



TMX 880 Times

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FIRST DEMONSTRATION OF TMX 880 AND EUROPA 8.1

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During the week of October 15th, anyone arriving at the Lucent Robbins Road facility in Westford was met with the Multiservice Core Network demonstration in the lobby.

The successful demonstration signified the first interoperability demo for many new INS products. It was the first using the TMX 880™ Multiservice Xchange Switch for ATM VP to MPLS cross connect functionality, the first demonstration of the Positron, OC3-POS card for the CBX-500™ Multiservice Wide Area Network Switch, the first demonstration of the Gigabit Ethernet Bio3 card in the GX 550™ Multiservice Wide Area Network Switch, and the first demonstration of phase-one NavisCore™ with the TMX 880 system management integration.

The Multiservice Core Networking Division showed the BSTDX 900, CBX 500, GX 550 and the TMX 880 systems running two video stream demonstrations over IP and also over ATM/MPLS.

Demonstrating the video-over-IP stream of traffic were the CBX 500 and GX 550 switches with two TMX 880 systems for the core. The OC-3 and OC-12 POS cards, and the Gigabit Ethernet/Bio3 cards, all part of Europa 8.1, were featured.

For this portion of the demonstration, the two TMX 880 systems in the core provided simple IP routing

functionality. This demonstration was managed by the newer Europa 8.1 release of NavisCore for the switching products only.

Demonstrating the ATM-to-MPLS stream were the BSTDX 900 system, CBX 500 and GX 550 switches and the same two TMX 880 systems for the core.

LIVE DEPLOYMENT AT WINFIRST

WINFirst has deployed a complete network solution that includes the NX64000 IP Core Router at the core of the network, GX 550 Multiservice Wide Area Network Switch and the Cajun 882.

Using Lucent's network solution, specifically the NX64000, WINfirst is driving the fiber-to-the-home business model that contains a variety of services, such as Cable TV, local telephone service, Internet access and future services that include pay-per-view movies. The Lucent systems are driving traffic in a revenue producing network for WINfirst.

The MR2 release of NavisCore with an integrated, launchable Navis TMX 880 EMS was used to manage this portion of the demonstration. For this proof of concept demonstration, Optitrunks were set up between the CBX 500 and the GX 550 switches. A video circuit was set up between the CBX and BSTDX systems. The TMX 880 router mapped the Optitrunk VP's to an MPLS LSP for transport over an OC-192 POS core.

Presentations were given throughout the week for those who were

interested in hearing more about the TMX 880 product and its new functionality. The demonstration and presentations were well received and generated a lot of interest.

For more information, or to see a video of the demonstration, please go to npi.bos.ascend.com or contact Bob Finizio.

HIGHLIGHTING GLENN MCGUIRE

Glenn McGuire, the System Architect for the TMX 880 system, was the fourth engineer hired by Nexabit, then NeoNet, when the company was seven weeks old. Hired to do ATM signaling work for the switch, he developed the TMX 880 VC manager. Later, he was responsible for the software architecture and was also project lead for various software development projects.



The Nexabit team initially intended to develop a Stinger-like box. When they realized their unique technology (an advanced switch fabric) was conducive to a smaller number of higher-speed interfaces, the team found this architecture was better suited for OC-192 or OC-48 speeds than small DSL lines.

Glenn brings substantial knowledge and experience from a diverse background. After earning a Bachelor of Science degree in Electrical Engineering from Worcester Polytechnic Institute, Glenn worked as a hardware engineer for a small robotics

firm. Later, he moved to the networking industry as a Technical Support Engineer for Cabletron. He then worked at Crosscomm, a company that produced enterprise bridges and routers, as a Software Engineer.

"I think my evolving career has given me a unique perspective on the networking industry, and on engineering in general"

The TMX 880 is Glenn's favorite project. "The TMX 880 was well thought out, I have really enjoyed working on all phases of the product... from conception to first release to deployment. Working with this group is very satisfying because we have been able to elegantly solve a lot of interesting problems."

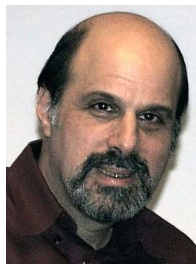
Glenn enjoys working with the TMX group. "Everyone has a voice here and the technology draws me. We have a lot of interesting MPLS projects, really new and exciting technology including tunneling ATM over MPLS."

"Recently as the group dynamics changed, I have had the opportunity to work with my counterparts in the Westford team. This has been very rewarding. There are many strong people working in Westford. Its good to see we are working together rather than working at cross-purposes. After recent management shifts, we are now decidedly pulling in the same direction — it will make both teams stronger".

As lead developer for the ATM over MPLS project, for future development he sees the adding of some sort of signaling, VNN, PNNI to the TMX 880 system.

"Which one gets done first is still up-in-the-air. Adding this signaling will make the TMX more scalable — more interoperable with Cascade equipment and third-party equipment, improving our position as a solution."

IN THE SPOTLIGHT SANDY GOLDFLESS



Sandy Goldfless, Protocols Architect for the Core Routing Division joined Lucent 1-½ years ago to lead the team of engineers who were developing MPLS and other

routing protocols for the NX64000™ IP Core Router.

Early on, he was asked to perform a feasibility study for ATM over MPLS, the results of this study formed the basis for the implementation of ATM over MPLS on the TMX 880 Multi-service Xchange Switch.

Having twenty-years experience in networking and systems development, Sandy has previously built cross products that played a "marriage broker" role between ATM and IP. Before coming to Lucent, Sandy was the Director of Software Engineering at Jupiter Technology and Telco Systems where he led Product Development in ATM, Frame Relay and IP.

