB, DB/2 or VSAM) or even flat files on the mainframe.

IT: *And printing?*

BH: The data base connection was at the top of our list after we tackled the printing problem. You may have read about the NetWare HostPrint NLM (NetWare Loadable Modules)—software that interfaces with the NetWare server; it basically allows the mainframe staff to send print jobs directly to a LAN printer without having to go through a workstation running printer emulation software on that network.

The printing application market is very interesting—it is the first time that anyone has put printer emulation on a server or server queue rather than on a workstation. What Novell did was to build LU1 and LU3 emulation into a NetWare NLM

running as a part of the server. The mainframe application can then send the print data directly to what it thinks is a printer, and the NetWare NLM printer emulation software places it into a printer queue. This eliminates a major conversion problem for customers because no changes are necessary to either the mainframe application or to the printer VTAM definition.

By sending the print data directly to the desired server, companies can eliminate dedicated print servers from the LAN. We also give them a central point for configuration and expedited network print traffic to the point where performance is 10 to 15 times better than with regular print emulation on a workstation.

IT: *What about file transfers?*

BH: Several third-party vendors are working on file transfer products. Many customers have a corporate site, and every so often, they need to transfer specific files from the mainframe to different file servers—perhaps the latest price list or customer orders. Also, several customers need to regularly transfer data from a LAN server to the corporate mainframe. Several third-party vendors are working on a solution where the mainframe will do unattended file transfers to the NetWare for SAA server using LU 6.2; NetWare for SAA will then redistribute these files over the network using TCP/IP or IPX to the various file services on the network.

IT: *Companies need to administer software intelligently. What is Novell doing to address this?*

BH: We have a number of third-party vendors building what we call "agents" (NLMs) in NetWare for SAA for software distribution. Tangram built a product called AM:PM, which distributes software from the mainframe to any workstation on the network using NetWare for SAA for all host communications. The product is now being marketed by Systems Center, Inc. (Reston, Va.)

Novell also has a software distribution product called Network Navigator, which also uses NetWare for SAA for mainframe attachment and propagates software and applications throughout a NetWare network to NetWare servers and workstations.

IT: *Since our readership is primarily mainframe-based, and thus have data backup and restore responsibilities, what is Novell doing to provide mainframe-based LAN backup solutions?*

BH: We are currently working with two major suppliers of backup software. In fact, IBM has already announced one of these products. IBM is working on a product where the mainframe will communicate with NetWare for SAA over a LU 6.2 connection, and then NetWare for SAA will communicate with servers and workstations, including UNIX over TCP and IPX, to backup existing servers and workstations. This uses the mainframe, basically, as the backup center.

IT: *Is this IBM's data facility distributed storage manager (DFDSM)?*
BH: Yes, it is.

IT: *Bernard, when management hears of migrating from one system to another, it sometimes sends shivers up and down their spine. What is Novell doing to assist management in both ease of migration and cost containment?*

BH: One thing that we have done to help people migrate from 100 percent SNA networks to networks that have NetWare environments was to build a product that would help them send NetWare protocols over an SNA backbone. This allows them to deploy NetWare equipment in the branch offices without having to set up a new wide area network (WAN) just for those devices. We built a NLM that would encapsulate the NetWare traffic over a LU 6.2 pipe. Then we let the mainframe front-end processor really do the routing. On the other end, there is another server with an NLM that de-encapsulates the traffic and puts it back on the LAN. This product is called NetWare SNA Links.

So, with no mainframe software, and with software that lists for around $1,000, we can wedge NetWare on an SNA backbone. And, so NetWare for SAA becomes a routing and migration vehicle.

Incidently, because there are so many third-party vendors that offer NetWare for SAA NLMs, we are now providing a NetWare for SAA Solutions Guide, which lists some of these vendors and their products. Things change so fast, however, that it is difficult to keep this guide current.

The market has, in fact, shown us over the past two years that our strategy was right on target.

IT: *What does it mean for a product to be Novell certified (both hardware and software)?*

BH: What we have is a certification process in-house that has a team assigned to it. This team is called Independent Manufacturers Software Program, or IMSP. The third-party will send us hardware or software and we will test it to see if it is runs on NetWare correctly. If it passes all required test and simulations, then they can advertise it as "Novell Certified."

IT: *Is this the "YES" logo that is seen on product advertising?*
BH: Correct. The "YES" logo is one of the ways in which Novell helps third-party vendors market their products.

IT: *How much knowledge does an enterprise need to implement NetWare?*
BH: This is actually a very good question. One of the main reasons for the success of NetWare for SAA is that for the SNA people, NetWare for SAA looks and feels like an IBM device. It has full NetView support, in the sense that it can be monitored and controlled like an IBM 3174 or IBM 3745.

