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www.startup.net/translight

QUARTERLY REPORT May 1 – July 31, 2006

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1. Participants

1.A. Primary Personnel

Participant's Name(s)	Project Role(s)	>160 Hours/Yr
Thomas A. DeFanti (1)	Principal Investigator	Yes
Maxine Brown (2)	Co-Principal Investigator	Yes

- (1) Tom DeFanti, PI, receives one-month funding and primarily focuses on managing the link procurement process, network engineering, budgets and accounts payable, and interfaces with personnel from Internet2/Abilene and DANTE/GÉANT2. DeFanti also participates in monthly IRNC phone calls and attends meetings as time permits.
- (2) Maxine Brown, co-PI, primarily focuses on managing documentation and education and outreach activities, and is responsible for TransLight/StarLight quarterly and annual reports, web pages and events planning. The co-PI also participates in monthly IRNC phone calls and attends meetings as requested.

1.B. Other Senior Personnel (Excluding PI and Co-PI)

Additional people who contributed greatly to the project, and received a salary, wage, stipend or other support from this grant:

Participant's Name(s)	Project Role(s)	>160 Hours/Yr
Alan Verlo (3)	Professional staff	Yes
Laura Wolf (4)	Professional staff	Yes
Steve Sander (5)	Professional staff	Yes
Pat Hallihan (6)	Professional staff	Yes
Lance Long (7)	Professional staff	Yes
Linda Winkler (8)	Professional staff	Yes
Rick Summerhill (9)	Professional staff	Yes
Roberto Sabatino (10)	Professional staff	Yes
Erik-Jan Bos (11)	Professional staff	Yes
Kees Neggers (12)	Other Senior Personnel	Yes
Joe Mambretti (13)	Other Senior Personnel	Yes

- (3) Alan Verlo is the TransLight/StarLight network engineer, and is a member of the StarLight engineering team. For several years, Verlo has also been a member of the SCinet committee, focusing on enabling international SC research demos that have connections in Chicago. He was also co-chair of the iGrid 2005 international cyberinfrastructure team, responsible for clusters and international networking.
- (4) Laura Wolf is the TransLight/StarLight technical writer and web developer.
- (5) Steve Sander is the TransLight/StarLight budget, accounts payable and equipment procurement person.
- (6) Pat Hallihan reports to Alan Verlo and is technical support staff.
- (7) Lance Long reports to Alan Verlo and is technical support staff.
- (8) Linda Winkler of Argonne National Laboratory, while not compensated by the University of Illinois at Chicago (UIC), serves as part-time StarLight engineer with Alan Verlo, and assists with TransLight/StarLight. For many years, Winkler has been a member of the SCinet committee, focusing on enabling international SC research demos that have connections in Chicago. She was also co-chair of the iGrid 2005 international cyberinfrastructure team, responsible for clusters and international networking.
- (9) Rick Summerhill is the Internet2 Director Network Research, Architecture, and Technologies and, while not compensated by UIC, is one of the stewards of the TransLight/StarLight link that connects Abilene at MAN LAN to GÉANT2 at their POP at the Amsterdam Internet Exchange.
- (10) Roberto Sabatino is the DANTE/GEANT2 Chief Technology Officer and, while not compensated by UIC, is one of the stewards of the TransLight/StarLight link that connects Abilene at MAN LAN to the GÉANT2 POP at the Amsterdam Internet Exchange.
- (11) Erik-Jan Bos is the SURFnet chief network engineer and, while not compensated by UIC, is one of the stewards of the TransLight/StarLight link connecting StarLight in Chicago to NetherLight at the Amsterdam Internet Exchange in Amsterdam.
- (12) Kees Neggers is SURFnet Managing Director and a founder and current chair of GLIF. While not compensated by UIC, he does the tenders and procures both TransLight/StarLight links on UIC's behalf, and is one of the stewards of the TransLight/StarLight link connecting StarLight in Chicago to NetherLight in Amsterdam.

- (13) Joe Mambretti is the StarLight managing director and head of the International Center for Advanced Internet Research (iCAIR) at Northwestern University. While not compensated by UIC, Joe has been a strong supporter and advisor regarding our IRNC efforts. Mambretti has assisted with connectivity issues, not only at StarLight, but also at MAN LAN.

