National Science Foundation, Directorate for Computer Information Science and Engineering
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January 2000 Monthly Status Report

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A. Summary of Technical Activities

A.1. Euro-Link Network Status and Institutions

A.1.a. CERN

CERN selected KPNQwest as their new transoceanic carrier. KPNQwest will connect CERN to Abilene at 60 Hudson Street in New York (CERN is an Internet2 member and a Primary Participant on Abilene), where CERN will then transit to other networks that peer with Abilene, including those peering at STAR TAP. However, KPNQwest is temporarily unable to house CERN's rack at 60 Hudson Street because of a power capacity problem in the building, and has instead offered to temporarily terminate the Geneva-USA circuit at the Qwest PoP in Chicago. There is some doubt that a 45Mbps or STM-1 circuit from the PoP to STAR TAP can be installed and functional by March 20; Ameritech is now working with Qwest on the installation.

No additional information on the iCAIR/CERN DiffServ testbed.

A.1.b. IUCC

After examining NLANR throughput data [http://moat.nlanr.net/TopThroughput/], Hank Nussbacher noted that of the top 100 flows (daily range of flows per day varies from tens of thousands, to one million), the median (#50) was about 5Mbps. He initiated an active email dialog with vBNS, NLANR, PSC, Internet2, STAR TAP and IUCC

engineers, inquiring why users don't "TCP tune" their systems [http://www.psc.edu/networking/perf_tune.html] to achieve higher throughput. While NLANR's Matt Mathis and Basil Irwin have a project to document application-accessible TCP tuning "knobs" for UNIX [http://www.ncne.nlanr.net/TCP/], it was expressed that tuning is operating system-specific (e.g., tuning for UNIX is different than Linux). Meanwhile, application programmers John Shalf and Jason Leigh (who spoke on behalf of Bob Grossman) advocate socket striping. Hank, however, firmly believes that the ability to increase throughput needs to be transparent to the end user.

Israel is currently testing a SkyX satellite link accelerator for its satellite T3 connection to STAR TAP (Hank plans to make a presentation at the fall Internet2 meeting in Washington) and is getting 17 Mbps easily, regardless of the window size defined. IUCC hopes to soon enable it for all users in Israel.

A.1.c. NORDUnet

No new activity to report this month.

A.1.d. RENATER2

Renater2 now peers with the STAR TAP Router.

A.1.e. SURFnet

SURFnet's connection to STAR TAP from its PoP in New York is being upgraded from 45 Mbps to 155 Mbps. Teleglobe is working with Ameritech on the local loop connection.

A.2. Engineering Services

A.2.a. STAR TAP Router

In early January, the STAR TAP Router peered with Renater2 and with GEMnet (NTT Laboratory's research network). These peerings will support collaboration among researchers served by current STAR TAP peers and NTT researchers. In late January, the STAR TAP Router brought up a peering session with the University of Iowa (part of MREN); peering sessions with many other MREN institutions are expected soon. These new peering sessions bring the total number of STAR TAP peers to 14.

A.2.b. 6TAP [www.6tap.net]

See [www.6tap.net]. No new activity to report this month.

A.2.c. STAR TAP Web Caches

*NLANR Caching project…*Duane Wessels has built and tested a Web Cache, running the Squid caching software, for STAR TAP. The cache PC was installed at Ameritech on December 14. NAP.NET has agreed to donate ISP service over a 1 Mbps connection. Once the NAP.NET service is in place (expected in late February), Duane will integrate the cache into NLANR's Global Caching Hierarchy.

Internet2 Distributed Storage Initiative/Novell… No new activity to report this month.

A.2.d. STAR TAP Performance Measurement Systems

*NLANR AMP (Active Measurement Platform) box…*See [http://www.startap.net/ENGINEERING/PERFORM.html].

Advanced Network & Services' Surveyor box… No new activity to report this month.

A.2.e. DiffServ

See [http://www.evl.uic.edu/cavern/EMERGE/]. No new activity to report this month.

A.2.f Renting Co-Location Space at Ameritech

The STAR TAP project currently has access to 1-1/2 racks, which are co-located at the Ameritech NAP and leased by Indiana University and Merit. Along with MREN, we are in the process of leasing two additional racks to handle the additional equipment we plan to install at the NAP. Progress with Ameritech has been slow, but temporary accommodations for the project will be made until a permanent space is found.

A.3. NOC Services

Indiana University is now providing NOC and engineering services for Euro-Link. The Euro-Link NOC web page went live on February 4 [http://noc.euro-link.org]. Engineering and NOC Listservs are operational.

Euro-Link utilization (traffic) graphs are available at [http://noc.euro-link.org/com2network2.htm].
Euro-Link BGP session monitoring is available at [http://startap.uits.iupui.edu/bgp-ping.html].
NOC engineers have begun development of a Euro-Link "weather map" modeled after the Abilene weather map.