Sandy also has a background in the Humanities. He earned a Doctorate degree from Harvard, in Ancient Near Eastern Civilizations.

Sandy's approach is real world: "I enjoy interfacing directly with so many stimulating people on leading technology topics, in the context of creating products that meet the customer's need. We don't work in an ivory tower, we see the projects completed and useful products coming out of those projects."

NX64000 - TMX 880 HISTORY

The TMX 880 team has its roots in Lucent's acquisition of Nexabit Networks in July 1999. Nexabit, originally NeoNET, was started in 1997 in Westborough, MA, later moving to Marlborough, MA. The company created a high-speed IP

core router, the NX64000 switch/router.

Shortly after the acquisition, Lucent groups located in the UK and in Illinois brought their talents to the NX64000 team.

The UK IP Development group, based in Reading, UK, was formed as part of Ascend in April 1998. The group worked on the ISIS routing protocol and the PIM multicast protocol for the BSTDX 9000 and CBX-500 ATM switches before joining the NX64000 team in January 2000.

The Indian Hill group at Naperville, Illinois, developed the Lucent flagship products DACS II, a digital access product, and the 5ESS, Lucent's largest switch, used for telephony and ISDN switching in central offices. In addition, this team developed the 4ESS, TSPS, OSPS, Globeview, PacketStar, TSPS, NNS and many other projects.

These talented team members, along with many newly hired people energized the NX64000 team as it underwent a remarkable metamorphosis during the summer of 2000.

A synergy, developed across the groups, created an enthusiastic, focused, and at the same time flexible, productive team. This dedicated group strengthened the system hardware, enhanced the software, and delivered the improved high-capacity NX64000 IP Core Router in December 2000.

The team has continued on the same path of excellence. They are releasing the cutting-edge MPLS implementation in December 2001 and are on track to deliver significant ATM feature improvements by mid 2002.

OCTAL GIGABIT ETHERNET IS ON SCHEDULE

The Octal (8-port) Gigabit Ethernet interface is a new high-density solution. It offers three types of optics short-range, long-range and ultra-long-range to meet a wide range of customer applications.

Recent development achievements by the Octal GigE group include:

- Adding MPLS over GigE to the feature set.
- Delivering the hardware design package to the manufacturing vendor for fabrication and board assembly.
- Working on both the hardware and firmware to improve the functionality and timing for the new Field-programmable Gate Array (FPGA) to generate considerable Cost of Goods and Services (COGS) savings.

TOP-NOTCH TMX 880 FEATURES

Significant for this release are the 400,000 lines of code added to enhance the system software. A few of these new features are listed below.

MPLS-TE

Traffic engineering for Multiprotocol Label Switching (MPLS) provides the ability to efficiently manage network resources and traffic forwarding.

Matching resource requirements for an MPLS label-switch path (LSP) with resource availability on system interfaces, coupled with support for priority queuing, ensures consistent forwarding treatment for label-switched packets. Dynamic bandwidth allocation effectively manages interface bandwidth.

MPLS FAST REROUTE AND FULL LSP BACKUP

The MPLS implementation now provides mechanisms to maintain traffic forwarding should a link or interface become inaccessible.

Support for fast rerouting of LSPs ensures that traffic is forwarded over local detours when a link is down. Should the link remain down, traffic can be rerouted over a secondary path.

RCP REDUNDANCY

The TMX 880 system is capable of supporting two RCP modules (primary and secondary). You can add a second, redundant, RCP to the system dynamically, with no data loss or degradation in performance to the components.

The primary acts as the RCP for the system while the secondary RCP updates itself with the data required to run the system. If the primary RCP fails, the secondary RCP continues to forward data packets.

The redundant system supports hardware failover from the primary RCP to the secondary RCP, both automatically and under administrative control from the CLI.

HOT TOPICS

SUCCESSFUL RCP REDUNDANCY DEMO

The TMX 880 team demonstrated multiple switchovers from the primary RCP to the secondary RCP.

A second (redundant) RCP was added to a live system, and removed from a live system without any interruption in traffic on both static and dynamic routes.

ATM CROSS-CONNECTS

A strategy and implementation plan for ATM cross-connects in the Normandy and Dover releases is being reviewed by product management. This document will be available soon.

NORMANDY INTEGRATION COMPLETE

Normandy integration is complete. Test efforts are fully engaged on this release.

RELEASE NUMBERS ASSIGNED!

Release numbers have been assigned for Normandy, release 8.0 and Dover, release 8.1.

QUALITY OF SERVICE DEMO

A demo of the Quality of Service functionality across CBX-TBX is planned for this week.

LOAD BALANCING

The UK and IH teams have proposed solutions for load balancing on the system!

OC-3/OC-12 BACK ON COURSE

The OC-3/OC-12 ATM performance is back on track. Congratulations to the team!

ADVANCED TOPICS CLASSES HELD

Training sessions on a wide range of topics for ATM, MPLS, QoS and Multiservice are being held in Marlborough. An Introduction to IP session is planned to be offered in Westford around January 2002.

INS EAST LAUNCHES AGILE GENESIS

Lucent has successfully launched Agile Genesis at INS East Coast.

Agile is a common process tool for manufacturing collaboration used to share product data with manufacturers (both internal and external).

SUPER-HOT TOPICS!

Watch for Super-hot topics in the TMX 880 Times December edition!

HOW TO SUBMIT ARTICLES

Your comments and ideas are welcome. Please email all suggestions to the editor: Ireneau@lucent.com.