1.C. Other Organizations That Have Been Involved as Partners

Argonne National Laboratory, Mathematics and Computer Science Division

Argonne National Laboratory <www.mcs.anl.gov> has been, and continues to be, a strong supporter of US international networking activities. Linda Winkler has facilitated STAR TAP/StarLight engineering since its inception, and is the lead engineer today; her salary comes from ANL.

Northwestern University, International Center for Advanced Internet Research (iCAIR)

Joe Mambretti, director of iCAIR <www.icaair.org>, also runs the StarLight facility <www.startap.net/starlight>, and is assisting with connectivity issues, not only at StarLight, but also at MAN LAN.

SURFnet

SURFnet, the national network for research and education in the Netherlands <www.surfnet.nl>, is a TransLight/StarLight “key institutional partner,” responsible for negotiating, procuring and implementing the TransLight OC-192 circuit(s) between Open Exchanges in the USA and in Europe, which UIC pays for upon receipt of an invoice from SURFnet, as has been our practice with our previous NSF HPIIS Euro-Link award.

1.D. Other Collaborators or Contacts

CANARIE

The Canadian Network for the Advancement of Research, Industry and Education (CANARIE) <www.canarie.ca> is Canada’s advanced Internet development organization. It operates CA*net 4, a series of point-to-point optical wavelengths, most of which are provisioned at 10Gbps speeds, interconnecting Canada's provincial research networks with each other and international peer networks, and forming an innovative framework to support grids and e-Science.

DANTE

Owned by European NRENs, DANTE <www.dante.net> is an organization that plans, builds and operates pan-European networks for research and education. The GÉANT2 project is a collaboration between 26 National Research & Education Networks representing 30 countries across Europe, the European Commission, and DANTE. Its principal purpose has been to develop the GÉANT2 network -- a multi-gigabit pan-European data communications network for research and education; see <www.geant2.net>. TransLight/StarLight funding makes a 10Gbps link available to Internet2, DOE and DANTE, to connect Abilene and ESnet with the pan-European backbone, GÉANT2.

ESnet

The Energy Sciences Network, (ESnet) <www.es.net> is funded by the DOE Office of Science to provide network and collaboration services in support of the agency's research missions, serving thousands of Department of Energy scientists and collaborators worldwide. ESnet provides direct connections to all major DOE sites with high-performance speeds, as well as fast interconnections to more than 100 other networks. TransLight/StarLight funding makes a 10Gbps link available to Internet2, DOE and DANTE, to connect Abilene and ESnet with the pan-European backbone, GÉANT2.

Global Lambda Integrated Facility (GLIF)

GLIF <www.glif.is> is an international virtual organization of NRENs, consortia and institutions that promotes lambda networking. GLIF provides lambdas internationally as an integrated facility to support data-intensive scientific research, and supports middleware development for lambda networking. It brings together premier networking engineers to develop an international infrastructure by identifying equipment, connection requirements, and necessary engineering functions and services.

GLORIAD

GLORIAD, the Global Ring Network for Advanced Applications Development, <www.gloriad.org> is currently

constructing a dedicated lightwave round-the-world link connecting scientific organizations in the United States, Russia, China, Korea, Canada, the Netherlands and the Nordic countries.

Internet2

Internet2 <www.internet2.edu> is a consortium of leading US research universities working in partnership with industry and government to develop and deploy advanced network applications and technologies. Abilene <<http://abilene.internet2.edu>> is an Internet2 high-performance backbone network that enables the development of advanced Internet applications and the deployment of leading-edge network services to Internet2 universities and research labs across the country. TransLight/StarLight funding makes a 10Gbps link available to Internet2, DOE and DANTE, to connect Abilene and ESnet with the pan-European backbone, GÉANT2.

National LambdaRail (NLR)

NLR <www.nlr.net> is a major initiative of US research universities and private sector technology companies to provide a national-scale infrastructure for research and experimentation in networking technologies and applications. TransLight/StarLight considers itself, in part, to be the international extension of NLR, and wants to encourage data-intensive e-science drivers needing gigabits of bandwidth to use NLR and international links for schedulable production services not available with “best effort” networks.

TransLight/Pacific Wave

TransLight/Pacific Wave <www.pacificwave.net/participants/irnc> is developing a distributed exchange facility on the West Coast (currently in Seattle, Sunnyvale, and Los Angeles) to allow interconnection of international research and education networks with US research networks.