Below is the list of informational items and forms that will appear on the Euro-Link NOC web page:

- Logo
- Welcome to NOC page
- Contact the NOC (email form)
- Trouble Ticket Submission form
- Network diagrams
- Change management web form
- Change management agenda
- Change management archive
- Weekly report page
- What's up monitoring link
- BGP session monitoring link
- Traffic weather map
- MRTG graphs
- Router command proxy
- Problem reporting procedures
- Change management procedures
- NOC staff listing
- Listserv information
- Listserv archives link
- Link to official home page
- Link to other web pages

A.4. Euro-Link Performance Analysis Tools

A.4.a. Network QoS of Real-Time Multimedia

An alpha version of QoSIMoTo (QoS Internet Monitoring Tool) [www.evl.uic.edu/cavern/qosimoto] will be released mid-February on the web for IRIX and Linux. QoSIMoTo is a program to view, in real-time, latency, bandwidth and jitter of multiple flows in Netlogger format. The program runs in the CAVE as well as on SGI desktop workstations and Linux PCs in CAVE-simulator mode.

A.4.b. Petri-Net Network Modeling

No new activity to report this month.

A.4.c. Network Monitoring

No new activity this month. Performance monitoring is being postponed until Netlogger is re-integrated into the next-generation CAVERNsoft code (to be released mid-February for IRIX, Linux and NT on the web) [www.evl.uic.edu/cavern/cavernG2].

A.4.d. Low Latency State Transmission Over Long Distance Networks

No new activity to report this month.

B. Accomplishments

B.1. Meetings Attended

February 3-4, 2000. Tom DeFanti and Maxine Brown were in Paris, France. DeFanti gave a presentation on Global Research Networks to ~150 people at Atelier [www.atelier.fr], a group of financial and technical people who meet regularly for information sharing and lectures on the economics of the internet and computer technologies. The director general of Atelier.fr is Jean-Michel Billaut. DeFanti and Brown also met with:

- Philippe Quéau, director of the Information and Informatics Division, UNESCO (United Nations Educational, Scientific and Cultural Organization)
- John B. Rose, program specialist, Information and Informatics Division, UNESCO
- Henrikas Yushkiavitshus, Undersecretary General for Communication, Information and Informatics
- Alain Giffard, Minister of Culture and Communication, France
- Xavier Dalloz, consultant

January 31-February 2, 2000. Tom DeFanti and Maxine Brown attended Imagina 2000 in Monte Carlo, Monaco. DeFanti gave a keynote ("carte blanche") talk on Global Networking and Tele-Immersion.

January 27-28, 2000. Tom DeFanti, Maxine Brown and John Jamison met with Steve Goldstein at NSF.

January 20-21, 2000. EVL doctoral student Javier Girado presented "Global Tele-Immersion: Working in CyberSpace," as a keynote speaker at the "Science and Technology and Companies: A Vision for the 21st Century" workshop and plenary sessions, held in Barcelona, Spain. The event was sponsored by Barcelona University (UB) and the Technical University of Catalunya (UPC), and reflected the interest of both institutions to foster joint research projects and a technology exchange, and to promote the new Scientific and Technological Park Barcelona 2000 (PCTB2000).

January 18, 2000. Tom DeFanti, Joe Mambretti and Linda Winkler attended a meeting at Argonne National Laboratory, where representatives of the company Akamai [www.akamai.com] discussed their interest in working with universities and research laboratories on web caching products. Mambretti offered to have MREN serve as its initial partner.

January 14, 2000. Tom DeFanti and Maxine Brown met with Cable & Wireless representatives at UIC:

- Mark Luptak, Account Manager, IP Special Markets (including STAR TAP)
- Todd Bullington, International Account Manager
- Chris Altman, Technical Sales Consultant

We discussed Mark Luptak's new job, in which he will continue to work on STAR TAP; C&W's "Distributed STAR TAP" press release (which Tom/Maxine have approved; release is still pending); the news that CERN has changed providers; and the potential that C&W will connect Hong Kong to STAR TAP.

January 13, 2000. John Jamison attended two meetings in Miami. At the first, JJ and Julio Ibarra of FIU discussed possible designs and strategies for implementing a Miami GigaPoP, which could serve as a convergence point for Latin American Research Networks. At the second meeting, JJ and representatives of IMPSAT discussed the technical details of connecting Chile's REUNA network to STAR TAP.

B.2. Publications

Ray Fang, "Forward Error Correction for Multimedia and Teleimmersion Streams," EVL internal technical report. February. [http://www.evl.uic.edu/cavern/FEC/RayFangFEC1999.pdf]

Steven N. Goldstein, Maxine D. Brown, Thomas A. DeFanti, "The Science, Technology and Research Transit Access Point (STAR TAP)," La Recherche, Paris, France, No. 328, February 2000, pp. 50-51. [http://www.startap.net/PUBLICATIONS/pubs.html#Application Papers].

B.3. Software Releases

The new CAVERNsoft G2 and QoSiMoto will be released on the web [http://www.evl.uic.edu/cavern] in mid-February. CAVERNsoft G2 will run on IRIX, Linux and NT. QoSiMoto will run on IRIX and Linux.

C. Collaboration Activities

- Ongoing with SARA in Amsterdam. We will upgrade their Saranav software to the new version of CAVERNsoft (CAVERNsoft G2) once it becomes available.
- Working with SARA in The Netherlands to experiment with an EVL-designed packet-level Forward Error Correction scheme.
- Worked with Cable & Wireless on a "Distributed STAR TAP" press release.

D. Summary of Award Expenditures (January)

The spending rate is within budget. We received Indiana University's paperwork and are now executing the UIC subcontract.