From the LAN side, it looks strictly like a LAN server. The LAN people do not need an in-depth knowledge of SNA to set up their side of NetWare for SAA. This minimizes the classical problem of either lack of communication or miscommunication between the LAN and SNA people.

In summary, to the mainframe people, NetWare for SAA looks like an IBM device and to the LAN people like a LAN server.

IT: *Networks are by nature a very difficult area to manage. Companies need tools that not only present network problems as they occur, but also tools that are proactive. What does NetWare for SAA offer?*

BH: We have a lot of network management (components) built into the product itself. The main component is called the NetWare Communications Services Manager. NetWare for SAA uses a Windows 3.1 interface for interaction. This means that one does not need to go to the NetWare server console to issue NetWare requests.

If a customer had, say, 500 sessions active, we can provide status information for each session—who the users are, what their network address is, what they are doing, what the LU pool was, when the session became active, how long it stayed active and what protocol they are using.

In addition, if anyone wanted to selectively trace a session, all they must do is highlight the session and then double click.

Also, if a session was hung, an authorized administrator can select this session and "kill" it. VTAM itself will do the termination; however, NetWare for SAA will automatically clean up the server.

NetWare for SAA offers several other tools as well, both Windows- and NetView-based.

IT: *Describe some of them.*

BH: Network Alerts can be received in "real-time" by the NetWare Communications Services Manager. These alerts can be seen in a Windows environment to be acted on either by a user or by the communications service manager itself. An alert seen in the Windows environment can be clicked on not only to see the current information, but also to see historical information associated with it.

IT: *What about NetView?*

BH: NetWare for SAA is fully manageable from NetView.

NetView can both send and receive commands to handle alerts, as well as load and unload NLMs on the server to handle certain event situations.

Today, when a customer buys NetWare, they also get a NetView agent and an SNA stack as well. This means that NetWare itself, the server, can be managed from NetView. Every NetWare server on the LAN can be managed from NetView.

IT: *Who can provide required knowledge?*

BH: A customer has several possibilities to get the required knowledge: from IBM to Novell's OEM partners (like Memorex-Telex and DCA, etc.) all to way to very sophisticated system integrators throughout the world, as well as our top resellers that integrate UNIX, TCP/IP and SNA. Also, as mentioned before, staff SNA and LAN people can provide much of the knowledge necessary without re-training.

The last release of NetWare for SAA (Version 1.3) allows a network administrator to configure one server and then to duplicate this configuration remotely across multiple NetWare for SAA servers. For example, from a central site, one server can be configured and then this change can be propagated to branch office servers without having to physically visit any of the branch offices.

IT: *What sort of background is recommended to work with a NetWare to IBM mainframe connection?*

BH: Customers can attend various classes offered from Novell Authorized Education Centers (NAECs) located throughout the world. Customers can send people through the Novell Certified Engineer (CNE) program, which trains them in some detail on the nuances of not only Novell networks, but also general network theory and practice as well. This would be a very wise investment that will pay off in the long term.

IT: *How does Novell address disaster preparedness, in regard to quickly recovering from a LAN outage?*

BH: A customer must simply restore a current copy of a server and then propagate it throughout the LAN.

IT: *Will Windows/NT be supported as a client when it is generally available, and if so, how?*

BH: Absolutely. I cannot give dates, but we have several third-party developers working on this. Not only will terminal emulation be available, but application connectivity as well.

IT: *Some people think that NetWare runs on MS-DOS. Could you please clear up this misconception?*

BH: NetWare is an operating system environment that has been optimized for network access, rather than for local applications and interface support (such as keyboards, mouse and graphics) as is the case for MS-DOS or OS/2.

NetWare is written to get data out of a network, process it and either place it into a data base or some local server function, or place the results back on the LAN as quickly as possible.

With MS-DOS as the operating system, we were limited to about 64 LU sessions. Now, with our optimized operating system running on a Intel 486 machine, we can support 500 users, taking no more that 15 percent of the CPU and support multiple protocols (IPX, TCP/IP, AppleTalk, etc.).

IT: *What trends does Novell see in the industry?*

BH: We see a trend toward a system that allows a customer to integrate the old with the new. The old being terminal emulation; the new being applications residing on workstations or servers that interface users directly with mainframe data and applications transparently without the user knowing about it. The new also means bringing the applications to the user, rather than the user having to go to the mainframe for the applications.

IT: *Anything new and exciting that Novell would like to pass on to* **Information Technologies'** *readers?*

BH: We are building a lot of redundancy in NetWare for SAA that we are delivering in both current and subsequent releases. We also are spending a lot of time automating network recovery. This recovery will either be under mainframe or LAN control.

We are certainly not through improving NetWare for SAA or our NetWare-to-host solutions. We are very "customer-driven" at Novell. We constantly search for the needs of our users and then build solutions into our products that address those needs.