2. Activities and Findings

2.A. Research Activities

2.A.1. Accomplishments and Milestones

We have been working on the following activities during the second quarter of year 2 of the grant:

- Working on a new TransLight/StarLight website, to be completed this Fall
- Provisioning 1Gbps links on TransLight/StarLight CHI/AMS for demanding applications (DRAGON/eVLBI, LHC/CERN and OptIPuter/GLVF)
- Provisioning 3Gbps on TransLight/StarLight CHI/AMS for GLORIAD
- Giving presentations on TransLight/StarLight at major conferences and workshops; participating in network engineering JET and GOLE meetings
- Disseminating copies of the iGrid 2005 special issue of the Elsevier journal *Future Generation Computer Systems (FGCS): The International Journal of Grid Computing: Theory, Methods and Applications*, October 2006, which was actually published in June 2006. Copies were sent to Kevin Thompson at NSF.
- Continuing to identify and develop production applications on both IRNC circuits.
- Assisted with the implementation of “TransLight,” a 10Gbps donated by Cisco Systems and deployed by National LambdaRail between TransLight/StarLight in Chicago and TransLight/Pacific Wave in Seattle.

2.A.2. Infrastructure

Topology

CHI/AMS...StarLight’s Calient switch has been configured for use by the DRAGON and EnLIGHTened projects.

NYC/AMS...Internet2 and GÉANT2 want to replace DANTE’s router at MAN LAN with an Alcatel switch to enable more flexible connections to Abilene and ESnet, but experienced interoperability problems between the Alcatel and the Nortel OME6500. The Nortel OME6500 sits, along with a Nortel HDXc, in the MAN LAN facility. In June, CANARIE helped test new Nortel boards, as they are interested in the interoperability problem.

TransLight...As of June 30th, TransLight/StarLight and TransLight/Pacific Wave are directly connected through a 10Gigabit Ethernet lightpath connection. The connection was donated by Cisco Systems and deployed by National LambdaRail. This new network fabric between the two TransLight entities creates a way for participating networks to easily configure direct connections when needed, and can be used for peering/exchange and transit.

In a demonstration of this new capability at an APAN meeting in July 2006, engineers at SURFnet in Amsterdam and T-LEX (operated by WIDE) in Tokyo established a direct path between their two routed networks using the new Pacific Wave-to-StarLight network fabric. A VLAN was created for the peering. (Note: The configuration included the IEEEAF link from Tokyo to Seattle, the TransLight link from Seattle to Chicago, and the SURFnet link from Chicago to Amsterdam.)

CANARIE/HKLight...CANARIE, as a GLORIAD member, is connecting to an OC-48 circuit from HKLight in Seattle, and will provide end-to-end connectivity to both StarLight and NetherLight (and possibly Lyon, France).

PoP Connectivity and Peering

No updates to report.

Lightpath Services

We are talking with several projects about providing 1Gbps connections between Chicago and Amsterdam in support of production science. We will first provide VLANs, but can provision as dedicated connections.

DRAGON... TransLight/StarLight (Alan Verlo) provisioned a 1GE VLAN for DRAGON on our IRNC link. SURFnet, with whom we partner, is provisioning another GE on their AMS/CHI route so the project has a redundant path.

Large Hadron Collider/CERN...Tom DeFanti is having discussions with Harvey Newman.

GLORIAD...Per June 2006 discussions with Kevin Thompson, TransLight/StarLight will provide GLORIAD with

3Gbps bandwidth on its CHI/AMS link until further notice. Implementation is delayed due to installation of new GLORIAD equipment at StarLight.

OptIPuter/Global Lambda Visualization Facility (GLVF)... Jason Leigh, who organized the GLVF¹ at iGrid 2005, has talked with Alan Verlo about provisioning a VLAN for persistent collaboration with European partners.

2.A.3. NYC/AMS Network Operations and Engineering

Usage

NYC/AMS...Internet2 statistics of Abilene/GÉANT2 peering at MAN LAN are available at: <http://stryper.uits.iu.edu/abilene/summary.cgi?network=nycm-geant-newyork&data=bits>.

