

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

SWITCH HITTERS

Centillion adding Ethernet to token-ring, ATM switch mix.

Page 6.

A trio of vendors pitch LAN switches with ATM links.

Page 9.

Beta report: Lotus Notes 4 proves to be enterprise-savvy

By Annmarie Timmins

Cambridge, Mass.

Lotus Development Corp.'s Notes has long endured a reputation as a joy to use but a beast to administer. But that could all change when Notes 4 ships later this year, according to those testing the first beta release.

Performance and scalability problems that have plagued previous versions are heavily tar-

geted by new Release 4 features. For instance, Lotus has enhanced replication by allowing servers to run multiple replication sessions simultaneously and, in the process, reduce the amount of time it takes to synchronize databases.

The Notes 4 beta, which has been in testers' hands for a little over a month, is already getting high marks for vast improvements in not only replication, but manageability, as well.

Topping the management list is QuickAdmin, a program that centralizes and enhances Notes administration, according to interviews with these users and beta documents obtained by *Network World*.

The overriding administrative goal is to give managers finer control of their systems, much of it through this QuickAdmin tool, which

See Notes 4, page 66

The big get bigger

3Com snacks on Chipcom in \$775m buyout, gets high-end internetworking technology.

By Michael Csenger

and Jodi Cohen

Santa Clara, Calif.

3Com Corp. last week surprised the industry by announcing plans to buy Chipcom Corp. for \$775 million, a move that highlights the ongoing consolidation that is dividing the internetworking market into a handful of giants and a cadre of smaller companies vying to be snapped up.

An even bigger surprise came late Friday when Cabletron Systems, Inc. — the one large internetworking vendor that has avoided the acquisitions route — asked the Federal Trade Commission for clearance to buy up to 50% or more of Chipcom's outstanding shares. The move was not a formal takeover bid, but may signal that Cabletron is trying to block the 3Com deal out of concern that it could hurt sales of Cabletron's high-end network gear.

If the 3Com deal goes through, the company would

become the second largest vendor in the internetworking industry, behind Cisco Systems, Inc. and ahead of Bay Networks, Inc. The union of 3Com and Chipcom prompts questions about whether increasing industry consolidation will benefit users by providing more one-stop shops or, ultimately, harm buyers by lessening competition, choice and innovation.

"There's nothing inherently



Merger-minded Chipcom CEO Rob Held (left) shakes on the \$775 million deal with 3Com CEO Eric Benhamou.

wrong about [industry consolidation], and if I were a Chipcom user, I'd actually feel more confi-

See 3Com-Chipcom, page 65

A CLOSER LOOK AT NOTES 4

REPLICATION

- ▶ Database size can be limited, with a warning emitted when limit is approached.
- ▶ Enhanced replication history can be stored in the log file.
- ▶ Additional replication settings for databases can be set on servers or local workstations.

ADMINISTRATION

- ▶ NOTES.INI file can be updated while server is running.
- ▶ Contains Admin Proxy Agent, a program that executes tasks on a server without an attendant. This could, for instance, find all references to a user's name and make required changes.

ATM standards get spit and polish

By Thomas Nolle

It may be the good ol' summertime, but for standards writers in the ATM Forum and other organizations, the livin' is hardly easy.

During interim meetings aimed at keeping key Asynchronous Transfer Mode interoperability standards on track, working groups made progress in finalizing standards for 25M bit/sec ATM and interface specifications that will make it easier for customers to

link on-site ATM devices. The forum also moved ahead on standards for supporting traditional LANs and LAN applications over ATM networks.

Perhaps the surest sign of real progress since the last *Network World* ATM Interoperability Report (NW, March 20, page 1) was the ATM Forum's release of a testing methods outline, which covers general test procedures and explains how forum specifications should be used in devel-

oping conformance tests.

That is an important first step in developing tests to ensure interoperability of ATM offerings. But as is often the case, that progress was overshadowed by

See ATM Report, page 12



001

NEWSPAPER \$5.00

Review

Putting your Web site into orbit: Five servers that help fire it up

By Joel Snyder

With the World-Wide Web taking off like a rocket, there's no need for anyone to be left on the launchpad. We looked at five enterprise-quality Web servers that can be used to open up corporate databases and distribute marketing and support information, and found some high-quality products that can meet the nonstop

expectations of large firms.

