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Division of Advanced Networking Infrastructure & Research (ANIR)

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A. Summary of Technical Activities

A.1. EuroLink Network Peering Status and Institutions

All EuroLink consortia members are connected to STAR TAP and peeing with vBNS, bringing the number of international (non-USA) networks to ten:

- France's RENATER2
- The Netherlands' SURFnet
- Israel's IUCC
- Nordic countries' NORDUnet
- CERN *(Note: CERN is in the process of peering with vBNS. Once this has happened, CERN will "officially" be part of the EuroLink consortium.)*

A.2. Engineering Services

A.2.a. STAR TAP Router

On August 19, a router which provides a STAR TAP layer 3 service came online. The STAR TAP router provides participating networks with a way to pick up the routes of additional networks without having to set up separate peering sessions. For those countries/consortia planning to exchange a large amount of traffic with another country/consortium, they will be encouraged to have their networks peer directly.

To date, the STAR TAP router is peering with APAN and several North American networks. We will be configuring the STAR TAP router to peer with most of the networks participating in STAR TAP over the next few months.

A.2.b. IPv6 Tunnel service at the 6TAP

The 6TAP an IPv6 service run by ESnet and hosted by the STAR TAP project is up and running. See www.6tap.net for more information. The "IPv6 Tunnel service at the 6TAP" is a new 6TAP service that Bob Fink of ESnet recently proposed. It will enable IPv6 networks to be connected at the 6TAP using IPv6 over IPv4 tunnels, compared to native IPv6 links as the current offering of the 6TAP, since many organizations will not be able to connect to the 6TAP via native links. This will help the deployment of the IPv6 Internet.

A router will be placed in the STAR TAP (we are currently working with Ameritech to find the space) and will BGP peer with Chicago NAP members in the full PVC mesh by announcing an IPv4 class C network and receiving all routes. This router will be connected to a tunnel server via a service LAN. The tunnel server will have an IPv6 native ATM link to the 6TAP router. The tunnel server will be the end-point of all IPv6 over IPv4 tunnels.

An additional service of the tunnel server will be to provide "6to4" relay service, providing a way for automatic tunnels to be created using the newly defined "Connection of IPv6 Domains via IPv4 Clouds without Explicit Tunnels." See: http://www.ietf.org/internet-drafts/draft-ietf-ngtrans-6to4-02.txt

A.2.c. STAR TAP Web Caches

Over the next few months, there are plans to install two web cache platforms at the STAR TAP. Duane Wessels of the NLANR Caching project is building a Web Cache running the Squid caching software for deployment at the STAR TAP. Once the Web Cache is installed at STAR TAP, Duane will integrate it into NLANR's Global Caching Hierarchy.

We are also working with Jamshid Mahdavi of Novell and Mich Beck of the Internet2 Distributed Storage Initiative to deploy an Internet2/Novell Cache system at the STAR TAP. .

A.2.d. STAR TAP Performance Measurement Systems

Over the next few months, there are plans to install performance measurement systems at the STAR TAP. With the help of Matt Zekauskas of Advanced Network & Services, we will be installing a Surveyor box. Alan Verlo is working with Hans Werner Braun and Tony McGregor of NLANR to install an NLANR AMP (Active Measurement Platform) box.

A.2.e. DiffServ

EVL plans to purchase a Cisco DiffServ router for its laboratory (for EuroLink and DOE EMERGE-funded activities). EVL is also planning to purchase a similar DiffServ router for STAR TAP.

A.3. EuroLink Performance Analysis Tools

A.3.a. Network QoS of Real-Time Multimedia

Two professors at UIC, Dan Schonfeld and Rashid Ansari, have considerable experience in developing techniques for real-time multimedia; however, their work is primarily done through computer simulation. EVL appointed one of its students as a Research Assistant for the Fall semester to implement their model and test it to confirm the simulation results over STAR TAP, between UIC in Chicago and SARA supercomputer center in Amsterdam, as well as between UIC and University of Tokyo in Japan.

A.3.b. Upcoming Meeting on Network Performance

Well, it's taken a month of planning, but EVL will host a major network performance meeting on September 23 to bring together all the major players, including UIC/EVL faculty and staff (Tom DeFanti, Oliver Yu, Dan Sandin, Alan Verlo), Ian Foster and Steve Tuecke of Argonne National Laboratory, and Ruth Aydt of Dan Reed's UIUC laboratory.

Planned topics include the following; PowerPoint slides will be uploaded to the STAR TAP/EuroLink web pages.

- PCHAR path characterization software
- NETW network weathermap code from Internet2
- Brian Tierney's Netlogger (currently used in CAVERNsoft)
- UDP Traffic Generator
- Virtue, Pablo and AutoPilot from UIUC
- Globus' gloperf and Heartbeat Monitor
- An LDAP-based discovery capability to allow us to discover what data sources are available (i.e., Globus MDS)
- An archiving capability, perhaps based on an SQL database (?)

B. Meetings Attended

Maxine Brown and Tom DeFanti met with Michael McRobbie and Karen Adams of Indiana University at EVL on August 31, 1999. We discussed (a) the EuroLink NOC subcontract, (b) an applications-focused iGrid 2000 event at INET 2000 in Yokohama, Japan in July 2000 (EVL would encourage European participation), and (c) an NSF HPIIS Review, which we shall propose take place in September 2000.

JJ Jamison attended NASA's "Bridging the GAP Workshop" in San Jose, August 9-11. This meeting provided updated information on multicast, QoS and security efforts of NASA and other US Agency networks.

Jason Leigh and Oliver Yu attended the Eighth IEEE International Symposium on High Performance Distributed Computing in Redondo Beach, California, August 3-6, 1999. They took the tutorial "Distributed Systems Performance Analysis Using Net Logger and Pablo" taught by Brian Tierney of Lawrence Berkeley National Laboratory and Ruth Aydt of UIUC.

C. Summary of Award Expenditures

The spending rate is within budget. Notable activities for this month include:

- Continuing to work with Indiana University to complete paperwork in order to execute the UIC subcontract. (Vacations among Indiana University staff kept the paperwork from being completed.)
- UIC has processed the RENATER2, NORDUnet, and SURFnet invoices for their first year $400,000 payment. Note that the Israel IUCC invoice was processed and paid in July.
- No NSF reimbursement for this fiscal year is expected by CERN *[Note: Once CERN becomes a member of the EuroLink Consortium, pending vBNS peering, it is eligible (starting next year, since this year's funds have already been disbursed) for a share of the $1.6M/yr EuroLink allocates for trans-Atlantic high-performance links.]*