GÉANT2 statistics are password protected; they are located at:

http://stats.geant.net/cgi-bin/cricket-1.0.2/grapher.cgi?target=%2Fbandwidth%2Fny1.ny.geant.net%2Fso-7_0_0:list-single-target=so-7_0_0;ranges=d%3Aw;view=Aggregate

CHI/AMS...L1 links cannot be monitored for usage, however the IRNC CHI/AMS link goes from the NetherLight HDXc into a Nortel ERX 8600 Layer-2 switch owned by the University of Amsterdam (UvA); statistics are at:

http://trafficlight.uva.netherlight.nl/cricket/grapher.cgi?ranges=d%3Aw;target=%2Fnortel%2Finterface%2Ften_giga_eth_8_3;view=octets.

Similarly, the IRNC CHI/AMS link goes from the StarLight HDXc into the StarLight Force10, for which MRTG usage diagrams are available. These graphs can be found at:

http://starlsd.sl.startup.net/mrtg/206.220.241.244_tengigabitethernet_1_1.html.

RENOG: Global NOC-NOC Communications

Following up on discussions at the CCIRN (Coordinating Committee on Intercontinental Research Networking) meeting www.ccirn.org, held April 26-27, 2006, Jim Williams is helping formulate RENOg to address some of the global issues that networks face today and will increasingly face in the future www.renog.org. While there is ongoing discussion on the usefulness of such a committee and its relationship to NANOG, it is a proactive step that TransLight/StarLight endorses. Network engineers from StarLight and TransLight/StarLight subscribed to the RENOg mailing list.

Measurement and Performance Tools

StarLight has a NDT server (ndt.sl.startup.net), an iperf server (iperf.sl.startup.net) with BWCTL software (bwctl.sl.startup.net) <Bandwidth Test Controller: <http://e2epi.internet2.edu/bwctl/>>, and an OWAMP server (owamp.sl.startup.net) (One-way Ping: <http://e2epi.internet2.edu/owamp/>).

The StarLight OWAMP server is currently being used to debug a network latency issue for the MINOS Project <http://www-numi.fnal.gov>> between the Soudan High Energy Physics Laboratory at the University of Minnesota and Fermilab. The iperf server has recently been used to debug a network performance issue with Argonne National Laboratory for the Southeast Regional Collaborative Access Team (SER-CAT) project <http://www.ser-cat.org>>.

These servers are each connected to the routed R&E networks, the CAVEwave lambda network, and the CHI/AMS TransLight/StarLight link.

Verlo will install the new network diagnostic tool Pathdiag, which Matt Mathis (PSC) announced at the July 2006 Joint Techs meeting, on StarLight's NDT server. Pathdiag <http://www.psc.edu/networking/projects/pathdiag/> is part of the NFS-funded Network Path and Application Diagnosis (NPAD) project at PSC and NCAR.

Verlo is also investigating Internet2's new perfSONAR tool <http://www.perfsonar.net/> to see if it will be useful and appropriate for StarLight. PerfSONAR is a joint project between Internet2, ESnet, and GÉANT2. CANARIE recently expressed interest in investigating this tool with StarLight as a possible GLIF GOLE resource.

¹ GLVF www.evl.uic.edu/cavern/glvf/ was launched in September 2005, and began as a group of international researchers and students participating in the iGrid 2005 Workshop who were designing and developing complementary, distributed visualization and collaboration technologies. These researchers decided to pool expertise, build on each other's successes, and integrate their work into a coherent whole, providing a unique model for international partnerships. GLVF's primary goals are to create de-facto international standards and integrated tools to enable advanced, real-time, interactive visualization and distance collaboration; to work with global scientific teams on the social science of collaboration, to both learn from and educate them on how to use these new technologies to transform the ways they do science; and, to globally train our students and junior faculty, the next-generation, globally-engaged workforce.

Services, Performance, Security, etc.

TL1 Toolkit...In July 2006, SARA announced the release of its TL1 Toolkit <<https://nrg.sara.nl/>>, which is available under an Apache License. This PERL library lets you execute TL1 commands without knowing the exact syntax and returns the output in a standard format. For example, if you work with different vendor devices or different model numbers, the TL1 syntax might be different, as well as the output. It's possible to retrieve information by calling a function or, if no function has been defined, it's possible to use the cmd() function to execute a TL1 function. This library currently has specific retrieve functions for Nortel OME6500, Nortel DWDM CPL, Nortel HDXc and Cisco ONS15454, but can be used to execute TL1 commands on *any* TL1 capable device using the cmd() function.