Commerce Server from Netscape Communications Corp. and WebSite from O'Reilly and Associates, Inc. stood out as the best general-purpose servers among those we tested. Purveyor, from Process Software Corp., and WebStar, which is from StarNine Technologies (previously

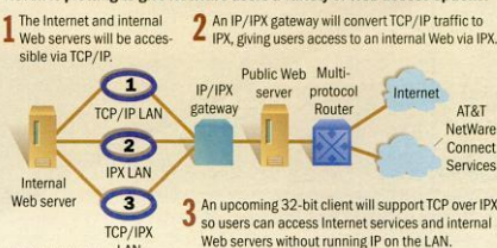
See Web servers, page 46



Novell reveals Internet strategy for NetWare

Opening NetWare to the 'Net

Novell is plotting to give NetWare users a variety of Web access options.



By Kevin Fogarty

San Jose, Calif.

Novell, Inc. is devising a broad plan to help NetWare users tie into the Internet and join the electronic commerce community, company officials said at a briefing here last week.

By year-end, Novell hopes to begin shipping a product bundle including a NetWare-based World-Wide Web server, a router with firewall filters and a dynamic IP addressing engine.

The company is also enhancing NetWare, page 8

Consortium rolls out ATM flow-control specification

By Tim Greene

A splinter group beat the ATM Forum to the punch last week when it delivered its own specification for flow control, a necessary element to bring users available bit rate (ABR) Asynchronous Transfer Mode services.

But the ATM Forum seems destined to adopt a separate

flow-control specification when it meets in Toronto next week.

Nevertheless, members of the splinter group, the Flow Control Consortium, said they would seek ATM Forum approval of their specification even though the forum rejected it last year by a vote of more than 10 to 1.

Ken Brinkerhoff, a spokesman for the Flow Control Con-

sortium, said devices could be built that support both flow-control schemes and, long term, the market would decide which scheme was best.

Others in the industry said that would make devices needlessly complex and expensive.

Groups' progress

The ATM Forum Traffic Management workgroup is finalizing a rate-based flow-control scheme, according to the head of the workgroup, Natalie Giroux. That approach lets the receiving device ask the sending machine to adjust the data rate.

The Flow Control Consortium has a **specification for a credit-based scheme** called Quantum Flow Control (see graphic), which lets a node send data only when its downstream partner has enough buffer credits to receive the data.

What ATM flow to go with?

Rate-based flow control

The receiving device and the sending device agree on the information rate the sender should use based on the capacity the network can handle.

Credit-based flow control

Nodes can send data to downstream devices only when those devices have enough credits, which represent buffer space.

In rejecting credit-based flow control last year, members of the ATM Forum said it required that large, expensive buffers be built into each switch within a WAN.

Also, credit-based flow control cannot support a guaranteed minimum cell rate. "You could be told to hold back completely," said David Hughes, a

staff scientist at StrataCom, Inc., who also sits on the ATM Forum Traffic Management workgroup.

ABR lets users tap whatever data capacity is available at a given moment in the network and would be priced lower than variable bit rate and committed bit rate service. ABR is attractive to carriers because it helps them exploit network capacity.

But some type of flow-control scheme is needed to ensure that the sender is not pushing along information too fast, which can result in discarded packets.

The Flow Control Consortium is seeking comment on its specification and will not officially present it to the ATM Forum until the spec is stable. The group also will not present it until a vendor commits to incorporating it in a product, demonstrating its market viability, Brinkerhoff said. ■

ATM Report

Continued from page 12

The rate-based approach to ABR would allow the receiving device to ask the sender directly to change the data transmission rate. Under the credit-based approach to ABR, a node is allowed to send to its downstream partner only when it has credits, which represent buffer space in the other device.

Opponents have raised two criticisms of rate-based ABR: It does not address point-to-multipoint applications or zero-cell-loss connections.

There seems to be little support for a return to the rate-vs.-credit debate, so it is not likely the draft ABR standard being developed — with a rate-based mechanism — is at risk. What may be at risk is the credibility of ABR and the forum itself.

It's difficult to reach a consensus on complex standards issues; forum members must accept majority rule, and they cannot keep revisiting old battles.

That's not to say that all decisions should be final. Case in point: The forum wisely reexamined its earlier decision not to embrace ATM25. In its August meeting, forum members should carefully consider the points raised by supporters of credit-based ABR flow control, but once a decision has been reached, members should endorse the result and move on to other topics.

Quality of service definitions and QoS assurance

Things have been fairly quiet in this area since our last report.

Discussions on video over ATM continue, focusing on whether a new class of service is needed for compressed video transport.

In the meantime, constant bit rate service will carry video traffic of all types.

Signaling

Because signaling is so closely tied to developments in other areas — P-NNI and ABR, just to name a couple — the working group has had to hold interim meetings to keep on track.