The TL1 Toolkit may prove useful for monitoring the StarLight/GOLE Nortel HDXc (and MAN LAN Nortel OME6500). In Chicago, both the TransLight/StarLight 10Gb circuit and the SURFnet 10Gb circuit terminate on the HDXc. Alan Verlo will investigate other potential applications for the TL1 Toolkit.

Network Description Language...SARA (which operates the NetherLight exchange in Amsterdam) and the University of Amsterdam are developing a network description language based on RDF. To gain practical experience with it, they had made descriptions of many of the GLIF Open Lambda Exchanges (GOLEs), with each being represented as a virtual device with interfaces connecting to other GOLEs. From this, optimal routing and pictures of the topology can be generated.

Internet2...Internet2, ESnet, GÉANT2 and CANARIE are collaborating on a number of issues. On July 11-12, 2006, technical representatives met in Ottawa, Ontario to coordinate network technology development and deployment efforts, including: deployment of next-generation hybrid services between the participant networks, coordinated development of control plane technologies to provision such services, the review of joint development work underway in the area of performance monitoring and measurement tools and infrastructure, network operations security coordination and the development of federated identity, and authentication and authorization infrastructures to support many of these advanced network services. Notes from the meeting will be posted online at <<http://www.geant2.net/server/show/nav.1227>>.

2.A.4. Meeting and Conference Participation

TransLight/StarLight principals have participated in the following meetings and conferences to promote IRNC:

July 25, 2006. Tom DeFanti and Maxine Brown participated in the monthly IRNC phone call.

July 17, 2006. Alan Verlo and Linda Winkler participated in a monthly phone call of network engineers from the major GLIF Open Lambda Exchanges (GOLEs) worldwide.

July 16-20, 2006. Alan Verlo and Linda Winkler attended the Summer 2007 ESCC/Internet2Joint Techs Workshop, Madison, WI. They also attended the JET meeting (July 19).

July 14, 2006. Michael Seablom, Head, Software Integration & Visualization Office at NASA Goddard, visited EVL to discuss applying LambdaRAM to prefetch data (not images) for NASA's Modeling, Analysis, and Prediction (MAP '06) project, which executes NASA's large global atmospheric model as well as NCAR's regional model for near real-time support for operations during this year's hurricane season. The goal is to reduce the substantial I/O latency in the analysis segment, which idles NASA's processors for 25-50% of the execution. Also accompanying him were Horace Mitchell, Brice Womack, Robert Burns, Robert Link and Pat Gary. In addition to LambdaRAM discussions, Jason Leigh, Luc Renambot and Maxine Brown showed them SAGE running on the 100-Megapixel tiled display, and there was discussion of visualization applications for which these technologies would be appropriate. *Note: LambdaRAM was tested and evaluated over the IRNC link between Chicago and Amsterdam.*

June 27, 2006. Tom DeFanti and Maxine Brown participated in the monthly IRNC phone call.

June 22-23, 2006. Tom DeFanti gave a keynote on "Global Lambda Exchanges" at the International Conference on IP + Optical Network 2006 (iPOP), Tokyo, Japan, sponsored by Japan's Photonic Internet Forum (PIF), Photonic Internet Lab (PIL), and ISOCORE <<http://pilab.org/ipop2006/>>. Also attending was Bernhard Fabianek of the European Commission.

June 20, 2006. Alan Verlo and Linda Winkler participated in the monthly JET meeting at NSF.

June 14, 2006. Alan Verlo participated in a monthly phone call of network engineers from the major GLIF Open

Lambda Exchanges (GOLEs) worldwide.

June 12-15, 2006. Maxine Brown gave an “OptIPuter” presentation at the TeraGrid '06 conference in Indianapolis. <<http://teragrid.org/events/2006conference>>. TeraGrid featured Brown's presentation in an article published in:

“The OptIPuter: 21st Century E-Science”

GRIDtoday, June 26, 2006, by Faith Singer-Villalobos, Texas Advanced Computing Center
<http://www.gridtoday.com/grid/701815.html>

The above article was circulated by:

*CA*net-news*, Bill St. Arnaud <<http://lists.canarie.ca/pipermail/news/2006/000295.html>>
NLR News <<http://www.nlr.net>>

Other publications that picked up story:

“Futuristic optical system tackles image processing: OptIPuter clustering system outlined at TeraGrid '06 conference”

NetworkWorld.com, 06/15/06, by Carolyn Duffy Marsan, NetworkWorld.com
<http://www.networkworld.com/news/2006/061506-optiputer.html>

“Futuristic Optical System Tackles Image Processing”

CIO India, reprinted from NetworkWorld.com, 06/15/06
<http://www.cio.in/news/viewArticle/ARTICLEID=1607>

“10 cutting-edge network research projects you should know about” (includes “Futuristic optical system” article that appeared in their magazine 6/15/06)

NetworkWorld.com, June 27, 2006, Network World Staff,
<http://www.networkworld.com/news/2006/062706-alpha-doggs.html>

SlashDot <<http://slashdot.org>> pointed to the above article on June 29, 2006.

Comments are at <<http://it.slashdot.org/article.pl?sid=06/06/29/0110220>>

May 31, 2006. US-India Summit on Education, Research & Technology <<http://us-india.calit2.net>> took place at Calit2/UCSD. India's Minister of Science & Technology and Ocean Development, the Hon. Kapil Sibal, led a delegation of top academics, government officials, corporate executives and other dignitaries from India for wide-ranging discussions with US counterparts. QUALCOMM CEO Paul E. Jacobs co-chaired the event with Jacobs School of Engineering Dean Frieder Seible, and Chancellor Marye Anne Fox welcoming attendees. A high point of the Summit was a keynote by Indian President APJ Abdul Kalam in high-definition video over optical fiber from the presidential palace in New Delhi to Calit2, organized by Tom DeFanti.

May 30, 2006. Maxine Brown participated in the monthly NSF IRNC phone call.

May 16, 2006. Alan Verlo and Linda Winkler participated in the monthly JET meeting at NSF.

May 12, 2006. Chip Cox (WHREN) visited UIC to talk with Tom DeFanti to catch up on international networking activities.

May 10, 2006. At the April 28th IRNC briefing to NSF/OISE at NSF headquarters, Bonnie Thompson, the NSF program manager responsible for US activities with Nordic countries, asked Maxine Brown to arrange an introduction to the head of NORDUnet (René Buch) during a trip she would soon be taking to Helsinki and Stockholm. They subsequently met in Stockholm on May 10. Buch sent follow-up email saying that, as a result of the meeting, “...I am sure that the NORDUnet / NSF cooperation will be even better in the future.”

May 9, 2006. Alan Verlo participated in a monthly phone call of network engineers from the major GLIF Open Lambda Exchanges (GOLEs) worldwide. Participating in the call were: Pieter de Boer, Andree Toonk and Ronald van der Pol (SARA), Akira Kato (T-LEX), Dongkyun Kim (KRLight), Bram Peeters (SURFnet), Thomas Tam (CANARIE), Christian Todorov (MANLAN), and Verlo and Linda Winkler (StarLight).

May 5-6, 2006. Maxine Brown attended a Global Environment for Networking Innovations (GENI) Town Hall Meeting in Chicago to better understand this initiative and how it relates to advanced international and national networking and applications.

May 4, 2006. Professors Ludek Matyska and Eva Hladka from Masaryk University in the Czech Republic visited

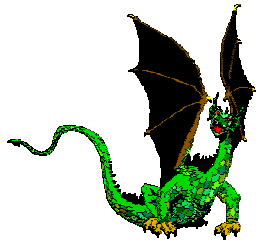
the UIC Electronic Visualization Laboratory to see our latest technologies and tools and discuss potential collaborations in networking, grids and collaboration. (Note: At the Internet2 Spring 2006 Member Meeting, April 23-26, Maxine introduced them to Jaroslav (Jarda) Flidr, a Czech who works on the DRAGON project at University of Maryland, and they had discussions about possibly extending the DRAGON testbed to Masaryk University.)

2.B. Research Findings

2.B.1. Research Findings for Current Quarter

E-Science Support (Quantified Science Drivers) Using IRNC-funded links

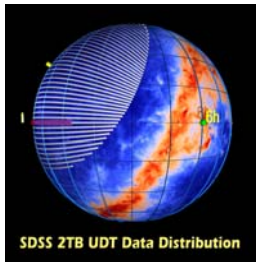
International collaborations are prevalent, collaborations include two or more continents, and more transoceanic links are becoming operational, so it is impossible to identify and document these applications – they are ubiquitous. Of interest to us, is to identify and serve high-end applications – that is, the data-intensive e-science applications requiring advanced networking capabilities – for they are the drivers for new networking tools and services to advance the state-of-the-art of production science. The following notable applications using the TransLight/StarLight CHI/AMS link took place in the preceding months.