The group's goal is to complete the Signaling 4.0 specification for a straw vote in August. It will have all the leaf-initiated join and proxy signaling features previously reported, but it may not accommodate ABR.

A leaf-initiated join enables an end node to initiate its own link into a one-to-many ATM-based conference. Proxy, or third-party, signaling is designed to let a signaling-capable station set up an ATM connection on behalf of a device that cannot signal.

As was the case with the P-NNI release, including ABR in the current signaling document is difficult because ABR was only recently finalized and is under pressure for reconsideration. If ABR is not included in the 4.0 document — the odds are about 2-to-1 that it will not be — the working group will release ABR signaling as an addendum.

In the management area, the forum is working to adopt the IETF's RFC 1595 as the standard for managing ATM equipment at a customer site — what the forum has called the M2 interface. This should speed development of ATM management tools and reduce the confusion of having multiple standards.

The M4 interface, which provides the management view into public network ATM services, is being worked on for submission in the October meeting. This specification will draw on the Network Management Forum's Ensemble document for its description of management entities and the basic concepts of high-level service management.

Interim Local Management Interface revisions for traffic

management and P-NNI signaling are being reviewed, as are the Management Information Bases (MIB) for traffic management enhancements such as ABR.

Application services and APIs

The Version 1.0 ATM LAN emulation specification was approved, and the working group is receiving feedback from vendors that are implementing the technology — feedback that will probably result in some minor tuning.

LAN emulation defines how applications designed for traditional token ring or Ethernet LANs can be run on ATM-based LANs, and how ATM LANs running these applications can work with stations running similar applications on existing LANs.

The LAN Emulation Client MIB is in the final ballot process, and service MIB proposals have been reviewed.

The MultiProtocol Over ATM (MPOA) working group finalized a basic architectural model for mapping Level 3 protocols such as IP to ATM, a critical extension of LAN emulation required for efficient ATM LAN and WAN protocol emulation over wide-area networks.

MPOA will likely use a series of route servers (which could be, but won't necessarily have to be, routers) to identify an ATM path from the ATM interface nearest the source of a data connection to the interface nearest the destination.

The route selection process will be similar to the next-hop approach of TCP/IP routing, where the request hops between route servers until a server is found that knows the ATM address.

As with LAN emulation,

MPOA will create an ATM switched virtual circuit (SVC) when a data relationship, like a TCP session, is established. The originating route server will cooperate with other route servers in a hop-by-hop manner to find the destination user.

If the destination is not an ATM device, the termination of the ATM SVC will likely be a router or hub connected to a legacy LAN. This device will format the LAN message for the protocol in use.

The proposed architecture will be compatible with any routing protocol that can carry an address of the form used by ATM, although some minor changes might be required in some protocols. The model is compatible with the P-NNI specification that defines ATM's own routing protocol.

That should make it possible for users to leverage their investment in routers and legacy protocols, yet still use MPOA principles for full ATM-based routing.

Some early testing of the IETF's standard for IP-over-ATM (RFC 1577), conducted by the University of New Hampshire's InterOperability Lab in late February, showed inconsistent interpretations of its signaling and address resolution aspects.

Except for ATM LAN Emulation, RFC 1577 is the most widely implemented ATM user interface, and problems with it validate customer concerns about early product interoperability.

The lab intends to test LAN emulation in August.

A standard that could form the basis for linking RFC 1577 local domains over a wide-area — sometimes called routing over large clouds — is being explored in a draft of a Next Hop Routing

Protocol.

At a higher level, the Windows Sockets application program interface (WinSock) Version 2.0 specification was approved and is available for public review. (Access Microsoft's Web site at <http://www.microsoft.com/Developer/winsock>.)

This release contains the first capabilities for Sockets over Connection-Oriented Media, the basis for mapping the WinSock API to an ATM SVC.

The use of "legacy" APIs to directly invoke ATM services would speed development of ATM applications and would allow these applications to access more of ATM's services than they would through indirect means such as LAN emulation.

IBM and Novell, Inc. are both developing software to directly access ATM via their own APIs (NetWare Sockets and IBM's Common Programming Interface for Communications).

Nolle is president of CIMI Corp., a technology assessment firm located in Voorhees, N.J. He can be reached at (609) 753-0004 or via the Internet at tnolle@ix.netcom.com.

FOR MORE DETAILS

Many of the standards and specifications discussed in this report are being developed by the ATM Forum. Here's how to find out more about the forum:

Phone: (415) 578-6860

Fax: (415) 525-0182

E-mail: info@atmforum.com

Web site: The URL is <http://www.atmforum.com>.