DRAGON Update

The DRAGON project installed a 10GE switch and its VLSR code in Amsterdam in April, and was used for the Internet2 Member Meeting demonstration. This system is key to extending lightpaths to Onsala, Sweden for the eVLBI work. Further, University of Amsterdam's Network Description Language (NDL) work is similar to the DRAGON XML for application specific topologies, so the two groups are working together to integrate these into a single XML language that describes both physical and logical networks, and instantiates and configures them. Jerry Sobieski contacted Tom DeFanti in May to inquire whether DRAGON GMPLS software could be run over CAVEwave; lessons learned would be useful as DRAGON begins using the IRNC links for eVLBI development.

Note: Alan Verlo has made arrangements at StarLight for rackspace for the DRAGON PC and a 10G port on the StarLight Force10. Verlo is also configuring StarLight's Calient switch for use by the DRAGON and EnLIGHTened projects.



Correction: In the last report, I mentioned the science driver "Cluster-Decomposition Association Rule (CDAR)," Bob Grossman, principal investigator. The title is incorrect. It is actually "The TeraFlow Project: High Performance Flows for Mining Large Distributed Data Archives," supported by NSF OCI-0430781 for the period October 1, 2004 – September 30, 2007, principal investigators: Robert Grossman and Alex Szalay (Johns Hopkins University).

The TeraFlow Project: High Performance Flows for Mining Large Distributed Data Archives

www.ncdm.uic.edu

Collaborators

National Center for Data Mining (NCDM)/University of Illinois at Chicago; Johns Hopkins University; University of California, San Diego; NASA Goddard Space Flight Center; US University of Melbourne, Australia
Chinese Academy of Sciences (CAS) Computer Network Information Center, National Astronomical Observatory; China
Garching Computing Centre, Max Plank Institute for Plasma Physics, Germany
Institute for Cosmic Ray Research, University of Tokyo, Japan
Korea Astronomy & Space Science Institute; Korea Institute of Science and Technology Information; Korea
SARA Computing and Networking Services; University of Amsterdam; The Netherlands

With support from StarLight (US); TransPAC2 (US); JGN2 (Japan); KREONet2 (Korea)



OptIPuter: LambdaStream and LambdaRAM

www.evl.uic.edu/cavern/optiputer

OptIPuter-developed network tools being developed by UIC/EVL (and tested over IRNC links) are getting interest from other communities.

Harvey Newman wants to test UDP-based LambdaStream over the UltraLight infrastructure, and Michael Seablom, Head, Software Integration & Visualization Office at NASA Goddard, is interested in our modifying LambdaRAM, which prefetches sections of very large image from remote sites, to prefetch data for weather model simulations. EVL will modify LambdaRAM to prefetch data for NASA's Modeling, Analysis, and Prediction (MAP '06) project, which executes NASA's large global atmospheric model as well as NCAR's regional model for near real-time support for operations during this year's hurricane season. The goal is to reduce the substantial I/O latency in the analysis segment, which idles NASA's processors for 25-50% of the execution.

2.B.2. Plans for the Coming Quarter (Quarterly Reports Only)

TransLight/StarLight plans for August 1 – October 31, 2006, include:

- Complete new TransLight/StarLight website, to be completed this Fall
- Provision 1Gbps links on TransLight/StarLight CHI/AMS for demanding applications (DRAGON/eVLBI, LHC/CERN and OptIPuter/GLVF)
- Provision 3Gbps on TransLight/StarLight CHI/AMS for GLORIAD
- Continue to represent TransLight/StarLight at major conferences and workshops; and, continue to participate in network engineering JET and GOLE meetings
- Continue working to identify and develop production applications on both circuits.

2.C. Research Training

National Research Network (NRN) management and engineers from Internet2, ESnet, DANTE and NLR work closely with IRNC management and engineers at UIC and SURFnet, as well as at MAN LAN, StarLight, and NetherLight, to facilitate connectivity and greater advances in global networking than a single-investigator effort would afford. In addition, numerous researchers, middleware developers, network engineers and international NRNs are involved as users of TransLight/StarLight. This global, dedicated community has elected to work together, on a persistent basis, to further the goals of international e-science collaboration.

2.D. Education/Outreach

TransLight/StarLight's primary education and outreach activities include web documentation, journal articles, and conference presentations and demonstrations. We also provide PowerPoint presentations and other teaching materials to collaborators to give presentations at many conferences, government briefings, etc.

Since 1986, EVL has partnered with NCSA, ANL, and more recently NU/iCAIR, in ongoing efforts to develop national/international collaborations at major professional conferences, notably ACM/IEEE Supercomputing (SC), IEEE High Performance Distributed Computing (HPDC), and Internet2 meetings. We have participated in European conferences (e.g., GLIF/LambdaGrid Workshops), NORDUnet annual meetings and a UKERNA seminar on optical networking. Our success has been in the development of teams, tools, hardware, system software, and human interface models on an accelerated schedule to enable multi-site collaborations for complex problem solving.

We organized the iGrid 2005 in San Diego in September 2005, and participate in the annual SC conferences to promote the goals of IRNC and TransLight/StarLight.

3. Publications and Products

3.A. Journals/Papers

None this quarter.

3.B. Books/Publications

None this quarter.

3.C. Internet Dissemination

www.startap.net/translight

3.D. Other Specific Products

Other than the information reported here, we have not developed any other specific product of significance.

4. Contributions

4.A. Contributions within Discipline

TransLight/StarLight, by its very nature, is interdisciplinary. There is clearly a fine team of computer scientists, computational scientists and networking engineers involved with TransLight/StarLight, facilitating greater advances in global networking than single-investigator efforts could produce. TransLight/StarLight developed its management team in the Chicago area (UIC/EVL), and leverages the efforts of national networking group (Internet2, ESnet and NLR) and foreign NRN (DANTE and SURFnet) technical and administrative contacts.

4.B. Contributions to Other Disciplines

Within the Computational Science and the Computer Science communities, TransLight/StarLight efforts help lead 21st century discipline science and computer science innovation. TransLight's OC-192 L3 circuit among Abilene, ESnet and GÉANT2 provides greater transatlantic connectivity, and the OC-192 L2 circuit between StarLight and NetherLight provides a unique infrastructure to study the effects of long-distance, high-bandwidth networks on advanced applications.

4.C. Contributions to Human Resource Development

We promote TransLight/StarLight through web documentation, journal articles, demonstrations and presentations at major networking conferences (e.g., Supercomputing, HPDC), PowerPoint presentations and other instructional material. We teach the infrastructure, the grid advancements, the technological innovations and the application advancements that global connectivity enables. In fact, thanks to previous NSF funding of STAR TAP, StarLight and Euro-Link, we have a mailing list of ~1,000 <stars@startup.net> individuals, from academia, government and industry, interested in information about international advanced networking developments.

4.D. Contributions to Resources for Research and Education

TransLight/StarLight is a necessary and integral part of application advances and technological innovations for the Computational Science and Computer Science communities, as well as of major interest to network engineers. In particular, the L2 TransLight/StarLight circuit between StarLight and NetherLight is part of the GLIF LambdaGrid fabric and represents a major resource for science and technology.

4.E. Contributions Beyond Science and Engineering

Because of TransLight/StarLight's interest in advanced applications and light-path provisioning, we often get inquiries from network equipment manufacturers and telecommunication providers about partnering with us to create and showcase a marketplace for wavelength-based network services and products. We look forward to working with these companies and introducing them to the Nation's foremost university and Federal laboratory networking engineers, computer programmers and applications scientists, who are developing and using today's evolving grid technologies. Our users expect us to grow in capacity and sophistication, and we look forward to the engineering challenges ahead.

5. Special Requirements

5.A. Objectives and Scope

A brief summary of the work to be performed during the next year of support if changed from the original proposal.
Our scope of work has not changed.

5.B. Special Reporting Requirements

Do special terms and conditions of your award require you to report any specific information that you have not yet reported?
No.

5.C. Animals, Biohazards, Human Subjects

Has there been any significant change in animal care and use, biohazards, or use of human subjects from what was originally approved (or approved later)?
No.